

THREATENED ANIMALS OF KERALA

Report Submitted to
Kerala State Biodiversity Board

Edited by
Sureshan, P.M. Subramanian, K.A. & Md. Jafer Palot

**Zoological Survey of India,
Western Ghat Regional Centre, Kozhikode. 673006, Kerala.**





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Introduction

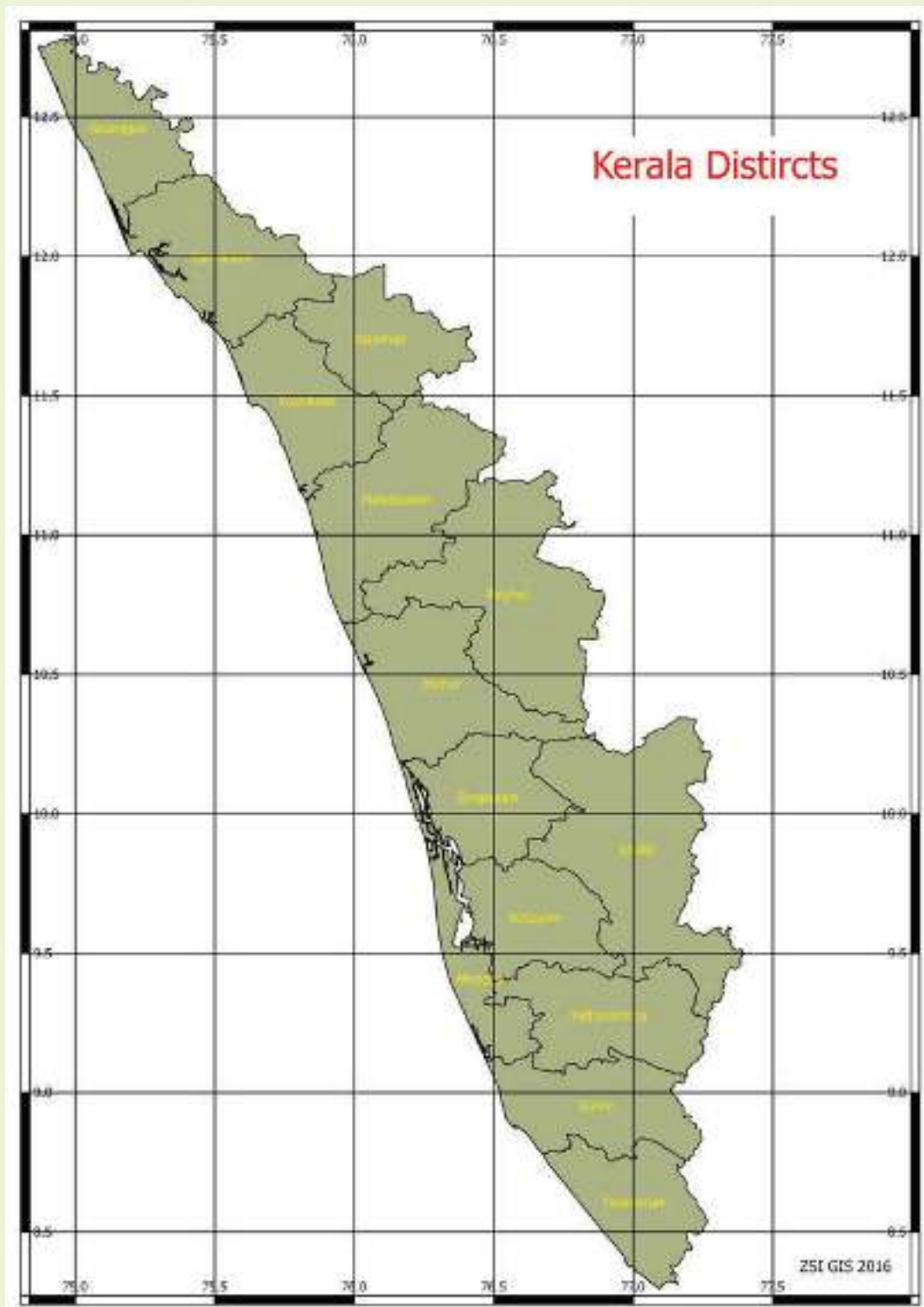
The biodiversity is facing unprecedented threat of extinction due to severe habitat loss triggered by anthropogenic pressure and impact of climate change. Major threats to natural resources include over harvesting, illegal trade, habitat destruction, invasive species, pollution, and other anthropogenic activities, many species of plants and animals are at the verge of extinction or are being destroyed by the activities of human beings. In this decade of ecosystem restoration, developing conservation strategies at local and regional level with people's participation is the way forward to achieve sustainable developmental goals. Though we have stringent laws to protect our biodiversity and wildlife, we have not achieved much progress in the matters of conservation of biodiversity outside protected areas. One of the main reasons for this is our poor knowledge on the status of biodiversity and lack of assessment of threat faced by species at various spatial scales. Without proper scientific assessment of the threats faced by various life forms it would be difficult to implement suitable programmes for their conservation.

The state of Kerala lies along the southern west coast of India between the latitudes $8^{\circ} 18'$ and $12^{\circ} 48'$ N and longitudes $74^{\circ} 52'$ and $77^{\circ} 2'$ E. It has a unique place in the geographical map of India, represented by a narrow coastal belt lying sandwiched between the Western Ghats on the east and Arabian Sea on the west. The State is bordered by Tamil Nadu on its Southern and Eastern part, Karnataka on the North and Eastern part, the Lakshadweep Sea on the West and the Indian Ocean along

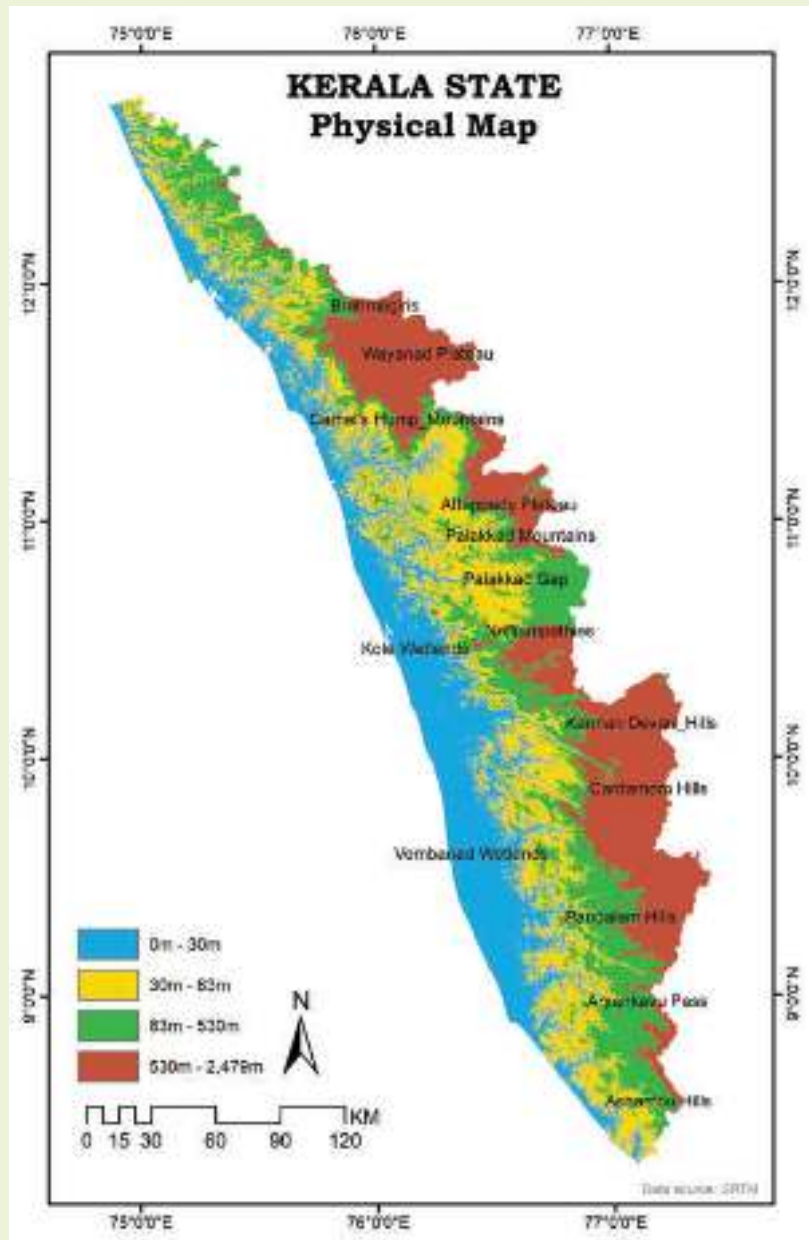
the South. The total land area of the state is 38,863 sq. km which accounts for about 1.2 per cent of the total geographical area of the country. The state is administratively divided into 14 districts and support about 2.76% of India's population which is estimated to be above 35 million. The State has a total coastline of about 579.35 km and from sea level it rises to about 2694 meter at Annamudi peak located in the Eravikulam National Park of Idukki district. Biogeographically the state is divided into three climatically distinct regions, viz. highland, midland and coastal lowland. More than 50% of the area is highland and mainly consist of Western Ghats. The midland is mainly of lateritic plateau with about 41% of the State. The lowlands are representing with only 10% of the state and consists of densely populated coastal plains, beach dunes, flood plains, wetlands, mangroves and swamps (Maps, 1 & 2).

The varied topographical features, high rainfall and geologic conditions have favoured the formation of varied ecosystems in Kerala from shola forests on the mountain valleys to the mangrove forests along sea coasts and estuaries. Almost 78 percent of the total land area of the State is under agriculture and habitation, and the remaining 22 percent of the land is under forests and forest plantations. Quite obviously, the pristine status of nature is better protected only in a limited area, and that too in the higher altitudes, whereas, most of the remaining area of the state is subjected to degradation and transformations of various types (Map 3).

Map 1



The most outstanding feature of the State is the formation of tropical rainforests along the windward side of the Southern Western Ghats, which is lying parallel to the west coast. A small extent of area of the State is along the rain shadow region the Western Ghats, where the vegetation is dominated by dry deciduous forests and scrub jungles. The wetlands are mostly confined to the low land region of the State. Champion and Seth (1968) recognized 26 forest types in Kerala of which the major ones are the west coast tropical evergreen, west coast semi-evergreen, southern moist mixed deciduous, southern dry mixed deciduous, southern montane wet temperate forests, southern subtropical hill forests, southern montane wet temperate grasslands and littoral forests (mangroves). Certain edaphic vegetational types recognized in the state are Bamboo brakes, Cane brakes, Reed brakes, Euphorbiaceous scrub jungles, laterite thorn forests and Myristica swamp forests. Based on dynamics, they recognized secondary forests such as secondary evergreen, secondary moist deciduous, secondary dry deciduous, etc.



The varied ecosystems in the state support a rich flora and fauna. Till the middle of nineteenth century, 70% of the geographical area of Kerala was under dense forest cover. However, during the beginning of 20th century this was reduced to less than 50%. In the pre- independent Kerala there was no significant steps undertaken for the wildlife conservation in the state since the focus during the period was on revenue oriented forest management. The

first official action towards the conservation of wildlife and biodiversity in Kerala was taken in 1934 by the Maharaja of the Princely state of Travancore, Chithira Thirunal Balarama Varma, by declaring the forests around Periyar lake as a private game reserve to stop the encroachment of tea plantations. The area was declared as Nellikampatty Game Reserve. Currently, the total forest area in the state is 10,566 km² (201-16), forming 27.19% of the total geographic area. There are five national parks, 2 tiger reserves, 15 wildlife sanctuaries, 3 bird sanctuaries and one community reserve with a total area of 3441.2072 km² which cover 32.6% of the total forest area and 8.9% of the geographical area of Kerala state.

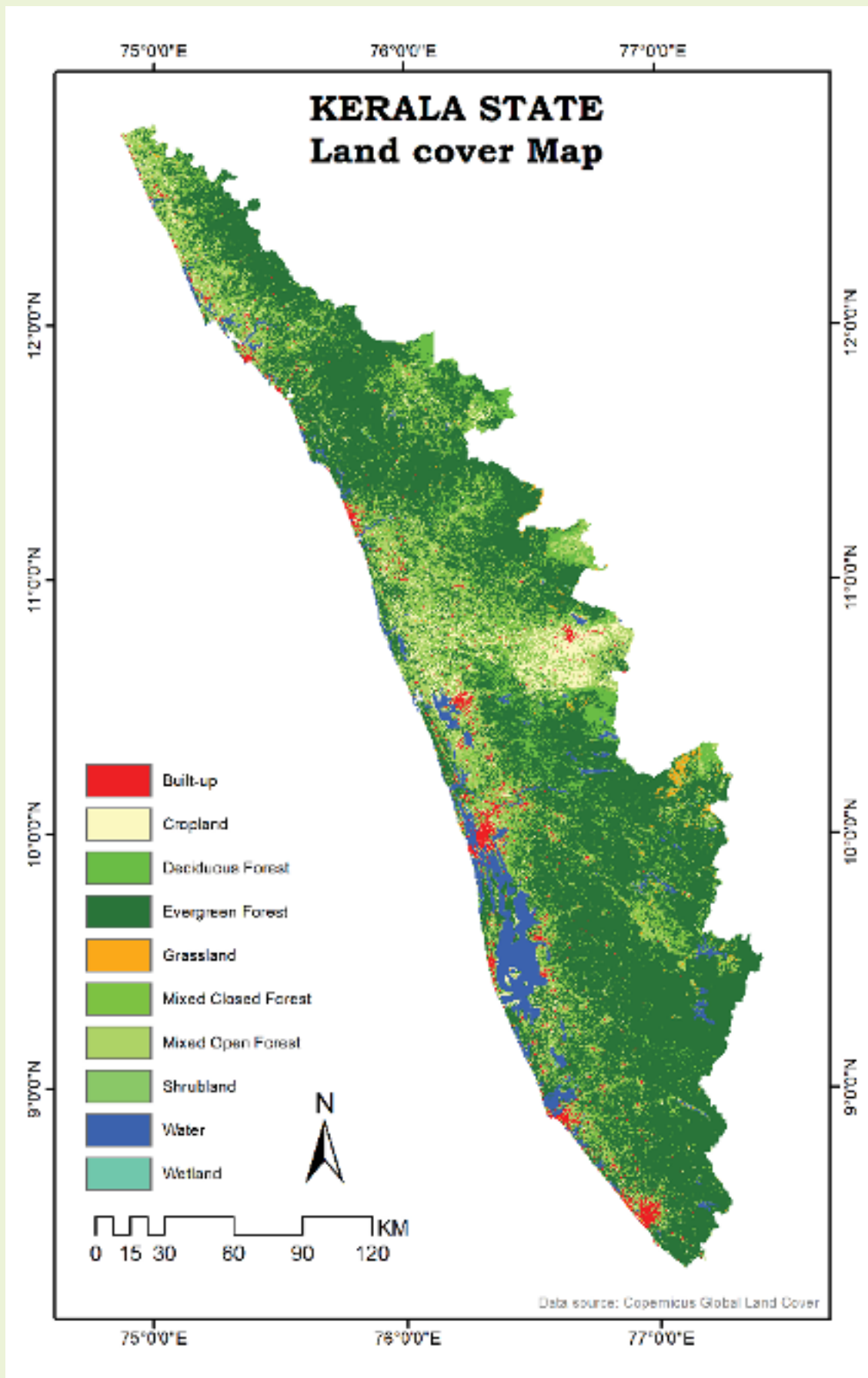


Table 1

Protected Areas (PAs) of Kerala

Name of WLS/NPs	G.O. No. & Date	Year of Formation	Total Area in sq. km
National Parks			
Eravikulam National Park	G.O.(MS)142/78 dated 19-05-1978	1978	97.0000
Silent Valley National Park	GO-5462/FSA3/82/AD dated 15.11.84	1984	237.5200
Anamudi Shola National Park	G.O.12876/F2/2003/F&WLD dated 14-12-2003	2003	7.5000
Mathikettan Shola National Park	GO(MS)No.50/2003/F&WLD dated 10-10-2003	2003	12.8170
Pambadum Shola National Park	G.O.12875/F2/2003/F&WLD dated 14-12-2003	2003	1.3180
Tiger Reserves & Wildlife Sanctuaries			
Parambikulam Wildlife Sanctuary (Tiger Reserve)	GO(P)39/73/AD dated 12..02..1973	1973	643.6600
	GO(P) No. 443/06/F&WLD dated 31..10..2006	2006	
Periyar Wildlife Sanctuary (Tiger Reserve)	F1-2854/AD dated 11-08-1950 G-11025/34/FRY(PT) dated 29-08-1977	1950	925.0000
		1977	
Neyyar WLS	GO(MS)871/58 dated 06..08..1958	1958	128.0000
Peechi-Vazhani WLS	GO(MS)871/58 dated 06..08..1958	1958	125.0000
Wayanad WLS	GO(MS)182/73/AD dated 30..05..1973	1973	344.4400
Idukki WLS	GO.7898/FM3/76/AD dated 09.02.76	1976	70.0000
Peppara WLS	GO(P)379/83/AD dated 21..12..1983	1983	53.0000
Thattekkad B.S	GO.35743/FM3/83/AD dated 27..08..83	1983	25.0000
Shendurney WLS	GO(P)258/84/AD dated 25..08..1984	1984	171.0000
Chinnar WLS	GO(P)229/84/AD dated 04..08..1984	1984	90.4400
Chimmony WLS	GO(P)259/84/AD dated 25..08..1984	1984	85.0000
Aralam WLS	GO(P)300/84/AD dated 15..10..1984	1984	55.0000
Mangalavanam Bird Sanctuary	G.O(MS) No.42/04/F&WLD dated 31..08..2004	2004	0.0274
Kurinjimala Sanctuary	G.O.(P)36/2006/F&WLD dated 06-10-2006	2006	32.0000
Choolannur Pea Fowl Sanctuary	G.O.(P) 24/2007/F&WLD dated 15-05-2007	2007	3.4200
Malabar WLS	G.O (P) 26/2009 / F&WLD dated 05-06-2009	2009	74.2150
Kottiyoor WLS	G.O (P) 17/2011 / F&WLD dated 01-03-2011	2011	30.3798
Karimpuzha WLS	G.O. (P) No. 9/2019/F&WLD dated 17-08-2019	2019	227.97
Community Reserve			
Kadalundi-Vallikunnu Community Reserve	G.O(MS)No.66/2007/F&WL dated 17-10-2007	2007	1.5000
TOTAL			3441 .2072

Due to increasing anthropogenic pressure and habitat destruction, population of many species of animals are declining in the state which is not assessed properly for initiating appropriate conservation interventions. For many species found in the state which are listed in the threatened category of IUCN and various schedules of Indian Wildlife (Protection) Act, proper assessments were not undertaken at regional level or global assessments are not updated. Apart from the species listed in IUCN Redlist, the Schedules of Wildlife (Protection) Act and CITES, several other species are also facing serious threat of extinction due to habitat destruction, over exploitation, climate change and lack of proper conservation intervention. Though many species listed in the threatened categories of IUCN are getting proper protection inside protected area network, their population surviving outside protected areas need urgent attention for initiating measures for conservation. Many species of invertebrates are rare and several endemic species are not listed in IUCN Redlist, Wildlife Act (Protection), CITES etc. Assessment of the surviving populations of threatened species of Kerala such as the present status of their population, habitat, threats etc. need to be undertaken immediately in order to recommend them for including in the red data book and also to develop programmes for their conservation.

The vertebrate diversity of Kerala is relatively well documented and IUCN Redlist assessments has been completed for many of the groups. However, the invertebrate diversity is not fully known and threat assessment is attempted only for a few groups. Species which are assessed as not threatened at global or country level may face threat of local extinction. Though there are many scientific publications on both invertebrates and vertebrates in Kerala, a compilation of the status of individual groups or species are so far not attempted which is very essential for their conservation or protecting them from further decline. In this context, it is imperative to assess the threatened status of many animal species or groups from the conservation point of view by the joint efforts of Kerala State Biodiversity Board, Kerala Forest Department, local administrative bodies, NGOs and individual experts.

An attempt has been made here to present the threat status of vertebrate animal groups and selected invertebrate animal groups from Kerala following IUCN assessment guidelines. In the case of freshwater fishes and birds, a regional level assessment has been attempted and findings are presented here and in the rest of the taxa dealt, the assessments are carried out by taxa experts based on available regional data or by extracting data from IUCN global assesment. The present work is undertaken by different taxa experts, many of them are members of IUCN taxa specialist groups.

IUCN is the international agency working for the conservation of nature and natural resources and their sustainable utilisation for the benefit of the mankind. The IUCN Red List of Threatened Species is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of quantitative criteria to evaluate the extinction risk of species globally. IUCN conducts studies on the assessment of extinction risk faced by different life forms and grade them in to different categories for prioritisation of conservation activities. This process of assessment is being continuously undertaken by the experts working on different groups under the guidelines of IUCN. The aim of the publication of IUCN Redlist is to convey the message of the urgency of conservation issues to the public and policy makers, as well as to help the international community to try to reduce species extinctions.

Though IUCN Red List Categories and Criteria were designed for global taxon assessments, many people are interested in applying them as subsets of global data, especially at regional, national or local levels. According to IUCN Red List Categorisation, species are at high risk of global extinction are classified into various categories such as Extinct (EX), Extinct in the wild (EW), Critically endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Not Evaluated (NE) Data Deficient (DD) and Least Concern (LC). Threat assessment of life forms are also being undertaken at regional level (country, region etc) by following guidelines of IUCN. Though many plant and animal species of Kerala find a place in various IUCN Red lists, none of the animal groups are assessed at the Regional (State) level.

EXTINCT (EX)

A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

EXTINCT IN THE WILD (EW)

A taxon is Extinct in the Wild when it is known only to survive in the cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a period appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when the best available evidence indicates that it is not Extinct and it is considered to be facing an extremely high risk of extinction in the wild. Survey should be over a time appropriate to the taxon's life cycle and life form.

ENDANGERED (EN)

A taxon is Endangered when the best available evidence indicates that it is not Critically Endangered but is considered to be facing a very high risk of Extinction in the wild in the near future, as defined by any of the criteria.

VULNERABLE (VU)

A taxon is Vulnerable when the best available evidence indicates that it is not Critically Endangered or Endangered but is therefore considered to be facing a high risk of extinction in the wild in the medium-term future, as defined by any of the criteria.

NEAR THREATENED (NT)

A taxon is near Threatened when it has evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is

close to qualify for or is likely to qualify for a threatened category in the near future.

LEAST CONCERN (LC)

A taxon is Least concern when it have been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are indicated in this category.

DATA DEFICIENT (DD)

A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of this taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available.

In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

NOT EVALUATED (NE)

A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.

Section 38 in THE BIOLOGICAL DIVERSITY ACT, 2002

Power of central government to notify threatened species –without prejudice to the provisions of any other law for the time being in force, the central government, in consultation with the concerned state government, may from time to time notify any species which is on the verge of extinction or likely to become extinct in the near future as a threatened species and prohibit or regulate collection there for any purpose and take appropriate steps to rehabilitate and preserve those species.

With a view to develop a Red data book of threatened species of Kerala, Kerala State Biodiversity Board (KSBB) has assigned a project to Zoological Survey of India, Western Ghat Regional Centre, Calicut to prepare a Red data Book on threatened species of Kerala (Terrestrial fauna including freshwater fauna). KSBB also desires to publish a list of species which require urgent conservation in Kerala scenario and need to be notified under section 38 of Biological Diversity Act (2002) to ensure their conservation and also to develop the data of species which face threat due to commercial trading in order to ensure their protection and sustainable harvesting. The duration of the project was 10 months; the fund was released during the end of August 2020 and accordingly, an MOU was signed between KSBB and ZSI, WGRC, Calicut with the following objectives.

Objectives of the Study

- To Prepare a Red data book of threatened species for Kerala (major terrestrial fauna including fresh water fauna) following the guidelines of IUCN red list criteria at regional level.
- Developing a priority list of species (mainly vertebrates and few invertebrates) for conservation and local action and species to be notified under Section 38 of Biological Diversity Act, 2002.
- Preparation of a list of species commercially traded and suggest recommendations for sustainable management measures.

Methodology

Assessment of extinction risk of fauna at regional level following IUCN guideline can be undertaken by two ways such as 1) to publish an unaltered subset of the global IUCN redlist containing those species that reproduce in the region or at any stage regularly visit the region or 2) to assess species

extinction risk within the region and publish Red lists. The second option involves many practical difficulties and in most of the cases it is not practical due to the lack of enough data regarding assessment of populations, handling non-breeding populations and non-indigenous taxa. In Kerala there were no previous attempts to assess the taxa at regional level. Because of this reason, in the present document the following methodology has been adopted for the preparation of the list of threatened fauna.

Ten faunal groups such as Mammalia, Aves, Reptiles, Amphibia, Pisces (Freshwater fishes), Lepidoptera (Butterflies), Odonata, Araneae (Mygalomorph spiders), Crustacea (Freshwater crabs) and Mollusca (Non marine molluscs) are considered for threat assessment. Faunal groups such as birds (Aves) and freshwater fishes (Pisces) for which enough data available are assessed here following the guidelines of IUCN regional level assessment by the taxa experts. For the faunal groups such as mammals, reptiles, amphibians, butterflies, dragonflies, mygalomorph spiders, freshwater crabs and molluscs, list of the threatened species occurring in the state are prepared as per the latest Redlist published by IUCN and suitable comments or suggestions are provided for upgrading or downgrading their status based up on the data available at state level. Priority list of species for conservation and local action and species to be notified under section 38 of Biological Diversity Act, 2002 and list of species commercially traded in the above taxa were also identified by the working groups. In order to achieve the above targets, expert group leaders were selected to co-ordinate the assessment work in the different faunal groups and they were given freedom to invite maximum number of experts working in that taxa.

EXECUTIVE SUMMARY OF THREAT ASSESSMENT

Summary of threat assessment of selected animal groups from Kerala is provided below in the form of a table (Table.2). Ten animal groups such as Mammals (excluding marine species) Birds, Reptiles (excluding marine species) , Amphibia, Freshwater fishes, Butterflies, Odonata, Freshwater crabs, Non marine molluscs and Myglaomorph spiders are selected for the threat assessment studies. Among these, Butterflies and Non marine molluscs are not assessed by IUCN till date. Except for these groups, a total of 252 species of animals face threat of extinction under various categories of IUCN global red list assessment in Kerala scenario. Birds and freshwater fishes of Kerala are assessed regionally by following the guidelines of IUCN Regional level assessment by expert groups and 20 species of birds and 35 species of freshwater fishes face threat of extinction in Kerala. For the remaining groups, species are assigned various threat categories based

on different criteria such as rarity, endemism, taxonomic distinctiveness, microhabitat preferences, level of threat etc. at regional level (Kerala) and probable upgrading or downgrading of global IUCN status are also proposed. A total of 37 animal species belonging to the above groups are recommended for inclusion under section 38 of Biological Diversity Act, 2002 taking in to consideration various threats faced by them. Among the vertebrates, amphibia contains maximum number of endemic species followed by freshwater fishes and reptilia. Many endemic species of amphibians and freshwater fishes are known only from the type locality or having limited distribution in the state and many of them are devoid of required data for a regional level assessment as per IUCN guidelines. Among invertebrates non marine molluscs are represented by maximum number of endemic species followed by freshwater crabs.

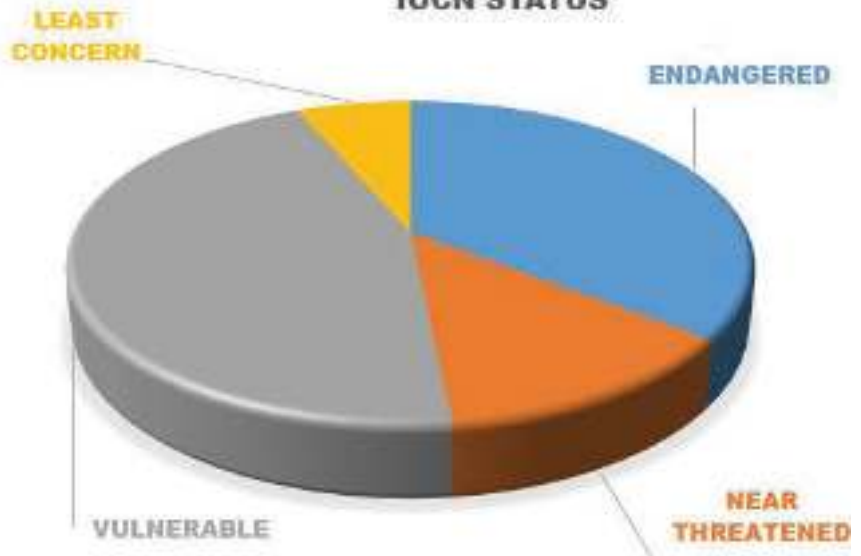
Table. 2
Threatened animals of Kerala

Taxa	Diversity						
	Family	Genera	Species	Endemic Species to Kerala	No. of Species Globally Threatened as per IUCN	No. of Species Threatened as per Regional Assessment	No. of species recommended for conservation under Section 38 of BD Act
Terrestrial Mammals	31	67	101	01	31	--	03
Birds	86	285	540	_	43	20	07
Reptiles	24	79	201	14	25	54	02
Amphibia	11	30	186	59	54	--	03
Freshwater fishes	36	84	196	53	58	35	09
Butterflies	06	168	326	_	--	49	05
Odonata	13	117	175	2	11	38	02
Freshwater crabs	01	14	35	24	08	15	04
Mygalomorph spiders	03	09	18	_	04	-	02
Non marine mollusca	12	34	96	75	--	03	_
Total					234	214	37

MAMMALS



**THREATENED MAMMALS OF KERALA
IUCN STATUS**



A total of 101 species of terrestrial mammals belonging to 67 genera under 31 families and 11 orders are recorded from Kerala (Nameer, 2015 & Jafer, 2020). Of these, 15 species are endemic to Western Ghats and one species Ranjini's field rat *Rattus ranjinae* is known only from Kerala. The occurrence of some species such as Malabar civet *Viverra civettina*, the fishing cat *Prionailurus viverrinus* and Eurasian otter *Lutra lutra* within the political boundary of Kerala have been ruled out by recent studies. As per the IUCN global assessment 2011, thirty one species of mammals are included in various threatened categories and out of these, Spiny Tree Mouse *Platacanthomys lasiurus* Blyth, Madras tree shrew, *Anathana ellioti* (Waterhouse) and Bare bellied

Hedgehog, *Paraechinus nudifentris* (Horsfield) are recommended for inclusion under section 38 of Biological Diversity Act 2002 and eight species face threat due to wild life trade. Another 31 species of marine mammals are also reported from the coastal boundaries of Kerala which are not dealt here since Central Marine Fisheries Research Institute (CMFRI) Kochi is providing the threat status of those species separately. However, the names of 31 species of marine mammals of Kerala are included in the checklist of Kerala mammals provided as a separate appendix in this document. The details of regional level assessment are given separately for 31 species of terrestrial mammals of Kerala .

Table. 3 Threatened Terrestrial Mammals of Kerala

(Based on IUCN assessment) (Ver. 2021-1)

Abbreviations: CR–Critically Endangered; EN–Endangered; VU– Vulnerable; NT–Near Threatened .LC- Least concern, DD- Data deficient, NE -Not Evaluated, KL- Kerala; TN- Tamil Nadu; KA- Karnataka; GA- Goa; MH- Maharashtra, WPA - Wildlife Protection Act.

Sl No	Common English name	Species	Malayalam name	IUCN Status	WPA	CITES	Endemism
1	Asian Elephant	<i>Elephas maximus</i> Linnaeus, 1758	ആന	EN	Schedule I	Appendix I	
2	Gray Slender Loris	<i>Loris lydekkerianus</i> Cabrera, 1908	കൂട്ടിത്തേന്മണ്ട്	NT	Schedule I	Appendix II	
3	Lion-tailed Macaque	<i>Macaca Silenus</i> (Linnaeus, 1758)	സിംഹവലൻ കുരങ്ങ്	EN	Schedule I	Appendix I	Western Ghats
4	Black-footed Gray Langur	<i>Semnopithecus hypoleucos</i> Blyth, 1841	കരിങ്കയ്യൻ കുരങ്ങ്	VU	Schedule II	Appendix I	Western Ghats
5	Nilgiri Langur	<i>Semnopithecus johnii</i> (J. Fischer, 1829)	കരിംകുരങ്ങ്	VU	Schedule I	Appendix II	Western Ghats
6	Tufted Gray Langur	<i>Semnopithecus priam</i> Blyth, 1844	തൊപ്പിപ്പനുമ്മൻ കുരങ്ങ്	NT	Schedule II	Appendix I	
7	Grizzled Giant Squirrel	<i>Ratufa macroura</i> (Pennant, 1769)	ചമ്പൻഅണ്ണാൻ	NT	Schedule I	Appendix II	
8	Travancore Flying Squirrel	<i>Petinomys fuscocapillus</i> (Jerdon, 1847)	കുന്നൻപറന്നൻ	NT	Schedule I		
9	Nilgiri Palm Squirrel	<i>Funambulus sublineatus</i> (Waterhouse, 1838)	കുന്നൻഅണ്ണാൻ	VU			Western Ghats
10	Spiny Tree Mouse	<i>Platacanthomys lasiurus</i> Blyth, 1859	മുളളലി	VU	Schedule V		Western Ghats
11	Bonhote's Mouse	<i>Mus famulus</i> Bonhote, 1898	കാട്ടുചുണ്ടലി	EN	Schedule V		Western Ghats
12	Ranjini's Field Rat	<i>Rattus ranjinae</i> Agarwal and Ghosal, 1969	നെല്ലലി	EN	Schedule V		Kerala
13	Sahyadris Forest Rat	<i>Rattus satarae</i> Hinton, 1918	സഹ്യാദ്രികാട്ടലി	VU	Schedule V		Western Ghats
14	Nilgiri Vandeleuria	<i>Vandeleuria nilagirica</i> Jerdon, 1867	വലൻചുണ്ടലി	EN	Schedule V		Western Ghats
15	Kelaart's Long-clawed Shrew	<i>Feroculus feroculus</i> (Kelaart, 1850)	സിദ്ധൻ നച്ചല	EN			

Mammal species of Kerala recommended for

inclusion under		biological diversity act, 2002.					Western Ghats
6	Days Shrew	<i>Suncus dayi</i> (Dobson, 1888)	കാട്ടുനരിച്ചെലി	EN			
17	Indian Pangolin	<i>Manis crassicaudata</i> E. Geoffroy, 1803	ഈനാമ്പെലി	EN	Schedule I	Appendix II	
18	Indian wild dog	<i>Cuon alpinus</i> (Pallas, 1811)	കാട്ടുനായ	EN	Schedule II	Appendix II	
19	Sloth Bear	<i>Melursus ursinus</i> (Shaw, 1791)	കരടി	VU	Schedule I	Appendix I	
20	Nilgiri Marten	<i>Martes gwatkinsi</i> Horsfield, 1851	മരനായ	VU	Schedule II	Appendix III	Western Ghats
21	Asian Small-clawed Otter	<i>Aonyx cinereus</i> (Illiger, 1815)	മലനീരനായ	VU	Schedule I	Appendix II	
22	Smooth-coated Otter	<i>Lutrogale perspicillata</i> (I. Geoffroy Saint-Hilaire, 1826)	നീരനായ	VU	Schedule II	Appendix II	
23	Rusty-spotted Cat	<i>Prionailurus rubiginosus</i> (I. Geoffroy Saint-Hilaire, 1831)	തൂരുമ്പിൻപൂച്ച	VU	Schedule I	Appendix I	
24	Fishing cat	<i>Prionailurus viverrinus</i> (Bennett, 1833)		VU	Schedule I		
25	Leopard	<i>Panthera pardus</i> (Linnaeus, 1758)	പുള്ളിപ്പുലി	NT	Schedule I	Appendix I	
26	Tiger	<i>Panthera tigris</i> (Linnaeus, 1758)	കടുവ	EN	Schedule I	Appendix I	
27	Barking Deer	<i>Muntiacus muntjak</i> (Zimmermann, 1780)	കേശമന്ത്	LC	Schedule III		
28	Sambar Deer	<i>Rusa unicolor</i> (Kerr, 1792)	കലമന്ത്	VU	Schedule III		
29	Gaur	<i>Bos gaurus</i> Smith, 1827	കാട്ടുപേരത്ത്	VU	Schedule I	Appendix I	
30	Four-horned Antelope	<i>Tetracerus quadricornis</i>	ഉല്ലമന്ത്	VU	Schedule I		
31	Nilgiri Tahr	<i>Nilgiritragus hylocrius</i>	വരയാട്	EN	Schedule I		Western Ghats

Sl.no.	Common name	Scientific Name	Justification
1	Spiny Tree Mouse	<i>Platacanthomys lasiurus</i> Blyth	This species is sensitive to habitat changes. Habitat loss is due to expansion of coffee and tea plantations, agro-industry based farming activities, and forest fires. To maintain healthy population large areas of undisturbed rainforests is needed (Mudappa et al, 2001). Consumed because of medicinal value. Moreover not listed in any of the schedules of wildlife protection Act
2.	Madras tree shrew	<i>Anathana ellioti</i> (Waterhouse)	Threat due to habitat loss, denudation for agriculture, thinning out of forest, plantation, development activities - construction of dams and roadways.
3.	Bare-bellied Hedgehog	<i>Paraechinus nudiventris</i> (Horsfield)	Threat due to expansion of agriculture and pesticide usage

Mammal species of Kerala which are in commercial trade

Due to strict enforcement of wildlife protection act, the trade of mammal species and their body parts are not much active in Kerala. But due the high demand of tiger body parts, scales of pangolin, civet, skin of otters etc. are secretly hunted by local

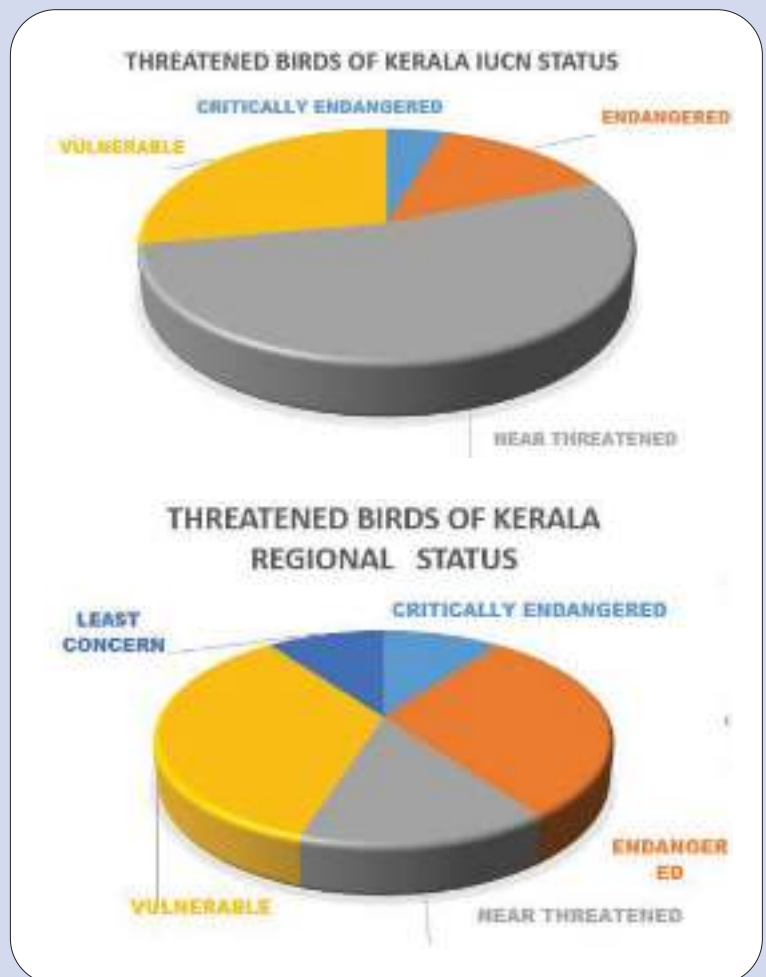
people. Due the ban of export of Ivory, hunting of elephants is drastically reduced in the state. Different species of mongoose are hunted for their valuable hairs which are used for making painting brush.

Sl. No	Order/Family	Scientific name	Common Name	Malayalam Name
1	PRIMATES Lorisidae	<i>Loris lydekkerianus</i> Cabrera, 1908	Grey Slender Loris	കുട്ടിഭരതന്മക്
2	RODENTIA Sciuridae	<i>Ratufa indica</i> (Erxleben, 1777)	Malabar Giant Squirrel	മലയണ്ണാൻ
3	RODENTIA Platacanthomyidae	<i>Platacanthomys lasiurus</i> Blyth , 1859	Spiny Tree Mouse	മുളളളലി
4	ERINACEOMORPHA Erinaceidae	<i>Paraechinus nudiventris</i> (Horsfield, 1851)	Bare-bellied Hedgehog	ഇത്തിശപന്നി
5	PHOLIDOTA Manidae	<i>Manis crassicaudata</i> E. Geoffroy, 1803	Indian Pangolin	ഇന്നാപേച്ചി
6	CARNIVORA Mustelidae	<i>Lutrogale perspicillata</i> (I. Geoffroy Saint-Hilaire, 1826)	Smooth-coated Otter	നിർനായ
7	CARNIVORA Viverridae	<i>Viverricula indica</i> (E. Geoffroy Saint-Hilaire, 1818)	Small Indian Civet	പുവെരുക
8	CARNIVORA Herpestidae	<i>Herpestes edwardsii</i> (E. Geoffroy Saint-Hilaire, 1818)	Indian Grey Mongoose	നാടൻ കീരി

BIRDS (AVES)



According to the recent checklist 540 species of birds are reported from Kerala. (Chandran et al. 2020). Of these, 43 species fall under various threatened categories of the IUCN global assessment. However, the threat levels of various species within Kerala are different from the global threat levels. In the present work, 20 species are categorised under various categories of IUCN regional level assessment out of a total of 37 species assessed. Out of the 20, seven species are considered as of high conservation priority for Kerala and 13 are of moderate conservation priority. Seven species of high conservation priority are recommended for inclusion in Section 38 of Biological Diversity Act.



THREATENED BIRDS OF KERALA

(As per IUCN Redlist)

Note: Vagrant species are excluded

1 No	Species	Malayalam Name	IUCN Category	Status in Kerala
1	Red-headed Vulture <i>Sarcogyps calvus</i>	കാതിലക്കുഴുകൻ	CR	Rare resident in Wayand WLS
2	White-rumped Vulture <i>Gyps bengalensis</i>	ചുട്ടിക്കുഴുകൻ	CR	Uncommon resident in Wayanad WLS
3	Great Knot <i>Calidris tenuirostris</i>	കിഴക്കൻനട്ട്	EN	Wintering sparingly in the undisturbed beaches, north of Kollam district
4	Black-bellied Tern <i>Sterna acuticauda</i>	കരിവയറൻ അള	EN	Lower Bharathapuzha river basin but breeding population possibly extinct.
5	Steppe Eagle <i>Aquila nipalensis</i>	കായൽപ്പരുന്ത്	EN	Rare winter visitor to coastal wetlands
6	Banasura Laughingthrush <i>Montecincla jerdoni</i>	ബാണാസുരചിലപ്പൻ	EN	Restricted to the sky islands of Aralam WLS, Banasura and Camel's Hump Mountains.
7	Nilgiri Laughingthrush <i>Montecincla cachimans</i>	നീലഗിരിചിലപ്പൻ	EN	Restricted to the sky islands of Silent Valley NP, Attappady RF, Muthikulam and Palakkad RF
8	Nilgiri Sholakili <i>Sholicola major</i>	ചെമ്പുവയറൻ ചോലക്കിളി	EN	Restricted to the sky islands north of Palakkad gap
9	Nilgiri Wood Pigeon <i>Columba elphinstonii</i>	മരപ്രാവ്	VU	Uncommon resident in the Western Ghats
10	Woolly-necked Stork <i>Ciconia episcopus</i>	കരുമ്പരക്കുരു, വക്കീൽക്കൊക്ക്, കന്യാസ്ത്രീക്കൊക്ക്	VU	Breeding in Bharathapuzha basin and Periyar TR but common winter visitor to all wetlands
11	Lesser Adjutant <i>Leptoptilos javanicus</i>	വയൽനായ്ക്കൻ	VU	Very rare. Restricted to the forested wetlands of Wayanad, Nilambur and Parambikulam WLS.
12	Indian Spotted Eagle <i>Clanga hastata</i>	ചെറിയ പുളളിപ്പരുന്ത്	VU	Uncommon winter visitor to large coastal wetlands
13	Greater Spotted Eagle <i>Clanga clanga</i>	വലിയ പുളളിപ്പരുന്ത്	VU	Regular winter visitor to large coastal wetlands
14	Great Hornbill <i>Buceros bicornis</i>	മലമുഴക്കി വേഴാമ്പൽ	VU	Uncommon resident in the Western Ghats but common in mature forests

15	Broad-tailed Grassbird <i>Schoenicola platyurus</i>	പോതകിളി	VU	Restricted to grasslands in the Western Ghats
16	Bristled Grassbird <i>Schoenicola striatus</i>	മുളളൻപുൽക്കുരുവി	VU	Nomadic winter visitor to the coastal wetlands
17	Yellow-throated Bulbul <i>Pycnonotus xantholaemus</i>	മഞ്ഞത്താലി ബുൾബുൾ	VU	Restricted to Chinnar WLS and sporadically elsewhere in the leeward side of the Ghats.
18	Ashambu Laughingthrush <i>Montecincla meridionalis</i>	തെക്കൻ ചിലുചിലുപ്പൻ	VU	Restricted to the sky islands south of Shengottah gap.
19	White-bellied Sholakili <i>Sholicola albiventris</i>	വെള്ളവയറൻ ചോലകിളി	VU	Restricted to the sky islands south of Palakkad gap
20	Nilgiri Pipit <i>Anthus nilghiriensis</i>	മലവരമ്പൻ, പുല്ലോളിയൻ	VU	Restricted to Munnar hills
21	Great Thick-knee <i>Esacus recurvirostris</i>	പെരുങ്കൊക്കൻ പ്ലോവർ	NT	Nomadic winter visitor to riverine and coastal wetlands
22	Eurasian Oystercatcher <i>Haematopus ostralegus</i>	കടൽ മണ്ണാത്തി	NT	Regular winter visitor in small numbers to the beaches
23	Eurasian Curlew <i>Numenius arquata</i>	വാൾകൊക്കൻ	NT	Regular winter visitor in small numbers to the coastal wetlands north of Kollam district
24	Bar-tailed Godwit <i>Limosa lapponica</i>	വരമ്പലൻ സ്പനാക്	NT	Regular winter visitor in small numbers to the coastal wetlands north of Kollam district
25	Black-tailed Godwit <i>Limosa limosa</i>	പട്ടമ്പലൻ സ്പനാക്	NT	Common and abundant winter visitor, augmented by passage migrants, to all fresh water, coastal wetlands
26	Curlew Sandpiper <i>Calidris ferruginea</i>	കടൽകാട	NT	Regular winter visitor in small numbers to coastal wetlands
27	River Tern <i>Sterna aurantia</i>	പുഴ തൂളി	NT	Common in inland reservoirs

28	Swinhoe's Storm-petrel <i>Oceanodroma monorhis</i>	തവീടൻ കാറ്റിളക്കി	NT	Common non-breeding visitor in off-shore waters
29	Flesh-footed Shearwater <i>Ardenna carneipes</i>	ചെങ്കാലൻ തിരവെട്ടി, അയലക്കാക്ക	NT	Common non-breeding visitor in off-shore waters
30	Painted Stork <i>Mycteria leucocephala</i>	വർണ്ണക്കൊക്ക്	NT	Common winter visitor to all wetlands with a tiny breeding population
31	Oriental Darter <i>Anhinga melanogaster</i>	ചേരക്കോഴി	NT	Common resident across Kerala
32	Spot-billed Pelican <i>Pelecanus philippensis</i>	പുള്ളിച്ചുണ്ടൻ കൊതുമ്പനം	NT	Regular winter visitor in small numbers to all wetlands with a small breeding population in Alappuzha-Ernakulam region
33	Black-headed Ibis <i>Threskiornis melanocephalus</i>	വെള്ളഅരിവാൾകൊക്കൻ, കഷീക്കൊക്ക്	NT	Common non-breeding visitor to all wetlands with some breeding sites across Kerala
34	Rufous-bellied Eagle <i>Lophotriorchis kienerii</i>	ചെമ്പൻ എറിയൻ, മുയലമുക്കൻ	NT	Resident along the Western Ghats in small numbers
35	Pallid Harrier <i>Circus macrourus</i>	മേടൂതപ്പി	NT	Uncommon winter visitor to the open grasslands in all zones
36	Lesser Fish Eagle <i>Haliaeetus humilis</i>	ചെറിയ മീൻപരുന്ത്	NT	Resident in all riverine habitats in the Western Ghats
37	Grey-headed Fish Eagle <i>Haliaeetus ichhyaetus</i>	വലിയ മീൻപരുന്ത്	NT	Small numbers restricted to northern Wayanad and Sholayar river basin
38	Malabar Pied Hornbill <i>Anthracoceros coronatus</i>	പണ്ടൻ വേഴാമ്പൽ	NT	Resident of Vazhachal region and the forests of northern Kerala but nomadic everywhere in central Kerala
39	Red-necked Falcon <i>Falco chicquera</i>	ചെന്തലയൻ പുള്ളി	NT	Nomadic non-breeding visitor across Kerala
40	Alexandrine Parakeet <i>Psittacula eupatria</i>	വൻ തത്ത	NT	Restricted to the forests of north-eastern Wayanad
41	Grey-headed Bulbul <i>Brachypodius priocephalus</i>	ചാരത്തലയൻ ബുൾബുൾ	NT	Uncommon resident along the wetter low- and mid-altitude forests of Western Ghats
42	Tytler's Leaf Warbler <i>Phylloscopus tytleri</i>	സൂചിമുഖി ഇലക്കുരുവി	NT	Uncommon winter visitor restricted to highlands
43	Palani Laughingthrush <i>Montecincla fairbanki</i>	വടക്കൻ ചിലുചിലപ്പൻ	NT	Restricted to the sky islands between Palakkad and Shengottah gap

**Redlist species of birds for Kerala with its conservation priority
(IUCN regional level assessment out of a total of 37 species assessed)**

No	Common name	Species name	Kerala Redlist	IUCN Redlist	Conservation Priority
1	Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	EN	LC	High
2	Indian Thick-knee	<i>Burhinus indicus</i>	VU	LC	High
3	Jerdon's Baza	<i>Aviceda jerdoni</i>	EN	LC	High
4	Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>	VU	NT	High
5	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>	EN	LC	High
6	Forest Wagtail	<i>Dendronanthus indicus</i>	EN	LC	High
7	Pacific Golden Plover	<i>Pluvialis fulva</i>	CR	LC	High
8	Malabar Lark	<i>Galerida malabarica</i>	LC	LC	Moderate
9	White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	LC	LC	Moderate
10	Black Bittern	<i>Ixobrychus flavicollis</i>	VU	LC	Moderate
11	Cotton Teal	<i>Nettapus coromandelianus</i>	VU	LC	Moderate
12	Grey-headed Bulbul	<i>Brachypodius priocephalus</i>	EN	NT	Moderate
13	Streaked Weaver	<i>Ploceus manyar</i>	VU	LC	Moderate
14	Watercock	<i>Gallicrex cinerea</i>	EN	LC	Moderate
15	Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	NT	Moderate
16	Curlew Sandpiper	<i>Calidris ferruginea</i>	NT	NT	Moderate
17	Eurasian Curlew	<i>Numenius arquata</i>	CR	NT	Moderate
18	Great Knot	<i>Calidris tenuirostris</i>	NT	EN	Moderate
19	Indian Eagle Owl	<i>Bubo bengalensis</i>	VU	LC	Moderate
20	Yellow Bittern	<i>Ixobrychus sinensis</i>	VU	LC	Moderate

Bird species of Kerala recommended for inclusion under section 38 of biological diversity act 2002

Sl.no.	Common name	Scientific Name	Justification
1	Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i> , (Gmelin)	Habitat loss due to draining of wetlands and paddy fields. Need conservation of wetlands especially <i>Pandanus</i> brakes and reed beds. High conservation priority species in Kerala
2.	Indian Thick-knee	<i>Burhinus indicus</i> , (Salvadori)	Threat due to habitat loss. Need conservation of wetlands, seashore. High conservation priority species in Kerala
3.	Jerdon's Baza	<i>Aviceda jerdoni</i> , (Blyth)	Threat due to Deforestation. High conservation priority species in Kerala. Need intensive study of habitat requirements. Conservation of forests in Wayanad.
4	Malabar Pied Hornbill	<i>Anthracoceros coronatus</i> , (Boddaert)	Species of high conservation priority in Kerala. Threat due to poaching. high demand in international market. Need monitoring of nesting sites
5	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i> , (Boddaert)	Species of high conservation priority in Kerala. Threat due to habitat degradation
6	Forest Wagtail	<i>Dendronanthus indicus</i> , (Gmelin)	Species of high conservation priority in Kerala. Threat due to degradation of low and mid-altitude forests
7	Pacific Golden Plover	<i>Pluvialis fulva</i> (Gmelin)	Species of high conservation priority in Kerala. Threat due to habitat degradation Need conservation of wetlands, seashore

Bird species of Kerala which are in commercial trade

SI/ No	Order/Family	Scientific Name	Common Name	Malayalam Name
1	Columbiformes/ Columbidae	<i>Streptopelia decaocto</i> (Frisvaldszky, 1838)	Eurasian Collared Dove	ഫെട്ടൻ ചെങ്ങാലി(ഫ്രാൻ)
2	Columbiformes/ Columbidae	<i>Streptopelia senegalensis</i> (Linnaeus, 1766)	Laughing Dove	തവിടൻ (ഫ്രാൻ)
3	Strigiformes/ Tytonidae	<i>Tyto alba</i> (Scopoli, 1769)	Common Barn Owl	വെള്ളിമുങ്ങ
4	Psittaciformes/ Psittaculidae	<i>Psittacula cyanocephala</i> (Linnaeus, 1766)	Plum- headed Parakeet	പൂന്തത്ത
5	Psittaciformes/ Psittaculidae	<i>Psittacula columboides</i> (Vigors, 1830)	Malabar Parakeet	നീലത്തത്ത
6	Psittaciformes/ Psittaculidae	<i>Psittacula eupatria</i> (Linnaeus, 1766)	Alexandrine Parakeet	വൻതത്ത
7	Psittaciformes/ Psittaculidae	<i>Psittacula krameri</i> (Scopoli, 1769)	Rose-ringed Parakeet	മോതിരത്തത്ത
8	Psittaciformes/ Psittaculidae	<i>Loriculus vernalis</i> (Sparman, 1787)	Vernal Hanging Parrot	നീലത്തത്ത
9	Passeriformes/ Ploceidae	<i>Ploceus philippinus</i> (Linnaeus, 1766)	Baya Weaver	തുകണാങ്കുരുവി
10	Passeriformes/ Estrildidae	<i>Amandava amandava</i> (Linnaeus, 1758)	Red Munia	കുങ്കുമകുരുവി
11	Passeriformes/ Estrildidae	<i>Euodice malabarica</i> (Linnaeus, 1758)	Indian Silverbill	വയലറ്റ
12	Passeriformes/ Estrildidae	<i>Lonchura striata</i> (Linnaeus, 1766)	White- rumped Munia	ആറ്റക്കുറുപ്പൻ
13	Passeriformes/ Estrildidae	<i>Lonchura punctulata</i> (Linnaeus, 1758)	Scaly- breasted Munia	ചുട്ടിയാറ്റ
14	Passeriformes/ Estrildidae	<i>Lonchura malacca</i> (Linnaeus, 1766)	Tricoloured Munia	ആറ്റച്ചമ്പൻ
15	Passeriformes/ Sturnidae	<i>Gracula indica</i> (Cuvier, 1829)	Southern Hill Myna	കാട്ടുമൈന

Reptiles (Reptilia)



A recent estimate from the State showed that a total of 201 species of terrestrial reptiles classified under 24 families belonging to 3 orders (Palot, 2021). Now the updated list consists of two species of crocodiles, 12 species of turtles and tortoises, 75 species of lizards and 112 species of snakes. Of these, 109 species (54%) are endemic to the Western Ghats, which include 14 species endemics to the geographical boundary of Kerala. One species of crocodile (Estuarine crocodile, *Crocodylus porosus*) has been extirpated from the coastal habitats of Kerala. As per the last IUCN assessment (2013), 25 species of terrestrial or freshwater reptilian fauna of Kerala are globally threatened, which included 10 endangered, 7 vulnerable, 6 near

threatened and 2 species in least concern category. In the present document, a list of threatened species of reptiles of Kerala are prepared based on the analysis of the data on rarity, endemism, taxonomic distinctiveness, micro-habitat preference, conservation status of the species in IUCN Redlist and Indian Wildlife (Protection) Act of 1972 from the region. Accordingly 53 species are grouped under various categories of IUCN at regional level (Critically endangered 1, Endangered 16, Near threatened 17 and Vulnerable 19) Two species viz. Indian Pond Terrapin *Melanochelys trijuga* and Flying Lizard *Draco dussumieri* are proposed for Section 38 of Biological Diversity Act.

THREATENED REPTILES OF KERALA

(Based on IUCN Redlist of 2013 (Srinivasulu et al., 2014))

SLNo	Species Name	Common Name	IUCN Status	ENDE MIC	WPA	Remarks
1	<i>Crocodylus palustris</i> (Lesson,1831)	Mugger (Marsh Crocodile)	VU		Sch. I	Patchy distribution in Kerala.
2	<i>Vijayachelys silvatica</i>	Cochin Forest Cane Turtle (Kerala Forest Terrapin, Kavalai Forest Turtle)	EN	WG	Sch. I	Patchy distribution in Kerala. Rare in most of the localities.
3	<i>Melanochelys trijuga</i>	Indian Black Turtle (Indian Pond Terrapin)	NT			Common throughout Kerala. Extensively poached for meat in many localities.
4	<i>Geochelone elegans</i>	Indian Star Tortoise (Indian Starred Tortoise)	VU		Sch. IV	Extensively collected from the wild as part of the pet trade.
5	<i>Indotestudo travancorica</i>	Travancore Tortoise (Forsten's Tortoise)	EN	WG	Sch. IV	Extensively poached for local consumption.
6	<i>Nilssonina leithii</i>	Leith's Softshell Turtle	VU		Sch. IV	Few isolated records in Kerala but distributed across Peninsular India.
7	<i>Pelochelys cantorii</i>	Asian Giant Softshell Turtle (Cantor's Giant Softshell Turtle)	EN		Sch. I	Very few records in Kerala. Patchy in distribution. Threatened with poaching and habitat degradation.
8	<i>Chitra indica</i>	Indian Narrow-headed Softshell Turtle (Narrow-headed Softshell Turtle)	EN		Sch. IV	A single record from the estuarine areas of Valapatanam river in Kannur district. Highly threatened due to habitat degradation and poaching.
9	<i>Agasthyagama beddomei</i>	Indian Kangaroo Lizard	EN	WG		This species is mostly restricted to low-land forests in the southern Western Ghats.
10	<i>Cnemaspis nairi</i>	Ponmudi Day Gecko	LC	WG		This species is known only from the Agasthyamalai hills of Kerala.
11	<i>Cnemaspis ornata</i>	Ornate Day Gecko (Ornate Dwarf Gecko)	NT	WG		Known only from the Agasthyamalai hills of Kerala and Tamil Nadu.
12	<i>Cnemaspis sisparensis</i>	Sispara Day Gecko	NT	WG		There is insufficient data available to assess the distribution and conservation status of this species

13	<i>Cnemaspis indica</i> Gray, 1846	Indian day Gecko	VU	WG		
14	<i>Cnemaspis wynadensis</i>	Wayanad Day Gecko	EN	KL		This species is currently known only from few localities in Wayanad.
15	<i>Dasia subcaerulea</i> (Boulenger, 1891)	Boulenger's Dasia	EN	WG		
16	<i>Eutropis clivicola</i>	Mountain Skink (Inger's Ponnudi Mabuya)	EN	KL		This species was described from Ponnudi hills in Thiruvananthapuram, Kerala. This species appears to be common in few localities but nothing is known about their populations status.
17	<i>Kaestlea laterimaculata</i>	Side-spotted Ground Skink	VU	WG		This species is widely distributed in the southern WG of Kerala and Tamil Nadu.
18	<i>Melanophidium bilineatum</i>	Yellow-striped Shieldtail (Two-lined Black Earth Snake)	VU	WG	Sch. IV	This species has a highly restricted distribution and is known from Periya, Sugandhagiri and Banasura hills of Wayanad, and Kakkayam in Malabar WLS in Kozhikode.
19	<i>Uropeltis grandis</i>	Violet Shieldtail (Smith's Earth Snake)	NT	WG	Sch. IV	Reported from Anamalai hills. No recent report from the region.
20	<i>Rhinophis travancoricus</i>	Travancore Shieldtail (Tamil Nadu Earth Snake)	EN	WG	Sch. IV	This species was described from Trivandrum in Kerala. But is also known from other lowland forested regions in southern Kerala and Ambadi in Kanyakumari, Tamil Nadu.
21	<i>Oligodon brevicauda</i>	Striped Kukri Snake (Short-tailed Kukri Snake)	VU	WG	Sch. IV	In recent past only one confirmed record from Agasthyamalai hills
22	<i>Ahaetulla perroteti</i>	Bronze-headed Vine Snake (Perrotet's Vine Snake)	EN	WG	Sch. IV	Known only from high-altitude shola grasslands of Nilgiri Hills in Kerala and Tamil Nadu.
23	<i>Ahaetulla dispar</i>	Günther's Vine Snake	NT	WG	Sch. IV	
24	<i>Ophiophagus hannah</i>	King Cobra	VU		Sch. II	
25	<i>Trimeresurus macrolepis</i>	Large-scaled Green Pit Viper	NT	WG	Sch. IV	

List of potential threatened species of reptiles (terrestrial) of Kerala with the assessment of their conservation status at regional level

Sl.No	Species Name	Common Name	IUCN status	ENDEMIC	WPA	Regional status
1	<i>Crocodylus palustris</i> (Lesson,1831)	Mugger (Marsh Crocodile)	VU		Sch. I	VU
2	<i>Vijayachelys silvatica</i>	Cochin Forest Cane Turtle (Kerala Forest Terrapin, Kavalai Forest Turtle)	EN	WG	Sch. I	EN
3	<i>Geochelone elegans</i>	Indian Star Tortoise (Indian Starred Tortoise)	VU		Sch. IV	VU
4	<i>Indotestudo travancorica</i>	Travancore Tortoise (Forsten's Tortoise)	VU	WG	Sch. IV	EN
5	<i>Nilssononia leithii</i>	Leith's Softshell Turtle	CR		Sch. IV	CR
6	<i>Pelochelys cantorii</i>	Asian Giant Softshell Turtle (Cantor's Giant Softshell Turtle)	EN		Sch. I	EN
7	<i>Chitra indica</i>	Indian Narrow-headed Softshell Turtle (Narrow-headed Softshell Turtle)	EN		Sch. IV	EN
8	<i>Calotes grandisquamis</i>	Large-scaled Forest Lizard (Large-scaled Calotes)	LC	WG		NT
9	<i>Monilisaurus ellioti</i>	Elliot's Forest Lizard	LC	WG		NT.
10	<i>Salea anamallyana</i>	Anamalai Spiny Lizard (Anamalai Salea)	LC	WG		NT
11	<i>Salea horsfieldii</i>	Horsfield's Spiny Lizard (Nilgiri Salea)	LC	WG		NT
12	<i>Agasthyagama beddomei</i>	Indian Kangaroo Lizard	EN			EN
13	<i>Cnemaspis chengodumalensis</i>	Chengodumala Day Gecko	NE	KL		EN
14	<i>Cnemaspis indica</i>	Indian Day Gecko	VU	WG		VU
15	<i>Cnemaspis kottiyooensis</i>	Kottiyur Day Gecko	NE	KL		VU

16	<i>Cnemaspis nilagirica</i>	Nilgiri Day Gecko	NT	WG		EN
17	<i>Cnemaspis zacharyi</i>	Zacharia's Day Gecko	NE	WG		NT
18	<i>Hemidactylus paaragowli</i>	Travancore Rock Gecko	NE	WG		VU
19	<i>Eutropis clivicola</i>	Mountain Skink (Inger's Ponnudi Mabuya)	EN	WG		VU
20	<i>Ristella rurkii</i>	Rurk's Cat Skink (Rurk's Ristella)	DD	WG		VU
21	<i>Kaestlea bilineata</i>	Two-lined Ground Skink	LC	WG		VU
22	<i>Kaestlea laterimaculata</i>	Side-spotted Ground Skink	VU	WG		NT
23	<i>Kaestlea travancorica</i>	Travancore Ground Skink	LC	WG		VU
24	<i>Kaestlea palnica</i>	Palni Hills Ground Skink	DD	WG		EN
25	<i>Varanus bengalensis</i>	Bengal Monitor	LC		Schedule I	NT
26	<i>Melanophidium punctatum</i>	Pied-belly Shieldtail (Beddome's Black Earth Snake)	LC	WG	Schedule IV	NT
27	<i>Melanophidium bilineatum</i>	Yellow-striped Shieldtail (Two-lined Black Earth Snake)	VU	WG	Schedule IV	EN
28	<i>Platyplectrurus madurensis</i>	Three-lined Shieldtail	EN	WG	Schedule IV	EN
29	<i>Plectrurus guentheri</i>	Purple Shieldtail (Gunther's Burrowing Snake)	DD	WG	Schedule IV	EN
30	<i>Uropeltis beddomii</i>	Beddome's Shieldtail (Beddome's Earth Snake)	DD	WG	Schedule IV	VU

31	<i>Uropeltis rubrolineata</i>	Red-lined Shieldtail (Red-lined Earth Snake)	LC	WG	Schedule IV	EN
32	<i>Uropeltis myhendrae</i>	Barred Shieldtail (Boulenger's Earth Snake)	DD	WG	Schedule IV	VU
33	<i>Uropeltis maculata</i>	Red-sided Shieldtail (Spotted Earth Snake)	DD	WG	Schedule IV	VU
34	<i>Uropeltis madurensis</i>	Madura Shieldtail	LC	WG	Schedule IV	VU
35	<i>Uropeltis pulneyensis</i>	Palni Shieldtail (Indian Earth Snake)	LC	WG	Schedule IV	NT
36	<i>Rhinophis sanguineus</i>	Red-bellied Shieldtail (Beddome's Shieldtail)	LC	WG	Schedule IV	VU
37	<i>Rhinophis travancoricus</i>	Travancore Shieldtail (Tamil Nadu Earth Snake)	EN	WG	Schedule IV	VU
38	<i>Rhinophis melanoleucus</i>	Black and White shieldtail	NE	KL	Schedule IV	EN
39	<i>Rhinophis karinthandani</i>	Karinthandan Shieldtail	NE	WG	Schedule IV	VU
40	<i>Python molurus</i>	Indian Rock python	NT		Schedule I	NT
41	<i>Eryx whitakeri</i>	Whitaker's Boa (Whitaker's Sand Boa)	NE		Schedule IV	NT
42	<i>Oligodon venustus</i>	Black-spotted Kukri Snake	LC	WG	Schedule IV	NT
43	<i>Rhabdops olivaceus</i>	Olive Forest Snake	LC	WG	Schedule IV	NT
44	<i>Ahaetulla perroteti</i>	Bronze-headed Vine Snake (Perrotet's Vine Snake)	EN	WG	Schedule IV	EN
45	<i>Ahaetulla travancorica</i>	Travancore Vine Snake	NE	WG	Schedule IV	VU
46	<i>Proahaetulla antiqua</i>	Antiq Vine Snake	NE	WG	Schedule IV	EN

47	<i>Xylophis captaini</i>	Captain's Wood Snake	LC	WG	Schedule IV	NT
48	<i>Xylophis perroteti</i>	Striped Narrow-headed Snake	LC	WG	Schedule IV	NT
49	<i>Xylophis mosaicus</i>	Anamalai Wood Snake				VU
50	<i>Dieurostus dussumieri</i>	Dussumier's Smooth Scale Water Snake (Kerala Mud Snake)	LC	KL	Schedule IV	NT
51	<i>Ophiophagus hannah</i>	King Cobra	VU		Schedule II	VU
52	<i>Trimeresurus macrolepis</i>	Large-scaled Green Pit Viper	NT	WG	Schedule IV	NT
53	<i>Trimeresurus strigatus</i>	Horseshoe Pit Viper	LC	WG	Schedule IV	EN

Reptile species of Kerala recommended for inclusion under section 38 of biological diversity act 2002

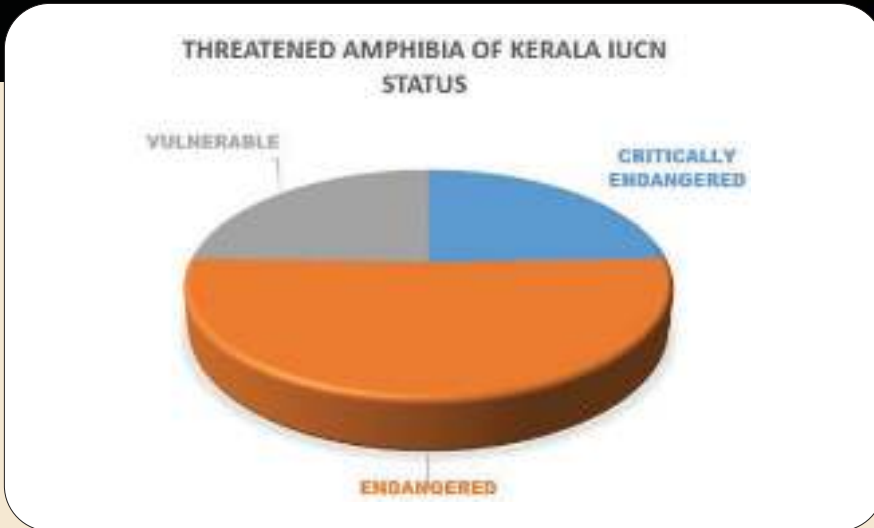
Sl. No.	Common Name	Scientific Name	Justification
1	Indian Pond Terrapin	<i>Melanochelys trijuga</i> Schweigger, 1812	Heavily hunted for meat. Not been protected under any of the Schedules of Indian Wildlife (Protection) Act of 1972.
2	South Indian Flying Lizard	<i>Draco dussumieri</i> Dumeril & Bibron, 1837	Locally captured for museum specimens and for alleged medicinal properties

Reptile Species of Kerala which are hunted/in Commercial Trade in Kerala

Though reptile species are not commonly exported in Kerala, many species are traded within and outside the country. Reptiles are mainly hunted for meat locally and traded as pets or animals with alleged medicinal properties within and outside country based on superstitious believes. Some species of sand boa fetch huge sum in the market because of alleged supernatural powers assigned to them. The detailed list of reptile species commonly involved in wildlife trade are listed below.

Sl. No	Common Name	Scientific name	Remarks
1	Indian Pond Terrapin	<i>Melanochelys trijuga</i> Schweigger 1812	Hunted for meat
2	Indian Flap-shelled Turtle	<i>Lissemys punctata</i> (Bonnatere, 1789)	Hunted for meat; pet trade.
3	Indian Star Tortoise	<i>Geochelone elegans</i> (Schoepff 1795)	Pet trade
4	Travancore tortoise	<i>Indotestudo travancorica</i>	Hunted for meat
5	Indian Chameleon	<i>Chamealeo zeylanica</i> Laurenti 1768	Pet trade
6	South Indian Flying Lizard	<i>Draco dussumieri</i> Dumeril & Bibron 1837	Museum collection and alleged medicinal properties
7	Bengal Monitor (Indian Monitor)	<i>Varanus bengalensis</i> (Daudin 1802)	Hunted for meat and skin to make musical instruments.
8	Indian Rock Python	<i>Python molurus</i> (Linnaeus 1758)	Hunted for meat & skin; pet trade
9	Red Sand Boa (Indian Sand Boa)	<i>Eryx johnii</i> (Russell 1801)	Pet trade, black magic
10	Common Sand Boa	<i>Eryx conicus</i> (Schneider 1801)	Pet trade, black magic

FROGS (AMPHIBIA)



In the updated checklist of amphibians for the state a total of 181 species are reported wherein type localities for the 125 species are within the political boundaries of the state and rest of the 56 species reported are either described from the adjacent states or the adjacent countries which have their distribution in Kerala. Among these, 53 species are categorized as threatened as per the latest IUCN assessment (IUCN 2004) (13 species Critically Endangered; 27 species as Endangered and 13 species as Vulnerable); 5 species as Near Threatened; 25 species as Least Concern; 32 species as Data Deficient and 66 species as not assessed category. Four species of frogs are proposed and discussed for inclusion in 'Section 38 of Biological Diversity Act' for Kerala, they are *Euphlyctis aff. aloysii*, *Euphlyctis aff. cyanophlyctis*, *Euphlyctis karaavali*, *Hoplobatrachus tigerinus* and *Hoplobatrachus crassus*.

THREATENED AMPHIBIANS OF KERALA
(based on IUCN 2004 to 2020 assessment) (As on July 2020)

Sl. No	Species	IUCN Red List Code*
	FAMILY: BUFONIDAE Gray	
1	<i>Duttaphrynus beddomii</i> (Gunther, 1875)	EN
2	<i>Duttaphrynus microtympanum</i> (Boulenger, 1882)	VU
3	<i>Ghatophryne ornata</i> (Gunther, 1876)	EN
4	<i>Ghatophryne rubigina</i> (Pillai and Pattabiraman, 1981)	VU
5	<i>Pedostibes tuberculosus</i> Gunther, 1875	EN
	FAMILY: DICROGLOSSIDAE Anderson	
6	<i>Euphlyctis karaavali</i> Priti, Naik, Seshadri, Singhal, Vidisha, Ravikanth and Gururaja, 2016	EN
7	<i>Minervarya murthii</i> (Pillai, 1979)	CR
8	<i>Minervarya nilagirica</i> (Jerdon, 1854)	EN
9	<i>Minervarya sahyadris</i> Dubois, Ohler and Biju, 2001	EN
	FAMILY: MICRIXALIDAE Dubois, Ohler and Biju	
10	<i>Micrixalus gadgili</i> Pillai and Pattabiraman, 1990	EN
11	<i>Micrixalus nudis</i> Pillai, 1978	VU
12	<i>Micrixalus saxicola</i> (Jerdon, 1853)	VU
	FAMILY: MICROHYLIDAE Günther	
13	<i>Melanobatrachus indicus</i> Beddome, 1878	EN
14	<i>Microhyla sholigari</i> Dutta and Ray, 2000	EN
15	<i>Uperodon mormoratus</i> (Rao, 1937)	EN
16	<i>Uperodon triangularis</i> (Gunther, 1875)	VU
	FAMILY: NASIKABATRACHIDAE Biju and Bossuyt	
17	<i>Nasikabatrachus sahyadrensis</i> Biju and Bossuyt, 2003	EN
	FAMILY: NYCTIBATRACHIDAE Blommers-Schlösser	
18	<i>Nyctibatrachus aliciae</i> Inger, Shaffer, Koshy and Bakde, 1984	EN
19	<i>Nyctibatrachus beddomii</i> (Boulenger, 1882)	EN
20	<i>Nyctibatrachus deccanensis</i> Dubois, 1984	VU
21	<i>Nyctibatrachus major</i> Boulenger, 1882	VU
22	<i>Nyctibatrachus minor</i> Inger, Shaffer, Koshy and Bakde, 1984	EN
23	<i>Nyctibatrachus vasanthi</i> Ravichandran, 1997	EN
	FAMILY: RANIDAE Batsch	
24	<i>Indosylvirana aurantiaca</i> (Boulenger, 1904)	VU
	FAMILY: RANIXALIDAE Dubois	
25	<i>Indirana brachytarsus</i> (Gunther, 1875)	EN
26	<i>Indirana gundia</i> (Dubois, 1986)	CR
27	<i>Walkerana diplosticta</i> (Gunther, 1876)	EN
28	<i>Walkerana leptodactyla</i> (Boulenger, 1882)	EN
29	<i>Walkerana phrynoderma</i> (Boulenger, 1882)	CR
	FAMILY: RHACOPHORIDAE Hoffman	
30	<i>Ghatixalus variabilis</i> (Jerdon, 1853)	EN
31	<i>Pseudophilautus wynaadensis</i> (Jerdon, 1853)	EN
32	<i>Raorchestes bobingeri</i> (Biju and Bossuyt, 2005)	VU
33	<i>Raorchestes chalazodes</i> (Günther, 1876)	CR

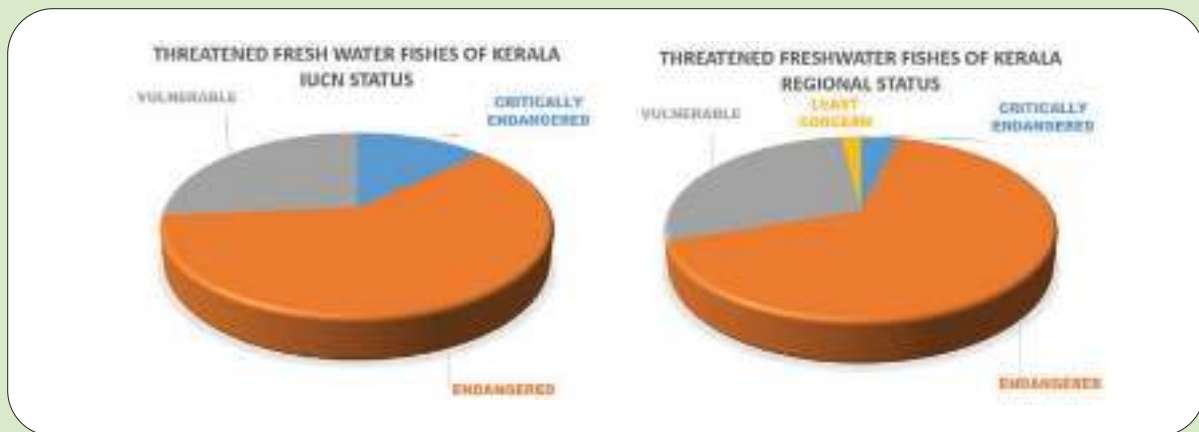
34	<i>Raorchestes charius</i> (Rao, 1937)	EN
35	<i>Raorchestes chlorosomma</i> (Biju and Bossuyt, 2009)	CR
36	<i>Raorchestes chromasynchysi</i> (Biju and Bossuyt, 2009)	VU
37	<i>Raorchestes dubois</i> (Biju and Bossuyt, 2006)	VU
38	<i>Raorchestes glandulosus</i> (Jerdon, 1853)	VU
39	<i>Raorchestes graminirupes</i> (Biju and Bossuyt, 2005)	VU
40	<i>Raorchestes griet</i> (Bossuyt, 2002)	CR
41	<i>Raorchestes kaikatti</i> (Biju and Bossuyt, 2009)	CR
42	<i>Raorchestes marki</i> (Biju and Bossuyt, 2009)	CR
43	<i>Raorchestes munnarensis</i> (Biju and Bossuyt, 2009)	CR
44	<i>Raorchestes nerostagona</i> (Biju and Bossuyt, 2005)	EN
45	<i>Raorchestes ponmudi</i> (Biju and Bossuyt, 2005)	CR
46	<i>Raorchestes resplendens</i> Biju, Shouche, Dubois, Dutta and Bossuyt, 2010	CR
47	<i>Raorchestes signatus</i> (Boulenger, 1882)	EN
48	<i>Raorchestes sushili</i> (Biju and Bossuyt, 2009)	CR
49	<i>Raorchestes tinniens</i> (Jerdon, 1853)	EN
50	<i>Raorchestes travancoricus</i> (Boulenger, 1891)	EN
51	<i>Rhacophorus calcadensis</i> Ahl, 1927	EN
52	<i>Rhacophorus lateralis</i> Boulenger, 1883	EN
53	<i>Rhacophorus pseudomalabaricus</i> Vasudevan and Dutta, 2000	CR

Amphibia species of kerala recommended for inclusion under section 38 of biological diversity act 2002

Sl. No.	Common Name	Scientific Name	Justification
1	Skipping frog	<i>Euphlyctis</i> aff. <i>aloyisii</i> , Joshy, Alam, Kurabayashi, Sumida, and Kuramoto	Locally collected for frog meat consumption. Threat due to Habitat destruction and use of pesticides.
2	Skipping frog	<i>Euphlyctis</i> aff. <i>cyanophlyctis</i> , (Schneider)	Locally collected for frog meat consumption. Threat due to Habitat destruction and use of pesticides.
3	Karaavali skipping frog	<i>Euphlyctis karaavali</i> , Priti, Naik, Seshadri, Singal, Vidisha, Ravikanth, and Gururaja,	Locally collected for frog meat consumption. Threat due to Habitat destruction and use of pesticides.
4	Indian bull frog	<i>Hoplobatrachus tigerinus</i> . Peters	Locally collected for frog meat consumption. Threat due to Habitat destruction and use of pesticides.



Fresh water fishes (Pisces)



Altogether 196 species of freshwater fishes belonging to 36 families 14 orders and 84 genera are currently known from Kerala, out of which 53 species, 7 genera and 2 families are endemic to the state. All species of freshwater fishes occurring in Kerala described till 2009 – 2010 are assessed by IUCN during 2010-2011. Accordingly there are 53 species of threatened freshwater fishes are occurring in Kerala as given in the chart below. Subsequent to IUCN redlist assessment in 2011, the literature on freshwater fishes of Kerala has increased considerably and the conservation status of many species have been changed as a result of new data generated during the last ten

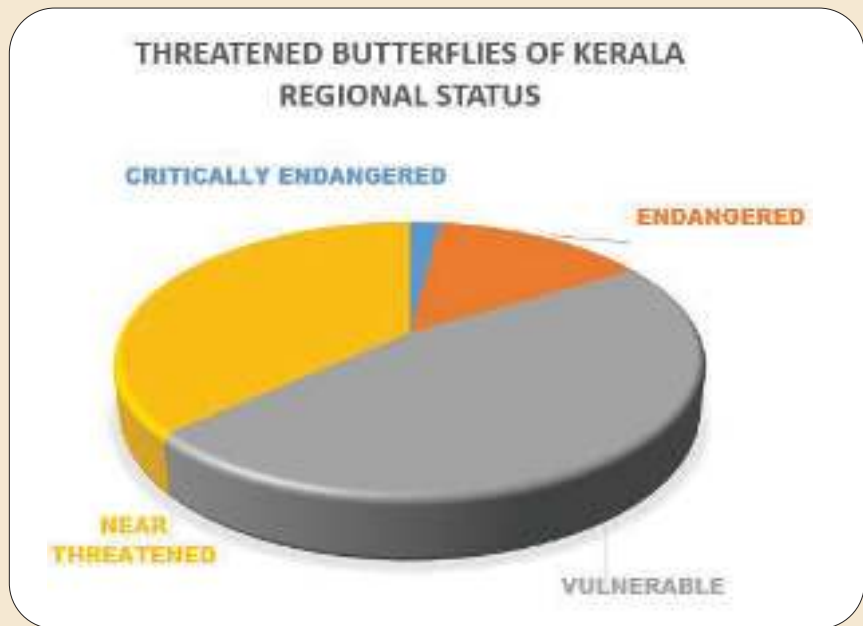
years. In the current programme 35 species of freshwater fishes (described from Kerala or described elsewhere and having a distribution in Kerala) have been assessed and proposed different conservation status as per IUCN guidelines. Nine species of freshwater fishes are prioritised for inclusion under the section 38 of the Biological Diversity Act. Apart from these, 17 species are listed in this document which are facing high levels of threats due to over exploitation and trade and need urgent attention for regular monitoring with specific focus on their exploitation and trade.

Threatened fishes of Kerala based on the IUCN Red List

Sl. No.	Species	Status of global IUCN Red List of Threatened Species	Status of present regional IUCN Red List Assessment
1	<i>Garra arunachalami</i>	CR	CR
2	<i>Hemibagrus punctatus</i>	CR	Likely to trigger EN
3	<i>Hypselobarbus thomassi</i>	CR	Likely to trigger VU
4	<i>Mesonoemacheilus herrei</i>	CR	Likely to trigger EN
5	<i>Neolissochilus wynaadensis</i>	CR	Likely to trigger EN
6	<i>Pethia pookodensis</i>	CR	Possibly meeting LC
7	<i>Tor remadevii</i>	CR	CR
8	<i>Dawkinsia arulius</i>	EN	EN
9	<i>Dawkinsia exclamation</i>	EN	EN
10	<i>Devario neilgherriensis</i>	EN	EN
11	<i>Eechathalakenda ophicephalus</i>	EN	EN
12	<i>Garra hughi</i>	EN	EN
13	<i>Garra surendranathanii</i>	EN	EN
14	<i>Ghatsa montana</i>	EN	EN
15	<i>Ghatsa santhamparaiensis</i>	EN	EN
16	<i>Glyptothorax anamalaiensis</i>	EN	EN
17	<i>Glyptothorax davissinghi</i>	EN	EN
18	<i>Glyptothorax housei</i>	EN	EN
19	<i>Glyptothorax madraspatanus</i>	EN	EN
20	<i>Snaha aruna</i>	EN	EN
21	<i>Horabagrus nigricollaris</i>	EN	EN
22	<i>Hypselobarbus dubius</i>	EN	EN
23	<i>Hypselobarbus micropogon</i>	EN	EN
24	<i>Hypselobarbus periyarensis</i>	EN	EN
25		EN	EN

26	<i>Mesonoemacheilus pulchellus</i>	EN	EN
27	<i>Ophichthys fossorius</i>	EN	EN
28	<i>Opsarius canarensis</i>	EN	EN
29	<i>Osteochilichthys longidorsalis</i>	EN	EN
30	<i>Pseudeutropius mitchelli</i>	EN	EN
31	<i>Pterocryptis wynaadensis</i>	EN	EN
32	<i>Puntius cauveriensis</i>	EN	EN
33	<i>Sahyadria denisonii</i>	EN	EN
34	<i>Sahyadria chalakkudiensis</i>	EN	EN
35	<i>Schistura striata</i>	EN	EN
36	<i>Tariqilabeo periyarensis</i>	EN	EN
37	<i>Tor malabaricus</i>	EN	EN
38	<i>Travancoria elongata</i>	EN	EN
39	<i>Travancoria jonesi</i>	EN	EN
40	<i>Batasio travancoria</i>	VU	VU
41	<i>Balitora mysorensis</i>	VU	VU
42	<i>Channa diplogramma</i>	VU	VU
43	<i>Carinotetraodon travancoricus</i>	VU	VU
44	<i>Garra menoni</i>	VU	VU
45	<i>Garra periyarensis</i>	VU	VU
46	<i>Horabagrus brachysoma</i>	VU	VU
47	<i>Hyporhamphus xanthopterus</i>	VU	VU
48	<i>Indoreonectes keralensis</i>	VU	VU
49	<i>Laubuka fasciata</i>	VU	VU
50	<i>Mesonoemacheilus menoni</i>	VU	VU
51	<i>Mesonoemacheilus pambarensis</i>	VU	VU
52	<i>Mesonoemacheilus periyarensis</i>	VU	VU
53	<i>Pseudosphromenus dayi</i>	VU	VU

Sl. No.	Common Name	Scientific Name	Justification
1	Hump-backed mahseer	<i>Tor remadevii</i> Kurup & Radhakrishnan	Threat due to indiscriminate fishing by local communities.
2	Gollum Snakehead	<i>Aenigmachanna Gollum</i> Britz, Anoop, Dahanukar and Raghavan	High demand in aquarium pet trade
3	Subterranean Catfish	<i>Kryptoglanis shajii</i> Vincent & J. Thomas	Threat due to high levels of water extraction from laterite aquifers. Species of unique evolutionary status
4	Blind catfish	<i>Horaglanis abdulkalami</i> Babu	..do..
5	Blind catfish	<i>Horaglanis alikunhii</i> Subhash Babu & Nayar	..do..
6	Blind catfish	<i>Horaglanis krishnai</i> , Menon	..do..
7	Blind synbranchid eel	<i>Rakthamichthys digressus</i>	..do..
8	Blind synbranchid eel	<i>Rakthamichthys indicus</i>	..do..
9	Blind synbranchid eel	<i>Rakthamichthys roseni</i>	..do..



A total of 326 species of butterflies belonging to 168 genera are recorded from the geographical boundary of Kerala. All the six families known from India are represented in the region, in which the family Nymphalidae dominated with 97 species (in 47 genera) followed by Lycaenidae (94 in 56 genera), Hesperidae (82 in 46 genera), Pieridae (32 in 14 genera) Papilionidae (19 in 4 genera) and two species (in one genera) from the family Riodinidae. No Indian butterfly species was assessed for IUCN Red List category till date. The assessment of 326 species of butterflies of Kerala attempted here was mainly based on the reliable published and unpublished information available during the assessment process. A total of 49 species of butterflies are shortlisted in to various Threatened category of IUCN, out of these, the Palni Sailer, *Neptis palnica* is

proposed to the Critically Endangered category owing to its narrow geographical range, 7 species are Endangered, 23 are Vulnerable and 18 species are in the Near Threatened category. Many of the endemic species or species which are in illegal trade are not listed in any of the Schedules of the Indian Wildlife (Protection) Act of 1972. Hence, five species vulnerable to illegal trade viz. Southern Birdwing *Troides minos*, Common Banded Peacock *Papilio crino*, Red Helen *Papilio helenus*, Tamil Lacewing *Cethosia mahratta*, Malabar Tree Nymph *Idea malabarica* are prioritised for inclusion in the Section- 38 of Biological Diversity Act 2002. Since Indian butterfly species are not assessed for IUCN Red List category till date, the list of butterflies assessed regionally based on the available data on endemism, rarity, distribution, threats etc.

Sl. No	Scientific Name	Common Name	Distribution in WG	Justification	Proposed IUCN Category*
Family: HESPERIIDAE					
1.	<i>Bibasis sena</i> , (Moore, 1866)	Orange-tail Awl	KL, TN, KA, GA, MH	Schedule- II species. Population found declining in Kerala and elsewhere in Western Ghats.	NT
2.	<i>Aeromachus dubius</i> Elwes & Edwards, 1897	Dingy Scrub Hopper	TN, KL, KA	<i>A. dubius</i> is reported from high altitude Shola grasslands of Anamalais and Palani Hills. Very patchy in distribution.	NT
3.	<i>Baracus subditus</i> Moore, [1884] *	Yellow-striped Hedge Hopper/ Striped Hedge Hopper	TN, KL	Narrow endemic. Known only from 2-3 localities of Idukki and Pathanamthitta Dts only.	EN
4.	<i>Thoressa evershedi</i> (Evans, 1910) *	Evershed's Ace/ Travancore Tawny Ace	TN, KL	Narrow endemic. Very Rare. A montane shola- grassland species	EN
5.	<i>Thoressa sitala</i> (de Nicéville, 1885) *	Sitala Ace/ Nilgiri Plain Ace	KL, KA	Narrow endemic. So far reported only from North of Palghat Gap up to Coorg. Reported from Kannur and Kozhikode Dts in the State. Very rare. Depends mostly on Shola Grasslands.	EN
6.	<i>Zographetus ogygia</i> (Hewitson, [1866])	Purple Spotted Flitter	KL, KA, GA	Rare. Rediscovered in 2013 from Aralam WLS Also reported from north & N.E. India	VU
7.	<i>Suastus minuta</i> (Moore, 1877)	Small Palm Bob	KL, TN, KA, GA	The Subspecies <i>bipunctus</i> is restricted to southern WG. Inhabits moist dense evergreen forests at lower and high elevations.	NT
8.	<i>Salanoemia sala</i> (Hewitson, 1866)	Maculate Lancer	KL, TN, KA, GA	Patchy in distribution. A few observations from the State	NT
9.	<i>Caltores canaraica</i> (Moore, [1884]) *	Kanara Swift/ Karwar Swift	TN, KL, KA	Endemic. Patchy in distribution. Reported from Wayanad & Parambikkulam	VU
10.	<i>Sarangasa purendra</i> (Moore, 1882)	Spotted Small Flat	TN, KL, KA, GA	<i>S. pandra</i> , population is found declining alarmingly. Depends mainly on Midland laterite hill ecosystem, which is under serious threat in the state.	NT

*Endemic to Western Ghats

Family : LYCAENIDAE					
11.	<i>Acytolepis lilacea</i> (Hampson, 1889)	Hampson's Hedge Blue/ Lilac Hedge Blue	TN, KL, KA	Schedule- II species. Larvae feeds only on <i>Cycas circinalis</i> plants in forested areas. Reported from Parambikkulam, Neyyar, Peechi etc. Very patchy in distribution	NT
12.	<i>Celatoxia albidisca</i> (Moore, [1884])*	White-disc Hedge Blue	TN, KL	Narrow endemic. Depends mostly on the Shola Grassland eco system of Anamalais and Palni Hills.	VU
13.	<i>Arhopala alea</i> (Hewitson, 1862) *	Rosy or Kanara Oakblue	TN, KL, KA, GA	Rare, Endemic. Mainly reported from Aralam, Kottiyoor WLS and Brahmagiri range in Wayanad. Also, Sporadic records from outside these regions.	NT
14.	<i>Rapala lankana</i> (Moore, 1879)	Malabar Flash	KL, TN,	Rare. Endemic to South India and Sri Lanka. Patchy in distribution. Inhabits dense forests and well-wooded areas. Association with Red ants needed for the survival of larvae in the wild.	NT
15.	<i>Prosotas noreia</i> (R.Felder, 1868)	White-tipped Lineblue	KL, TN, KA, GA, MH	Schedule- I species. Prefer dense forests up to 1000m. Very few records from Kerala.	NT
16.	<i>Ionolyce helicon</i> (C.Felder, 1860)	Pointed Lineblue	KL, TN, KA	Schedule-II species. Rare among Lineblue butterflies. Population declining in Kerala and elsewhere in Western Ghats.	NT
17.	<i>Spindasis abnormis</i> (Moore, 1883)	Abnormal Silverline	KL, TN, GA, KA, MH	Only one confirmed report from Brahmagiri hills, Wayanad. Local and seasonal populations reported from northern WG in Maharashtra.	VU
18.	<i>Horaga viola</i> Moore, 1882	Brown Onyx	TN, KL, KA, GA	Very rare in the State and elsewhere in India (NE). Only recorded from Kannapuram, Kannur district and from Wayanad in Kerala.	VU
19.	<i>Hypolycaena nilgirica</i> Moore, [1884] *	Nilgiri Tit	TN, KL	Very rare in Kerala and Western Ghats. Only reported from Chinnar WLS in Kerala. Other records are from Coimbatore region, mainly in Kallar.	VU
20.	<i>Creon cleobis</i> (Godart, [1824])	Broadtail Royal	TN, KL, KA, GA	Prefers moderate elevations and well wooded areas. Rare in Kerala. Only few localities in Wayanad & Idukki. Also from N & NE	NT
21.	<i>Tajuria maculatus</i> (Hewitson, [1865])	Spotted Royal	TN, KL, KA	Very rare in Western Ghats and elsewhere in India. Very few records from Kerala. Also from TN & KA & NE	VU

22.	<i>Tajuria melastigma</i> (de Niveville, 1887)	Branded Royal	TN, KL, KA	Very rare in Western Ghats and elsewhere in India. Very few records from the State (Idukki, Wayanad and Nelliampathy).	VU
23.	<i>Ancema sudica</i> (Evans, 1926)	Silver Royal/ Sahyadri Silver Royal	TN, KL, KA, GA, MH	A rare Western Ghats endemic. Only recorded from Wayanad and Aralam wls.	VU
Family: NYMPHALIDAE					
24.	<i>Idea malabarica</i> (Moore, 1877) *	Malabar Tree Nymph	TN, KL, KA, GA, MH	Iconic endemic species of Western Ghats. Inhabits dense moist evergreen forests. Affinity to riparian and swamp ecosystems.	NT
25.	<i>Parantica nilgiriensis</i> (Moore, 1877)*	Nilgiri Tiger	TN, KL, KA	Endemic to higher mountains of South India. Mostly a species of Evergreen Shola Forests above 1200M.	NT
26.	<i>Argynnis castetsi</i> Oberthür, 1891*	Palni Fritillary	TN, KL	Endemic to Western Ghats South of Palghat Gap (Anamalai & Palni hills), now treated as a separate species. Inhabits Montane shola Grassland ecosystem of Western Ghats.	VU
27.	<i>Argynnis (castetsi) hybrida</i> Evans, 1912*	Nilgiri Fritillary	TN, KL.	Endemic to Western Ghats north of Palghat Gap (Nilgiri Hills), now treated as a separate species. Inhabits Montane shola Grassland ecosystem of Western Ghats.	VU
28.	<i>Neptis palnica</i> Eliot, 1969*	Palni Sailer	KL	Narrow endemic. Earlier a sub sp of <i>N. soma.</i> , now treated as separate species. Inhabits Evergreen shola forests of higher mountains south of Palghat Gap. All the records are only from Idukki dt.	CR
29.	<i>Amathusia phidippus</i> (Linnaeus, 1763)	Palmking	KL	South east Asian species. Western Ghats ssp, <i>friderici</i> treated as a separate species by some authors. Records in our state are solely from Shendurney WLS.	EN
30.	<i>Parantirrhoea marshalli</i> Wood-Mason, [1881] *	Travancore Evening Brown	TN, KL, KA	Endemic to Western Ghats. A rare, monotypic species, very local and confined to low land evergreen forests with dense <i>Ochlandra rheedi</i> thickets. Protected under Sch.II of WPA.	VU
31.	<i>Mycalesis igilia</i> Fruhstorfer, 1911*	Small Longbrand Bushbrown/ Bicoloured Bushbrown	TN, KL, KA	Rare endemic. Confined to Dense evergreen and moist deciduous forests, lower to moderate elevations.	VU

32.	<i>Mycalesis orcha</i> Evans, 1912	Pale-brand Bushbrown	TN, KL, KA	Rare. Narrow Endemic. Prefer dense jungles at moderate elevations.	VU
33.	<i>Telinga adolpheii</i> (Guérin-Méneville, 1843)*	Red-eye Bushbrown	TN, KL, KA	Narrow endemic. Suspected divoltine. Confined to Montane shola forests north of Palghat gap. Found two or three as a small colony. Reported from Paithal mala (Kannur dt) in Kerala. Other records are from Nilgiris and Coorg. Declining in population.	EN
34.	<i>Telinga davisoni</i> (Moore, [1891])*	Palni Bushbrown	TN, KL	Narrow endemic. Confined to the forests of high elevation in Anamalais and Palni hills.	EN
35.	<i>Telinga oculus</i> (Marshall, 1881)*	Red-disc Bushbrown	TN, KL	Narrow endemic. A charismatic butterfly. Found as small colonies in dense evergreen forests adjacent to Montane grasslands of Western Ghats. Reported mostly from Anamalais, Agasthyamalais and Palni hills. Recently reported from Coorg.	VU
36.	<i>Ypthima chenu</i> (Guérin-Méneville, 1843)*	Nilgiri Four-ring	TN, KL	Endemic to Nilgiris & Anamalais. Prefer high elevation rocky grasslands. Rare.	VU
37.	<i>Ypthima singala</i> R. Felder, 1868	Sinhalese Five-ring	TN, KL	Reported only from Chinnar WLS in Kerala. Other records are from Coimbatore and Sathyamangalam regions in TN. Also known from Sri Lanka. Rare.	VU
38.	<i>Ypthima striata</i> Hampson, [1889]	Striated Fivering/Nilgiri Jewel Fivering	TN, KL, KA	Records from Agasthyamalai hills and Anamalais. Other records from TN, KA and also AP(Eastern ghats). Endemic to South India	NT
39.	<i>Ypthima ypthimoides</i> (Moore, 1881)*	Palni Four ring	TN, KL	Narrow endemic (Anamalais, Palni hills & Agasthyamalai hills). Found in small colonies and prefer rocky grasslands at high elevation.	VU
40.	<i>Ypthima tabella</i> (Marshall, 1883)	Baby fivering/Sahyadri Baby Fivering	KL, TN, KA, MH	Only a few colonies reported from Mangaladevi of Periyar Tiger Reserve in Kerala. Another report from Meghamalais and from MH. In Kerala, confined to Montane Grasslands.	VU
Family: PAPILIONIDAE					
41.	<i>Papilio buddha</i> Westwood 1872*	Buddha Peacock	TN, KL, KA,	A rare endemic. State butterfly of Kerala. This iconic and charismatic butterfly faces	VU

			GA, MH	serious threat of losing its habitat in Kerala. Deforestation in midland laterite hills causes threats to the survival of its only known larval food plant, <i>Zanthoxylum rhetsa</i> . Rare and mostly recorded from North of Palghat gap up to MH.	
42.	<i>Papilio liomedon</i> Moore, [1875] *	Malabar Banded Swallowtail	TN, KL, KA, GA	Rare endemic. Inhabits dense evergreen forests or well-wooded areas at lower elevations.	VU
43.	<i>Pachliopta pandiyana</i> (Moore, 1881) *	Malabar Rose	TN, KL, KA, GA, MH	Rare endemic. Population seasonal and scanty.	VU
44.	<i>Papilio dravidarum</i> Wood-Mason, 1880	Malabar Raven	TN, KL, KA, GA	Western Ghats Endemic Declining population	NT
Family : PIERIDAE					
45.	<i>Eurema nilgiriensis</i> (Yata, 1990) *	Nilgiri Grass Yellow	TN, KL, KA, GA, MH	A widespread low to midland endemic. Inhabits dense evergreen riparian forests. Only one host plant for larvae, recorded, ie <i>Ventilago bombaiensis</i> .	NT
46.	<i>Eurema andersoni</i> (Moore, 1886)	One-Spot Grass Yellow	TN, KL, KA, GA, MH	Sub sp <i>shimai</i> is very rare in Kerala. Reports from Marayur and Chinnar only. Not rare in NE India.	NT
47.	<i>Appias lalage</i> (Doubleday, 1842)	Spot Puffin	TN, KL, KA	Known only from Idukki, Palakkad, Pathanamthitta & Trivandrum districts. Reported from higher elevations. Also known from N & NE India	EN
48.	<i>Appias wardii</i> (Moore, [1884]) *	Lesser Albatross/ Sahyadri Albatross	TN, KL, KA	Rare endemic. Sympatric with <i>A. albina</i> (Common Albatross). Data deficient due to difficulty in differentiating from female <i>A. albina</i> . Very local.	NT
49.	<i>Colias nilagiriensis</i> (C. & R. Felder, 1859)*	Nilgiri Clouded Yellow	TN, KL, KA	Narrow endemic (Nilgiris, Anamalais & Palni hills). Confined to the Montane grasslands of higher elevations. Disturbances to the Montane grasslands adversely affect this species.	VU

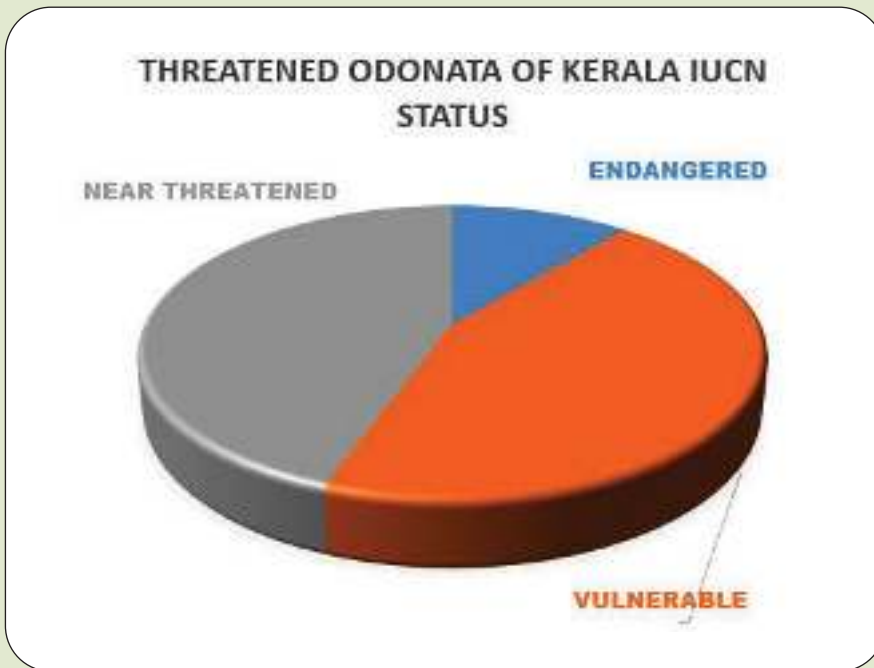
Butterfly species of Kerala recommended for inclusion under section 38 of Biological Diversity Act 2002

Sl. No	Scientific Name	Common Name	Family	Justification
1	<i>Troides minos</i> (Cramer, [1779])	Southern Birdwing	Papilionidae	Showy attractive butterfly. Largest butterfly in India.
2	<i>Papilio crino</i> Fabricius, 1793	Common Banded Peacock	Papilionidae	One of the beautiful butterfly species in the region. Reported from very few localities in Kerala. A popular species in illegal trade
3	<i>Papilio helenus</i> Linnaeus, 1758	Red Helen	Papilionidae	One of the largest butterflies in the region. Reported in the illegal trade
4	<i>Cethosia mahratta</i> Moore, 1872	Tamil Lacewing	Nymphalidae	A rare and beautiful endemic species of the Western Ghats. Rarely reported in the illegall trade
5	<i>Idea malabarica</i> (Moore, 1877)	Malabar Tree Nymph	Nymphalidae	A rare endemic species of the Western Ghats. Reported from the illegal trade

Following are some of the colourful and magnificent butterfly sepcies collecting by people illegely for trading They are used for making different types of trophies or ornaments in the international market.

1. Southern Birdwing *Troides minos* (Cramer, [1779])
2. Common Banded Peacock *Papilio crino* Fabricius, 1793
3. Red Helen *Papilio helenus* Linnaeus, 1758
4. Tamil Lacewing *Cethosia mahratta* Moore, 1872
5. Malabar Tree Nymph *Idea malabarica* (Moore, 1877)

Dragonflies and damselflies (Odonata)



Currently 175 species Odonates are recorded from Kerala and high diversity and endemism of species are reported from the streams and rivers of the Western Ghats region. However recent discoveries of new species from the coastal wetlands highlight the importance of this threatened habitats which lie outside protected area network and is fast disappearing due to agricultural expansion and urbanization. As per International Union for Conservation of Nature (IUCN) assessment eleven species are listed under threatened categories. Among them one species is endangered, six are Near Threatened and four are Vulnerable (Subramanian et al., 2011). Based on current published information and filed studies the threat assessment of Odonates of Kerala is

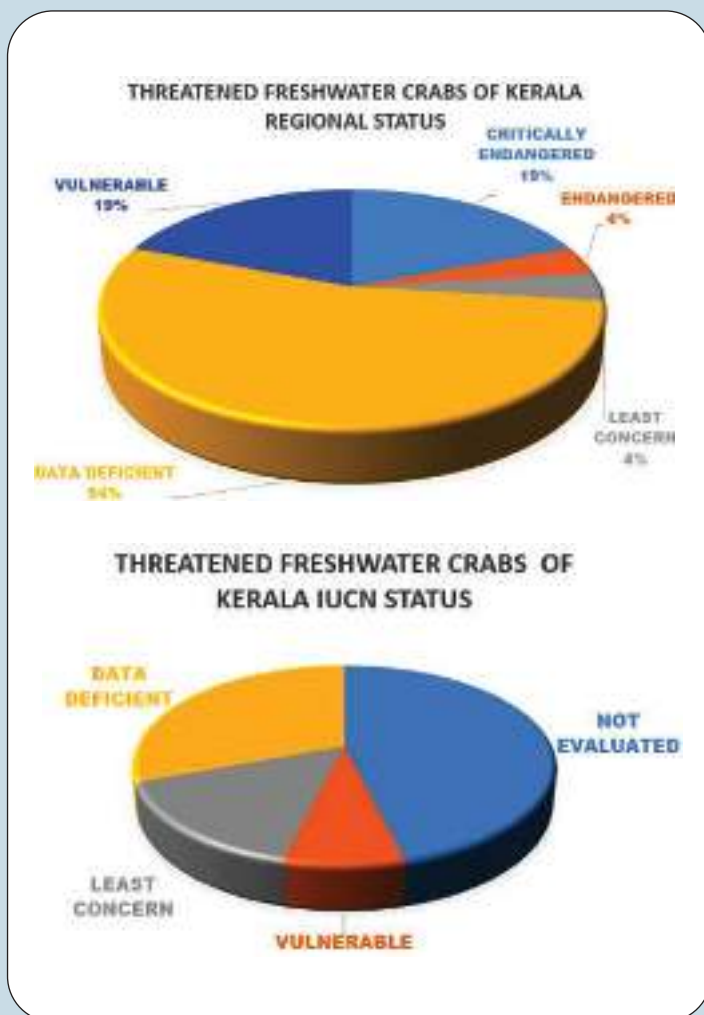
attempted here. Accordingly a total of 38 species were prioritized for threat assessment from the 175 Odonate species reported from Kerala by considering the criteria of endemism, rarity, IUCN Red List status and microhabitat specificity. Two species of damselflies viz. *Calocypha laidlawi* and *Disparoneura apicalis* are also recommended for listing under Section 38 of Biological Diversity Act 2002

SINo.	Species	IUCN Status
1.	<i>Idionyx galeata</i> Fraser, 1924	Endangered
2.	<i>Heliogomphus promelas</i> (Selys, 1873)	Near Threatened
3.	<i>Megalogomphus hanningtoni</i> (Fraser, 1923)	Near Threatened
4.	<i>Melanoneura bilineata</i> Fraser, 1922	Near Threatened
5.	<i>Phylloneura westermanni</i> (Selys, 1860)	Near Threatened
6.	<i>Chlorogomphus xanthoptera</i> (Fraser, 1919)	Vulnerable
7.	<i>Disparoneura apicalis</i> (Fraser, 1924)	Vulnerable
8.	<i>Indosticta deccanensis</i> (Laidlaw, 1915)	Vulnerable
9.	<i>Protosticta sanguinostigma</i> Fraser, 1922	Vulnerable

Odonata species Recommended for listing under Section 38 of BD Act (2002) for conservation action

Sl No	Family	Species	Justification
1	Chlorocyphidae	<i>Calocypha laidlawi</i> (Fraser, 1924)	Endemic to the Southern Western Ghats, recorded only from Kerala and Karnataka till date. Mostly restricted to Myristica swamps and associated streams. IUCN Red List Status: .
2	Platycnemididae	<i>Disparoneura apicalis</i> (Fraser, 1924)	Endemic to riparian habitats in the Western Ghats, reported only from Kodagu in Karnataka and Kuruva Islands, Wayanad, Kerala till date. IUCN Red List Status: Data Deficient.

Freshwater crabs (Crustacea)



A total of 35 species of freshwater crabs in 14 genera of the lone family Gecarcinidae, including 24 endemic species are currently known from Kerala. The information on the freshwater crab species of Kerala available in the IUCN Red List of Threatened Species was based on an older version [Version 3.1 (2008)]. During the last decade, another 12 species of freshwater crabs have been recorded from the state. The regional IUCN Red List Assessment of freshwater crabs of Kerala is, attempted here by following the latest criteria [Version 14 (2019)] and recommended guidelines. Accordingly five species are categorised as Critically Endangered, including one possibly extinct species; four species as Endangered; four species as Vulnerable; and two species as Near Threatened. Among the crab species with a threatened category (Critically Endangered, Endangered, or Vulnerable), only four species are recommended here for inclusion as threatened species under Section 38 of the Biological Diversity Act, 2002, viz., *Arcithelphusa tumpikkai* Pati, Sujila & Sudha Devi, 2019, *Cylindrotelphusa breviphallus* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017, *Cylindrotelphusa granulata* (Pillai, 1951), and *Vela virupa* Bahir & Yeo, 2007.

THREATENED FRESHWATER CRABS OF KERALA

Sl No	Species	Status of global IUCN Red List of Threatened Species	Status of present regional IUCN Red List Assessment
1	<i>Arcithelphusa cochleariformis</i> Pati & Sudha Devi, 2015 *	NE	VU B1ab(iii)+2ab(iii)
2	<i>Arcithelphusa tumpikkai</i> Pati, Sujila & Sudha Devi, 2019 *	NE	EN B1ab(iii)+2ab(iii)
3	<i>Baratha peena</i> Bahir & Yeo, 2007 *	DD	DD
4	<i>Baratha pushta</i> Bahir & Yeo, 2007 *	DD	DD
5	<i>Barytelphusa cunicularis</i> (Westwood in Sykes, 1836)	LC	LC
6	<i>Cylindrotelphusa breviphallus</i> Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017 *	NE	CR B2ab(iii)
7	<i>Cylindrotelphusa granulata</i> (Pillai, 1951) *	NE	CR (Possibly Extinct) B1ab(iii)+2ab(iii)
8	<i>Cylindrotelphusa longiphallus</i> Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017 *	NE	CR B2ab(iii)
9	<i>Cylindrotelphusa steniops</i> (Alcock, 1909)	LC	NT, nearly meeting VU B1b(iii)+2b(iii)
10	<i>Kani maranjandu</i> Kumar, Raj & Ng, 2017 *	NE	DD
11	<i>Karkata ghanarakta</i> Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017 *	NE	DD
12	<i>Karkata kusumbha</i> Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017 *	NE	DD
13	<i>Lamella lamellifrons</i> (Alcock, 1909) *	LC	NT, nearly meeting VU B2b(iii)
14	<i>Oziotelphusa biloba</i> Bahir & Yeo, 2005 *	VU	VU B1ab(iii)+2ab(iii)
15	<i>Oziotelphusa kerala</i> Bahir & Yeo, 2005 *	DD	DD
16	<i>Oziotelphusa wagrakarowensis</i> (Rathbun, 1904)	VU	CR B2ab(iii)
17	<i>Pilarta anuka</i> Bahir & Yeo, 2007 *	DD	DD
18	<i>Pilarta aroma</i> Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017 *	NE	DD
19	<i>Pilarta punctatissima</i> Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017 *	NE	DD
20	<i>Snaha aruna</i> Bahir & Yeo, 2007 *	DD	DD
21	<i>Spiralothelphusa gibberosa</i> Pati & Sudha Devi, 2015 *	NE	CR B2ab(iii)
22	<i>Travancoriana charu</i> Bahir & Yeo, 2007 *	DD	DD
23	<i>Travancoriana convexa</i> (Roux, 1931)	LC	VU B1ab(iii)+2ab(iii)
24	<i>Travancoriana granulata</i> Pati & Sharma, 2013 *	NE	DD
25	<i>Travancoriana kuleera</i> Bahir & Yeo, 2007	DD	DD
26	<i>Travancoriana pollicaris</i> (Alcock, 1909)	DD	DD

27	<i>Travancoriana schirnerae</i> Bott, 1969	LC	DD
28	<i>Vanni ashini</i> Bahir & Yeo, 2007 *	DD	DD
29	<i>Vanni deepta</i> Bahir & Yeo, 2007 *	DD	DD
30	<i>Vanni giri</i> Bahir & Yeo, 2007	DD	DD
31	<i>Vanni malabarica</i> (Henderson, 1912) *	DD	VU B1ab(iii)+2ab(iii)
32	<i>Vanni nilgiriensis</i> (Roux, 1931)	DD	EN B1ab(iii)+2ab(iii)
33	<i>Vanni travancorica</i> (Henderson, 1913)	DD	DD
34	<i>Vela carli</i> (Roux, 1931)	DD	EN B1ab(iii)+2ab(iii)
35	<i>Vela virupa</i> Bahir & Yeo, 2007 *	DD	EN B1ab(iii)+2ab(iii)
* Species endemic to Kerala			

Freshwater crab species of Kerala recommended for inclusion under section 38 of Biological Diversity Act 2002

Sl.no.	Scientific Name	Justification
1	<i>Arcithelphusa tumpikkai</i> Pati, Sujila & Sudha Devi	Facing threat due to habitat degradation and agrarian development, more likely to become extinct in the near future
2	<i>Cylindrotelphusa breviphallus</i> Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan	Facing threat due to habitat degradation and pesticide pollution.
3	<i>Cylindrotelphusa granulata</i> (Pillai)	Threat due to habitat conversion. The species might be now on the verge of extinction
4	<i>Vela virupa</i> Bahir & Yeo	Facing threat due to habitat degradation and pesticide pollution.

Mygalomorph spiders (Arachnida)

For the Threat assessment of spiders only Mygalomorph spiders are considered in the present document. Mygalomorph spiders belong to the family Theraphosidae, are known as 'Tarantula spiders'. The last assessment for the spider species of India by IUCN was in 2008 (Molur et al., 2008a). Based on the available data on the species distribution and abundance and CITES database the current assessment has been attempted. Out of the 18 species of mygalomorph spiders reported from Kerala, four species could be categorized as



Threatened. Among the Mygalomorph spiders, three species of the genus *Poecilotheria* are also listed in the Appendix II of CITES. Based on the literature review and the field explorations it has been observed that most of the threatened species of Mygalomorph spiders are reported from the protected areas of the State.

THREATENED MYGALOMORPH SPIDERS OF KERALA (Based on IUCN assessment 2008)

No.	Species	Kerala Redlist	IUCN Redlist	CITES	Conservation priority
1.	<i>Haploclostus kayi</i> Gravelly, 1915	EN	EN	-	High
2.	<i>Poecilotheria regalis</i> Pocock, 1899	LC	LC	Appendix II	Low
3.	<i>Poecilotheria rufilata</i> Pocock, 1899	EN	EN	Appendix II	High
4.	<i>Poecilotheria striata</i> Pocock, 1895	VU	VU	Appendix II	Moderate

MYGALOMORPH SPIDERS OF KERALA WHICH ARE IN COMMERCIAL TRADE

1. *Poecilotheria rufilata* Pocock, 1899.
2. *Poecilotheria striata* Pocock, 1895

MOLLUSCA (NON -MARINE MOLLUSCS)



Kerala has 68 terrestrial snails and 28 freshwater molluscs. Of the 28 freshwater molluscs, 21 species of freshwater molluscs are Gastropods and seven species are bivalves. Of the 96 species of non-marine molluscs known from Kerala, 75 species are endemic to the state and most of the endemism occurs in terrestrial snails. None of the freshwater molluscs reported from Kerala are threatened and none of the species are either listed in Indian Wildlife (Protection) Act or in the CITES. An assessment of non-marine molluscs of Kerala was attempted here based on the available literature and from the field surveys conducted all along the Western Ghats during the last two decades. Based on this, the species *Corilla anax* (Benson 1865) is categorised as Endangered, The species *Beddomea calcadensis* (Blanford 1870) and *Apatetes bourdilloni* (Theobald 1876) has been classified as Near Threatened. Since the non marine molluscs are not assessed by IUCN till date the list of species emerged out from the regional level assess is provided here

Threatened non-marine molluscs of Kerala

Sl No.	Species	Status
	Family Corillidae	
1	<i>Corilla anax</i> (Benson 1865)	Endangered
	Family Camaenidae	
2	<i>Beddomea calcadensis</i> (Blanford 1870)i	Near Threatened
3	<i>Apatetes bourdilloni</i> (Theobald 1876)	Near Threatened

(Based on regional level assessment)

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REGIONAL REDLIST ASSESSMENT



MAMMALS

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Background:

Mammals are perhaps the most dominant life forms on earth. They have been evolved over the past 225 million years or so and occupy all the continents and oceans. Currently, more than 5000 species of mammals are recognised globally (Wilson and Mittermeier, 2009) and the number keep increasing, thanks to the field surveys combined with the taxonomical studies using modern molecular techniques. More than 400 species of mammals are known from India (Nameer, 2015).

Why this work:

The primary objective of this work is to enlist the threatened mammals of Kerala, as per the most recent assessment by the IUCN (Ver. 2021-1). The other objective is to propose high conservation priority species for inclusion under Section 38 of the Biological Diversity Act.

Methodology:

The threatened status of the mammals of Kerala was extracted from the most recent IUCN publications. Moreover, the same has

been arranged taxonomically, adding additional information on the global distribution, distribution within India and Kerala, habitat, and threats. For each of the threatened mammals, information on the schedules of the Wild Life (Protection) Act, 1972 and the appendix of Convention on International Trade in Endangered Species of Fauna and Flora (CITES) are also given.

Results:

Out of the 98 species of terrestrial mammals of Kerala, 31 are threatened with various levels of extinction risk. Fourteen species belong to the Endangered category, 17 species are Vulnerable, five are Near Threatened. One species, the *Suncus niger* is Not Evaluated. Details provided in Table 3.

The large mammal species that are found in Kerala and coming under the Endangered category are Asian elephant, tiger, Nilgiri tahr, Lion-tailed macaque, Wild dog, while the small sized Endangered mammals found in Kerala include Indian pangolin, and the rodents such as Bonhot's mouse, Ranjini's field rat, Nilgiri vande-

leuria. The other Endangered mammals in Kerala include two species of shrews such as Kelaart's long-clawed shrew and Day's shrew, and two species of bats such as Andersen's leaf-nosed bat and Salim Ali's fruit bat.

There are 14 terrestrial mammal species of Kerala that belong to the Vulnerable category. These include leopard, sloth bear, gaur, sambar deer, Four-horned antelope, Nilgiri langur, Nilgiri marten, Small-clawed otter, Smooth Indian otter. The rodent species in the Vulnerable category are, Sahyadris forest rat, Spiny tree mouse and Nilgiri palm squirrel. An interesting change in the conservation status is on the Bonnet macaque, which has been elevated to the Vulnerable category from the Least Concern category.

Additionally, there are four species of mammals of Kerala that belong to the Near Threatened category of the IUCN. They are the gray Slender loris, Tufted gray langur, Grizzled giant squirrel and Rusty-spotted cat.

Redlist assessment

Asian Elephant

ENDANGERED

Elephas maximus

Local Name (Malayalam): അനന്ത

Order: Proboscidea

Family: Elephantidae

Global Distribution: Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand and Viet Nam.

Distribution within India: North-western and north-eastern Himalayan foothills, central and southern India.

Distribution within Kerala: Throughout the forests of Kerala.

Habitat: Wide range of forest types including shola grasslands, evergreen, semi-evergreen, deciduous patches, adjacent plantations.

Conservation Status: WPA (1972)- Schedule 1, IUCN- Endangered A2c, CITES- Appendix I, CMS- Appendix I

Threats: Habitat loss and fragmentation, poaching, human-wildlife conflict.

Slender Loris

NEAR THREATENED

Loris lydekkerianus

Local Names (Malayalam): കുട്ടിത്തേവാക്

Order: Primates

Family: Lorisidae

Global Distribution: Peninsular India and Sri Lanka

Distribution within India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu.

Distribution within Kerala: Most of the forests of Kerala and adjacent areas.

Habitat: In open scrub jungle, dry and moist deciduous forests and evergreen forests.

Conservation Status: WPA (1972)- Schedule I, IUCN- Near Threatened A2cd, CITES- Appendix II, CMS- Unlisted.

Threats: Road kills, hunting for traditional medicine and trade and habitat destruction.

Bonnet Macaque

VULNERABLE

Macaca radiata

Local Names (Malayalam): നാടൻ കുരങ്ങ്

Order: Primates

Family: Cercopithecidae

Global Distribution: Peninsular India.

Distribution within India: South India.

Distribution within Kerala: Throughout forests of Kerala and human-dominated landscapes.

Habitat: In urban and rural areas, tropical dry thorn, scrub, dry and moist deciduous forest, semi-evergreen and evergreen forest.

Conservation Status: WPA (1972)- Schedule II, IUCN- Vulnerable A2acd+3cd, CITES- Appendix II, CMS- Unlisted.

Threats: Human-animal interactions in agricultural and urban areas are an increasing threat to the species. Killing as pests, capturing and releasing macaques at sites far off (thereby affecting the group composition). Feeding monkeys is considered a significant threat as it is suspected that commensal areas are sinks for groups and individuals are replaced constantly from an ever-depleting resource of forest populations. Road kills are also an increasing threat in ecotourism zones. Deliberate feeding of animals in this tourist zone may also cause considerable behavioural changes to the animal.

Lion-tailed Macaque

ENDANGERED

Macaca silenus

Local Names (Malayalam): സിംഹവാലൻ കുരങ്ങ്



Order: Primates

Family: Cercopithecidae

Global Distribution: Western Ghats of South India.

Distribution within India: Endemic to the Western Ghats in the states of Karnataka, Kerala, and Tamil Nadu.

Distribution within Kerala: Most of the evergreen forests of Kerala and in some adjoining estates.

Habitat: Dense evergreen and semi-evergreen forest (100-1700m) and adjoining plantations.

Conservation Status: WPA (1972)- Schedule I, IUCN- Endangered C2a(i), CITES- Appendix I, CMS- Unlisted.

Threats: Hunting, habitat loss and fragmentation.

Nilgiri Langur

VULNERABLE

Semnopithecus johnii

Local Names (Malayalam): കരികുരങ്ങ്

Order: Primata

Family: Cercopithecidae

Global Distribution: Western Ghats of South India.

Distribution within India: Endemic to the Western Ghats in the states of Karnataka, Kerala, and Tamil Nadu.

Distribution within Kerala: Most of the forests of Kerala and adjoining plantations.

Habitat: Evergreen, semi-evergreen, and moist deciduous forests and adjoining plantations between 500-2500m.

Conservation Status: WPA (1972)- Schedule I, IUCN- Vulnerable C2a(i), CITES- Appendix I, CMS- Unlisted.

Threats: Hunting for medicinal purposes, forest fragmentation, habitat destruction, road kills.

Tufted Gray Langur

NEAR THREATENED

Semnopithecus priam

Local Names (Malayalam): തൊഴികുരങ്ങ്

Order: Primata

Family: Cercopithecidae.

Global Distribution: Peninsular India and Sri Lanka.

Distribution within India: Andhra Pradesh, Karnataka, Tamil Nadu and Kerala.

Distribution within Kerala: Wayanad WLS, Chinnar WLS and Parambikulam TR.

Habitat: Dry deciduous, dry scrub and plantation. Conservation Status: WPA (1972)- Schedule II, IUCN- Near Threatened A2cd+3cd, CITES- Appendix I, CMS- Unlisted.

Threats: Poaching, forest fragmentation, habitat destruction and road kills.

Grizzled Giant Squirrel

NEAR THREATENED

Ratufa macroura

Local Names (Malayalam): ചാവൽ അണ്ണാൻ



Order: Rodentia

Family: Sciuridae

Genus: Ratufa

Global Distribution: South India and Sri Lanka

Distribution within India: Kerala, Karnataka and Tamil Nadu.

Distribution within Kerala: Chinnar WLS

Habitat: Riparian (riverine) forests among the dry deciduous/dry evergreen/scrub jungle.

Conservation Status: WPA (1972)- Schedule II, IUCN- Near Threatened A2c, CITES- Appendix 2, CMS- Unlisted.

Threats: Hybridization (with Indian Giant Squirrel), pilgrimage, tourism, road kills, habitat loss and poor regeneration of food/breeding plants.

Nilgiri Palm Squirrel

VULNERABLE

Funambulus sublineatus

Local Names (Malayalam): കുന്തൽ അണ്ണാൻ

Order: Rodentia

Family: Sciuridae

Global Distribution: Western Ghats of South India.

Distribution within India: Kerala and Tamil Nadu.

Distribution within Kerala: Throughout the forests of Kerala.

Habitat: Evergreen and moist deciduous forests, Ochlandra reedbeds and forest adjacent plantations

Conservation Status: WPA (1972)- , IUCN- Vulnerable B2ab(i,ii,iii), CITES- Unlisted, CMS- Unlisted.

Threat: Habitat loss and fragmentation.

Spiny Tree Mouse

VULNERABLE

Platacanthomys lasiurus

Local Names (Malayalam): മുരളല്ലി

Order: Rodentia

Family: Platacanthomyidae

Global Distribution: Western Ghats of South India.

Distribution within India: Kerala, Karnataka, Tamil Nadu.

Distribution within Kerala: Throughout the forests of Kerala.

Habitat: Evergreen and moist deciduous forests.

Conservation Status: WPA (1972)- Unlisted, IUCN- Vulnerable A2c, CITES- Unlisted, CMS- Unlisted.

Threat: Habitat loss and fragmentation.

Bonhote's Mouse

ENDANGERED

Mus famulus

Local Names (Malayalam): കാട്ടുമുട്ടുമുണ്ടലി

Order: Rodentia

Family: Muridae

Global Distribution: Western Ghats of South India.

Distribution within India: Kerala and Tamil Nadu.

Distribution within Kerala: Most of the high-altitude evergreen forests.

Habitat: Evergreen forests and grasslands.

Conservation Status: WPA (1972)- Schedule V, IUCN- Endangered B1ab(ii,iii), CITES- Unlisted, CMS- Unlisted.

Threat: Habitat loss and fragmentation.

Ranjini's Field Rat

ENDANGERED

Rattus ranjinae

Local Names (Malayalam): നല്ലൂലി

Order: Rodentia

Family: Muridae

Global Distribution: Western Ghats of South India.

Distribution within India: Kerala.

Distribution within Kerala: Alleppey, Thrissur and Thiruvananthapuram.

Habitat: Paddy fields

Conservation Status: WPA (1972)- Schedule V, IUCN- Endangered B1ab(iii)+2ab(iii), CITES- Unlisted, CMS- Unlisted.

Remarks: Detailed taxonomic assessment need to be undertaken to ascertain the status of this species.

Sahyadris Forest Rat

VULNERABLE

Rattus satarae

Local Names (Malayalam): സാഹ്യദ്രി കാട്ടുമുട്ടുമുണ്ടലി

Order: Rodentia

Family: Muridae

Global Distribution: Western Ghats of South India.

Distribution within India: Maharashtra, Goa, Tamil Nadu, Karnataka and Kerala.

Distribution within Kerala: Most of the forests of Kerala and adjacent areas.

Habitat: Montane moist deciduous and evergreen forests.

Conservation Status: WPA (1972)- Schedule V, IUCN- Vulnerable B2ab(i,ii,iii,iv,v), CITES- Unlisted, CMS- Unlisted.

Threat: Habitat loss and fragmentation.

Nilgiri Vandeleuria

ENDANGERED

Vandeleuria nilagirica

Local Names (Malayalam): വാലൻ മുട്ടുമുണ്ടലി

Order: Rodentia

Family: Muridae

Global Distribution: Western Ghats of South India.

Distribution within India: Kerala, Karnataka and Tamil Nadu.

Distribution within Kerala: Throughout the evergreen forests of Kerala and adjacent areas.

Habitat: Montane evergreen forest and adjacent plantations.

Conservation Status: WPA (1972)- Schedule V, IUCN- Endangered B2ab(iii), CITES- Unlisted, CMS- Unlisted.

Threat: Habitat loss and fragmentation, use of pesticides.

Kelaart's Long-clawed Shrew

ENDANGERED

Feroculus feroculus

Local Names (Malayalam): സിജോൺ നെച്ചൂലി

Order: Soricomorpha

Family: Soricidae

Genus: Feroculus

Global Distribution: South India and Sri Lanka.

Distribution within India: Kerala and Tamil Nadu.

Distribution within Kerala: Eravikulam NP

Habitat: Inhabits montane forest, montane swamp and marshes.

Conservation Status: WPA (1972)- Unlisted, IUCN- Endangered B2ab (ii, iii), CITES- Unlisted, CMS- Unlisted.

Threats: Habitat loss and fragmentation

Day's Shrew

ENDANGERED

Suncus dayi

Local Names (Malayalam): കാട്ടു നെച്ചൂലി

Order: Soricomorpha

Family: Soricidae

Genus: Suncus

Global Distribution: Western Ghats of South India.

Distribution within India: Tamil Nadu and Kerala.

Distribution within Kerala: Eravikulam National Park and Periyar Tiger Reserve.

Habitat: Montane grassland-shola habitat.

Conservation Status: WPA (1972)- Unlisted, IUCN- Endangered B2ab (ii, iii), CITES- Unlisted, CMS- Unlisted.

Threats: Habitat loss and fragmentation.

Hill Shrew

NOT EVALUATED

Suncus niger

Local Names (Malayalam): മല നെച്ചെലി

Order: Soricomorpha

Family: Soricidae

Global Distribution: Western Ghats of South India.

Distribution within India: Tamil Nadu, Karnataka and Kerala.

Distribution within Kerala: Eravikulam National Park.

Habitat: This species has been mostly recorded from montane forests and grasslands.

Conservation Status: WPA (1972)- Unlisted, IUCN- Not Evaluated, CITES- Unlisted, CMS- Unlisted.

Threats: Habitat loss and fragmentation.

Andersen's Leaf-nosed Bat

ENDANGERED

Hipposideros Pomona

Local Names (Malayalam): ആന്റേഴ്സണ്ണിന്റെ ഇലമുക്കൻ വറ്റാൽ

Order: Chiroptera

Family: Hipposideridae

Global Distribution: Western Ghats of South India

Distribution within India: Karnataka, Kerala and Tamil Nadu

Distribution within Kerala: Dense forests of Kerala

Habitat: Evergreen Forest

Conservation Status: WPA (1972)- Unlisted, IUCN- Endangered B2ab (ii, iii, iv, v), CITES- Unlisted, CMS- Unlisted.

Threats: Habitat loss, cave tourism and climate change.

Salim Ali's Fruit Bat

ENDANGERED

Latidens salimalii

Local Names (Malayalam): സലിംഅലി പഴംതീനി വറ്റാൽ

Order: Chiroptera

Family: Pteropodidae

Global Distribution: Western Ghats of South India.

Distribution within India: Tamil Nadu and Kerala.

Distribution within Kerala: Silent Valley NP, Periyar TR, Mankulam RF and Agastyamalai BR.

Habitat/Ecology: Evergreen forests.

Conservation Status: WPA (1972)- Schedule 1, IUCN- Endangered C1, CITES- Unlisted, CMS- Unlisted.

Threats: Habitat loss, roost disturbance and climate change.

Indian Pangolin

ENDANGERED

Manis crassicaudata

Local Names (Malayalam): ഇന്ത്യൻപേഴ്സി



Order: Pholidota

Family: Manidae

Global Distribution: Bangladesh, India, Nepal, Pakistan and Sri Lanka.

Distribution within India: Most of peninsular India.

Distribution within Kerala: Throughout Kerala in the forests and the adjacent areas.

Habitat: Wide range of forests including moist and dry deciduous forests, dry scrub, plantations and well-wooded human-dominated landscapes.

Conservation Status: WPA (1972): Schedule I, IUCN- Endangered A3d+4d, CITES- Appendix II, CMS- Unlisted.

Threats: Hunting and poaching for meat and scales, trade.

Indian Wild Dog

ENDANGERED

Cuon alpinus

Local Names (Malayalam): കാട്ടുനായ, ചെന്നായ

Order: Carnivora

Family: Canidae

Genus: Cuon

Global Distribution: Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Nepal and Thailand.

Distribution within India: Patchy distribution in central Indian highlands, northeast India, Western Ghats, Eastern Ghats and some parts of Himalayas. Distribution within Kerala: Throughout the forests of Kerala.

Habitat: Dry and moist deciduous forests, evergreen and semi-evergreen forests.

Conservation Status: WPA (1972)- Schedule II, IUCN- Endangered C2a(i), CITES- Appendix II (2013), CMS- Threats: Habitat loss, fragmentation, agriculture, mining and land-use change.

Sloth Bear

VULNERABLE

Melursus ursinus

Local Names (Malayalam): കരടി

Order: Carnivora

Family: Ursidae

Global Distribution: India, Nepal and Sri Lanka.

Distribution within India: Throughout peninsular India, lower elevations of Himalayas, patchy in north-east India, absent in desert, semi-arid and non-forested areas.

Distribution within Kerala: Most of the forests of Kerala.

Habitat: Inhabits a wide variety of habitats, including evergreen, moist and dry deciduous forests, dry scrub, montane wet temperate grasslands, and adjacent plantations.

Conservation Status: WPA (1972)- Schedule I, IUCN- Vulnerable A3c, CITES- Appendix I, CMS- Unlisted.

Threats: Habitat loss, fragmentation, agriculture, mining, land-use change, hunting and human-wildlife conflict.

Nilgiri Marten

VULNERABLE

Martes gwatkinsii

Local Names (Malayalam): മരനാട

Order: Carnivora

Family: Mustelidae

Global Distribution: Western Ghats of South India

Distribution within India: Karnataka, Tamil Nadu and Kerala.

Distribution within Kerala: Dense forests and its adjoining areas

Habitat: Montane wet temperate forests and grasslands, high elevation evergreen forests and forest fringes. Occasionally found in tea plantations.

Conservation Status: WPA (1972)- Schedule II part II, IUCN- Vulnerable D1, CITES- Appendix III of CITES by India, CMS-

Threats: Habitat loss, fragmentation and tourism.

Asian Small-clawed Otter

VULNERABLE

Aonyx cinereus

Local Names (Malayalam): മലമ്പിരനാട

Order: Carnivora

Family: Mustelidae

Global Distribution: Bangladesh; Bhutan; Brunei Darussalam; Cambodia; China; India; Indonesia; Lao People's Democratic Republic; Malaysia; Myanmar;

Nepal; Philippines; Singapore; Taiwan, Province of China; Thailand; Viet Nam.

Distribution within India: Arunachal Pradesh, Assam, West Bengal, Himachal Pradesh, Maharashtra, Karnataka, Kerala and Tamil Nadu.

Distribution within Kerala: Periyar Tiger Reserve, Silent Valley National Park and Eravikulam National Park.

Habitat: Shallow and rocky forest streams in high altitude areas.

Conservation Status: WPA (1972)- Schedule I, IUCN- Vulnerable A2acde, CITES- Appendix II, CMS-

Threats: Habitat degradation.

Smooth-coated Otter

VULNERABLE

Lutrogale perspicillata

Local Names (Malayalam): തീരനാട

Order: Carnivora

Family: Mustelidae

Global Distribution: Bangladesh; Bhutan; Brunei Darussalam; Cambodia; China; India; Indonesia; Iraq; Lao People's Democratic Republic; Malaysia; Myanmar; Nepal; Pakistan; Thailand; Viet Nam.

Distribution within India: Found all over India except in the high Himalayas and arid areas of Deccan and northwest India.

Distribution within Kerala: Throughout waterbodies of Kerala in the hills and the plains.

Habitat: They are the top predators of aquatic habitats. Inhabit rivers, lakes, dams, extensive paddy fields, and mangrove forests.

Conservation Status: WPA (1972)- Schedule II, IUCN- Vulnerable A2cde, CITES- Appendix II, CMS- Unlisted.

Threats: Loss of water bodies and their degradation, pollution, aquaculture and conflict with people.

Rusty-spotted Cat

NEAR THREATENED

Prionailurus rubiginosus

Local Names (Malayalam): തുരുമ്പൻ പൂച്ച

Order: Carnivora

Family: Felidae

Global Distribution: India, Nepal and Sri Lanka.

Distribution within India: Throughout southern and central India; Saurashtra and parts of Rajasthan (west), Sariska (north), isolated population in Jammu and Kashmir.

Distribution within Kerala: Wayanad, Walayar, Parambikulam TR and Chinnar.

Habitat: Moist and dry deciduous forests, shrub land.

Conservation Status: WPA (1972)- Schedule I, IUCN- Near Threatened A3c, CITES- Appendix I, CMS Unlisted.

Threats: Habitat loss, habitat fragmentation, commercial and residential development, mining, hunting and diseases.

Leopard

VULNERABLE

Panthera pardus

Local Names (Malayalam): പുള്ളിപ്പുലി

Order: Carnivora

Family: Felidae

Global Distribution: Asia (South and South East) and Africa.

Distribution within India: All over India except high Himalayas and arid parts of Kutch and Rajasthan.

Distribution within Kerala: Throughout the forests and adjacent plantations of Kerala.

Habitat: Wide range of forests including evergreen, moist deciduous, and dry deciduous forests, adjacent plantations and scrublands.

Conservation Status: WPA (1972)- Schedule I, IUCN- Vulnerable A2cd, CITES- Appendix I, CMS- Unlisted.

Threats: Urbanisation, agriculture, mining, habitat loss and fragmentation, land-use change and human-wildlife conflict.

Tiger

ENDANGERED

Panthera tigris

Local Names (Malayalam): കടുവ

Order: Carnivora

Family: Felidae

Global Distribution: Bangladesh, Bhutan, China, India, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Nepal, Russia and Thailand.

Distribution within India: Terai foothills of Himalayas, North-East India, central India, Eastern Ghats and Western Ghats.

Distribution within Kerala: Forest of Kerala.

Habitat: Inhabits a wide range of forests, including high altitude shola, evergreen, dry deciduous, moist deciduous habitats.

Conservation Status: WPA (1972)- Schedule I, IUCN- Endangered A2abcd; C1, CITES- Appendix I, CMS-Unlisted.

Threats: Urbanisation, agriculture, mining, habitat

loss and fragmentation, land-use change, hunting and human-wildlife conflict.

Sambar Deer

VULNERABLE

Rusa unicolor

Local Names (Malayalam): കലമാൻ മൂവ്

Order: Artiodactyla

Family: Cervidae

Global Distribution: South and south-east Asia and parts of China.

Distribution within India: Throughout mainland India except for trans-Himalayan and desert zones. Distribution within Kerala: Throughout the forests of Kerala and adjacent areas.

Habitat: Evergreen and deciduous areas forests and adjacent plantations.

Conservation Status: WPA (1972)- Sch. III, IUCN- Vulnerable A2cd+3cd+4cd, CITES- Unlisted, CMS- Unlisted.

Threats: Habitat loss and fragmentation, hunting for meat.

Gaur

VULNERABLE

Bos gaurus

Local Names (Malayalam): കാട്ടുപോത്ത്

Order: Artiodactyla

Family: Bovidae

Global Distribution: Bhutan; Cambodia; China; India; Laos; Malaysia; Myanmar; Nepal; Thailand and Viet Nam.

Distribution within India: South-western India, central India and north-eastern India.

Distribution within Kerala: Throughout the forests of Kerala.

Habitat: Forests including dense and open forests, evergreen and deciduous areas, old-growth and secondary forests and grass-cropland adjacent to forests.

Conservation Status: WPA (1972)- Sch. 1, IUCN- Vulnerable A2cd+3cd+4cd, CITES- Appendix I, CMS- Unlisted.

Threats: Habitat loss, fragmentation and poaching.

Four-horned Antelope

VULNERABLE

Tetracerus quadricornis

Local Names (Malayalam): ഉല്ലമാൻ

Order: Artiodactyla

Family: Bovidae

Global Distribution: Peninsular India.

Distribution within India: Occur in scattered populations over most of India, from the Himalayan foothills to peninsular India.

Distribution within Kerala: Wayanad WLS.

Habitat: Dry thorn and dry deciduous forests.

Conservation Status: WPA (1972)- Sch. 1, IUCN-Vulnerable C2a(i), CITES- As per latest CITES data, CMS- As per CMS data.

Threats: Habitat loss and fragmentation.

Nilgiri Tahr

ENDANGERED

Nilgiritragus hylocrius

Local Names (Malayalam): റാതൊട്

Order: Artiodactyla

Family: Bovidae

Genus: Nilgiritragus

Global Distribution: Western Ghats of South India

Distribution within India: Karnataka, Tamil Nadu and Kerala.

Distribution within Kerala: Most of the high-elevation grasslands of Kerala from Brahmagiris to Agasthyamalai.

Habitat: Montane grasslands and cliffs among the shola forests.

Conservation Status: WPA (1972)- Sch. I, IUCN-Endangered C2a(i), CITES- Unlisted, CMS- Unlisted.

Threats: Habitat loss and human disturbances, quite a few small and isolated populations.

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BIRDS

By

Praveen J, Abhinand Chandran & C Sashikumar

Introduction

Birds are one of the better studied groups of vertebrates in Kerala. The state checklist that we maintain has 540 species (Chandran et al. 2020), following the taxonomy of Indian BIRDS. BirdLife International assess the threat levels of birds for the IUCN annually. Under this, 32 species found in Kerala fall under various threatened categories of the IUCN with an additional 32 falling as Near Threatened. However, the threat levels of various species within Kerala are different from the global threat levels – some of them showing significant increase in recent years (e.g. Painted Stork *Mycteria leucocephala*) while other declining more rapidly (e.g. Eurasian Curlew *Numenius arquata*).

Our endemic species are residents of the Western Ghats and the protected areas and reserve forests conserve most of them. As a majority of our endemic species have excellent population within Kerala, the IUCN assessment for these species are more realistic at a state/regional level as well. However, species that are not endemic or largely living outside forests tend to get their regional threats under assessed barring a few trans-continental coastal migrants. Hence, such species are rapidly lost as they do not figure under the gambit of any existing regional conservation programs. Land use and land cover of Kerala has changed rapidly in the last

few decades. It is important to assess how our birds are doing under these intensive changes happening in areas outside reserve forests.

In summary, while we have threat level assessment for most of our forest species from the IUCN, we lack the regional threat level assessment for all the species that live outside the forest areas barring a few wetland dependent birds. Hence, it is imperative to augment the global redlist with a regional redlist from Kerala to bring parity of focus.

Methodology

As the scope of the exercise is to come out with a list of threatened bird species in Kerala outside the protected area network, with a view on their conservation priority in a limited timeframe, we took 20 species votes from each author for assessment to come up with a total of 37 species to assess. While this selection has an inherent bias, our combined experience is expected to cover most species that require urgent conservation attention. On this list, we conducted IUCN's regional redlist assessment. After conducting the first step (What to assess), we selected 32 species to assess - visiting populations of nine of them were assessed while the breeding population was assessed for the remaining. For one species (Orange-breasted Green Pigeon), though the assessment criteria required to

assess both breeding and visiting population, lack of phenotypic differences between the populations lead to an assessment that considered them together. Black-bellied Tern, that used to breed historically, has not been found breeding in the last two decades and hence we treat its breeding population as regionally extinct (RE).

Population Declines: We assessed population trends using the methodology detailed in State of India's Birds (SoIB 2020), with the same year bands (Before 2000, 2000-2006, 2007-2010, 2011-2012, 2013, 2014, 2015, 2016, 2017, 2018); that included curated data upto May 2019. While SoIB (2020) used 200 km x 200 km grids for the entire country, the higher data density in Kerala enabled us to do it with 100km x 100km grids. The data was assessed specifically for the state of Kerala and the decline percentage with 95% CI calculated.

We made strong cut-offs to treat only well-groomed as certain (e.g. $I\text{Means} > 2\text{ SE}$ and $\text{Overall SE} < 50$). We used the pessimistic value of decline in reporting frequency for assessing the threat level against Criteria A.

Range Size: We used eBird data to calculate the Extent of Occurrence (EOO) and Area of Occupancy (AOO) for these birds by keeping relevant filters to account for the required accuracy. For EOO,

we used all eBird lists from Kerala post 2000 with duration < 8 hours and distance < 50km. For AOO, we used two square sizes: 1/16th of a degree (~7km x 7km = 50 sq.km) and 1/8 th of a degree (13.8 x 13.8km = 192.5 sq.km.) as two aggregation units. Using this, we scaled it down to 2km x 2km as recommended by IUCN for AOO using a uniform scaling factor.

We did not directly use 2 x 2 for AOO since our list density will drastically reduce for using with such higher accuracy. Hence, all eBird lists from Kerala post 2000 with duration < 4 hours and distance < 10km were only used to ensure we do not account for false positive squares due to likelihood of records being included from a broader area. These range size parameters were used to assess against Criteria B.

Population Size:We did not have any metric for the population of mature individuals in the state in the case of any of these 32 species. Hence, we collaborated with bird experts from every district to arrive at an upper bound of the population in that district to cap the upper bound of the total number of mature individuals in Kerala. We only did this evaluation for the species that would meet the sub criteria for population decline. We used that to assess species meeting the thresholds for Criteria C (CR: 250, EN: 2,500, VU: 10,000) and even Criteria

D (CR: 50, EN: 250, VU: 1,000) - though there are none for Criteria D.

Extinction probability:There is no quantitative analysis done for these bird species on their extinction probability and hence we did not assess against Criteria E.

After the criteria is assessed, we used to regional redlist guidelines to downlist based on rescue effect from global population to arrive at the final threat category.

Once the redlist is done, we used the following parameters to assign a Conservation Priority (Critical, High, Medium) for the birds in the non-protected areas in Kerala.

1. IUCN Redlist Status
2. Conservation Concern of State of India's Birds
3. Percentage share of global population/global range in Kerala
4. Percentage share of regional population/regional range in Kerala (E.g. Western Ghats population is a regional population).
5. Assessment of success/failure of relevant conservation practices in that past in Kerala

Results

We came up with a list of twenty species that fall in the various threat categories of IUCN as per regional redlist guidelines. We assess seven of them as high conservation priority for Kerala and 13 are of moderate conservation

priority. The details of the redlist assessment for each of the species are provided below We also carry the full global list of threatened birds and species classified under Appendix found in Kerala after removing the vagrants as Appendix A.

Acknowledgements

Our thanks to Ashwin Viswanathan for sharing the species decline trends in Kerala based on the data and methodology used in State of India's Birds. We thank all the eBird editors of Kerala who participated in assessing the population levels of these species in their respective districts.

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Critically Endangered

Pacific Golden Plover

Regional Redlist: CR A4b

***Pluvialis fulva* (J. F. Gmelin, 1789)**

Global Redlist (IUCN): LC

Local Name (Malayalam): പൊൻമണൽകോഴി

Distribution: Global: Breeds in Eastern Palearctic region (Russia) and Alaska (USA). Winters upland and coastal habitats from Hawaiian Islands to east-central Japan, Okinawa, Polynesia, Micronesia, Melanesia, New Guinea, New Zealand, Australia, south China, Taiwan, South East Asia (including Thailand, Malaysia, Singapore, Indonesia, Philippines, Bangladesh, Nepal, India, Sri Lanka, Pakistan, Iran, Bahrain, and northeastern Africa (Ethiopia, Somalia)).



India: Winter visitor to the coasts of entire region, Andaman & Nicobar Is and Lakshadweep Is.

Kerala: Widespread winter visitor throughout the coastal zone of the state in appropriate habitat.

Habitat/Ecology: Tidal mudflats, ploughed and wet fields, coastal lagoons, edges of lakes, river banks and grasslands near the coast.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Red list Status-Least Concern, Regional Red list-Critically Endangered, CMS-Appendix II.

Population trend in Kerala Since 2000: Long Term Decline: 91%, Short Term Decline: 47%

Regional Redlist Assessment

Pacific Golden Plover winters in the larger wetlands in the coastal plains and adjoining estuaries. Its regional population is inferred to have declined by 70% over a period of 14 years (3 generations = 13.8y) between 2000 and 2014 and is projected to be declining by 83% between 2014 and 2028 - projected for nine years using a five-year decline of 47% between 2014 and 2019. Its EOO is over 38,000

sq.km while its AOO is over 3,600 sq.km. - both not approaching the thresholds of Vulnerable. The number of mature individuals wintering in Kerala is not expected to approach the thresholds of Vulnerable as the total wintering population itself is believed to be over 10,000 individuals. Hence, the highest category of threat is CR A4b. Based on the results of State of India's Birds, the rate of decline across the country is similar (<https://www.stateofindiasbirds.in/species/pagplo/>). Rate of immigration is likely to decrease due to climate change (<https://birdsoftheworld.org/bow/species/pagplo/cur/conservation>) and consequent elimination of suitable nesting habitat (Wauchope et al. 2017). Its breeding habitat is classified as highly imperiled (Galbraith et al. 2014). Hence, the regional status does not require any correction.

Geographic/Habitat of sustainable population in Kerala: Throughout the coastal line and major wetlands of the state where it winters mainly.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- None.

Threats: Habitat loss.

Recommended conservation measures in Kerala: Conservation of wetlands, seashore

Conservation priority area in Kerala: High.

BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal and Midland regions of all districts except Wayanad and Idukki.

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Eurasian Curlew

Regional Redlist: CR: A2b

***Numenius arquata* (Linnaeus, 1758)**

Global Redlist (IUCN): NT



Local Names (Malayalam): വാൾകൊക്കര

Distribution: Global: Breeds in Palearctic region; winters from Iceland and British Is southern to Mediterranean, eastern, north-western and southern Africa, Madagascar, and from southern Caspian Sea to Persian Gulf and western India, and east through South Asia to eastern China and southern Japan, and south to Philippines and Greater Sundas.

India: Winter visitor to coasts of entire region including Lakshadweep Is. and Andamans and Nicobar Is. A few non-breeders over summer.

Kerala: Regular winter visitor in small numbers along the coastline of Kerala.

Habitat/Ecology: Tidal mudflats, estuaries, seashore, mangrove wetlands, backwaters.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Near Threatened, Regional Redlist- Critically Endangered, CMS- Appendix II.

Population trend in Kerala Since 2000: Long Term

Decline: 89%, Short Term Decline: Uncertain.

Regional Red list Assessment

Eurasian Curlew winters along the tidal mudflats, seashore, estuaries, mangrove wetlands and backwaters of Kerala (Sashikumar et al. 2011). The regional population is inferred to have declined by 96% between 1991 to 2019 (3 generations = 28.2 y) -projected for 28 years into the past from 89% decline between 2000 to 2019 (19 years). This qualifies it as Critically Endangered under the criteria A2b. EOO is about 16,000 sq.km. while AOO is 2,178 sq. km - EOO meeting the thresholds for Vulnerable - but it does not meet two of the sub-criteria (number of locations > 10, no extreme fluctuations) to be classified as such and hence will meet only Near

Threatened category under criteria B1. Though it is suspected to have a continuing decline, we do not have high confidence measures for 1 GEN (9y) or 2 GEN (19y) to evaluate the species under Criteria C. Globally, habitat alteration of breeding, migration staging and wintering areas likely to intensify the population decline of this species and hence globally it is classified as Near Threatened (Birdlife International, 2021; Van Gils et al., 2020). In India, there is a strong long term decline across the country and is classified as Moderate concern (<https://www.stateofindiasbirds.in/species/eurcur/>). As the conditions outside the region and within the region are deteriorating, the regional status does not require a correction.

Geographic/Habitat of sustainable population in Kerala: Throughout the coastal line and coastal wetlands of northern and central Kerala

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- None.

Threats: Unknown.

Recommended conservation measures in Kerala: Conservation of coastal wetlands, seashore and mudflats.

Conservation priority area in Kerala: Moderate. BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal region.

Stake holders responsible for conservation and sustainable utilization: Land owners, Kerala Forests and Wildlife Department, Local governing bodies.

References:

BirdLife International (2021) Species factsheet: *Numenius arquata*. Downloaded from <http://www.birdlife.org> on 07/01/2021. Recommended citation for factsheets for more than one species: BirdLife International (2021) IUCN Red List for birds. Downloaded from <http://www.birdlife.org> on 07/01/2021.

Van Gils, J., P. Wiersma, G. M. Kirwan, and C.J. Sharpe (2020). Eurasian Curlew (*Numenius arquata*), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. <https://doi.org/10.2173/bow.eurcur.01>

Endangered

Cinnamon Bittern

Regional Redlist: EN A4b, C1

Ixobrychus cinnamomeus (J. F. Gmelin, 1789)

Global Redlist (IUCN): LC



Local Names (Malayalam): മുഴക്കൈക്കാച്ചു

Distribution: Global: Indian Subcontinent to central, southern & eastern China and Taiwan, and through South East Asia to Greater and Lesser Sundas, Sulawesi and Philippines; also occurs in Sri Lanka, Andaman and Nicobar Is and Maldives.

India: Widespread resident- Gangetic Plain, North-east India, Patchily distributed in central India & Deccan Plateau, West & East coasts, and Andaman & Nicobar Is.

Kerala: Uncommon resident. Patchily distributed across Kerala.

Habitat/Ecology: Flooded paddy fields, reed beds, grassy areas and mangroves.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Least Concern, Regional Redlist- Endangered.

Population trend in Kerala Since 2000: Long Term Decline: 57%, Short Term Decline: Uncertain.

Regional Redlist Assessment

Cinnamon Bittern is an uncommon resident of paddyfields, reedbeds, swamps and mangroves where it occurs in small numbers (Sashikumar et al. 2011). Its regional population is inferred to have declined by 24% over a period of 10 years (3 generations = 11.7y) between 2000 and 2010 and is projected to be declining by 74% between 2013 and 2023- projected for 8 years using a six year past decline of 49% between 2013 and 2019. Population reduction approaching the threshold of Endangered and the category of threat is EN A4b. Its EOO is over 41,000 sq.km while its AOO is over 870 sq.km. - both not approaching the thresholds of

Vulnerable. The number of mature individuals in Kerala is not expected to be more than 2,600 individuals (upper bound of total population) and it has declined by 72% in 8 years (2 generations = 7.8y). Hence, the highest category of threat is VU C1. Based on the results of State of India's Birds, the rate of decline across the country is similar (<https://www.stateofindiasbirds.in/species/cinbit1/>). It is highly unlikely that a significant immigration of propagules that are likely to reproduce within the region due to its overall population decline. Hence, the regional status does not require any correction.

Geographic/Habitat of sustainable population in Kerala: Mangroves and wetlands of Northern Kerala, Kole wetlands of Malappuram and Thrissur districts, Kuttanad Wetlands, Coastal wetlands of Central and Southern Kerala.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- No information, Pet trade- None, Wildlife trade- None.

Threats: Habitat loss due to draining of wetlands and paddy fields.

Recommended conservation measures in Kerala: Conservation of wetlands especially Pandanus brakes and reed beds.

Conservation priority area in Kerala: High.

BMC responsible for conservation and sustainable utilization: Local Governing bodies of the Coastal and Midland areas of Kasaragod, Kannur, Kozhikode, Malappuram, Thrissur, Ernakulum, Kottayam, Alappuzha, Pathanamthitta, Kollam and Thiruvananthapuram districts.

Stake holders responsible for conservation and sustainable utilization: Farmers, Kerala Forests and Wildlife Department, Department of Fisheries.

Cultural significance and associated traditional knowledge: None.

References:

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1-835. DC Books. Kottayam, Kerala
SolB 2020. State of India's Birds factsheet: Cinnamon Bittern *Ixobrychus cinnamomeus* <https://www.stateofindiasbirds.in/species/cinbit1/>. Accessed on 2020-07-06.

Grey-headed Bulbul

Regional Redlist: EN A2b

***Brachypodius priocephalus* (Jerdon, 1839)**

Global Redlist (IUCN): NT



Local Names (Malayalam):

ചാരതലയൻ ബുൾബുൾ

Distribution: Global: Western Ghats (from extreme southern Maharashtra and Goa south to Kerala) in south-western India.

India: Western Ghats (from extreme southern Maharashtra and Goa south to Kerala) in south-western India.

Kerala: Uncommon resident of the forests of Kerala. Also reported from some sacred groves of northern Kerala.

Habitat/Ecology: Evergreen and moist deciduous forests, secondary forests.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Near Threatened, Regional Redlist- Endangered.

Population trend in Kerala Since 2000: Long Term Decline: 45%, Short Term Decline: Uncertain.

Regional Redlist Assessment

Grey-headed Bulbul is a resident of low- and mid-elevation evergreen forests that exhibit several life history traits associated with low productivity such as relatively short breeding season, low clutch size (lowest in the genus), less number of broods per year and nesting failures due to predation (Balakrishnan 2011). Its regional population is inferred to have declined by 60% over a period of 12 years (3 generations = 12.6y) between 2007 and 2019 and is projected to be declining by 32% between 2013 and 2025 - projected for six years using a six year past decline of 16.5% between 2013 and 2019. Its EOO is over 40,000 sq.km while its AOO is over 5,100 sq.km. - both not approaching the thresholds of Vulnerable. The number of mature

individuals wintering in Kerala is not expected to approach the thresholds of Vulnerable as the total resident population itself is believed to be over 10,000 individuals. Hence, the highest category of threat is EN A2b. Being an endemic bird of the Western Ghats, with most of its prime habitats within Kerala, there is less likelihood that the adjoining populations will rescue the regional population lest it approaches regional extinction. Hence, the regional status does not require any correction.

Geographic/Habitat of sustainable population in Kerala: Protected areas of the state, sacred groves of N Kerala.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- None.

Threats: Deforestation.

Recommended conservation measures in Kerala: Conservation of forests next to running water sources.

Conservation priority area in Kerala: Moderate.

Stake holders responsible for conservation and sustainable utilization: Kerala Forests and Wildlife Department.

References:

Balakrishnan, P. (2011). Breeding biology of the Grey-headed Bulbul *Pycnonotus priocephalus* (Aves: Pycnonotidae) in the Western Ghats, India. *Journal of Threatened Taxa*. 3(1): 1415–1424

Jerdon's Baza

Regional Redlist: EN B1B2

***Aviceda jerdoni* (Blyth, 1842)**

Global Redlist: LC



Local Names (Malayalam): പ്രാജർഡൻ

Distribution: Global: Southern Western Ghats, northern Eastern Ghats, central India and southern

Sri Lanka; southern Nepal, Northeast India through Myanmar, southern China (south-west Yunnan, north-western and south-western Guangxi, Hainan), Thailand and parts of Indochina to northern Malay Peninsula, Borneo, Philippines, Sulawesi, Togian Is, Banggai Is and Sula Is. Also in Nicobar Is.

India: Resident in terai and foothills of Eastern Himalayas and Bengal duars to Assam Valley, southern Western Ghats (mainly Wayanad and Karnataka Ghats) and northern Eastern Ghats.

Kerala: Rare resident, most of the sightings from Wayanad where its breeding observed.

Habitat/Ecology: Evergreen and moist deciduous forests; sometimes coffee and tea plantations.

Conservation Status: WPA (1972)- Schedule-I, IUCN Redlist Status- Least Concern, Regional Redlist- Endangered, CITES- Appendix II, CMS- Appendix II.

Population trend in Kerala Since 2000: Long Term Decline: Uncertain, Short Term Decline: Uncertain

Regional Red list Assessment

Rare resident of the forests; most sightings from north Kerala, especially Wayanad where its breeding has been observed in a tea plantation (Sashikumar et al. 2011). The status of the regional population of Jerdon's Baza is uncertain but it has been inferred that there is a continuing decline in area, extent and quality of its habitat. Its EOO is 558 sq.km. and AOO is 299 sq. km. qualifying it as Endangered (criteria B1 and B2). Assessed as Near Threatened as per criteria A and C. its national trend is uncertain (data deficient) and its distribution range size is Moderate; its category of conservation concern has been assessed as Moderate (<https://www.stateofindiasbirds.in/species/jerbaz1/>).

Geographic/Habitat of sustainable population in Kerala: Major population restricted to forests and plantations of Wayanad district. It can be seen in other protected areas in small numbers.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- No information.

Threats: Deforestation.

Recommended conservation measures in Kerala: Intensive study of habitat requirements. Conservation of forests in Wayanad.

Conservation priority area in Kerala: High BMC responsible for conservation and sustainable utilization: All local bodies in Wayanad district.

Stake holders responsible for conservation and

sustainable utilization: Kerala Forests and Wildlife Department, Estate owners.

Cultural significance and associated traditional knowledge: None.

References:

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1–835. DC Books. Kottayam, Kerala

SolB 2020. State of India's Birds factsheet: Jerdon's Baza *Aviceda jerdoni* <https://www.stateofindias-birds.in/species/jerbaz1/>. Accessed on 2020-07-06.

Watercock

Regional Redlist: EN A4b

***Gallicrex cinerea* (J. F. Gmelin, 1789)**

Global Redlist (IUCN): LC



Local Names (Malayalam): തിപ്പാരികണ്ണൻ

Distribution: Global: Pakistan, India, Maldives and Sri Lanka east to central & eastern China, Korea, S Japan and S Ryukyu Is, and S through Andamans, Nicobars and South East Asia to Sumatra and Philippines. Winters south to Greater and Lesser Sundas and Sulawesi.

India: Widespread resident and summer visitor, along base of Himalayas and Gangetic Plain to Assam Valley, widespread through Peninsula, Andamans and Nicobars Is.

Kerala: Uncommon resident. Patchily distributed across Kerala in suitable habitats.

Habitat/Ecology: Wet paddy fields and swamps.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Least Concern, Regional Redlist- Endangered.

Population trend in Kerala Since 2000: Long Term Decline: 36%, Short Term Decline: 34%

Regional Redlist Assessment

Watercock is an uncommon resident of paddyfields and swamps where it is patchily distributed across Kerala (Sashikumar et al. 2011). Its regional

population is inferred to have declined by 12% over a period of 10 years (3 generations = 12y) between 2000 and 2010 and is projected to be declining by 64% over a period of 10 years between 2014 and 2024, using a five year past decline of 35% between 2014 and 2019. Population reduction approaching the threshold of Endangered and the category of threat is EN A4b. Its EOO is over 37,000 sq.km while its AOO is over 3500 sq.km. - both not approaching the thresholds of Vulnerable. The number of mature individuals in Kerala is not expected to be more than 7200 individuals (upper bound of total population) and it has declined by 47% in 8 years (2 generations = 8y) approaching the thresholds of Vulnerable and the category of threat is VU C1. Its national trend is uncertain (data deficient) but current trends showing strong decline in population and its distribution range size is Moderate (<https://www.stateofindiasbirds.in/species/waterc1/>). Hence, the regional status does not require any correction.

Geographic/Habitat of sustainable population in Kerala: Coastal wetlands of Kerala and paddy fields of Palakkad district.

Level of Exploitation: Commercial Consumption-None, Local consumption- All rallids trapped with noose, Poaching- Some poaching in wetlands, Pet trade- None, Wildlife trade- None.

Threats: Poaching, conversion of wetlands.

Recommended conservation measures in Kerala: Conservation of wetlands and paddy fields.

Conservation priority area in Kerala: Moderate.

BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal and Midland regions of all districts.

Stake holders responsible for conservation and sustainable utilization: Land owners, Kerala Forests and Wildlife Department, Local governing bodies.

References:

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1–835. DC Books. Kottayam, Kerala
 SolB 2020. State of India's Birds factsheet: Watercock *Gallicrex cinerea* <https://www.stateofindiasbirds.in/species/waterc1/>. Accessed on 2020-07-06

Yellow-wattled Lapwing

Regional Redlist: EN A4b

***Vanellus malabaricus* (Boddaert, 1783)**

Global Redlist (IUCN): LC



Local Names (Malayalam): മഞ്ഞക്കണ്ണി തിത്തീരി

Distribution: Global: Southern Pakistan (Sind), and India from Gujarat and Himachal east to Bihar and south through the peninsula to Sri Lanka; non-breeding visitor to southern Nepal (has bred), West Bengal and Bangladesh.

India: Resident (with local movements) from Kutch to about Delhi area and east through Gangetic Plain to Bihar; and through Peninsula.

Kerala: Resident. Widespread throughout the state in appropriate habitat.

Habitat/Ecology: Generally dry biotope. Barren lands, lateritic plains, fallow fields, playground, irrigated and freshly ploughed paddy fields.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Least Concern, Regional Redlist- Endangered, CMS- Appendix II.

Population trend in Kerala Since 2000: Long Term

Decline: Uncertain, Short Term Decline: 49%

Regional Redlist Assessment

Yellow-wattled Lapwing is a resident of the laterite midlands and is patchily distributed across Kerala (Sashikumar et al. 2011). Its regional population is projected to be declining by 88% over a period of 16 years (3 generations = 16.2y) between 2014 and 2030 - projected for 16 years using a five year past decline of 49% between 2014 and 2019. Its EOO is over 37,000 sq.km while its AOO is over 4,200 sq.km. - both not approaching the thresholds of Vulnerable. The number of mature individuals in Kerala is not expected to be more than 2,200 individuals (upper bound of total population) and it has declined by 86% in 11 years (2 generations = 10.8y). Hence, the highest category of threat is CR A4b while it also meets EN C1. However, it is likely that the regional population is experiencing significant immigration of propagules that are likely to reproduce within the region and it is unlikely that this immigration will reduce in the period till 2030.

Hence, we down list the regional status by one level from CR to EN.

Geographic/Habitat of sustainable population in **Kerala:** Midland lateritic plains and hillocks of the state. Major population restricted to laterite plains of north Kerala, Calicut University campus, dry lands of Palakkad, Kole wetlands, Nedumbassery wetlands, HMT estate, Kuttanad wetlands and NTPC ground.

Level of Exploitation: Commercial Consumption-None, Local consumption-None, Poaching-None, Pet trade-None, Wildlife trade-None.

Threats: Loss of habitat.

Recommended conservation measures in Kerala:

Conservation of open scrubland and laterite plains.

Conservation priority area in Kerala: High.

BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal and Midland regions of all districts.

Stake holders responsible for conservation and sustainable utilization: Land owners, Kerala Forests and Wildlife Department, Local governing bodies.

References:

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1–835. DC Books. Kottayam, Kerala

Forest Wagtail

Regional Redlist: EN A4b, A2b

***Dendroanthus indicus* (J. F. Gmelin, 1789)**

Global Redlist: LC



Local Names (Malayalam): കാട്ടുവാലു കുലുക്കി

Distribution: Global: Russian Far East (southern Ussuriland) south to south-eastern China (South to south-western Sichuan, northern Guizhou and northern Fujian) and, rare, southern Japan

(south-western Honshu, north-western Kyushu); winters in South and South East Asia, south to south-western India, Sri Lanka and Greater Sundas.

India: Winter visitor with widely scattered passage records, mainly north-eastern and south Assam hills. Winters primarily Western Ghats and Andaman's Is.

Kerala: Widespread winter visitor throughout the state in appropriate habitat.

Habitat/Ecology: Forests, plantations.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Least Concern, Regional Redlist-Endangered, CMS- Appendix II.

Population trend in Kerala Since 2000: Long Term Decline: 80%, Short Term Decline: 47%

Regional Redlist Assessment

Uncommon winter visitor to Kerala,, mainly in the forested areas and sporadically at other places also (Sashikumar et al. 2011). Its past decline is 57.83% over a period of 10 years from 2007 to 2017 (3 Generations = 10 years) and a projected decline of 72.32% qualifying it as Endangered (Criteria A4b, A2b). Elsewhere in India also, it is showing a strong long-term declining trend (<https://www.stateofindiabirds.in/species/forwag1/>). Its EOO is 41189 sq. km. and AOO is 6231, both in the threshold of Least Concern. The number of mature individuals wintering in Kerala has been assessed to be 4850, assigning this species in Vulnerable (Criteria C1) category.

Geographic/Habitat of sustainable population in Kerala: Protected areas and reserve forests of the state where it winters mainly.

Level of Exploitation: Commercial Consumption-None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- None.

Threats: Unknown.

Recommended conservation measures in Kerala: Conservation of low and mid-altitude forests.

Conservation priority area in Kerala: High.

Stake holders responsible for conservation and sustainable utilization: Kerala Forest and Wildlife Department.

Cultural significance and associated traditional knowledge: Wagtails in general are subject of folklore.

References:

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1–835. DC Books. Kottayam, Kerala

SoIB 2020. State of India's Birds factsheet: Forest Wagtail *Dendroanthus indicus* <https://www.stateofindiabirds.in/species/forwag1/>. Accessed on 2020-07-06

Vulnerable

Black Bittern

Regional Redlist: VU A4b, A2b, C1

***Ixobrychus flavicollis* (Latham, 1790)**

Global Redlist (IUCN): LC



Local Names (Malayalam): കരിങ്കൊച്ച

Distribution: Pakistan east to south-eastern China, Peninsular India, Sri Lanka & Maldives, south to Greater Sundas, Philippines, Sulawesi and satellite islands. Moluccas, Timor, Aru Is, lowland New Guinea, and Bismarck Archipelago south to western, northern and eastern Australia and Solomon Is.

India: Widespread resident. Summer visitor (mainly) to Gangetic Plain to Assam Valley. Resident locally along coasts and rivers of southern India.

Kerala: Uncommon resident, patchily distributed across Kerala in suitable habitats.

Habitat/Ecology: Paddy fields, reed beds, grassy areas and mangroves.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Least Concern, Regional Redlist- Vulnerable.

Population trend in Kerala Since 2000: Long Term Decline: 62%, Short Term Decline: 31%.

Regional Redlist Assessment

Black Bittern is an uncommon resident of paddy-fields, reedbeds, swamps and mangroves where it occurs in small numbers (Sashikumar et al. 2011). Its regional population is inferred to have declined by 72% over a period of 17 years (3 generations = 16.8y) between 2000 and 2017 and is projected to be declining by 72% over a period of 17 years between 2014 and 2031, using a five year past

decline of 31% between 2014 and 2019. Population reduction approaching the threshold of Endangered and the category of threat is EN A2b and EN A4b. Its EOO is over 41,000 sq.km while its AOO is over 4000 sq.km. - both not approaching the thresholds of Vulnerable. The number of mature individuals in Kerala is not expected to be more than 1900 individuals (upper bound of total population) and it has declined by 69% in 11 years (2 generations = 11.2y). Hence, the highest category of threat is VU C1. Its national trend is uncertain but its current trend showing strong decline and its distribution range size is Moderate (<https://www.stateofindiasbirds.in/species/blabit1/>). However, it is likely that the regional population is experiencing significant immigration of propagules that are likely to reproduce within the region and it is unlikely that this immigration will reduce in the period till 2031. Hence, we down list the regional status by one level from EN to VU.

Geographic/Habitat of sustainable population in Kerala: Mangroves and coastal wetlands of Kerala.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- No information, Pet trade- None, Wildlife trade- None. Threats: Habitat loss due to draining of wetlands and paddy fields.

Recommended conservation measures in Kerala: Conservation of wetlands especially Pandanus brakes and reed beds.

Conservation priority area in Kerala: Moderate.
BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal and Midland regions of all districts.

Stake holders responsible for conservation and sustainable utilization: Farmers, Kerala Forests and Wildlife Department, Department of Fisheries.

References:

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1-835. DC Books. Kottayam, Kerala
SolB 2020. State of India's Birds factsheet: Black Bittern *Ixobrychus flavicollis* <https://www.stateofindiasbirds.in/species/blabit1/>. Accessed on 2020-07-06.

Cotton Teal

Regional Redlist: VU A4b

Nettapus coromandelianus (J.F. Gmelin, 1789)

Global Redlist (IUCN): LC



Local Names (Malayalam): പട്ടെ എരണ്ട

Distribution: Most of Oriental Region; north New Guinea, eastern Australia (mainly eastern Queensland).

India: Resident with local movements, from Gujarat to Delhi area, east to Assam Valley, and through Peninsula.

Kerala: Uncommon resident. Occurs in small numbers throughout the state in suitable habitats.

Habitat/Ecology: Wetlands with aquatic vegetation, mainly fresh water.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Least Concern, Regional Redlist- Vulnerable, CMS- Appendix II.

Population trend in Kerala Since 2000: Long Term Decline: 39%, Short Term Decline: 20%

Regional Redlist Assessment

Cotton Teal is a resident of the freshwater wetlands in coastal plains and midlands across Kerala (Sashikumar et al. 2011). Its regional population is inferred to be declining by 24% over a period of 10 years (3 generations < 10y) between 2007 and 2017 and projected to decline at 37% over a period of 10 years between 2014 and 2024, using a five year past decline of 20% between 2014 and 2019. Its EOO is over 39,000 sq.km while its AOO is over 4,000 sq.km. - both not approaching the thresholds of Vulnerable. The number of mature individuals in Kerala is believed to be over 10,000 (upper bound of total population) and hence not expected to approach the thresholds of Vulnerable. Hence, the highest category of threat is VU A4b. Based on the results of State of India's Birds, the rate of decline across the country is similar with a long-term decline of 60% and current annual decline of 8%

(<https://www.stateofindiabirds.in/species/cop-goo1/>). Though the regional population receives a significant immigration of propagules that are likely to reproduce in the region, this immigration is also expected to decrease basis national declines in its population. Hence, the regional status does not require any correction.

Geographic/Habitat of sustainable population in Kerala: Major wetlands and freshwater ponds of the state.

Level of Exploitation: Commercial Consumption- None, Local consumption- Sparingly hunted for local consumption, Poaching- Some poaching in wetlands, Pet trade- None, Wildlife trade- None.

Threats: Poaching, conversion of wetlands.

Recommended conservation measures in Kerala: Arresting conversion of inland freshwater wetlands.

Conservation priority area in Kerala: Moderate. BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal and Midland regions of all districts.

Stake holders responsible for conservation and sustainable utilization: Farmers, Kerala Forests and Wildlife Department, Department of Fisheries.

References:

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1–835. DC Books. Kottayam, Kerala.

Indian Thick-knee

Regional Redlist: VU B1, B2

Burhinus indicus (Salvadori, 1865)

Global Redlist (IUCN): LC



Local Names (Malayalam): വയൽകണ്ണൻ

Distribution: Global: India south of Himalayas and Sri Lanka; east to Vietnam and northern Malay Peninsula; probably also Pakistan east of the Indus river.

India: Widespread resident- from Gujarat north to southern Kashmir, along base of Himalayas and north-western Bengal, south to Kolkata and through Peninsula (except Western Ghats strip).

Kerala: Uncommon resident with a patchy distribution in Kerala.

Habitat/Ecology: Grassy laterite plains interspersed with cashew plantation or scrub jungle and banks of creeks.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Least Concern, Regional Redlist- Vulnerable.

Population trend in Kerala Since 2000: Long Term Decline: Uncertain, Short Term Decline: Uncertain.

Regional Redlist Assessment

Indian Thick-knee is an uncommon resident of grassy laterite plains interspersed with cashew plantation, scrub jungle and banks of creeks (Sashikumar et al. 2011). The status of the regional population of Indian Thick-knee is uncertain but it has been inferred that there is a continuing decline in area, extent and quality of its habitat. Its population declines within the region are uncertain but is believed to be strongly declining and 62% long-term decline nationally (<https://www.stateofindiasbirds.in/species/indthk1/>) and global population trend also appears to be decreasing (<http://datazone.birdlife.org/species/factsheet/indian-thick-knee-burhinus-indicus>). Its EOO is 10358 sq.km. and AOO is 646 sq. km. qualifying it as Vulnerable (criteria B1 and B2). The number of mature individuals in Kerala is not estimated but it will not meet any of the subcriteria of C as the population declines are not available, no extreme fluctuations are observed nor will meet the subcriteria for number of mature individuals in each subpopulation. Hence, the highest category of threat is Vulnerable B1 and B2. As both nationally and globally, there is suspected ongoing decline, the status of immigration of propagules is unknown. The rate of destruction of laterite hills and open habitats in the midlands are happening at a great pace and the coastal habitats face threats from reclamation. Hence, the regional status does not require any correction.

Geographic/Habitat of sustainable population in Kerala: Lateritic plains of Kasaragod and Kannur districts, Calicut University Campus, Beaches of Malappuram and Thrissur districts, Scrub jungles of Amateur taluk (Palakkad district), Kole wetlands and KAU campus in Thrissur district, Nedumbassery

wetlands in Ernakulam district.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- None.

Threats: Habitat loss, laterite mining, fire.

Recommended conservation measures in Kerala: Conservation of laterite plains in North Kerala, and hillocks of Palakkad district.

Conservation priority area in Kerala: High.

BMC responsible for conservation and sustainable utilization: Madayi Grama Panchayath, Tarur Grama Panchayath.

Stake holders responsible for conservation and sustainable utilization: Land owners, Kerala Forests and Wildlife Department, Local governing bodies.

Cultural significance and associated traditional knowledge: None.

References:

BirdLife International (2021) Species factsheet: *Burhinus indicus*. Downloaded from <http://www.birdlife.org> on 10/01/2021.

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1–835. DC Books. Kottayam, Kerala.

SoIB 2020. State of India's Birds factsheet: Indian Thick-knee *Burhinus indicus* <https://www.stateofindiasbirds.in/species/indthk1/>. Accessed on 2020-07-06.

Malabar Pied Hornbill

Regional Redlist: VU A4b, C1

***Anthracoceros coronatus* (Boddaert, 1783)**

Global Redlist (IUCN): NT

Local Names (Malayalam): പാണ്ടൻ തേഴൊമ്പൽ



Distribution: Global: Western India (Western Ghats south from southern Maharashtra), central and eastern India (from south-western West Bengal and Bihar to Andhra Pradesh and Madhya Pradesh) and Sri Lanka.

India: Resident in Peninsular hills, NE Peninsula from SW W Bengal and Bihar to N Andhra, Western Ghats (mainly along E edge) south of S Maharashtra.

Kerala: Rare resident with a patchy distribution in Kerala.

Habitat/Ecology: Evergreen and moist deciduous forests.

Conservation Status: WPA (1972)- Schedule-I, IUCN Redlist Status- Near Threatened, Regional Redlist- Vulnerable, CITES- Appendix II.

Population trend in Kerala Since 2000: Long Term Decline: Uncertain, Short Term Decline: 33%

Regional Redlist Assessment

Malabar Pied Hornbill is a resident of lowland riverine forests and sparsely populated midland villages of north-central Kerala with similar remnant habitats. It is nomadic and moves locally for large distances in search of fruiting trees. Its regional population is projected to be declining by 74% over a period of 17 years (3 generations = 16.5y) between 2014 and 2031 - projected for 17 years using a five year past decline of 33% between 2014 and 2019. This meets criteria Endangered under A4b. Its EOO is over 27,000 sq.km while its AOO is over 1,900 sq.km. - AOO within the threshold of Vulnerable but it does not meet two of the sub-criteria (number of locations > 10, no extreme fluctuations) to be classified as such and hence will meet only Near Threatened category under criteria B2. The number of mature individuals in Kerala is not expected to be more than 400 individuals (upper bound of total population) and it is projected to be declining by 30% over a period of 11 years (2 generations = 11y) between 2011 and 2022 - projected for 11 years using an eight year past decline of 22% between 2011 and 2019. This meets criteria Endangered under Criteria C1. Hence, the highest category of threat is EN A4b, C1 while it also meets NT B2. However, it is likely that the regional population is experiencing significant immigration of propagules that are likely to reproduce within the region as significant population of this species habitats forests outside the and it is unlikely that this immigration will reduce in the period till 2031 though there is a moderate recent decline across the country (<https://www.stateofindiasbirds.in/species/ma->

phor1/). Hence, we downlist the regional status by one level from EN to VU.

Geographic/Habitat of sustainable population in Kerala: Major population of this species restricted to forests north of Wayanad (Aralam WLS, Thirunelli) and Vazhachal RF and neighbouring contiguous forests. It can also be seen in other protected areas with a straggling population, sporadic movements observed (depends on fruiting trees).

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- Nests raided in some cases, Pet trade- No information available, Wildlife trade- All Hornbills in high demand in international market and hence possibility of wildlife trade cannot be ruled out.

Threats: Poaching.

Recommended conservation measures in Kerala: Monitoring nesting sites.

Conservation priority area in Kerala: High.

BMC responsible for conservation and sustainable utilization: Aralam WLS, Kottiyoor WLS, Wayanad WLS, North Wayanad Forest Division, Silent Valley NP, Palakkad Forest Division, Parambikulam Tiger Reserve, Vazhachal RF, and Thattekkad Bird Sanctuary.

Stake holders responsible for conservation and sustainable utilization: Kerala Forests and Wildlife Department, Vana Samrakshana Samithi, Tribal co-operatives.

Cultural significance and associated traditional knowledge: Hornbills in general considered as harbinger of rains. Incarcerated female and chicks considered said to be a culinary delicacy and having medicinal properties for some tribals.

References:

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1-835. DC Books. Kottayam, Kerala.

Streaked Weaver

Regional Redlist: VU A4b

***Ploceus manyar* (Horsfield, 1821)**

Global Redlist (IUCN): LC



Local Names (Malayalam): കായലാറ്റു

Distribution: Global: Pakistan, India, Sri Lanka, south-eastern Nepal, south-eastern Bhutan, Bangladesh, Myanmar, southern China (western Yunnan), Laos; north-western, central and south-eastern Thailand, Cambodia and southern Vietnam, Java and Bali. Introduced to northern Egypt (Nile Delta), Saudi Arabia, United Arab Emirates and Singapore, also probably to Qatar and Kuwait.

India: Resident mostly along sub-Himalayan region to Brahmaputra Plains, scattered localities over Peninsula.

Kerala: Uncommon resident. Patchy distribution in Kerala in suitable habitats.

Habitat/Ecology: Backwaters and paddy fields, particularly near coastal area.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Least Concern, Regional Redlist- Vulnerable.

Population trend in Kerala Since 2000: Long Term Decline: Uncertain, Short Term Decline: 36% Regional Redlist Assessment

Patchily distributed, the major population in central and south Kerala. Short-term decline is (5 years – 2014 to 2019) is 36.5% and Projected Decline is almost 60% (3 generations = 10 years), qualifying it as Vulnerable under IUCN Redlist Criteria A4b. Its EOO is 21,550 sq. km. and AOO is 1781 sq. km both not crossing the threshold of Vulnerable. The number of mature individuals is inferred to be 7,700 and there is a continuing threat of its habitat loss. The State of India's Birds has assigned its conservation concern as Moderate, with a current trend of strong decline (<https://www.stateofindias-birds.in/species/strwea2/>).

Geographic/Habitat of sustainable population in Kerala: Kole wetlands of Malappuram and Thirissur districts, Kadamakudy wetlands of Ernakulam district, Changaram wetlands of Alappuzha, Kuttanad wetlands, Karingali puncha of Pathanamthitta district, Vellayani-Punchakkari wetlands of Thiruvananthapuram district.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- Potentially caught with Munias, Wildlife trade- None.

Threats: Habitat loss.

Recommended conservation measures in Kerala: Conservation of wetlands and paddy fields. Conservation priority area in Kerala: Moderate.

BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal and Midland regions of Malappuram, Thrissur, Ernakulam,

Alappuzha, Kottayam, Pathanamthitta, and Thiruvananthapuram.

Stake holders responsible for conservation and sustainable utilization: Farmers, Kerala Forests and Wildlife Department, Department of Fisheries.

References:

SolB 2020. State of India's Birds factsheet: Streaked Weaver Ploceus manyarhtts://www.stateofindias-birds.in/species/strwea2/ Accessed on 2020-07-06.

Yellow Bittern

Regional Redlist: VU A2b

Ixobrychus sinensis (J.F. Gmelin, 1789)

Global Redlist (IUCN): LC



Local Names (Malayalam): മഞ്ഞരുകൊച്ചു

Distribution: Global: Oman; Seychelles; Indian Subcontinent, south-eastern Russia and Japan through central & eastern China and Taiwan to South East Asia, Greater and Lesser Sundas, Philippines, New Guinea (possibly), northern Solomons (Bougainville) and western Micronesia. Northern populations migrate to south of the range, to South India, Philippines and Indonesia, some reaching Wallacea and New Guinea.

India: Widespread resident. South-western Gujarat to Gangetic Plain, Northeast India and Peninsula, Lakshadweep and Andamans and Nicobars Is.

Kerala: Uncommon resident. Patchily distributed across Kerala in suitable habitats.

Habitat/Ecology: Low-lying coastal wetlands with extensive reed beds, weedy edge of tanks and canals, paddy fields.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Least Concern, Regional Redlist- Vulnerable.

Population trend in Kerala Since 2000: Long Term Decline: 62%, Short Term Decline: 24%

Regional Redlist Assessment

Yellow Bittern is a resident of low-lying coastal wetlands with extensive reed beds. Its regional population is inferred to have declined by 59% over a period of 10 years (3 generations = 10.5y) between 2000 and 2010 and is projected to be declining by 46% between 2014 and 2024 - projected for 10 years using a five year past decline of 25% between 2014 and 2019. This meets the criteria of Endangered under A2b and Vulnerable under A4b. Its EOO is over 35,000 sq.km while its AOO is over 3,400 sq.km. - both not approaching the thresholds of Vulnerable. The number of mature individuals in Kerala is not expected to be more than 6200 individuals (upper bound of total population) and it is projected to be declining by 46% over a period of 10 years (3 generations = 10.5y) between 2014 and 2024 - projected for 10 years using a five year past decline of 25% between 2014 and 2019. This meets criteria Vulnerable under Criteria C1. Hence, the highest category of threat is Endangered A2b. However, it is likely that the regional population is experiencing significant immigration of propagules that are likely to reproduce within the region and it is unlikely that this immigration will reduce in the period till 2024. Hence, we down list the regional status by one level from EN to VU.

Geographic/Habitat of sustainable population in Kerala: Coastal wetlands and mangrove forests of the state.

Level of Exploitation: Commercial Consumption-None, Local consumption- None, Poaching- No information, Pet trade- None, Wildlife trade- None. Threats: Habitat loss due to draining of wetlands and paddy fields.

Recommended conservation measures in Kerala: Conservation of wetlands especially Pandanus brakes and reed beds.

Conservation priority area in Kerala: Moderate.

BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal and Midland regions of all districts.

Stake holders responsible for conservation and sustainable utilization: Farmers, Kerala Forests and Wildlife Department, Department of Fisheries.

Near-threatened

Bar-tailed Godwit

Regional Redlist: NT B1, B2

***Limosa lapponica* (Linnaeus, 1758)**

Global Redlist (IUCN): NT



Local Names (Malayalam): വരവറലൻ തിന്നാട്

Distribution: Global: Breeds in Palearctic region and Alaska (USA). In winter, concentrations occur along Atlantic coasts of Europe and Africa from British Isles south to South Africa, along northwest coast of Indian Ocean, and in Australasia from south-western China to Australia and New Zealand, including Indochina, Indonesia, and islands of south-western Pacific.

Winter visitor to the coasts, mainly western India, recorded from eastern coasts, Andamans and Nicobars Is. and Lakshadweep Is.

Kerala: Regular winter visitor in small numbers along the coastline of Kerala.

Habitat/Ecology: Coastal mudflats, seashore, estuaries, mostly saltwater wetlands but can be seen occasionally inland.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Near Threatened, Regional Redlist- Near Threatened, CMS- Appendix II.

Population trend in Kerala Since 2000: Long Term

Decline: Uncertain, Short Term Decline: Uncertain

Regional Redlist Assessment

Bar-tailed Godwit is a regular winter visitor in small numbers to coastal mudflats, seashore, estuaries, mostly saltwater wetlands but can be seen occasionally inland (Sashikumar et al. 2011). Information of its national population trend is unknown (Data deficient) (<https://www.stateofindiabirds.in/species/batgod/>) and global population trend of nominate subspecies is unknown but all other populations appear to be declining rapidly (Birdlife International, 2021; McCaffery et al. 2020). Its EOO is only about 13,000 sq.km while its AOO is not more than 1730 sq.km- both meeting the thresholds for Vulnerable - but it does not meet two of the sub-criteria (number of locations > 10, no extreme fluctuations) to be classified as such and hence will meet only Near Threatened category under criteria B1 and B2. The number of mature individuals in Kerala

is not estimated but it will not meet any of the sub criteria of C as the population declines are not available, no extreme fluctuations are observed nor will meet the sub criteria for number of mature individuals in each subpopulation. Hence, the highest category of threat is Near Threatened B1, B2. As there is ongoing decline in global population, the rate of winter migration is expected to decrease. All shorebirds habitats within the region are threatened due to reclamation of land for development. Hence, the regional status does not require any correction.

Geographic/Habitat of sustainable population in Kerala: Throughout the coastal line of northern and central Kerala.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- None.

Threats: Unknown.

Recommended conservation measures in Kerala: Conservation of coastal wetlands and mudflats.

Conservation priority area in Kerala: Moderate. BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal regions.

Stake holders responsible for conservation and sustainable utilization: Land owners, Kerala Forests and Wildlife Department, Local governing bodies.

References:

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1–835. DC Books. Kottayam, Kerala

BirdLife International (2021) Species factsheet: *Limosa lapponica*. Downloaded from <http://www.birdlife.org> on 12/01/2021

McCaffery, B. J. and R. E. Gill (2020). Bar-tailed Godwit (*Limosa lapponica*), version 1.0. In Birds of the World (S. M. Billerman, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. <https://doi.org/10.2173/bow.batgod.01>

Curlew Sandpiper

Regional Redlist: NT B1, B2

***Calidris ferruginea* (Pontoppidan, 1763)**

Global Redlist (IUCN): NT



Local Names (Malayalam): കടൽകാക്ക

Distribution: Global: Arctic Siberia from Yamal Peninsula to Kolyuchinskaya Gulf (northern Chukotskiy Peninsula). Winters from sub-Saharan Africa through Middle East and South & South East Asia to Australasia.

India: Winter visitor mainly to coasts, also inland.

Kerala: Regular winter visitor distributed across coastal Kerala in suitable habitats.

Habitat/Ecology: Seashore, tidal mudflats at estuaries, waterlogged paddy fields, marshes, and fish and shrimp ponds.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Near Threatened, Regional Redlist- Near Threatened, CMS- Appendix II.

Population trend in Kerala Since 2000: Long Term Decline: Uncertain, Short Term Decline: Uncertain.

Regional Redlist Assessment

Curlew Sandpiper is a winter visitor to the shores of Kerala - frequenting estuaries, beaches and low-lying coastal wetlands. Its population declines within the region are uncertain but is believed to be declining as there is a strong (>87%) long-term decline nationally (<https://www.stateofindias-birds.in/species/cursan/>) as well as globally (<http://datazone.birdlife.org/species/factsheet/curlew-sandpiper-calidris-ferruginea>). Its EOO is only about 13,000 sq.km while its AOO is not more than 1,700 sq.km. - both within the thresholds of Vulnerable but it does not meet two of the sub-criteria (number of locations > 10, no extreme fluctuations) to be classified as such and hence will meet only Near Threatened category under criteria B1 & B2.

The number of mature individuals in Kerala is not estimated but it will not meet any of the sub criteria of C as the population declines are not available, no extreme fluctuations are observed nor will meet the sub criteria for number of mature individuals in each subpopulation. Hence, the highest category of threat is Near Threatened B1, B2. As both nationally and globally, there is ongoing decline the rate of winter migration is expected to decrease. All shorebirds habitats within the region are threatened due to reclamation of land for development. Hence, the regional status does not require any correction.

Geographic/Habitat of sustainable population in Kerala: Throughout the coastal line and coastal wetlands of the state.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- None.

Threats: Unknown.

Recommended conservation measures in Kerala: Conservation of wetlands, seashore and mudflats.

Conservation priority area in Kerala: Moderate.

BMC responsible for conservation and sustainable utilization: Local governing bodies of coastal regions.

Stake holders responsible for conservation and sustainable utilization: Land owners, Kerala Forests and Wildlife Department, Local governing bodies.

Great Knot

Regional Redlist: NT B1, B2

***Calidristenuirostris* (Horsfield, 1821)**

Global Redlist: VU



Local Names (Malayalam): കിഴക്കൻ നട്ട്

Distribution: Global: NE Siberia from Verkhoyansk Mts E to Magadan, Koryak Highlands and S Chukotskiy Peninsula; distribution poorly known.

Winters mainly in SE Asia and S to Australia; also in Arabia, Pakistan, NW, S & NE India and Bangladesh. India: Winter visitor to coasts. Also reported from Lakshadweep Is and Andamans Is.

Kerala: Uncommon winter visitor in small numbers to Kerala coasts.

Habitat/Ecology: Sandy or muddy estuaries and coasts.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Endangered, Regional Redlist- Near Threatened, CMS- Appendix I.

Population trend in Kerala Since 2000: Long Term Decline: Uncertain, Short Term Decline: Uncertain.

Regional Redlist Assessment

Irregular winter visitor, uncommon (Sashikumar et al. 2011). Its status in Kerala is uncertain over the years. Great Knot's EOO is 5,175 and EOO is 708, assigning this migratory species to Near Threatened category with Criteria B1 and B2, Its status is uncertain for the rest of India as well, but due to the restricted distribution range its conservation concern has been set as High (<https://www.stateof-indiasbirds.in/species/grekno/>).

Geographic/Habitat of sustainable population in Kerala: Beaches like Payyambalam, Muzhuppilangad (Kannur), Kottappuram, Kappad, Elathur (Kozhikode), Kadalundi Reserve, Ponnani (Malappuram), Chavakkad (Thrissur), Puthuvype (Ernakulam), and Purakkad (Alappuzha).

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- None.

Threats: Unknown.

Recommended conservation measures in Kerala: Conservation of coastal wetlands, seashore and mudflats.

Conservation priority area in Kerala: Moderate.

BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal region of Kannur, Kozhikode, Malappuram, Thrissur, Ernakulam, and Alappuzha districts.

Stake holders responsible for conservation and sustainable utilization: Land owners, Kerala Forests and Wildlife Department, Local governing bodies.

References:

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1–835. DC Books. Kottayam, Kerala.

SoIB 2020. State of India's Birds factsheet: Great Knot *Calidris tenuirostris* <https://www.stateofindiabirds.in/species/grekn0/>. Accessed on 2020-07-06

Indian Eagle Owl

Regional Redlist: VU B1, B2

***Bubo bengalensis* (Franklin, 1831)**

Global Redlist (IUCN): LC



Local Names (Malayalam): കൊമ്പൻ മുങ്ങ

Distribution: Global: Indian Subcontinent (except Sri Lanka) north to foothills of Himalayas.

India: Resident, outer ranges of S Kashmir, along outer Himalayas and adjacent plains, Bihar and western Bengal and throughout Peninsula.

Kerala: Rare resident. As the suitable habitat is scarce in the state, it is very rare.

Habitat/Ecology: Dry rocky country, abandoned quarries.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Least Concern, Regional Redlist- Vulnerable, CITES- Appendix II.

Population trend in Kerala Since 2000: Long Term Decline: Uncertain, Short Term Decline: Uncertain.

Regional Redlist Assessment

Indian Eagle Owl is a rare resident of dry rocky habitat. As the suitable habitat is scarce in the state, it is considered to be very rare (Sashikumar et al. 2011). Its status in Kerala is uncertain over the years (Data deficient), so criteria A is not evaluated. Its EOO is only about 1,000 sq.km while its AOO is not more than 125 sq.km- both within the thresholds of Vulnerable and meeting the two sub-criterias (number of locations > 10, no extreme fluctuations). Hence the category of threat is Vulnerable (Criteria B1 and Criteria B2). The number of mature individuals in Kerala is not estimated. The global population trend is stable (Birdlife International,

2021) but the rate of destruction of rocky hills and barren habitats are happening at a great pace within the state, also the number of illegal quarries working in the state is very high recently. Hence, the regional status does not require any correction.

Geographic/Habitat of sustainable population in Kerala: Dry rocky hills of Palakkad district.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- Though no trade known from Kerala for this species, it is under widespread trade across India.

Threats: Wildlife trade?

Recommended conservation measures in Kerala: Conservation of dry rocky scrub habitat, and strict enforcement of Wildlife Protection Act to curb illegal trade.

Conservation priority area in Kerala: Moderate.

BMC responsible for conservation and sustainable utilization: Kerala Agricultural University (Mannuthy), Chinnar WLS, Palakkad Forest Division. Stake holders responsible for conservation and sustainable utilization: Kerala Forests and Wildlife Department, KAU.

References:

Sashikumar, C., Praveen J., M. J. Palot, & P. O. Nameer (2011) Birds of Kerala: status and distribution. 1–835. DC Books. Kottayam, Kerala
 BirdLife International (2021) Species factsheet: *Bubo bengalensis*. Downloaded from <http://www.birdlife.org> on 16/01/2021.

Malabar Lark

***Galerida malabarica* (Scopoli, 1786)**



Local Names (Malayalam): കൊമ്പൻ വാറമ്പാടി

Distribution: Global: South-eastern Gujarat and Western Ghats, also reported from south-western Gujarat.

India: South-eastern Gujarat and Western Ghats, also reported from south-western Gujarat.

Kerala: Resident. Patchily distributed across northern and central Kerala in suitable habitats.

Habitat/Ecology: Fallow paddy fields, lateritic plains with grass and scrub, and grassy hillside.

Conservation Status: WPA (1972)- Schedule-IV, IUCN Redlist Status- Least Concern, Regional Redlist- Least Concern.

Population trend in Kerala Since 2000: Long Term Decline: Uncertain, Short Term Decline: Uncertain.

Geographic/Habitat of sustainable population in Kerala: Lateritic plains and wetlands of northern Kerala. Kole wetlands of Malappuram and Thrissur districts, hillocks of Palakkad district, Nedumbassery wetlands and HMT estate of Ernakulam district.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- None.

Threats: Habitat loss.

Recommended conservation measures in Kerala: Conservation of open grassland and fallow land in the coastal and midlands.

Conservation priority area in Kerala: Moderate.

BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal and Midland regions of districts north of Kottayam. Stake holders responsible for conservation and sustainable utilization: Land owners, Kerala Forests and Wildlife Department, Local governing bodies.

White-bellied Sea Eagle

Haliaeetus leucogaster (J.F. Gmelin, 1788)



Local Names (Malayalam):

വെള്ളവയറൻ കടൽപ്പരുന്ത്

Distribution: Global: India and Sri Lanka through South East Asia, Andaman Is and southern China, Sunda Is, Philippines, Wallacea, New Guinea and Bismarcks to Australia and Tasmania.

India: Resident along the coasts, also in Andaman & Nicobar Is.

Kerala: Uncommon resident. Thinly distributed along the coastline from the north to south till Mahe. Stray observations from the coast and inland waterbodies till south.

Habitat/Ecology: Sea coast, occasionally recorded at inland waterbodies.

Conservation Status: WPA (1972)- Schedule-I, IUCN Redlist Status- Least Concern, Regional Redlist- Least Concern, CITES- Appendix II, CMS- Appendix II.

Population trend in Kerala Since 2000: Long Term Decline: Uncertain, Short Term Decline: Uncertain.

Geographic/Habitat of sustainable population in Kerala: Coastline from the north to south till Mahe where it known to breed.

Level of Exploitation: Commercial Consumption- None, Local consumption- None, Poaching- None, Pet trade- None, Wildlife trade- No information.

Threats: Loss of nest trees.

Recommended conservation measures in Kerala: Identification of nest trees, offering incentive to the landowners of nest trees, nest monitoring.

Conservation priority area in Kerala: Moderate. BMC responsible for conservation and sustainable utilization: Local governing bodies of Coastal region north of Mahe.

Stake holders responsible for conservation and sustainable utilization: Land owners, Kerala Forests and Wildlife Department, Local governing bodies.

Cultural significance and associated traditional knowledge: Mentioned in the folklore of fishermen community for its 'magical power' in catching sea snakes. Its large nest on large trees in the coastal area used traditionally for decades attracts local attention.

References:

Palot, Mohamed Jafer 2011. Status and conservation of White-bellied Sea-eagle, *Haliaeetus leucogaster* (Gmelin). Status of Indian birds and their conservation: First International Conference on Indian Ornithology (ICIO) - 2011. 267. Salim Ali Centre for Ornithology and Natural History. Coimbatore, India.

REPTILES



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Introduction

Among the terrestrial vertebrates, reptiles are the most species-rich group with more than 11,000 species in the world (Uetz et al., 2021). The reptile fauna of India is unique in its diversity and endemism. They have a zoogeographical affinity more towards Oriental region, as well as others, showing close relationship to the Indo-Malayan region. India has more than 250 years of history in studies of reptilian fauna with a diversity of more than 572 species (Aengals et al., 2018). Kerala, with its long coastline and the topographically complex hills of the southern and central Western Ghats, harbours exceptional reptilian diversity. Although there have been several attempts to study the reptile diversity of Kerala during the colonial and post-colonial periods (e.g. Beddome 1870, 1878; Boulenger 1887, 1890, 1893; Ferguson, 1895; Wall, 1905, 1918; Annandale, 1909; Murthy, 1981; Inger et al. 1984; Radhakrishnan, 1996, 1997; Thomas et al. 1997; Zacharias, 1997; Easa, 1998; Ajith, 1998; Abraham et al. 1999; Palot & Radhakrishnan, 2002, 2003, 2004; Easa & Ramachandran 2004; Jahas & Easa 2008, Cyriac et al. 2018, 2020; Cyriac & Umesh, 2011, 2014, Chaithanya et al., 2019), reptiles remain one of the least known vertebrate classes.

The snakes of Kerala in Malayalam language by Adiyodi (1965), was the first published book pertaining to the snakes of the State. The first comprehensive checklist on the reptilian fauna of the State was compiled by Radhakrishnan (1997), who listed 169 species. Subsequently, Palot & Radhakrishnan (2003) compiled a checklist with vernacular names of snakes of Kerala. Further, as part of biodiversity documentation, Kerala Forest Research Institute (KFRI) published a series of checklists on the biodiversity of the State including reptiles (Easa & Ramachandran, 2004). More recently, Palot (2015) updated a checklist of reptiles of Kerala by listing 173 species from the region. A recent estimate from the State showed that a total of 202 species of reptiles (Annexure-I) classified under 24 families belonging to 3 orders (Palot, 2021, In press). Now the updated list consists of two species of crocodiles, 12 species of turtles and tortoises, 75 species of lizards and 112 species of snakes. Of these, 109 species (54%)

are endemic to the Western Ghats, which include 14 species endemics to the geographical boundary of Kerala. One species of crocodile (Estuarine crocodile, *Crocodylus porosus*) has been extirpated from the coastal habitats of Kerala.

Threatened taxa

Reptiles generally have narrower distributional ranges than other vertebrates such as birds and mammals making them more susceptible to threat processes (Anderson and Marcus, 1992; Chapple et al., 2021). Nearly one in five reptilian species are threatened with extinction, with another one in five species categorized as Data Deficient (Böhm et al. 2013). In India, there is limited information on the population trends and conservation status of most reptile species, and no Indian reptile is known to have become 'extinct' in recent times. However, there are clear signs of population decline in many larger reptile species. For instance, the estuarine crocodile that once had a wide distribution in Peninsular India is now extinct in most of its older ranges, including Kerala. Thus, highlighting the urgent need to collect basic natural history and ecological data on Indian reptiles and reassess their conservation status.

The last IUCN assessment of the region (Srinivasulu et al., 2014), documented 53 species of threatened or data deficient reptiles from the state of Kerala, which included one 'Critically Endangered', 13 'Endangered', 10 'Vulnerable', and 7 'Near Threatened' species. The assessment also listed 23 species as 'Data Deficient' according to the IUCN's categorization. All the marine turtle species reported from the coastal waters of Kerala viz. Leatherback Sea Turtle (*Dermochelys coriacea*), Hawksbill Sea Turtle (*Eretmochelys imbricata*), Green Sea Turtle (*Chelonia mydas*) and the Olive Ridley Turtle (*Lepidochelys olivacea*) are endangered. The very rapidly deteriorating status of endemic tortoises and freshwater turtles in India has resulted in an increasing number of these species being listed as threatened. Species such as the Cochin Cane Turtle (*Vijayachelys silvatica*), the Travancore Tortoise (*Indotestudo travancorica*), Giant Softshell Turtle (*Pelochelys cantorii*) and the Leith's Softshell

Turtle (*Nelsonia leithii*), are globally threatened species. Charismatic species such as the King Cobra (*Ophiophagus hannah*) have been classified as 'Vulnerable' by the IUCN Redlist (2010) due to drastic decline in its population across many parts of its range. However, many lesser-known species such as Uropeltid snakes (Shieldtails), geckos and skinks have very narrow geographical ranges, and their status is not yet ascertained and listed in data deficient category of the IUCN Redlist. In light of new data collected by us over several years, we here reassess the conservation status of the reptiles of Kerala, and identify potential threats to species in the region..

Methodology

In the present work, we attempted to assess or reassess the conservation status of the reptiles of Kerala following the IUCN criteria. We enlist potential threatened species by assessing its status in the state of Kerala based on our data collected over several herpetological surveys conducted over the years, published literature, and verifying observations by other herpetologists of the region. We assessed the conservation status of each species listed in the checklist of reptiles of Kerala (Palot, 2015), and few additional species that were recently described from the State. The conservation status of species were based on rarity, endemism, taxonomic distinctiveness, threats to its habitat, conservation status of the species in IUCN Redlist and Indian Wildlife (Protection) Act of 1972 from the region. The data accumulated over 25 years of herpetological research in the Western Ghats part of Kerala by the regional centre of ZSI (Kozhikode) is also considered for the finalisation of the list.

Since the data on the distribution and status of many of the newly described species are lacking, most of them are listed in the 'Data Deficient' category of the IUCN. The marine turtles and sea snakes are not included for the present assessment.

Results

As per the last IUCN assessment (2014), 25 species of terrestrial or freshwater reptilian fauna of Kerala are globally threatened, which included 9 Endangered, 9 Vulnerable and 7 species in Near Threatened category. In the present work, we assessed the conservation status of the 185 species of terrestrial and freshwater reptilian fauna of Kerala (Table-2). Based on our assessment of the distribution and threats to each species we identified 37 potential threatened species in Kerala, of which one Critically Endangered, 16 species can be considered Endangered and another 21 species as Vulnerable. We also identified 13 species as Near Threatened and 69 species as Least Concern. We found that there is insufficient data to assess conservation status for a large majority of species (64 species), which we classified as Data Deficient. We also updated the conservation status of several species assessed by Srinivasulu et al. (2014), based on additional data. For instance, we consider *Kaestlea palnica*, *Plectrurus guentheri*, *Uropeltis rubrolineata* and *Trimeresurus strigatus*, which were classified as Least Concern or Data Deficient by Srinivasulu et al. (2014), to be Endangered. Similarly, we treat *Uropeltis beddomii*, *U. myhendrae* and *Rhinophis sanguines*, which were considered as Least Concern or Data Deficient by Srinivasulu et al. (2014), as Vulnerable species. .

Table-2:**List of potential Threatened species of Terrestrial/ freshwater****Reptiles of Kerala along with our assessment of their conservation status.****WLS indicates Wildlife Scantuary, NP indicates National Parks and TR indicates Tiger Reserves.**

Sl.no.	English name	Species name	IUCN status 2013	Endemic	WPA	Remarks	Kerala Status
I. ORDER CROCODYLIA							
1. Family Crocodylidae (crocodiles)							
1	Mugger Marsh Crocodile	<i>Crocodylus palustris</i>	VU		Sch. I	Widely distributed across India. It has a patchy distribution in Kerala with reports from Kabini in Wayanad and around Athirapalli and Parambikulam WLS. Captive populations were released in Neyyar WLS and Peruvannamuzhi as part of a captive breeding program established in 1977.	VU
II. ORDER TESTUDINES							
2. Family Geoemydidae (turtles & terrapins)							
2	Cochin Forest Cane Turtle	<i>Vijayachelys silvatica</i>	EN	W G	Sch. I	This is a very rare species with a very patchy distributed in semi-evergreen and evergreen forests of Kerala, Tamil Nadu and Karnataka. Population estimations have indicated very low densities possibly due to its crepuscular habits (Kanagavel et al., 2013).	EN
3	Indian Black Turtle	<i>Melanochelys trijuga</i>	NT			The most common freshwater turtle throughout Kerala. it is extensively poached for meat in many localities. Populations in Kerala appear to be stable and can be considered as Least Concern within the state.	LC
5. Family Testudinidae (tortoises)							
4.	Indian Star Tortoise	<i>Geochelone elegans</i>	VU		Sch. IV	Recorded from the drier regions of Kerala, but widely distributed in India. Extensively collected from the wild for pet trade.	VU
5	Travancore Tortoise	<i>Geochelone elegans</i>	VU	W G	Sch. IV	A widely distributed species in semi-evergreen and evergreen forests of the Western Ghats in Kerala, Tamil Nadu and Karnataka, extensively poached for local consumption and also threatened by forest-fires. Considering these threats, Kanagavel & Raghavan (2013), suggested that the conservation	EN

						status of this species be elevated to Endangered.	
6. Family Trionychidae (softshell turtles)							
6	Leith's Softshell Turtle	<i>Nilssonia leithii</i>	CR		Sch. IV	Few isolated records in Kerala but distributed across Peninsular India. It was recently elevated from Vulnerable to Critically Endangered.	CR
7	Indian Flapshell Turtle	<i>Lissemys punctata</i>	VU		Sch. I	Locally common across Kerala but severely hunted for meat and is part of the pet trade. Recently elevated from Least Concern to Vulnerable based on new data on the species.	VU
8	Asian Giant Softshell Turtle	<i>Pelochelys cantorii</i>	EN		Sch. I	A widespread species in South and Southeast Asia but with a very patchy distribution. This species is threatened by poaching and degradation of wetland and river habitats.	EN
9	Narrow-headed Softshell Turtle	<i>Chitra indica</i>	EN		Sch. IV	A single record from the estuarine areas of Valapattanam river in Kannur district (Palot & Murthy, 2015). Highly threatened due to habitat degradation and poaching.	EN
III. ORDER SQUAMATA							
7. Family Agamidae (lizards)							
10	Common Green Forest Lizard		NE			It is common in most low to mid-elevation forests.	LC
11	Large-scaled Forest Lizard		LC	W G		Wide, but highly patchy distribution in Kerala and Tamil Nadu. The species is an arboreal lizard restricted to semi-evergreen and evergreen forests, thus, is likely to be threatened by habitat fragmentation (Ishwar et al. 2003), can be considered as Near Threatened.	NT
12	Nilgiri Forest Lizard	<i>Calotes nemoricola</i>	LC	W G		Wide but highly patchy distribution.	DD
13	Indian Garden Lizard	<i>Calotes versicolor</i>	NE			Common throughout India and in Kerala.	LC
14	Montane Forest Lizard	<i>Monilisaurus montanus</i>	NE	W G		This is a recently described species, and is known only from	DD

						high elevation forests in four locations in the Western Ghats.	
15	Spiny-headed Forest Lizard	<i>Monilisaurus acanthocephalus</i>	NE	W G		This is a recently described species, and is currently known only from high elevation forests of Meghamalai hills.	DD
16	Roux's Forest Lizard	<i>Monilisaurus rouxii</i>				Patchy but wide distribution in the Western Ghats.	LC
17	Elliot's Forest Lizard	<i>Monilisaurus ellioti</i>	LC	W G		Patchily distributed over Kerala, Tamil Nadu and Karnataka. Could consider elevating the conservation status to Near Threatened	NT
18	Orange-lipped Forest Lizard	<i>Microauris aurantolabium</i>	NE	W G		Known only from the Agasthyamalai hills. There is not enough data to assess its status .	DD
19	Anamalai Spiny Lizard	<i>Salea anamallyana</i>	LC	W G		Widely distributed in the highland montane shola grassland ecosystem in Anamalais. It is threatened by habitat fragmentation and encroachment of plantations, can be considered as Near Threatened.	NT
20	Horsfield's Spiny Lizard	<i>Salea horsfieldii</i>	LC	W G		A high altitude species restricted to the Nilgiri hills of Kerala and Tamil Nadu. Could consider elevating the conservation status to Near Threatened	NT
21	Indian Kangaroo Lizard	<i>Agasthyagama beddomei</i>	EN	W G		Mostly restricted to low-land forests in the southern Western Ghats.	EN
22	Blanford's Rock Agama	<i>Psammophilus blanfordanus</i>	LC			Reported from Thenmala in Shendurney WLS (Annandale, 1909). Reports needs confirmation.	LC
23	South Indian Rock Agama	<i>Psammophilus dorsalis</i>	LC			Widely distributed and common across Peninsular India and across Kerala.	LC
24	Fan-throated Lizard	<i>Sitana marudhamneydhal</i>	NE			This is a recently described species. Currently Known from the sand dune beaches of southernmost coast of Thiruvananthapuram district.	DD
25	Southern Flying Lizard	<i>Draco dussumieri</i>	LC			Widely distributed in the Western Ghats but is thought to be have multiple cryptic species.	LC

8. Family Chamaeleonidae (chamaeleons)							
26	Indian Chamaeleon	<i>Chamaeleo zeylanicus</i>	NE		Sch. II	Widely distributed in the drier regions of India. It has a patchy distribution in Kerala and is known from the drier regions of Palakkad.	DD
9. Family Gekkonidae (geckoes)							
27	Aaronbauer's Day Gecko	<i>Cnemaspis aaronbaueri</i>	NE	W G		This species is restricted to the Agasthyamalai Hills of Kerala and Tamil Nadu.	DD
28	Anamudi Day Gecko	<i>Cnemaspis anamudiensis</i>	NE	W G		This species is currently known only from montane shola forests of Pettimudi in Anamudi reserve forest, Anamudi Shola NP in Idukki district of Kerala.	DD
29	Beddome's Day Gecko	<i>Cnemaspis beddomei</i>	DD	W G		This species is restricted to the Agasthyamalai Hills and is confidently recorded from few locations in Ponmudi and Peppara Wildlife Sanctuary of Kerala.	DD
30	Chengodumala Day Gecko	<i>Cnemaspis chengodumalensis</i>	NE			A recently described species from the midland hillocks of Kozhikode. It is currently under severe threat from illegal quarrying in these hills. Assuming a 50 km square area for each location, the estimated area of occupancy (AOO) would be < 200 km square. Given the narrow distribution (< 5 localities) and the threat from habitat loss, the conservation status can be considered as Endangered.	EN
31	Indian Day Gecko	<i>Cnemaspis indica</i>	VU	W G		Has a restricted distribution and is known from the Nilgiri hills. In Kerala, there is confirmed reports only from Sispara in Silent Valley NP.	VU
32	Slender Day Gecko	<i>Cnemaspis gracilis</i>				Distributed in the few dry localities in Kerala and Tamil Nadu.	LC3
33	Kottiyur Day Gecko	<i>Cnemaspis kottiyorensis</i>	NE	KL		Known from six localities in evergreen forests of Kerala and Karnataka (Cyriac et al., 2020). Given the restricted distribution and the small area of occupancy (assuming 50 km square for each	VU

						locality), the species can be considered as Vulnerable.	
34	Coastal Day Gecko	<i>Cnemaspis littoralis</i>	DD	W G		This is a widespread gecko in the coastal areas and drier regions of Kerala.	LC
35	Agasthyamala Day Gecko		NE	W G		The species is currently known from Pandimotta in Shendhurney WLS (Cyriac et al., 2018) but is presumed to have a wider distribution in Agasthyamalai hills.	DD
36	Mountain Day Gecko	<i>Cnemaspis monticola</i>	DD	KL		Known only from the type specimens collected from Wayanad, Kerala (Manamendra-Arachchi et al., 2007).	DD
37	Ponmudi Day Gecko	<i>Cnemaspis nairi</i>	LC	W G		This species is known only from the Agasthyamalai hills of Kerala.	DD
38	Nilgiri Day Gecko	<i>Cnemaspis nilagirica</i>	NT	W G		This species was recently rediscovered after about 130 years and is currently known only from the higher reaches of Thudukki and Sispara in Silent Valley NP (Cyriac et al., 2019). Given its restricted range (3 localities) in high elevation forests in the Nilgiri hills, it can be considered as Endangered.	EN
39	Ornate Day Gecko	<i>Cnemaspis ornata</i>	NT	W G		Known only from the Agasthyamalai hills of Kerala and Tamil Nadu.	DD
40	Palakkad Day Gecko	<i>Cnemaspis palakkadensis</i>	NE	W G		A recently described species. Known only from lowland moist deciduous and semi-evergreen forests of Anakkal reserve forest in Palakkad district.	DD
41	Mysore Day Gecko	<i>Cnemaspis mysorensis</i>	LC	W G		This species is common in human habitations and rocky outcrops of Bangalore and Mysore. However, record from Kerala is likely erroneous.	LC
42	Sispara Day Gecko	<i>Cnemaspis sisparensis</i>	NT	W G		Described from Sholakkal (now Cholakkal in Malappuram district) at the base of Sispara Ghat. Recently two other species <i>Gonatodes bireticulatus</i> and <i>Cnemaspis anaikattiensis</i> are synonymized with <i>C. sisparensis</i> .	DD

43	Wayanad Day Gecko	<i>Cnemaspis wynadensis</i>	EN	KL		This species is currently known only from few localities in Wayanad.	DD
44	Zacharia's Day Gecko	<i>Cnemaspis zacharyi</i>	NE	W G		This is a recently described large-sized gecko species from Kerala. This species has mostly been observed outside protected areas, where its habitat is under threat from conversion of forest areas into plantations.	NT
45	Kollegal Ground Gecko	<i>Cyrtodactylus cf. collegalensis</i>	LC			This species is recently split into multiple species.	DD
46	Four-clawed Gecko	<i>Gehyra mutilata</i>	NE			A widely but patchily distributed gecko In India, Sri Lanka, south China, Japan, south-east Asia, Australia, Oceania, Madagascar and Masacrene Islands.	LC
47	Janaki's Dravidogecko	<i>Dravidogecko janakiae</i>	NE	W G		Recently described from Munnar hills, Idukki district.	DD
48	Smith's Dravidogecko	<i>Dravidogecko smithi</i>	NE	W G		Recently described from Ponmudi hills, Thiruvananthapuram	DD
49	Wayanad Dravidogecko	<i>Dravidogecko septentrionalis</i>	NE	W G		Recently described from Wayanad hills.	DD
50	Common Spotted Gecko	<i>Hemidactylus parvimaculatus</i>	NE			A widely distributed gecko found in the southern parts of India and Sri Lanka (Lajmi et al., 2016).	LC
51	Travancore Rock Gecko	<i>Hemidactylus paaragowli</i>	NE	W G		This species is currently known only from low to mid-elevation forests in Ambanad, Achankovil, and Devarmalai-Sivagiri Hill in Kollam, Kerala (Srikanthan et al., 2018). Given the very small restricted range of the species, it can be considered as Vulnerable.	VU
52	Prashad's Gecko	<i>Hemidactylus prashadi</i>	LC	W G		This species is highly adaptable and has recently started colonizing human habitations in Kerala.	LC
53	Asian House Gecko	<i>Hemidactylus frenatus</i>	LC			Widely distributed species across India.	LC

54	Bark Gecko	<i>Hemidactylus leschenaultii</i>	LC			Has a wide distribution in India but a patchy distribution in Kerala.	LC
55	Murray's Day Gecko	<i>Hemidactylus murrayi</i>	NE			A few reports from Kerala. previously synonymized with <i>H. brooki</i> but revalidated by Lajmi et al. 2016.	DD
56	Termite Hill Gecko	<i>Hemidactylus triedrus</i>	NE			Known from the drier regions of Kerala, Tamil Nadu, Telangana and Andhra Pradesh.	DD
11. Family Lacertidae (lacertas)							
57	Leschenau It's Lacerta	<i>Ophisops aculateltia</i>	NE			Patchy in distribution in Peninsular India. In Kerala, common in Chinnar WLS.	DD
58	Beddome's Lacerta	<i>Ophisops beddomei</i>	LC			Earlier records. No recent reports from the state.	LC
10. Family Scincidae (Skinks)							
59	Blue-bellied Tree Skink	<i>Dasia subcaerulea</i>	EN	W G		Isolated records from Bodinaikanur in Madurai and Kudremukh in Karnataka. One unconfirmed report from Periya in Wayanad, Kerala.	DD
60	Allapalli Grass Skink	<i>Eutropis allapallensis</i>	LC			A widespread species recorded from several localities in peninsular India.	LC
61	Beddome's Grass Skink	<i>Eutropis beddomii</i>	NE			A widely distributed skink throughout Peninsular India and Sri Lanka.	LC
62	Bibron's Seashore Skink	<i>Eutropis bibronii</i>	LC			Widely distributed on the eastern coast of Peninsular India from Orissa to Kanyakumari in Tamil Nadu, and in Sri Lanka.	LC
63	Gunther's Grass Skink	<i>Eutropis brevis</i>	NE	W G		This species is known to be distributed throughout the wet forests of the southern Western Ghats of Kerala and Tamil Nadu.	DD
64	Common Keeled Skink	<i>Eutropis carinata</i>	LC			This is a widespread species distributed throughout the Indian subcontinent.	LC
65	Mountain Skink	<i>Eutropis clivicola</i>	EN	KL		This species was described from Ponmudi hills in Kerala. Given its wide but patchy distribution (10 localities), the species can be considered as Vulnerable.	VU
66	Bronze Grass Skink	<i>Eutropis macularia</i>	NE			A widespread species in the Indian subcontinent.	LC

67	Dawson's Grass Skink	<i>Eutropis dawsoni</i>		W G		This species is restricted to the evergreen forests patches below the Shencottah gap in Kerala and Tamil Nadu.	DD
68	White-spotted Supple Skink	<i>Riopa albopunctata</i>	NE			Has a wide distribution across the Indian Subcontinent but few authentic records from Kerala.	DD
69	Spotted Supple Skink	<i>Riopa aculate</i>	NE			Common throughout the Indian subcontinent	LC
70	Gunther's Supple Skink	<i>Riopa guentheri</i>	LC			Known from the Travancore region of Kerala ,but widely distributed in other parts of Peninsular India.	DD
71	Beddome's Cat Skink	<i>Ristella beddomii</i>	LC	W G		A widely distributed species from the central and southern Western Ghats of Karnataka, Kerala and Tamil Nadu.	LC
72	Günther's Cat Skink	<i>Ristella guentheri</i>	DD	W G		This species is restricted to south of the Palakkad gap in the southern Western Ghats of Kerala and Tamil Nadu. Reports of this species from Wayanad need confirmation.	DD
73	Rurk's Cat Skink	<i>Ristella rurkii</i>	DD	W G		This species has a restricted distribution in the Anamalai and Palni hills of Kerala and Tamil Nadu. In Kerala, this species is found in high-elevation evergreen and shola forests of Parambikulam, Marayoor (VPC Pers. Obs.), Anamudi Shola NP, Pambadum Shola NP and Eravikulam NP. VU	VU
74	Travancore Cat Skink	<i>Ristella travancorica</i>	DD	W G		Restricted to the Southern WG of Kerala and Tamil Nadu.	DD
75	Beddome's Ground Skink	<i>Kaestlea beddomii</i>	LC	W G		This species shows a wide but patchy distribution in the central and southern WG of Karnataka, Kerala and Tamil Nadu.	DD
76	Two-lined Ground Skink	<i>Kaestlea bilineata</i>	LC	W G		This species is restricted to the high-altitude evergreen and shola-grassland habitats of the Nilgiri hills of Kerala and Tamil Nadu. Although, this species is common in high-altitude forests of this range, it is under threat from human encroachment in to	VU

						shola-grassland habitats. Given the low EOO and the restricted distribution, this species can be listed as Vulnerable.	
77	Side-spotted Ground Skink	<i>Kaestlea laterimaculata</i>	VU	WG		This species is widely distributed in the southern WG of Kerala and Tamil Nadu. Given its wide distribution in Kerala and other parts of Tamil Nadu, this species can be considered as Near Threatened.	NT
78	Travancore Ground Skink	<i>Kaestlea travancorica</i>	LC	WG		Widely distributed south of the Palakkad gap in the southern WG of Kerala and Tamil Nadu. Given its restricted distribution to high-elevation forests of Kerala and Tamil Nadu, this species can be considered as Vulnerable	VU
79	Palni Hills Ground Skink	<i>Kaestlea palnica</i>	DD	WG		This species has a highly restricted range to the high-altitude shola grasslands of Anamalai and Palni Hills of Kerala and Tamil Nadu. However, given the highly restricted distribution range (5 confirmed locations) and an estimated AOO of 250 km square (assuming 50 km square at each location), this species can be considered as Endangered.	EN
80	Dussumier's Litter Skink	<i>Sphenomorphus dussumieri</i>	LC	WG		A very common skink from the lowland forests of Kerala.	LC
81	Earless Skink	<i>Chalcides pentadactylus</i>	DD	KL		This species was described from Kadalundi in Beypore, Kozhikode dt.	DD
12. Family Varanidae (monitor lizards)							
82	Bengal Monitor	<i>Varanus bengalensis</i>	LC		Sch. I	Distributed throughout India and across most forested areas of Kerala. This species is common in most of its range in Kerala but is extensively hunted for its meat.	NT
Suborder: Serpentes							
13. Family Typhlopidae (worm snakes)							
83	Brahminy Worm Snake	<i>Indotyphlops braminus</i>	NE		Sch. I	Widespread species. Should be in Least concern category	NT

84	Beaked Worm Snake	<i>Grypotyphlops acutus</i>	LC		Sch. IV	Widely distributed in the drier regions across Kerala.	LC
14. Family Gerrhopilidae (worm snakes)							
85	Thurston's Worm Snake	<i>Gerrhopilus thurstoni</i>	DD	W G	Sch. IV	Historically known from only few specimens from Wayanad, Nilgiris, Thrissur and Cochin.	DD
86	Tindall's Worm Snake	<i>Gerrhopilus tindalli</i>	DD	W G	Sch. IV	Historically reported from Nilambur in Kerala and Pillur in Tamil Nadu	DD
87	Beddome's Worm Snake	<i>Gerrhopilus beddomii</i>	DD	W G	Sch. IV	No recent report from the region.	DD
15. Family Uropeltidae (shieldtails)							
88	Pied-belly Shieldtail	<i>Melanophidium punctatum</i>	LC	W G	Sch. IV	This species was thought to be widely distributed throughout the Western Ghats but a recent taxonomic revision of the genus has found <i>Melanophidium punctatum</i> to be restricted to the Southern Western Ghats of Kerala and Tamil Nadu.	NT
89	Yellow-striped Shieldtail	<i>Melanophidium bilineatum</i>	VU	W G	Sch. IV	This species has a highly restricted distribution This species is threatened by the extensive road network and fragmentation of forested areas in its range and several road killed specimen have been observed. Given the highly restricted distribution of this species (< 5 localities), the species can be considered as Endangered.	EN
90	Wayanad Shieldtail	<i>Melanophidium wynaudense</i>	LC	W G	Sch. IV	Recent studies show the presence of cryptic species within this group and the status of this species needs to be reevaluated.	DD
91	Three-lined Shieldtail	<i>Platyplectrurus trilineatus</i>	DD	W G	Sch. IV	This species is known from high elevation forests of the Anamalai and Shembaganur in Palni Hills of Kerala and Tamil Nadu. In Kerala, It is known from Munnar in Idukki.	DD
92	Three-lined Shieldtail	<i>Platyplectrurus madurensis</i>	EN	W G	Sch. IV	This species has a very restricted distribution in high elevation forests above 1800 m ASL of the Anamalai and Palni Hills of Kerala and Tamil Nadu. It is one	EN

						of the most common species in Kodaikanal. In Kerala, it has been reported from Nemmakadu in Munnar, Pambadumshola NP and Mannavanchola NP.	
93	Western Shieldtail	<i>Teretrurus sanguineus</i>	LC	W G	Sch. IV	Although distributed throughout the central and southern WG of Kerala and Tamil Nadu, recent phylogenetic analysis indicates the presence of multiple cryptic species. Thus, restricting the range of <i>T. sanguineus</i> to the Anamalai hills. However, there is insufficient data on the range and population status of this species and it should be listed as Data Deficient.	DD
94	Wall's Shieldtail	<i>Teretrurus rhodogaster</i>	LC	W G	Sch. IV	We doubt this species occurs in Kerala. Most recorded specimens are from Shembaganur in Kodaikanal. Possibilities are from the higher reaches of Kurinjimala WLS in Idukki district. It should be treated as Data Deficient	DD
95	Golden Shieldtail	<i>Plectrurus aureus</i>	DD	KL	Sch. IV	This species is only known from historical specimens collected from Chembra peak in Wayanad. However, recent surveys to the region have not been able to locate this snake.	DD
96	Purple Shieldtail	<i>Plectrurus guentheri</i>	DD	W G	Sch. IV	This species is restricted to high-altitude forests of the Nilgiris in Kerala and Tamil Nadu. In Kerala it is reported only from Walakkad and Sispara in Silent Valley NP where it is rarely encountered. This species is under threat from degradation of forests and human encroachment into shola-grassland habitats. Given the highly restricted geographic range (< 5 localities), this species can be considered as Endangered.	EN
97	Perrotet's Shieldtail	<i>Plectrurus perroteti</i>	LC	W G	Sch. IV	This species is one of the most common snakes in high-altitude regions the Nilgiris of Kerala and Tamil Nadu.	LC

98	Elliot's Shieldtail	<i>Uropeltis ellioti</i>	LC		Sch. IV	This species has a wide distribution throughout forested regions of Peninsular India and is likely a species complex. Its occurrence in Kerala is doubtful and is likely due to misidentification	LC
99	Cochin Shieldtail	<i>Uropeltis nitida</i>	DD	KL	Sch. IV	This species is reported from Nelliampathi hills in Palakkad and from Parambikulam WLS (VPC Pers. Obs).	Dd
100	Nilgiri Shieldtail	<i>Uropeltis ocellata</i>	LC	W G	Sch. IV	This species is reported to be one of the most commonly found uropeltid snakes in evergreen forests of the Nilgiri hills in Kerala and Tamil Nadu, north of the Palakkad gap. However, this species belongs to a larger species complex	DD
101	Beddome's Shieldtail	<i>Uropeltis beddomii</i>	DD	W G	Sch. IV	This species is reported from the slightly drier regions of Anamalai hills of Kerala and Tamil Nadu. It is known to be found in agricultural landscapes in this region and is thus under threat from extensive land use changes.	VU
102	Anamalai Shieldtail	<i>Uropeltis macrorhyncha</i>	DD	W G	Sch. IV	Not much data is available on the species from Kerala. Data deficient	DD
103	Black-bellied Shieldtail	<i>Uropeltis woodmasoni</i>	LC	W G	Sch. IV	Although reported to be common in the Palni hills (Kodaikanal), there are no recent reports of this species from Kerala.	DD
104	Kerala Shieldtail	<i>Uropeltis ceylanicus</i>	LC		Sch. IV	This species belongs to a large species complex and the current status needs to be reevaluated.	DD
105	Periyar Shieldtail	<i>Uropeltis arcticeps</i>	LC	W G	Sch. IV	This species belongs to a large species complex and the current status needs to be reevaluated.	DD
106	Red-spotted Shieldtail	<i>Uropeltis rubromaculatus</i>	LC	W G	Sch. IV	This species is known from high-elevation forests of the Anamalai Hills of Kerala and Tamil Nadu.	DD
107	Red-lined Shieldtail	<i>Uropeltis rubrolineata</i>	LC	W G	Sch. IV	This species is reported from the Agasthyamalai hills of Kerala and Tamil Nadu (KMTR). It is threatened by extensive vehicular movement and tourism	EN

						activities in this region. Given the highly restricted distribution of the species within the Agasthyamalai hills of Kerala and Tamil Nadu (5 localities) and an estimated Area of Occupancy of < 500 km square, this species can be considered as Endangered.	
108	Barred Shieldtail	<i>Uropeltis myhendrae</i>	DD	W G	Sch. IV	This species is fairly common in most of its range and is threatened by forest fragmentation and the extensive road network within its range. The habitat of this species is also being degraded by extensive rubber plantations. Given its wide but patchy distributional range (<10 localities), this species can be considered as Vulnerable.	VU
109	Red- sided Shieldtail	<i>Uropeltis maculata</i>	LC	W G	Sch. IV	This is a common species in high-elevation forests of the Anamalai hills above 1800m ASL. Given its restricted range (6 localities) and the degradation of high-elevation shola grassland forests within its habitat, this species can be considered as Vulnerable.	VU
110	Madura Shieldtail	<i>Uropeltis madurensis</i>	LC	W G	Sch. IV	This species is found in mid to high elevation forested regions of the cardamom hills in Kerala and Tamil Nadu. It is common in its range and is also seen in plantations. Considering its restricted range, it can be considered Vulnerable.	VU
111	Peter's Shieldtail	<i>Uropeltis petersi</i>	DD	W G	Sch. IV	This species is known from a type series of 6 specimens (Pyron et al. 2016), all collected from forests above Pollachi in the Anamalai hills at 4000ft (ca 1200m) ASL.	DD
112	Ashambu Shieldtail	<i>Uropeltis liura</i>	DD	W G	Sch. IV	A very common snake found in high elevation evergreen forests of the Agasthyamalai hills of Tamil Nadu.	DD
113	Palni Shieldtail	<i>Uropeltis pulneyensis</i>	LC	W G	Sch. IV	This is a common species in high-elevation forests above	NT

						1800m ASL of Anamalai and Palni hills of Kerala and Tamil Nadu. It is one of the most common snakes in Kodaikanal where it can be found even near human habitations. Given the restricted and patchy distribution in high-elevation forests of Palni and Anamalai hills, this species can be considered as Near Threatened.	
114	Violet Shieldtail	<i>Uropeltis grandis</i>	NT	W G	Sch. IV	Reported from Anamalai hills. No recent report from the region.	DD
115	Red-bellied Shieldtail	<i>Rhinophis sanguineus</i>	LC	W G	Sch. IV	This species is restricted to mid-elevation evergreen forests in Wayanad of Kerala and Nilgiri district of Tamil Nadu. There is insufficient information on the population of this species. The habitat of this species is largely under cultivated plantations and is under extensive threat from land encroachments.	VU
116	Cardamom Shieldtail	<i>Rhinophis fergusonianus</i>	DD	KL	Sch. IV	This species is only known from the type specimen collected from the Cardamom hills of Idukki district.	DD
117	Travancore Shieldtail	<i>Rhinophis travancoricus</i>	EN	W G	Sch. IV	This species was described from Thiruvananthapuram in Kerala. But is also known from other lowland forested regions in southern Kerala and Ambadi in Kanyakumari, Tamil Nadu. The habitat of this species is under threat due to expanding rubber plantations and the extensive road network cutting through forested areas.	VU
118	Black and White shieldtail	<i>Rhinophis melanoleucus</i>	NE	KL	Sch. IV	This newly described species restricted to evergreen forests of south-western Wayanad. The current habitat of this species is mostly under coffee plantations and is under threat from land encroachment. Given the extremely narrow distribution range (<5 localities) of this species within a small region of Wayanad, this species can be considered as Endangered.	EN

119	Black and White shieldtail	<i>Rhinophis karinthandani</i>	NE	W G	Sch. IV	This is a newly described species currently known only from evergreen forests of Wayanad. This species is found to be locally abundant and tolerant to agricultural lands and plantations.	VU
16. Family Pythonidae (pythons)							
120	Indian Rock python	<i>Python molurus</i>	NT		Sch. I	A common species distributed throughout the Indian subcontinent. Although common, this species is sometimes hunted for meat in few regions of the state.	NT
121	Common Sand Boa	<i>Eryx conicus</i>	NE		Sch. IV	The species is widely distributed all along the State. This species is illegally collected from the wild for trade, which may be leading to local decline.	LC
122	Red Sand Boa (Indian Sand Boa)	<i>Eryx johnii</i>	NE		Sch. IV	Mainly seen in drier tracts of Kerala, but has a wider distribution across India. This species is illegally collected from the wild for trade, which may be leading to local decline.	DD
123	Whitaker's Boa (Whitaker's Sand Boa)	<i>Eryx whitakeri</i>	NE		Sch. IV	Many reports from the northern part of the Kerala in Kannur, Kozhikode and Kasargod districts. This species is illegally collected from the wild for trade, which may be leading to local decline.	NT
124	Lesser Stripe-necked Snake	<i>Liopeltis calamaria</i>	NE		Sch. IV	This species has a wide distribution across India and Sri Lanka but is uncommon throughout its range.	DD
125	Trinket Snake	<i>Coelognathus helena</i>	NE		Sch. IV	The species is widely distributed all along the State.	LC
126	Rat Snake	<i>Ptyas mucosa</i>	NE		Sch. II	One of the widely distributed species in the State	LC
127	Banded Racer	<i>Argyrogena fasciolata</i>	NE		Sch. IV	This species has a wide distribution across India and Sri Lanka but is uncommon throughout its range.	DD
128	Black-spotted Kukri Snake	<i>Oligodon venustus</i>	LC	W G	Sch. IV	This species known to have a wide distribution in forested areas of Kerala and Tamil Nadu. Although there is no information on population trends, this species is negatively impacted	NT

						by plantations and threatened by conversion of natural habitats into plantation (Bhupathy and Nixon, 2011).	
129	Travancore Kukri Snake	<i>Oligodon travancoricus</i>	DD	W G	Sch. IV	Known to have a patchy distribution in Kerala and Tamil Nadu, south of the Palakkad gap.	DD
130	Common Kukri Snake	<i>Oligodon arnensis</i>	NE		Sch. IV	A very common snake across Kerala and other parts of India.	LC
131	Russell's Kukri Snake	<i>Oligodon taeniolatus</i>	LC		Sch. IV	A very common snake across Kerala and other parts of India	LC
132	Western Kukri Snake	<i>Oligodon affinis</i>	LC		Sch. IV	In Kerala, the species is distributed to evergreen or semi evergreen forests of most of the Protected areas of the State	LC
133	Striped Kukri Snake	<i>Oligodon brevicauda</i>	VU	W G	Sch. IV	Historically reported from the Anamalai hills, Agasthyamalai hills and Nilgiri hills.	DD
134	Ashok's Bronzeback Tree Snake	<i>Dendrelaphis ashoki</i>	LC	W G	Sch. IV	This species has a wide distribution throughout the central and southern Western Ghats.	LC
135	Giri's Bronzeback Tree Snake	<i>Dendrelaphis girii</i>	LC	W G	Sch. IV	Widely distributed across the Western Ghats.	LC
136	Large-eyed Bronzeback Tree Snake	<i>Dendrelaphis grandoculis</i>	LC	W G	Sch. IV	This species has a wide but patchy distribution in moist forests of the the central and southern Western Ghats of Karnataka, Kerala and Tamil Nadu.	LC
137	Southern Bronzeback Tree Snake	<i>Dendrelaphis chairecaeos</i>	NE	W G	Sch. IV	This species is widely distributed in the central and southern Western Ghats of Karnataka, Kerala and Tamil Nadu.	LC
138	Common Bronzeback Tree Snake	<i>Dendrelaphis tristis</i>	NE		Sch. IV	One of the commonest snake species in India	LC
139	Ornate Flying Snake	<i>Chrysopelea ornata</i>	NE		Sch. IV	This species has a wide distribution in the Western Ghats.	LC
140	Barred Wolf Snake	<i>Lycodon striatus</i>	NE		Sch. IV	A widely distributed species across the Indian subcontinent	DD

141	Common Wolf Snake	<i>Lycodon aulicus</i>	NE		Sch. IV	One of the commonest snake species in Kerala	LC
142	Russell's Wolf Snake	<i>Lycodon fasciolatus</i>	NE		Sch. IV	One of the commonest snake species in Kerala	LC
143	Travancore Wolf Snake	<i>Lycodon travancoricus</i>	NE		Sch. IV	One of the commonest snake species in Kerala .	LC
144	Bridal Snake	<i>Lycodon nympha</i>	NE		Sch. IV	This species is known to have a patchy but wide distribution in the dryer regions of Peninsular India and Sri Lanka. Deficient	DD
145	Dumeril's Black-headed Snake	<i>Sibynophis subpunctatus</i>	NE		Sch. IV	This is a widespread snakes from Indian and Sri Lanka	LC
146	Olive Forest Snake	<i>Rhabdops olivaceus</i>	LC	W G	Sch. IV	This is a rare semi-aquatic snake known only from few isolated records from Karnataka and Kerala. Many records of this species are from outside protected areas and are affected by habitat degradation.	NT
147	Common Cat Snake	<i>Boiga trigonata</i>	LC		Sch. IV	A common snake found in the drier regions of the Indian subcontinent.	LC
148	Thackeray's Cat Snake	<i>Boiga thackerayi</i>	NE		Sch. IV	Earlier considered as <i>B. ceylonensis</i> . Common in most evergreen forests across Kerala.	LC
149	Collared Cat Snake	<i>Boiga nuchalis</i>	NE		Sch. IV	This is a wide spread species in forested areas across India.	LC
150	Forsten's Cat Snake	<i>Boiga forsteni</i>	LC		Sch. IV	This is a widespread species but with a patchy distribution across India	LC
151	Travancore Cat Snake	<i>Boiga dightoni</i>	DD	KL	Sch. IV	This species is reported from Pirmed in Idukki district and Ponmudi hills in Thiruvananthapuram district.	DD
152	Yellow Green Cat Snake	<i>Boiga flaviviridis</i>	NE		Sch. IV	A recently described species, which is known to have a wide distribution in Peninsular India.	DD
153	Whitaker's Cat Snake	<i>Boiga whitakeri</i>	NE	W G	Sch. IV	A recently described species from the Southern Western Ghats of Kerala and Tamil Nadu (Ganesh et al., 2021).	DD
154	Bronze-headed Vine Snake	<i>Ahaetulla perroteti</i>	EN	W G	Sch. IV	Known only from high-altitude shola grasslands of Nilgiri Hills in Kerala and Tamil Nadu. Although it is very common in	EN

						these landscapes, it has a highly restricted distribution and is under threat from conversion of shola grasslands into plantations.	
155	Günther's Vine Snake	<i>Ahaetulla dispar</i>	NT	W G	Sch. IV	A recent revision of the vine snakes in the Western Ghats established that this species is restricted to high elevation forests below the Palakkad gap and above the Shengottah gap	DD
156	Long-nosed Vines Snake	<i>Ahaetulla oxyrhyncha</i>	NE		Sch. IV	This species was recently resurrected from the <i>Ahaetulla nasuta</i> group and is distributed throughout the Peninsular India	LC
157	Brown Vine Snake	<i>Ahaetulla sahyadrensis</i>	LC	W G	Sch. IV	This species was split from <i>Ahaetulla pulverulenta</i> , which is restricted to Sri Lanka. This species has a wide distribution in the Central and Southern Western Ghats.	LC
158	Isabelline/Wall's Vine Snake	<i>Ahaetulla isabellina</i>	NE	W G	Sch. IV	Recently resurrected from the <i>Ahaetulla nasuta</i> group. It is recorded from Southern Western Ghats, south of the Palakkad Gap, from an elevation of 550 m to 1475m ASL.	LC
159	Malabar Vine Snake	<i>Ahaetulla malabarica</i>	NE	W G	Sch. IV	A recently described species from the <i>Ahaetulla nasuta</i> group.	LC
160	Travancore Vine Snake	<i>Ahaetulla travancorica</i>	NE	W G	Sch. IV	A recently described species which was split from <i>Ahaetulla dispar</i> . At present, this species is known from a few localities in the Agasthyamalai hills Kerala and Tamil Nadu. Although common in its range, it can be considered Vulnerable given its highly restricted distribution (< 5 localities).	VU
161	Antiq Vine Snake	<i>Proahaetulla antiqua</i>	NE	W G	Sch. IV	A recently described species from the Agasthyamalai hills of Kerala and Tamil Nadu. Given the narrow distributional range (2 localities), this species could be considered Endangered	EN
162	Striped Keelback	<i>Amphiesma stolatum</i>	NE		Sch. IV	Widely distributed throughout India	LC
163	Beddome's Keelback	<i>Hebius beddomei</i>	LC	W G	Sch. IV	This is one of the most common snakes found throughout most of the Western Ghats.	LC

164	Hill Keelback	<i>Hebius monticola</i>	LC	W G	Sch. IV	Widespread species in the central and southern Western Ghats, generally found in undisturbed habitats.	LC
165	Checkered Keelback	<i>Fowlea piscator</i>	NE		Sch. II	Widely distributed across India and is one of the most common snakes in Kerala.	LC
166	Green Keelback	<i>Rhabdophis plumbicolor</i>	NE		Sch. IV	A widely distributed species across the Indian subcontinent	LC
167	Olive Keelback Water Snake	<i>Atretium schistosum</i>	LC		Sch. II	A widespread species in India and Sri Lanka.	DD
18. Family Pareidae (narrow-headed snakes)							
168	Captain's Wood Snake	<i>Xylophis captaini</i>	LC	W G	Sch. IV	A very common snake in the lowland forests along the Achankovil hills to Agasthyamalai hills in the southern Western Ghats. Bupathy et al. (2016) assessed the conservation status of this species and recommended it to be elevated to Near Threatened.	NT
169	Striped Narrow-headed Snake	<i>Xylophis perroteti</i>	LC	W G	Sch. IV	This species has a very restricted distribution in high elevation shola grasslands of Nilgiri hills in Kerala and Tamil Nadu. Although this species is very common in its range and is generally tolerant of degraded habitats and plantations (Bupathy et al., 2016), they are threatened by extensive road mortality (Santhoshkumar and Kannan, 2017).	NT
170	Günther's Narrow-headed Snake	<i>Xylophis stenorhynchus</i>	DD	W G	Sch. IV	Very rare. Known only from the Anamalai hills. A recent observation of this species from Munnar needs confirmation.	DD
171	Anamalai Wood Snake	<i>Xylophis mosaicus</i>				A recently described species from the high elevation grasslands of Anamalai and Palni hills. The habitats of this species has experienced extensive rains and landslides during the last few years. Given the restricted and patchy distribution (<10 localities) of this species in grassland-shola	VU

						habitats, it can be considered as Vulnerable.	
19. Family Homalopsidae (mud snakes)							
172	Dussumier's Smooth Scale Water Snake	<i>Dieurostus dussumieri</i>	LC	KL	Sch. IV	Distributed on the coastal plains of Kerala from the wetlands to the Neyyar river in Thiruvananthapuram district to the wetlands of Korappuzha river in Kozhikode district. Although, common throughout its range, the wetland habitats of this species is threatened by pollution, many of which have become sites of waste disposal (MPJ, VPC & UPK Pers. Obs.). Therefore, the species can be considered as Near Threatened.	NT
173	Dog-faced Water Snake	<i>Cerberus rynchops</i>	LC		Sch. II	Known throughout most of the mangrove forests and intertidal zones on the western and eastern coast of Peninsular India	LC
174	Glossy Marsh Snake	<i>Gerarda prevostiana</i>	LC		Sch. IV	This species has a wide distribution in intertidal zones in Asia.	LC
20. Family Elapidae (elapid snakes)							
175	Common Indian Krait	<i>Bungarus caeruleus</i>	NE		Sch. IV	Widely distributed across India.	LC
176	Slender Coral Snake	<i>Calliophis melanurus</i>	NE		Sch. IV	Widely distributed in the drier regions of the Western Ghats, Eastern Ghats and Sri Lanka.	LC
177	Striped Coral Snake	<i>Calliophis nigrescens</i>	LC	W G	Sch. IV	Patchy but wide distribution in the central and southern Western Ghats. It is locally common in some localities in Wayanad and Periyar TR and Munnar.	LC
178	Beddome's Coral Snake	<i>Calliophis beddomei</i>	DD		Sch. IV	Known only from few isolated records in Karnataka, Kerala and Tamil Nadu.	DD
179	Bibron's Coral Snake	<i>Calliophis bibroni</i>	LC	W G	Sch. IV	Wide but patchy distribution in the central and southern Western Ghats.	LC
180	Spectacled Cobra	<i>Naja naja</i>	NE		Sch. II	Widely distributed in the Indian subcontinent and one of the most common venomous snakes in Kerala.	LC
181	King Cobra	<i>Ophiophagus hannah</i>	VU		Sch. II	A widely distributed species across forested regions of South and Southeast Asia. However, recent phylogeographic analyses	VU

						have suggested that the species includes multiple species and the Western Ghats populations are a separate distinct species. Although mostly	
21. Family Viperidae (vipers)							
182	Russel's Viper	<i>Daboia russelii</i>	NE		Sch. II	One of the most common venomous snakes found in the Indian subcontinent.	LC
183	Saw-scaled Viper	<i>Echis carinatus</i>	NE		Sch. IV	A common snake in the drier regions of India. In Kerala.	LC
184	Common Hump-nosed Pit Viper	<i>Hypnale hypnale</i>	NE		Sch. IV	Widely distributed in the Western Ghats and is one of the more common venomous snakes in Kerala	LC
185	Large-scaled Green Pit Viper	<i>Trimeresurus macrolepis</i>	NT	W G	Sch. IV	Recorded from high altitude (above 900m ASL) forests of Kerala and Tamil Nadu, south of the Palakkad gap. Although occurring mostly within protected areas, they are often killed by vehicles on roads passing through forested areas	NT
186	Malabar Pit Viper	<i>Trimeresurus malabaricus</i>	LC	W G	Sch. IV	One of the most common snakes in the forests of the Western Ghast.	LC
187	Horseshoe Pit Viper	<i>Trimeresurus strigatus</i>	LC	W G	Sch. IV	Restricted to high-altitude montane shola grasslands habitats of the upper Nilgiri hills in Kerala and Tamil Nadu. This species is threatened by conversion of shola-grassland habitats into plantations (Bupathy & Nixon, 2011). Considering its highly restricted distribution and threats to its habitat, this species can be considered as Endangered.	EN
188	Bamboo Pit Viper	<i>Trimeresurus gramineus</i>	LC		Sch. IV	A widespread species with a patchy distribution in Peninsular India.	DD

Reptiles are objects of fear, but also a subject of worship in India from time immemorial. Many snakes and lizards are dreaded and often killed. This 'phobia' of snakes and other reptiles may be a product of human evolution and has to some extent proved a hurdle in conservation efforts. The principal cause for the decline of reptile populations in India is identified as habitat destruction/alteration like forest clearing, damming, rapid urbanization, pollution and mining. Many species of reptiles have very narrow distributional ranges and often lie outside protected areas. For instance, the recently described uropeltid snake *Rhinophis melanoleucus* from Wayanad and the gecko *Cnemaspis chengodumalaensis*, both predominantly occur outside protected areas (Cyriac et al., 2020a,b). The habitat of *Cnemaspis chengodumalaensis* in the midland hillocks of northern Kerala are under severe threat from illegal granite quarrying and mining (Cyriac et al., 2020a). Many of the potentially threatened species we identified are restricted to high-altitude montane shola-grassland habitats. These habitats, although ecologically fragile and aid in water storage, have been viewed as having no commercial value which has led to the conversion of these grassland habitats into plantations. This along with man-made fire in these mountain habitats can have a great impact on species restricted to such habitats. Roads and highways inside the forests, wetlands and other natural habitats are known to be deadly for many species of reptiles, particularly snakes, that regularly attempt to cross during their foraging and seasonal movements at the time of breeding. Climate change also has a huge negative impact on reptiles. Kerala has seen sudden bursts of heavy rainfalls over the last few years causing more regular flooding and landslids in many ecologically fragile habitats, many of which harbour highly range restricted species of snakes and lizards. Collection of specimens for food, medicine and trade may also contribute to their population decline. Many species of Freshwater Turtles and Monitor lizards are still smuggled out of the country for their alleged medicinal properties. The illegal trade of the Indian Star Tortoise, Indian Chameleon, Sand Boas and Pythons are increased many folds in recent past (Pragatheesh et al, 2021). The major reptilian fauna, which are in commercial trade in Kerala are listed in the Table-2. The recent invasion of exotic species like Red-eared

Slider (*Trachemys scripta elegans*) is a new threat to our turtle species and the biodiversity of the water bodies of the state. Indiscriminate use of insecticides, herbicides and pesticides in agriculture and forestry practices could also aggravated the depletion of many habitat-specialist reptiles such as uropeltid snakes and other wetlands associated species.

Conservation:

Conservation aspects of reptiles gained prominence in 1970s. The Government of India banned snake skin trade in mid 1970s that halted a slaughter of about 10 million snakes per year. The Government also listed some species as protected under the Indian Wildlife (Protection) Act (1972), mainly in the context of the threat posed by the skin trade. Another important aspect of conservation is the designation of large number of Protected Areas, such as National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger Reserves and Reserve Forests, which are safe home to many species of reptiles.

As per the Indian Wildlife (Protection) Act of 1972, Indian Rock Python *Python molurus*, is the only snake species in Kerala listed in the Schedule -1 of the Act. Snakes such as Indian Rat Snake *Ptyas mucosa*, Olive Keelback *Atractium schistosum*, Indian Cobra *Naja naja*, Russel's Viper *Daboia russelii*, Checkered Keelback *Fowlea piscator*, Dog-faced Water Snake *Cerberus rynchops* and the King Cobra *Ophiophagus hannah* are listed in the Schedule - II of the Act. In an amendment on the Indian Wildlife (Protection) Act (1986), all the snake families are listed in the various schedules of the Wildlife Act. Most of the turtle and tortoise species are in various schedules of the Act. In contrast, the lizards have not been given much attention. Except for a two species viz. Indian Monitor Lizard (*Varanus benghalensis*.) and the Indian Chameleon (*Chamaeleo zeylanicus*), none are listed in any of the Schedules of Indian Wildlife (Protection) Act.

As per the new provisions of Indian Biodiversity Act (2002), we have selected two species of Reptiles of Kerala viz. Indian Pond Terrapin and South Indian Flying Lizard under section 38 of the Act (Table-3).

Summary

We assess or reassess the conservation status of 185 species of terrestrial and freshwater reptiles found in Kerala based on its distribution and our assessment of threats to the species. There was insufficient data to assess the conservation status of a large number of species and were listed as Data Deficient. We identified 37 potentially threatened species (1 Critically Endangered, 16 Endangered and 21 Vulnerable species). We also identified 13 species as Near Threatened. About 35% of all the species we assessed were listed as Data Deficient, stressing on the need for further investigations on the herpetofauna of the region. Most of the threatened species have very restricted geographic ranges and are threatened by extensive habitat degradation due to fragmentation, conversion to plantations and illegal quarrying and mining in ecologically fragile habitats or from trade and consumption. A few threatened species were also predominantly found to be outside protected areas. We also propose two species viz. Indian Pond Terrapin *Melanochelys trijuga* and South Indian Flying Lizard *Draco dussumieri* prioritised for inclusion in Section 38 of Indian Biological Diversity Act.

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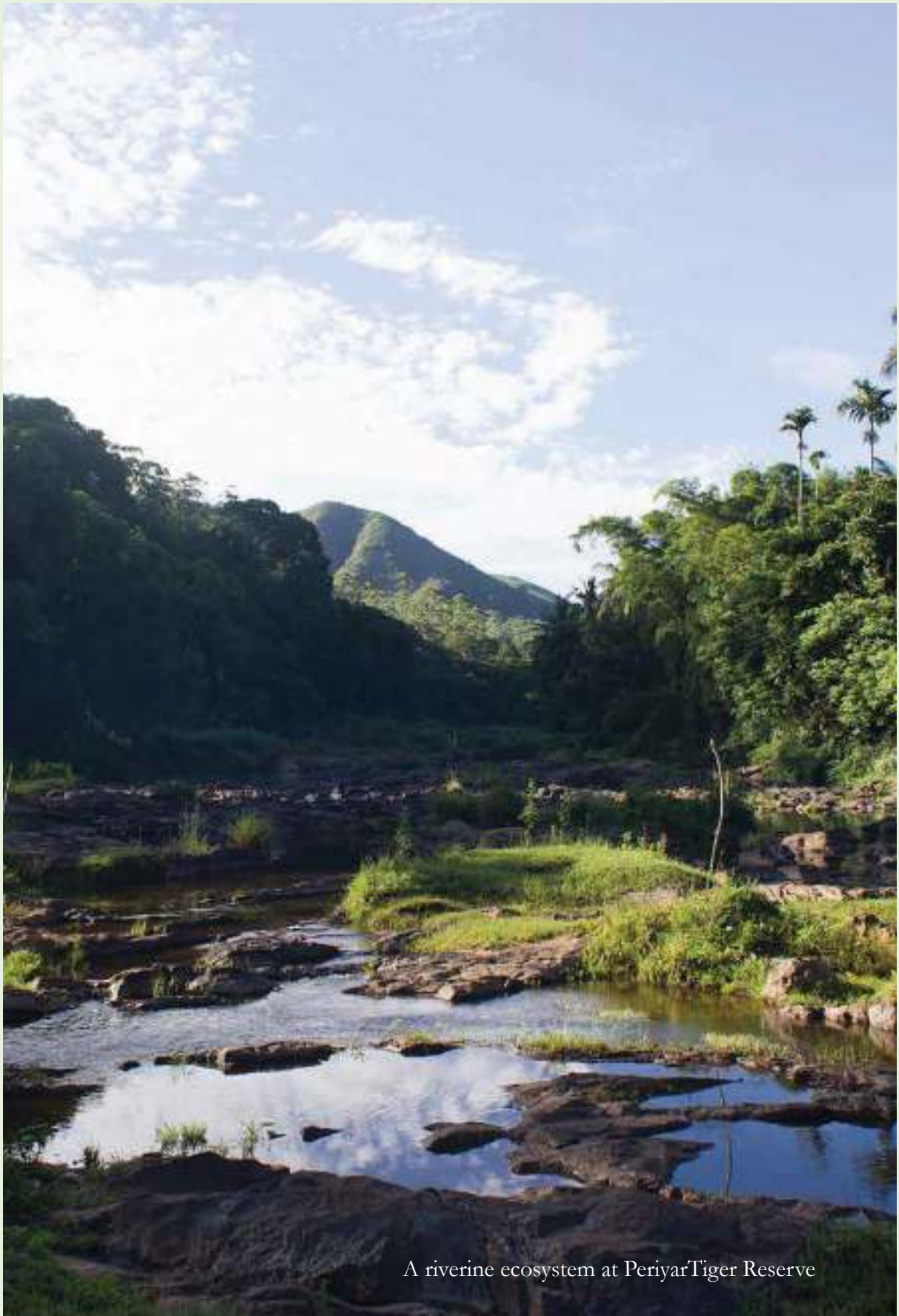
THREATENED AMPHIBIANS OF KERALA

STATUS AND CONSERVATION



Raorchestes travancoricus
@ Sandeep Das

K. P Dinesh | Sujith V Gopalan | Sandeep Das



A riverine ecosystem at Periyar Tiger Reserve

Threatened Amphibians of Kerala

Background of the study

Amphibians are the cold-blooded poikilothermic vertebrates which are preliminary in their body forms and are the connecting link between the vertebrate life between the water and land (Zardoya and Meyer, 2001). Wherein the terminology 'Amphibia' is derived from the Greek language "amphi" meaning "of both or double kinds" and "bios" referring "life" (AmphibiaWeb, 2018). For the completion of the life cycle amphibian require both fresh water (for tadpoles) as well as land (adults).

In the ecosystem amphibians play a very crucial role in the food web both as predators (by eating insects and invertebrates) and prey (being eaten by snakes, birds and carnivorous small mammals). For having primitive body structure and internal organs they are very sensitive and these are the first vertebrate's life forms to sense any adverse environmental changes due to their moist sensitive skin and occupy all the three habitats (Land, water and air). All these above vital reasons Amphibians are referred as 'ecological indicators' (Simon et al., 2011). Very presence or absence of amphibians in an ecosystem adds value to the ecosystem diversity and its assessment.

Objectives of the study

The present account has been prepared with the following three set of objectives

- Enlisting the amphibian species of Kerala with their general distribution and conservation status (see Appendix I)
- Enlisting the threatened amphibian species of Kerala based on the IUCN red list (IUCN, 2020) (see Appendix II and Plate I, Plate II, Plate III, Plate IV, Plate V, Plate VI & Plate VII)
- Proposal of high conservation priority species for inclusion in Section 38 of Biological Diversity Act

Methodology followed

Amphibian species for the state Kerala were documented with the latest international (Frost, 2021) and Indian (Dinesh et al., 2021) data bases. IUCN criteria were considered from the earlier IUCN assessments between the years 2004 to 2020 for the Indian species (IUCN, 2020) (the latest assessment is in progress). For the proposal of high conservation priority species for inclusion in Section 38 of Biological Diversity Act the

amphibian species which were earlier in the 'frog leg trade' and species used for academic purpose are considered with updated taxonomic names.

Outcomes:

a) Amphibian species distribution status and conservation Status In general amphibians include legged and tailless frogs (Anura), legged and tailed salamanders (Caudata) and legless caecilians (Gymnophiona). Globally 8282 species of amphibians are documented including 7301 frog species, 767 species of salamanders and 214 species of caecilians (Frost, 2021). In India amphibian species documented till April 2020 include 406 species of frogs, two species of salamanders and 39 species of caecilians totalling to 447 species (Dinesh et al., 2020)

For the state Kerala 104 species of amphibians were enlisted by Dinesh et al., (2010) followed by the studies of Das (2015) enlisting 151 species. In the updated checklist of amphibians for the state a total of 186 species are reported (see Appendix I), wherein type localities for the 125 species are within the political boundaries of the state and rest of the 56 species are reported are either described from the adjacent states or the adjacent countries which have their distribution from Kerala.

From the state Kerala, chronologically the first species descriptions started from the year 1838 with the description of the species *Rana malabarica* (now *Hydrophylax malabaricus*) by Tschudi and the latest being the species *Raorchestes drutaahu*, *Raorchestes kakkayamensis*, *Raorchestes keirasabinae*, *Raorchestes sanjappai* and *Raorchestes vellikkannan* in 2021. In pre-independent India 37 species were discovered from the state and in the post-independent India 88 species were discovered from the state (wherein 76 species were being discovered in the last two decade).

b) Threatened amphibian species of Kerala

For the Threatened taxa of amphibians for the state IUCN Red List among the 186 species reported for the state 54 species could be categorized as threatened species (13 species Critically Endangered; 27 species as Endangered and 14 species as Vulnerable); 5 species as Near Threatened; 27 species as Least Concern; 32 species as Data Deficient and 68 species as Not Assessed category.

IUCN categories as per 2004 assessment		Threatened species			Total	Lower risk species				Total
Group	Total	CR	EN	VU		NT	LC	DD	NA	
Amphibia	186	13	27	14	54	5	27	32	68	132

Among the 14 species of amphibians categorized as Critically Endangered taxonomy needs to be stabilized for the species *Minervarya murthii* (wherein the species is not recorded after its description in 1979) and all the species enlisted are either reported from either reserve forests or protected areas of the state.

From the Endangered category 27 species are reported and all the species are either reported from reserve forests or protected areas except for the species *Euphlyctis karaavali* which is having predominant distribution towards the coastal plain fresh water bodies. In the Vulnerable category list for the state 13 species are documented wherein most of the species are either reserve forests or protected areas whereas the species like *Indosylvirana aurantiaca* are narrow range endemics in one or two districts for these species' maintenance of pristinity of fresh water bodies are crucial for the survival of the species.

Five species reported under the Near Threatened category are either reserve forests or protected areas as most of these species are reported from hilly tracts of the state. Although 27 species are categorized as Least Concern based on the IUCN Global assessment the species like *Hydrophylax malabaricus* needs reassessment as there is a recent taxonomic correction in the species complex and the species is mostly restricted to homestead as well as agro ecosystems in Kerala.

Under the Data Deficient and Not Assessed category 32 and 68 species are placed respectively, as both the categories include recently described species they require field based local assessment to decipher their exact conservation status due to the fact that many of these species are either point endemics or narrow endemics. In these categories the taxonomic status of the species *Minervarya brevipalmata* (Peters, 1871), *Minervarya parambikulamana* (Rao, 1937), members of the caecilian genus *Uraeotyphlus* needs to be resolved. Although most of the species of these two categories are reported from either reserve forests or protected areas only the species *Indosylvirana urbis* is known from the urban landscapes.

c) Proposal of high conservation priority species for inclusion in Section 38 of Biological Diversity Act (Commercial / local consumption / poaching / pet trade / wildlife trade).

India was one of the largest frog legs exporting countries of the world during 1980's which was almost 4,000 tonnes of frog legs per annum (Anonymous, 1980;

Abdulali, 1985; Pandian and Marian, 1986; Oza, 1990). The species of frogs involved in frog leg trade were *Rana tigerina* (now *Hoplobatrachus tigerinus*), *Rana crassa* (now *Hoplobatrachus crassus*) and *Rana hexadactyla* (now *Euphlyctis hexadactylus*) (Pandian and Marian, 1986; Soundarapandian et al., 2007) from India. The studies suggested that more than 60 million frogs were harvested for frog leg export and 3 to 18 million frogs (including the other species of were used for academic as well as research purposes (Pandian and Marian, 1986; Soman, 1990) included frogs from wild as well as cultivated for exports. From India *Rana tigerina* (now *Hoplobatrachus tigerinus*) was the most harvested species accounting to 75% of those days export (Pandian and Marian, 1986).

In the Convention on International Trade in Endangered Species of Wild Fauna and Flora Appendix II (CITES Appendix II includes species which are not necessarily endangered, but the trade of the species is not regulated owing to the decline in their populations) two edible frog species from India and Bangladesh (*Rana hexadactyla* and *Rana tigerina*) were included (Abdulali, 1985; Pandian and Marian, 1986; Dash and Mahanta, 1993). Due to problems in the taxonomic identity of the species mentioned above the species should be read as *Euphlyctis hexadactylus* and *Hoplobatrachus tigerinus* for India. For Kerala, under the CITES Appendix II the two species should be read as *Euphlyctis karaavali* and *Hoplobatrachus tigerinus* for the state as the taxonomic resolution for the *Euphlyctis* species is very recent (Dinesh et al., 2021).

In the Schedule list of India (The Wildlife Protection Act, 1972), amphibians are protected under Schedule II (one species) and Schedule IV (two species). The species of Salamander protected under Schedule II in India is not available in Kerala. The two species included under the Schedule IV were Fresh water Frogs (*Rana* spp.) and Viviparous toads (*Nectophrynoides* sp.)

In the strict taxonomic sense there are no species of *Rana* available in India (Frost, 2021). In today's amphibian systematics the genus *Rana* is recognized under the family Ranidae with 53 species having their range of distribution in Eurasia (China) and western North America (Frost, 2020).

All the species of *Rana* referred during 1970's from India (Daniel, 1975) actually belong to the today's families Dicoglossidae (with 80 species from India), Ranidae (39 species from India) and Ranixalidae (18 species from India) (Dinesh, 2020).

From the perspective of frog leg trade ban and protection of the exploited species for trade and academics, the frog species of the family Dicroglossidae (*Euphlyctis cyanophlyctis* complex) (entire India), *Euphlyctis aloysii* (Western India), *Euphlyctis hexadactylus* (from eastern coastal plains of India), *Euphlyctis karaavali* (from western coastal plains of India), *Hoplobatrachus tigerinus* (from entire India) and *Hoplobatrachus crassus* (from South and North east India) can be inferred under Schedule IV for Fresh water frogs (*Rana* sps.) proposed in 1972. In true sense we don't have any reported viviparous toads / frogs from India. The actual viviparous toads are *Nimbaphrynoides occidentalis*, *Nectophrynoides species*, *Eleutherodactylus jasperi*, and *Limnonectes larvaepartus*, having their distribution in Africa (Frost, 2020).

During 1970's taxonomy the present-day Malabar Tree Toad, *Pedostibes tuberculosus* from the Western Ghats was considered as *Nectophryne tuberculosa* (Daniel, 1963) and the present day *Bufoides kempfi* from Meghalaya was considered as *Nectophryne kempfi* (Frost, 2020). Since the Malabar Tree Toad is arboreal and phytotelmatic in habitat the present-day *Pedostibes tuberculosus* from the Western Ghats and *Bufoides kempfi* from Meghalaya can be inferred under Schedule IV for Viviparous toads (*Nectophrynoides* sp.) proposed in 1972. In the changing scenario of amphibian taxonomy and systematics the species names of amphibians listed in the schedule list are interpreted in a conventional way. Since there are reports of consumption of frogs (considered a delicacy, mainly fried, or made into a curry, and served by the innumerable toddy and arrack shops, <http://bwcindia.org/Web/Awareness/LearnAbout/Frogs.html>) and usage of few species of frogs in the academic purpose four species of frogs are proposed and discussed for inclusion in 'Section 38 of Biological Diversity Act' for Kerala below. The species include *Euphlyctis karaavali*, *Hoplobatrachus crassus* and *Hoplobatrachus tigerinus*.

1) *Euphlyctis Karaavali*

Priti, Naik, Seshadri, Singal, Vidisha, Ravikanth, and Gururaja, 2016



Euphlyctis karaavali

Euphlyctis karaavali Priti, Naik, Seshadri, Singal, Vidisha, Ravikanth, and Gururaja, 2016. *Euphlyctis karaavali*

Priti, Naik, Seshadri, Singal, Vidisha, Ravikanth, and Gururaja, Asian Herpetol. Res., 7:233.

Common name: Karaavali Skittering Frog

Vernacular name:

Global distribution: India (Frost, 2021).

India distribution: Western coastal plains of Karnataka and Kerala, more towards the fresh water bodies of the seashore lines (Dinesh et al., 2021; Dinesh, et al., in review)

Kerala distribution: Entire western coastal plains of Kerala, more towards the fresh water bodies of the seashore lines (Dinesh et al., 2021; Dinesh, et al., in review)

Habitat Ecology: Primarily aquatic to semiaquatic species, mostly active during night.

Population trend in Kerala Since 2000 (Stable, decreasing, increasing): No specific populations studies are available for the species as such. General observation suggests the decrease in population size due to shrinking favourable habitats.

Threats: Indiscriminate use of pesticides in the agricultural landscapes, water pollution around the homestead as well as industrialized areas and increasing temperature due to climate change.



Euphlyctis karaavali habitat

Habitat fragmentation is considered as one of the major threats for amphibian survival, as the habitat fragmentation due to human intervention other developmental activities separate the interaction of actively breeding populations creating a 'genetic bottlenecks'.

General description: Large sized skittering frog, adult size ranges from 61 mm to 106 mm (SVL). Head width more than head length; snout pointed and slightly projected beyond mouth. Obtuse canthus rostralis concave. Nostrils closer to snout tip. Rounded tympanum more than half of the eye. Tibiotarsal articulation reaches back of eye when the hindlimb is kept parallel to the body. Toes fully webbed; inner metatarsal tubercle more than the length of first toe and outer metatarsal tubercle absent. Dorsum light green colored with alternate yellow and dark strips in the background. Ventral surface mottled. Among the paired adults' males are smaller than females; males with two dark blackish purple vocal sacs on the throat and in males first finger with nuptial pad.

Justification for proposal under 'Section 38 of Biological Diversity Act' for Kerala:

Although the 'Frog leg trade' is completely banned in India there are stray reports of local 'frog meat'

consumption during the active breeding seasons of these frogs (monsoon). To create awareness and to conserve the species at local level conservation protection is necessary.

2) *Hoplobatrachus crassus*

(Jerdon, 1853)



Hoplobatrachus crassus in its habitat

Hoplobatrachus crassus (Jerdon, 1853)

1853, *Rana malabarica* Kelaart, Prodr. Faunae Zeylan., 1: 191. 1853, *Rana crassa* Jerdon, J. Asiat. Soc. Bengal, 22: 531. 1863, *Hoplobatrachus ceylanicus* Peters, Monatsber. Preuss. Akad. Wiss. Berlin, 1863: 445-470.

Common name: Carnatic Bull frog

Global distribution: India, Nepal, Bangladesh, Myanmar, Bhutan and Sri Lanka

India distribution: Uttar Pradesh, Madhya Pradesh, Orissa, Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, West Bengal, Assam, Arunachal Pradesh and Nagaland (Dutta, 1997, Dinesh et al., 2009, Frost, 2021)

Kerala distribution: Found in most of the marshy wet lands, stagnant water bodies and paddy fields of the entire state (below 400-meter elevations).

Habitat Ecology: Primarily aquatic to semiaquatic species, mostly active during night.

Population trend in Kerala Since 2000 (Stable, decreasing, increasing): No specific populations studies are available for the species as such. General observation suggests the decrease in population size due to shrinking favourable habitats.

Threats: Indiscriminate use of pesticides in the agricultural landscapes, water pollution around the homestead as well as industrialized areas and increasing temperature due to climate change. Habitat fragmentation is considered as one of the major threats for



Hoplobatrachus crassus in its habitat at Nenmara, Palaghat

amphibian survival, as the habitat fragmentation due to human intervention other developmental activities separate the interaction of actively breeding populations creating a 'genetic bottlenecks.

General description: Large sized bull frog, adult size varies from 55 mm to 84 mm (SVL). Head longer than wide, snout pointed and slightly extended over the lower jaw. Rounded canthus rostralis and the loreal region concave. Nostrils closer to snout tip than to the anterior corner of eyes. Interorbital distance subequal to the diameter of upper eyelid. Rounded tympanum, 50% of the eye diameter. Tibiotarsal articulation reached only to the tympanum when the hindlimb is kept parallel to the body. Toes fully webbed, shovel shaped inner metatarsal tubercle almost 60% of the length of 1st toe length. Dorsal surface of the body yellowish green to olive or greyish brown with irregular dark spots. Dorsum with discontinuous longitudinal folds. Flank of the body grayish-brown with darker rounded spots. Limbs with incomplete dark bands. Ventral surface of the limbs white in colour, throat mottled with black and belly white. Among the paired adults' females are larger than the males and males have a sub-gular vocal sac in the throat region and nuptial pads on inner side of first finger.

Justification for proposal under 'Section 38 of Biological Diversity Act' for Kerala: Although the 'Frog leg trade' is completely banned in India there are stray reports of local 'frog meat' consumption during the active breeding seasons of these frogs (monsoon). To create awareness and to conserve the species at local level conservation protection is necessary.

3) *Hoplobatrachus tigerinus*

(Daudin, 1802)

Hoplobatrachus tigerinus (Daudin, 1802)

1802. *Rana tigerina* Daudin, "An. XI", Hist. Nat. Rain. Gren. Crap., Quarto: 64.

1829. *Rana picta* Gravenhorst, Delic. Mus. Zool. Vratislav., 1: 39.

Common name: Indian Bull frog

Vernacular name:

Global distribution: Afghanistan, Pakistan, India, Nepal, Bhutan, Myanmar, Bangladesh and as an introduced species in the Andaman Islands and Madagascar (Frost, 2021)

India distribution: Throughout India in almost all the states (Dutta, 1997; Dinesh et al., 2009, Frost, 2021)

Kerala distribution: Found in most of the marshy wet lands, stagnant water bodies and paddy fields of the entire state (below 400-meter elevations). Also recorded near to sea shoreline fresh water bodies



Hoplobatrachus tigerinus

Habitat Ecology: Primarily aquatic to semiaquatic species, mostly active during night.

Population trend in Kerala Since 2000 (Stable, decreasing, increasing): No specific populations studies are available for the species as such. General observation suggests the decrease in population size due to shrinking favourable habitats.



Hoplobatrachus igerinus habitat at Melpadam, Alappuzha

Threats: Indiscriminate use of pesticides in the agricultural landscapes, water pollution around the homestead as well as industrialized areas and increasing temperature due to climate change. Habitat fragmentation is considered as one of the major threats for amphibian survival, as the habitat fragmentation due to human intervention other developmental activities separate the interaction of actively breeding populations creating a 'genetic bottlenecks'.

General description: Large sized bull frog, adult size varies from 50 mm to 113 mm (SVL). Head longer than wide, pointed snout with slightly extended lower jaw. Obtuse canthus rostralis with oblique loreal region. Nostrils closer to tip of snout. Interorbital distance subequal to the diameter of upper eyelid. Rounded tympanum, 50% to 70% of the eye diameter. Tibiotarsal articulation reaches front of eyes when the hindlimb is kept parallel to the body. Toes fully webbed except 4th toe. Inner metatarsal tubercle shovel shaped, long, flattened and blunt at the base of 1st toe. Dorsal

surface of the body yellowish green to olive or greyish brown in colour. Body patterns are irregular varying from dark olive to greyish brown or irregular spots. The region of flanks yellowish green. Mid dorsal line on the body present or absent. Limbs with incomplete dark bands. Ventral surface of the limbs white in colour, throat mottled with black and belly white. Among the paired adults' females are larger than the males and males have a blue coloured sub-gular vocal sac in the throat region.

Justification for proposal under 'Section 38 of Biological Diversity Act' for Kerala: Although the 'Frog leg trade' is completely banned in India there are stray reports of local 'frog meat' consumption during the active breeding seasons of these frogs (monsoon). To create awareness and to conserve the species at local level conservation protection is necessary.

Discussion

Population trend in Kerala Since 2000 (Sustainable population / threatened population in Kerala). There is limited information regarding the population level studies for the amphibians of Kerala as the new species documentation is still in progress. In one of the studies by Oomen et al., (2000) *Gegeneophis ramaswamii* was found to be abundant during their sampling in Thriuvananthapuram districts of Kerala. Kanagavel et al., (2018) reported the *Walkerana phrynoderma* to be rare compared to *Walkerana leptodactyla* based on their large-scale studies in the Anamalai hill ranges.

Cultural significance and associated traditional knowledge: There are reports of consumption of tadpoles by the indigenous communities as a part of traditional knowledge (Thomas and Biju, 2015).

Threats: Although most of the amphibians reported for the state are reported from the reserve as well as protected areas, habitat fragmentation is considered as one of the serious threats for the survival of amphibian species added with other threats. However, the amphibians reported from the homestead areas, agroecosystems and urban landscapes are facing threats from the common problems like pollution, release of effluents to freshwater bodies, indiscriminate use of fertilisers and pesticides in agroecosystems, littering of waste in the ecotourism areas and waste disposal alongside the roads passing through the forests. There are reports of chytrid fungus *Batrachochytrium dendrobatidis* (Bd) in the genus *Indirana* (Nair et al. 2011, Dahanukar et al. 2013, Molur et al. 2015) in the Western Ghats, but its presence and virulence in Kerala is yet to be ascertained.

Other Recommended conservation measures for amphibians of Kerala. The species *Indosylvirana urbis* described from the urban landscapes of Ernakulam is known to have distribution in the urban landscapes of Malappuram and Thrissur districts of Kerala and is not reported from any reserve forests or protected areas. There is a need to prioritise the conservation efforts for the species habitats as the species needs fresh water bodies for breeding and wet lands for their survival during non-breeding seasons. Breeding sites for the species *Indosylvirana urbis* should be identified and prioritised for the conservation of wetlands in the urban landscapes in the districts of Ernakulam, Malappuram and Thrissur. Since there is more potential of description of new species of amphibians from the state and exact distribution range for the newly described species are wanting, forest permits should be prioritised for the research explorations adhering to National Biodiversity Rules for the national research institutes.

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Appendix II

IUCN Red List categories (based on 2004 to 2020 assessment) for the amphibians of Kerala (as on July 2020)

SI No	Scientific name	IUCN Red List Code*
	CLASS: AMPHIBIA Gray	
	ORDER: ANURA Fischer von Waldheim	
	FAMILY: BUFONIDAE Gray	
1	<i>Duttaphrynus beddomii</i> (Gunther, 1875)	EN
2	<i>Duttaphrynus microtympanum</i> (Boulenger, 1882)	VU
3	<i>Ghatophryne ornata</i> (Gunther, 1876)	EN
4	<i>Ghatophryne rubigina</i> (Pillai and Pattabiraman, 1981)	VU
5	<i>Pedostibes tuberculosus</i> Gunther, 1875	EN
	FAMILY: DICROGLOSSIDAE Anderson	
6	<i>Euphlyctis karaavali</i> Priti, Naik, Seshadri, Singhal, Vidisha, Ravikanth and Guru-raja, 2016	EN
7	<i>Minervarya murthii</i> (Pillai, 1979)	CR
8	<i>Minervarya nilagirica</i> (Jerdon, 1854)	EN
9	<i>Minervarya sahyadris</i> Dubois, Ohler and Biju, 2001	EN
	FAMILY: MICRIXALIDAE Dubois, Ohler and Biju	
10	<i>Micrixalus gadgili</i> Pillai and Pattabiraman, 1990	EN
11	<i>Micrixalus nudis</i> Pillai, 1978	VU
12	<i>Micrixalus saxicola</i> (Jerdon, 1853)	VU
	FAMILY: MICROHYLIDAE Günther	
13	<i>Melanobatrachus indicus</i> Beddome, 1878	EN
14	<i>Microhyla sholigari</i> Dutta and Ray, 2000	EN
15	<i>Uperodon mormoratus</i> (Rao, 1937)	EN
16	<i>Uperodon triangularis</i> (Gunther, 1875)	VU
	FAMILY: NASIKABATRACHIDAE Biju and Bossuyt	
17	<i>Nasikabatrachus sahyadrensis</i> Biju and Bossuyt, 2003	EN
	FAMILY: NYCTIBATRACHIDAE Blommers-Schlösser	
18	<i>Nyctibatrachus aliciae</i> Inger, Shaffer, Koshy and Bakde, 1984	EN
19	<i>Nyctibatrachus beddomii</i> (Boulenger, 1882)	EN
20	<i>Nyctibatrachus deccanensis</i> Dubois, 1984	VU
21	<i>Nyctibatrachus major</i> Boulenger, 1882	VU
22	<i>Nyctibatrachus minor</i> Inger, Shaffer, Koshy and Bakde, 1984	EN
23	<i>Nyctibatrachus vasanthi</i> Ravichandran, 1997	EN

	FAMILY: RANIDAE Batsch	
24	<i>Indosylvirana aurantiaca</i> (Boulenger, 1904)	VU
	FAMILY: RANIXALIDAE Dubois	
25	<i>Indirana brachytarsus</i> (Gunther, 1875)	EN
26	<i>Indirana gundia</i> (Dubois, 1986)	CR
27	<i>Walkerana diplosticta</i> (Gunther, 1876)	EN
28	<i>Walkerana leptodactyla</i> (Boulenger, 1882)	EN
29	<i>Walkerana phrynoderma</i> (Boulenger, 1882)	CR
	FAMILY: RHACOPHORIDAE Hoffman	
30	<i>Ghatixalus variabilis</i> (Jerdon, 1853)	EN
31	<i>Pseudophilautus wynaadensis</i> (Jerdon, 1853)	EN
32	<i>Raorchestes bobingeri</i> (Biju and Bossuyt, 2005)	VU
33	<i>Raorchestes chalazodes</i> (Günther, 1876)	CR
34	<i>Raorchestes charius</i> (Rao, 1937)	EN
35	<i>Raorchestes chlorosomma</i> (Biju and Bossuyt, 2009)	CR
36	<i>Raorchestes chromasynchysi</i> (Biju and Bossuyt, 2009)	VU
37	<i>Raorchestes dubois</i> (Biju and Bossuyt, 2006)	VU
38	<i>Raorchestes glandulosus</i> (Jerdon, 1853)	VU
39	<i>Raorchestes graminirupes</i> (Biju and Bossuyt, 2005)	VU
40	<i>Raorchestes griet</i> (Bossuyt, 2002)	CR
41	<i>Raorchestes kaikatti</i> (Biju and Bossuyt, 2009)	CR
42	<i>Raorchestes marki</i> (Biju and Bossuyt, 2009)	CR
43	<i>Raorchestes munnarensis</i> (Biju and Bossuyt, 2009)	CR
44	<i>Raorchestes nerostagona</i> (Biju and Bossuyt, 2005)	EN
45	<i>Raorchestes ponmudi</i> (Biju and Bossuyt, 2005)	CR
46	<i>Raorchestes resplendens</i> Biju, Shouche, Dubois, Dutta and Bossuyt, 2010	CR
47	<i>Raorchestes signatus</i> (Boulenger, 1882)	EN
48	<i>Raorchestes sushili</i> (Biju and Bossuyt, 2009)	CR
49	<i>Raorchestes tinniens</i> (Jerdon, 1853)	EN
50	<i>Raorchestes travancoricus</i> (Boulenger, 1891)	EN
51	<i>Rhacophorus calcadensis</i> Ahl, 1927	EN
52	<i>Rhacophorus lateralis</i> Boulenger, 1883	EN
53	<i>Rhacophorus pseudomalabaricus</i> Vasudevan and Dutta, 2000	CR
*CR: Critically Endangered; EN: Endangered; VU: Vulnerable;		

Threatened Amphibians of Kerala

<p><i>Duttaphrynus beddomii</i> EN</p>  <p>തെക്കൻ ചൊരിത്തവള</p>	<p><i>Duttaphrynus microtympanum</i> VU</p>  <p>ചെറുചെവിതൻ</p>
<p><i>Blaira ornata</i> EN</p>  <p>തിവയൻ അരുവിയൻ</p>	<p><i>Blaira rubigina</i> VU</p>  <p>ചെമ്പൻ അരുവിയൻ</p>
<p><i>Pedostibes tuberculosus</i> EN</p>  <p>മുച്ചെറിയൻ</p>	<p><i>Euphlyctis karaavali</i> EN</p>  <p>പൊന്തൻ തവള</p>
<p><i>Minervarya murthii</i> CR</p>  <p>മുർത്തി ചിലപ്പൻ</p>	<p><i>Minervarya nilagirica</i> EN</p>  <p>നിലഗിരി ചിലപ്പൻ</p>

Minervarya sahyadris

EN



ചിലു ചിലപ്പൻ

Micrixalus gadgili

EN



ഗാഡ്ഗിൽ പീലിശിരയൻ

Micrixalus nudis

VU



വയനാട് പീലിശിരയൻ

Micrixalus saxicola

VU



വടക്കൻ പീലിശിരയൻ

Melanobatrachus indicus

EN



ചൊലകറുമ്പി

Microhyla sholigari

EN



ഷോളിഗാരി കുറിമുക്കൻ

Uperodon marmoratus

EN



ചെങ്കൽ കുറിവായൻ

Uperodon triangularis

VU



മലബാർ കുറിവായൻ

Nasikabatrachus sahyadrensis

EN



പാതാള തവള

Nyctibatrachus aliciae

EN



അലിസി രാത്തവള

Nyctibatrachus beddomii

EN



ബെഡ്ഡം രാത്തവള

Nyctibatrachus deccanensis

VU



ചോല രാത്തവള

Nyctibatrachus major

VU



പെർഗ്ഗം രാത്തവള

Nyctibatrachus minor

EN



കേരളം രാത്തവള

Nyctibatrachus vasanthi

EN



കളക്ട്രാസ് രാത്തവള

Indosylvirana aurantiaca

VU



ബൊലൈഞ്ചർ സ്വർണത്തവള

Indirana brachytarsus

EN



ആനമല പാറത്തവള

Indirana gundia

CR



ഗുണ്ടിയ പാറത്തവള

Walkerana diplosticta

EN



പുളളി പാറത്തവള

Walkerana leptodactyla

CR



ബൊലബെൻ പാറത്തവള

Walkerana phrynoderma

CR



ചൊറിയൻ പാറത്തവള

Ghatixalus variabilis

EN



പച്ചച്ചോല മരത്തവള

Pseudophilautus wynaadensis

EN



വയനാടൻ ഇലത്തവള

Raorchestes bobingeri

VU



ബോബിൻഗർ ഇലത്തവള

Raorchestes chalazodes

CR



പച്ച ഇാറ്റത്തവള

Raorchestes charius

EN



ശേഷാചർ ഇലത്തവള

Raorchestes chlorosomma

CR



പച്ചക്കണ്ണി ഇലത്തവള

Raorchestes chromasynchysi

VU



സമ്മിശ്ര ഇലത്തവള

Raorchestes dubois

VU



കൊടെ ഇലത്തവള

Raorchestes glandulosus

CR



മാനന്തവാടി ഇലത്തവള

Raorchestes graminirupes

VU



പൊന്മുടി ഇലത്തവള

Raorchestes griet

CR



ഗ്രിയറ്റ് ഇലത്തവള

Raorchestes kaikatti

CR



കൈകാട്ടി ഇലത്തവള

Raorchestes marki

CR



മാർക്കി ഇലത്തവള

Raorchestes munnarensis

CR



മൂന്നാർ ഇലത്തവള

Raorchestes nerostagona

EN



ഈത്തുളളി തവള

Raorchestes ponmudi

CR



വലിയ ഇലത്തവള

Raorchestes resplendens

CR



ആനമുടി ഇലത്തവള

Raorchestes signatus

EN



നക്ഷത്രക്കണ്ണി ഇലത്തവള

Raorchestes sushili

CR



സുഷിലി ഇലത്തവള

Raorchestes tinni

EN



നീലഗിരി ഇലത്തവള

Raorchestes travancoricus

EN



നീലക്കണ്ണി ഇലത്തവള

Rhacophorus calcadensis

EN



കളക്കോട് പച്ചിലപ്പാറൻ

Rhacophorus lateralis

EN



വരയൻ പച്ചിലപ്പാറൻ

Rhacophorus pseudomalabaricus

CR



പുളളി പച്ചിലപ്പാറൻ



Critically Endangered



Endangered



Vulnerable



Wetlands

are habitats in which much of the threatened amphibian species survive outside the protected areas. The three species identified as the most threatened in this study (*Euphlyctis karaavali*, *Hoplobatrachus crassus*, and *Hoplobatrachus tigerinus*) thrive in the wetland habitats of the state. These species cannot be just conserved by the protection of the law under the wildlife protection act, but they have a better chance of survival if the habitat of the species is also conserved.



FRESH WATER FISHES



Horaglanis krishnai

By

Rajeev Raghavan, A. Biju Kumar, C. P. Shaji, Anvar Ali, V. K. Anoop, Anu Radhakrishnan,
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Local fisher with a catch of *Anguilla bengalensis*
©Rajeev Raghavan

Executive Summary

The streams and rivers flowing through the southern part of the Western Ghats encompassing the state of Kerala have been long considered an exceptional hotspot of freshwater biodiversity and endemism, with particular reference to freshwater fish. The diversity of microhabitats in the unique array of aquatic ecosystems in Kerala, the prehistoric position of this landmass in the Gondwana land, and the later migration of freshwater fish after the collation of Indian mainland with the Asian continent is the reason for this exceptional diversity of freshwater fish in Kerala. Since the late 1700s, Kerala's aquatic ecosystems and biodiversity have been of immense interest to naturalists, explorers, and ichthyologists. This has resulted in the region being comparatively well-studied and documented within the Western Ghats Hotspot. Despite more than 200 years of exploration and research, the freshwater fish fauna of the Kerala part of Western Ghats is still underestimated, as evident from the flurry of discovery and descriptions of new families, genera and species over the last ten years.

The Kerala part of Western Ghats is also one of the

most heavily populated and modified regions within the Hotspot. The high human footprint and its resultant impacts have led to extensive loss of habitats, reducing populations and shrinking critical habitats of freshwater species, and pushing them to the brink of extinction. The current freshwater ichthyofaunal assemblage in Kerala is comprised of around 196 species (though this number may increase once current taxonomic inaccuracies are cleared) within 36 families and 84 genera. The uniqueness of this ichthyofaunal assemblage is in its endemism – 27% of the species (53 species) found in Kerala are found nowhere else on this planet. This endemism is not only restricted to the species level, as in the case of many regions of the world. The small state of Kerala is home to two endemic families (probably matched nowhere else in the world!) and seven endemic genera of which three are monotypic.

Kerala's freshwater fish fauna is currently threatened by a high level of natural and anthropogenic stressors, and will continue so for the years to come. Though no species are declared 'extinct', there are currently 52 species of threatened freshwater fishes in Kerala (7 critically endangered, 31 endangered and 14 vulnerable). The IUCN has not officially assessed an additional 35 species of freshwater fishes that were described since 2010, but available information on their distribution, population and threats suggests that many would trigger the criteria for threatened species on the IUCN Red List.

This report is a comprehensive and updated compilation of the status of threatened freshwater fishes of Kerala, including information on their diversity, distribution, threats and conservation. Information provided in this report will hopefully form the basis for raising the profile of freshwater fish in the state, and facilitate the development and implementation of future conservation action.



Local fishers preparing for monsoon floodplain (Ootha) fish

Background

Freshwater biodiversity is in a state of global crisis [1]. Since 1900, the world has lost between 61–74% of its wetlands [2] and populations of freshwater dependent species have declined drastically compared to those in terrestrial and marine environments [3]. This has led to one in three freshwater-dependent species being assessed as threatened with extinction [4], and multiple anthropogenic stressors continuing to significantly impact critical habitats [5–6]. Despite this precarious state, there is very little awareness, attention and investment for freshwater biodiversity conservation [7–9], and it is also often overlooked in global assessments, investment mechanisms and targets (for e.g., CBD Aichi 2020 Targets and the Sustainable Development Goals/SDGs).

Freshwater fish are extremely diverse with 18,118 species [10] comprising a little more than 50% of the world's known fish species. This number is expected to only increase, as an average of close to 250 new species of freshwater fish continues to be described every year [11]. Freshwater fish are vital to global food security and livelihoods, particularly in the developing world. Global inland (primarily freshwater) fish catch is around 16 million tons, and equivalent to the total animal protein consumption of 36 million people [12] mostly in Low-Income Food Deficit Countries. Despite these striking statistics, freshwater fish have become one of the most threatened vertebrate groups on the planet. Of around 10,000 species of freshwater fish assessed by the IUCN, 80 species have already been declared extinct, and close to one-third threatened with extinction [13–14].

Scope and Definitions

The geographical scope of this report is the State of Kerala, and its political boundaries. Endemism is therefore defined in the context of the State of Kerala, and so are aspects like population status and trends (since the year 2000), habitat type and trends, levels of exploitation, other threats and conservation needs/requirements.

Freshwater fish has been defined as those species that spend their entire (or a significant part of) life including their spawning period in strict freshwater habitats, and catadromous species (such as anguillid eels) which perform obligatory migrations between freshwater and marine habitats (including using

estuaries and backwater systems). Therefore, typical marine or estuarine fish species that intermittently enter freshwater habitats are excluded from this checklist. Also excluded are exotic/alien fishes that have been introduced either legally or illegally (which may or may not have become invasive).

Family level taxonomy follows the most recent work of Nelson and colleagues [15] and the updated version (May 2021) of Catalog of Fishes [10] with some exceptions. In the case of groups for which recent comprehensive taxonomic revisions are available, for e.g., loaches of the sub order Cobitoidea [16], Cypriniformes [17], these are followed. General definitions concerning taxonomy and nomenclature follow the work of Kottelat [16].

For information on distribution including those related to protected areas, only the state of Kerala has been considered - even in the case of species not endemic to the state.

We have excluded all 'species names' published in predatory 'open-access' journals from this report. Predatory journals are defined as fake, scam, unscholarly and deceptive journals that compromise the peer-review procedure and require authors to 'pay-to-publish', apparently the only criteria for publication [18–19]. For detailed discussion on the issue of predatory journals and their influence and impacts on Indian freshwater ichthyology (including those from Kerala), please refer to two important publications [20–21]. Please also refer to Annexure 1 for the species which were excluded.

The conservation status of fish species mentioned in this report follows the IUCN Red List of Threatened Species™ [13] unless otherwise mentioned.

Freshwater Fishes of Kerala – taxonomic overview

Total Orders: 14; Families: 36; Genera: 84; Species: 196.

Endemic Families: 2 (Aenigmachannidae; Kryptoglanidae)

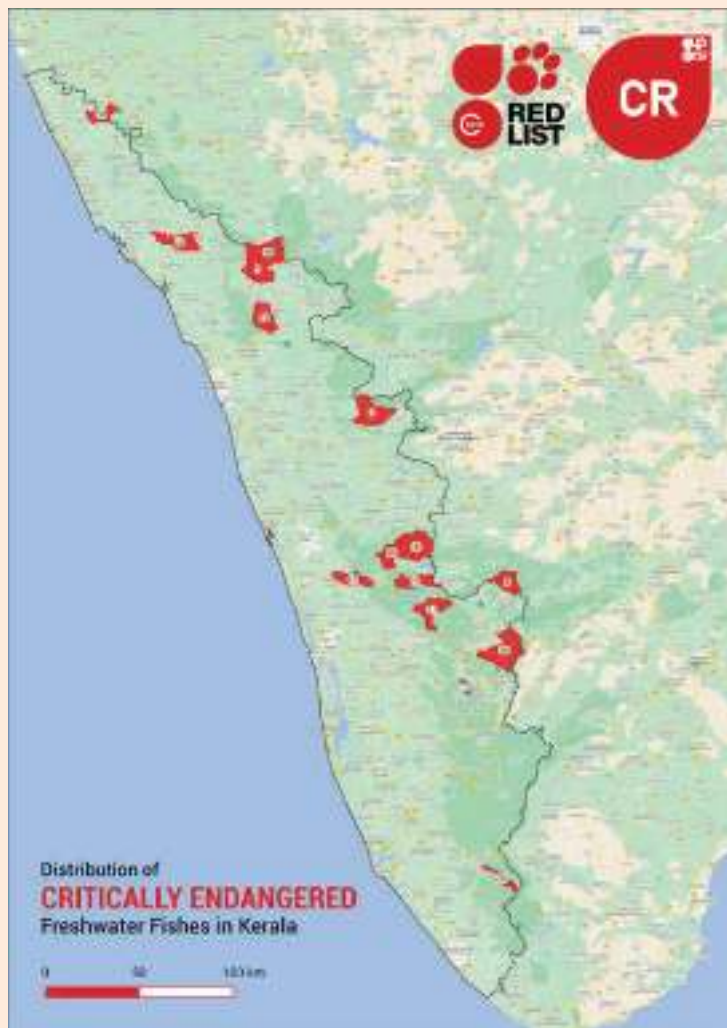
Endemic Genera: 7 (8%) (Aenigmachanna, Horaglanis, Kryptoglanis, Lepidopygopsis, Neochela, Pseudotropius, Travancoria)

Endemic Species: 53 (27%)

Monotypic Genera: 5 (Dayella, Eechathalakenda, Ehirava, Lepidopygopsis, Neochela)

All species of freshwater fishes occurring in Kerala described until the years 2009/2010 was assessed against the Categories and Criteria of the IUCN Red List in a project on the IUCN Red Listing of freshwater biodiversity of Western Ghats undertaken during 2010/2011. The conservation status of these species are available as detailed species accounts from www.iucnredlist.org. No species of freshwater fish found in Kerala are declared either 'Extinct' or 'Extinct in the Wild'. There are also no species that has been assessed as 'Critically Endangered with a tag that it is likely extinct'. Currently, there are 53 species of threatened freshwater fishes in Kerala.

Subsequent to the IUCN Red List assessments in 2011, the literature on freshwater fishes of Kerala has increased both in quantity and quality. The conservation status of many species is now likely to be outdated (and changed) as a result of new data generated during the last ten years. These are discussed under the various species accounts.



Only those sub-basins containing major populations have been mapped*

Distribution of Critically Endangered Freshwater Fish Species*

- Garra arunachalami* (35), *Hemibagrus punctatus* (3,5,8), *Hypsibarbus thomassi* (10,12,30,31, 36,38,42)
- Mesonoemacheilus herrei* (19,26), *Neolissochilus wynaadensis* (5,39,43), *Pethia pookodensis* (5,39,43)
- Tor remadevii* (3,5,8,39,43)

***Garra arunachalami* (Cyprinidae)
Critically Endangered**

Malayalam Name: അരുണാചലം കല്ലൊട്ടി
Endemism: Kerala
Distribution in Kerala: Panniyar tributary of Periyar River; Districts: Idukki
Habitats: Small riffles, rocky streams and rivulets with swift to turbulent water flow
Population Status: Unknown; but likely to have declined as a result of continuous threats in its habitat
Threats: Pollution from nearby human settlements; use of pesticides in plantations; flow regulations as a result of water holding structures in plantations; alien species; run-off from the automobile workshops and other small-scale industries in the landscape.
Exploitation: Not known
Occurrence in Protected Area: Likely inside the Shola National Parks
WPA/CITES/CMS: No
Conservation status: Critically Endangered
Conservation needs: Maintaining minimum environ-

mental flows; managing alien species; can be considered as a flagship fish species of the Shola National Parks and the Santhampara hill landscape so as to increase profile and bring in the required awareness among local communities

Stakeholders: Kerala State Forest and Wildlife Department (including Plantation Corporation of Kerala); Private Plantation Holdings; Kerala State Biodiversity Board

Traditional Knowledge: Local communities call the species as Ennapandian

Research needs: Population; Ecology

***Hemibagrus punctatus* (Bagridae)
Critically Endangered**

Malayalam Name: ഏട്ടക്കുറ്റി, ഏട്ട
Endemism: Western Ghats
Distribution in Kerala: Bhavani, Kabini and Pambar Rivers, and adjoining reservoirs
Districts: Palakkad; Wayanad; Idukki
Habitats: Rapid rivers and clear water streams; also known to occur in midland areas with slow to moderate

flow, poor vegetation cover, and with mud, sand and gravel as the major substrates; confined to large rocky pools during summer and the day-time

Population Status: Declining

Threats: Indiscriminate fishing often using destructive methods; fishing of mature individuals during breeding season; changes in river flow including drying of pools in the summer

Exploitation: High levels of exploitation (as a food fish)

Occurrence in Protected Area: Wayanad WLS

WPA/CITES/CMS: No

Conservation status: Critically Endangered; this conservation status needs to be reassessed as new information on distribution and threats is available since the last IUCN Red List assessment in 2011. Likely to trigger the 'Endangered' category.

Conservation needs: Maintaining minimum environmental flows; development of a breeding technology; protecting large pools in rivers; enforcing catch-size and mesh restrictions through the inland fisheries act and penalization on violation.

Stakeholders: Kerala State Fisheries Department, Irrigation Department, Kerala State Forest and Wildlife Department; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Population; Life history; Ecology

Hypselobarbus thomassi (Cyprinidae)

Critically Endangered

Malayalam Name: ചെമ്പൻ കുറ്റൽ

Endemism: Western Ghats

Distribution in Kerala: Not clearly known. Confirmed records are available from Chandragiri, Valapattanam, Chalakudy, Periyar and Kallada Rivers including reservoirs in these basins.

Districts: Kollam, Ernakulam, Thrissur, Idukki, Kannur, Kasargod

Habitats: Benthopelagic, inhabits large streams and rivers in pool-riffle and run and glide habitats (only juveniles) of fast to moderately flowing streams and rivers having riparian vegetation; adults of the species always dwell in moderately deep pools; also occur in the reservoirs of the major river systems where the species is found

Population Status: Declining

Threats: Indiscriminate fishing often using destructive methods; changes in river flow including drying of pools in the summer

Exploitation: High levels of exploitation particularly in reservoirs (as a food fish) in Chalakudy and Kallada

Occurrence in Protected Area: Aralam WLS, Shendurney WLS

WPA/CITES/CMS: No

Conservation status: Critically Endangered; this conservation status needs to be reassessed as new

information on distribution and threats is available since the last IUCN Red List assessment in 2011. Likely to trigger the 'Vulnerable' category.

Conservation needs: Maintaining minimum environmental flows; strict enforcement of fisheries act through ensuring mesh size regulations and catch quotas; complete ban on fishing during the breeding season and regulation on collection of individuals below the size at first maturity based on recent research; develop conservation hatcheries

Stakeholders: Kerala State Fisheries Department, Kerala State Forest and Wildlife Department; Kerala

State Electricity Board; Kerala State Tribal Department

Traditional Knowledge: Not documented

Research needs: Distribution; Population

Mesonoemacheilus herrei (Nemacheilidae)

Critically Endangered

Malayalam Name: ആനമല കൊയ്മ

Endemism: Western Ghats

Distribution in Kerala: Not clearly known. Confirmed records are available from the upper reaches of Bharathapuzha and Chalakudy. A morphologically similar 'species' is also known from the Bhavani.

Districts: Palakkad, Thrissur

Habitats: Stream with clear, fast-flowing water that is well-oxygenated, and a substrate made up of rock, cobbles, gravel, and sand; extremely sensitive to changes in water temperature and flow; prefer riparian canopy shade and an epilithic layer of microbes and debris; also found among the leaf litter trapped in between the cobbles and pebbles in the shore margins of fast flowing streams.

Population Status: Declining

Threats: Deterioration of water quality; run-off of pesticides from plantations; likely to be impacted by climate-change associated alterations to its habitats in the upper-reaches

Exploitation: Not known

Occurrence in Protected Area: Parambikulam WLS

WPA/CITES/CMS: No

Conservation status: Critically Endangered; this conservation status needs to be reassessed as new information on distribution and threats is available since the last IUCN Red List assessment in 2011. Likely to trigger the 'Endangered' category.

Conservation needs: Maintaining minimum environmental flows; ensuring pesticides do not reach critical habitats

Stakeholders: Kerala State Forest and Wildlife Department (including Plantation Corporation); Private Plantation Holdings; Kerala State Biodiversity Board

Traditional Knowledge: Not documented
Research needs: Distribution; Population; Minimum environmental flow.

Neolissochilus wynaadensis (Cyprinidae)

Critically Endangered

Malayalam Name: മഞ്ഞ കടന്ന,

വയനാടൻ കുറുമ്പ, വയനാടൻ പരുൽ

Endemism: Western Ghats

Distribution in Kerala: Noolpuzha Stream of Kabini River inside the Wayanad Wildlife Sanctuary as well as streams near Vythiri in Wayanad. Also, from streams near Periya and Thirunelly

Districts: Wayanad

Habitats: Intermittent pools in the slow to moderately flowing streams with thick riparian cover; juveniles prefer the shallow marginal areas of the stream with canopy and instream habitat cover, where the silt, sand, gravel and pebbles being the chief substrates.

Population Status: Declining

Threats: Loss of critical habitats; poaching by local communities; alterations in flow regimes; future impacts to upstream habitats due to climate change

Exploitation: High (as food fish)

Occurrence in Protected Area: Wayanad WLS

WPA/CITES/CMS: No

Conservation status: Critically Endangered; this conservation status needs to be reassessed as new information on distribution and threats is available since the last IUCN Red List assessment in 2011. Likely to trigger the 'Endangered' category.

Conservation needs: Maintaining minimum environmental flows; riparian afforestation; enforcement of fishing laws and regulations; awareness among locals; development of captive breeding technology

Stakeholders: Kerala State Fisheries Department, Kerala State Forest and Wildlife Department; Kerala State Tourism Department; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology (migration)

Pethia pookodensis (Cyprinidae)

Critically Endangered

Malayalam Name: പുക്കോടൻ പരുൽ

Endemism: Kerala

Distribution in Kerala: Wayanad District; Districts: Wayanad

Habitats: Diverse habitats ranging from the shallow margins of the lakes, pools and still areas of the shoreline of streams and streamlets flowing at a moderate speed; among rooted aquatic vegetation in these habitats where the substrate type ranges from silt to pebbles.

Population Status: Stable.

Threats: No species-specific threats

Exploitation: Not known

Occurrence in Protected Area: Wayanad WLS

WPA/CITES/CMS: No

Conservation status: Critically Endangered; this conservation status needs to be reassessed as new information on distribution and threats is available since the last assessment in 2011. The species is now known to be common, and widely distributed throughout the ponds, lakes and rivers of Wayanad district. The conservation status of the species would need to be down-listed to 'Least Concern'.

Conservation needs: Monitoring of populations in known habitats

Stakeholders: Kerala State Fisheries Department, Kerala State Forest and Wildlife Department; Kerala State Tourism Department

Traditional Knowledge: Not documented

Research needs: Population; Ecology

Tor remadevii (Cyprinidae)

Critically Endangered

Malayalam Name: കുയിൽ മീൻ, കുയിൽ

Endemism: Western Ghats

Distribution in Kerala: Kabini, Bhavani, Pambar;

Districts: Idukki, Palakkad, Wayanad

Habitats: Adult individuals prefer moderate to deep pools in the fast-flowing streams whereas those of the juveniles are restricted to the cascades, glides and runs and slow riffles in the stream course; species has also adapted to the deep lotic habitats of the reservoirs where it performs lateral migration

Population Status: Declining

Threats: Poaching; Habitat loss; Pollution; Alien species

Exploitation: High (outside protected areas), medium (in buffer zones of PAs) – used as food fish

Occurrence in Protected Area: Wayanad WLS, Chinnar WLS

WPA/CITES/CMS: No

Conservation status: Critically Endangered

Conservation needs: As the rarest mahseer in the world and a species that has shown catastrophic declines in its range, this species needs immediate protection under the Indian Wildlife Protection Act; can be considered a flagship aquatic species of the Chinnar and Wayanad WLS so as to raise the profile of freshwater fish conservation; pilot-scale/controlled reintroduction programs based on international guidelines and regular monitoring

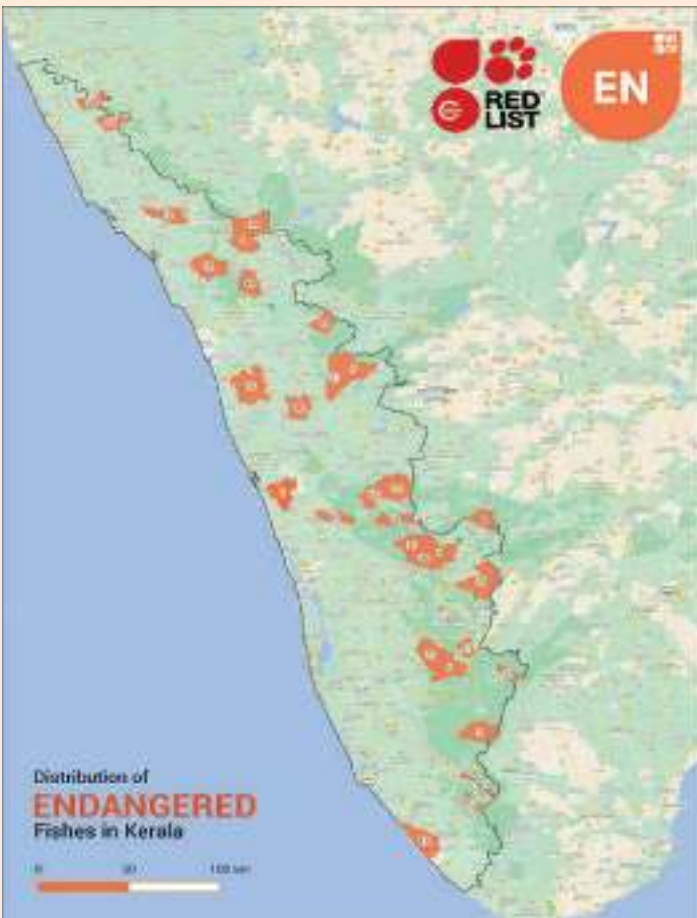
Stakeholders: Kerala State Fisheries Department, Kerala State Forest and Wildlife Department, Kerala Tourism Development Corporation

Traditional Knowledge: Considered sacred by forest-dwelling tribes

Research needs: Population; Ecology (migration); Life History; Population Genetics

Distribution of Endangered Freshwater Fish Species*

Dawkinsia arulius (5, 39, 43), *Dawkinsia exclamatio* (17), *Devario neilgherriensis* (5, 39,43), *Eechathalakenda ophicephalus* (4, 23,41), *Garra hughi* (8,9), *Garra surendranathanii* (2,4,30,31,41,42), *Ghatsa montana* (19, 26), *Ghatsa santhamparaiensis* (35), *Glyptothorax anamalaiensis* (14,19,26), *Glyptothorax davissinghi* (14), *Glyptothorax housei* (19, 26), *Glyptothorax madraspatanus* (3,5,39), *Horabagrus nigricollaris* (31, 42), *Hypselobarbus dubius* (5), *Hypselobarbus micropogon* (5), *Hypselobarbus periyarensis* (32), *Lepidopygopsis typus* (32), *Mesonoemacheilus pulchellus* (not mapped), *Ophichthys fossorius* (7, 11, 13, 16), *Opsarius canarensis* (12, 34, 38), *Osteochilichthys longidorsalis* (31,40,42), *Pseudeutropius mitchelli* (2,4,21,31,38,40,41,42), *Pterocryptis wynaadensis* (5,39,43), *Puntius cauveriensis* (5,39), *Sahyadria denisonii* (14,18,21,40), *Sahyadria chalakkudiensis* (2, 4, 23, 31, 42), *Schistura striata* (5,39), *Tariqilabeo periyarensis* (32), *Tor malabaricus* (12,14,18,21,38), *Travancoria elongata* (30,31,32,40), *Travancoria jonesi* (30, 31,40)



Only those sub-basins containing major populations have been mapped*

Dawkinsia arulius (Cyprinidae)

Endangered

Malayalam Name: അറുളി പരൽ, ചീറ പുളളിച്ചി

Endemism: Western Ghats

Distribution in Kerala: Kabini Districts: Wayanad

Habitats: Moderate to fast flowing streams and stream-lets with sand, pebbles and cobbles being the major substrates; affinity towards intermittent pools in the stream course and to the moderately deep bank areas of the stream with canopy cover; outside the forested areas, the species is found in clear-waters with rooted aquatic vegetation.

Population Status: Declining

Threats: Habitat loss; Pollution; loss of canopy cover and riparian vegetation

Exploitation: Low (for the aquarium trade)

Occurrence in Protected Area: Wayanad WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of populations outside the protected area network; ensuring sustenance of riparian vegetation and prevention of bank erosion and alteration of substrates

Stakeholders: Kerala State Forest and Wildlife Department

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology; Captive breeding.

Dawkinsia exclamatio (Cyprinidae)

Endangered

Malayalam Name: അശ്വരൂ പരൽ

Endemism: Kerala

Distribution in Kerala: Kallada River - Umayar and Kulathupuzhayar, including Thenmala and Shendurney

WLS; Districts: Kollam

Habitats: Middle reaches of rivers and likely in feeder canals of reservoirs; found in association with other filament-barbs of the region; hide in the crevices and intermittent pools in the stream course with moderate to fast flow and canopy cover. During the flooded season, it disperses to the low-lying areas.

Population Status: Unknown

Threats: Habitat loss; Pollution; Alien species; Exploitation

Exploitation: Low (as food fish, and for the aquarium trade)

Occurrence in Protected Area: Shendurney WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of populations outside the protected area network.

Stakeholders: Kerala State Forest and Wildlife Department; Kerala State Fisheries Department; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology

Devario neilgherriensis (Danionidae)

Endangered

Endemism: Western Ghats

Distribution in Kerala: Kabini ; Districts: Wayanad

Habitats: Fast-flowing, clear water streams with dense canopy cover; sand, pebble, bedrock and boulder are the preferred substrates.

Population Status: Declining

Threats: Habitat loss; Pollution; Alien species

Exploitation: Not known

Occurrence in Protected Area: Wayanad WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Protection of river channels and riparian forests; enforcement of strict policies on sand mining; sewage disposal and river protection

Stakeholders: Kerala State Forest and Wildlife Department; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology

Echathalakenda ophicephalus (Cyprinidae)

Endangered

Malayalam Name: ഇരുളിലക്കണ്ട

Endemism: Western Ghats

Distribution in Kerala: Upper reaches of the Periyar, Pampa and Meenachil.

Districts: Idukki, Kottayam, Pathanamthitta

Habitats: Rocky pools in which decaying vegetation is present in large quantities; always found in the shallow-to moderately-deep bank areas of the streams and streamlets with thick canopy cover especially bamboo reeds; also found in the crevices and holes among the bamboo reed roots and the sinuous portions of the stream course, where the substrate ranges from silt-laden sand to cobbles; juveniles of the species are found to forage in the marginal areas of the streams but the adults hide in the crevices and pools where their body colour matches the surroundings.

Population Status: Unknown

Threats: Deforestation and loss of canopy cover; pollution

Exploitation: Low (mostly as bycatch)

Occurrence in Protected Area: Periyar NP

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of populations; managing riparian vegetation

Stakeholders: Kerala State Forest and Wildlife Department; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Population; Life history; Ecology

Garra hughi (Cyprinidae)

Endangered

Malayalam Name: വെണ്ണക്കല്ലൊട്ടി

Endemism: Western Ghats

Distribution in Kerala: Periyar and Pambar Rivers. A morphologically similar species occurs in the Neyyar and Vamanapuram rivers, but their conspecificity to topotypic *G. hughi* needs to be determined.

Districts: Idukki

Habitats: Benthopelagic fish associated with mountain streams; juveniles occur in more clean waters closer to the banks and in pools and puddles along the course of the stream; adult individuals are found foraging on the epi-periphytonic mass on the cobbles and boulders of the wide, fast flowing wide streams.

Population Status: Unknown

Threats: Alterations in river flow; pollution from plantations and human settlements; future impacts of climate change in the upper reaches

Exploitation: Not known

Occurrence in Protected Area: Eravikulam NP, Chinnar WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of populations; managing riparian vegetation

Stakeholders: Kerala State Forest and Wildlife Department (including Plantation Corporation); private plantation holdings; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Life history; Ecology

Garra surendranathanii (Cyprinidae)

Endangered

Malayalam Name: കുറുമ്പൻ കല്ലൊട്ടി

Endemism: Kerala

Distribution in Kerala: Chalakudy, Periyar, Achankovil, Pamba; Districts: Thrissur, Idukki, Pathanamthitta

Habitats: Torrential streams where they inhabit stream reaches such as glides, runs, step pools, cascades, rapids and fast flowing riffles; during spawning season, it migrates to the upstream habitats through the glides and fast flowing riffles; juveniles usually found associated with sand and gravel in the riffles.

Population Status: Unknown

Threats: Habitat loss; Pollution; Collection for the aquarium trade

Exploitation: Low (for the aquarium trade)

Occurrence in Protected Area: Periyar NP, Parambikulam WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Maintenance of flow; restoration of riparian vegetation; monitoring of populations outside protected areas

Stakeholders: Kerala State Forest and Wildlife Department, Kerala State Biodiversity Board

Traditional Knowledge: None

Research needs: Population

Ghatsa montana (Balitoridae)

Endangered

Malayalam Name: പച്ച കൽനക്കി, കാടൻ കൽനക്കി, വെളുമ്പൻ കൽനക്കി

Endemism: Western Ghats

Distribution in Kerala: Chalakudy and Bharathapuzha;

Districts: Thrissur and Palakkad

Habitats: Torrential Mountain streams where they are seen attached to substrates such as pebbles, cobbles and small rocks; in the narrow streams and rivulets inside the plantations, the species is found associated with gravel and pebbles with rooted aquatic vegetation along the banks.

Population Status: Declining

Threats: Loss of critical habitats; pollution from plantations; alien species; future impacts of climate change in the upper reaches; landslides and associated stream habitat substrate alteration; removal of riparian vegetation and associated stream bank erosion

Exploitation: Not known

Occurrence in Protected Area: Parambikulam WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Maintenance of flow, monitoring of populations inside plantation-based streams; eradication of alien species from habitat; region specific afforestation programmes in river banks, and protection of canopy

Stakeholders: Kerala State Forest and Wildlife Department (including Plantation Corporation); private plantation holdings; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Impact of plantation-based pollutants

Ghatsa santhamparaiensis (Balitoridae)

Endangered

Malayalam Name: കൽക്കാരി

Endemism: Kerala

Distribution in Kerala: Periyar (Panniyar tributary) ; Districts: Idukki

Habitats: torrential mountain streams where they are seen attached to substrates such as pebbles, cobbles and small rocks

Population Status: Declining

Threats: Pollution; use of pesticides in plantations; flow regulations as a result of water holding structures in plantations; alien species; future impacts of climate change on upstream habitats; erosion of stream banks resulting alteration of substrate structure and increased siltation.

Exploitation: Not known

Occurrence in Protected Area: Likely to occur in Shola National Parks

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Maintenance of flow, monitoring of populations inside plantation-based streams; protection of riparian cover and stream bank stability; eradication of alien species maintaining minimum environmental flows; can be considered as a flagship fish species of the Shola National Parks and the Santhampara hill landscape so as to increase profile and bring in the required awareness among, and attention of local communities

Stakeholders: Kerala State Forest and Wildlife Department (including Plantation Corporation); private plantation holdings; Kerala State Biodiversity Board
Traditional Knowledge: Not documented

Research needs: Distribution; Population; Impact of plantation-based pollutants

Glyptothorax anomalaiensis (Sisoridae)

Endangered

Malayalam Name: വെള്ളിക്കെട്ടൻ പാറക്കുരി, വെളുമ്പൻ കൽക്കാരി

Endemism: Western Ghats

Distribution in Kerala: Bharathapuzha, Chaliyar and Chalakudy. Records from other river systems (e.g., Achankovil, Pampa) need to be verified, and may comprise a distinct yet-to-be described species.

Districts: Malappuram, Palakkad, Thrissur

Habitats: Torrential Mountain streams where they occur in small cascades, rapids or riffle pools with boulders, and sometimes sand as the substrate; adults' dwell in streams with moderate to torrential flow chiefly with sand, gravel and pebbles as the substrate, while juveniles of the species prefer living buried in the sandy to gravelly bed of the stream.

Population Status: Declining

Threats: Pollution; use of pesticides in plantations; flow regulations as a result of water holding structures in plantations; sand mining, stream bank erosion and water abstraction activities

Exploitation: Not known

Occurrence in Protected Area: Karimpuzha WLS, Parambikulam WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Maintenance of flow, monitoring of populations inside plantation-based streams; afforestation programmes to ensure canopy density and prevent stream bank erosion

Stakeholders: Kerala State Forest and Wildlife Department (including Plantation Corporation); Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology

Glyptothorax davissinghi (Sisoridae)

Endangered

Malayalam Name: ഇരുളൻ പാറക്കുളി

Endemism: Kerala

Distribution in Kerala: Chaliyar;

Districts: Malappuram

Habitats: Torrential streams, where they are found restricted to rapids, step pools, fast flowing riffles and cascades

Population Status: Not known

Threats: Mortality during destructive fishing practices for other large-bodied species; alteration of flow patterns

Exploitation: Medium (bycatch – plant poison-based fishing)

Occurrence in Protected Area: Karimpuzha WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Maintenance of flow; monitoring of populations

Stakeholders: Kerala State Forest and Wildlife Department

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology

Glyptothorax housei (Sisoridae)

Endangered

Malayalam Name: കൽക്കാരി

Endemism: Western Ghats

Distribution in Kerala: Chalakudy, Bharathapuzha. Records from Periyar and Pambar needs verification after comparisons to topotype; Districts: Palakkad, Thrissur

Habitats: Torrential streams, where they are found restricted to rapids, step pools, fast flowing riffles and cascades.

Population Status: Declining

Threats: Pollution; use of pesticides in plantations; flow regulations as a result of water holding structures in plantations; land use changes and stream bank erosion

Exploitation: Not known

Occurrence in Protected Area: Parambikulam WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Maintenance of flow; monitoring of populations inside plantation-based streams; afforestation programmes and protection of river banks

Stakeholders: Kerala State Forest and Wildlife Department (including Plantation Corporation); Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Taxonomy; Distribution; Population; Ecology

Glyptothorax madraspatanus (Sisoridae)

Endangered

Malayalam Name: മഞ്ഞവയറൻ പാറക്കുളി,

മഞ്ഞവളയൻ കൽക്കാരി

Endemism: Western Ghats

Distribution in Kerala: Bhavani and Kabini; Districts: Palakkad, Wayanad

Habitats: Torrential streams, where they are found restricted to rapids, step pools, fast flowing riffles and cascades; juveniles prefer fast flowing riffles with sandy to gravely substrate.

Population Status: Declining

Threats: Pollution; alterations in flow

Exploitation: Not known

Occurrence in Protected Area: Wayanad WLS, Silent Valley NP

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Maintenance of flow; monitoring of populations; restoration of degraded stream habitats; stream habitat-specific afforestation programmes and prevention bank erosion.

Stakeholders: Kerala State Forest and Wildlife Department; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology

Horabagrus nigricollaris (Horabagridae)

Malayalam Name: കരിംകുഴുത്തൻ മഞ്ഞക്കുളി,

കരിംകുഴുത്തൻ മഞ്ഞളട്ട

Endangered

Endemism: Western Ghats

Distribution in Kerala: Periyar and Chalakudy ;

Districts: Ernakulam and Thrissur

Habitats: Pools and riffles; prefer deep-pools in the middle part of the stream; nocturnal species preferring to hide in the deep pools; forage in the crevices of the stream bank vegetation, step pool reaches, as well as among the leaf litter in the shallow, sandy areas of the river bank.

Population Status: Declining

Threats: Indiscriminate fishing; alterations in flow

Exploitation: Medium (as food fish and for the aquarium trade)

Occurrence in Protected Area: No

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Maintenance of flow; monitoring of populations; enforcement of fisheries laws and regulations; identification of deep-pools and protecting them with support of local communities

Stakeholders: : Kerala State Forest and Wildlife Department; Kerala State Tourism Department; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Populatopn ecology

***Hypselobarbus dubius* (Cyprinidae)**

Endangered

Malayalam Name: മാമുൾ, കല്ലുരട്ടി കുരൾ

Endemism: Western Ghats

Distribution in Kerala: Kabini; likely to be present in Bhavani ; Districts: Wayanad, Palakkad

Habitats: Deep pools and in the main river channel with fast flowing water, having large boulders, sand and pebbles as substrate; recorded only from the reaches of the river with clear water and dense riparian canopy cover; longitudinal migration within the river channel during the winter period and is observed to collect pebbles with their mouth creating small heaps - presumably for spawning, hence the local name "Kallurutti kooral"; juveniles are found in shoals in the shallow sandy areas of the river bank with leaf litter and riparian cover; also inhabit the reservoirs

Population Status: Declining

Threats: Habitat loss due to river channel modification; substrate modification; deforestation; siltation; damming; over fishing and invasive species

Exploitation: High (outside protected areas), Low (inside protected areas) – as food fish

Occurrence in Protected Area: Wayanad WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Protection of river channels and riparian forests; enforcement of strict policies on sand mining, sewage disposal and river protection, land use changes and associated stream bank erosion and destructive fishing practices

Stakeholders: Kerala State Forest and Wildlife Department; Kerala State Biodiversity Board

Traditional Knowledge: Considered sacred by forest-dwelling tribes

Research needs: Population ecology

***Hypselobarbus micropogon* (Cyprinidae)**

Endangered

Malayalam Name: കോഴിമീൻ

Endemism: Western Ghats

Distribution in Kerala: Kabini River; however, the species is likely to be present in Bhavani River

Districts: Wayanad, Palakkad

Habitats: Main River channel with fast-flowing clear water, having large boulders- bedrock assemblages, with sand and pebbles as substrate and dense riparian canopy cover. The species is observed to collect pebbles with their mouth creating small heaps - presumably for spawning, hence the local name "Kallunthi"; juveniles forage in shoals in the shallow sandy marginal areas of the sinuous stream with leaf litter deposition and overhanging canopy; also found in reservoirs.

Population Status: Declining

Threats: Habitat loss due to river channel modification; substrate modification; deforestation; siltation; damming and alien species; intolerant to siltation and easily perish in regions with continuous disturbance to substrates; land use change associated stream bank erosion.

Exploitation: Medium (outside protected areas) – as food fish

Occurrence in Protected Area: Wayanad WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Protection of river channels and riparian forests; enforcement of strict policies on sand mining, sewage disposal and river protection.

Stakeholders: Kerala State Forest and Wildlife Department; Kerala State Biodiversity Board

Traditional Knowledge: Considered sacred by forest-dwelling tribes

Research needs: : Population; Distribution; Ecology

***Hypselobarbus periyarensis* (Cyprinidae)**

Endangered

Malayalam Name: കരിയാൻ

Endemism: Kerala

Distribution in Kerala: Periyar ; Districts: Idukki

Habitats: Adults prefer moderate to deep pool habitats of the fast-flowing streams; juveniles in the shallow marginal areas of the streams as well as the riffle- step pool reaches of the streams with overhanging vegetation; also seen in the lacustrine system within the protected area.

Population Status: Stable

Threats: Bycatch; Alien species; Future impacts of climate change

Exploitation: Medium (as bycatch)

Occurrence in Protected Area: Periyar NP

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of habitats for alien species; managing bycatch; regulation of fishing practices and fixing of minimum legal size.

Stakeholders: Kerala State Forest and Wildlife Department

Traditional Knowledge: Not documented

Research needs: Impacts of alien species; Population; Ecology

***Lepidopygopsis typus* (Cyprinidae)**

Endangered

Malayalam Name: ബ്രാഹ്മണകുണ്ട

Endemism: Kerala

Distribution in Kerala: Periyar ; Districts: Idukki

Habitats: Adults inhabiting moderate to deep pools with sandy to bedrock substrate in the turbulent clear water streams; juveniles forage in shoal in shallow

marginal areas, glide and slow flowing riffle habitats of the streams with overhanging vegetation.

Population Status: Stable

Threats: Bycatch; Alien species; Future impacts of climate change

Exploitation: Low to medium (as bycatch)

Occurrence in Protected Area: Periyar NP

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of habitats for alien species; managing bycatch

Stakeholders: Kerala State Forest and Wildlife Department

Traditional Knowledge: Not documented

Research needs: Impacts of alien species; Population; Ecology

Mesonoemacheilus pulchellus (Nemacheilidae)

Endangered

Malayalam Name: സുന്ദരി കൊയ്മ

Endemism: Western Ghats

Distribution in Kerala: Not clearly known but likely to occur only in the Bhavani

Districts: Palakkad (Likely)

Habitats: Fast-flowing streams that are clear and well-oxygenated; sand, pebbles, cobbles, and boulders are preferred substrates

Population Status: Not known

Threats: Unknown. However general loss and deterioration of hillstream habitats due to pollution and flow alterations may be applicable to this species as well.

Exploitation: Not known

Occurrence in Protected Area: Silent Valley NP (Likely)

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Not known

Stakeholders: Kerala State Forest and Wildlife Department

Traditional Knowledge: Not documented

Research needs: Taxonomy; Distribution; Population

Remarks: No verifiable records of this species are available in the recent past. It may likely be that the species never existed in Kerala and all previous records are misidentifications. Otherwise, it is highly likely that this species is locally extinct in Kerala.

Ophichthys fossorius (Synbranchidae)

Endangered

Malayalam Name: കുഴിപ്പുളവൻ, കട്ടപ്പുളവൻ

Endemism: Kerala

Distribution in Kerala: Not clearly known but is likely to occur throughout the lowlands of Kerala

Districts: All coastal districts (See above)

Habitats: Fossorial. Mostly encountered from paddy fields, wetlands, home gardens, irrigation channels of plantations and agro-based areas, dykes of ponds

Population Status: Not known

Threats: Reclamation of wetlands; paddy fields and other

area; pollution; developmental activities

Exploitation: Not known

Occurrence in Protected Area: None

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Protection of wetlands, paddy fields and other open areas; education and awareness of local communities

Stakeholders: Department of Agriculture; Department of Revenue; Department of Fisheries; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology; Impacts of anthropogenic threats

Opsarius canarensis (Danionidae)

Endangered

Endemism: Kerala

Distribution in Kerala: Not clearly known, but likely to occur in Chandragiri, Kuppam, Valapattanam and Anjarakandy rivers in northern Kerala (=Malabar); Districts: Kannur and Kasargod districts (Likely)

Habitats: Fast-flowing, clear-water streams in the middle to upper reaches with canopy cover; juveniles tend to aggregate in the slow-flowing riffle habitats and the undisturbed shallow marginal areas of the stream with sand and gravel as the substrate.

Population Status: Not known

Threats: Not known. However general threats to hill streams including pollution, loss of riparian cover and alterations in flow may likely impact this species. Land use changes associated stream bank erosion, and collection for the aquarium pet trade.

Exploitation: Low to medium (aquarium trade)

Occurrence in Protected Area: Aaralam WLS (Likely)

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of the likely habitats for the presence of the species. Stream habitat specific afforestation programmes and prevention of bank erosion.

Stakeholders: Department of Forest and Wildlife; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population

Osteochilichthys longidorsalis (Cyprinidae)

Endangered

Malayalam Name: ഹോഡോൺ

Endemism: Kerala

Distribution in Kerala: Bharathapuzha, Chalakudy and Periyar ; Districts: Ernakulam, Palakkad and Thrissur

Habitats: Deep pools of the streams with sand and bedrock as the substrates; adult prefer deep pools of the stream with canopy whereas juveniles forage in groups the marginal areas of the stream with overhanging vegetation.

Population Status: Declining

Threats: Bycatch; Pollution; Habitat loss; destructive fishing practices including dynamiting and poisoning

Exploitation: Medium to high (bycatch)

Occurrence in Protected Area: None

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring and protection of deep pools; prevention of sand mining in critical habitats; development of a captive breeding technology

Stakeholders: Department of Forest and Wildlife; Department of Fisheries; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Population; Ecology

Pseudeutropis mitchelli (Schilbeidae)

Endangered

Malayalam Name: വെള്ളിവാള

Endemism: Kerala

Distribution in Kerala: Chandragiri, Bharathapuzha, Chaliyar, Achankovil, Pampa, Chalakudy and Periyar

Districts: Kasargod, Palakkad, Malappuram, Ernakulam, Thrissur, Pathanamthitta

Habitats: a pelagic catfish appearing in groups in the fast-flowing streams after a heavy shower; usually seen in the marginal shallow areas of the streams with little water flow and overhanging vegetation; also prefers clear calm shallow waters with sand, silt and gravel as the chief substrates.

Population Status: Declining

Threats: Bycatch; Pollution; Habitat loss; Indiscriminate Fishing

Exploitation: Medium (Bycatch)

Occurrence in Protected Area: None

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring and protection of deep pools; prevention of sand mining in critical habitats; development of a captive breeding technology

Stakeholders: Department of Forest and Wildlife; Department of Fisheries

Traditional Knowledge: Not documented

Research needs: Distribution, Population, Ecology, Threats

Pterocryptis wynaadensis (Siluridae)

Endangered

Malayalam Name: വയനാടൻ വാള, തുളുമ്പൻ വാള

Endemism: Western Ghats

Distribution in Kerala: Kabini, Kuttyadi, Valappatanam, Chandragiri, Kuppam

Districts: Wayanad, Kannur, Kasargod

Habitats: Adults are found in the rocky crevices and holes amongst roots of the riparian vegetation as well as between cobbles and pebbles; adults are strictly nocturnal and comes out of the hiding places and forage amongst the leaf litter accumulated on the marginal areas of stream with moderate velocity. In the rivers they

prefer clear well oxygenated waters with sand, silt, gravel, pebble and cobble as the chief substrates. Adults are known to migrate from the hill streams to the low-lying paddy fields and other floodplain wetlands at the onset of rain. Young individuals above a 'finger-size' are found in plenty hiding under leaves, amongst roots and leaf litter in the shallow calm marginal areas of the stream.

Population Status: Declining

Threats: Bycatch; Pollution; Habitat loss; Indiscriminate Fishing

Exploitation: Medium to high (as food fish)

Occurrence in Protected Area: Wayanad WLS, Aralam WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring and protection of deep pools and riparian zones; education and awareness among local communities; captive breeding technology

Stakeholders: Department of Forest and Wildlife; Department of Fisheries

Traditional Knowledge: Not documented

Research needs: Population; Ecology; Threats

Puntius cauveriensis (Cyprinidae)

Endangered

Malayalam Name: കാവേരി പരൽ

Endemism: Western Ghats

Distribution in Kerala: Kabini; Districts: Wayanad

Habitats: Fast-flowing streams with dense canopy; Sand, boulders and bed-rock are the preferred substrates; usually seen hiding under submerged roots and marginal vegetation.

Population Status: Declining

Threats: Pollution; Habitat loss

Exploitation: Not known

Occurrence in Protected Area: Wayanad WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of known populations; maintenance of flows and ensuring riparian cover in critical habitats

Stakeholders: Department of Forest and Wildlife

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology

Sahyadria denisonii (Cyprinidae)

Endangered

Malayalam Name: ചരകണിയാൻ

Endemism: Western Ghats

Distribution in Kerala: The genus Sahyadria is a complex of several 'evolutionary distinct lineages'. The species boundaries are not clear, and therefore the distribution. However, the genus and its constituent lineages considered as 'Sahyadria denisonii' are present in major west-flowing rivers including Chandragiri, Kuppam, Anjarakandy, Valappatanam, Kuttyadi, Kada-lundi, Chaliyar and Bharathapuzha.

Districts: Kasargod, Kannur, Kozhikode, Malappuram
Habitats: Shallow to moderately deep calm areas of the fast-flowing streams with clear, well-oxygenated water; juveniles forage in groups along the marginal areas of the stream with thick overhanging vegetation.

Population Status: Though local populations had declined significantly in the recent past, no current estimates are available.

Threats: Collections for the aquarium trade was the major threat to the species, but it is now known that the levels of off-take have reduced considerably. Large adults are also harvested for local household consumption; stream bank erosion and the pesticide pollution from the adjacent plantations, pollution from human settlements and tourism infrastructure are the other major threats

Exploitation: Medium (bycatch; for the aquarium trade)

Occurrence in Protected Area: Aaralam WLS, Malabar WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of known populations; maintenance of flows and ensuring riparian cover in critical habitats; popularization of captive breeding technology that is currently available

Stakeholders: Department of Forest and Wildlife; Department of Fisheries

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Impact of aquarium collections

Sahyadria chalakkudiensis (Cyprinidae)

Endangered

Malayalam Name: ചോരക്കണ്ടിയാൻ

Endemism: Western Ghats

Distribution in Kerala: The genus *Sahyadria* is a complex of several 'evolutionary distinct lineages'. The species boundaries are not clear, and therefore the distribution. However, the genus and its constituent lineages considered as '*Sahyadria chalakkudiensis*' are present in major west-flowing rivers including Chalakudy, Periyar, Pampa, Achankovil and Manimala.

Districts: Ernakulam, Thrissur, Kottayam, Pathanamthitta

Habitats: Shallow to moderately deep calm areas of the fast-flowing streams with clear, well-oxygenated water; juveniles forage in groups along the marginal areas of the stream with thick overhanging vegetation.

Population Status: Though local populations had declined significantly in the recent past; no current estimates are available. Likely to be declining

Threats: Collections for the aquarium trade was the major threat to the species, but it is now known that the levels of off-take have reduced considerably. Large adults are also harvested for local household consumption; stream bank erosion and the pesticide pollution

from the adjacent plantations, pollution from human settlements and tourism infrastructure are the other major threats

Exploitation: Medium (bycatch; for the aquarium trade; and rarely as food fish)

Occurrence in Protected Area: None

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of known populations; maintenance of flows and ensuring riparian cover in critical habitats; popularization of captive breeding technology that is currently available

Stakeholders: Department of Forest and Wildlife; Department of Fisheries

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Impact of aquarium collections

Schistura striata (Nemacheilidae)

Endangered

Malayalam Name: ഓലിയവരൻ കൊയ്ത്ത്,

വയനാടൻ കൊയ്ത്ത്, വരയൻ കൊയ്ത്ത്

Distribution in Kerala: Kabini; Districts: Wayanad

Habitats: Clear-water streams with sand, cobbles and pebbles and canopy cover; dwell in a highly vegetated aquatic stream with thicker leaf litter layers; seasonal variations in streamflow and depth are expected.

Population Status: Declining

Threats: Habitat loss particularly significant in first and second order streams; pollution from agro-based plantations especially tea plantations; climate change

Exploitation: Not known

Occurrence in Protected Area: Wayanad WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of known populations; maintenance of flows and ensuring riparian cover in critical habitats

Stakeholders: Department of Forest and Wildlife; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology

Ariqilabeo periyarensis (Cyprinidae)

Endangered

Malayalam Name: കുരിശപ്പാച്ചി

Endemism: Kerala

Distribution in Kerala: Periyar; Districts: Idukki

Habitats: A typical rheophilic species preferring the cascades, step – pools, rapids and fast flowing riffles in the main stream channel; juveniles show affinity towards the slow flowing riffles and the shallow marginal areas of the adjoining streamlets with canopy.

Population Status: Stable

Threats: Bycatch; Alien species; Future impacts of climate change

Exploitation: Low (as bycatch)

Occurrence in Protected Area: Periyar NP

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Monitoring of critical habitats; managing alien species

Stakeholders: Department of Forest and Wildlife

Traditional Knowledge: Not documented

Research needs: Population; Ecology; Impacts of alien species

Tor malabaricus (Cyprinidae)

Endangered

Malayalam Name: കറ്റികുയിൽ

Endemism: Western Ghats

Distribution in Kerala: Middle to upper reaches of all major west-flowing rivers above the Palghat Gap. Major areas of distribution are in the Valapattanam, Kuttyadi, Chaliyar and Bharathapuzha (Thootha). Records from rivers below Palghat Gap comprise a distinct species.

Districts: Kasargod, Kannur, Kozhikode, Malappuram, Palakkad

Habitats: Clear-water, well oxygenated streams; prefers cascades, pools and riffles deep pool habitats with canopy in the main stream channel; juveniles abound the clear, well oxygenated streams; also, in reservoirs
Population Status: Declining

Threats: Indiscriminate Fishing often using destructive methods, Loss of Habitats, Climate Change, water diversion and abstraction projects, land use associated bank erosions, pollution from plantations and human settlements, competition from transplanted and exotic species stocked for enhancing reservoir fish production. Targeted fishery exists in all the habitats where tourism is developed.

Exploitation: High (as a food fish)

Occurrence in Protected Areas: Aaralam WLS, Malabar WLS, Proposed Karimpuzha WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Extensive monitoring of local populations; development of a captive breeding technology

Stakeholders: Department of Forest and Wildlife; Department of Fisheries

Traditional Knowledge: Not documented

Research needs: Taxonomy; Population, Ecology; Threats

Travancoria elongata (Balitoridae)

Endangered

Malayalam Name: നെടും കൽക്കി, നീളൻ കൽപ്പുളോൻ

Endemism: Kerala

Distribution in Kerala: Periyar and Chalakudy ;

Districts: Palakkad, Thrissur, Ernakulam, Idukki

Habitats: A typical rheophilic species inhabiting the cascades, step- pools, rapids and fast flowing riffle habitats in the stream channel.

Population Status: Declining

Threats: Loss of Habitats; Alterations in flow; pollution; future impacts of climate change; land use changes associated siltation; stream bank erosion and loss of canopy.

Exploitation: Very low (for the aquarium trade)

Occurrence in Protected Areas: Periyar NP, Parambikulam WLS, Idukki WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Extensive monitoring of local populations; ensuring critical habitats are intact and preventing pollution

Stakeholders: Department of Forest and Wildlife

Traditional Knowledge: Not documented

Research needs: Population; Ecology; Threats

Travancoria jonesi (Balitoridae)

Endangered

Malayalam Name: കുളുൻ കൽമനക്കി, , നീളൻ കൽപ്പുളോൻ

Endemism: Kerala

Distribution in Kerala: Periyar and Chalakudy ;

Districts: Palakkad, Thrissur, Ernakulam, Idukki

Habitats: A typical rheophilic species inhabiting the cascades, step- pools, rapids and fast flowing riffle habitats in the stream channel.

Population Status: Declining

Threats: Loss of Habitats, Alterations in flow, pollution, future impacts of Climate Change. In plantation streams, the species face multiple threats including pesticide pollution, water abstraction and diversion structures altering stream ecology and habitat.

Exploitation: No

Occurrence in Protected Areas: Periyar NP, Parambikulam WLS, Eravikulam NP, Idukki WLS

WPA/CITES/CMS: No

Conservation status: Endangered

Conservation needs: Extensive monitoring of local populations; ensuring critical habitats are intact and preventing pollution

Stakeholders: Department of Forest and Wildlife

Traditional Knowledge: Not documented

Research needs: Population, Ecology; Threats

Vulnerable Freshwater Fish Species*≠

Balitora mysorensis (5), Batasio travancoria (2,4,10,23), Channa diplogramma (1,6,22,24,25,29), Carinotetraodon travancoricus, Garra menoni (37), Garra periyarensis (32), Horabagrus brachysoma (1,6,12,22,24,29,31,42), Hyporhamphus xanthopterus, Indreonectes keralensis (4,9,23,25,32,35,41) Laubuka fasciata (15,21,26,28,31,42), Mesonoemacheilus menoni (32), Mesonoemacheilus pambarensis (3,5,8), Mesonoemacheilus periyarensis (32), Pseudosphromenus dayi (2,22,23,41)



**Only those sub-basins containing major populations have been mapped; ≠distribution of C. travancoricus and H. xanthopterus have not been marked as they are wide ranging species found in lowland rivers across the State*

Species in Focus III

Blind Catfish, *Horaglanis krishnai*

blind, aquifer-dwelling catfish with uncertain affinities



Distribution: Thrissur, Ernakulam, Kottayam, Pathanamthitta and Alappuzha districts.

Habitat: Lateritic aquifers and associated groundwater and subterranean habitats. Often encountered in dug-out wells

Threats: Unmanaged groundwater extraction, pollution, alien species

IUCN Red List Status: Data Deficient

Balitora mysorensis (Balitoridae)

Vulnerable

Malayalam Name: മുത്തുച്ചുട്ടൻ

Endemism: Western Ghats

Distribution in Kerala: Kabini; Likely to occur in Bhavani and Pambar but requires verification

Districts: Wayanad; Palakkad, Idukki (see above)

Habitats: Clear-water, well oxygenated mountain streams; prefers cascades and riffles; often seen associated with hard substrates against the flow of water

Population Status: Declining

Threats: Loss of Habitats; Alterations in flow; pollution; future impacts of climate change

Exploitation: No

Occurrence in Protected Areas: Wayanad WLS, Silent Valley NP, Pambar WLS

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Extensive monitoring of populations outside PAs; ensuring critical habitats are intact, and preventing pollution

Stakeholders: Department of Forest and Wildlife; Kerala State Biodiversity Board

Traditional Knowledge: None

Research needs: Population; Ecology; Threats

Batasio travancoria (Bagridae)

Vulnerable

Malayalam Name: നീലക്കുരി, മീശയില്ലാക്കുരി

Endemism: Western Ghats

Distribution in Kerala: Periyar, Chalakudy, Pampa, Manimala, Neyyar, Achankovil

Districts: Ernakulam, Thrissur, Kottayam, Pathanamthitta, Kollam, Thiruvananthapuram

Habitats: Shallow marginal areas of the main stream as well as the adjoining streamlets with moderate to thick canopy; finds shelter in the moderately deep pools with leaf litter, crevices and holes amongst the stream ward roots of the trees and bushes where the major substrates be silt, sand and gravel.

Population Status: Declining

Threats: Loss of Habitats; Alterations in flow; pollution; land use changes associated siltation; canopy loss and bank erosion.

Exploitation: Very low (bycatch)

Occurrence in Protected Areas: Parambikulam WLS, Neyyar WLS

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Extensive monitoring of populations outside PAs; ensuring critical habitats are intact, and preventing pollution

Stakeholders: Department of Forest and Wildlife; Kerala State Biodiversity Board

Traditional Knowledge: None

Research needs: Distribution; Population, Ecology; Threats; captive breeding

Channa diplogramma (Channidae)

Vulnerable

Malayalam Name: പറ്റലിവാക, മണൽ വാക

Endemism: Western Ghats

Distribution in Kerala: Microlevel distribution is still unclear. Known from certainty from Kallada, Achankovil, Pamba, Manimala, Meenachil, Muvvatupuzha, Periyar, Chalakudy, Bharathapuzha, Valapattanam

Districts: Kollam, Kottayam, Pathanamthitta, Ernakulam, Thrissur, Palakkad, Kannur

Habitats: Reservoirs, deep channels of rivers, floodplains, paddy fields and lower reaches of rivers; in association amongst rooted and floating aquatic weeds in lowland flood plain areas or associated with canopy cover in streams and reservoirs. prefer calm areas without human presence and forage with the young ones in the shallow weedy areas of the flood plain areas and the moderately deep to shallow marginal areas of the reservoirs.

Population Status: Declining

Threats: Indiscriminate fishing; loss of habitats; pollution, targeted fishing for food and recreational fishery, indiscriminate fishing of adult (parent) fishes, indiscriminate collection of juveniles for aquarium pet trade and small-scale aquafarming.

Exploitation: Very high (food fish, recreational catch-and-take fishery)

Occurrence in Protected Areas: Shendurney WLS, Neyyar WLS

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Effective implementation and enforcement of fisheries acts; ensuring spawning habitats are protected; regulation on catch-and-take angling

Stakeholders: Department of Fisheries; Kerala State Biodiversity Board

Traditional Knowledge: None

Research needs: Distribution; Population, Ecology; Threats

Carinotetraodon travancoricus (Tetraodontidae)

Vulnerable

Malayalam Name: ആറ്റുണ്ട

Endemism: Western Ghats

Distribution in Kerala: Microlevel distribution is still unclear; but likely to be present in lowland areas of major west flowing rivers ; Districts: Likely to be found in all coastal districts

Habitats: Low-land rivers and its associated floodplain

area including the paddy fields and canals; always found moving in shoal along the shallow margins of the river bank or found associated in shoal amongst the rooted macro-vegetation, or below the floating aquatic weed mass where the substrates be silt and sand. Migrate to low saline areas for breeding.

Population Status: Declining

Threats: loss of habitats; pollution; targeted collection for aquarium pet trade

Exploitation: High (for aquarium trade)

Occurrence in Protected Areas: None

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Effective implementation and enforcement of fisheries acts; preventing pollution

Stakeholders: Department of Fisheries; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population, Ecology; Threats

Garra menoni (Cyprinidae)

Vulnerable

Malayalam Name: കുളളൻ കല്ലൊട്ടി, കല്ലുന്തി

Endemism: Kerala

Distribution in Kerala: Bharathapuzha. The record from Pambar needs verification as it is highly unlikely that a species found in the upper reaches of a west-flowing drainage above the Palghat Gap, will also occur in an east-flowing drainage below the Palghat Gap. ; Districts: Palakkad

Habitats: Fast-flowing clear water streams in the upper reaches

Population Status: Stable

Threats: Not Known; however, its distribution to the upper reaches of the Bharathapuzha makes it vulnerable to future impacts of climate change

Exploitation: None

Occurrence in Protected Areas: Silent Valley NP

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Monitoring of populations

Stakeholders: Department of Forests and Wildlife

Traditional Knowledge: None

Research needs: Population, Ecology; Threats

Garra periyarensis (Cyprinidae)

Vulnera

Malayalam Name: പെരിയാർ കല്ലൊട്ടി, കല്ലുകാരി

Endemism: Kerala

Distribution in Kerala: Periyar; Districts: Idukki

Habitats: Fast-flowing clear streams in the upper reaches with riparian vegetation, where the substrates chiefly be the cobbles and bedrock; juveniles are found associated with the slow flowing riffles along the side of the

main stream course.

Population Status: Stable

Threats: Alien species, Future impacts of climate change

Exploitation: Not known

Occurrence in Protected Area: Periyar NP

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Monitoring of critical habitats; managing alien species

Stakeholders: Department of Forest and Wildlife

Traditional Knowledge: Not documented

Research needs: Population; Ecology; Impacts of alien species.

Horabagrus brachysoma (Horabagridae)

Vulnerable

Malayalam Name: മഞ്ഞക്കുരി, മഞ്ഞളട്ട

Endemism: Western Ghats

Distribution in Kerala: Lowland regions of all major west-flowing river systems

Districts: Likely in all districts except Idukki, Wayanad and Palakkad

Habitats: Deep pool habitats in midland streams to the low land rivers and its flood plains; migrate in shoals during the south west monsoon to the low-lying paddy fields and other inundated areas for breeding; chief substrates in the deep pool habitats of the stream are sand and bedrock whereas in the floodplain habitats it be the silt and sand; always found among rooted aquatic vegetation and below the floating aquatic mass; In the main stream it prefers moderately deep pools and hide in the crevices and holes along the stream banks with overhanging vegetation cover. Though a fish with intense nocturnal behavior, the juveniles of the species are found in shoals foraging in the shallow areas of the paddy fields and other floodplain wetlands.

Population Status: Declining

Threats: Targeted fishing, pollution, massive collection of broodstock during the breeding period, targeted collection of juveniles for aquarium pet trade and small-scale fish farming, destructive fishing practices including dynamiting and electric fishing and targeted fishing using traditional traps and under size banned seine nets.

Exploitation: Very high (food fish)

Occurrence in Protected Area: Karimpuzha WLS

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Monitoring of critical habitats; enforcement of inland fisheries act

Stakeholders: Department of Fisheries

Traditional Knowledge: Mucous considered to have medicinal properties

Research needs: Population, Ecology; Threats

Hyporhamphus xanthopterus (Hemiramphidae)

Vulnerable

Malayalam Name: അറ്റച്ചുവപ്പൻ

Endemism: Kerala

Distribution in Kerala: Microlevel distribution is not clearly known; records are available from several lowland regions of major west-flowing river systems, and its associated backwaters

Districts: Likely in all districts (needs confirmation) except Idukki, Wayanad and Palakkad

Habitats: Lowland regions of major rivers including the interconnected backwater systems; reservoirs in the respective riverine systems where the species is known to occur.

Population Status: Not known

Threats: Bycatch - usually caught along with Xenentodon cancila; pollution

Exploitation: Medium (bycatch)

Occurrence in Protected Area: None

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Monitoring of populations

Stakeholders: Department of Fisheries

Traditional Knowledge: Not documented

Research needs: Distribution; Population, Ecology; Threats.

Indoreonectes keralensis (Nemacheilidae)

Vulnerable

Malayalam Name: കേരള കൊയ്ത്ത,

കേരള കൊയ്ത്ത്, കൈരളി കൊയ്ത്ത

Endemism: Western Ghats

Distribution in Kerala: Periyar, Pampa, Meenachil,

Muvattupuzha; Districts: Idukki, Kottayam, Pathanamthitta

Habitats: Middle and upper reaches of rivers including torrential hill-streams and first order streams. Known to migrate to first and second order streams for spawning. The species can survive in muddy environments with very little water usually found adjacent to the main stream.

Population Status: Not known

Threats: Loss of habitats; pollution from plantations; future impacts of climate change

Exploitation: Not known

Occurrence in Protected Area: Idukki WLS, Eravikulam NP, Periyar NP

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Monitoring of populations and critical habitats

Stakeholders: Department of Forests and Wildlife (including Plantation Corporation)

Traditional Knowledge: Not documented

Research needs: Population; Ecology; Threats

Laubuka fasciata (Cyprinidae)

Vulnerable

Malayalam Name: വരയൻ ചീലൻ

Endemism: Kerala

Distribution in Kerala: Not clearly known. Reliable records are available from Periyar, Bharathapuzha, Chaliyar, Chalakudy, Meenachil, Muvattupuzha, Manimala, Pampa and Achankovil. It is likely that they occur in other major west-flowing rivers as well.

Districts: Palakkad, Malappuram, Thrissur, Ernakulam, Puzhakkal, Kechery, Kottayam, Pathanamthitta

Habitats: Inhabits the slow flowing, moderately deep stream channels with silt and sand as substrates. The species appear in shoals in the marginal areas of the stream under overhanging vegetation.

Population Status: Declining

Threats: Loss of habitats; pollution

Exploitation: Not known

Occurrence in Protected Area: Parambikulam WLS (likely)

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Monitoring of populations

Stakeholders: Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population, Ecology; Threats

Mesonoemacheilus menoni (Nemachelidae)

Vulnerable

Malayalam Name: മേനോൻ കൊയ്ത്ത്

Endemism: Kerala

Distribution in Kerala: Periyar; Districts: Idukki

Habitats: Fast-flowing, clean, and well-oxygenated streams; substrate include sand, gravel, cobbles, and bedrock, with an epilithic layer of algae, diatoms, and other microorganisms and debris; prefer the shade provided by riparian plants

Population Status: Stable

Threats: Alien species; Future impacts of climate change

Exploitation: Not known

Occurrence in Protected Area: Periyar NP

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Monitoring of populations; managing alien species

Stakeholders: Department of Forest and Wildlife

Traditional Knowledge: Not documented

Research needs: Population Ecology; Impacts of alien species

***Mesonoemacheilus pambarensis* (Nemachelidae)**

Vulnerable

Malayalam Name: കാവേരി കൊയ്റ്റ്

Endemism: Western Ghats

Distribution in Kerala: Kabini, Bhavani, Pambar; Districts: Wayanad, Palakkad, Idukki

Habitats: Fast-flowing, clean, and well-oxygenated run, riffle and glide habitats; substrate include sand, gravel, cobbles, and bedrock

Population Status: Stable

Threats: Habitat loss; pollution; removal of riparian cover

Exploitation: Not known

Occurrence in Protected Area: Wayanad WLS, Silent Valley NP, Chinnar WLS

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Monitoring of populations; managing alien species

Stakeholders: Department of Forest and Wildlife

Traditional Knowledge: Not documented

Research needs: Population; Ecology; Impacts of alien species

***Mesonoemacheilus periyarensis* (Nemachelidae)**

Vulnerable

Malayalam Name: പെരിയാർ കൊയ്റ്റ്

Endemism: Kerala

Distribution in Kerala: Periyar; Districts: Idukki

Habitats: Fast-flowing, clean, and well-oxygenated streams; substrate include sand, gravel, cobbles, and bedrock, with an epilithic layer of algae, diatoms, and other microorganisms and debris; prefer the shade provided by riparian plants. The juveniles of the species are found aggregating around and inside the leaf litter trapped in the slow flowing riffles.

Population Status: Stable

Threats: Alien species, Future impacts of climate change

Exploitation: Not known

Occurrence in Protected Area: Periyar NP

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Monitoring of populations; managing alien species

Stakeholders: Department of Forest and Wildlife

Traditional Knowledge: Not documented

Research needs: Population; Ecology; Impacts of alien species

***Pseudosphromenus dayi* (Osphronemidae)**

Vulnerable

Malayalam Name: ഡേയുടെ കരിങ്കണ്ണ

Endemism: Kerala

Distribution in Kerala: Microlevel distribution not clearly known; reliable records available from Periyar, Meenachil, Manimala, Achankovil. ; Districts: Idukki, Kottayam and Pathanamthitta

Habitats: A lowland species preferring calm waters and macro vegetation. Usually found associated with rooted aquatic plants and below the floating aquatic weed mats and also found in the small channels within the paddy fields where the chief substrate type been the silt and sand. The species always tend to congregate in the dead flow ends of the sinuous course the stream.

Population Status: Not known

Threats: Alien species, Loss of habitats

Exploitation: Not known

Occurrence in Protected Area: Not known

WPA/CITES/CMS: No

Conservation status: Vulnerable

Conservation needs: Currently not identified - can only be determined after information on distribution and threats become available

Stakeholders: Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology; Impacts of alien species

Extinction risk and 'proposed' conservation status of newly described (since 2010) freshwater fishes of Kerala (not currently assessed on the IUCN Red List)

Thirty-five species of fish have been described from Kerala (or described elsewhere, and having a distribution in Kerala) since the IUCN Assessment of Western Ghats freshwater fishes in 2010/2011. **Of these at least 14 trigger and fulfill the criteria of threatened species on the IUCN Red List.**

List of freshwater fishes of Kerala which have not been assessed for the IUCN Red List, their distribution, population status, threats and proposed conservation status

Species	Distribution	Population	Threats	Proposed Status
<i>Aenigmachanna gollum</i>	Fragmented	Not known	GE, PO, HL, IE	EN
<i>Aenigmachanna mahabali</i>	Single location	Not known	GE, PO, HL	EN
<i>Aplocheilus parvus</i>	Widespread	Stable	Not species-specific	LC
<i>Balitora jalpalli</i>	Fragmented	Not known	HL, PO, CC	VU
<i>Bhavana annandalei</i>	Restricted	Not known	HL, PO, CC	VU
<i>Channa pseudomarulius</i>	Widespread	Stable	Not species-specific	LC
<i>Clarias dayi</i>	Very restricted	Declining	IAS, HL	CR
<i>Dario neela</i>	Fragmented	Not known	HL, PO	NT
<i>Dario urops</i>	Restricted	Not known	HL, PO	NT
<i>Dawkinsia austellus</i>	Not known	Not known	Not known	DD
<i>Dawkinsia lepida</i>	Fragmented	Not known	HL, PO	NT
<i>Dawkinsia rubrotinctus</i>	Restricted	Not known	HL, PO	NT
<i>Ehirava fluviatilis</i>	Widespread	Stable	Not species-specific	LC
<i>Garra emarginata</i>	Single location	Not known	Not known	DD
<i>Garra mlapparaensis</i>	Single location	Not known	IAS, CC	VU
<i>Ghatsa silasi</i>	Single location	Not known	IAS, CC	VU
<i>Glyptothorax elankadensis</i>	Single location	Not known	HL, PO	NT
<i>Horaglanis abdulkalami</i>	Restricted	Not known	GE, PO, HL	EN
<i>Kryptoglanis shajii</i>	Restricted	Not known	GE, PO, HL	EN
<i>Labeo nigriscens</i>	Fragmented	Declining	HL, PO	NT
<i>Laubuka trevori</i>	Restricted	Not known	Not known	DD
<i>Mastacembelus malabaricus</i>	Not known	Not known	Not known	DD
<i>Mesonoemacheilus tambaraparniensis</i>	Restricted	Not known	HL, PO, CC	VU
<i>Notopterus synurus</i>	Restricted	Declining	HL, PO, IE	VU
<i>Opsarius malabaricus</i>	Restricted	Not known	HL, PO	NT
<i>Oreochthys coorgensis</i>	Restricted	Not known	HL, PO	NT
<i>Oreochthys incognito</i>	Very restricted	Not known	HL, PO	DD
<i>Pangio bhujia</i>	Restricted	Not known	GE, PO, HL	EN
<i>Paracanthocobitis sinuate</i>	Restricted	Not known	HL, PO	NT
<i>Pethia nigripinna</i>	Restricted	Not known	HL, PO	NT
<i>Pristolepus rubripinnis</i>	Fragmented	Declining	HL, PO	NT
<i>Puntius madhusoodani</i>	Not known	Not known	Not known	DD
<i>Puntius melanostigma</i>	Not known	Not known	Not known	DD
<i>Rasbora dandia</i>	Widespread	Stable	Not species-specific	LC
<i>Rasbora neilgherriensis</i>	Restricted	Declining	HL, PO	VU

HL: Habitat loss, PO: Pollution, IE: Indiscriminate Exploitation, IAS: Invasive Alien Species, CC: Climate Change, GE: Groundwater Extraction

Likely Conservation Status of the Freshwater Fish Species of Kerala not yet assessed against IUCN Categories and Criteria



- Critically Endangered
- Endangered
- Vulnerable
- Near Threatened
- Least Concern
- Data Deficient

Species in Focus V

Blind eel, *Rakthamichthys digressus*

A bizarre, blind worm eel occurring in lateritic aquifers



Distribution: Kasargod, Kannur, Kozhikode, Malappuram Districts

Habitat: Lateritic aquifers and associated groundwater and subterranean habitats. Often encountered in dug-out wells

Threats: Unmanaged groundwater extraction, pollution, alien species, human-fish conflicts

IUCN Red List Status: Data Deficient

***Aenigmachanna gollum* (Aenigmachannidae)**

Not Evaluated

Malayalam Name: പാതാള വരാൽ

Endemism: Kerala

Distribution in Kerala: Kozhikode, Malappuram, Ernakulam districts

Districts: Kozhikode, Malappuram, Ernakulam districts

Habitats: Paddy fields, dug-out wells, wetlands, flood-plain areas, homestead ponds

Population Status: Not known

Threats: Reclamation of wetlands and paddy fields; groundwater extraction; pollution

Exploitation: Medium to high (recently emerged collection for the aquarium trade)

Occurrence in Protected Area: None

WPA/CITES/CMS: No

Conservation status: Currently Not Assessed; Triggers the Endangered Category

Conservation needs: Community based conservation and protection; strict laws against conversion of known habitats

Stakeholders: Kerala State Forest and Wildlife Department; Kerala State Biodiversity Board; Kerala State Agriculture Department

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology (migration and behaviour)

***Aenigmachanna mahabali* (Aenigmachannidae)**

Not Evaluated

Malayalam Name: പാതാള വരാൽ

Endemism: Kerala

Distribution in Kerala: Peringara near Thiruvalla;

Districts: Pathanamthitta

Habitats: Dug-out well; also, likely to occur in adjoining wetlands and paddy fields

Population Status: Not known (only one specimen has ever been collected)

Threats: Reclamation of wetlands and paddy fields; groundwater extraction; pollution

Exploitation: Not known

Occurrence in Protected Area: None

WPA/CITES/CMS: No

Conservation status: Currently Not Assessed; Triggers the Endangered Category

Conservation needs: Community based conservation and protection; strict laws against conversion of wetlands and paddy fields

Stakeholders: Kerala State Forest and Wildlife Department; Kerala State Biodiversity Board; Kerala State Agriculture Department

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology (migration and behaviour)

***Balitora jalpalli* (Balitoridae)**

Not Evaluated

Malayalam Name: ജലപ്പല്ലി കൽനക്കി

Endemism: Kerala

Distribution in Kerala: Bharathapuzha (Kunthi and Thootha) and Kabini

Districts: Palakkad and Wayanad

Habitats: Clear-water, well oxygenated mountain streams; prefers cascades, step pools and fast flowing riffles; often seen adhered to hard substrates such as bedrock and boulders.

Population Status: Unknown

Threats: Loss of Habitats; Alterations in flow; pollution; future impacts of Climate Change

Exploitation: Not known

Occurrence in Protected Areas: Wayanad WLS, Silent Valley NP

WPA/CITES/CMS: No

Conservation status: Not Assessed; Triggers the Vulnerable Category

Conservation needs: Extensive monitoring of populations outside PAs; ensuring critical habitats are intact, and preventing pollution

Stakeholders: Department of Forest and Wildlife; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population, Ecology; Threats

***Bhavana annandalei* (Balitoridae)**

Not Evaluated

Malayalam Name: കൽനക്കി

Endemism: Western Ghats

Distribution in Kerala: Neyyar, Vamanapuram, Kallada (also likely to occur in the upper reaches of all river systems draining the Agasthyamalai Biosphere Reserve)

Districts: Thiruvananthapuram, Kollam

Habitats: Clear-water, well oxygenated mountain streams; prefers cascades and riffles; often seen associated with hard substrates against the flow of water

Population Status: Unknown

Threats: Loss of Habitats; Alterations in flow; pollution; future impacts of climate change

Exploitation: Not known

Occurrence in Protected Areas: Neyyar WLS, Shendurney WLS, Peppara WLS

WPA/CITES/CMS: No

Conservation status: Not Assessed; Triggers the Vulnerable Category

Conservation needs: Extensive monitoring of populations outside PAs; ensuring critical habitats are intact, and preventing pollution

Stakeholders: Department of Forest and Wildlife

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology; Threats

Clarias dayi (Clariidae)

Not Evaluated

Malayalam Name: വയനാടൻ മുഴി, വയനാടൻ മുഴി

Endemism: Western Ghats

Distribution in Kerala: Kabini; Districts: Wayanad

Habitats: Sluggish streams with canopy cover; also, in lacustrine systems; wetlands

Population Status: Declining – likely to have declined by over 90% since 1990

Threats: Not clearly known; but loss of critical habitats is an important threat

Exploitation: Not known (but maybe taken as bycatch)

Occurrence in Protected Areas: Wayanad WLS

WPA/CITES/CMS: No

Conservation status: Not Assessed; Triggers the Critically Endangered Category

Conservation needs: Systematic monitoring; development of a captive breeding technology; awareness and education among tribal communities; identification of spawning sites

Stakeholders: Department of Forest and Wildlife

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology; Threats

Garra mlapparaensis (Cyprinidae)

Not Evaluated

Malayalam Name: മൂപ്പാറ കല്ലെട്ടി

Endemism: Kerala

Distribution in Kerala: Periyar; Districts: Idukki

Habitats: Fast-flowing, clear, and well-oxygenated streams; with sand, pebbles, cobbles, boulders and bedrock as the substrates. Juveniles of the species are found associated with slow flowing riffles with sand and pebbles as the major substrates.

Population Status: Not known (only a few individuals have ever been recorded)

Threats: Alien species; Future impacts of climate change

Exploitation: Not known

WPA/CITES/CMS: No

Conservation status: Not Assessed; Triggers the Vulnerable Category

Conservation needs: Monitoring of populations; managing alien species

Stakeholders: Department of Forest and Wildlife

Traditional Knowledge: Not documented

Research needs: Distribution; Population, Ecology; Impacts of alien species

Horaglanis abdukalami (Clariidae)

Not Evaluated

Malayalam Name: അമ്പലൂർകലാം കുരുടൻമുഴി

Endemism: Kerala

Distribution in Kerala: multiple locations in Thrissur district; Districts: Thrissur

Habitats: Lateritic aquifers and associated subterranean channels; often encountered in dug-out wells

Population Status: Not known

Threats: Reclamation of wetlands and paddy fields; groundwater extraction; pollution

Exploitation: Not known

Occurrence in Protected Area: None

WPA/CITES/CMS: No

Conservation status: Currently Not Assessed; Triggers the Endangered Category

Conservation needs: Community based conservation and protection; strict laws against conversion of wetlands and paddy fields; protection of wells

Stakeholders: Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology

Kryptoglanis shajii (Kryptoglanidae)

Not Evaluated

Malayalam Name: ക്രിപ്റ്റോഗ്ലാനിഡ്

Endemism: Kerala

Distribution in Kerala: multiple locations in Thrissur district; Districts: Thrissur

Habitats: Lateritic aquifers and associated subterranean channels; often encountered in dug-out wells; also occurs in channels in plantations and small home-stead ponds

Population Status: Not known

Threats: Reclamation of wetlands and paddy fields, groundwater extraction, pollution

Exploitation: No

Occurrence in Protected Area: None

WPA/CITES/CMS: No

Conservation status: Currently Not Assessed; Triggers the Endangered Category

Conservation needs: Community based conservation and protection; strict laws against conversion of wetlands and paddy fields; protection of wells

Stakeholders: Kerala State Biodiversity Board

Traditional Knowledge: None

Research needs: Distribution; Population; Ecology

Notopterus synurus (Osteoglossidae)

Not Evaluated

Malayalam Name: അമ്പലൂർ വാള

Endemism: Peninsular India

Distribution in Kerala: Kabini; reservoirs in Bharathapuzha; likely to occur in Bhavani and Pambar

Districts: Wayanad, Palakkad (Palakkad and Idukki – see above)

Habitats: Small rivulets, marginal areas of the low land rivers and associated floodplain areas where the substrate types being silt, sand, gravel and pebbles. The species is found to hide among the rooted macro vegetation and below the weedy mats.

Population Status: Declining

Threats: Habitat loss; sand mining; pollution; indiscriminate fishing

Exploitation: High (as food fish)

Occurrence in Protected Area: Wayanad WLS

WPA/CITES/CMS: No

Conservation status: Currently Not Assessed; Triggers the Vulnerable Category

Conservation needs:

Stakeholders: Kerala State Fisheries Department; Kerala State Forest and Wildlife Department; Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology, Threats

Pangio bhujia (Cobitidae)

Not Evaluated

Malayalam Name: പാതാള പുത്താരകൻ

Endemism: Kerala

Distribution in Kerala: Cherinjil (Kozhikode), Kondotty (Malappuram)

Districts: Kozhikode, Malappuram

Habitats: Lateritic aquifers and associated subterranean channels; often encountered in dug-out wells; also occurs in channels in plantations and small home-stead ponds

Population Status: Not known

Threats: Reclamation of wetlands and paddy fields; groundwater extraction; pollution

Exploitation: Not known

Occurrence in Protected Area: None

WPA/CITES/CMS: No

Conservation status: Currently Not Assessed; Triggers the Endangered Category

Conservation needs: Community based conservation and protection; strict laws against conversion of wetlands and paddy fields; protection of wells

Stakeholders: Kerala State Biodiversity Board

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology

Rasbora neilgherriensis (Danionidae)

Not Evaluated

Malayalam Name: ഓരി

Endemism: Western Ghats

Distribution in Kerala: Kabini; likely to occur in Bhavani ; Districts: Wayanad, Palakkad

Habitats: Prefer the clear water streams and rivulets with moderate flow and canopy where the substrate types being silt, sand, gravel, pebbles and cobbles. The juveniles of the species are found associated with the marginal sinuous areas with low water velocity.

Population Status: Declining

Threats: Loss of critical habitats; bycatch; pollution

Exploitation: Low to medium (bycatch)

Occurrence in Protected Area: Wayanad WLS, Silent Valley NP

WPA/CITES/CMS: No

Conservation status: Currently Not Assessed; Triggers the Vulnerable Category

Conservation needs: Monitoring of critical habitats and populations; development of a captive breeding technology

Stakeholders: Kerala State Forest and Wildlife Department

Traditional Knowledge: Not documented

Research needs: Distribution; Population; Ecology

Species in Focus VI

Subterranean eel loach, *Pangio bhujia*

The first miniature subterranean eel-loach



Distribution: Kozhikode and Malappuram Districts

Habitat: Lateritic aquifers and associated groundwater and subterranean habitats. Also known to occur in small water channels of agro-based plantations. Often encountered in dug-out wells

Threats: Unmanaged groundwater extraction, pollution, alien species

IUCN Red List Status: Not Assessed

Key Fish Areas (KFAs) in Kerala

Given the lack of funding and investment for freshwater biodiversity conservation [8, 22], and the fact that many freshwater taxa around the world are living on the edge; there is an urgent need to identify and prioritise species and sites for conservation planning and action. Limited resources available make the single-species approach to conservation unrealistic [23], and encourages the prioritisation of sites/areas that if protected, will help conserve the greatest diversity [24].

The global protected area network, considered to be one of the most effective in situ management strategies to overcome biodiversity loss continues to grow. Yet, despite this expansion, protected areas cover only less than 25% of areas of importance for biodiversity. The true extent of the world's fresh waters contained in the protected area network remains largely unknown, as there are very few dedicated 'freshwater

protected areas'; and freshwater ecosystems are (generally) only protected incidentally through their incorporation into the terrestrial protected area network. Despite this the number of freshwater fish species that occur in some of these terrestrial protected areas probably far exceed those of mammals, birds and reptiles. Yet, protected areas for example in the Western Ghats rarely acknowledge the importance, or need for conserving fish. This is strange as some of these protected areas are potential freshwater 'Alliance for Zero Extinction (AZE)' sites, i.e., sites that harbour 95 % of the population of one or more 'Critically Endangered' and/or 'Endangered' species – which are global priorities for conservation [25]. On the other hand, there is also an issue that many endemic, and threatened freshwater-dependent taxa are poorly represented inside terrestrial protected areas.

While the IUCN Red List is the

widely accepted standard for assessing global risk of extinction of species, a threshold-based criteria - the Key Biodiversity Area (KBA) approach has been developed for identifying and prioritising sites of greatest conservation importance for ensuring species survival [26–28]. KBAs are extensions of the concept of Important Bird Areas (IBAs), the largest and most comprehensive network of sites that have been identified as significant for the global persistence of biodiversity [29]; derived from a set of criteria based on two key elements of systematic conservation planning, i.e. 'Vulnerability' (measure of scarcity of options in time for conserving biodiversity) and 'Irreplaceability' (measure of spatial options available for conservation of a particular species) [29, 30–31]. We have prioritised 12 areas/sites in the State of Kerala that can be prioritised for the implementation of 'Key Fish Areas/KFAs'.

1. Periyar Tiger Reserve [Thannikudy, Ummikuppanthodu, Mlappara]

Type of Area: IUCN Category II Protected Area (National Park)

River system: Periyar

Fish species: 40

Fish species endemic to the IFA: 8

Threatened fish species: 12

Major Threats: Alien species, fishery bycatch

Major Conservation interventions required: Regular monitoring of alien species; management of bycatch in the lake

Alliance for Zero Extinction Site: Yes

Priority species: *Lepidopygopsis typus* (EN), *Tariqilabeo periyarensis* (EN), *Hypselobarbus periyarensis* (EN), *Garra periyarensis* (VU), *Mesonoemacheilus periyarensis* (VU), *Mesonoemacheilus menoni* (VU), *Garra mlapparaensis* (NA) and

Ghatsa silasi (NA)

2. Silent Valley National Park [Kunthi tributary]

Type of Area: IUCN Category II Protected Area

River system: Bharathapuzha

Fish species: 40

Fish species endemic to the IFA: 3

Threatened fish species:

Major Threats: Climate Change

Major Conservation interventions required: Regular monitoring for occurrence of alien species

Alliance for Zero Extinction Site: No
Priority species: *Ghatsa menoni* (LC), *Ghatsa pillaii* (LC), *Mesonoemacheilus remadevii* (LC). *Garra menoni* (LC).

3. Chinnar Wildlife Sanctuary [Pambar River]

Type of Area: IUCN Category IV

Protected Area

River system: Pambar

Fish species: 25

Fish species endemic to the IFA: 1* (*undescribed species of *Ghatsa*)

Threatened fish species: 3

Major Threats: Loss of critical habitats due to flow alterations and climate change

Major Conservation interventions required: Regular monitoring of alien species

Alliance for Zero Extinction Site: No
Priority species: *Tor remadevii* (CR), *Glyptothorax housei* (EN), *Garra hughii* (EN)

4. Wayanad Wildlife Sanctuary [Kabini River and its tributaries – Noolpuzha, Kalindi, Nugu]

Type of Area: IUCN Category IV Protected Area

River system: Kabini

Fish species: 101

Fish species endemic to the IFA: 2

Threatened fish species: 18

Major Threats: Alien Invasive Species, Indiscriminate Fishing

Major Conservation interventions required: Regular monitoring of spread of alien species

Alliance for Zero Extinction Site: No
Priority species: *Tor remadevii* (CR), *Hypselobarbus dubius* (EN), *Neolissochilus wynaadensis* (CR), *Hypselobarbus micropogon* (EN), *Hemibagrus punctatus* (CR), *Balitora mysorensis* (VU), *Schistura striata* (EN), *Dario neela* (NA), *Glyptothorax madraspatanus* (EN), *Pethia nigripinna* (NA), *Garra mccllellandi* (LC), *Pterocryptis wynaadensis* (EN), *Puntius cauveriensis* (VU), *Devario neilgherriensis* (EN), *Rasbora neilgherriensis* (NA)

5. Karimpuzha Wildlife Sanctuary [New Amarambalam Forests]

Type of Area: IUCN Category IV Protected Area

River system: Chaliyar

Fish species: 45

Fish species endemic to the IFA: 1

Threatened fish species: 6

Major Threats: Fishing using unsustainable methods

Major Conservation interventions required: Regular monitoring of habitat quality and populations of the endemic species; improving awareness among local tribal communities on the impacts of using plant poisons and other destructive fishing methods

Alliance for Zero Extinction Site: Yes
Priority species: *Tor malabaricus* (EN), *Glyptothorax davissinghi* (EN)

6. Chalakudy [Vettilapara to Poringal]

Type of Area: Reserved Forests

River system: Chalakudy

Fish species: 62

Fish species endemic to the IFA: 0

Threatened fish species: 15

Major Threats: Indiscriminate

fishing, drying of pools during summer, flow regulation

Major Conservation interventions required: Regular patrol on the river banks and monitoring indiscriminate fishing

Alliance for Zero Extinction Site: No
Priority species: *Tor malabaricus* (EN), *Travancoria elongata* (EN), *Sahyadria chalakkudiensis* (EN), *Osteochilichthys longidorsalis* (EN), *Horabagrus nigricollaris* (EN), *Garra surendranathanii* (EN), *Batasio travancoria* (VU), *Sahyadria chalakkudiensis* (EN), *Osteochilichthys longidorsalis* (EN), *Horabagrus nigricollaris* (EN), *Garra surendranathanii* (EN), *Batasio travancoria* (VU)

7. Periyar [Pooyamkutty-Edamalar-Maankulam]

Type of Area: Reserved Forests

River system: Periyar

Fish species: 54

Fish species endemic to the IFA: 1

Threatened fish species: 10

Major Threats: Indiscriminate Fishing

Major Conservation interventions required: Regular monitoring for indiscriminate fishing activities, and spread of alien species

Alliance for Zero Extinction Site: No
Priority species: *Tor malabaricus* (EN), *Travancoria elongata* (EN), *Sahyadria chalakkudiensis* (EN), *Osteochilichthys longidorsalis* (EN), *Horabagrus nigricollaris* (EN), *Garra surendranathanii* (EN), *Batasio travancoria* (VU), *Garra emarginata* (NA)

8. Santhampara hills [Panniyar stream]

Type of Area: Mosaic of forests and plantations of tea and cardamom

River system: Periyar

Fish species: 24

Fish species endemic to the IFA: 2

Threatened fish species: 5

Major Threats: Alien Invasive Species, Pollution, Habitat deterio-

ration

Major Conservation interventions required: Monitoring for spread of alien species; routine water quality assessments and monitoring of pollutants; transforming plantations to organic farming

Alliance for Zero Extinction Site: Yes
Priority species: *Garra hughi* (EN), *Garra arunachalami* (CR), *Ghatsa santhamparaiensis* (EN), *Travancoria jonesi* (EN), *Indoreonectes keralensis* (VU)

9. Shendurney Wildlife Sanctuary and the adjoining aquascapes of the Kallada

Type of Area: IUCN Category IV Protected Area, and mosaic of human dominated landscape

River system: Kallada

Fish species: 35

Fish species endemic to the IFA: 1

Threatened fish species: 8

Major Threats: Fishing using unsustainable methods

Major Conservation interventions required: Monitoring of threatened fish populations; licensing and enforcement of management plans in the reservoir fishery

Alliance for Zero Extinction Site: Yes (only the range of *Dawkinsia exclamatio*)

Priority species: *Travancoria jonesi* (EN), *Dawkinsia exclamatio* (EN), *Hypselobarbus thomassi* (CR), *Tor malabaricus* (EN).

10. Upper reaches of Achankovil River

Type of Area: Reserved Forests

River system: Achankovil

Fish species: 40

Fish species endemic to the IFA: 0

Threatened fish species: 6

Major Threats: Loss of riparian cover

Major Conservation interventions required: monitoring for alien species, improving awareness among forest-dwelling communities

Alliance for Zero Extinction Site: No
Priority species: *Tor malabaricus*

(EN), *Sahyadria chalakkudiensis* (EN), *Glyptothorax anamalaiensis* (EN), *Garra surendranathanii* (Endangered)

11. Thoothapuzha tributary from Vellinezhi to Mukkali

Type of Area: Mosaic of Reserved Forests, Agricultural land and Human Habitation

River system: Bharathapuzha

Fish species: 55

Fish species endemic to the IFA: 0

Threatened fish species: 7

Major Threats: Sand mining, Deterioration of habitats, flow regulation

Major Conservation interventions required: Monitoring of habitats

with regard to sand mining issues; monitoring for spread of alien species

Alliance for Zero Extinction Site: No
Priority species: *Osteochilichthys longidorsalis* (EN), *Pseudolaguvia austrina* (NA), *Sahyadria denisonii* (EN), *Glyptothorax anamalaiensis* (EN)

12. Paddy fields/wetlands in Malappuram (Kottakal, Vengara, Kondotty)

Type of Area: Paddy fields, flood-plains, wetlands and human habited agricultural landscapes

Fish species: Detailed inventory not available

Fish species endemic to the IFA: 0 (but harbours a significant population of *Aenigmachanna gollum* – a living fossil)

Threatened fish species: 1

Major Threats: Alien Invasive Species, Pollution, Reclamation of paddy fields and wetlands

Major Conservation interventions required: Education and awareness programs, community-based conservation reserves, fish refugias

Alliance for Zero Extinction Site: No
Priority species: *Aenigmachanna gollum* (NA), *Rakthamichthys digressus* (DD), *Ophichthys fossorius* (EN), *Pangio bhujia* (NA)



Species in Focus VII

Imperial White Collared Catfish , *Horabagrus nigricollaris*

An enigmatic freshwater catfish of the family Horabagridae



Distribution: Periyar (Edamalayar-Pooyamkutti) and Chalkudy (Vettilapara-Athirapilly) Rivers

Habitat: Riffles and deep pools

Threats: Indiscriminate fishing, Pollution, Habitat loss due to flow regulation

IUCN Red List Status: Endangered

Alien species – major threat to freshwater fish species in Kerala

Alien species are recognized as the second major cause of global biodiversity decline. A total of 30 alien fish species are known from the Kerala part of the southern Western Ghats, posing severe threats to the native fish diversity through competition for shared resources, including food and predation. Of the 30 alien fish species recorded from the Kerala part of Western Ghats, 12 species – *Oreochromis mossambicus*, *O. niloticus*, *Pterygoplichthys pardalis*, *Clarias gariepinus*, *Cyprinus carpio*, *Poecilia reticulata*, *P. mexicana*, *Gambusia affinis*, *Trichopodus trichopterus*, *Oncorhynchus mykiss*, *Xiphophorus hellerii* and *X. maculatus* has established strong breeding populations in the wild, and seven of them have turned invasive. The occurrence of *Oreochromis mossambicus* and *Cyprinus carpio* in most water bodies both inside and outside the protected area network of the state have been overlooked by biodiversity managers, fisheries scientists and conservation biologists, and there is a huge lacuna in understanding the on-ground impacts caused by such invasive species. The Periyar and Chalakudy rivers, which were identified as 'Important Fish Areas' due to the presence of many endemic, and threatened fish species, harbours 17 and 15 alien fish, respectively. The North African catfish *Clarias gariepinus* has established substantial breeding populations in the reservoirs built across the Periyar and Kabini rivers, and in many of its tributaries. The abundance of large-sized predatory fishes such as the North African

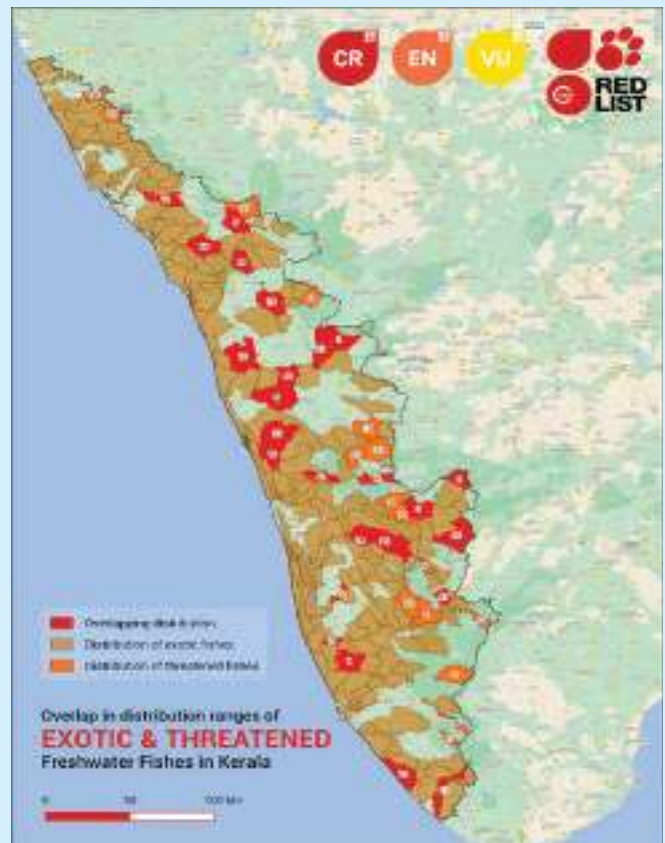
catfish in critical fish habitats, including within the protected areas, and breeding populations of common carp, a high competitor of native fish in most of the reservoirs and rivers with threatened fish species is clear evidence of lack of sound invasion biology studies and management. The common carp has also established breeding populations in rivers, especially in places such as Kulathupuzha and Aruvikkara, where the threatened *Tor* sp. is considered sacred and revered, and their abundance in the Periyar lake, an AZE site, is a concern for many threatened point endemic species. The presence of *Poecilia reticulata* in many high order streams of the WG is yet another concern for the high-altitude fish fauna, as they are voracious feeders of fish eggs and invertebrate larvae. *Pterygoplichthys pardalis*, is now known to compete strongly with native fish species for food and space; the species being a significant menace in the natural streams of the Karamana river in Thiruvananthapuram. Baseline data on distribution of alien fish species in Kerala is available, however what is lacking is the enforcement of policies, and on-ground management efforts. In critical habitats, management programmes including possible options for eradication need to be prioritised. Efforts to strengthen the knowledge base on invasion biology of alien species need to be put in place to safeguard the unique diversity of endemic fish species.



The exotic African catfish in Thiruvachira Sree Krishna Temple Pond, Kozhikode



Exotic common carp (in red) with threatened mahseer species in the Kulathupuzha river





Alliance for Zero Extinction Sites (AZE)

The Alliance for Zero Extinction (AZE) was launched in the year 1995 to identify, effectively conserve and safeguard the most important sites for preventing global species extinctions (see [\[www.zeroextinction.org\]\(http://www.zeroextinction.org\)\). The Alliance for Zero Extinction \(AZE\) identifies and safeguards key sites, each one of which is the last remaining refuge of one or more Endangered \(EN\) or Critically Endangered \(CR\) species.](http://www.zeroextinc-</p>
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Table 2. List of freshwater fish-based Alliance for Zero Extinction (AZE) Sites in Kerala

Name of the area	Trigger Species
Periyar Tiger Reserve	<i>Lepidopygopsis typus</i> , <i>Tariqilabeo periyarensis</i> , <i>Hypselobarbus periyarensis</i>
New Amarambalam	<i>Glyptothorax davissinghi</i>
Santhampara	<i>Garra arunachalami</i> , <i>Ghatsa santhamparaiensis</i>
Kallada River	<i>Dawkinsia exclamation</i>

Fish species prioritised for Section 38 of Biological Diversity Act

The following nine species are prioritised for inclusion under the Section 38 of the Biological Diversity Act.

1. Hump-backed mahseer, *Tor remadevii*

Assessed as Critically Endangered on the IUCN Red List, *Tor remadevii* is the world's rarest mahseer whose global distribution has reduced by >90% over the last decades. The species is currently restricted to the tributaries of the Cauvery in Kerala including the Bhavani, Pambar and Kabini. Though much of its current distribution range in Kerala may fall inside protected areas or reserved forests, the migratory habit of the species could mean that they move out of the protected stretches during certain seasons. At such times, they are the target of indiscriminate fishing by local communities. This species needs to be included under Section 38 given its extremely high risk of extinction, small population size and the fact that it does not contribute a primary source of food security, income or livelihoods to the local riverine communities. Areas where strict enforcement and monitoring should be carried out include the areas outside the boundaries of the Chinnar Wildlife Sanctuary, Wayanad Wildlife Sanctuary and the Bhavani Forest Range of Silent Valley National Park.



Tor remadevii

2. Gollum Snakehead, *Aenigmachanna gollum*

A recently (2019) described species which comprises an evolutionary distinct lineage within the order Anabantiformes and a 'living fossil'. The family Aenigmachannidae to which the species belongs is endemic to Kerala, and is therefore of considerable conservation priority. Current known populations of this species occur in human-dominated landscapes such as paddy-fields, floodplain associated wetlands and channels in agro-plantations in Malappuram, Kozhikode, Thrissur and Ernakulam Districts. Though this species is not yet assessed for its IUCN Red List Status, this species needs to be included under Section 38 given its extremely unique evolutionary status, and increased demand from the international aquarium pet trade as a 'Feng Shui' fish, and most importantly because the distribution of this species overlaps with areas with high human footprint. There is also a dearth of information on the habitat requirements, population size and threats to this species.

3. Subterranean Catfish, *Kryptoglanis shajii*

Kryptoglanis shajii is an evolutionarily distinct fish belonging to the family Kryptoglanidae which is endemic to the State of Kerala. Though it was originally discovered from lateritic aquifers and dug-out wells in Thrissur District, subsequent surveys have shown that

there is also an epigeal population that lives in wetlands,

channels in agro-based plantations, and ponds. The species has not received any research attention and therefore there is no baseline information on any aspect of its life history, ecology and population status. Though this species is not yet assessed for its IUCN Red List Status, this species needs to be included under Section 38 given its extremely unique evolutionary status, and because its distribution overlaps with areas with high human footprint, where anthropogenic pressures might likely lead to population declines.

4. Species of the blind catfish genus *Horaglanis* (*Horaglanis abdukalami*, *H. alikunhii*, *H. krishnai*)

The genus *Horaglanis* comprises three species of evolutionarily distinct, blind catfishes endemic to Kerala, where they occur in lateritic aquifers and homestead dug-out wells in Thrissur, Ernakulam, Kottayam, Pathanamthitta and Alappuzha districts. Two species (*H. alikunhii* and *H. krishnai*) are assessed as Data Deficient on the IUCN Red List, while *H. abdukalami* has not yet been assessed. These three species need to be included under Section 38 given its extremely unique evolutionary status, and because its distribution overlaps with areas with high human footprint, where anthropogenic pressures might likely lead to population declines. The lateritic aquifers are threatened by high levels of water extraction, and the connected dug-out wells through which the species are opportunistically sighted are threatened by the use of disinfectants and the occasional introduction of alien species including the predatory African Catfish, *Clarias gariepinus*.

5. Species of the blind synbranchid eel genus *Rakthamichthys* (*Rakthamichthys digressus*, *R. indicus* and *R. roseni*)

The recently established synbranchid genus *Rakthamichthys* comprises three species of evolutionarily distinct, blind eels occurring in lateritic aquifers, dug-out wells, and caves in Kasargod, Kannur, Kozhikode, Malappuram, Thrissur, Ernakulam, Kottayam, Pathanamthitta, Alappuzha and Kollam districts. Though all three species are assessed as Data Deficient on the IUCN Red List, these are potential candidates for inclusion under Section 38 given its unique evolutionary status, and because its distribution overlaps with areas of high human footprint, where anthropogenic pressures might likely lead to population declines. The lateritic aquifers are

threatened by high levels of water extraction, and the connected dug-out wells through which the species are opportunistically sighted are threatened by the use of disinfectants and the occasional introduction of alien species including the predatory African Catfish, *Clarias gariepinus*. An emerging threat to these species is an interesting case of Human-Fish conflicts where the eels are killed as they superficially resemble snakes.

6. Highly exploited species that merits special mention

Several other species of freshwater fishes are facing high levels of threats, especially populations located outside the protected area

network. These species are in particular threatened by indiscriminate fishing, often using destructive gears including fine-meshed nets, use of plant poisons, chemicals, and dynamite. These species are currently not being suggested for inclusion in Section 38 of the Biological Diversity Act because of the sole reason that they contribute significantly to local livelihoods and food security in many riverine and reservoir habitats of Kerala. These species need to be prioritised for regular monitoring by the Kerala State Fisheries Department, and the Kerala State Biodiversity Board with specific focus on their exploitation and trade.

1. <i>Channa diplogramma</i> Areas to be monitored	പുലിവാക [Highest Priority] Pampa, Achankovil, Muvattupuzha Rivers
2. <i>Hypselobarbus thomassi</i> Areas to be monitored	കെമ്പൻ കുരൽ Kallada (Thenmala), Chalakudy, Periyar
3. <i>Horabagrus brachysoma</i> Areas to be monitored	മഞ്ഞക്കുളി Periyar, Chalakudy, Pampa, Achankovil, Muvattupuzha, Meenachil, Karuvanoor
4. <i>Tor malabaricus</i> Areas to be monitored	കറ്റി, ചുര Bharathapuzha, Chaliyar, Kuttyadi, Valapattanam
5. <i>Osteochilichthys longidorsalis</i> Areas to be monitored	ഓലോൺ Bharathapuzha, Chalakudy, Periyar
6. <i>Clarias dussumieri</i> Areas to be monitored	നാടൻമുഴി Kole wetlands, rivers and wetlands in Ernakulam, Idukki and Thrissur Districts
7. <i>Hypselobarbus dubius</i> Areas to be monitored	മാമുൾ Kabini
8. <i>Hypselobarbus micropogon</i> Areas to be monitored	കോഴിമീൻ, കോഴിമീൻ, Kabini
9. <i>Kantaka brevidorsalis</i> Areas to be monitored	കോഴിമീൻ, നീലമുളളൻ

10. <i>Hypselobarbus kurali</i> Areas to be monitored	കുഴികുത്തി കുരൽ Malampuzha, Mullaperiyar and Idukki reservoirs
11. <i>Systomus sarana</i> Areas to be monitored	കുറുവാ പരൽ, കരിന്തലപ്പൻ Kole wetlands, Confluent rivers of Lake Vembanad
12. <i>Channa pseudomarulius</i> Areas to be monitored	ചേറൻ, ചേറുമീൻ Kole wetlands, Confluent rivers of Lake Vembanad
13. <i>Labeo dussumieri</i> Areas to be monitored	പുല്ലൻ, തുളി Confluent rivers of Lake Vembanad
14. <i>Wallago attu</i> Areas to be monitored	ആറ്റുവാള Kole wetlands, Confluent rivers of Lake Vembanad
15. <i>Anguilla bengalensis</i> Areas to be monitored	പുള്ളിമലിഞ്ഞീൻ All major rivers, estuaries, and reservoirs
16. <i>Anguilla bicolor</i> Areas to be monitored	കറുത്തമലിഞ്ഞീൻ All major rivers, estuaries, and reservoirs
17. <i>Carinotetraodon travancoricus</i> Areas to be monitored	ആട്ടുണ്ട, തവളപ്പൊട്ടൻ Lowland areas of all major west-flowing rivers

Freshwater fish species of Kerala included under the Indian Wildlife (Protection) Act 1972

No species of freshwater fish are explicitly listed under the Indian Wildlife (Protection) Act 1972. However, a few species are included as a result of their 'family' listed under the Act.

Two species of freshwater fish found in Kerala are listed under the Schedule I of the Indian Wildlife (Protection) Act 1972 (IWPA). These include the freshwater pipefish, *Ichthyocampus carce* and the Crocodile Tooth Pipe Fish, *Microphis cunclus* as both these species are members of the family Syngnathidae – all members of which are included under the highest schedule of the IWPA.

Ichthyocampus carce

Malayalam Name: ശുദ്ധജല

രൈപ്പി മത്സ്യം

Distribution in Kerala: Not clearly

known; but likely to occur in lowland areas of major west-flowing river systems

Population Status: Not known
Threats: Loss of habitats especially shoreline vegetation and riparian cover; pollution

Conservation status: Least Concern (this however does not represent the status of the fish in Kerala which needs to be assessed once information becomes available)

Conservation needs: Systematic monitoring of known habitats and populations

Stakeholders: Kerala State Biodiversity Board; Department of Fisheries

Traditional Knowledge: None

Research needs: Distribution; Population, Ecology; Threats

Microphis cunclus

Malayalam Name: മുതലപ്പല്ലൻ രൈപ്പി

മത്സ്യം, രൈപ്പിമീൻ

Distribution in Kerala: Not clearly

known; but likely to occur in lowland areas of major west-flowing river systems; verifiable records available from Periyar and Chalakudy

Population Status: Not known
Threats: Loss of habitats especially shoreline vegetation and riparian cover; pollution

Conservation status: Least Concern (this however does not represent the status of the fish in Kerala which needs to be assessed once information becomes available)

Conservation needs: Systematic monitoring of known habitats and populations

Stakeholders: Kerala State Biodiversity Board; Department of Fisheries

Traditional Knowledge: None

Research needs: Distribution; Population, Ecology; Threats

Threats to freshwater fishes of Kerala – a photo journey

Intensive fishing for spawners of *Labeo dussumieri*, known as "thooliyilakkam" – scene from Meenachil River, River fish-kills are becoming a common occurrence in many rivers of Kerala
Entire stretches of rivers are being

lost as a result of a range of anthropogenic impacts – Scene
Pollution from agro-based sources particularly from plantations are a major threat to hillstream fishes of Kerala
A cascade of dams now alters free-flowing rivers in Kerala resulting in significant downstream

impacts including loss of critical habitats for fish, Downstream impacts of dams in the Chalakudy River Fish kills in paddy fields following droughts. Such drought periods were common after catastrophic floods in Kerala over the last three years



*Intensive fishing for spawners of *Labeo dussumieri*, known as "thooliyilakkam" – scene from Meenachil River*



River fish-kills are becoming a common occurrence in many rivers of Kerala



Entire stretches of rivers are being lost as a result of a range of anthropogenic impacts – Scene



Pollution from agro-based sources particularly from plantations are a major threat to hillstream fishes of Kerala



A cascade of dams now alters free-flowing rivers in Kerala resulting in significant downstream impacts including loss of critical habitats for fish



Downstream impacts of dams in the Chalakudy River



Fish kills in paddy fields following droughts. Such drought periods were common after catastrophic floods in Kerala over the last three years

Threats to freshwater fishes of Kerala – a photo journey

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Recommendations

The following are a set of brief recommendations for raising the profile, and improving freshwater fish conservation and management efforts in Kerala.

- Detailed exploratory studies to be carried out in every major river system of the state including

inside protected areas to determine the actual fish diversity. Such studies should be undertaken in every tributary at all altitudes, and in different seasons of the year in order to get a better picture of

freshwater fish diversity of the state and to prioritize conservation action

- Integrative taxonomic studies to be carried out on groups for which considerable ambiguities exist. State-of-the-art molecular techniques to be adopted.

- A repository for freshwater fishes of Kerala to be developed with properly curated voucher specimens. The collections should include both topotypes of the various species, and additional material from various locations. One such repository can be initiated in the Biodiversity Museum of KSBB

- An online interactive database on the freshwater fishes of Kerala to be developed, which would serve as an information dissemination platform and trigger studies and research, besides providing essential data for with extensive information of use to students, researchers, policy makers and the public.

- Research on various aspects of distribution, population, biology, ecology, and threats to various endemic and threatened species of the state to be carried out on an urgent basis. Priority research

areas for various species have been explicitly mentioned in this report under the various species accounts.

- Long-term monitoring programs to be developed and implemented for threatened species, and those that are facing population decline due to exploitation and other causes. Species that require comprehensive monitoring are mentioned in this report.

- 'Key Fish Areas' to be implemented on the ground with necessary conservation plans and strategies for the endemic and threatened fish species. Areas outside protected area network to be given immediate priority, where co-management programmes may be envisaged with the participation of Biodiversity Management Committees.

- State-level quarantine and management plans to be developed and implemented for preventing alien fish species, especially in areas of high importance (Key Fish Areas, areas where threatened species occur). Promoting the use of advanced techniques such as e-DNA for detecting their presence in critical freshwater habitats/KFAs and inside protected areas. Few KFAs need to be prioritised for the management of invasive alien fish species, and management plans developed for urgent implementation

- Flagship species to be selected for prioritised areas to increase awareness among public. Targeted awareness programmes on freshwater fish diversity/freshwater biodiversity is to be launched by the KSBB to highlight the importance of freshwater fish among the public.

Complete ban on fishing during the breeding season including collection of fry and juveniles from the breeding grounds.

Enforcement of the Inland Fisheries and Aquaculture Act during the mass migration of freshwater fishes during their spawning season (Ootha)

The KSBB should take proactive steps to regulate the trade of endemic and threatened fish species (see species accounts for their exploitation and use information) with the support of BMCs, besides updating the list of freshwater fish species in the People's Biodiversity Register

Few KFAs outside the PA network – such as those in the wetlands and paddy fields of Malappuram District may be considered for protection as Heritage Sites by the KSBB, as these areas harbour unique species found nowhere else on the planet.

An anthropogenic study to understand the local knowledge, and interactions of local (mostly forest-dwelling) communities with freshwater fish species need to be initiated.

Awareness programs and classes on native freshwater fishes and their conservation issues to be undertaken in schools and colleges in the State, and to be included in the curriculum of courses in colleges and Universities offering fisheries and other aquatic-science related disciplines

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Species excluded from the report and reasons

The 2012 amendment to the International Code of Zoological Nomenclature (ICZN)[1] has made it easier for 'researchers' to publish taxonomic work in paid, open-access, and (mostly) poor-quality online journals that have been listed as 'potential predatory', 'suspicious' or 'predatory' [2], leading to a surge of low-quality papers (from mostly tropical countries) publishing 'supposedly new taxa' [3]. The 'new names' published in these poorly-written papers, however, becomes 'available' according to relevant codes of the ICZN. These names are subsequently picked up by the print media, listed in scientific databases such as the 'Eschmeyer's Catalog of Fishes', 'FishBase' and 'WORMS', and also integrated into national environment and biodiversity reports, including country reports to the Convention on Biological Diversity.

The 'principle of priority', one of the oldest principles of binomial nomenclature ensures that scientific names of taxa can have authorities/authors' names appended to them forever, and the relevant codes of ICZN guarantees that an available name cannot be ignored, altered or reverted, even if the diagnosis and description is extremely poor and invaluable; or even in case the taxon is unidentifiable [3-4]. This situation is apparently known to promote "taxonomic nihilism" [5], 'mihi itch' [6] or 'nominomania' [7] - securing an authorship of the species and thereby being immortalized [5].

Taxonomy is a rigorous science [8] involving extensive field surveys, examination of museum collections, and laboratory studies of morphology and anatomy, followed by critical analysis and hypothesis testing [9] to identify, diagnose and describe taxa. Every taxonomist should have their rationale clear as to why a new taxon is being proposed, and their proposals should always be supported by unambiguous data [10]. Taxonomic studies that culminate in the description of a new taxon can in many cases take months, or years to complete based on the resources and funding required.

Since 2012/2013, several papers describing 'new' fish species have been published in 'predatory', pay-to-publish open-access journals, or in online-only journals in which the peer review has been severely compromised. Some of these recent 'low-quality papers' have in particular, been accused of using a "clutch at straws" or "science mimicry" approach to diagnose 'new' species, relying on minutiae and even story-telling [11]. Such practices, though not specifically referred to as 'unacceptable' in ICZN, would severely

hamper the quality of taxonomic research and compound the taxonomic uncertainties prevailing in research, especially in the era of taxonomic impediment.

Most (if not all) of the Indian freshwater fish taxonomy papers (especially those dealing with description of new taxa) since 1990 have been published in reputed journals cited in either Scopus™ or the Science Citation Index™. These include journals such as *Zootaxa*, *Ichthyological Exploration of Freshwaters*, *Journal of Fish Biology*, *Ichthyological Research*, *Copeia*, *Vertebrate Zoology*, *Raffles Bulletin of Zoology*, *Current Science*, *Journal of Threatened Taxa*, *Hydrobiologia*, *Environmental Biology of Fishes* and the *Indian Journal of Fisheries*. Many papers have also been published in the *Journal of the Bombay Natural History Society* and *Records of the Zoological Survey of India*, which represent two of India's oldest natural history journals. In all these journals, ichthyologists with experience in freshwater fish taxonomy (including on Indian fishes) serve on the editorial board and peer-review the submitted manuscripts.

Therefore, all 'ambiguous' and

'unclear' names which have been published in 'online' pay and publish journals have been excluded from the list of freshwater fishes of Kerala, and from being mentioned anywhere in this report except in this annexure. There are also cases in which the same author has published several names in a taxonomy journal (e.g., *Biosystematica*) of which one is clearly a distinct species (*Glyptothorax elankadensis*), while the others (e.g., *Mystus heoki* and *M. indicus*) are not clearly diagnosed, and are no doubt a result of poor understanding of the concepts and practices of taxonomy. In this case, only the name considered to represent a clear, diagnosable species is added and the others are excluded.

We use this annexure in this report to bring attention to this practice of 'taxonomic vandalism', and highlight the need for maintaining clarity, integrity and ethics in taxonomy. The issue of predatory publications and its impact on Indian ichthyology has been discussed in detail by many authors of this report [12], as well as by leading taxonomists around the world [11].

Species	Type locality	Authors	Journal
1. <i>Barilius cyanochlorus</i>	Chully	Plamoottil & Vineeth	Biodiversitas
2. <i>Batasio flavus</i>	Paduthode (Manimala)	Plamoottil	J. Res. Biol.
3. <i>Garra palaruvica</i>	Palaruvi	Arunachalam et al.	Int. J. Zool. Res.
4. <i>Hypselobarbus keralaensis</i>	Karamana Basin	Arunachalam et al.	Iran. J. Ichthyol
5. <i>Hypselobarbus menoni</i>	Mlappara	Arunachalam et al.	Species
6. <i>Hypselobarbus vaigaiensis</i>	Periyar Tiger Reserve	Arunachalam et al.	Species
7. <i>Labeo filiferus</i>	Edakadathy	Plamoottil & Zupancic	Biosci. Discovery
8. <i>Macrognaathus albus</i>	Chenappady	Plamoottil & Abraham	Int. J. Pure Appl. Zool.
9. <i>Macrognaathus fasciatus</i>	Karuthavaddaserikkara	Plamoottil & Abraham	J. Exp. Zool. Ind.
10. <i>Mystus catapogon</i>	Mavelikkara	Plamoottil	J. Res. Biol.
11. <i>Mystus heoki</i>	Elankadu	Plamoottil & Abraham	Biosystematica
12. <i>Mystus indicus</i>	Kuttoor	Plamoottil & Abraham	Biosystematica
13. <i>Mystus keralai</i>	Chenappady	Plamoottil & Abraham	Int. J. Pure. Appl. Zool.
14. <i>Mystus menoni</i>	Elankadu	Plamoottil & Abraham	Int. J. Pure. Appl. Zool.
15. <i>Neolissochilus microphthalmos</i>	Ambayathode	Arunachalam et al.	Fish Taxa
16. <i>Olyra astrifera</i>	Kottangal	Arunachalam et al.	Int. J. Zool. Res
17. <i>Pristolepis pentacantha</i>	Bavali (Wayanad)	Plamoottil	Int. J. Sci. Res
18. <i>Pristolepis procerus</i>	Chaliyar	Plamoottil	Europ. J. Zool. Res.
19. <i>Puntius dolichopterus</i>	Kayamkulam	Plamoottil	Int. J. Pure. Appl. Zool
20. <i>Puntius nelsoni</i>	Kallumkal	Plamoottil	Int. J. Fauna. Biol. Stud
21. <i>Puntius euspilurus</i>	Mananthavady	Plamoottil	Int. J. Res. Stud. Biosci.
22. <i>Puntius kyphus</i>	Thiruvalla	Plamoottil	J. Exp. Zool. Ind.
23. <i>Puntius nigronotus</i>	Mananthavady	Plamoottil	J. Res Biol
24. <i>Puntius ocellus</i>	Kasargod	Plamoottil & Vineeth	Egypt. Acad. J. Biol. Sci
25. <i>Puntius viridis</i>	Kallumkal	Plamoottil & Abraham	J. Res. Biol
26. <i>Rasbora ataenia</i>	Alappuzha	Plamoottil	Int. J. Innov. Stud. Aq. Biol. Fish

There is also a second group, which includes 'names' that were published in 'predatory', open-access journals and subsequently synonymized. These are provided below.

Name/Year	Location	Author/s	Journal
1. <i>Horabagrus melanosome</i> Currently a synonym of <i>Horabagrus brachysoma</i> (see Ali et al. 2014)	West Venpala	Plamoottil & Abraham	Int. J. Pure. Appl. Zool.
2. <i>Systemus chryseus</i> Currently a synonym of <i>Systemus sarana</i> (see Sudasinghe et al. 2020)	Keezhvaipur	Plamoottil	Int. J. Fauna. Biol. Stud.
3. <i>Systemus rufus</i> Currently a synonym of <i>Systemus sarana</i> (see Sudasinghe et al. 2020)	Venpala	Plamoottil	Int. J. Fauna. Biol. Stud.
4. <i>Systemus laticeps</i> Currently a synonym of <i>Systemus sarana</i> (see Sudasinghe et al. 2020)	Thiruvalla	Plamoottil	Int. J. Fauna. Biol. Stud

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BUTTERFLIES



By

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Introduction

Butterflies are the most fascinating and easily recognizable group of Insects. They belong to the insect order Lepidoptera. It is one of the largest orders of Insecta that includes moths and butterflies. A total of 326 species of butterflies belonging to 168 genera are recorded from the geographical boundary of Kerala. All the six families known from India are represented in the region. The family Nymphalidae dominated with 97 species (in 47 genera) followed by Lycaenidae (94 in 56 genera), Hesperidae (82 in 46 genera), Pieridae (32 in 14 genera) Papilionidae (19 in 4 genera) and two species (in one genera) from the family Riodinidae.

All the 39 species (Table-1) of endemic butterflies

known from Western Ghats are reported from the state of Kerala. Among the endemics, Nilgiri Clouded Yellow *Colias nilgiriensis*, Red-disc Bushbrown *Telinga oculus*, Red-eye Bushbrown *Telinga adolphei*, Palni-Bushbrown *Telinga davisoni*, Nilgiri Fourring *Ypthima chenui* Palni Fourring *Ypthima ypthimoides*, Palni Sailer *Neptis palnica*, Nilgiri Fritillary *Argynnis hybrida*, Palni Fritillary *Argynnis castetsi*, Nilgiri Tiger *Parantica nilgiriensis*, Yellow Striped Hedge Hopper *Baracus subditus*, Sitala Ace *Thoressa sitala*, and Evershed's Ace *Thoressa evershedii* are restricted to the high altitude montane shola grassland ecosystems of the region. Most of the endemics are in narrow distributional ranges and confined to small areas within the mountain system

Table. 1: Endemic butterflies of Western Ghats reported from Kerala

Sl.No.	Scientific Name	Common Name	Family
1.	<i>Graphium teredon</i>	Narrow-banded Bluebottle	Papilionidae
2.	<i>Pachliopta pandiyana</i>	Malabar Rose	Papilionidae
3.	<i>Papilio liomedon</i>	Malabar Banded Swallowtail	Papilionidae
4.	<i>Papilio dravidarum</i>	Malabar Raven	Papilionidae
5.	<i>Papilio buddha</i>	Buddha Peacock	Papilionidae
6.	<i>Appias wardii</i>	Lesser Albatross	Pieridae
7.	<i>Colias nilgiriensis</i>	Nilgiri Clouded Yellow	Pieridae
8.	<i>Eurema nilgiriensis</i>	Nilgiri Grass Yellow	Pieridae
9.	<i>Parantirrhoea marshalli</i>	Travancore Evening Brown	Nymphalidae
10.	<i>Mycalesis igilia</i>	Small Longbrand Bushbrown	Nymphalidae
11.	<i>Telinga oculus</i>	Red-disc Bushbrown	Nymphalidae
12.	<i>Telinga davisoni</i>	Palni Bushbrown	Nymphalidae
13.	<i>Telinga adolphei</i>	Red-eye Bushbrown	Nymphalidae
14.	<i>Zipaetis saitisi</i>	Tamil Cat's Eye	Nymphalidae
15.	<i>Ypthima chenu</i>	Nilgiri Fourring	Nymphalidae
16.	<i>Ypthima ypthimoides</i>	Palni Fourring	Nymphalidae
17.	<i>Cethosia mahratta</i>	Tamil Lacewing	Nymphalidae
18.	<i>Neptis palnica</i>	Palni Dirty Sailer	Nymphalidae
19.	<i>Argynnis hybrida</i>	Nilgiri Fritillary	Nymphalidae
20.	<i>Argynnis castetsi</i>	Palni Fritillary	Nymphalidae
21.	<i>Parantica nilgiriensis</i>	Nilgiri Tiger	Nymphalidae
22.	<i>Idea malabarica</i>	Malabar Tree Nymph	Nymphalidae
23.	<i>Kallima horsfieldi</i>	Southern Blue Oakleaf	Nymphalidae
24.	<i>Celatoxia albidisca</i>	White disc Hedge Blue	Lycaenidae
25.	<i>Curetis siva</i>	Shiva Sunbeam	Lycaenidae
26.	<i>Arhopala alea</i>	Rosy or Kanara Oak Blue	Lycaenidae
27.	<i>Acytolepis lilacea</i>	Hampson's Hedge Blue	Lycaenidae
28.	<i>Celaenorrhinus fusca</i>	Tamil Spotted Flat	Hesperidae
29.	<i>Baracus hampsoni</i>	Hampson's Hedge Hopper	Hesperidae
30.	<i>Baracus subditus</i>	Yellow-striped Hedge Hopper	Hesperidae
31.	<i>Arnetta mercara</i>	Coorg Forest Hopper	Hesperidae
32.	<i>Thoressa sitala</i>	Sitala Ace	Hesperidae
33.	<i>Caltoris canaraica</i>	Kanara Swift	Hesperidae
34.	<i>Thoressa evershedii</i>	Evershed's Ace	Hesperidae
35.	<i>Sovia hyrtacus</i>	Bicolour Ace	Hesperidae
36.	<i>Thoressa honorei</i>	Madras Ace	Hesperidae
37.	<i>Thoressa astigmata</i>	Southern Spotted Ace	Hesperidae
38.	<i>Quedara basiflava</i>	Golden Tree Flitter	Hesperidae
39.	<i>Oriens concinna</i>	Tamil Dartlet	Hesperidae

Unlike other animal groups, no Indian butterfly species was assessed for IUCN Red List category till date. The assessment of 326 species of butterflies of Kerala was mainly based on the reliable published and unpublished information available during the assessment process. Due to the prevailing covid situation and the paucity of time we tried to shortlist the threatened butterflies of the State mainly by sharing our experience earned through many years in the field. Following criteria and methodology were also adopted for shortlisting the threatened butterflies of the area.

1. By considering the conservation status, taxonomic distinctiveness, rarity, endemism and the availability of the larval food plants or microhabitat preference of the butterflies

2. The population data available from the surveys conducted by Zoological Survey of India and the periodic surveys organized by NGOs throughout the State with the support of Kerala Forests & Wildlife Department during the last 20 years also considered.

3. Published records on butterflies of the State in various reports, books and journals.

4. Information from the Social media like WhatsApp, Facebook, Instagram, email discussion groups, etc.

5. Collection data available with the local museums of Zoological Survey of India, Western Ghat Regional Centre, Kozhikode, Kerala Forest Research Institute, Peechi, Govt. Museum, Thiruvananthapuram, etc.

6. Data accumulated and available in www.ifoundbutterflies.org, which compiles the data of spot records of butterflies uploaded from various parts of the country.

Considering the above criteria, a total of 49 species of butterflies are shortlisted in to various Threatened category of IUCN (Table-2). Of the 49 species, the Palni Sailer, *Neptis palnica* is proposed to the Critically Endangered category owing to its narrow geographical range, 7 species are Endangered, 23 are Vulnerable and 15 species are in the Near Threatened category. Of the 49 threatened butterfly species, 10 are from the family Hesperidae, 13 from Lycaenidae, 17 from Nymphalidae, 4 from Papilionidae and 5 represented the family.

THREATENED BUTTERFLIES OF KEALA SPECIES ACCOUNT

1. *Bibasis sena sena* (Moore, [1866]) - Orange-tailed Awl

NOT ASSESSED

Taxonomy:

Order: Lepidoptera
 Family: HesperIIDae
 Species: *Bibasis sena sena*(Moore, [1866])

Common Name: Orange-tailed Awl

Vernacular Name: Suvarna Aara
 സുവർണ്ണ ആര

Distribution:

Global: India, Southeast India
 India: Western Ghats, Western and Eastern sub-Himalayas

Kerala: Mainly distributed to northern part of Palakkad gap.

Habitat: Found mainly in the riparian patches, Evergreen forests and mixed forests at the foot of Ghats till about 600m

Conservation Status

WLPA: Schedule-II
 IUCN: Not Assessed
 CITES: Not Assessed



Photo © Dr Kalesh Sadasivan

Population Status in Kerala: Possibly declining,
Threats: *Hiptage bengalensis* its larval hostplant is a riparian shrub, loss of river edges anthropogenic causes and flash floods.

Conservation Measures: River bank conservation, prop-

agation of hostplant and planting along water courses.
Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.
Remarks: Schedule- II species. Population declining in Kerala and elsewhere in Western Ghats

2. *Aeromachus dubius dubius* Elwes & Edwards, 1897-Dingy Scrub Hopper

Taxonomy:

Family: HesperIIDae
 Species: *Aeromachus dubius dubius*
 Elwes & Edwards, 1897

Common Name: Dingy Scrub Hopper

Vernacular Name: Kaatu Pulchandan
 കാട്ടുപുൽച്ചാടൻ

Distribution:

Global: Western Ghats and Northeast India.
 India: Western Ghats, Western and Eastern sub-Himalayas
 Kerala: Western ghats north and south of Palghat gap
 Habitat: Primary & secondary wetGrasslands of high elevations (>900m)

Conservation Status

WLPA: Not listed
 IUCN: Not Assessed
 CITES: Not Assessed



Photo © Dr Kalesh Sadasivan

Population Status in Kerala: Stable
Threats: Ochlandra reed loss; Forest fires (natural, man-made, as a part of management practice) of primary grasslands.
Conservation Measures: Montane Shola Grassland conservation, relook at burning of grasslands; preven-

tion of forest fires and grassland
Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.
Remarks: Very local montane species; *A.dubius dubius* is reported from high altitude Shola grasslands of Anamalais and Palani Hills. Very patchy in distribution

3. *Baracus subditus* Moore, [1884]- Yellow Striped Hedgehopper

Taxonomy:

Family: HesperIIDae
 Species: *Baracus subditus* Moore, [1884]
 Common Name: Yellow Striped Hedgehopper
 Vernacular Name: Manja Varayan,
 മഞ്ചവാരയൻ

Distribution:

Global: India, in Western Ghats south of Palakkad gap
 India: Western Ghats only
 Kerala: Distributed north and south of Palghat gap, but mainly in Munnar High Range

Habitat:

Confined to primary Grasslands at edges of Temperate Montane sholas and (>1800m)

Conservation Status

WLPA: Not listed
 IUCN: Not Assessed
 CITES: Not Assessed



Photo © Dr Kalesh Sadasivan

Population Status in Kerala: Declining
Threats: Ochlandra reed loss; Forest fires (natural, man-made, as a part of management practice) of primary grasslands of Munnar and Periyar.

Conservation Measures: Montane Shola Grassland conservation, relook at burning of grasslands; preven-

tion of forest fires and grassland

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Strictly endemic to Western Ghats; Very local and rare. A montane shola- grassland species

4. *Thoressa evershedii* (Evans, 1910)- Evershed's Ace

Taxonomy:

Family: HesperIIDae
 Species: *Thoressa evershedii* (Evans, 1910)
 Common Name: Evershed's Ace
 Vernacular Name: Anamala Sharavegan
 അനമലശരവേഗൻ

Distribution:

Global: India, in Western Ghats south of Palakkad gap
 India: Western Ghats only
 Kerala: Distributed to south of Palakkad gap.
 Habitat: Confined to Ochlandra reed brakes, Sub-tropical evergreen and edges of Temperate Montane sholas (>1200m)

Conservation Status

WLPA: Not listed
 IUCN: Not Assessed
 CITES: Not Assessed



Photo © Dr Kalesh Sadasivan

Population Status in Kerala: Declining
Threats: Ochlandra reed loss; Forest fires (natural, man-made, as a part of management practice) of primary grasslands of Munnar and Periyar.

Conservation Measures: Montane Shola Grassland conservation, relook at burning of grasslands; preven-

tion of forest fires and grassland

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Strictly endemic to southern Western Ghats; Very Rare. A montane shola- grassland species

5. *Thoressa sitala* (de Nicéville, 1885) — Sitala Ace

Taxonomy:

Family:	Hesperiidae
Species:	<i>Thoressa sitala</i> (de Nicéville, 1885)
Common Name:	Sitala Ace
Vernacular Name:	Nilagiri Sharavaegan നീലഗിരിശരവേഗൻ

Distribution:

Global:	India, in Western Ghats south of Palakkad gap
India:	Western Ghats only
Kerala:	Distributed north and south of Palghat gap, but mainly in Munnar High Range

Habitat:

Confined to primary Grasslands at edges of Temperate Montane sholas and (>1800m)

Conservation Status

WLPA:	Not listed
IUCN:	Not Assessed
CITES:	Not Assessed

Photo © Jebin Jose



Population Status in Kerala: Declining
Threats: Ochlandra reed loss; Forest fires (natural, man-made, as a part of management practice) of primary grasslands.

Conservation Measures: Montane Shola Grassland conservation, relook at burning of grasslands; prevention of forest fires and grassland

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Very rare species, only few records north of Palghat gap. Narrow endemic. So far reported only from North of Palghat Gap up to Coorg. Reported from Kannur and Kozhikode districts in the State. Very rare. Depends mostly on Shola Grasslands.

6. *Zographetus ogygia ogygia* (Hewitson, [1866]) —Purple-spotted Flitter

Taxonomy:

Family:	Hesperiidae
Species:	<i>Zographetus ogygia ogygia</i> (Hewitson, [1866])
Common Name:	Purple-spotted Flitter
Vernacular Name:	Neela Marathullan നീലമരത്തുളളൻ

Distribution:

Global:	India, Southeast Asia
India:	Western Ghats, Western and Eastern sub-Himalayas
Kerala:	All districts confined to Evergreen forests and mixed forests
Habitat:	Found mainly in the Evergreen forests and mixed forests at the foot of Ghats till below 900m

Conservation Status

WLPA:	Not listed
IUCN:	Not Assessed
CITES:	Not Assessed

Photo © Dr Kalesh Sadasivan



Population Status in Kerala: Possibly declining.
Threats: Loss of primary West coast Tropical rain forests and secondary forests, cash crops like Rubber in midlands.

Conservation Measures: Protection of West coast

Tropical rain forests and secondary forests

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Very rare species. Rediscovered in 2013 from Aralam WLS

7. *Suastus minuta bipunctus* Swinhoe, 1894 — Small Palm Bob

Taxonomy:

Family:	Hesperiidae
Genus:	<i>Suastus</i>
Species:	<i>Suastus minuta bipunctus</i> Swinhoe, 1894
Common Name:	Sahyadri Small Palm Bob
Vernacular Name:	Kunhi kurumban കുഞ്ഞിക്കുറുമ്പൻ

Photo © Dr Kalesh Sadasivan



Distribution:

Global:	India, Southeast Asia
India:	Western Ghats, Northeast India, Southeast Asia
Kerala:	Throughout the state in wet primary jungles
Habitat:	Found mainly in the Cane brakes (Calamus), riparian patches, Evergreen forests and mixed forests at the foot of Ghats till about 1200m where Calamus sps– its larval hostplant grows

Conservation Status

WLPAs:	Not listed
IUCN:	Not Assessed
CITES:	Not Assessed

Population Status in Kerala: Declining

Threats: Loss of Cane brakes, extensive cane harvest (NTFP), and loss of rainforests due to anthropogenic factors.

Conservation Measures: Calamus (Cane) harvest to

be controlled, Cane propagation and planting

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Rare species, with very few records.

8. *Salanoemia sala* (Hewitson, [1866]) - Maculate Lancer

Taxonomy:

Family:	Hesperiidae
Species:	<i>Salanoemia sala</i> (Hewitson, [1866])
Common Name:	Maculate Lancer
Vernacular Name:	Chekavan ചേകവാൻ

Distribution:

Global:	India, Southeast Asia
India:	Western Ghats, Northeast India, Southeast Asia
Kerala:	Throughout the state in wet primary jungles
Habitat:	Found mainly in the Cane brakes, riparian patches, Evergreen forests and mixed forests at the foot of Ghats till about 1200m where Calamus sps– its larval hostplant grows

Conservation Status

WLPAs:	Not listed
IUCN:	Not Assessed
CITES:	Not Assessed

Population Status in Kerala: Possibly declining

Threats: Loss of Cane brakes, extensive cane harvest (NTFP), and loss of rainforests due to anthropogenic factors.

Conservation Measures: Calamus (Cane) harvest to

be controlled, Cane propagation and planting

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Rare species, with very few records.

Photo © Dr Kalesh Sadasivan



9. *Caltoris canaraica* Moore, [1884] - Kanara Swift

Taxonomy:

Family: Hesperidae
Species: *Caltoris canaraica* (Moore, [1884])
Common Name: Kanara Swift
Vernacular Name: Kanara Sharashalabham
കാനറാ ശരശലഭം



Distribution:

Global: Western Ghats of India and adjoining Deccan
India: Western Ghats, Western and Eastern sub-Himalayas
Kerala: Mainly distributed to northern part of Palakkad gap.
Habitat: Confined to Bamboo brakes and edges of Temperate Montane sholas (>600m)

Conservation Status

WLP: Not listed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Declining
Threats: Loss of bamboo forests and Ochlandra reed brakes; invasive species like Senna and Chromolaena in Wayanad exacerbated by man-made fires and degradation of habitat

Conservation Measure s: Bamboo propagation and planting, invasive species control
Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.
Remarks: Very few records from Kerala, Bamboo brakes of Wayanad has a good population

10. *Sarangesa purendra hopkinsi* Evans, 1921- Spotted Small Flat

Taxonomy:

Family: Hesperidae
Species: *Sarangesa purendra hopkinsi*
Evans, 1921
Common Name: Spotted Small Flat
Vernacular Name: Para parappan
പരാപരപ്പൻ



Distribution:

Global: India
India: Western Ghats, Western and Eastern sub-Himalayas
Kerala: Mainly distributed to northern part of Palghat gap.
Habitat: Confined to coastal laterite hills of northern Kerala

Conservation Status

WLP: Not listed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Rare, local and Declining
Threats: Anthropogenic factors, mining of coastal laterite hills of northern Kerala
Conservation Measures: Conservation of coastal

laterite hills
Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.
Remarks: Population in Kerala confined to coastal laterite hills needing immediate protection

11. *Acytolepis lilacea*, Hampson, 1889 - Hampsons Hedge Blue

Taxonomy:

Family:	Lycaenidae
Species:	<i>Acytolepis lilacea lilacea</i>
Common Name:	Hampsons Hedge Blue
Vernacular Name:	Kattu Velineeli

Distribution:

Global:	Indo-China and Srilanka
India:	Sub species Lilacea is endemic to South India. Recorded from Kerala and Tamilnadu.
Kerala:	Local populations reported from Parambikkulam Tiger Reserv (Palakkad), Neyyar, Agasthyamalais (Thiruvananthapuram), and Thrissur.
Habitat:	Found in forested areas of lower to moderate elevations up to 1000 m, if its larval host plant <i>Cycus circinalis</i> is found in abundance.

Conservation Status

WLPA:	Schedule-II
IUCN:	Not Assessed
CITES:	Not Assessed

Threats: Deforestation and threats to larval host plant, which is cut in large, for medicinal purposes, from unprotected areas.

Conservation Measures: Protection of Larval host plant, *Cycus circinalis* and strict enforcement of Indian Wildlife (Protection) Act.

Stakeholders: Kerala State Biodiversity Board, Kerala



State Forest and Wildlife Department.

Remarks: This species is very local and depends on the forests with a considerable population of *Cycus circinalis*. The pupae are infected with parasite wasps in large, and thus, this species has a key role in the life cycle of such wasps in the wild.

12. *Celatoxia albidisca*, Moore, 1884- White-disc Hedgeblue

Taxonomy:

Family:	Lycaenidae
Species:	<i>Celatoxia albidisca</i> Moore, 1884.
Common Name:	White-disc Hedge Blue
Vernacular Name:	Irulan Velineeli

Distribution:

Global:	India
India:	Endemic to the Western Ghats.
Kerala:	Mainly distributed to the southern part of Palakkad gap and to Nilgiris.
Habitat:	Found mostly in the edges of and openings within the typical Montane shoal forests of Western Ghats.

Conservation Status

WLPA:	Not Listed
IUCN:	Not Assessed
CITES:	Not Assessed

Population Status in Kerala: Declining

Threats: Deforestation and increasing human invasion into the unprotected montane grasslands and forested areas.

Conservation Measures: Protection of Montane grasslands and Sholas. Protection of unprotected and

ecologically vulnerable montane habitats.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: This species is endemic to Western Ghats and one among the two species of its genus, distributed in India. A species depends on a fragile ecosystem.



13. *Arhopala alea*, Hewitson, 1862 - Kanara Oakblue

Taxonomy:

Family: Lycaenidae
Species: *Arhopala alea*, Hewitson, 1862
Common Name: Kanara Oakblue
Vernacular Name: Rosy Thalirneeli

Distribution:

Global: India
India: Endemic to the Western Ghats.
Recorded from Kerala, Karnataka and Goa states.

Kerala: Recorded from Aralam WLS ,(Kannur district),
Silent valleyNP, (Palakkad),Shendurney WLS (Kollam district),
Peppara WLS,(Thiruvananthapuram district),Kakkad (Kozhikode district),
Nadukani (Malappuram district).

Habitat: A species depends mainly on the riparian ecosystem of lower to mid elevation forests.

Conservation Status

WLPA: Schedule I
IUCN: Not Assessed
CITES: Not Assessed



Population Status in Kerala: Declining

Threats: Deforestation and threats to the riparian ecosystem in unprotected habitats.

Conservation Measures: Protection of riverine forests and strict enforcement of Wildlife (Protection) Act.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: This species is endemic to Western ghats and its larval host plants belongs to the riverine forests. An uncommon and seasonal species depending on a fragile ecosystem.

14. *Rapala lankana*, Moore, 1879 - Malabar Flash

Taxonomy:

Family: Lycaenidae
Species: *Rapala lankana*, Moore, 1879.
Common Name: Malabar Flash
Vernacular Name: Malabar minnan

Distribution:

Global: India, Sri Lanka
India: Recorded from Kerala,
,
Tamilnadu and Karnataka states.

Kerala: Recorded from Kannur,Kozhikode,Malappuram,Ernakulam
and Thiruvananthapuram districts.

Habitat: A species of lower to moderate elevation dense forests and occasionally seen in adjacent areas.

Conservation Status

WLPA: Not Listed
IUCN: Not Assessed
CITES: Not Assessed



Population Status in Kerala: Declining

Threats: Deforestation and threats to the riparian ecosystem in unprotected habitats.

Conservation Measures: Protection of unprotected forested areas

Stakeholders: Kerala State Biodiversity Board, Kerala

State Forest and Wildlife Department.

Remarks: This species is endemic to Western ghats and its early stages have strong association with Red ants (*Oecophylla smaragdina*) and this association is found inevitable for the survival of this species in the wild. A rare species

15. *Prosotas noreia*, R.Felder, 1868- White-tipped Lineblue

Taxonomy

Family: Lycaenidae
Species: *Prosotas noreia hampsoni*,
R.Felder, 1868

Common Name: White-tipped Lineblue
Vernacular Name: Vellivarayan Neeli

Distribution:

Global: South Asia, Java.
India: South India, NE India, Odisha,
Madhya Pradesh

Kerala: Recorded from Kannur, Kozhikode and Wayanad districts.

Habitat: A species of lower to moderate elevation forests and scrub jungles of plains.

Conservation Status

WLPA: Schedule. I
IUCN: Not Assessed
CITES: Not Assessed



Population Status in Kerala: Declining

Threats: Deforestation and threats to the scrubs due to human indulgence.

Conservation Measures: Protection of unprotected scrub jungles in open lands. Strict enforcement of

Indian Wildlife (Protection) Act.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: This species is rare in Kerala, and its early stages and larval host plant are yet to be recorded.

16. *Lonolyce helicon*, C.Felder, 1860 - Pointed Lineblue

Taxonomy

Family: Lycaenidae
Species: *Lonolyce helicon viola*, C.Felder, 1860
Common Name: Pointed Lineblue

Vernacular Name: Muna varayan Neeli

Distribution:

Global: Indo-Malayan Realm.
India: Western Ghats, NE India.

Kerala: Mainly recorded from Kannur, Kozhikode, Malappuram, Idukki and Wayanad districts.

Habitat: A species of lower to moderate elevation forests up to 1000m. Often seen puddling on the banks of forest streams. Rare in Kerala

Conservation Status

WLPA: Schedule. II
IUCN: Not Assessed
CITES: Not Assessed



Population Status in Kerala: Declining

Threats: Deforestation and threats to the forest streams and the related riparian eco system.

Conservation Measures: Protection of forest streams and riverine forests. Strict enforcement of Indian Wildlife (Protection) Act.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: This species is rare in Kerala with a few records, and its early stages and larval host plant are yet to be recorded from the state. Its affinity towards forest streams is often observed

17. *Spindasis abnormis*, Moore, 1883- Abnormal Silverline

Taxonomy

Family: Lycaenidae
Genus: *Spindasis*, Wallengren, 1857.
Species: *Spindasis abnormis*, Moore, 1883
Common Name: Abnormal Silverline
Vernacular Name: Apurva Vellivarayan

Distribution:

Global: Indo-Malayan Realm.
India: Western Ghats (Kerala, Maharashtra)
Kerala: One and only confirmed record from Brahmagiris, Wayanad
Habitat: A species of lower to moderate elevation forests up to 1500m and also in plains.

Conservation Status

WLPA: Not Listed
IUCN: Not Assessed
CITES: Not Assessed



Population Status in Kerala: Not Assessed

Threats: Deforestation and threats to evergreen shola forests.

Conservation Measures: Has to systematically assess the population of this very rare species in the state and to conserve such habitats.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: This species is very rare in Kerala with a single record, and rare elsewhere. Its habitat preference and ecology has yet to be studied from the state.

18. *Horaga viola*, Moore, 1882 - Brown Onyx

Taxonomy

Family: Lycaenidae.
Species: *Horaga viola*, Moore, 1882
Common Name: Brown Onyx
Vernacular Name: Kattu Gomedakam

Distribution:

Global: Indo-Malayan Realm.
India: Western Ghats (Kerala, Karnataka), NE India, Himachal Pradesh, Uttarakhand.
Kerala: So far multiple records from, Kannapuram, Kannur district only.

Habitat:

Inhabits low land dense forests. In Kerala Midland laterite ecosystem may be another habitat.

Conservation Status

WLPA: Schedule II
IUCN: Not Assessed
CITES: Not Assessed



Population Status in Kerala: Not Assessed

Threats: Deforestation and threats to un protected low land forests and laterite hills.

Conservation Measures: Has to systematically assess the population of this very rare species in the state and to conserve such habitats. Strict enforcement of Indian Wildlife (Protection) Act.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: This species is very rare in Kerala with multiple records from a single spot since 2014. Its habitat preference, early stages and ecology have yet to be studied from the state.

19. *Hypolycaena nilgirica*, Moore, 1883- Nilgiri Tit

Taxonomy

Family: Lycaenidae
Species: *Hypolycaena nilgirica*, Moore, 1883.
Common Name: Nilgiri Tit
Vernacular Name: Neelagiri Neeli

Distribution:

Global: India, Srilanka
India: Western Ghats (Kerala,Tamilnadu).
Kerala: Multiple records from, Chinnar WLS, Idukki district only.
Habitat: Inhabits low land evergreen as well as deciduous forests.
Populations very local.Active at forest openings,and open stream banks.

Conservation Status

WLPA: Schedule II
IUCN: Not Assessed
CITES: Not Assessed



Population Status in Kerala: Declining

Threats: Deforestation and human intervention as tourists in its habitats.

Conservation Measures: Has to systematically assess the population of this very rare species in the state ,discovering further hot spots of this species and conserve them.Since the larvae feed mostly on orchids, conservaton of such vuinerable micro habi-

tats is also crucial. Strict enforcement of Indian Wildlife (Protection) Act.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: This species very rare in Kerala with multiple records from a single place since 2015. Its habitat preference, early stages and flight periods etc, have yet to be studied from the state.

20. *Creon cleobis*, Godart, 1824- Broad-tail Royal

Taxonomy

Family: Lycaenidae
Species: *Creon cleobis cleobis*, Godart, 1824.
Common Name: Broad-tail Royal.
Vernacular Name: Valan Neelambari.

Distribution:

Global: South Asia
India: Western Ghats(Goa southwards), NE India,Himachal Pradesh.
Kerala: Recorded from, Kannur, Wayanad,Idukki and Thiruvananthapuramdistricts.
Habitat:Inhabits lower to moderate elevation dense forests up to 2000m.

Conservation Status

WLPA: Not Listed
IUCN: Not Assessed
CITES: Not Assessed



Population Status in Kerala: Declining

Threats: Deforestation and human intervention in unprotected foot hills of Western Ghats in the form of tourism, mining and constructions. In Kerala this species has been recorded from the foot hills in Kannur and Wayanad districts apart from the records from protected forests.Since the larvae feed on Loranthus sp., felling of trees on the foot hills cause serious threat to its survival.

Conservation Measures: The foot hills of Western Ghats are to be protected.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: This species is rare in Kerala with a few records from four districts.In Kerala its presence is found from foot hills to shola forests up to 1600m, that too very seasonal.

21. *Tajuria maculates*, Hewitson, 1865- Spotted Royal

Taxonomy

Family:	Lycaenidae
Species:	<i>Tajuria maculates</i> , Hewitson, 1865
Common Name:	Spotted Royal
Vernacular Name:	Pottu Vellambari.

Distribution:

Global:	Asia
India:	Western Ghats(Karnataka southwards),NE India.
Kerala:	Recorded from, Kannur, Kozhikode, Palakkad, Idukki and Thiruvananthapuram districts.
Habitat:	Mostly Inhabits dense forests and hills with heavy rainfall at lower to high elevation dense forests up to 1800m.

Conservation Status

WLPAs:	Schedule II
IUCN:	Not Assessed
CITES:	Not Assessed

Population Status in Kerala: Declining

Threats: Deforestation and human intervention at the foot hills of Western Ghats, due to mining, Tourism, and constructions.

Conservation Measures: The foot hills of Western Ghats are to be protected. Strict enforcement of Indian Wildlife (Protection) Act.

Stakeholders: Kerala State Biodiversity Board, Kerala

State Forest and Wildlife Department.

Remarks: This species is very rare in Kerala with a few records from five districts. In Kerala its presence is found from unprotected hills as well as protected forests. Mostly this species is an inhabitant of hills with dense tree cover and the protection of this habitat is crucial for its survival. Ecology of this species in Western Ghats is yet to be well studied.



22. *Tajuria melastigma*, de Niceville, 1887- Branded Royal

Taxonomy

Family:	Lycaenidae
Species:	<i>Tajuria melastigma</i> , de Niceville, 1887.
Common Name:	Branded Royal
Vernacular Name:	Varayan Neelambari.

Distribution:

Global:	Indomalayan Realm
India:	Western Ghats, NE India.
Kerala:	Recorded from Wayanad, Palakkad, and Idukki districts.
Habitat:	Mostly Inhabits dense forests and hills with heavy rainfall at lower to moderate elevation dense forests.

Conservation Status

WLPAs:	Schedule II
IUCN:	Not Assessed
CITES:	Not Assessed

Population Status in Kerala: Not assessed

Threats: Deforestation and human intervention in unprotected forested hills.

Conservation Measures: Unprotected, well wooded hills of Western Ghats are to be safeguarded. Strict enforcement of Indian Wildlife (Protection) Act.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: This species is very rare in Kerala with a few records from three districts. In Kerala its presence is found from hills of dense forests. Mostly this species is an inhabitant of hills with dense tree cover and the protection of this habitat is crucial for its survival. Flight season of this species in Western Ghats is yet to be well studied.



23. *Ancema sudica*, Evans, 1926.- Silver Royal

Taxonomy

Family: Lycaenidae
Species: *Ancema sudica* Evans, 1926.
Common Name: Silver Royal
Vernacular Name: Rajathambari

Distribution:

Global: Indomalayan Realm
India: Endemic to Western Ghats .
Kerala: Recorded from, Kannur, Kozhikode and Wayanad, districts.
Habitat: Mostly Inhabits forests at lower to moderate elevation.

Conservation Status

WLP: Not Listed
IUCN: Not Assessed
CITES: Not Assessed



Population Status in Kerala: Declining

Threats: Deforestation and human intervention in unprotected forested hills.

Conservation Measures: Unprotected, well wooded hills of Western Ghats are to be safeguarded.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: This species is endemic to Western ghats and very rare in Kerala with a few records from three districts. In Kerala its presence was recorded from wild life sanctuaries and adjacent habitats. Protection of low land evergreen forests is a must for the survival of this rare butterfly.

24. *Idea malabarica* (Moore, 1877)- Malabar Tree Nymph

Taxonomy:

Family: Nymphalidae
Species: *Idea malabarica* (Moore, 1877)
Common Name: Malabar Tree Nymph
Vernacular Name: Vanadevata

Distribution:

Global: India
India: Endemic to Western Ghats south of Maharashtra Recorded from Kerala, Tamil Nadu, Karnataka, Goa and Maharashtra States.
Kerala: Patchy in distribution.
Habitat: The species is distributed to the evergreen patches of Western Ghats. Mainly seen in forest clearings and above the forest canopy.

Conservation Status

WLP: Not listed
IUCN: Not Assessed
CITES: Not Assessed



Population Status in Kerala: Locally declining

Threats: As it's a monophagous butterfly known to feed only the plant – *Thottea siliquosa*, the survival of the species is depend on the low land evergreen forest patches, which is already under threat from habitat degradation.

Conservation Measures: There should be check on human activities posing any further threat in its range

of occurrence. Efforts should be made to raise this butterfly through ranching and captive breeding.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Larval Food Plants: *Aganosma cymosa* (Palavarikody), *Parsonsia albofavesces* (Malath-eelatha) (Family: Apocynaceae)

25. *Parantica nilgiriensis* (Moore, 1877) - Nilgiri Tiger

Taxonomy:

Family:	Nymphalidae
Species:	<i>Parantica nilgiriensis</i> (Moore, 1877)
Common Name:	Nilgiri Tiger
Alternate Name:	None
Vernacular Name:	Nilgiri Kaduva

Distribution:

Global:	India
India:	Endemic to Southern Western Ghats south of Karnataka Recorded from Kerala, Karnataka and Tamil Nadu States.
Kerala:	Recorded from Higher reaches of Western Ghats, especially in higher reaches of Agasthayamalais, Periyar Tiger reserve, Silent Valley, Karimpuzha WLS, Wayanad WLS, Aralam WLS.
Habitat:	Mostly distributed to the shola grassland ecosystem or montane tropica evergreen ecosystems in Western Ghats.

Conservation Status

WLPA:	Not listed
IUCN:	Not Assessed
CITES:	Not Assessed



Population Status in Kerala: Locally declining

Threats: Degradation of montane shola or evergreen forest ecosystem due to forest fire, and the spread of invasive or exotic plant species.

Conservation Measures: There should be check on human activities posing any further threat in its range of occurrence. Efforts should be made to raise his

butterfly through ranching and captive breeding.

Stakeholders: Kerala State Forest and Wildlife Department.

Remarks: A rare butterfly of the region. Known larval food plant of the species are *Tylophora indica* and *T. flexuosa*

26. *Argynnis castetsi* Oberthür, 1891- Palni Fritillary

Taxonomy:

Family:	Nymphalidae
Species:	<i>Argynnis castetsi</i> Oberthür, 1891
Common Name:	Nilgiri Fritillary
Vernacular Name:	Palani Cholatheyyan

Distribution:

Global:	India
India:	Endemic to Southern Western Ghats south of Palakkad gap Recorded from Kerala and Tamil Nadu States.
Kerala:	Distributed to the higher reaches of Eravikulam NP, Pambadumshola NP, Anaimudishola NP, Mathikettan shola NP and Kurinjimala Sanctuary in Idukki district.
Habitat:	Inhabits high land montane shola grassland ecosystem of southern Western Ghats.

Conservation Status

WLPA:	Not listed
IUCN:	Not Assessed
CITES:	Not Assessed



Population Status in Kerala: Locally declining

Threats: As it's a monophagous butterfly known to feed only the plant – *Thottea siliquosa*, the survival of the species is depend on the low land evergreen forest patches, which is already under threat from habitat degradation.

Conservation Measures: There should be check on

human activities posing any further threat in its range of occurrence. Efforts should be made to raise this butterfly through ranching and captive breeding. Stakeholders: Kerala State Forest and Wildlife Department.

Remarks: Earlier treated as the subspecies of *Argynnis hyperbius* (Linnaeus, 1763).

27. *Argynnis hybrida* Evans, 1912- Nilgiri Fritillary

Taxonomy:

Family:	Nymphalidae
Species:	<i>Argynnis hybrida</i> Evans, 1912
Common Name:	Nilgiri Fritillary
Vernacular Name:	Nilgiri Cholatheyyan

Distribution:

Global:	India
India:	Endemic to Southern Western Ghats north of Palakkad gap in Kerala and Tamil Nadu states

Kerala: North of Palakkad gap mainly in the higher reaches of Silent Valley National Park and Karimpuzha WLS

Habitat: Inhabits montane shola grassland ecosystem of southern Western Ghats

Conservation Status

WLPA:	Not listed
IUCN:	Not Assessed
CITES:	Not Assessed



Population Status in Kerala: Locally declining

Threats: Since it's a narrow endemic species and found in the high altitude montane shola grassland ecosystem, the degradation of this pristine mountains largely affected the species, Forest fire, extension of plantations in grasslands are the major threats.

Conservation Measures: The species should be enlisted in the Schedules of Indian Wildlife Protection

Act. Atmost case should be taken to understand the habitat requirement of this narrow endemic species from the endangered mountain ecosystem of Nilgiris. Stakeholders: Kerala State Forest and Wildlife Department.

Remarks: The taxonomy of the species is not clear. Earlier, treated as a subspecies of *Argynnis hyperbius* (Linnaeus, 1763).

28. *Neptis palnica* Eliot, 1969 Creamy Sailer

Taxonomy:

Family:	Nymphalidae
Species:	<i>Neptis palnica</i> Eliot, 1969
Common Name:	Palni Sailer
Vernacular Name:	Palani Ponthachutan പളനി പൊന്തച്ചുറ്റൻ

Distribution:

Global:	India (Western Ghats south of Palghat Gap)
India:	Endemic to Southern Western Ghats south of Palghat Gap
Kerala:	Distributed to Southern part of Palakkad gap Recorded from Pambadumchola N.P. Munnar, Idukki district. Kerala

Habitat: Sub-tropical evergreen and Temperate Montane sholas (>1200m)

Conservation Status:

WLPA:	Schedule-II (Part-II)
IUCN:	Not Assessed
CITES:	Not Assessed



Population Status in Kerala: Not assessed

Threats: Forest fires (natural, man-made, as a part of management practice) Sub-tropical evergreen and Temperate Montane sholas

Conservation Measures: Very rare. Reported only

from Idukki district.

Strict enforcement of Indian Wildlife (Protection) Act.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Very rare in Kerala

29. *Amathusia phidippus friderici* Fruhstorfer, 1904-Palmking

Taxonomy:

Family: Nymphalidae
Species: *Amathusia phidippus*
(Linnaeus, 1763
Common Name: Palmking
Vernacular Name: Olarajan
ഒലാജ രാജൻ



Distribution:

Global: India, Southeast Asia
India: Western Ghats(Kerala) and Andamans
Kerala: Records solely from Trivandrum, Kollam and Pattanamthitta Districts
Habitats: Human habitations, Primary evergreen, Cane brakes and plantations

Conservation Status:

WLPA: Not Listed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Not assessed

Threats: Habitat loss, Cane harvest (Calamus being a larval host)

Conservation Measures: Calamus (Cane) harvest to

be controlled, Cane propagation and planting

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Very rare in Kerala

30. *Parantirrhoea marshalli* Wood-Mason, 1881- Travancore Evening Brown

Taxonomy:

Family: Nymphalidae
Species: *Parantirrhoea marshalli*
Wood-Mason, [1881]
Common Name: Travancore Evening Brown
Vernacular Name: Eetasalabham ഇടാശാലഭം



Distribution:

Global: India (Western Ghats south of Agumbe)
India: Western Ghats (Kerala, Tamil Nadu and Karnataka)
Kerala: Very local and confined to evergreen forests, Myristica swamps and dense Ochlandra vegetation. Lower Periyar Valley (Edamalayar, Pooyamkutti), Kulathupuzha and Palode reserve forests.

Habitats:

Confined to Ochlandra reed brakes, primary evergreen forests, subtropical evergreen and Myristica swamps with Ochlandra reed. From foothills to 1000 metres.

Conservation Status

WLPA: Sch.II
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Not assessed

Threats: Ochlandra (Eeta) harvest for paper mills and as NTFP, loss of habitat, most of the Ochlandra patches in low land are only Reserve forests with respect to legal status.

Conservation Measures: Ochlandra propagation

and planting, Habitat conservation by incorporation of Ochlandra habitats under Protected areas network.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Narrow endemic.

31. *Mycalesis igilia* Fruhstorfer, 1911-Sahyadri Small Long-brand Bushbrown

Taxonomy:

Family: Nymphalidae
Species: *Mycalesis igilia* Fruhstorfer, 1911
Common Name: Small Longbrand Bushbrown
Verna Vernacular Name: Thavitan തവീടൻ



Distribution:

Global : India
India : Western Ghats(Kerala,Tamil Nadu and Karnataka)
Kerala : Confined to moist deciduous forests, and bamboos brakes of WG north of Palghat gap in Nilgiri— Coorg stretch
Habitats: Rare and narrow endemic. Confined to moist deciduous forests and bamboos brakes of low to moderate elevations. Locally common in the Bamboo jungles of Nilgiris, Coorg, and Wayanad

Conservation Status :

WLPA:
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Declining

Threats: Loss of bamboo forests; invasive species like Senna and Chromolaena in Wayanad exacerbated by man-made fires and degradation of habitat

Conservation Measures: Bamboo propagation and

planting, invasive species control

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Endemic to WG

32. *Mycalesis orcha* Evans, 1912 - Pale-brand Bushbrown

Taxonomy:

Family: Nymphalidae
Species: *Mycalesis orcha* Evans, 1912
Common Name: Pale-brand Bushbrown
Vernacular Name: Varayan Thavitan വരയൻ തവീടൻ



Distribution:

Global : India
India : Western Ghats (Kerala, Tamil Nadu and Karnataka)
Kerala : Endemic to Southern Western Ghats below Palghat Gap.
Habitat : Narrow Endemic. Prefer dense jungles and grasslands at moderate elevations.

Conservation Status :

WLPA: Not Listed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Confined to Ochlandra reed brakes, grasslands at edges of Sub-tropical evergreen and edges of Temperate Montane sholas

Threats: Forest fires (natural, man-made, as a part of management practice) of primary grasslands of Pambikukam Munnar and Periyar.

Conservation Measures: Grassland conservation, relook at burning of grasslands; prevention of forest fires and grassland

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

33. *Telinga adolphei* (Guérin-Méneville, 1843) -Red-eye Bushbrown

Taxonomy:

Family: Nymphalidae
 Species: *Telinga adolphei*
 (Guérin-Méneville, 1843)
 Common Name: Red-eye Bushbrown
 Vernacular Name : ചെങ്കണ്ണൻ തവീടൻ



Distribution:

Global: India
 India: Western Ghats (Kerala, Tamil Nadu and Karnataka)
 Kerala: Confined to Montane shola forests and grasslands (>1200m) north of Palghat gap.

Habitat :

Sub-tropical evergreen and edges of Temperate Montane sholas (>1200m)
 Conservation Status :
 WLPA: Not listed
 IUCN: Not Assessed
 CITES: Not Assessed

Population Status in Kerala: Declining in population.

Threats: Forest fires (natural, man-made, as a part of management practice) of primary grasslands of Munnar and Periyar.

Conservation measures : Montane Shola Grassland

conservation, relook at burning of grasslands; prevention of forest fires and grassland

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department

Remarks: Montane species Rare and Narrow endemic to WG

34. *Telinga davisoni* (Moore, [1891] - Palni Bushbrown

Taxonomy:

Family: Nymphalidae
 Species: *Telinga davisoni* (Moore, [1891])
 Common Name: Palni Bushbrown
 Vernacular Name: പാണി തവീടൻ



Distribution:

Global: India
 India: Western Ghats (Kerala and Tamil Nadu)
 Kerala: Narrow endemic. Confined to the forests of high elevation in Eastern Anamalais and Palni hills.

Habitat: Confined to primary Grasslands at edges of Temperate Montane sholas and (>1800m) of Munnar (Kurinjimala, Chinnar, Marayur, Pampadumshola and Anamudi shola)

Conservation status:

WLPA: Not Listed
 IUCN: Not Assessed
 CITES: Not Assessed

Population Status in Kerala: Not assessed

Threats: Forest fires (natural, man-made, as a part of management practice) of primary grasslands of Munnar

Conservation measures : Montane Shola Grassland

conservation, relook at burning of grasslands; prevention of forest fires and grassland

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Rare and narrow endemic to WG

35. *Telinga oculus* (Marshall, 1881) -Red-disc Bushbrown

Taxonomy:

Family: Nymphalidae
Species: *Telinga oculus* (Marshall, 1881)
Common Name: Red-disc Bushbrown
Vernacular Name: Theekkannan
തീക്കണ്ണൻ



Distribution:

Global: India
India: Western Ghats south of Palghat Gap (Kerala and Tamil Nadu)
Kerala: Reported from Munnar high ranges, Periyar, Palnis and Agasthyamalais
Habitat: Sub-tropical evergreen and edges of Temperate Montane sholas (>900m)

Conservation status:

WLP: Not Listed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Not assessed

Threats: Forest fires (natural, man-made, as a part of management practice) of primary grasslands of Munnar

Conservation measures: Montane Shola Grassland conservation, relook at burning of grasslands; preven-

tion of forest fires and grassland

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Rare and Endemic to WG Narrow endemic south of Palghat Gap

36. *Ypthima chenu* (Guérin-Méneville, 1843)- Nilgiri Fourring

Taxonomy:

Family: Nymphalidae
Species: *Ypthima chenu*
(Guérin-Méneville, 1843)
Common Name: Nilgiri Four-ring
Vernacular Name: Neelagiri Naalkanni
നീലഗിരി നാൽകണ്ണി



Distribution:

Global: India
India: Endemic to Nilgiris & Anamalais. Prefer high elevation rocky grasslands. Rare..
Habitat: Confined to the Montane grasslands of Western Ghats

Conservation Status

WLP: Not Assessed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Need monitoring

Threats: Most of the habitats are protected areas, No immediate threat.

Conservation Measures: Stakeholders: Kerala State

Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Need population assessment.

37. *Ypthima singala* R. Felder, 1868- Sinhalese Five-ring

Taxonomy:

Family: Nymphalidae
Species: *Ypthima singala* R. Felder, 1868
Common Name: Sinhalese Five-ring
Vernacular Name: Chinnar Panchanethri
ചിന്നാർ പഞ്ചനേത്രി



Distribution:

Global: India
India: Reported only from Chinnar WLS in Kerala. Other records are from Coimbatore and Sathyamangalam regions in TN. Also known from Sri Lanka. Rare..
Habitat: Dry Deciduous forests and thorny scrub forests

Conservation Status

WLPA: Not Assessed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Need monitoring

Threats: Most of the habitats are protected areas, No immediate threat.

Conservation Measures: Stakeholders: Kerala State

Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Need population assessment.

38. *Ypthima striata* Hampson, [1889] -Striated Five-ring

Taxonomy:

Family: Nymphalidae
Species: *Ypthima striata* Hampson, [1889]
Common Name: Striated Five-ring
Vernacular Name: Rathna Panchanethri
രത്ന പഞ്ചനേത്രി



Distribution:

Global: India
India: Records from Agasthyamalai hills and Anamalais. Other records from Tamil Nadu, Karnataka and also Andhra Pradesh (Eastern ghats). Endemic to South India.
Habitat: Confined to the Montane grasslands of Western Ghats and Eastern Ghats.

Conservation Status

WLPA: Not Listed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Need monitoring

Threats: Most of the habitats are protected areas, No immediate threat.

Conservation Measures: Stakeholders: Kerala State

Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Need population assessment.

39 *Ypthima ypthimoides* (Moore, 1881)- Palni Four-ring

Taxonomy:

Family: Nymphalidae
Species: *Ypthima ypthimoides* (Moore, 1881)
Common Name: Palni Four-ring
Vernacular Name: Palani naalkanni
പളനി നീലക്കണ്ണി



Distribution:

Global: India
India: Tamil Nadu and Kerala. Narrow endemic (Anamalais, Palni hills & Agasthyamalai hills). Found in small colonies and prefer rocky grasslands at high elevation..

Habitat:

Confined to the Montane grasslands of Western Ghats in the states of Kerala and Tamil Nadu, at high elevations

Conservation Status

WLPA: Not Listed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Need monitoring

Threats: Most of the habitats are protected areas, No immediate threat.

Conservation Measures:

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Need population assessment.

40. *Ypthima tabella* (Marshall, 1883)- Baby Five-ring

Taxonomy:

Family: Nymphalidae
Species: *Ypthima tabella* (Marshall, 1883)
Common Name: Baby Five-ring
Vernacular Name: Cheru panchanethri
ചെറു പഞ്ചനേത്രി



Distribution:

Global: India
India: Maharashtra, Karnataka, Kerala, Tamil Nadu.
Habitat: Only a few colonies reported from Mangaladevi of Periyar Tiger Reserve in Kerala. Another report from Meghamalais and from MH. In Kerala, confined to Montane Grasslands..

Conservation Status

WLPA: Not Listed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Need monitoring

Threats: Most of the habitats are protected areas, No immediate threat.

Stakeholders: Kerala State Biodiversity Board, Kerala

State Forest and Wildlife Department.

Remarks: Need population assessment.

41. *Papilio buddha* Westwood, 1872 - Buddha Peacock

Taxonomy:

Family: Papilionidae
Species: *Papilio buddha* Westwood, 1872
Common Name: Buddha Peacock
Vernacular Name: Buddha Mayoore
ബുദ്ധമയൂരി



Distribution:

Global: India
India: Endemic to the Western Ghats south of Maharashtra. Recorded from Kerala, Karnataka, Goa and Maharashtra States.
Kerala: Mainly distributed to northern part of Palakkad gap. Flight period is from July to December or January.
Habitat: Found mainly in the midland laterite hillocks and the foothills of Western Ghats, where its larval food plant Indian Prickly Ash Tree (*Zanthoxylum rhetsa*) grown. Also distributed to the sacred groves of northern Kerala.

Conservation Status

WLPA: Schedule-II (Part-II)
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Declining

Threats: This iconic and charismatic butterfly faces serious threat of losing its habitat in Kerala. Deforestation in midland laterite hills causes threats to the survival of its only known larval food plant, *Zanthoxylum rhetsa*. A most sought-after species in illegal trade.

Conservation Measures: Protection of midland later-

ite hillocks and the habitats of *Zanthoxylum rhetsa* tree. Strict enforcement of Indian Wildlife (Protection) Act.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: The species is designated as State Butterfly of Kerala in 2018 by the Government of Kerala.

42. *Papilio liomedon* Moore, 1875- Malabar banded Swallowtail

Taxonomy:

Family: Papilionidae
Species: *Papilio liomedon* Moore, 1875
Common Name: Buddha Peacock
Vernacular Name: Pulli Vaalan
പുല്ലിവാലൻ



Distribution:

Global: India
India: Endemic to Southern Western Ghats south of Goa. Recorded from Kerala, Karnataka, Goa and Tamil Nadu States.
Kerala: Fairly common. Found during wet season from June to November or December.
Habitat: Mainly distributed to the forested tracts of the Western Ghats or well wooded midland laterite hillocks or plains of Kerala.

Conservation Status

WLPA: Schedule-I (Part-IV)
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Declining

Threats: Even though a prolific breeder, the mortality mainly due to parasitic attack on early stages is very high in the species. A few individuals survive after the parasitic attack. Habitat degradation, the pressure on the larval foodplants and the changes in the rainfall pattern also affected the population of this rare butterfly.

Conservation Measures: There should be check on

human activities posing any further threat in its range of occurrence. Efforts should be made to raise this butterfly through ranching and captive breeding.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: One of the rarest Papilionids in the region. Known larval foodplants of the species are *Acronychia pedunculata* (Mootta naari), *Melicope lunu-ankenda* (Kaattu Rubber or Kanala) (Family: Rutaceae)

43. *Pachliopta pandiyana* (Moore, 1881)- Malabar Rose

Taxonomy:

Family: Papilionidae
Species: *Pachliopta pandiyana* (Moore, 1881)
Common Name: Malabar Rose
Vernacular Name: Malabar Rose

Distribution:

Global: India
India: Endemic to Southern Western Ghats south of Goa.
Recorded from Kerala, Karnataka, Goa and Tamil Nadu States.
Kerala: Locally common.
Habitat: Mostly distributed to the evergreen patches of Western Ghats or well wooded areas where the larval food plant *Thottea siliquosa* grown.

Conservation Status

WLPA: Not listed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Locally declining

Threats: As it's a monophagous butterfly known to feed only the plant – *Thottea siliquosa*, the survival of the species is depend on the low land evergreen forest patches, which is already under threat from habitat degradation.

Conservation Measures: There should be check on human activities posing any further threat in its range of occurrence. Efforts should be made to raise this butterfly through ranching and captive breeding.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: A rare butterfly of the region.



44. *Papilio dravidarum* Woodmason, 1881- Malabar Raven

Taxonomy:

Family: Papilionidae
Species: *Papilio dravidarum*
Woodmason, 1881
Common Name: Malabar Raven
Vernacular Name: Pullikaruppan

Distribution:

Global: India
India: Endemic to the Western Ghats south of Maharashtra.
Recorded from Kerala, Tamil Nadu, Karnataka, Goa and Maharashtra States.
Kerala: Widely distributed all along the State
Habitat: Found mainly in the forested tracts of Western Ghats, rarely to the country well-wooded country side and sacred groves in midland laterite hillocks of northern Kerala

Conservation Status

WLPA: Not Listed
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Possibly Declining

Threats: Dweeding and removal of herbs and shrubs from the countryside is major threat to its larval food plants. Indiscriminate use of herbicides also detrimental to the population.

Conservation Measures: Totally ban the usage of

herbicides in the villages and the protection of low land evergreen forests.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Known larval food plants from Kerala are *Clausena heptaphylla* and *Glycosmis pentaphylla*



45. *Eurema nilgiriensis* (Yata, 1990)-Nilgiri Grass Yellow

Taxonomy:

Family:	Pieridae
Species:	<i>Eurema nilgiriensis</i> (Yata, 1990)
Common Name:	Nilgiri Grass Yellow
Vernacular Name:	Neelagiri paappaaththi നീലഗിരി പാപ്പാത്തി



Distribution:

Global:	India.
India:	Endemic to the Western Ghats south of Maharashtra. Recorded from Kerala, TamilNadu, Karnataka, Goa, Maharashtra.
Kerala:	Throughout Kerala.
Habitat:	A widespread low to midland endemic. Inhabits dense. evergreen riparian forests. Only one host plant for larvae, recorded, ie <i>Ventilago bombaiensis</i> .

Conservation Status

WLPAs:	Not Listed.
IUCN:	Not Assessed.
CITES:	Not Assessed.

Population Status in Kerala: Possibly declining.

Threats: The Endemic uncommon butterfly is mostly seen near mid-elevation riparian habitats in Kerala. Deforestation of the habitats are a threat to its only known larval food plant, *Ventilago bombaiensis*.

Conservation Measures: Protection of midland streams and its host plant *Ventilago bombaie*. Popularising conservation importance.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife. Department.

46. *Eurema andersonii* (Moore,1886)- One Spot Grass Yellow

Taxonomy:

Family:	Pieridae
Species:	<i>Eurema andersonii</i> (Moore,1886)
Common Name:	One Spot Grass Yellow
Vernacular Name:	Chola paappaathi ചോല പാപ്പാത്തി



Distribution:

Global:	India, Other countries in Southeast Asia.
India:	<i>Eurema andersonii</i> has three subspecies in India. (1) <i>Eurema andersonii shimai</i> Yata & Gaonkar, 1999 Endemic to Western Ghats. (2) <i>Eurema andersonii jordani</i> Corbet & Pendlebury, 1932 North India and Northeast India. (3) <i>Eurema andersonii evansi</i> Corbet & Pendlebury, 1932 Andamans.
Kerala:	Subspecies <i>Eurema andersonii shimai</i> Yata & Gaonkar, 1999 is very rare in Kerala.
Habitat:	Reports from Marayur and Chinnar only.

Conservation Status

WLPAs:	Not in any schedule.
IUCN:	Not Assessed.
CITES:	Not Assessed.

Population Status in Kerala: Very rare.

Threats: Though rare, Most of the habitats are in protected areas. Deforestation of the surrounding areas is a threat to the population.

Conservation Measures: Protection of the host-plants *Zanthoxylum rhetsa* and *Ventilago maderaspa-*

tana.

(Rhamnaceae) and its habitat are required.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Need population and distribution assessment

47. *Appias lalage* (Doubleday, 1842)- Spotted Puffin

Taxonomy:

Family: Pieridae
Species: *Appias lalage* (Doubleday, 1842)
Common Name: Spotted Puffin
Vernacular Name: പുളളി പഫിൻ



Distribution:

Global: India, Indochina and Hainan.
India: North India, Northeast India and Kerala.
Kerala: Known only from Idukki, Palakkad, Pathanamthitta & Trivandrum districts.
Habitat: Reported from higher elevations.

Conservation Status

WLP: Not Listed
IUCN: Not Assessed.
CITES: Not Assessed.

Population Status in Kerala: Possibly declining

Threats: Deforestation in its habitat.

Conservation Measures:

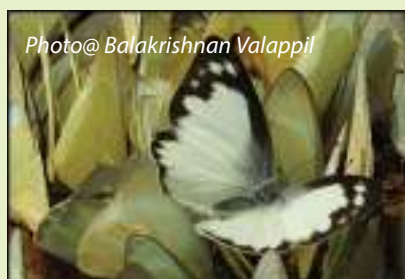
Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Need population monitoring.

48. *Appias wardii* (Moore, [1884])- Lesser Albatross

Taxonomy:

Family: Pieridae
Species: *Appias wardii* (Moore, [1884])
Common Name: Lesser Albatross
Vernacular Name: പുളളി ആൽബാട്രോസ്



Distribution:

Global: India
India: Rare endemic. Sympatric with *A. albina* (Common Albatross). Data deficient due to difficulty in differentiating from female *A. albina*. Reported from Karnataka, Kerala, and Tamil Nadu.
Kerala: Seen throughout Kerala along with Common Albatross at mid-elevations and above.
Habitat: Found mainly in the midland laterite hillocks and the foothills of the Western Ghats, where its larval food plant Indian Prickly Ash Tree (*Zanthoxylum rhetsa*) grown. Also distributed to the sacred groves of northern Kerala.

Conservation Status

WLP: Schedule II
IUCN: Not Assessed
CITES: Not Assessed

Population Status in Kerala: Need Assessment

Threats: Deforestation in its habitat.

Conservation Measures: Protection of habitat.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Endemic to the Western Ghats.

49. *Colias nilagiriensis* (C. & R. Felder, (1859) -Nilgiri Clouded Yellow

Taxonomy:

Family:	Pieridae
Species:	<i>Colias nilagiriensis</i> (C. & R. Felder, (1859)
Common Name:	Nilgiri Clouded yellow
Vernacular Name:	Peethambaran ചീതാഞ്ചരൻ



Distribution:

Global:	India
India:	Narrow endemic to the Sothern Western Ghats Recorded from Kerala, and Tamil Nadu (Nilgiris, Palni Hills, and Anamalais) States.
Kerala:	Malappuram, Palakkad, Idukki districts.
Habitat:	Confined to the Montane grasslands of Western Ghats in the states of Kerala and Tamil Nadu, at high elevations where its larval food plant <i>Parochetus communis</i> Indian and <i>Trifolium repens</i> are grown.

Conservation Status

WLPAs:	Not Listed
IUCN:	Not Assessed
CITES:	Not Assessed

Population Status in Kerala: Need monitoring

Threats: Most of the habitats are protected areas, No immediate threat.

Stakeholders: Kerala State Biodiversity Board, Kerala State Forest and Wildlife Department.

Remarks: Need population assessment.

Conservation of Butterflies

The important butterfly habitats of the state have been facing lot of threats in the recent period. The original pristine habitats are cleared for the construction of dams, roads and railway lines. The extensive agricultural activities, indiscriminate use of pesticides and agrochemicals, monoculture plantations, mining, forest fire and pollution further deteriorated the natural habitats of the state. The climate change, illegal trade in butterflies, the spread of invasive species, clearing of road side flora in the name of beautification and the unplanned tourism activities also contributed to the decline of certain population of butterflies in the region.

Among The insets, butterflies have been a major element in the illegal trade in the past. In Kerala, some of the beautiful species such as Peacocks (*Papilio* spp) were largely collected during the British period. Small quantities of butterflies are still collected for global trade. There were reports of butterflies and beetles confiscated by forest or custom officials from Kerala.

In recent years, considerable attention has been given by the government in the conservation of butterflies. In 2018, Kerala Government designated Buddha Peacock *Papilio buddha* as the state butterfly for the state.

The Indian Wildlife Protection Act, 1972 was the first

step towards the conservation of insects as it included "Butterflies and moths" without reference to any particular species. The Act was amended in 1980 and included a large number of species/subspecies of butterflies under three Schedules. Accordingly, 128 species of butterflies were included in the Schedule- I, 307 species in Schedule- II and 19 in Schedule -IV of the Act. Among the Scheduled list of Kerala butterflies, species such as the Crimson Rose (*Pachliopta hector*), Malabar Banded Swallowtail (*Papilio liomedon*), Orchid Tit (*Hypolycaena othona*), White-tipped Lineblue (*Prosoptas noreia*), Blue Nawab (*Eriboea schreiberi*) and the Danaid Eggfly (*Hypolimnna misippus*) are listed in the Schedule-I of the Act; 32 species are listed in the Schedule –II (and 11 species categorized in to the Schedule-IV of the Act. But, many of the rare and endemic butterflies of the country have not been included in the scheduled list.

Of the 326 species recorded from Kerala, species such as the Crimson Rose (*Pachliopta hector*), Malabar Banded Swallowtail (*Papilio liomedon*), Orchid Tit (*Hypolycaena othona*), White-tipped Lineblue (*Prosoptas noreia*), Blue Nawab (*Eriboea schreiberi*) and the Danaid Eggfly (*Hypolimnna misippus*) are listed in the Schedule-I of the Indian Wildlife (Protection) Act of 1972. 32 species are listed in the Schedule –II (Table-3) and 11 species (Table-4) categorized in to the Schedule-IV of the Act.

Table- 3: Butterflies listed in Schedule-II of Indian Wildlife (Protection) Act of 1972

S.No	Species	Family
1.	Paris Peacock <i>Papilio paris</i> (Linnaeus, 1758)	Papilionidae
2.	Malabar Banded Peacock/ Buddha Peacock <i>Papilio buddha</i> (Westwood, 1872)	Papilionidae
3.	Lesser Gull <i>Cepora nadina</i> (Lucas, 1852)	Pieridae
4.	Striped Albatross <i>Appias libythea</i> (Fabricius, 1775)	Pieridae
5.	Plain Puffin <i>Appias indra</i> (Moore, 1858)	Pieridae
6.	Southern Duffer/ Sahyadri Blue Banded Duffer <i>Discophora lepida</i> (Moore, 1858)	Nymphalidae
7.	Great Evening Brown <i>Melanitis zitenius</i> (Herbst, 1796)	Nymphalidae
8.	Travancore Evening Brown <i>Parantirrhoea marshalli</i> Wood-Mason, 1881	Nymphalidae
9.	White-bar Bushbrown <i>Mycalesis anaxias</i> (Hewitson, 1862)	Nymphalidae
10.	Small Leopard <i>Phalanta alcippe</i> (Stoll, 1782)	Nymphalidae
11.	Clear Sailer <i>Neptis nata</i> (Moore, 1858)	Nymphalidae
12.	Clipper <i>Parthenos sylvia</i> (Cramer, 1775)	Nymphalidae
13.	Grey Count <i>Tanaecia lepidea</i> (Butler, 1868)	Nymphalidae
14.	Black-vein Sergeant <i>Athyma ranga</i> (Moore, 1858)	Nymphalidae
15.	Painted Courtesan <i>Euripus consimilis</i> (Westwood, 1851)	Nymphalidae
16.	Blue Oakleaf <i>Kallima horsfieldii</i> (Kollar, 1844)	Nymphalidae
17.	King Crow <i>Euploea klugii</i> (Moore, 1858)	Nymphalidae
18.	Gram Blue <i>Euchrysops cnejus</i> (Fabricius, 1798)	Lycaenidae
19.	Hampson's Hedge Blue/ Lilac Hedge Blue <i>Acytolepis lilacea</i> (Hampson, 1889)	Lycaenidae
20.	Pea Blue <i>Lampides boeticus</i> (Linnaeus, 1767)	Lycaenidae
21.	Pointed Lineblue <i>Ionolyce helicon</i> (C & R Felder, 1860)	Lycaenidae
22.	Scarce Shot Silverline <i>Spindasis elima</i> (Moore, 1877)	Lycaenidae
23.	Long-banded Silverline <i>Spindasis lohita</i> (Horsfield, 1829)	Lycaenidae
24.	Silver -streaked Acacia Blue <i>Zinaspas todara</i> (Moore, 1884)	Lycaenidae
25.	Many-tailed Oakblue <i>Thaduka multicaudata</i> (Moore, 1879)	Lycaenidae
26.	Tamil or Dusted Oakblue <i>Arhopala bazaloides</i> (Hewitson, 1878)	Lycaenidae
27.	Peacock Royal <i>Tajuria cippus</i> (Fabricius, 1798)	Lycaenidae
28.	Banded Royal <i>Rachana jalindra</i> (Horsfield, 1829)	Lycaenidae
29.	White Tufted Royal <i>Pratapa deva</i> (Moore, 1858)	Lycaenidae
30.	Branded Royal <i>Tajuria melastigma</i> de Niceville, 1887	Lycaenidae
31.	Common Onyx <i>Horaga onyx</i> (Moore, 1858)	Lycaenidae
32.	Indigo Flash <i>Rapala varuna</i> (Horsfield, 1829)	Lycaenidae

Table-4: Butterflies listed in Schedule-IV of Indian Wildlife (Protection) Act of 1972

S.No	Species	Family
1.	Painted Sawtooth <i>Prioneris sita</i> (C&R Felder, 1865)	Pieridae
2.	Striped Albatross <i>Appias libythea</i> (Fabricius, 1775)	Pieridae
3.	Gaudy Baron <i>Euthalia lubentina</i> (Cramer, 1777)	Nymphalidae
4.	Red Spot Duke <i>Dophla evelina</i> (Stoll, 1790)	Nymphalidae
5.	Dark Pierrot <i>Tarucus ananda</i> (de Niceville, 1884)	Lycaenidae
6.	Plain Banded Awl <i>Hasora vitta</i> (Butler, 1870)	Hesperiidae
7.	Paint Brush Swift/ Complete Paint Brush Swift <i>Baoris farri</i> (Moore, 1878)	Hesperiidae
8.	Contiguous Swift <i>Polytremis lubricans</i> (Herrich-Schaffer, 1869)	Hesperiidae
9.	Madras Ace/ Sahyadri Orange Ace <i>Thoressa honorei</i> (de Niceville, 1887)	Hesperiidae
10.	Tree Flitter <i>Hyarotis adrastus</i> (Stoll, 1780)	Hesperiidae
11.	Tamil Dartlet/ Sahyadri Dartlet <i>Oriens concinna</i> (Edwards, 1897)	Hesperiidae

Unfortunately, many of the endemic species or species which are in illegal trade not being listed in any of the schedules of the Indian Wildlife (Protection) Act of 1972. Hence, we are proposing following five species vulnerable to illegal trade to include in the Section- 38 under Biological Diversity Act of 2002 (Table-5).

Table-5: Butterfly species prioritised for Section 38 of Biological Diversity Act

Sl. No	Scientific Name	Common Name	Family	Justification
1	<i>Troides minos</i> (Cramer, [1779])	Southern Birdwing	Papilionidae	Showy attractive butterfly. Largest butterfly in India.
2	<i>Papilio crino</i> Fabricius, 1793	Common Banded Peacock	Papilionidae	One of the beautiful butterfly species in the region. Reported from very few localities in Kerala. A popular species in illegal trade
3	<i>Papilio helenus</i> Linnaeus, 1758	Red Helen	Papilionidae	One of the largest butterflies in the region. Reported in the illegal trade
4	<i>Cethosia mahratta</i> Moore, 1872	Tamil Lacewing	Nymphalidae	A rare and beautiful endemic species of the Western Ghats. Rarely reported in the illegal trade
5	<i>Idea malabarica</i> (Moore, 1877)	Malabar Tree Nymph	Nymphalidae	A rare endemic species of the Western Ghats. Reported from the illegal trade



Troides minos (Cramer, [1779])



Papilio crino Fabricius, 1793



Papilio helenus Linnaeus, 1758



Cethosia mahratta Moore, 1872



Idea malabarica (Moore, 1877)

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DRAGON FLIES AND DAMSEL FLIES



Chlorogomphus xanthoptera

Introduction

Order Odonata, commonly known as dragonflies and damselflies, are aquatic insects associated with freshwater wetlands and surrounding landscape. The larvae are aquatic and the adults are terrestrial. Their evolutionary history dates back to Permian (250 million years BP) era, making them one of the oldest insect orders.

Globally 6308 species in 685 genera of odonates are known. In India, 504 species and subspecies in 153 genera and 17 families are known (Subramanian and Babu, 2020; Kalkman et al., 2020; Subramanian and Babu unpublished data). In the Western Ghats 201 species are reported of which 174 species are known to occur in Kerala. High diversity is found in hill streams, and forested riverine habitats and most of the endemic species are restricted to this habitat. Habitats like ponds, lakes, coastal marshes, irrigation canals and paddy fields have common and wide spread species. In Kerala, the hill streams of Wayanad, Nilgiris, Anamalais, Cardamom Hills and Agasthyamalai are rich in endemic species (Subramanian, 2007; Subramanian et al., 2018). The families such as Gomphidae, Platystictidae and genera such as *Macromia* (Macromiidae) and *Idionyx* (Genera Incertae sedis) are rich in endemic species.

Odonates utilize both running and standing waters for breeding and foraging. They complete their lifecycle in freshwater habitats and only a few species can tolerate brackish waters. They are highly specific to particular aquatic habitat, and this specificity makes them an ideal insect model to monitor freshwater ecosystems health and study

diverse questions in ecology, evolutionary biology and biogeography.

Ecological Significance

Odonates are important invertebrate predators of wetlands and surrounding terrestrial landscapes. In their larval and adult stages, they prey upon a variety of invertebrates including several species of insect pests and disease vectors such as mosquitoes. They are highly specific to their breeding and foraging habitat and very sensitive to changes in habitat. Being an apex invertebrate predator in wetlands, they are good indicators of wetland health. Several species of odonata inhabiting in human dominated landscapes such as paddy fields, plantations, agroecosystems, rural and urban habitations are important biocontrol agents of agricultural pests and disease vectors.

Odonata Diversity of Kerala

The odonate diversity of Kerala is relatively well documented when compared to other Indian states. Currently 174 species are recorded from the state. High diversity and endemism are reported from the streams and rivers of the Western Ghats region. However recent discoveries of new species such as *Platylestes kiranai* Emiliyamma, palot and Charesh, 2020 from the coastal wetlands highlight the importance of these threatened habitats which lie outside the protected area network and are fast disappearing due to agricultural expansion and urbanization.

Threatened Odonata of Kerala

As per International Union for Conservation of Nature (IUCN) assessment nine species are

listed under threatened list. Among them one species is endangered, four are Near Threatened and four are Vulnerable (IUCN, 2021, Subramanian et al., 2011). This assessment is ten years old and need to be updated with current data on distribution and threats. With this objective, based on current published information and field studies the threat assessment of odonates of Kerala is carried out.

Assessment Methodology

The current assessment of threatened odonates of Kerala was carried out based on published IUCN threat assessment (IUCN, 2021; Subramanian et al., 2011), literature and field work carried out by the authors in different parts of the state. The georeferenced data from the Atlas of Odonata of the Western Ghats (Subramanian et al., 2018) was updated to identify geographic regions for high diversity and conservation prioritization. Online expert consultation was also carried out as part of this exercise to prioritize the species.

Results

Odonata diversity is not uniformly distributed in the state. High diversity is reported from streams and rivers flowing through evergreen forests of the Western Ghats. Here 160 species are reported compared to moist deciduous and coastal zone where 115 and 120 species are reported respectively (Map-01). Across river basins, high diversity is reported from Kabani, Chaliyar, Chalakudi, Periyar and Pamba. These river basins have more than 75 species (Map-2).

A total of 38 species were prioritized for threat assessment from a total of 174 odonate species reported from Kerala by consid-

ering the criteria of endemism, rarity, IUCN Red List status and microhabitat specificity.

Based on this assessment species are divided into (1) species recommended under Section 38 of BD Act (2002) for conservation action (2) high conservation priority species (3) species with conservation concern. Two

species of damselflies *Calocypha laidlawi* and *Disparoneura apicalis* are recommended for listing under Section 38 of BD Act. The global population of *D. apicalis* is currently known to occur only in Kuruva islands of Wayanad and *C. laidlawi* is reported from few localities in the mid altitude forest wetlands of southern Kerala. The habitat of both the

species are high threatened and require immediate conservation action. Species under high threat (Table-2) and conservation concern (Table-3) also require conservation attention. However, more data is required to assess the conservation status of species under these two categories.



Calocypha laidlawi



Phylloneura westermanni

Table-2: Species Recommended for listing under Section 38 of BD Act (2002) for conservation action

SI No	Family	Species	Justification
1	Chlorocyphidae	<i>Calocypha laidlawi</i> (Fraser, 1924)	Endemic to the Southern Western Ghats, recorded only from Kerala and Karnataka till date. Mostly restricted to Myristica swamps and associated streams. IUCN Red List Status: .
2	Platycnemididae	<i>Disparoneura apicalis</i> (Fraser, 1924)	Endemic to riparian habitats in the Western Ghats, reported only from Kodagu in Karnataka and Kuruva Islands, Wayanad, Kerala till date. IUCN Red List Status: Data Deficient.

Table-3: High Priority Threatened Species

Sl No	Family	Species	Justification
1	Chlorogomphidae	<i>Chlorogomphus xanthoptera</i> (Fraser, 1919)	Endemic to the Western Ghats, found only in high altitude forests south of the Palghat Gap. IUCN Red List Status: Vulnerable.
2	<i>Genera Incertae Sedis</i>	<i>Idionyx galeata</i> Fraser, 1924	Endemic to the Western Ghats, known only from Wayanad, Nilgiris and Kodagu till date. Occurs only in high altitude forests, breeding in hill streams. IUCN Red List Status: Endangered.
3	Gomphidae	<i>Davidioides martini</i> Fraser, 1924	Endemic to the Southern Western Ghats, recorded only from a few locations in Kerala till date. Breeds only in montane forest streams. IUCN Red List Status: Data Deficient
4	Gomphidae	<i>Megalogomphus superbus</i> Fraser, 1931	Endemic to the Southern Western Ghats, very few records in recent times. Breeds only in forested hill streams that are perennial. IUCN Red List Status: Data Deficient
5	Lestidae	<i>Platylestes kirani</i> Emiliyamma, Jafer & Charesh 2020	Restricted to wetlands in the plains of west coast of India. Described only in 2020 based on specimens from Kannur. Other records are from Thrissur district and Maharashtra. All records outside the Protected Area network. IUCN Red List Status: Not Assessed.
6	Libellulidae	<i>Lyriothemis acigastra</i> (Selys, 1878)	Distribution and ecology unclear, first reported from Kerala in 2013 only. Occurs as colonies, very patchily distributed in Kerala. Other records are from Assam and West Bengal. Highly seasonal with very short flight season (June to August). IUCN Red List Status: Data Deficient
7	Libellulidae	<i>Lyriothemis flava</i> Oguma, 1915	Shows high microhabitat specificity, breeding only in phytotelmata (water collected in tree holes) in evergreen and semi-evergreen forests. First report from Kerala was from Silent Valley National Park in 2013. Very few records thereafter. Other records are from Assam, West Bengal and some other Asian countries like China, Bangladesh, Japan and Myanmar. IUCN Red List Status: Least Concern
8	Platycnemididae	<i>Caconeura gomphoides</i> (Rambur, 1842)	Endemic to the Western Ghats. Till date, known only from high altitude peat bogs and grassy uplands in the Nilgiri landscape. IUCN Red List Status: Data Deficient
9	Platycnemididae	<i>Melanoneura bilineata</i> Fraser, 1922	Endemic to the Southern Western Ghats. Restricted to hill streams with good forest cover. IUCN Red List Status: Near Threatened. IUCN Red List Status:
10	Platycnemididae	<i>Phylloneura westermanni</i> (Selys, 1860)	Endemic to the Southern Western Ghats. Seen mostly in Myristica swamps and associated streams. IUCN Red List Status: Near Threatened.
11	Platystictidae	<i>Indosticta deccanensis</i> (Laidlaw, 1915)	Endemic to the Western Ghats, found only in slow-flowing streams with dense vegetation in southern Western Ghats. IUCN Red List Status: Vulnerable.
12	Platystictidae	<i>Protosticta monticola</i> Emiliyamma & Palot, 2016	Endemic to the Southern Western Ghats. Low dispersal ability. Discovered only in 2016. Known only from a few locations in Anamalai Hills, Idukki. Occurs only in Shola forests above 1600 metres. IUCN Red List Status: Not Assessed
13	Platystictidae	<i>Protosticta sholai</i> Subramanian & Babu 2020	Endemic to the Southern Western Ghats. Low dispersal ability. Discovered only in 2020. Known only from a few locations in Periyar Tiger Reserve and adjacent areas of Tamil Nadu. Occurs only in Shola forests above 1500 metres. IUCN Red List Status: Not Assessed



Melaneura bilineata



Megalogramphus superbus

Table 4: Species of Conservation Concern

SI No	Family	Species	Justification
1	<i>Genera Incertae Sedis</i>	<i>Idionyx minima</i> Fraser, 1931	Endemic to the Western Ghats, very rare, recorded only from a few high-altitude forest sites in Kerala. IUCN Red List Status: Data Deficient
2	<i>Genera Incertae Sedis</i>	<i>Idionyx travancorensis</i> Fraser, 1931	Endemic to the Southern Western Ghats, recorded only from Kerala and Tamil Nadu till date. Breeds in high altitude mountain streams. IUCN Red List Status: Data Deficient
3	Gomphidae	<i>Acrogomphus fraseri</i> Laidlaw, 1925	Endemic to the Southern Western Ghats. Till date, recorded only from the Agasthyamalai landscape. Breeds only in montane perennial streams. IUCN Red List Status: Data Deficient
4	Gomphidae	<i>Chlorogomphus campioni</i> (Fraser, 1924)	Endemic to the Western Ghats, recorded only from high altitude hill streams in the Nilgiri landscape. IUCN Red List Status: Least Concern
5	Gomphidae	<i>Cyclogomphus flavoannulatus</i> Rangnekar et al 2019	Endemic to the Western Ghats, recently discovered and known to occur in few places in Kerala and Goa. IUCN Red List Status: Not Assessed
6	Gomphidae	<i>Cyclogomphus heterostylus</i> Selys, 1854	Endemic to the Western Ghats, rare and seasonal. Breeds in marshlands along rivers and lakes, mostly in unprotected areas. IUCN Red List Status: Data Deficient
7	Gomphidae	<i>Heliogomphus promelas</i> (Selys, 1873)	Endemic to forested areas of Western Ghats and found in unpolluted streams. IUCN Red List Status: Near Threatened
8	Gomphidae	<i>Megalogramphus hanningtoni</i> (Fraser, 1923)	Endemic to the Western Ghats, rare and restricted to hill streams. IUCN Red List Status: Near Threatened
9	Gomphidae	<i>Melligomphus acinaces</i> (Laidlaw, 1922)	Endemic to the Western Ghats, rare and restricted to hill streams. IUCN Red List Status: Data Deficient
10	Gomphidae	<i>Nychogomphus striatus</i> (Fraser, 1924)	Endemic to the Western Ghats, rare and restricted to hill streams. IUCN Red List Status: Data Deficient
11	Lestidae	<i>Indolestes pulcherrimus</i> Fraser, 1924	Endemic to the Western Ghats, recorded only from Coorg in Karnataka, Masinagudi in Tamil Nadu and recently, from Wayanad Wildlife Sanctuary in Kerala. Breeds in submontane marshes and ponds. IUCN Red List Status: Data Deficient
12	Libellulidae	<i>Epithemis mariae</i> (Laidlaw, 1915)	Endemic to the Western Ghats, found in marshes associated with hill streams. IUCN Red List Status: Least Concern
13	Macromidae	<i>Macromia annaimalaiensis</i> Fraser, 1931	Endemic to the Southern Western Ghats. Recorded only from forested hill streams south of the Palghat Gap. Very few recent records. IUCN Red List Status: Not Assessed

14	Macromidae	<i>Macromia bellicosa</i> Fraser, 1924	Endemic to the Southern Western Ghats. Breeds only in submontane streams. Recorded only from Kerala and Tamil Nadu till date. IUCN Red List Status: Least Concern
15	Macromidae	<i>Macromia irata</i> Fraser, 1924	Endemic to the Western Ghats. Recorded only from Kerala and Karnataka till date. Breeds in hill streams. IUCN Red List Status: Least Concern
16	Platycnemididae	<i>Elatoneura souteri</i> (Fraser, 1924)	A rare endemic species restricted to southern Western Ghats. IUCN Red List Status: Data Deficient
17	Platycnemididae	<i>Esme longistyla</i> Fraser, 1931	Endemic to the Western Ghats and closely associated with hill streams. IUCN Red List Status: Least Concern
18	Platycnemididae	<i>Esme cyaneovittata</i> Fraser, 1922	Endemic to the Western Ghats and found in undisturbed hill streams. IUCN Red List Status: Data Deficient
19	Platystictidae	<i>Protosticta antelopoides</i> Fraser, 1931	Endemic to the Western Ghats. The species is currently known to occur only in Kozhikode and Wayanad districts. IUCN Red List Status:
20	Platystictidae	<i>Protosticta mortoni</i> Fraser, 1924	Endemic to the Western Ghats. The species is currently known to occur only from very few localities. IUCN Red List Status: Data Deficient
21	Platystictidae	<i>Protosticta ponmudiensis</i> Kiran, Kalesh & Kunte, 2015	Endemic to the Western Ghats. The species is currently known to occur only from Ponmudi hills. IUCN Red List Status: Data Deficient
22	Platystictidae	<i>Protosticta rufostigma</i> Kimmins, 1958	Endemic to the Western Ghats. The species was recently rediscovered and is currently known to occur only from few localities. IUCN Red List Status: Data Deficient

Recommendations for Conservation

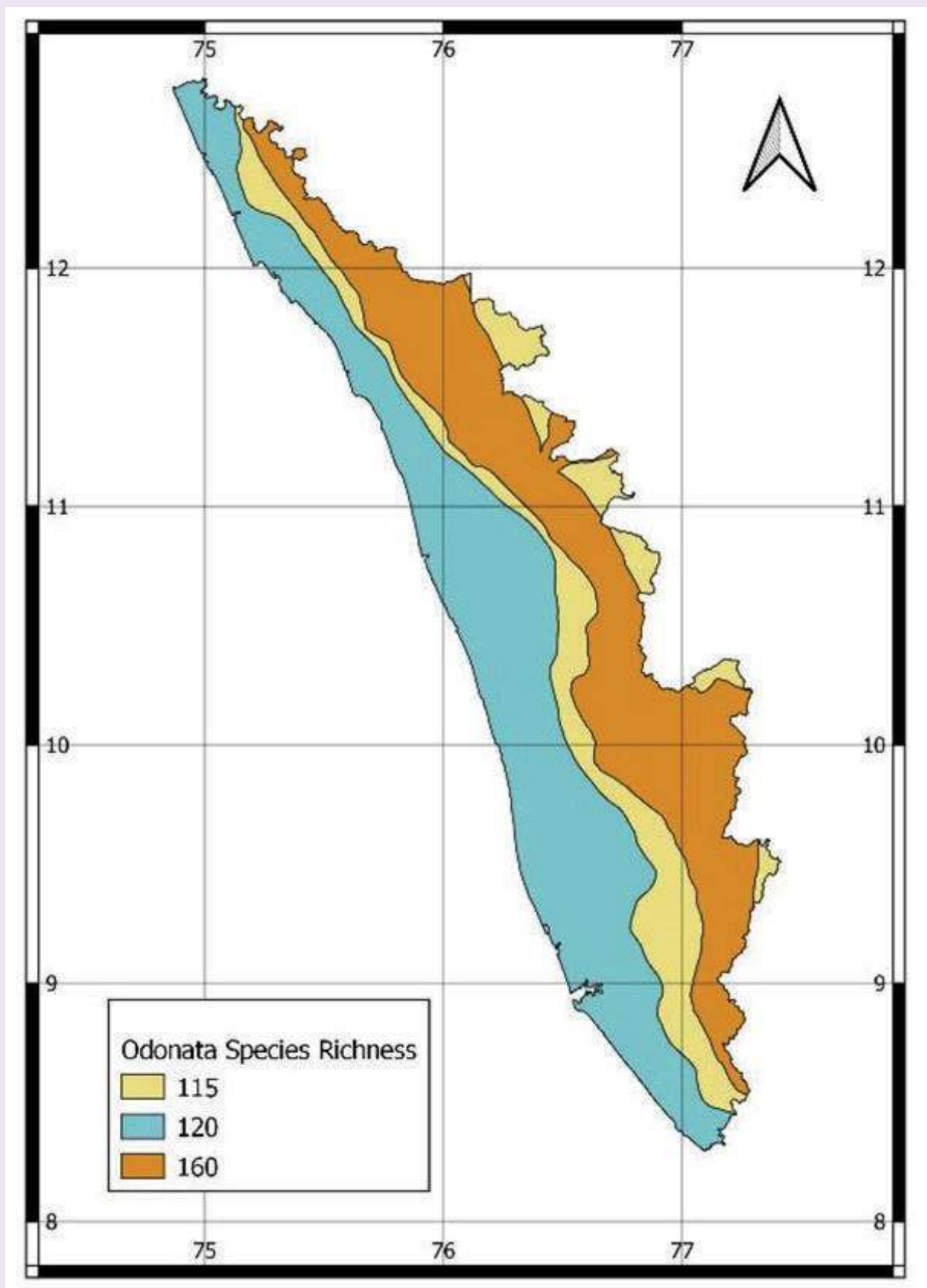
Based on rapid threat assessment of odonates of Kerala following recommendations are provided.

1. Populations of species outside protected areas face several anthropogenic threats such as habitat destruction, habitat alteration, pesticide pollution.
2. Through People's Biodiversity Register, important wetlands at panchayat level need to be identified and mapped for conservation of odonates and their wetland habitats.
3. Long term monitoring of threatened odonates through citizens science programmes may be initiated.
4. Biology and ecology of threatened odonates of Kerala may be studied in collaboration with colleges, universities and research organizations.
5. Incorporate odonate studies in wetland conservation and monitoring programmes.

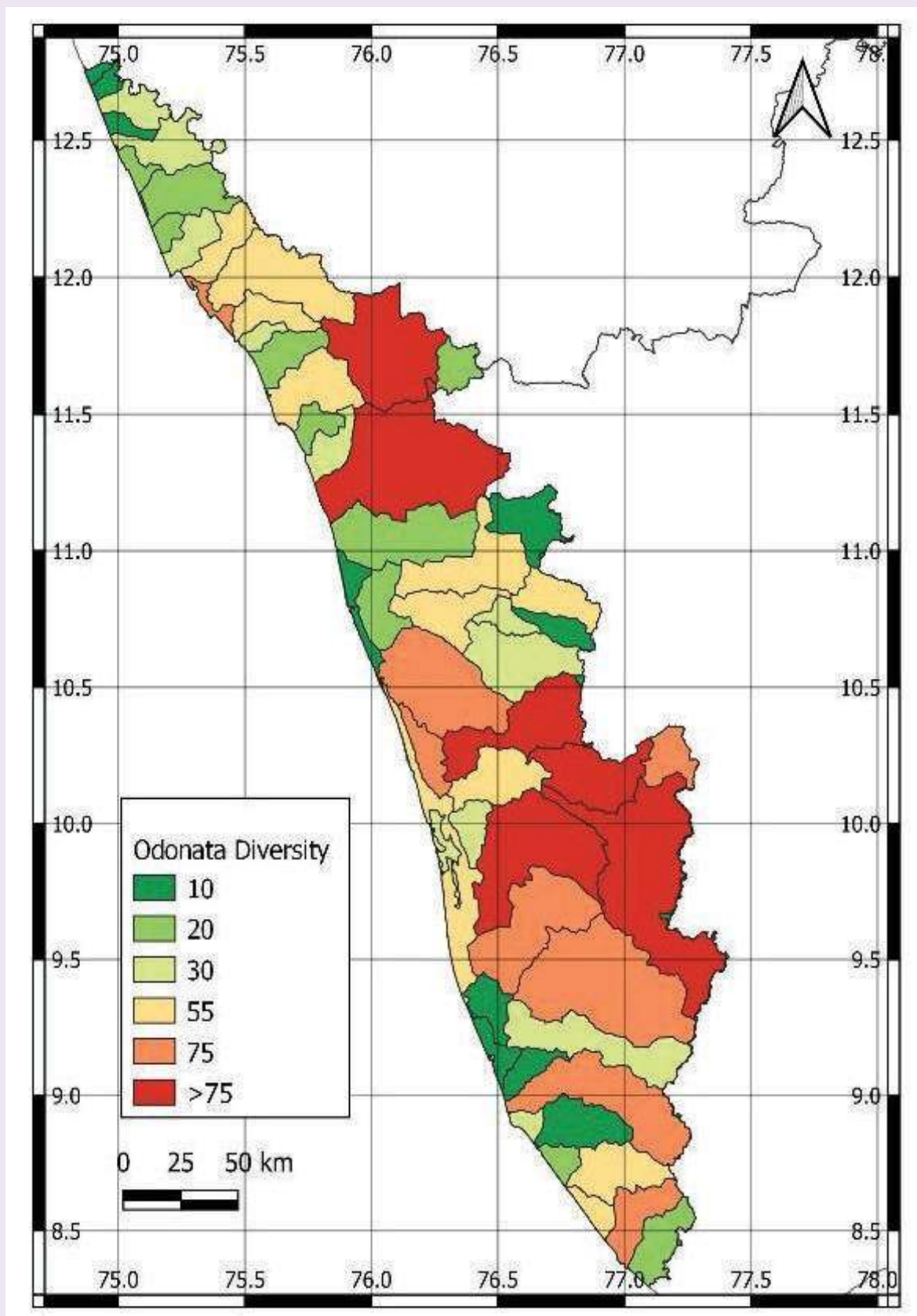
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Map-01. Diversity of odonates across ecoregions of Kerala



Map-02. Diversity of odonates across riverbasins of Kerala



MYGALOMORPH SPIDERS



By
Sunil Jose K & Souvik Sen

Introduction

Usually, people see spiders as ugly and useless animals with very little place in existence. In preserving our biodiversity, their role has never been fully understood. Spiders have many uses in medicine and industry, despite being overlooked and seldom appreciated by humanity. Worldwide, 49235 species of spiders are known (World Spider Catalog, 2021), and 1856 species (Caleb and Sankaran, 2021) have been recorded in India so far.

They are the largest order of class Arachnida. Except for Antarctica, spiders are present in every continent. Spiders have many uses in medicine and industry. Their silk have wonderful properties and used in bulletproof clothing, artificial ligament etc. Spider venom is equally important and used to produce painkill-

ers and to treat chronic visceral pain caused by irritable bowel syndrome.

The purpose of this study is to prepare a list of threatened spiders of Kerala that are on the verge of extinction owing to anthropogenic influences and habitat loss. A comprehensive report on such threatened spiders is prepared using our observations and pertinent data from the literatures.

Methodology

For the Threatened spiders of Kerala, we have considered only Mygalomorph spiders and followed the IUCN Red List categories, wherein the last assessment for the species of India was in 2008 (Molur et al., 2008a). The data on the species distribution and abundance were also obtained from personal

observation and from the information provided by researchers, tribal and forest people. CITES database has also been checked for the purpose.

Results

Of the 18 species of mygalomorph reported from Kerala, four species could be categorized as Threatened species and seven species as Data Deficient. All the red listed mygalomorphs are belonging to the family Theraphosidae, known for 'Tarantula spiders'. Among these, three species of the genus *Poecilotheria* are also listed in the Appendix II of CITES. Based on the literature review and our field explorations it has been observed that most of the threatened species are reported from the protected areas

Appendix A: Regional Redlist Assessment

Haploclostus kayi Gravelly, 1915 Endangered

Common name (English): Parambikulam Large Burrowing Spider; Local names (Malayalam): Urambuli.

Distribution: Tamil Nadu: Indira Gandhi Wildlife Sanctuary (Molur et al., 2008b); Kerala: Parambikulam Wildlife Sanctuary, Nilambur (Jose, 2017a), Chimmuni Wildlife Sanctuary (Aswathy et al., 2020).

Habitat and ecology: This Southern Western Ghats endemic was reported from moist deciduous forest and evergreen rainforest (Molur et al., 2008b) and lives in burrows along the embankment of the road and also on the forest floor. These tarantulas remain at burrow entrances to catch their prey.

Threats: Habitat loss and degradation are major threats for the species (Molur et al., 2008b). Lack of specific habitats may be the primary reason for its absence from the majority of forests. The species is also threatened due to collection by international

pet traders (Molur et al., 2008b).

Conservation status: Its burrow in the forest is extremely difficult to locate. The species may require intact forest areas as well as unique habitats. Even in the forest where the species is prevalent, they are restricted to a few locations. This species must be included in the CITES Appendix II to protect it from international pet traders.



***Poecilotheria regalis* Pocock, 1899**

Status: Least Concern

Endangered



Common names (English): Indian ornamental tarantula, Regal Parachute Spider; Local names (Malayalam): Oorambuli, Iruli, Kaduvachilanthi.

Distribution: Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, Kerala: Parambikulam Wildlife Sanctuary (Molur et al., 2008c), Siruvani, Palakkad (Jose, 2011).

Habitat and ecology: The species was reported from deciduous forest in Kerala, Karnataka and Tamil Nadu and live in the holes of trees, which they line with silk. They prey mainly on insects which wander near their burrow. They are usually found with many individuals living in the same burrow. This communal habit might have been developed because of the shortage of good holes in the trees. They are more commonly observed outside the tree burrow after the rains. They enter houses near the forest, searching for proper holes to live. They are nocturnal and capture prey during the night. Informations are also available on their breeding biology in captivity (Molur et al., 2008c).

Threats: Habitat loss and degradation along with pet trading are the present threats for the species (Molur et al., 2008c).

Conservation status: In India, the species can be found in the Western Ghats as well as in few locations in the Eastern Ghats. The species has a wide range and inhabits a large area, and although threats to the habitat and population are present.

***Poecilotheria rufilata* Pocock, 1899**
Status: Endangered

Common names (English): Red slate ornamental tarantula, Reddish Parachute Spider, Rufus Parachute Spider; Local Names (Malayalam): Oorambuli,

Iruli, Kaduvachilanthi.

Distribution: Kerala: Agasthyavanam Biosphere Reserve, Bonakadu, Shenthurney, Peppara Dam, Kallar, and Ponmudi (Charpentier, 1996).



Habitat and ecology: This Southern Western Ghats endemic species was found in the degraded moist deciduous and evergreen forest. It has also been reported from teak plantations and sometimes enters human settlements (Siliwal et al., 2008a). It is an arboreal species that spends most of its existence hidden underneath loose bark of trees. When compared to other tiger spiders, this species is extremely flighty and nervous.

Threats: Other than habitat loss and degradation, the species is also threatened as there is a pressure from pet traders in smuggling it out of the country (Siliwal et al., 2008a).

Conservation status: This species is one of the least known *Poecilotheria* species in Kerala. They are now known only from Thiruvananthapuram and Kollam districts in Kerala.

***Poecilotheria striata* Pocock, 1895**

Status: Vulnerable



Common names: Mysore Ornamental tarantula, Striated Parachute Spider, Striped Parachute Spider. Local Names (Malayalam): Oorambuli, Iruli, Kaduvachilanthi.

Distribution: Tamil Nadu, Karnataka, Kerala:Kozhikode, Kannur (Siliwal et al., 2008b), Parambikulam Wild life sanctuary (Siliwal et al., 2008b; Jose, 2011), Thattekkad, Muvattupuzha, Achenkovil, Kulathupuzha, Chinnar, Kaduthuruthy (Jose, 2011).

Habitat and ecology: These arboreal spiders live in cracks or holes in the bark of trees. Both moist and dry deciduous forests support the species. It has a strong resemblance to *Poecilotheria regalis* in terms of habit. They exhibit gregarious behaviour, which most likely originated as a result of a scarcity of nesting holes in forest trees.

Threats:Habitat loss and degradation along with collection for international pet trade are major threats for the species (Siliwal et al., 2008b). Tree harvesting and forest fires are significant factors in their population reduction.

Conservation status: This species is the most frequent of the three *Poecilotheria* species found in Kerala. Because they are restricted to a few specific trees with suitable nesting holes, therefore, forest fires and tree logging may have a negative impact on their habitat. Humans occasionally kill these spiders when they enter their homes.

Population trend in Kerala

The level of data is not adequate to suggest any kind of population level assessment of the listed threatened mygalomorphs. The decrease of forest cover and urbanisation is responsible to a general reduction in the diversity of mygalomorph spiders.

Level of Exploitation

Many spiders do not face any direct threats from humans for any financial benefits. However, tarantulas such as *Poecilotheria* and *Haploclastus* species are often illegally obtained by pet dealers in Europe and America. Europeans' curiosity about these vibrant and wild animals facilitates their trade. There are many websites on the internet that market these animals to pet owners in Europe and the United States. Breeders may say that their animals are raised in the laboratories, but breeding is difficult in many species.

Recommended conservation measures in Kerala

One of the first steps needed for protection is to encourage public knowledge that spiders are not

detrimental to their lives. Reducing forest invasions and enhancing forest management will reduce the extinction of spider especially mygalomorphs.

Arboreal mygalomorphs, like *Poecilotheria* are vulnerable to forest fires and tree destruction. We don't have enough data to assess the extent of damage caused by recent flooding to these species' habitats and populations. Minimising tree damage and avoiding landscape alteration for development can help them to survive.

Conservation priority area in Kerala

In the case of mygalomorph spiders, Southern Kerala has been recorded to have more species diversity. Compared to the north of Kerala, this may be attributed to greater forest cover in the south. There is a greater species diversity and population of threatened tarantulas in south Kerala.

Cultural significance and associated traditional knowledge

Poecilotheria species are considered extremely dangerous by the tribals of Kerala, and they believe their bite can make the victim crawl like a spider. Tribal's fear may help to prevent the destruction of tree species, where tarantulas inhabit.

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FRESH WATER CRABS



By
Sameer Kumar Pati

INTRODUCTION

Freshwater crabs are the decapod crustaceans and exclusively belong to the infraorder Brachyura. Globally, 1589 species of crabs in five families (Gecarcinidae, Potamidae, Potamonautidae, Pseudothelphusidae, and Trichodactylidae) are known to exist in tropical and subtropical freshwater ecosystems (WoRMS Editorial Board, 2020). These crabs spend their entire life in freshwater and never return to the sea. The life cycle with direct development is characteristic to them.

Freshwater crabs dwell in various freshwater bodies, including rivers, streams, lakes, ponds, swamps, and rice fields (Yeo et al., 2008). They also occupy some semi-terrestrial and terrestrial habitats like phytotelmata, leaf litter in the forest floor, and crevices of laterite boulders (Bahir & Yeo, 2007; Kumar et al., 2017; Pati & Thackeray, 2018). The various ecological and economic role played by freshwater crab made them an important animal group. Their roles include ecosystem functioning, support in small-scale fisheries or aquarium trade, acting as a pest of paddy crops, hosting human disease-causing parasites, involvement in the preparation of medicines, etc. (Ng, 1988; Yeo et al., 2008; Cumberlidge et al., 2009; Kumar et al., 2017).

A very high level of endemism is seen in freshwater crabs, especially for the highland species (Cumberlidge et al., 2009; Klaus et al., 2014). Cumberlidge et al. (2009) argued that the conservation of freshwater crabs is as important as that of reef-building corals, birds, odonates, reptiles, freshwater fishes, and mammals. The secretive habitats of freshwater crabs, however, challenge studies related to biodiversity and conservation.

The present report deals with the assessment of threats to the species of freshwater crabs in Kerala and recommends the species that can be considered as threatened under Section 38 of the Biological Diversity Act, 2002.

METHODOLOGY

The following information on each species of freshwater crabs in Kerala is gathered from published literature (Milne Edwards, 1853; Heller, 1862; Alcock, 1909a, 1909b, 1910; Henderson, 1912, 1913; Roux, 1931; Pillai, 1951; Bott, 1970; Ng & Tay, 2001; Bahir & Yeo, 2005, 2007; Srivastava, 2005; Dev Roy et al., 2009; Pati & Sharma, 2011, 2013; Pati et al., 2014, 2017, 2019a, 2019b, 2019c; Pati & Sudha Devi, 2015a,

2015b; Kumar et al., 2017; Raj et al., 2017; Rajesh et al., 2017; Bhaskar et al., 2019; Pati & Vargila, 2019): geographic distribution; habitat and ecology; conservation status; population trend in Kerala since 2000; geographic location/habitat of sustainable and threatened population in Kerala; level of exploitation; threats; conservation priority areas in Kerala; BMC and stakeholders responsible for conservation and sustainable utilization; cultural significance and associated traditional knowledge (see Appendix).

The conservation status of each crab species was verified from the IUCN Red List of Threatened Species at the global level (IUCN, 2020). While the information currently available for the freshwater crabs of Kerala in the IUCN Red List of Threatened Species was based on an older version [Version 3.1 (2008)], some 12 species were never evaluated by IUCN. It is now necessary to reassess the status of all the species of freshwater crabs in Kerala using the latest criteria [Version 14 (2019)]. Since the present document aims to provide information on the threatened species of freshwater crabs in Kerala, the regional IUCN Red List Assessment is carried out by following the recommended criteria (IUCN, 2012a) and guidelines (IUCN, 2012b; IUCN Standards and Petitions Committee, 2019). The species with an extinction risk and falls one of the threatened categories (Critically Endangered, Endangered, or Vulnerable) as an outcome of the regional IUCN Red List Assessment is regarded as a threatened species. Among those threatened species, only a few species are recommended as threatened under Section 38 of the Biological Diversity Act, 2002, because they are either on the verge of extinction or more likely to become extinct in the near future.

Procedure for regional IUCN Red List Assessment ***Decision on freshwater crab species and populations to be assessed:***

Crab species that are extant and native to Kerala are considered for the present assessment. An extant species is here defined as the species that is known in the area where locality records were originated during the past three decades (1991–2020) and the suitable habitats are still exist. It is also ensured that the extant species must have a native breeding population within Kerala and lack a non-breeding visitor population. The calculation of Extension of Occurrence (EOO) and Area of Occupancy (AOO) are based only on the extant range of a species, which were achieved using QGIS and GeoCAT, respectively.

The range of a species is considered as “possibly extinct” when that species was formerly known to occur in Kerala but now most likely extirpated from there due to one or more threats, and if there is no confirmed recent record despite repeated searches. The possibly extinct range is not used here for calculation of EOO. The species with a possible extinct range, however, is considered for assessment. Among the freshwater crabs of Kerala, only a lone species has a possibly extinct range, i.e., *Cylindrotelphusa granulata* (Pillai, 1951).

Species with uncertain presence in Kerala were not considered for the present assessment because the taxon has been wrongly identified previously or the locality information is incorrect. In Kerala, the presence of two species is uncertain, i.e., *Spiralothelphusa hydrodroma* (Herbst, 1794), and *Spiralothelphusa wuellerstorfi* (Heller, 1862).

Preliminary estimation of extinct risk:

Only regional population of a crab species were assessed for initial estimation of extinction risk following IUCN Red List criteria. If the species is endemic to Kerala then the preliminary estimation is the final regional assessment, which is also be considered as the final global IUCN Red List Assessment for that species. Interestingly, 24 species of freshwater crabs are endemic to the state. If the species is non-endemic then a final estimation of extinct risk is required after applying the IUCN regional guidelines.

Final estimation of extinct risk:

The final estimation of extinct risk was achieved by considering two major issues affecting regional assessments, i.e., breeding population and visiting population. Visiting population is nevertheless seen in none of the crab species of Kerala. The breeding population is further affected by immigration. It is nevertheless unknown whether the regional population of all the non-endemic species experience any significant immigration of propagules likely to reproduce in the region or not. Therefore, there is no change in the preliminary estimation (see IUCN, 2012b: fig. 3, table 1).

RESULTS AND DISCUSSION

In India, 128 species of freshwater crabs in two families (91 gecarcinucid species and 37 potamid species) are currently known (cf. Pati & Thackeray, 2018; Mitra, 2019, 2020; Pati et al., 2019a, 2020; Mitra et al., 2020). Among the Indian states, Kerala has the highest diversity of freshwater crabs with 35 gecarcinucid species in 14 genera (Rajesh et al., 2017; Pati et al., 2019b) (Table 1) (see Appendix); this excludes

two species (*Spiralothelphusa hydrodroma* and *Spiralothelphusa wuellerstorfi*) whose presence is uncertain. The state is home to 24 endemic species (69% species of Kerala) (Table 1) (see Appendix). As many as 31 species of Kerala are known from the Western Ghats (see Appendix).

According to the global IUCN Red List of Threatened Species, only two species of Kerala were in a threatened category (Vulnerable) and six species in the Least Concern. The remaining 27 species of Kerala were either Data Deficient or not being evaluated by IUCN. The present regional IUCN Red List Assessment, however, recognized five species as Critically Endangered, including one possibly extinct species; four species as Endangered; four species as vulnerable; two species as Near Threatened; one species as Least Concern; and 19 species as Data Deficient (Table 1) (see Appendix).

Threatened species of freshwater crabs in Kerala

In total, 13 species of freshwater crabs in Kerala come under one or the other threatened categories (Critically Endangered, Endangered, or Vulnerable) according to the present regional IUCN Red List Assessment (see Table 1 and Appendix). Among them, the following four species may be considered to notify them as threatened according to Section 38 of the Biological Diversity Act, 2002, because of the reasons specified for each species.

1) *Arcithelphusa tumpikkai* Pati, Sujila & Sudha Devi, 2019

Reasons: The highland species, *Arcithelphusa tumpikkai*, is endemic to Wayanad district of Kerala and hitherto unknown from any protected areas. The species is qualified for the "Endangered B1ab(iii)+2ab(iii)" category according to the present regional IUCN Red List Assessment. The species is facing continuing decline in the extent and quality of its habitat due to habitat degradation and agrarian development. The species is more likely to become extinct in the near future because currently no conservation action is being taken.



Image after Pati et al. (2019a)

2) *Cylindrotelphusa breviphallus* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017

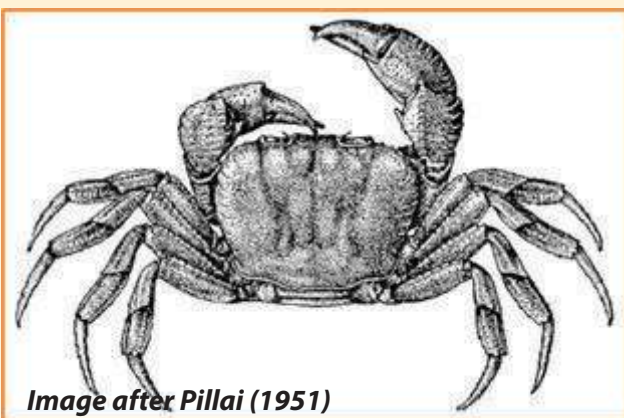
Reasons: The highland species, *Cylindrotelphusa breviphallus*, is endemic to Thiruvananthapuram district of Kerala and is so far known from none of the protected areas. The species is qualified for the "Critically Endangered B2ab(iii)" category according to the present regional IUCN Red List Assessment. The species is facing continuing decline in the extent and quality of its



habitat due to habitat degradation and pesticide pollution. The species is more likely to become extinct in the near future because currently no conservation action is being taken.

3) *Cylindrotelphusa granulata* (Pillai, 1951)

Reasons: *Cylindrotelphusa granulata* is a lowland species and previously known only from the type locality, North Paravur in Ernakulam district of Kerala. According to the present regional IUCN Red List Assessment, the species is qualified for the "Critically Endangered (Possibly Extinct) B1ab(iii)+2ab(iii)" category. The species was known to dwell in low-lying paddy fields, which have been converted into aquaculture ponds. There is no recent report the species. The species seems to be extirpated from the unprotected area due to habitat conversion. The species might be now on the verge of extinction.



4) *Vela virupa* Bahir & Yeo, 2007

Reasons: The highland species, *Vela virupa*, is endemic to Idukki district of Kerala and is so far unrecorded from any protected areas. The species is qualified for the "Endangered B1ab(iii)+2ab(iii)" category according to the present regional IUCN Red List Assessment. The species is facing continuing decline in the extent and quality of its habitat due to habitat degradation and pollution. The species is more likely to become extinct in the near future because currently no conservation action is being taken



SUMMARY

Kerala possesses 35 species of freshwater crabs in 14 genera of the lone family Gecarcinucidae, including 24 endemic species and 31 species from its Western Ghats mountains.

The information on the freshwater crab species of Kerala available in the IUCN Red List of Threatened Species was based on an older version [Version 3.1 (2008)]. During the last decade, another 12 species of freshwater crabs have been recorded from the state. The regional IUCN Red List Assessment is, therefore, carried out on the freshwater crabs of Kerala by following the latest criteria [Version 14 (2019)] and recommended guidelines.

The present regional IUCN Red List Assessment recognized five species as Critically Endangered, including one possibly extinct species; four species as Endangered; four species as vulnerable; two species as Near Threatened; one species as Least Concern; and 19 species as Data Deficient.

Among the crab species with a threatened category (Critically Endangered, Endangered, or Vulnerable), only four species are recommended here for inclusion as threatened species under Section 38 of the Biological Diversity Act, 2002, viz., *Arcithelphusa tumpikkai* Pati, Sujila & Sudha Devi, 2019, *Cylindrotelphusa breviphallus* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017, *Cylindrotelphusa granulata* (Pillai, 1951), and *Vela virupa* Bahir & Yeo, 2007

Assessment of threats to the species of freshwater crabs in Kerala.

Arcithelphusa cochleariformis Pati & Sudha Devi, 2015

Taxonomy

Phylum Arthropoda

Class Malacostraca

Order Decapoda

Family Gecarcinucidae

Species *Arcithelphusa cochleariformis* Pati & Sudha Devi, 2015

Local name (Malayalam): Kundan [for dwarf] njandu (കുണ്ടൻ നെണ്ടി)

Common name (English) Greater box-shaped crab (proposed herein)

Distribution

Global India only

India Endemic to Kerala; Western Ghats only

Kerala Endemic to Wayanad district; Western Ghats only



Habitat/ecology:

The species is a semi-terrestrial crab and mainly dwells in shallow to deep burrows adjacent to water channels of betel nut plantations, which were once rice fields. Forest or grasslands were the natural habitats for the new species before their conversion to rice fields. They also live away from the water channels in open or shaded areas of banana and betel nut plantations. Individuals can also be located in marshy lands and along paddy field embankments. The species is omnivore and mainly feeds on a wide range of plant material, earthworms and insects. The species also feeds on decaying leaves and detritus. These crabs are mainly nocturnal and very rarely forage during the day time. Herons, egrets, wild boars, mongooses and cats are their predators.

Conservation status

WPA (1972): None

IUCN (Global Assessment):
Not evaluated (IUCN,2020)

IUCN (Regional Assessment): Vulnerable
B1ab(iii)+2ab(iii)

CITES None

CMS None

Population trend in Kerala since 2000: Seems to be stable

Geographic location/habitat of sustainable population in Kerala: Wayanad district; Wayanad Wildlife Sanctuary; Western Ghats

Geographic location/habitat of threatened population in Kerala: Wayanad district; Western Ghats

Level of exploitation

Commercial None

Local consumption None

Poaching None

Pet trade None

Wildlife trade None

Threats

No threat is documented. Possible anthropogenic threats include habitat degradation and pesticide pollution in unprotected areas.

Recommended conservation measures in Kerala

Pesticide application in agricultural plantations should be minimized because it has an adverse effect on freshwater crabs.

Conservation priority area in Kerala: Wayanad district; Wayanad Wildlife Sanctuary; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmers; tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Wayanad district of Kerala and found only in the Western Ghats. The species is also known from a protected area. Its extent of occurrence (EOO) is 2196 km², and area of occupancy (AOO) is 44 km². The number of locations for the species is 8, which was calculated based on the most likely threat that may affect the currently-unaffected areas in the future and the number of subpopulations in the unaffected areas. There is a continuing decline in the extent and quality of its habitat due to habitat degradation and agrarian development. The species, therefore, qualifies for the "Vulnerable B1ab(iii)+2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Arcithelphusa tumpikkai Pati, Sujila & Sudha Devi, 2019

Taxonomy

Species *Arcithelphusa tumpikkai* Pati, Sujila & Sudha Devi, 2019

Local name (Malayalam): Kundan [for dwarf] njandu (കുണ്ടൻ ഞണ്ടി) or Kunjan [for small] njandu (ചെറിയ കുണ്ടൻ ഞണ്ടി)

Common name (English): Lesser box-shaped crab (proposed herein)



Image after Pati et al. (2019a)

Distribution

Global	India only
India	Endemic to Kerala; Western Ghats only
Kerala	Endemic to Wayanad district; West ern Ghats only

Habitat/ecology

The species dwells in Shola forests, mountainous streams, natural springs, rice fields, and banana/betel nut/cassava plantations. Crabs live in shallow burrows under small and moist boulders. Individuals also inhabit muddy banks along the water channels of paddy fields and various plantations. These crabs generally prefer to stay near water bodies or moist places. The species seems to be locally abundant in rather elevated areas of Wayanad district.

Conservation status

WPA (1972): None
 IUCN (Global Assessment): Not evaluated (IUCN, 2020)
 IUCN (Regional Assessment) Endangered B1ab(iii)+2ab(iii)
 CITES None
 CMS None

Population trend in Kerala since 2000: Seems to be stable

Geographic location/habitat of sustainable population in Kerala: Wayanad district; Western Ghats

Geographic location/habitat of threatened population in Kerala: Wayanad district; Western Ghats

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None

Pet trade	None
Wildlife trade	None

Threats

No threat is documented. Possible anthropogenic threats include habitat degradation and pesticide pollution. Also, the species is unknown from any protected areas.

Recommended conservation measures in Kerala: Pesticide application in agricultural plantations should be minimized because it has an adverse effect on freshwater crabs.

Conservation priority area in Kerala: Wayanad district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmers

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Wayanad district of Kerala and found only in the Western Ghats. The species is unknown from any protected areas. Its extent of occurrence (EOO) is 472 km², and area of occupancy (AOO) is 16 km². The number of locations for the species is 2, which was calculated based on the most likely threat that may affect the currently-unaffected areas in the future. There is a continuing decline in the extent and quality of its habitat due to habitat degradation and agrarian development. The species, therefore, qualifies for the "Endangered B1ab(iii)+2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Baratha peena Bahir & Yeo, 2007

Taxonomy

Species *Baratha peena* Bahir & Yeo, 2007

Local name (Malayalam): No specific name; all crabs are locally known as njandu (ഞണ്ടി)

Common name (English): Fat Indian crab (proposed herein)

Distribution:

Global	India only
India	Endemic to Kerala; Western Ghats only
Kerala	Endemic to Idukki district; Western Ghats only

Habitat/ecology: The species dwells in muddy soil on the margin of streamlets.

Conservation status

WPA (1972): None
 IUCN (Global Assessment): Data Deficient (Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Data Deficient
CITES None
CMS None

Population trend in Kerala since 2000: Unknown
Geographic location/habitat of sustainable population in Kerala: Idukki district; Western Ghats
Geographic location/habitat of threatened population in Kerala: Unknown

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented.

Recommended conservation measures in Kerala:

No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Idukki district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Idukki district of Kerala and so far known only from two adjacent localities in the Western Ghats. Both the localities are unprotected. The data on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment

Baratha pushta Bahir & Yeo, 2007

Taxonomy

Species *Baratha pushta* Bahir & Yeo, 2007

Local name (Malayalam): No specific name; all crabs are locally known as njandu ന്നാണ്ടു



Common name (English): Swollen Indian crab (proposed herein)

Distribution:

Global	India only
India	Endemic to Kerala; Western Ghats only
Kerala	Endemic to Idukki district; Western Ghats only

Habitat/ecology: The species dwells in muddy banks of rocky streams.

Conservation status:

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Esser & Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Data Deficient

CITES None

CMS None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable population in Kerala: Idukki district; Western Ghats

Geographic location/habitat of threatened population in Kerala: Unknown

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats

No threat is documented.

Recommended conservation measures in Kerala:

No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Idukki district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Idukki district of Kerala and so far known only from the type locality in the Western Ghats. The type locality is an unprotected area. The data on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment

***Barytelphusa cunicularis* (Westwood in Sykes, 1836)**

Taxonomy

Species *Barytelphusa cunicularis* (Westwood in Sykes, 1836)

Local name (Malayalam): Kari [for black] njandu (കരിഞ്ഞണ്ടി)

Common name (English): Burrowing heavy crab (proposed herein)



Distribution

Global: India only

India: Andhra Pradesh; Goa; Gujarat; Jharkhand; Karnataka; Kerala; Madhya Pradesh; Maharashtra; Odisha; Rajasthan; Tamil Nadu; Telangana; Uttar Pradesh; Uttarakhand; West Bengal; Puducherry Union Territory; Western Ghats

Kerala: Ernakulam, Idukki, Kannur, Kasaragod, Kollam, Kottayam, Kozhikode, Malappuram, Palakkad, Pathanamthitta, Thiruvananthapuram, Thrissur and Wayanad districts; Western Ghats

Habitat/ecology

The species is primarily an aquatic crab and dwells under boulders in shallow or deep streams and rivers. It can be also found on land away from water bodies. These crabs are omnivores and feed on various animal and vegetation matters. The species can occupy both low-lying areas and highlands. It generally prefers deep forested areas.

Conservation status

WPA (1972): None

IUCN (Global Assessment) Least Concern (Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Least Concern

CITES None

CMS None

Population trend in Kerala since 2000: Stable

Geographic location/habitat of sustainable population in Kerala: Ernakulam, Idukki, Kannur, Kasaragod, Kollam, Kottayam, Kozhikode, Malappur-

am, Palakkad, Pathanamthitta, Thiruvananthapuram, Thrissur and Wayanad districts; Thattekkad Bird Sanctuary; Aralam Wildlife Sanctuary; Chimmoni Wildlife Sanctuary; Chinnar Wildlife Sanctuary; Idukki Wildlife Sanctuary; Malabar Wildlife Sanctuary; Parambikulam Wildlife Sanctuary; Peppara Wildlife Sanctuary; Shendurney Wildlife Sanctuary; Periyar Tiger Reserve; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	Low
Local consumption	Medium
Poaching	None
Pet trade	None
Wildlife trade	None

Threats

No threat is documented. Overexploitation could be the potential reason for depletion of the species in the wild, especially from the unprotected areas.

Recommended conservation measures in Kerala:

No major conservation issue for the species because it is a very common species with a stable population. The species is also found in several protected areas.

Conservation priority area in Kerala: Thattekkad

Bird Sanctuary; Aralam Wildlife Sanctuary; Chimmoni Wildlife Sanctuary; Chinnar Wildlife Sanctuary; Idukki Wildlife Sanctuary; Malabar Wildlife Sanctuary; Parambikulam Wildlife Sanctuary; Peppara Wildlife Sanctuary; Shendurney Wildlife Sanctuary; Periyar Tiger Reserve; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department;

local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local fishermen; tribal community

Cultural significance and associated traditional knowledge: These crabs have medicinal properties.

Remarks

The species is the largest among Indian crabs. It is widely distributed in India and very common in Kerala. Tribal people of Kerala used to collect large-sized crabs for food. The species is also known from several protected areas of Kerala. The species has been given the status of "Least Concern" in the global IUCN Red List of Threatened Species because of its wide distribution and presumed large population, and the species is unlikely to be declining fast enough. In Kerala, its extent of occurrence (EOO) is 57410 km², and area of occupancy (AOO) is 288 km². The species does not meet any criteria for a threatened category.

Also, there is no decline in the EOO, AOO, area, extent and/or quality of habitat, or number of locations. The species, therefore, qualifies for the "Least Concern" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

***Cylindrotelphusa breviphallus* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017**

Taxonomy

Species *Cylindrotelphusa breviphallus* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017

Image after Pati et al. (2017)

Local name (Malayalam): No specific name; all crabs are locally known as njandu ന്നാണ്ടു

Common name (English): Highland humped crab (proposed herein)



Image after Pati et al. (2017)

Distribution

Global India only
 India Endemic to Kerala; Western Ghats only
 Kerala Endemic to Thiruvananthapuram district; Western Ghats only

Habitat/ecology

The species dwells under stones of steep hill streams, in shallow burrows in wet soil adjoining shaded areas of streams, and under the roots of large trees above the ground level. These crabs can also be found in tea gardens. The species is generally active during the daylight. The population size of the species appears to be low within its distributional range.

Conservation status

WPA (1972)	None	
IUCN (Global Assessment) (IUCN, 2020)	Not evaluated	
IUCN (Regional Assessment)	Critically Endangered B2ab(iii)	
CITES	None	
CMS	None	

Population trend in Kerala since 2000

Seems to be decreasing

Geographic location/habitat of sustainable population in Kerala: Ponmudi in Thiruvananthapuram district; Western Ghats

Geographic location/habitat of threatened population in Kerala: Ponmudi in Thiruvananthapuram district; Western Ghats

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented. Possible anthropogenic threats include habitat degradation and pesticide pollution. Also, the species is unknown from any protected areas.

Recommended conservation measures in Kerala: Pesticide application in tea gardens should be minimized because it has an adverse effect on freshwater crabs.

Conservation priority area in Kerala: Ponmudi in Thiruvananthapuram district; Western Ghats.

MC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmers; local people
Cultural significance and associated traditional knowledge: Unknown

Remarks

The species is endemic to Thiruvananthapuram district of Kerala and so far known only from two adjacent localities in the Western Ghats. Both the localities are unprotected. Its population size appears to be low in Ponmudi and adjacent areas. Its extent of occurrence (EOO) is 472 km², and area of occupancy (AOO) is 8 km². The number of locations for the species is 1, which was calculated based on the most likely threat that may affect the currently-unaffected areas in the future. There is a continuing decline in the extent and quality of its habitat due to habitat degradation and pesticide pollution. The species, therefore, qualifies for the "Critically Endangered B2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

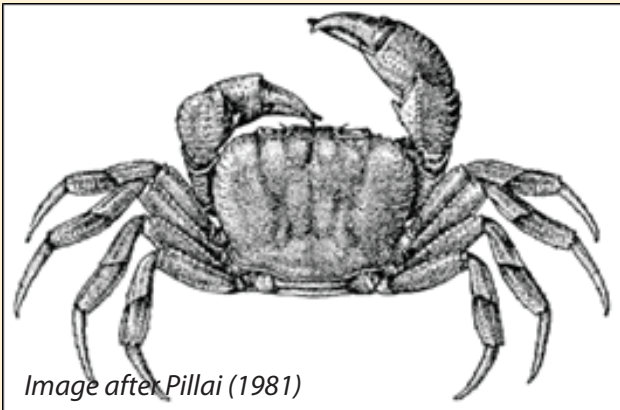
Cylindrotelphusa granulata (Pillai, 1951)

Taxonomy

Species *Cylindrotelphusa granulata* (Pillai, 1951)

Local name (Malayalam): No specific name; all crabs are locally known as njandu ന്റുണ്ടു

Common name (English): Granular humped crab (proposed herein)



Distribution

Global	India only
India	Endemic to Kerala
Kerala	Endemic to Ernakulam district

Habitat/ecology

The species was once reported to occur abundantly on drylands and adjacent low-lying paddy fields. These crabs can make deep burrows that reach the water level.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Not evaluated (IUCN, 2020)

UCN (Regional Assessment): Critically Endangered (Possibly Extinct) B1ab(iii)+2ab(iii)

CITES: None

CMS: None

Population trend in Kerala since 2000: No crab population is reported since 1944.

Geographic location/habitat of sustainable population in Kerala: None

Geographic location/habitat of threatened population in Kerala: North Paravur of Ernakulam district, Kerala

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats

The species might have been extirpated from the only known locality (North Paravur of Ernakulam district, Kerala) due to the conversion of its habitat (low-lying paddy fields) into aquaculture pond.

Recommended conservation measures in Kerala: Unauthorized habitat conversion should be restricted because it can affect the existence of freshwater crabs. Extensive surveys must be conducted in the known localities and possible habitats of the species.

Conservation priority area in Kerala: North Paravur of Ernakulam district

BMC responsible for conservation and sustainable utilization: Local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people

Cultural significance and associated traditional knowledge: Unknown

Remarks

The species is so far known only from the type locality (North Paravur in Ernakulam district of Kerala), which is an unprotected area. The habitat of the species, i.e., the low-lying paddy fields have been converted into aquaculture ponds. Recent attempts to collect data on the species were unsuccessful because these crabs might be extirpated from the area due to habitat conversion. Its extent of occurrence (EOO) is 73 km², and area of occupancy (AOO) is 4 km². The number of locations for the species is 1, which was calculated based on the most serious plausible threat (habitat loss) that can rapidly eliminate the population. The species, therefore, qualifies for the "Critically Endangered (Possibly Extinct) B1ab(iii)+2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Cylindrotelphusa longiphallus

Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017

Cylindrotelphusa steniops (Alcock, 1909)



Species *Cylindrotelphusa longiphallus* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017

Local name (Malayalam): No specific name; all crabs are locally known as njandu ന്റുണ്ടു

Common name (English): Narrow-faced crab (proposed herein)

Distribution

Global: India only

India: Endemic to Kerala

Kerala: Endemic to Thrissur district

Habitat/ecology: The species dwells in deep interconnected burrows along paddy field embankments in shaded or open areas. Crabs are common at the type locality.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Not evaluated (IUCN, 2020)

IUCN (Regional Assessment: Critically Endangered B2ab(iii)

CITES: None

CMS: None

Population trend in Kerala since 2000: Seems to be stable: Geographic location/habitat of sustainable population in Kerala: Kuzhikattusseri in Thrissur district

Geographic location/habitat of threatened population in Kerala: Kuzhikattusseri in Thrissur district

Level of exploitation

Commercial None

Local consumption None

Poaching None

Pet trade None

Wildlife trade None

Threats: No threat is documented. Possible anthropogenic threats include pesticide pollution. Also, the species is unknown from any protected areas.

Recommended conservation measures in Kerala: Pesticide application in paddy fields should be minimized because it has an adverse effect on freshwater crabs.

Conservation priority area in Kerala: Kuzhikattusseri in Thrissur district

BMC responsible for conservation and sustainable utilization: Local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmers

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Thrissur district of Kerala. These crabs are common at the type locality. Unfortunately, the species is so far not reported from any protected areas. Its extent of occurrence (EOO) is 236 km², and area of occupancy (AOO) is 4 km². The number of locations for the species is 1, which was calculated based on the most likely threat that may affect the currently-unaaffected areas in the future. There is a continuing decline in the extent and quality of its habitat due to habitat degradation and pesticide pollution. The species, therefore, qualifies for the "Critically Endangered B2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Cylindrotelphusa steniops (Alcock, 1909)

Taxonomy

Species *Cylindrotelphusa steniops* (Alcock, 1909)

Local name (Malayalam): No specific name; all crabs are locally known as njandu ന്റുണ്ടു

Common name (English): Narrow-faced crab (proposed herein)



Distribution

Global: India only

India: Kerala; Tamil Nadu; Western Ghats

Kerala: Idukki, Kollam, Kozhikode, Pathanamthitta, Thiruvananthapuram and Thrissur districts; Western Ghats

Habitat/ecology: The species dwells in deep burrows adjacent to or away from streams in shaded or open areas. These crabs make deep burrows in loose soil on wet forest floor, near riverbanks, and paddy fields. Crabs have a deep carapace, which might be an adaptation to survive in the habitat with very low oxygen level.

Conservation status

WPA (1972): None

IUCN (Global Assessment) Least Concern
(Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment) Near Threatened,
nearly meeting VU B1b(iii)+2b(iii)

CITES None

CMS None

Population trend in Kerala since 2000: Stable

Geographic location/habitat of sustainable population in Kerala: Idukki, Kollam, Kozhikode, Pathanamthitta, Thiruvananthapuram and Thrissur districts; Malabar Wildlife Sanctuary; Shendurney Wildlife Sanctuary, Peppara Wildlife Sanctuary; Western Ghats

Geographic location/habitat of threatened population in Kerala: Kollam, Kozhikode, Pathanamthitta, Thiruvananthapuram and Thrissur districts; Western Ghats

Level of exploitation

Commercial None

Local consumption None

Poaching None

Pet trade None

Wildlife trade None

Threats

No threat is documented. Possible anthropogenic threats include habitat conversion and pesticide pollution in agricultural field.

Recommended conservation measures in Kerala

Unauthorized habitat conversion should be restricted, and pesticide application in paddy fields should be minimized because both the threats severely affect freshwater crabs.

Conservation priority area in Kerala: Kollam, Kozhikode, Pathanamthitta, Thiruvananthapuram and Thrissur districts; Malabar Wildlife Sanctuary; Shendurney Wildlife Sanctuary, Peppara Wildlife Sanctuary; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmers; local people; tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks

The species has been given the status of "Least

Concern" in the global IUCN Red List of Threatened Species because it is widely dispersed, known from 10 locations and collected recently, and there were no known threats. In Kerala, its extent of occurrence (EOO) is 19949 km², and area of occupancy (AOO) is 48 km². The number of locations for the species in Kerala is 11, which was calculated based on the most likely threat that may affect the currently-affected areas in the future and the number of subpopulations in the unaffected areas. The species meets the area requirements under criterion B1 and B2 for Vulnerable (EOO < 20,000 km² and AOO < 2,000 km²) and occurs at more than 10 locations. Also, there is a continuing decline in the extent and quality of its habitat due to habitat loss/degradation and pesticide pollution. The species, therefore, qualifies for the "Near Threatened nearly meeting VU B1b(iii)+2b(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Kani maranjandu Kumar, Raj & Ng, 2017

Taxonomy

Species *Kani maranjandu* Kumar, Raj & Ng, 2017

Local name (Malayalam): Mara [for tree] njandu (മരത്തണ്ട)

Common name (English): Kani tree crab (proposed herein)



Distribution

Global: India only

India: Endemic to Kerala; Western Ghats only

Kerala: Endemic to Thiruvananthapuram district; Western Ghats only

Habitat/ecology

The species is an arboreal crab and dwells in tree holes of different trees from ground level to 10 m high. Crabs are found only in those trees, which are clearly away from streams. Younger individuals take shelter in canopy. The species uses phytotelms for water and food. These crabs usually feed on leaves, seeds, slugs, worms and insects on trees. Mongooses

and owls are their known predators. The post-monsoon (September–October) is the breeding season for this species.

Conservation status

WPA (1972): None
 IUCN (Global Assessment): Not evaluated (IUCN, 2020)
 IUCN (Regional Assessment): Data Deficient
 CITES: None
 CMS: None

Population trend in Kerala since 2000: Unknown
Geographic location/habitat of sustainable population in Kerala: Kottoor Reserve Forest, Thiruvananthapuram district; Western Ghats
Geographic location/habitat of threatened population in Kerala: Kottoor Reserve Forest, Thiruvananthapuram district; Western Ghats

Level of exploitation

Commercial	None
Local consumption	Low
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: The species is found in the degraded forest areas of the Kottoor Reserve Forests, Agasthyamala Biological Park. Habitat degradation poses potential threat on these arboreal crabs.

Recommended conservation measures in Kerala: Conservation of larger trees in the degraded forest ecosystems of the Western Ghats has been suggested.

Conservation priority area in Kerala: Kottoor Reserve Forest, Thiruvananthapuram district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department

Stakeholders responsible for conservation and sustainable utilization: Tribal community

Cultural significance and associated traditional knowledge: The "Kani" tribe occasionally catch these tree crabs to prepare an oil for treating skin diseases and ear ache. The tribesmen do not catch females that bear eggs or carry juveniles during the breeding season of the crab.

Remarks

The species is endemic to the Western Ghats and known only from the type locality in Thiruvananthapuram district of Kerala. The type locality is an unprotected area, the species was found in degrad-

ed forest areas. The arboreal nature of the species makes it a highly stenotopic crab with a restricted population. Its extent of occurrence (EOO) is 165 km², and area of occupancy (AOO) is 4 km². The number of locations for the species can not be used because more than half of the species' range is in an unaffected area. Although the species was found in a degraded forest, there is no evidence of its direct impact on the species. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Karkata ghanarakta
Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017

Taxonomy
 Species *Karkata ghanarakta* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Maroon Kerala crab (proposed herein)



Image after Pati et al. (2017)

Distribution

Global: India only
 India: Endemic to Kerala; Western Ghats only
 Kerala: Ernakulam and Idukki districts; Western Ghats only

Habitat/ecology

The species dwells only in a degraded semi-evergreen forest patch in rocky terrain with almost no undergrowth or water flow. Crabs are found in the crevices underneath boulders of the rocky terrain.

Conservation status

WPA (1972) None
 IUCN (Global Assessment) Not evaluated (IUCN, 2020)
 IUCN (Regional Assessment) Data Deficient
 CITES None
 CMS None

Population trend in Kerala since 2000: Seems to be stable

Geographic location/habitat of sustainable population in Kerala: Ernakulam district; Thattekkad Bird Sanctuary; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats

Although the species was found in a degraded semi-evergreen forest patch of the Thattekkad Bird Sanctuary, the degraded forest may not have direct impact on the species.

Recommended conservation measures in Kerala:

Conservation action should be taken to protect the forest habitats of the Thattekkad Bird Sanctuary.

Conservation priority area in Kerala: Ernakulam district; Thattekkad Bird Sanctuary; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people

Cultural significance and associated traditional knowledge: Unknown

Remarks

The species is endemic to the Western Ghats and so far known only from two neighbouring districts of Kerala. The species is very common in the Thattekkad Bird Sanctuary, a protected area. Its extent of occurrence (EOO) is 411 km², and area of occupancy (AOO) is 20 km². The number of locations for the species can not be used because more than half of the species' range is in an unaffected area. Although the species was found in a degraded forest, there is no evidence of its direct impact on the species. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Karkata kusumbha

Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017

Taxonomy

Species *Karkata kusumbha* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017

Local name (Malayalam): No specific name; all crabs are locally known as njandu (ഞണ്ടി)



Distribution

Global: India only

India: Endemic to Kerala; Western Ghats only

Kerala: Endemic to Idukki district; Western Ghats only

Habitat/ecology

The species dwells under cobblestones of small streams and in burrows on loose soil away from water bodies. Crabs wander on the ground when their burrows get flooded during the rainy season. The species is not very common at the type locality.

Conservation status

WPA (1972) None

IUCN (Global Assessment) Not evaluated (IUCN, 2020)

IUCN (Regional Assessment) Data Deficient

CITES None

CMS None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable population in Kerala: Thaalumkandam in Idukki district; Western Ghats

Geographic location/habitat of threatened population in Kerala: Unknown

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented.

Recommended conservation measures in Kerala:

No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Thaalumkandam in Idukki district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people

Cultural significance and associated traditional knowledge: Unknown

Remarks

The species is endemic to Idukki district of Kerala and so far known only from the type locality in the Western Ghats. The type locality is an unprotected area. These crabs are not very common at the type locality. The data on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Lamella lamellifrons (Alcock, 1909)

Taxonomy

Species *Lamella lamellifrons* (Alcock, 1909)

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നാണ്ടു)

Common name (English): Flat crab (proposed herein)



Distribution

Global: India only

India: Endemic to Kerala; Western Ghats

Kerala: Ernakulam, Idukki, Kannur, Kollam, Kottayam, Kozhikode, Pathanamthitta, Thiruvananthapuram and Thrissur districts; Western Ghats

Habitat/ecology

The species is predominantly aquatic crab and spends all the time in shallow or deep streams and adjacent pools. Although the species is endemic to Kerala, it is very common with wider distribution. These crabs prefer clean and fast flowing waters.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Least Concern (Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Near Threatened, nearly meeting VU B2b(iii)

CITE: None

CMS: None

Population trend in Kerala since 2000: Stable

Geographic location/habitat of sustainable population in Kerala: Ernakulam, Idukki, Kannur, Kollam, Kottayam, Kozhikode, Pathanamthitta, Thiruvananthapuram and Thrissur districts; Thattekad Bird Sanctuary; Malabar Wildlife Sanctuary; Peppara Wildlife Sanctuary; Western Ghats

Geographic location/habitat of threatened population in Kerala: Idukki, Kannur, Kollam, Kottayam, Kozhikode, Pathanamthitta and Thrissur districts; Western Ghats

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats

Since the species prefers clean fast flowing waters and the geographical area of its existence is growing and developing, habitat degradation due to anthropogenic activities and pollution pose threat on these crabs.

Recommended conservation measures in Kerala: Habitat degradation and pollution need to be curtailed in streams where these crabs reside.

Conservation priority area in Kerala: Idukki, Kannur, Kollam, Kottayam, Kozhikode, Pathanamthitta and Thrissur districts; Thattekad Bird Sanctuary; Malabar Wildlife Sanctuary; Peppara Wildlife Sanctuary; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people; tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks

The species is endemic to Kerala but very common and widely distributed in the state. The species is also known from three protected areas of Kerala. The species, however, has been given the status of "Least Concern" in the global IUCN Red List of Threatened Species because of its wide distribution and presumed large population, and the species is unlikely to be declining fast enough. Its extent of occurrence (EOO) is 23791 km², and area of occupancy (AOO) is 84 km². The number of locations for the species in Kerala is 20, which was calculated based on the most likely threat that may affect the currently-unaffected areas in the future and the number of subpopulations in the unaffected areas. The species meets the area requirements under criterion B2 for Vulnerable (AOO < 2,000 km²) and occurs at many more than 10 locations. Also, there is a continuing decline in the extent and quality of its habitat due to habitat degradation and pollution. The species, therefore, qualifies for the "Near Threatened nearly meeting VU B2b(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment

***Oziotelphusa biloba* Bahir & Yeo, 2005**

Taxonomy

Species *Oziotelphusa biloba* Bahir & Yeo, 2005

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Bilobed swamp crab (proposed herein)



Distribution

Global	India only
India	Endemic to Kerala; Western Ghats
Kerala	Kozhikode, Malappuram, Palakkad

and Thrissur districts; Western Ghats

Habitat/ecology

The species dwells in shallow to deep burrows along muddy banks of rice-field embankments. It can be also found underneath the granite fences bordering the paddy fields. Crabs can be seen in large numbers in those habitats.

Conservation status

WPA (1972)	None
IUCN (Global Assessment)	Vulnerable (Esser & Cumberlidge, 2008) [Version 3.1 (2008)]
IUCN (Regional Assessment)	Vulnerable
B1ab(iii)+2ab(iii)	
CITES	None
CMS	None

Population trend in Kerala since 2000: Seems to be stable

Geographic location/habitat of sustainable population in Kerala: Kozhikode, Malappuram, Palakkad and Thrissur districts; Western Ghats

Geographic location/habitat of threatened population in Kerala: Kozhikode, Malappuram, Palakkad and Thrissur districts

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats

No threat is documented. Possible anthropogenic threats include habitat loss/degradation and pesticide pollution.

Recommended conservation measures in Kerala: Pesticide application in paddy fields should be minimized because it has an adverse effect on freshwater crabs.

Conservation priority area in Kerala: Kozhikode, Malappuram, Palakkad and Thrissur districts; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmers

Cultural significance and associated traditional knowledge: Unknown

Remarks

The species is endemic to Kerala but can be seen in large numbers in the known localities. The species is also known from a protected area. Its extent of occurrence (EOO) is 8204 km², and area of occupancy (AOO) is 36 km². The number of locations for the species is 9, which was calculated based on the most likely threat that may affect the currently-unaffected areas in the future and the number of subpopulations in the unaffected areas. There is a continuing decline in the extent and quality of its habitat due to habitat loss/degradation and pesticide pollution. The species, therefore, qualifies for the "Vulnerable B1ab(iii)+2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Ozietelphusa Kerala Bahir & Yeo, 2005

Taxonomy

Species *Ozietelphusa kerala* Bahir & Yeo, 2005

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Kerala swamp crab (proposed herein)



Distribution

Global: India only
India: Endemic to Kerala
Kerala: Kollam district

Habitat/ecology

The species dwells in burrows along rice-field embankments and margins of adjacent streams. Its population size is unknown.

Conservation status

WPA (1972): None
IUCN (Global Assessment): Data Deficient (Cumberlidge, 2008) [Version 3.1 (2008)]
IUCN (Regional Assessment): Data Deficient
CITES: None
CMS: None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable population in Kerala: Kollam district

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented. Possible anthropogenic threats include habitat loss/degradation and pesticide pollution. Also, the species is unknown from any protected areas.

Recommended conservation measures in Kerala:

Pesticide application in paddy fields should be minimized because it has an adverse effect on freshwater crabs.

Conservation priority area in Kerala: Kollam district

BMC responsible for conservation and sustainable utilization: Local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmers

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Kollam district of Kerala and so far known only from few specimens, which were collected from two adjacent localities. Unfortunately, the species is so far not reported from any protected areas. Its population size is unknown. Its extent of occurrence (EOO) is 118 km², and area of occupancy (AOO) is 8 km². The number of locations for the species can not be used because more than half of the species' range is in an unaffected area. Currently, there is no evidence of a continuing decline in the extent and quality of its habitat though the species is likely to face threats from habitat loss/degradation and pesticide pollution. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Oziotelphusa wagrakarowensis (Rathbun, 1904)

Taxonomy

Species *Oziotelphusa wagrakarowensis* (Rathbun, 1904)

Local name (Malayalam): Kochu [for small] njandu (കൊച്ചു നെണ്ടി)

Common name (English): Vajrakarur swamp crab (proposed herein)



Image after Pati et al. (2019b)

Distribution

Global: India only

India: Andhra Pradesh; Karnataka; Kerala; Maharashtra; Western Ghats

Kerala: Wayanad district; Western Ghats only

Habitat/ecology: The species dwells in burrows along rice-field embankments and margins of shallow slow-flowing rocky streams. In Kerala, the species mainly feeds on insects associated with paddy fields (Md. Jafer Palot, personal communication). Its population size is unknown.

Conservation status

WPA (1972)	None
IUCN (Global Assessment) (Esser & Cumberlidge, 2008) [Version 3.1 (2008)]	Vulnerable
IUCN (Regional Assessment) Endangered B2ab(iii)	Critically
CITES	None
CMS	None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable population in Kerala: Wayanad district; Western Ghats

Geographic location/habitat of threatened population in Kerala: Wayanad district; Western Ghats

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented. Possible anthropogenic threats include habitat degradation and pesticide pollution. Also, the species is unknown from any protected areas.

Recommended conservation measures in Kerala: Pesticide application in paddy fields should be minimized because it has an adverse effect on freshwater crabs. Excessive pesticide application also eradicates insects associated with paddy fields. In Kerala, the species primarily feeds on those insects.

Conservation priority area in Kerala: Wayanad district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people; tribal community

Cultural significance and associated traditional knowledge: Tribal people of Wayanad district in Kerala believe crabs of this species controls insect pests of paddy fields by feeding on them (Md. Jafer Palot, personal communication).

Remarks: The species has been given the status of "Vulnerable" in the global IUCN Red List of Threatened Species because it was previously known from two locations with a restricted population. In fact, the species is widely distributed and now known from 27 localities in Andhra Pradesh, Karnataka, Kerala and Maharashtra. All these localities, however, are unprotected. In Kerala, its extent of occurrence (EOO) is 190 km², and area of occupancy (AOO) is 4 km². The number of locations for the species in Kerala is 1, which was calculated based on the most likely threat that may affect the currently-unaffected areas in the future. There is a continuing decline in the extent and quality of its habitat due to habitat loss/degradation and pesticide pollution. The species, therefore, qualifies for the "Critically Endangered B2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Pilarta anuka Bahir & Yeo, 2007

Taxonomy

Species *Pilarta anuka* Bahir & Yeo, 2007

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Small hairy crab (proposed herein)



Distribution

Global: India only

India: Endemic to Kerala; Western Ghats only

Kerala: Endemic to Thiruvananthapuram district; Western Ghats only

Habitat/ecology

The species dwells under small stones in moist soil of dry streams. These crabs can be also found among leaf litters on forest floor. These crabs camouflage in wet soil and leaf litter due to their densely setose ambulatory legs that accumulate sand particles. Its population size is unknown.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Data Deficient

CITES: None

CMS: None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable population in Kerala: Ponmudi in Thiruvananthapuram district; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented.

Recommended conservation measures in Kerala:

No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Ponmudi in Thiruvananthapuram district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Thiruvananthapuram district of Kerala and so far known only from two adjacent localities in the Western Ghats. Both the localities are unprotected. The data on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Pilarta aroma Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017

Taxonomy

Species *Pilarta aroma* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Hairless crab (proposed herein)



Distribution

Global: India only

India: Endemic to Kerala; Western Ghats only

Kerala: Endemic to Thiruvananthapuram district; Western Ghats only

Habitat/ecology: The species dwells underneath cobblestones in highland streams with clear and cold water. These crabs are stenotopic. Its population size is unknown

WPA (1972): None

IUCN (Global Assessment): Not evaluated (IUCN, 2020)

IUCN (Regional Assessment): Data Deficient

CITES: None

CMS: None

Population trend in Kerala since 2000: Unknown
Geographic location/habitat of sustainable population in Kerala: Pongalappara in Thiruvananthapuram district; Agasthyamala Biosphere Reserve; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented.

Recommended conservation measures in Kerala: No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Pongalappara in Thiruvananthapuram district; Agasthyamala Biosphere Reserve; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department

Stakeholders responsible for conservation and sustainable utilization: Tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Thiruvananthapuram district of Kerala and so far known only from the type locality in the Western Ghats. The type locality is a protected area. The data on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

***Pilarta punctatissima* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017**

Species *Pilarta punctatissima* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Punctate crab (proposed herein)



Image after Pati et al. (2017)

Distribution

Global: India only

India: Endemic to Kerala; Western Ghats only

Kerala: Endemic to Ernakulam district; Western Ghats only

Habitat/ecology: The species was reported from a stream flowing across a marshy area in a degraded semi-evergreen forest patch with abundant aquatic vegetation. These crabs can be found in rocky crevices along the course of stream. Its population size appears to be low.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Not evaluated (IUCN, 2020)

IUCN (Regional Assessment): Data Deficient

CITES: None

CMS: None

Population trend in Kerala since 2000: Seems decreasing

Geographic location/habitat of sustainable population in Kerala: Thattekkad Bird Sanctuary in Ernakulam district; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: Although the species was found in a degraded semi-evergreen forest patch of the Thattekkad Bird Sanctuary, the degraded forest may not have direct impact on the species.

Recommended conservation measures in Kerala:

Conservation action should be taken to protect the forest habitats of the Thattekkad Bird Sanctuary.

Conservation priority area in Kerala: Thattekkad Bird Sanctuary in Ernakulam district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department

Stakeholders responsible for conservation and sustainable utilization: Tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Ernakulam district of Kerala and so far known only from the type locality in the Western Ghats. The type locality, however, is a protected area. The population of the species is low and only restricted to the Thattekkad Bird Sanctuary. Its extent of occurrence (EOO) is 308 km², and area of occupancy (AOO) is 8 km². The number of locations for the species can not be used because more than half of the species' range is in an unaffected area. Although the species was found in a degraded forest, there is no evidence of its direct impact on the species. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Snaha aruna Bahir & Yeo, 2007

Taxonomy

Species *Snaha aruna* Bahir & Yeo, 2007

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നാണ്ഡു)

Common name (English): Red smooth crab (proposed herein)



Distribution

Global: India only

India: Endemic to Kerala; Western Ghats only

Kerala: Endemic to Idukki district; Western Ghats only

Habitat/ecology: The species dwells under stones of shallow streamlets. Its population size is unknown.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Esser & Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Data Deficient

CITES: None

CMS: None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable population in Kerala: Nayamakad Tea Estate in Idukki district; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial None

Local consumption None

Poaching None

Pet trade None

Wildlife trade None

Threats: No threat is documented.

Recommended conservation measures in Kerala:

No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Nayamakad Tea Estate in Idukki district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmers; local people

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Idukki district of Kerala and so far known only from the type locality in the Western Ghats. Unfortunately, the type locality is an unprotected area. The data on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

***Spiralothelphusa gibberosa* Pati & Sudha Devi, 2015**

Species *Spiralothelphusa gibberosa* Pati & Sudha Devi, 2015

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Humped swamp crab (proposed herein)



Image after Pati & Sudha Devi (2015b)

Distribution

Global: India only

India: Endemic to Kerala

Kerala: Endemic to Thrissur district

Habitat/ecology: The species dwells in shallow burrows along rice-field bunds and canal embankments. Its population was high at the type locality.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Not evaluated (IUCN, 2020)

IUCN (Regional Assessment): Critically Endangered B2ab(iii)

CITES: None

CMS: None

Population trend in Kerala since 2000: Seems to be stable

Geographic location/habitat of sustainable population in Kerala: Kizhoor near Kunnamkulam in Thrissur district

Geographic location/habitat of threatened population in Kerala: Kizhoor near Kunnamkulam in Thrissur district

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented. Possible anthropogenic threats include pesticide pollution. Also, the species is unknown from any protected areas.

Recommended conservation measures in Kerala: Pesticide application in paddy fields should be minimized because it has an adverse effect on freshwater crabs.

Conservation priority area in Kerala: Kizhoor near Kunnamkulam in Thrissur district

BMC responsible for conservation and sustainable utilization: Local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmers

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Thrissur district of Kerala and so far known only from the type locality. Its population was high at the type locality. Unfortunately, the type locality is an unprotected area. Its extent of occurrence (EOO) is 237 km², and area of occupancy (AOO) is 4 km². The number of locations for the species is 1, which was calculated based on the most likely threat that may affect the currently-unaffected areas in the future. There is a continuing decline in the extent and quality of its habitat due to habitat loss/degradation and pesticide pollution. The species, therefore, qualifies for the "Critically Endangered B2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

***Travancoriana charu* Bahir & Yeo, 2007**

Taxonomy

Species *Travancoriana charu* Bahir & Yeo, 2007

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Beautiful Travancore crab (proposed herein)



Distribution

Global: India only

India: Endemic to Kerala; Western Ghats only

Kerala: Endemic to Thiruvananthapuram district; Western Ghats only

Habitat/ecology: The species dwells under boulders of streamlets in well-shaded area. Its population size is unknown.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Esser & Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Data Deficient

CITES: None

CMS: None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable population in Kerala: Ponmudi in Thiruvananthapuram district; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented.

Recommended conservation measures in Kerala: No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Ponmudi in Thiruvananthapuram district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Thiruvananthapuram district of Kerala and so far known only from the type locality in the Western Ghats. Unfortunately, the type locality is an unprotected area. The data on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Travancoriana convexa (Roux, 1931)

Taxonomy

Species *Travancoriana convexa* (Roux, 1931)

Local name (Malayalam): No specific name; all crabs are locally known as njandu ന്റുണ്ടു)

Common name (English): Convex Travancore crab (proposed herein)



Distribution

Global: India only

India: Karnataka; Kerala; Tamil Nadu; Western Ghats only

Kerala: Idukki, Kollam and Thrissur districts; Western Ghats only

Habitat/ecology: The species mainly dwells under boulders of shallow and small streams. These crabs can be also found in paddy field and muddy canals. Its population size is unknown.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Least Concern (Esser & Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Vulnerable B1ab(iii)+2ab(iii)

CITES: None

CMS: None

Population trend in Kerala since 2000: Stable

Geographic location/habitat of sustainable population in Kerala: Idukki, Kollam and Thrissur districts; Shendurney Wildlife Sanctuary; Periyar Tiger Reserve; Western Ghats

Geographic location/habitat of threatened population in Kerala: Idukki and Thrissur districts; Western Ghats

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented. Possible anthropogenic threats include habitat degradation and pesticide pollution.

Recommended conservation measures in Kerala: Pesticide application in paddy fields should be minimized because it has an adverse effect on freshwater crabs.

Conservation priority area in Kerala: Idukki, Kollam and Thrissur districts; Shendurney Wildlife Sanctuary; Periyar Tiger Reserve; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local

government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmer; local people; tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species has been given the status of "Least Concern" in the global IUCN Red List of Threatened Species because of its wide distribution and presumed large population, and the species is unlikely to be declining fast enough. The species is so far known from nine localities in the Western Ghats of Karnataka, Kerala and Tamil Nadu. In Kerala, its extent of occurrence (EOO) is 6076 km², and area of occupancy (AOO) is 8 km². The number of locations for the species in Kerala is 7, which was calculated based on the most likely threat that may affect the currently-unaaffected areas in the future and the number of subpopulations in the unaffected areas. There is a continuing decline in the extent and quality of its habitat due to habitat loss/degradation and pesticide pollution. The species, therefore, qualifies for the "Vulnerable B1ab(iii)+2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Travancoriana granulata Pati & Sharma, 2013

Taxonomy

Species *Travancoriana granulata* Pati & Sharma, 2013

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നാണ്ടു)

Common name (English): Granular Travancore crab (proposed herein)



Distribution

Global: India only

India: Endemic to Kerala; Western Ghats only

Kerala: Endemic to Idukki district; Western Ghats only

Habitat/ecology: The species is restricted only to the high and isolated mountain plateau (altitude 1708–2472 m) of the Western Ghats in Idukki district of Kerala. These crabs inhabit swampy water bodies and streams in addition to the shola forest. A large population was noticed previously. The species,

however, is not recorded since 1995, and its current population size is unknown.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Not evaluated (IUCN, 2020)

IUCN (Regional Assessment): Data Deficient

CITES: None

CMS: None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable population in Kerala: Eravikulam National Park of Idukki district; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial: None

Local consumption: None

Poaching: None

Pet trade: None

Wildlife trade: None

Threats: The species is found in a protected area, and anthropogenic threats are less likely there. There is nevertheless a long instance of burning of grasslands in the national park for providing food for an endemic herbivorous mammal. The effect of habitat degradation due to burning of grasslands, however, may not have direct impact on this species.

Recommended conservation measures in Kerala:

Management of grasslands in the Eravikulam National Park should be done carefully by considering its impact on other animals, including freshwater crabs.

Conservation priority area in Kerala: Eravikulam National Park of Idukki district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department

Stakeholders responsible for conservation and sustainable utilization: Tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Idukki district of Kerala and so far known only from the Eravikulam National Park in the Western Ghats. Its extent of occurrence (EOO) is 1324 km², and area of occupancy (AOO) is 24 km². The number of locations for the species can not be used because more than half of the species' range is in an unaffected area. Although there is a long instance of burning of grasslands in the national park, there is no evidence of its direct impact on the species. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Travancoriana kuleera Bahir & Yeo, 2007

Taxonomy

Species *Travancoriana kuleera* Bahir & Yeo, 2007

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നണ്ടു)

Common name (English): Small Travancore crab (proposed herein)



Distribution

Global: India only

India: Kerala; Tamil Nadu; Western Ghats only

Kerala: Kozhikode and Malappuram districts; Western Ghats only

Habitat/ecology: The species dwells under small stones of very shallow streams in well-shaded area. Its population size is unknown.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Esser & Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Data Deficient

CITES: None

CMS: None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable population in Kerala: Kozhikode and Malappuram districts; Malabar Wildlife Sanctuary; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented.

Recommended conservation measures in Kerala: No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Kozhikode and Malappuram districts; Malabar Wildlife Sanctuary; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people; tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is known from two localities in Kerala, with sustainable population in Kozhikode and Malappuram districts. One of the localities is within a protected area. Its extent of occurrence (EOO) is 979 km², and area of occupancy (AOO) is 8 km². The data on its population size, population trends, and long-term threats in Kerala are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Travancoriana pollicaris (Alcock, 1909)

Taxonomy

Species *Travancoriana pollicaris* (Alcock, 1909)

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നണ്ടു)

Common name (English): Arch-thumbed Travancore crab (proposed herein)



Distribution

Global: India only

India: Karnataka; Kerala; Tamil Nadu; Western Ghats

Kerala: Kannur, Palakkad and Thiruvananthapuram districts; Western Ghats

Habitat/ecology: The species dwells under boulders of small rocky streams. Its population size is unknown.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Data Deficient

CITES: None

CMS: None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable population in Kerala: Kannur, Palakkad and Thiruvananthapuram districts; Aralam Wildlife Sanctuary; Parambikulam Wildlife Sanctuary; Peppara Wildlife Sanctuary; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented.

Recommended conservation measures in Kerala:

No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Kannur, Palakkad and Thiruvananthapuram districts; Aralam Wildlife Sanctuary; Parambikulam Wildlife Sanctuary; Peppara Wildlife Sanctuary; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is precisely known from three localities in Kerala, with sustainable population in Kannur, Palakkad and Thiruvananthapuram districts. All three localities are within the protected areas. Its extent of occurrence (EOO) is 12489 km², and area of occupancy (AOO) is 12 km². The data on its population size, population trends, and long-term threats in Kerala are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Travancoriana schirnerae Bott, 1969

Taxonomy

Species *Travancoriana schirnerae* Bott, 1969

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Schirner's Travancore crab (proposed herein)



Distribution

Global: India only

India: Karnataka; Kerala; Tamil Nadu; Puducherry Union Territory; Western Ghats

Kerala: Idukki and Thiruvananthapuram districts; Western Ghats

Habitat/ecology: The species dwells under boulders of small rocky streams. These crabs can be also found on wet soil under large boulders in tea gardens. The species are seen in shaded or open areas.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Least Concern (Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Data Deficient

CITES: None

CMS: None

Population trend in Kerala since 2000: Stable

Geographic location/habitat of sustainable population in Kerala: Idukki and Thiruvananthapuram districts; Peppara Wildlife Sanctuary; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented.

Recommended conservation measures in Kerala:

No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Idukki and Thiruvananthapuram districts; Peppara Wildlife Sanctuary; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmers; tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species has been given the status of "Least Concern" in the global IUCN Red List of Threatened Species because of its wide distribution and presumed large population, and the species is unlikely to be declining fast enough. The species seems to be widely distributed and common in South India. In Kerala, its extent of occurrence (EOO) is 5942 km², and area of occupancy (AOO) is 12 km². The data on its population size, population trends, and long-term threats in Kerala are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Vanni ashini Bahir & Yeo, 2007

Taxonomy

Species *Vanni ashini* Bahir & Yeo, 2007

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Discoverer forest crab (proposed herein)



Distribution

Global: India only

India: Endemic to Kerala; Western Ghats only

Kerala: Palakkad and Thiruvananthapuram districts; Western Ghats only

Habitat/ecology: The species dwells under stones in moist soil of dry steam margins in shaded area. The species seems to be uncommon in the type locality and adjacent areas.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Esser & Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Data Deficient

CITES: None

CMS: None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable pop-

ulation in Kerala: Ponmudi in Thiruvananthapuram district; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial None

Local consumption None

Poaching None

Pet trade None

Wildlife trade None

Threats: No threat is documented.

Recommended conservation measures in Kerala:

No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Ponmudi in Thiruvananthapuram district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Kerala and previously known from two localities in the Western Ghats, which are some 240 km apart. One of these localities is in the Nilgiri Biosphere Reserve. The sustainable population of the species only exists at Ponmudi of Thiruvananthapuram district. The data on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Vanni deepa Bahir & Yeo, 2007

Taxonomy

Species *Vanni deepa* Bahir & Yeo, 2007

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Golden forest crab (proposed herein)



Distribution

Global: India only
 India: Endemic to Kerala; Western Ghats only
 Kerala: Endemic to Idukki district; Western Ghats only

Habitat/ecology: The species dwells in moist soil and under stones adjacent to drying streams. Its population size is unknown.

Conservation status

WPA (1972): None
 IUCN (Global Assessment): Data Deficient (Esser & Cumberlidge, 2008) [Version 3.1 (2008)]
 IUCN (Regional Assessment): Data Deficient
 CITES: None
 CMS: None

Population trend in Kerala since 2000: Unknown
 Geographic location/habitat of sustainable population in Kerala: Idukki district; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented.

Recommended conservation measures in Kerala: No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Idukki district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is endemic to Idukki district of Kerala and so far known only from the type locality in the Western Ghats. Unfortunately, the type locality is an unprotected area. The data on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats are insufficient. The species, therefore, qualifies for the

"Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Vanni giri Bahir & Yeo, 2007

Taxonomy

Species *Vanni giri* Bahir & Yeo, 2007

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Highland forest crab (proposed herein)

**Distribution**

Global: India only
 India: Karnataka; Kerala; Western Ghats only
 Kerala: Idukki district; Western Ghats only

Habitat/ecology: The species dwells in moist soil and under stones adjacent to streamlets. Its population size is unknown.

Conservation status

WPA (1972): None
 IUCN (Global Assessment): Data Deficient (Esser & Cumberlidge, 2008) [Version 3.1 (2008)]
 IUCN (Regional Assessment): Data Deficient
 CITES: None
 CMS: None

Population trend in Kerala since 2000: Unknown
Geographic location/habitat of sustainable population in Kerala: Idukki district; Western Ghats
Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented. The species, however, was previously recorded from an unprotected area.

Recommended conservation measures in Kerala: No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Idukki district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is known from one locality in Kerala, with sustainable population in Idukki district. Its extent of occurrence (EOO) is 444 km², and area of occupancy (AOO) is 4 km². The data on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Vanni malabarica (Henderson, 1912)

Taxonomy

Species *Vanni malabarica* (Henderson, 1912)

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Malabar forest crab (proposed herein)



Image after Pati et al. (2014)

Distribution

Global: India only

India: Endemic to Kerala; Western Ghats only

Kerala: Kozhikode, Palakkad and Thrissur districts; Western Ghats only

Habitat/ecology: The species dwells underneath stones along stream margins or inside streams. Large-sized crabs can be found between plant roots along banks of fast flowing streams. The species seems to be common in the known localities.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Vulnerable B1ab(iii)+2ab(iii)

CITES: None

CMS: None

Population trend in Kerala since 2000: Seems to be stable

Geographic location/habitat of sustainable population in Kerala: Kozhikode and Thrissur districts; Chimmini Wildlife Sanctuary; Malabar Wildlife Sanctuary; Peechi-Vazhani Wildlife Sanctuary; Western Ghats

Geographic location/habitat of threatened population in Kerala: Kozhikode and Thrissur districts; Western Ghats

Level of exploitation

Commercial None

Local consumption None

Poaching None

Pet trade None

Wildlife trade None

Threats: No threat is documented. Possible anthropogenic threats include habitat degradation and pollution, especially in the unprotected areas.

Recommended conservation measures in Kerala: Habitat degradation and pollution need to be curtailed in streams where these crabs reside.

Conservation priority area in Kerala: Kozhikode and Thrissur districts; Chimmini Wildlife Sanctuary; Malabar Wildlife Sanctuary; Peechi-Vazhani Wildlife Sanctuary; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people; tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species has been given the status of "Data Deficient" by the IUCN because it was previously known only from the type locality and the absence of information on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats. The species is endemic to Kerala but now known from 9 localities with sustainable populations in 6 localities of Kozhikode and Thrissur districts. Four out of six subpopulations of the species are within three protected areas. Its extent of occurrence (EOO) is 4720 km², and area of occupancy (AOO) is 24 km². The number of locations for the species is 6, which was calculated based on the most likely threat that may affect the currently-unaffected areas in the future and the number of subpopulations in the unaffected areas. There is a continuing decline in the extent and quality of its habitat due to habitat degradation and pollution. The species, therefore, qualifies for the "Vulnerable B1ab(iii)+2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Vanni nilgiriensis (Roux, 1931)

Taxonomy

Species *Vanni nilgiriensis* (Roux, 1931)

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നാണ്ഡു)

Common name (English): Nilgiri forest crab (proposed herein)



Image after Pati et al. (2019b)

Distribution

Global: India only

India: Karnataka; Kerala; Tamil Nadu; Western Ghats only

Kerala: Wayanad district; Western Ghats only

Habitat/ecology: The species dwells under stones or boulders and among leaf litters along stream margins in the forest (P.S. Sujila, personal communication).

Conservation status

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment: Endangered B1ab(iii)+2ab(iii)

CITES: None

CMS: None

Population trend in Kerala since 2000: Seems to be stable

Geographic location/habitat of sustainable population in Kerala: Wayanad district; Western Ghats

Geographic location/habitat of threatened population in Kerala: Wayanad district; Western Ghats.

Level of exploitation

Commercial None

Local consumption None

Poaching None

Pet trade None

Wildlife trade None

Threats: No threat is documented. Possible anthropogenic threats include habitat degradation and pollution.

Recommended conservation measures in Kerala:

Habitat degradation and pollution need to be curtailed in streams where these crabs reside.

Conservation priority area in Kerala: Wayanad district; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is known from two localities in Kerala, with sustainable population in Wayanad district. Its extent of occurrence (EOO) is 190 km², and area of occupancy (AOO) is 8 km². The number of locations for the species is 2, which was calculated based on the most likely threat that may affect the currently-unaffected areas in the future. There is a continuing decline in the extent and quality of its habitat due to habitat degradation and pollution. It is unknown whether the regional population experience any significant immigration of propagules likely to reproduce in the region or not. The species, therefore, qualifies for the "Endangered B1ab(iii)+2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Vanni travancorica (Henderson, 1913)

Taxonomy

Species *Vanni travancorica* (Henderson, 1913)

Local name (Malayalam): No specific name; all crabs are locally known as njandu (ഞണ്ടി)

Common name (English): Travancore forest crab (proposed herein)



Distribution

Global: India only

India: Karnataka; Kerala; Tamil Nadu; Western Ghats only

Kerala: Kollam and Thiruvananthapuram districts; Western Ghats only

Habitat/ecology: The species dwells under leaf litters in shady areas, underneath stones and logs in wet soil, and in shallow burrows along stream margins. The species is very common at the type locality, Ponmudi and adjacent areas.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Esser & Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Data Deficient

CITES: None

CMS: None

Population trend in Kerala since 2000: Seems to be stable

Geographic location/habitat of sustainable population in Kerala: Kollam and Thiruvananthapuram districts; Peppara Wildlife Sanctuary; Shendurney Wildlife Sanctuary; Western Ghats

Geographic location/habitat of threatened population in Kerala: None

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented. More than half of the species' range is in an unaffected area.

Recommended conservation measures in Kerala: No conservation measure is recommended because the data on species' long-term threats are insufficient.

Conservation priority area in Kerala: Kollam and Thiruvananthapuram districts; Peppara Wildlife Sanctuary; Shendurney Wildlife Sanctuary; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local people; tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is known from four localities in Kerala, with sustainable population in Kollam and Thiruvananthapuram districts. Its extent of occurrence (EOO) is 1143 km², and area of occupancy (AOO) is 16 km². The number of locations for the species can not be used because more than half of the species' range is in an unaffected area. The data on its population size, population trends, and long-term threats are insufficient. The species, therefore, qualifies for the "Data Deficient" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Vela carli (Roux, 1931)

Taxonomy

Species *Vela carli* (Roux, 1931)

Local name (Malayalam): Vella [for white] njandu (വെള്ള ഞണ്ടി) or Pal [for milk] njandu (പാൽ ഞണ്ടി)

Common name (English): Carl's marsh crab (proposed herein)



Image after Pati et al. (2014)

Distribution

Global	India only
India only	Kerala; Tamil Nadu; Western Ghats only
Kerala districts;	Kozhikode, Palakkad and Wayanad Western Ghats only

Habitat/ecology

The species was originally collected from a stream pool. These crabs can be also found in burrows along paddy field embankments (Md. Jafer Palot, personal communication).

Conservation status

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Endangered B1ab(iii)+2ab(iii)

CITES: None

CMS: None

Population trend in Kerala since 2000: Unknown

Geographic location/habitat of sustainable population in Kerala: Kozhikode and Wayanad districts; Malabar Wildlife Sanctuary; Western Ghats

Geographic location/habitat of threatened population in Kerala: Wayanad district; Western Ghats

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented. Possible anthropogenic threats include habitat degradation and pesticide pollution.

Recommended conservation measures in Kerala: Habitat degradation and pollution need to be curtailed in streams, which are the only known habitat of the species.

Conservation priority area in Kerala: Kozhikode and Wayanad districts; Malabar Wildlife Sanctuary; Western Ghats

BMC responsible for conservation and sustainable utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmer; local people; tribal community

Cultural significance and associated traditional knowledge: Unknown

Remarks: The species is known from four localities in Kerala, with sustainable population in Kozhikode and Wayanad districts. Its extent of occurrence (EOO) is 1975 km², and area of occupancy (AOO) is 12 km². The number of locations for the species is 3, which was calculated based on the most likely threat that may affect the currently-unaffected areas in the future and the number of subpopulations in the unaffected areas. There is a continuing decline in the extent and quality of its habitat due to habitat degradation and pesticide pollution. It is unknown whether the regional population experience any significant immigration of propagules likely to reproduce in the region or not. The species, therefore, qualifies for the "Endangered B1ab(iii)+2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

Vela virupa Bahir & Yeo, 2007

Taxonomy

Species *Vela virupa* Bahir & Yeo, 2007

Local name (Malayalam): No specific name; all crabs are locally known as njandu (നൊണ്ടി)

Common name (English): Brownish marsh crab (proposed herein)



Distribution

Global: India only

India: Endemic to Kerala; Western Ghats only

Kerala: Endemic to Idukki district; Western Ghats only

Habitat/ecology: The species dwells in deep burrows along paddy field embankments and muddy stream margins at high elevations (1050–1140 m altitude). Its population size is unknown.

Conservation status

WPA (1972): None

IUCN (Global Assessment): Data Deficient (Cumberlidge, 2008) [Version 3.1 (2008)]

IUCN (Regional Assessment): Endangered B1ab(iii)
+2ab(iii)
CITES: None
CMS: None

Population trend in Kerala since 2000: Unknown
Geographic location/habitat of sustainable population in Kerala: Idukki district; Western Ghats
Geographic location/habitat of threatened population in Kerala: Idukki district; Western Ghats

Level of exploitation

Commercial	None
Local consumption	None
Poaching	None
Pet trade	None
Wildlife trade	None

Threats: No threat is documented. Possible anthropogenic threats include habitat degradation and pollution due to increase in human population, industrial development and agrarian development. Recommended conservation measures in Kerala: Habitat degradation and pollution need to be curtailed in streams and paddy fields where these crabs reside.

Conservation priority area in Kerala: Idukki district; Western Ghats

BMC responsible for conservation and sustain-

able utilization: Forest and Wildlife Department; local government bodies (Panchayats)

Stakeholders responsible for conservation and sustainable utilization: Local farmer; local people
Cultural significance and associated traditional knowledge: Unknown

Remarks: The species has been given the status of "Data Deficient" by the IUCN because it is known only from two adjacent localities and the absence of information on its extent of occurrence, ecological requirements, population size, population trends, and long-term threats. The species, however, has a restricted population at a higher elevation of the Western Ghats in Idukki district of Kerala. Both the known locations are unprotected areas. Rapid increase in human population and industrial or agrarian development pose most likely threat in future. Its extent of occurrence (EOO) is 415 km², and area of occupancy (AOO) is 8 km². The number of locations for the species is 2, which was calculated based on the most likely threat that may affect the currently-unaffected areas in the future. There is a continuing decline in the extent and quality of its habitat due to habitat degradation and pollution. The species, therefore, qualifies for the "Endangered B1ab(iii)+2ab(iii)" category as per the recommended criteria and guidelines for the Regional IUCN Red List Assessment.

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NON-MARINE MOLLUSCA



By
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Introduction

Non-marine molluscs include both freshwater as well as terrestrial (=land) molluscs. They are inhabitants of almost all kind of terrestrial and freshwater habitats. Majority of the diversity is found in the terrestrial molluscs compared to freshwater molluscs. The Western Ghats hotspot has nearly 300 species and subspecies of terrestrial molluscs and around 65 species of freshwater molluscs. Much of the diversity occurs in the southern parts of the Ghats (below 12°N).

The assessment for IUCN red list has been carried out only for freshwater molluscs of India. Of the 200 and odd species of freshwater molluscs of India, only nine species are threatened (four species are Endangered and five species are Vulnerable). None of the terrestrial snails were assessed till data. Hence the status of terrestrial snails is unknown.

A very few studies from Kerala on non-marine molluscs, most of which are concentrated on the listing of the species in a given habitat or random collection from different places. There are no systematic studies that looked at the population changes, distribu-

tion patterns and threats for both freshwater as well as for terrestrial molluscs of the Western Ghats in general and Kerala in particular. The Kerala state has 68 terrestrial snails and 28 freshwater molluscs. Of the 28 freshwater molluscs, 21 species of freshwater molluscs are Gastropods and seven species are bivalves. Of the 96 species of non-marine molluscs, 75 species are endemic to Kerala state and most of the endemism occurs in terrestrial snails. None of the freshwater molluscs reported from Kerala are threatened and none of the species are either listed in WPA or in the CITIES.

Assessment

Draft assessment was carried out based on the available literature and from the field surveys of the author. Based on this, I classify *Corilla anax* (Benson 1865) as Endangered. This species was reported first from "Hills near Kottayam", but I failed to locate any population in that area. The habitat loss is the main threat to this species. This species is seen in Valparai plateau with good numbers. Hence categorized as Endangered. The two species *Beddomea calcadensis* (Blanford 1870), *Apatetes bourdilloni* (Theobald

1876) has been classified as Near Threatened due to the loss of Evergreen forests in southern part of Kerala, where this species is exclusively found. Among 28 freshwater molluscs, five are Data Deficient and 23 are Least Concern. Many species are known only from a few localities.

Conclusion

Only one species is provisionally assigned to threatened (Endangered) category based on the available data. Most of the freshwater molluscs are either common or the status is unknown. More intensive survey is required to assess the distribution range, threats and population trends. A few freshwater molluscs are edible, they are *Lamellidens corrianus* (Lea, 1834), *Lamellidens marginalis* (Lamarck, 1819), *Corbicula striatella* Deshayes, 1854 and *Villorita cyprinoides* (Gray, 1825). Among these *Villorita cyprinoides* is collected/harvested from wild population in large quantities from Vembanad lake. This species deserve to be mentioned in the list. The complete list of non-marine molluscs of Kerala state is given in the table

REDLIST ASSESSMENT

Endangered



Corilla anax (Benson 1865)

(Family Corillidae)

This species is the sole member of the genus Corilla in India. There are about 10 species in the same genus from Sri Lanka. This species inhabits forest floor with thick litter and high moisture in the evergreen forests of Kerala and Tamil Nadu. The type locality is "Mavillicuray" in the

"Travancore hills as per Benson. Several attempts to find this species in and around this region were unsuccessful. There is a good population thriving in Valparai. The threats to this species is habitat loss *Beddomea calca-densis* (Blanford 1870) (Family Camaenidae)

This species is reported from Kalakkad in Tamil Nadu and from base of Ponmudi, near Trivandrum in Kerala. They are semi arboreal species found on shrubs and herbs in highly shaded part of Evergreen forests. The threats to this species is habitat loss

Near Threatened

Apatetes bourdilloni (Theobald 1876)

(Family Camaenidae)

This species is reported from base of Ponmudi, near Trivandrum in Kerala. They are semi arboreal species found on shrubs and herbs in highly shaded part of Evergreen forests. Nothing else is known for this species. The threats to this species is habitat loss.

Table 1: The complete list of non-marine molluscs of Kerala assessed for its conservation status for Kerala Biodiversity Board. *indicates draft assessment for land snails for KBA

Family	Genus	IUCN	Kerala*	Priority
Terrestrial molluscs		NA	DD	
Streptaxidae	<i>Streptaxis footei</i> W. & H. Blanford 1860	NA	DD	
Streptaxidae	<i>Streptaxis watsoni</i> W. & H. Blanford 1860	NA	DD	
Streptaxidae	<i>Streptaxis beddomii</i> Blanford 1899	NA	DD	
Streptaxidae	<i>Streptaxis personatus</i> Blanford 1880	NA	DD	
Streptaxidae	<i>Huttonella bicolor</i> (Hutton 1834)	Invasive	Invasive	Low
Ariophantidae	<i>Ariophanta thyreus</i> Benson 1852	NA	DD	
Ariophantidae	<i>Ariophanta belangeri</i> Desh. 1834	NA	DD	
Ariophantidae	<i>Ariophanta basilessa</i> (Blanford, 1880)	NA	DD	
Ariophantidae	<i>Ariophanta basileus</i> (Benson, 1861)	NA	DD	
Ariophantidae	<i>Ariophanta beddomii</i> Blanford 1874	NA	DD	
Ariophantidae	<i>Ariophanta grassii</i> Blanford 1901	NA	DD	
Ariophantidae	<i>Indrella ampulla</i> Godwin-Austen, 1901	NA	DD	
Ariophantidae	<i>Euplecta semidecussata</i> Pfeiffer, 1851	NA	LC	
Ariophantidae	<i>Euplecta subcastor</i> Beddome, 1891	NA	DD	
Ariophantidae	<i>Euplecta travancorica</i> Benson, 1865	NA	DD	
Ariophantidae	<i>Euplecta indica</i> Pfeiffer, 1846	NA	LC	
Ariophantidae	<i>Euplecta acuducta</i> Benson 1850	NA	DD	
Ariophantidae	<i>Euplecta ? orbiates</i> Blanford 1901	NA	DD	
Ariophantidae	<i>Macrochlamys indica</i> Benson 1832	NA	LC	
Ariophantidae	<i>Macrochlamys ? woodiana</i> Pfeiffer 1851	NA	DD	
Ariophantidae	<i>Macrochlamys ? vallicola</i> Pfeiffer, 1854	NA	DD	
Ariophantidae	<i>Macrochlamys ? prava</i> Blanford, 1904	NA	DD	
Helicarionidae	<i>Mariaella dussumieri</i> Gray 1855	NA	LC	
Helicarionidae	<i>Mariaella beddomei</i> Godwin-Austen, 1888	NA	DD	
Helicarionidae	<i>Pseudaustenia atra</i> Godwin-Austen, 1888	NA	DD	

Cerastidae	<i>Rachisellus pulcher</i> (Gray 1825)	NA	DD	
Subulinidae	<i>Glessula tornensis</i> Blanford 1870	NA	DD	
Subulinidae	<i>Glessula textilis</i> (Blanford 1866)	NA	DD	
Subulinidae	<i>Glessula subserena</i> Beddome 1906	NA	DD	
Subulinidae	<i>Glessula senator</i> (Hanley 1875)	NA	DD	
Subulinidae	<i>Glessula subperrotteti</i> Beddome 1906	NA	DD	
Subulinidae	<i>Glessula anamullica</i> (Blanford 1866)	NA	DD	
Subulinidae	<i>Glessula subinornata</i> Beddome 1906	NA	DD	
Subulinidae	<i>Glessula travancorica</i> Gude 1914	NA	DD	
Subulinidae	<i>Glessula malabarica</i> Gude 1914	NA	DD	
Subulinidae	<i>Glessula filosa</i> Blanford 1870	NA	DD	
Cyclophoridae	<i>Craspedotropis bilirata</i> (Beddome 1875)	NA	DD	
Cyclophoridae	<i>Micralaux scabra</i> Theobald 1876	NA	DD	
Cyclophoridae	<i>Ditropis beddomei</i> (Blanford 1869)	NA	LC	
Cyclophoridae	<i>Ditropis convexa</i> (Blanford 1869)	NA	DD	
Cyclophoridae	<i>Ditropis planorbis</i> (Blanford 1869)	NA	DD	
Cyclophoridae	<i>Cyclophorus nilagiricus</i> (Besnson 1852)	NA	DD	
Cyclophoridae	<i>Pterocyclus pseudocumingi</i> Möllendorff 1897	NA	DD	
Cyclophoridae	<i>Pearsonia travancorica</i> (Blanford 1880)	NA	DD	
Cyclophoridae	<i>Cyathopoma latilabre</i> Beddome 1875	NA	DD	
Cyclophoridae	<i>Cyathopoma travancoricum</i> Beddome 1875	NA	DD	
Cyclophoridae	<i>Cyathopoma wynaadense</i> Blanford 1868	NA	DD	
Cyclophoridae	<i>Cyathopoma procerum</i> Blanford 1868	NA	DD	
Cyclophoridae	<i>Mychopoma hirsutum</i> Blanford 1869	NA	DD	
Cyclophoridae	<i>Dicharax footei</i> (Blanford 1861)	NA	DD	
Cyclophoridae	<i>Nicida nitidula</i> (Blanford 1868)	NA	DD	
Cyclophoridae	<i>Opisthostoma macrostoma</i> Blanford 1869	NA	DD	
Cyclophoridae	<i>Cyclotopsis subdiscoidea</i> (Sowerby 1850)	NA	DD	
Achatinidae	<i>Lissachatina fulica</i> (Férussac, 1821)	Invasive	Invasive	Low
Verocinidae	<i>Laevicaulis alte</i> (Férussac, 1822)	Invasive	Invasive	Low
Freshwater molluscs				

Paludomindae	<i>Paludomus transchauricus</i> (Gmelin, 1771)	LC	LC	Moderate
Paludomindae	<i>Paludomus sulcatus</i> Reeve, 1847	LC	LC	Moderate
Paludomindae	<i>Paludomus stomatodon</i> Benson, 1862	LC	LC	Moderate
Lynimidae	<i>Radix rufescens</i> (Lamarck, 1822)	LC	LC	Low
Lynimidae	<i>Racesina luteola</i> (Lamarck, 1822)	LC	LC	Low
Ancyclidae	<i>Ferrissia tenuis</i> (Bourguignat, 1862).	LC	LC	Low
Ancyclidae	<i>Ferrissia verruca</i> (Benson, 1855).	LC	LC	Low
Planorbidae	<i>Indoplanorbis exustus</i> (Desbayes, 1834).	LC	LC	Low
Planorbidae	<i>Gyraulus convexiusculus</i> (Hutton, 1849)	LC	LC	Low
Unionidae	<i>Lamellidens consobrinus</i> (Lea, 1859)	LC	LC	Moderate
Unionidae	<i>Lamellidens corrianus</i> (Lea, 1834)	LC	LC	Moderate
Unionidae	<i>Lamellidens marginalis</i> (Lamarck, 1819)	LC	LC	Moderate
Corbiculidae	<i>Corbicula annandalei</i> Prashad, 1928	LC	LC	Moderate
Corbiculidae	<i>Corbicula striatella</i> Deshayes, 1854.	LC	LC	Moderate
Corbiculidae	<i>Villorita cyprinoides</i> (Gray, 1825)	LC	LC	High

Checklist of species

Checklist of Terrestrial mammals of Kerala

Order/Family Species	Common Name
Order: Proboscidea	
Family Elephantidae	
1. <i>Elephas maximus</i> (Linnaeus, 1758)	Asian Elephant (Indian Elephant)
Order: Scandentia	
Family Tupaiidae	
2. <i>Anathana ellioti</i> (Waterhouse, 1850)	Madras Treeshrew (South Indian Treeshrew)
Order: Primates	
Family Lorisidae	
3. <i>Loris hydekkerianus</i> (Cabrera, 1908)	Gray Slender Loris (Grey Slender Loris)
Family Cercopithecidae	
4. <i>Macaca radiata</i> (E. Geoffroy, 1812)	Bonnet Macaque
5. <i>Macaca silenus</i> (Linnaeus, 1758)	Lion-tailed Macaque
6. <i>Semnopithecus hypoleucos</i> (Blyth, 1841)	Black-footed Gray Langur (Black footed Gray Langur, Malabar sacred Langur)
7. <i>Semnopithecus johnii</i> (J. Fischer, 1829)	Nilgiri Langur
8. <i>Semnopithecus priam</i> (Blyth, 1844)	Tufted Gray Langur (Tufted Gray Langur, Coromandel Sacred Langur)
Order: Rodentia	
Family Sciuridae	
9. <i>Ratufa indica</i> (Erxleben, 1777)	Malabar Giant Squirrel (Indian Giant Squirrel)
10. <i>Ratufa macroura</i> (Pennant, 1769)	Grizzled Giant Squirrel (Sri Lankan Giant Squirrel)
11. <i>Petaurista philippensis</i> (Elliot, 1839)	Indian Giant Flying Squirrel (Large Brown Flying Squirrel)
12. <i>Petinomys fuscocapillus</i> (Jerdon, 1847)	Travancore Flying squirrel
13. <i>Funambulus palmarum</i> (Linnaeus, 1766)	Three-striped Palm Squirrel (Indian Palm Squirrel)
14. <i>Funambulus sublineatus</i> (Waterhouse, 1838)	Nilgiri Palm Squirrel
15. <i>Funambulus tristriatus</i> (Waterhouse, 1837)	Jungle Palm Squirrel (Western Ghats Stripped Squirrel)
Family Platacanthomyidae	
16. <i>Platacanthomys lasiurus</i> (Blyth, 1859)	Spiny Tree Mouse (Spiny Dormouse)
Family Muridae	

17. *Bandicota bengalensis* (Gray, 1835, in 1830-1835) Lesser Bandicoot-rat (Indian mole-rat)
18. *Bandicota indica* (Bechstein, 1800) Greater Bandicoot-rat
19. *Golunda ellioti* (Gray, 1837) Indian Bush Rat
20. *Madromys blanfordi* (Thomas, 1881) Blanford's Madromys (White-tailed Wood-rat)
21. *Mus booduga* (Gray, 1837) Little Indian Field Mouse
22. *Mus famulus* (Bonhote, 1898) Bonhote's Mouse (Servant Mouse)
23. *Mus musculus* (Linnaeus, 1758) House Mouse
24. *Mus platythrix* (Bennett, 1832) Brown Spiny Mouse (Flat haired Mouse)
25. *Rattus norvegicus* (Berkenhout, 1769) Brown Rat
26. *Rattus ranjinae* (Agarwal & Ghosal, 1969) Ranjini's Field Rat (Kerala Rat)
27. *Rattus rattus* (Linnaeus, 1758) House Rat (Roof Rat)
28. *Rattus satarae* (Hinton, 1918) Sahyadris Forest Rat
29. *Tatera indica* (Hardwicke, 1807) Indian Gerbil
30. *Vandeleuria nilagirica* (Jerdon, 1867) Nilgiri Vandeleuria (Nilgiri Long tailed Tree Mouse)
- Family Hystricidae**
31. *Hystrix indica* (Kerr, 1792) Indian Crested Porcupine
- Order: Lagomorpha**
- Family Leporidae**
32. *Lepus nigricollis* (F. Cuvier, 1823) Black-naped Hare (Indian Hare)
- Order: Erinaceomorpha**
- Family Erinaceidae**
33. *Paraechinus nudiventris* (Horsfield, 1851) Bare-bellied Hedgehog (Madras Hedgehog)
- Order: Soricomorpha**
- Family Soricidae**
34. *Feroculus feroculus* (Kelaart, 1850) Kelaart's Long-clawed Shrew
35. *Suncus dayi* (Dobson, 1888) Day's Shrew
36. *Suncus murinus* (Linnaeus, 1766) House Shrew (Gray Musk Shrew)
37. *Suncus niger* (Horsfield, 1851) Hill Shrew (Indian Highland Shrew)
38. *Suncus etruscus* (Savi, 1822) Pygmy White-toothed Shrew
- Order: Chiroptera**
- Family Pteropodidae**
39. *Cynopterus brachyotis* (Muller, 1838) Lesser Dog-faced Fruit Bat
40. *Cynopterus sphinx* (Vahl, 1797) Short-nosed Fruit Bat (Greater Short-nosed Fruit Bat)
41. *Eonycteris spelaea* (Dobson, 1871) Dawn Bat (Lesser Dawn Bat)
42. *Pteropus giganteus* (Brunnich, 1782) Indian Flying Fox
43. *Rousettus leschenaultia* (Desmarest, 1820) Fulvous Fruit Bat (Leschenault's Rousette)

Family Emballonuridae44. *Saccolaimus saccolaimus* (Temminck, 1838)

Pouch-bearing Bat (Naked-rumped Pouch Bat)

45. *Taphozous melanopogon* (Temminck, 1841)

Bearded Sheath-tailed Bat (Black-bearded Tomb Bat)

46. *Taphozous longimanus* (Hardwicke, 1825)

Long-armed Sheath-tailed Bat (Long-winged Tomb Bat)

Family Megadermatidae47. *Megaderma Lyra* (E. Geoffroy, 1810)

Greater False-vampire Bat

48. *Megaderma spasma* (Linnaeus, 1758)

Lesser False-vampire Bat

Family Rhinolophidae49. *Rhinolophus beddomei* (Andersen, 1905)

Lesser Woolly Horseshoe Bat (Beddomme's Horseshoe Bat)

50. *Rhinolophus lepidus* (Blyth, 1844)

Blyth's Horseshoe Bat

51. *Rhinolophus pusillus* (Temminck, 1834)

Least Horseshoe Bat

52. *Rhinolophus rouxii* (Temminck, 1835)

Rufous Horseshoe Bat

Family Hipposideridae53. *Hipposideros ater* (Templeton, 1848)

Dusky Leaf-nosed Bat

54. *Hipposideros fulvus* (Gray, 1838)

Fulvus Leaf-nosed Bat

55. *Hipposideros speoris* (Schneider, 1800)

Schneider's Leaf-nosed Bat

56. *Hipposideros galeritus* Cantor, 1846

Cantor's leaf-nosed Bat

57. *Hipposideros Pomona* Anderson, 1918

Anderson's leaf-nosed Bat

Family Molossidae58. *Tadarida aegyptiaca* (E. Geoffroy, 1818)

Egyptian Free-tailed Bat

Family Rhinopomatidae59. *Rhinopoma hardwickii* Gray, 1831

Lesser Mouse-tailed Bat

Family Vespertilionidae60. *Harpiocephalus harpia* (Temminck, 1840)

Hairy-winged Bat (Lesser Hairy-winged Bat)

61. *Kerivoula picta* (Pallas, 1767)

Painted Bat (Painted Woolly Bat)

62. *Myotis horsfieldii* (Temminck, 1840)

Horsfield's Mouse-eared Bat (Horsfield's Myotis)

63. *Myotis peytoni* Wroughton and Riley, 1913

Peyton's Whiskered Bat

64. *Falsistrellus affinis* (Dobson, 1871)

Chocolate Bat

65. *Pipistrellus ceylonicus* (Kelaart, 1852)

Kelaart's Pipistrelle

66. *Pipistrellus tenuis* (Temminck, 1840)

Least Pipistrelle

67. *Scotozous dormeri* (Dobson, 1875)

Dormer's Bat

68. *Scotophilus heathii* (Horsfield, 1831)

Greater Asiatic Yellow House Bat

69. *Scotophilus kublii* (Leach, 1821)

Lesser Asiatic Yellow Bat

70. *Tylonycteris pachypus* (Temminck, 1840)

Bamboo Bat

Family Miniopteridae71. *Miniopterus fuliginosus* Hodgson, 1835

Eastern Bentwing Bat

Order: Pholidota**Family Manidae**72. *Manis crassicaudata* (E. Geoffroy, 1803)

Indian Pangolin

Order: Carnivora**Family Canidae**

73. *Vulpes bengalensis* (Shaw, 1800)
74. *Canis aureus* (Linnaeus, 1758)
75. *Cuon alpinus* (Pallas, 1811)

Bengal Fox
Golden Jackal
Indian Wild Dog (Dhole)

Family Ursidae

76. *Melursus ursinus* (Shaw, 1791)

Sloth Bear

Family Mustelidae

77. *Martes gwatkinsi* (Horsfield, 1851)
78. *Aonyx cinerea* (Illiger, 1815)

79. *Lutrogale perspicillata* (I. Geoffroy Saint-Hilaire, 1826)

Nilgiri Marten
Asian Small-clawed Otter
(Clawless Otter)
Smooth-coated Otter (Indian
Smooth –coated Otter)

Family Viverridae

80. *Viverra civettina* Blyth, 1862
81. *Viverricula indica* (E. Geoffroy Saint-Hilaire, 1818)
82. *Paradoxurus hermaphroditus* (Pallas, 1777)
83. *Paradoxurus jerdoni* (Blanford, 1885)

Malabar Civet
Small Indian Civet
Common Palm Civet (Toddy Cat)
Brown Palm Civet (Jerdon's Palm
Civet)

Family Herpestidae

84. *Herpestes fuscus* (Gray, 1837)
85. *Herpestes edwardsii* (E. Geoffroy Saint-Hilaire, 1818)
86. *Herpestes smithii* (Gray, 1837)
87. *Herpestes vitticollis* (Bennet, 1835)

Brown Mongoose
Indian Gray Mongoose
Ruddy Mongooses
Stripe-necked Mongoose

Family Felidae

88. *Felis chaus* (Schreber, 1777)
89. *Prionailurus bengalensis* (Kerr, 1792)
90. *Prionailurus rubiginosus* (I. Geoffroy Saint-Hilaire, 1831)
91. *Prionailurus viverrinus* (Bennett, 1833)
92. *Panthera pardus* (Linnaeus, 1758)
93. *Panthera tigris* (Linnaeus, 1758)

Jungle Cat
Leopard Cat
Rusty-spotted Cat
Fishing Cat
Leopard
Tiger

Order: Artiodactyla**Family Suidae**

94. *Sus scrofa* (Linnaeus, 1758)

Wild Boar (Wild Pig)

Family Tragulidae

95. *Moschiola indica* (Gray, 1852)

Indian Chevrotain (Mouse Deer)

Family Cervidae

96. *Axis axis* (Erxleben, 1777)
97. *Muntiacus muntjak* (Zimmermann, 1780)
98. *Rusa unicolor* (Kerr, 1792)

Spotted Deer (Chital)
Barking Deer (Indian Muntjac)
Sambar Deer

Family Bovidae

99. *Bos gaurus* (Smith, 1827)
100. *Tetracerus quadricornis* (de Blainville, 1816)
(Chousingha)
101. *Nilgiritragus hylocrius* (Ogilby, 1838)

Gaur (Indian Gaur)
Four-horned Antelope

Nilgiri Tahr

Checklist of birds of Kerala

Order/Family Species	Common Name
Order: Anseriformes	
Family Anatidae	
1. <i>Dendrocygna javanica</i> (Horsfield, 1821)	Lesser Whistling Duck
2. <i>Anser indicus</i> (Latham, 1790)	Bar-headed Goose
3. <i>Tadorna ferruginea</i> (Pallas, 1764)	Ruddy Shelduck
4. <i>Aythya nyroca</i> (Guldenstadt, 1770)	Ferruginous Duck
5. <i>Aythya fuligula</i> (Linnaeus, 1758)	Tufted Duck
6. <i>Spatula querquedula</i> (Linnaeus, 1758)	Garganey
7. <i>Spatula chipeata</i> (Linnaeus, 1758)	Northern Shoveler
8. <i>Mareca strepera</i> (Linnaeus, 1758)	Gadwall
9. <i>Mareca Penelope</i> (Linnaeus, 1758)	Eurasian Wigeon
10. <i>Anas poecilorhyncha</i> (Forster, JR, 1781)	Indian Spot-billed Duck
11. <i>Anas acuta</i> (Linnaeus, 1758)	Northern Pintail
12. <i>Anas crecca</i> (Linnaeus, 1758)	Common Teal (Eurasian Teal, Green-winged Teal)
13. <i>Sarkidiornis melanotos</i> (Pennant, 1769)	Comb Duck (Knob-billed Duck)
14. <i>Nettapus coromandelianus</i> (Gmelin, JF, 1789)	Cotton Teal (Cotton Pygmy- Goose)
Order: Galliformes	
Family Phasianidae	
15. <i>Pavo cristatus</i> (Linnaeus, 1758)	Indian Peafowl
16. <i>Coturnix coromandelica</i> (Gmelin, JF, 1789)	Rain Quail
17. <i>Perdica asiatica</i> (Latham, 1790)	Jungle Bush Quail
18. <i>Perdica erythrorhyncha</i> (Sykes, 1832)	Painted Bush Quail
19. <i>Francolinus pondicerianus</i> (Gmelin, JF, 1789)	Gray Francolin
20. <i>Gallus sonneratii</i> (Temminck, 1813)	Gray Junglefowl
21. <i>Galloperdix lunulata</i> (Gmelin, JF, 1789)	Red Spurfowl
22. <i>Galloperdix lunulata</i> (Valenciennes, 1825)	Painted Spurfowl
Order: Phoenicopteriformes	
Family Phoenicopteridae	
23. <i>Phoenicopterus roseus</i> (Pallas, 1811)	Greater Flamingo
Family Podicipedidae	
24. <i>Tachybaptus ruficollis</i> (Pallas, 1764)	Little Grebe
Order: Columbiformes	
Family Columbidae	
25. <i>Columba livia</i> (Gmelin, JF, 1789)	Rock Pigeon (Rock Dove)
26. <i>Columba elphinstonii</i> (Sykes, 1832)	Nilgiri Wood Pigeon
27. <i>Streptopelia orientalis</i> (Latham, 1790)	Oriental Turtle Dove
28. <i>Streptopelia decaocto</i> (Frisvaldszky, 1838)	Eurasian Collared Dove

29. *Streptopelia tranquebarica* (Hermann, 1804) Red Collared Dove (Red Turtle Dove)
30. *Streptopelia chinensis* (Scopoli, 1786) Spotted Dove
31. *Streptopelia senegalensis* (Linnaeus, 1766) Laughing Dove
32. *Treron bicinctus* (Jerdon, 1840) Orange-breasted Green Pigeon
33. *Treron pompadora* (Gmelin, 1789) Pompadour Green Pigeon (Gray-fronted Green Pigeon)
34. *Treron phoenicopterus* (Latham, 1790) Yellow-legged Green Pigeon (Yellow-footed Green Pigeon)
35. *Chalcophaps indica* (Linnaeus, 1758) Emerald Dove
36. *Ducula aenea* (Linnaeus, 1766) Green Imperial Pigeon
37. *Ducula badia* (Raffles, 1822) Mountain Imperial pigeon (Nilgiri Imperial Pigeon)

Order: Pterocliiformes

Family Pteroclididae

38. *Pterocles exustus* (Temminck, 1825) Chestnut-bellied Sandgrouse

Order: Phaethontiformes

Family Phaethontidae

39. *Phaethon aethereus* (Linnaeus, 1758) Red-billed Tropicbird
40. *Phaethon lepturus* (Daudin, 1802) White-tailed Tropicbird

Order: Caprimulgiformes

Family Podargidae

41. *Batrachostomus moniliger* (Blyth, 1849) Sri Lanka Frogmouth

Family Caprimulgidae

42. *Lyncornis macrotis* (Vigors, 1831) Great Eared Nightjar
43. *Caprimulgus indicus* (Latham, 1790) Gray Nightjar (Jungle Nightjar)
44. *Caprimulgus atripennis* (Jerdon, 1845) Jerdon's Nightjar
45. *Caprimulgus asiaticus* (Latham, 1790) Indian Nightjar
46. *Caprimulgus affinis* (Horsfield, 1821) Savanna Nightjar

Family Apodidae

47. *Hemiprocne coronate* (Tickell, 1833) Crested Treeswift
48. *Zoonavena sylvatica* (Tickell, 1846) White-rumped Spinetail (White-rumped Needletail)
49. *Hirundapus giganteus* (Temminck, 1825) Brown-backed Needletail
50. *Aerodramus unicolor* (Jerdon, 1840) Indian Swiftlet
51. *Cypsiurus balasiensis* (Gray, JE, 1829) Asian Palm Swift
52. *Tachymarptis melba* (Linnaeus, 1758) Alpine Swift
53. *Apus pacificus* (Blyth, 1845) Pacific Swift (Blyth's Swift)
54. *Apus affinis* (Gray, JE, 1830) Indian House Swift (Little Swift)
55. *Apus apus* (Linnaeus, 1758) Common Swift

Order: Cuculiformes

Family Cuculidae

56. *Centropus sinensis* (Stephensm, 1815) Greater Coucal

57. *Centropus bengalensis* (Gmelin, JF, 1788)
 58. *Taccocua leschenaultii* (Lesson, 1830)
 59. *Phaenicophaeus viridirostris* (Jerdon, 1840)
 60. *Clamator jacobinus* (Boddaert, 1783)
61. *Clamator coramandus* (Linnaeus, 1766)
 62. *Eudynamis scolopaceus* (Linnaeus, 1758)
 63. *Cocomantis sonneratii* (Latham, 1790)
 64. *Cocomantis passerinus* (Vahl, 1797)
 65. *Surniculus lugubris* (Horsfield, 1821)
66. *Hierococcyx sparverioides* (Vigors, 1832)
 67. *Hierococcyx varius* (Vahl, 1797)
 68. *Cuculus micropterus* (Gould, 1838)
 69. *Cuculus canorus* (Linnaeus, 1758)
 70. *Cuculus poliocephalus* (Latham, 1790)
- Order: Gruiformes**
Family Rallidae
71. *Rallina eurizonoides* (Lafresnaye, 1845)
 72. *Lewinia striata* (Linnaeus, 1766)
 73. *Zapornia fusca* (Linnaeus, 1766)
 74. *Zapornia pusilla* (Pallas, 1776)
 75. *Amaurornis phoenicurus* (Pennant)
 76. *Gallicrex cinerea* (Gmelin, JF, 1789)
 77. *Porphyrio porphyrio* (Linnaeus, 1758)
78. *Gallinula chloropus* (Linnaeus, 1758)
79. *Fulica atra* (Linnaeus, 1758)
- Order: Otidiformes**
Family Otidiae
80. *Syphéotides inidcus* (Miller, JF, 1782)
 81. *Chlamydotis macqueenii* (Gray, JE, 1832)
 Houbara)
- Order: Procellariiformes**
Family Oceanitidae
82. *Oceanites oceanicus* (Kuhl, 1820)
 83. *Pelagodroma marina* (Latham, 1790)
 84. *Hydrobates monorhis* (Swinhoe, 1867)
- Family Procellariidae**
85. *Ardenna pacifica* (Gmelin, JF, 1789)
 86. *Ardenna tenuirostris* (Temminck, 1835)
 87. *Ardenna careipes* (Gould, 1844)
 88. *Calonectris leucomelas* (Temminck, 1836)
- Lesser Coucal
 Sirkeer Malkoha
 Blue-faced Malkoha
 Pied Cuckoo (Pied Crested Cuckoo, Jacobian Cuckoo)
 Chestnut-winged Cuckoo
 Asian Quail
 Banded Bay Cuckoo
 Gray-bellied Cuckoo
 Drongo Cuckoo (Fork-tailed Drongo Cuckoo)⁷
 Large Hawk Cuckoo
 Common Hawk Cuckoo
 Indian Cuckoo
 Common Cuckoo
 Lesser Cuckoo
- Slaty-legged Crake
 Slaty-breasted Rail
 Ruddy-breasted Crake
 Bailon's Crake
 White-breasted Waterhen
 Watercock
 Purple Swamphen (Gray-headed swamphen)
 Common Moorhen (Eurasian Moorhen)
 Common Coot (Eurasian Coot)
- Lesser Florican
 Macqueen's Bustard (Asian
- Wilson's Strom-petrel
 White-faced Strom-petrel
 Swinhoe's Strom-petrel
- Wedge-tailed Shearwater
 Short-tailed Shearwater
 Flesh-footed Shearwater
 Streaked Shearwater

89. *Calonectris borealis* (Cory, 1881) Cory's Shearwater
 90. *Puffinus bailloni* (Bonaparte, 1857) Tropical Shearwater
 91. *Bulweria fallax* (Jouanin, 1955) Jouanin's petrel
- Order: Pelecaniformes**
- Family Ciconiidae**
92. *Leptoptilos javanicus* (Horsfield, 1821) Lesser Adjutant
 93. *Mycteria leucocephala* (Pennant, 1769) Painted Stork
 94. *Anastomus oscitans* (Boddaert, 1783) Asian Openbill
 95. *Ciconia nigra* (Linnaeus, 1758) Black Stork
 96. *Ciconia episcopus* (Boddaert, 1783) Woolly-necked Stork (Asian Woollyneck)
 97. *Ciconia ciconia* (Linnaeus, 1758) European White Stork
- Family Ardeidae**
98. *Pelecanus onocrotalus* (Linnaeus, 1758) Great White Pelican
 99. *Pelecanus philippensis* (Gmelin, JF, 1789) Spot-billed Pelican
- Family Ardeidae**
100. *Botaurus stellaris* (Linnaeus, 1758) Eurasian Bittern (Great Bittern)
 101. *Lxobrychus minutus* (Linnaeus, 1766) Little Bittern
 102. *Lxobrychus sinensis* (Gmelin, JF, 1789) Yellow Bittern
 103. *Lxobrychus cinnamomeus* (Gmelin, JF, 1789) Cinnamon Bittern
 104. *Lxobrychus flavicollis* (Latham, 1790) Black Bittern
 105. *Gorsachius melanolophus* (Raffles, 1822) Malayan Night Heron
 106. *Nycticorax nycticorax* (Linnaeus, 1758) Black-crowned Night Heron
 107. *Butorides striata* (Linnaeus, 1758) Striated Heron (Green-backed Heron, Little Heron)
 108. *Ardeola grayii* (Sykes, 1832) Indian Pond Heron
 109. *Bubulcus ibis* (Boddaert, 1783) Cattle Egret
 110. *Ardea cinerea* (Linnaeus, 1758) Gray Heron
 111. *Ardea purpurea* (Linnaeus, 1766) Purple Heron
 112. *Ardea alba* (Linnaeus, 1758) Great Egret
 113. *Ardea intermedia* (Wagler, 1829) Intermediate Egret
 114. *Egretta garzetta* (Linnaeus, 1766) Little Egret
 115. *Egretta gularis* (Bosc, 1792) Western Reef Egret (Western Reef Heron)
- Family Threskiornithidae**
116. *Threskiornis melanocephalus* (Latham, 1790) Black-headed Ibis
 117. *Platalea leucorodia* (Linnaeus, 1758) Eurasian Spoonbill
 118. *Pseudibis papillosa* (Temminck, 1824) Indian Black Ibis (Red-naped Ibis)
 119. *Plegadis falcinellus* (Linnaeus, 1766) Glossy Ibis
- Family Fregatidae**
120. *Fregata ariel* (Gray, GR, 1845) Lesser Frigatebird
 121. *Fregata minor* (Gmelin, JF, 1789) Great Frigatebird
 122. *Fregata andrewsi* (Mathews, 1914) Christmas Island Frigatebird

Family Sulidae

123. *Sula sula* (Linnaeus, 1766) Red Footed Booby
124. *Sula dactylatra* (Lesson, 1831) Masked Booby

Family Phalacrocoracidae

125. *Microcarbo niger* (Vieillot, 1817) Little Cormorant
126. *Phalacrocorax carbo* (Linnaeus, 1758) Great Cormorant
127. *Phalacrocorax fuscicollis* (Stephens, 1826) Indian Cormorant
128. *Anhinga melanogaster* (Pennant, 1769) Oriental Darter

Order: Charadriiformes**Family Burhinidae**

129. *Burhinus oediconemus* (Salvadori, 1865) Eurasian Thick-knee (Indian Stone-curlew, Indian Thick-knee)
130. *Esacus recurvirostris* (Curvier, 1829) Great Thick-knee (Great Stone-curlew)

Family Haematopodidae

131. *Haematopus ostralegus* (Linnaeus, 1758) Eurasian Oystercatcher

Family Recurvirostridae

132. *Recurvirostra avosetta* (Linnaeus, 1758) Pied Avocet
133. *Himantopus himantopus* (Linnaeus, 1758) Black Winged Stilt

Family Charadriidae

134. *Pulvialis squatarola* (Linnaeus, 1758) Gray Plover (Black-bellied Plover)
135. *Pulvialis fulva* (Gmelin, JF, 1789) Pacific Golden Plover
136. *Charadrius hiaticula* (Linnaeus, 1758) Common Ringed Plover
137. *Charadrius dubius* (Scopoli, 1786) Little Ringed Plover
138. *Charadrius alexandrinus* (Linnaeus, 1758) Kentish Plover
139. *Charadrius mongolus* (Pallas, 1776) Lesser sand Plover
140. *Charadrius leschenaultia* (Lesson, 1826) Greater Sand Plover
141. *Charadrius asiaticus* (Pallas, 1773) Caspian Plover
142. *Venellus malabaricus* (Boddaert, 1783) Yellow-wattled Lapwing
143. *Venellus cinereus* (Blyth, 1842) Gray-headed Lapwing
144. *Vanellus indicus* (Boddaert, 1783) Red-wattled Lapwing
145. *Vanellus gregarius* (Pallas, 1771) Sociable Lapwing
146. *Vanellus leucurus* (Lichtenstein, MHK, 1823) White-tailed Lapwing

Family Rostratulidae

147. *Rostratula benghalensis* (Linnaeus, 1758) Greater Painted-snipe

Family Jacanidae

148. *Hydrophasianus chirurgus* (Scopoli, 1786) Pheasant-tailed Jacana
149. *Metapidius indicus* (Latham, 1790) Bronze-winged Jacana

Family Scolopacidae

150. *Numenius phaeopus* (Linnaeus, 1758) Whimbrel
151. *Numenius arquata* (Linnaeus, 1758) Eurasian Curlew
152. *Limosa lapponica* (Linnaeus, 1758) Bar-tailed Godwit
153. *Limosa limosa* (Linnaeus, 1758) Black-tailed Godwit
154. *Arenaria interpres* (Linnaeus, 1758) Ruddy Turnstone
155. *Calidris tenuirostris* (Horsfield, 1821) Great Knot

156. *Calidris canutus* (Linnaeus, 1758) Red Knot
 157. *Calidris pugnax* (Linnaeus, 1758) Ruff
 158. *Calidris falcinellus* (Pontoppidan, 1763) Board-billed Sandpiper
 159. *Calidris ferruginea* (Pontoppidan, 1763) Curlew Sandpiper
 160. *Calidris temminckii* (Leisler, 1812) Temminck's Stint
 161. *Calidris subminitua* (Middendorff, 1853) Long-toed Stint
 162. *Calidris alba* (Pallas, 1764) Sanderling
 163. *Calidris alpina* (Linnaeus, 1758) Dunlin
 164. *Calidris minuta* (Leisler, 1812) Little Stint
 165. *Calidris subruficollis* (Vieillot, 1819) Buff-breasted Sandpiper
 166. *Calidris melanotos* (Vieillot, 1819) Pectoral Sandpiper
 167. *Scolopax rusticola* (Linnaeus, 1758) Eurasian Woodcock
 168. *Gallinago nemoricola* (Hodgson, 1836) Wood Snipe
 169. *Gallinago stenura* (Bonaparte, 1831) Pintail Snipe
 170. *Gallinago megala* (Swinhoe, 1861) Swinhoe's snipe
 171. *Gallinago gallinago* (Linnaeus, 1758) Common Snipe
 172. *Lymnocyptes minimus* (Brunnich, 1764) Jack Snipe
 173. *Xenus cinereus* (Guldenstadt, 1775) Terek Sandpiper
 174. *Actitis hypoleucos* (Linnaeus, 1758) Common Sandpiper
 175. *Tringa ochropus* (Linnaeus, 1758) Green Sandpiper
 176. *Tringa erythropus* (Pallas, 1764) Spotted Redshank
 177. *Tringa nebularia* (Gunnerus, 1767) Common Greenshank
 178. *Tringa tetanus* (Linnaeus, 1758) Common Redshank
 179. *Tringa galreola* (Linnaeus, 1758) Wood Sandpiper
 180. *Tringa stagnatilis* (Bechstein, 1803) Marsh Sandpiper
 181. *Phalaropus lobatus* (Linnaeus, 1758) Red-necked Phalarope
- Family Turnicidae**
182. *Turnix tanki* (Blyth, 1843) Yellow-legged Buttonquail
 183. *Turnix suscitator* (Gmelin, JF, 1789) Barred Buttoquail
- Family Dromadidae**
184. *Dromas ardeola* (Paykull, 1805) Crab-plover
- Family Glareolidae**
185. *Cursorius coromandelicus* (Gmelin, JF, 1789) Indian courser
 186. *Glareola pratincola* (Linnaeus, 1766) Collared Pratincole
 187. *Glareola maldivarum* (Forster, JR, 1795) Oriental Pratincole
 188. *Glareola lactea* (Temminck, 1820) Little Pratincole (Small Pratincole)
- Family Stercorariidae**
189. *Stercorarius longicaudus* (Vieillot, 1819) Long-tailed Skua (Long-tailed Jaeger)
 190. *Stercorarius parasiticus* (Linnaeus, 1758) Arctic Suka (Parasitic Jaeger)
 191. *Stercorarius pomarinus* (Temminck, 1815) Pomarine Skua (Pomarine Jaeger)
 192. *Stercorarius maccormicki* (Saunders, H, 1893) South Polar Skua
 193. *Stercorarius antarcticus* (Lesson, 1831) Brown Skua

Family Laridae

194. *Anous stolidus* (Linnaeus, 1758) Brown Noddy
195. *Anous tenuirostris* (Temminck, 1823) Lesser Noddy
196. *Gygis alba* (Sparrman, 1786) White tern
197. *Rissa tridactyla* (Linnaeus, 1758) Black-legged Kittiwake
198. *Xema sabini* (Sabine, 1819) Sabine's Gull
199. *Chroicocephalus genei* (Breme, 1839) Slender-billed Gull
200. *Chroicocephalus brunnicephalus* (Jerdon, 1840) Brown-headed Gull
201. *Chroicocephalus ridibundus* (Linnaeus, 1766) Black-headed Gull
202. *Ichthyaetus ichthyaetus* (Pallas, 1773) Pallas's Gull
203. *Larus fuscus* (Linnaeus, 1758) Lesser Black-backed Gull
204. *Onychoprion fuscatus* (Linnaeus, 1766) Sooty Tern
205. *Onychoprion anaethetus* (Scopoli, 1786) Bridled Tern
206. *Sternula albifrons* (Pallas, 1764) Little Tern
207. *Gelochelidon nilotica* (Gmelin, JF, 1789) Gull-billed Tern
208. *Hydroprogne caspia* (Pallas, 1770) Caspian Tern
209. *Chlidonias leucopterus* (Pallas, 1811) Whiskered Tern
210. *Chlidonias leucopterus* (Temminck, 1815) White-winged Tern
211. *Sterna aurantia* (Gray, JE, 1831) River Tern
212. *Sterna dougallii* (Montagu, 1813) Roseate Tern
213. *Sterna hirundo* (Linnaeus, 1758) Common Tern
214. *Sterna repressa* (Hartert, 1916) White-checked Tern
215. *Sterna acuticauda* (Gray, JE, 1831) Black-bellied Tern
216. *Thalasseus sandvicensis* (Lesson, 1831) Lesser Crested Tern
217. *Thalasseus sandvicensis* (Latham, 1787) Sandwich Tern
218. *Thalasseus bergii* (Lichtenstein, MHK, 1823) Greater Crested Tern

Order: Accipitriformes

Family Pandionidae

219. *Pandion haliaetus* (Linnaeus, 1758) Osprey

Family Accipitridae

220. *Elanus caeruleus* (Desfontaines, 1789) Black-winged Kite (Black-shouldered Kite)
221. *Pernis ptilorhynchus* (Temminck, 1821) Oriental Honey Buzzard (Crested Honey Buzzard)
222. *Aviceda jerdoni* (Blyth, 1842) Jerdon's Baza
223. *Aviceda leuphotes* (Dumont, 1820) Black Baza
224. *Neophron percnopterus* (Linnaeus, 1758) Egyptian Vulture
225. *Spilornis cheela* (Latham, 1790) Crested Serpent Eagle
226. *Circaetus gallicus* (Gmelin, JF, 1788) Short-toed Snake Eagle (Short-toed Eagle)
227. *Sarcogyps calvus* (Scopoli, 1786) Red-headed Vulture
228. *Gyps himalayensis* (Hume, 1869) Himalayan Vulture (Himalayan Griffon)
229. *Gyps bengalensis* (Gmelin, JF, 1788) White-rumped Vulture
230. *Gyps indicus* (Scopoli, 1786) Indian Vulture

231. *Aegyptius monachus* (Linnaeus, 1766) Cinereous Vulture
232. *Nisaetus nipalensis* (Hodgson, 1836) Mountain Hawk Eagle (Legge's Hawk Eagle)
233. *Nisaetus cirrhatus* (Gmelin, JF, 1788) Changeable Hawk Eagle (Crested Hawk Eagle)
234. *Lophotriorchis kienerii* (de Sparre, 1835) Rufous-bellied Eagle (Rufous-bellied Hawk Eagle)
235. *Ictinaetus malaiensis* (Temminck, 1822) Black Eagle
236. *Clanga hastata* (Lesson, 1831) Indian Spotted Eagle
237. *Clanga clanga* (Pallas, 1811) Greater Spotted Eagle
238. *Aquila nipalensis* (Hodgson, 1833) Steppe Eagle
239. *Aquila heliaca* (Savigny, 1809) Eastern Imperial Eagle
240. *Aquila fasciata* (Vieillot, 1822) Bonelli's Eagle
241. *Hieraaetus pennatus* (Gmelin, JF, 1788) Booted Eagle
242. *Circus aeruginosus* (Linnaeus, 1758) Western Marsh Harrier (Eurasian Marsh-Harrier)
243. *Circus cyaneus* (Linnaeus, 1766) Hen Harrier
244. *Circus macrourus* (Gmelin, SG, 1770) Pallid Harrier
245. *Circus melanoleucos* (Pennant, 1769) Pied Harrier
246. *Circus pygargus* (Linnaeus, 1758) Montagu's Harrier
247. *Accipiter trivirgatus* (Temminck, 1824) Crested Goshawk
248. *Accipiter badius* (Gmelin, JF, 1788) Shikra
249. *Accipiter virgatus* (Temminck, 1822) Besra
250. *Accipiter nisus* (Linnaeus, 1758) Eurasian Sparrowhawk
251. *Haliaeetus leucogaster* (Gmelin, JF, 1788) White-bellied Sea Eagle
252. *Haliaeetus albicilla* (Linnaeus, 1758) White-tailed Sea Eagle
253. *Ichthyophaga humilis* (Muller, S & Schlegel, 1841) Lesser Fish Eagle
254. *Ichthyophaga ichthyactis* (Horsfield, 1821) Gray-headed Fish Eagle
255. *Haliastur indus* (Boddaert, 1783) Brahminy Kite
256. *Milvus migrans* (Boddaert, 1783) Black Kite
257. *Butastur teesa* (Franklin, 1831) White-eyed Buzzard
258. *Buteo buteo* (Linnaeus, 1758) Common Buzzard (Eurasian Buzzard)
- Order: Strigiformes**
- Family Tytonidae**
259. *Phodilus badius* (Horsfield, 1821) Bay Owl (Sri Lanka Bay Owl)
260. *Tyto longimembris* (Jerdon, 1839) Eastern Grass Owl
261. *Tyto alba* (Scopoli, 1769) Common Barn Owl
- Family Strigidae**
262. *Ninox scutulata* (Raffles, 1822) Brown Hawk Owl (Brown Boobook)
263. *Glaucidium radiatum* (Tickell, 1833) Jungle Owlet
264. *Athene brama* (Temminck, 1821) Spotted Owlet
265. *Otus brucei* (Hume, 1873) Pallid Scopes Owl
266. *Otus sunia* (Hodgson, 1836) Oriental Scops Owl

267. *Otus bakamoena* (Pennant, 1769) Collared Scopes Owl (Indian Scops Owl)
268. *Asio flammeus* (Pontoppidan, 1763) Short-eared Owl
269. *Strix ocellata* (Lesson, 1839) Mottled Wood Owl
270. *Strix leptogrammica* (Temminck, 1832) Brown Wood Owl
271. *Bubo bengalensis* (Franklin, 1831) Indian Eagle Owl (Rock Eagle Owl)
272. *Bubo nipalensis* (Hodgson, 1836) Spot-bellied Eagle Owl
273. *Ketupa zeylonensis* (Gmelin, JF, 1788) Brown Fish Owl
- Order: Trogoniformes**
- Family Trogonidae**
274. *Hrapactus fasciatus* (Pennant, 1769) Malabar Trogon
- Order: Bucerotiformes**
- Family Bucerotidae**
275. *Buceros bicornis* (Linnaeus, 1758) Great Hornbill
276. *Anthracoceros coronatus* (Boddaert, 1783) Malabar Pied Hornbill
277. *Ocyrceros griseus* (Latham, 1790) Malabar Gray Hornbill
278. *Ocyrceros birostris* (Scopoli, 1786) Indian Gray Hornbill
- Family Upupidae**
279. *Upupa epops* (Linnaeus, 1758) Common Hoopoe (Eurasian Hoopoe)
- Order: Piciformes**
- Family Picidae**
280. *Jynx torquilla* (Linnaeus, 1758) Northern Wryneck (Eurasian Wryneck)
281. *Picumnus innominatus* (Burton, 1836) Speckled Piculet
282. *Hemicircus canente* (Lesson, 1832) Heart-spotted Woodpecker
283. *Dinopium javanense* (Ljungh, 1797) Common Golden-backed Woodpecker (Common Flameback)
284. *Dinopium benghalense* (Linnaeus, 1758) Lesser Golden-backed Woodpecker (Black-rumped Flameback)
285. *Micropternus brachyurus* (Vieillot, 1818) Rufous Woodpecker
286. *Picus chlorolophus* (Vieillot, 1818) Lesser Yellow-naped Woodpecker (Lesser Yellownape)
287. *Picus xanthopygaeus* (Gray, JE & Gray, GR, 1847) Streak-throated Woodpecker
288. *Dryocopus Javensis* (Horsfield, 1821) White-bellied Woodpecker
289. *Chrysocolaptes lucidus* (Tickell, 1833) Greater Golden-backed Woodpecker (Greater Flameback)
290. *Chrysocolaptes festivus* (Boddaert, 1783) White-naped Woodpecker
291. *Dendrocopos moluccensis* (Vigors, 1832) Brown-capped Pygmy Woodpecker
292. *Dendrocopos mabrattensis* (Latham, 1801) Yellow-crowned Woodpecker

Family Ramphastidae

293. *Psilopogon zeulanicus* (Gmelin, JF, 1788)
294. *Psilopogon viridis* (Boddaert, 1783)
295. *Psilopogon malabaricus* (Blyth, 1847)
296. *Psolopogon haemacephalus* (Statius muller, 1776)

- Brown-headed Barbet
White-checked Barbet
Coppersmith Barbet
Coppersmith Barbet

Order: Coraciiformes**Family Meropidae**

297. *Nyctyornis athertoni* (Jardine & selby, 1828)
298. *Merops orientalis* (Latham, 1801)
299. *Merops leschenaulti* (Vieillot, 1817)
300. *Merops philippinus* (Linnaeus, 1767)
301. *Merops persicus* (Pallas, 1773)

- Blue-bearded Bee-eater
Green Bee-eater
Chestnut-headed Bee-eater
Blue-tailed Bee-eater
Blue-checked Bee-eater

Family Coraciidae

302. *Coracias benghalensis* (Linnaeus, 1758)
303. *Coracias garullus* (Linnaeus, 1758)
304. *Eurystomus orientalis* (Linnaeus, 1766)

- Indian Roller
European Roller
Dollarbird (Oriental Dollarbird)

Family Alcedinidae

305. *Ceyx erithaca* (Linnaeus, 1758)

306. *Alcedo meninting* (Horsfield, 1821)
307. *Alcedo atthis* (Linnaeus, 1758)
308. *Ceryle rudis* (Linnaeus, 1758)
309. *Pelargopsis capensis* (Linnaeus, 1766)
310. *Halcyon smyrnensis* (Linnaeus, 1758)

- Oriental Dwarf Kingfisher (Black-backed Dwarf Kingfisher)
Blue-eared Kingfisher
Common Kingfisher
Pied Kingfisher
Stork-billed Kingfisher
White-throated Kingfisher (White-breasted Kingfisher)
Black-capped Kingfisher

311. *Halcyon pileata* (Boddaert, 1783)

Order: Falconiformes**Family Falconidae**

312. *Falco naumanni* (Fleischer, JG, 1818)
313. *Falco tinnunculus* (Linnaeus, 1758)

314. *Falco chicquera* (Daudin, 1800)

315. *Falco amurensis* (Radde, 1863)
316. *Falco severus* (Horsfield, 1821)
317. *Falco peregrinus* (Tunstall, 1771)

- Lesser Kestrel
Common Kestrel (Eurasian Kestrel)
Red-necked Falcon (Red-headed Falcon)
Amur Falcon
Oriental Hobby
Peregrine Falcon

Order: Psittaciformes**Family Psittaculidae**

318. *Psittacula cyanocephala* (Linnaeus, 1766)
319. *Psittacula columboides* (Vigors, 1830)

320. *Psittacula eupatria* (Linnaeus, 1766)
321. *Psittacula krameri* (Scopoli, 1769)
322. *Loriculus vernalis* (Sparman, 1787)

- Plum-headed Parakeet
Malabar Parakeet (Blue-winged Parakeet)
Alexandrine Parakeet
Rose-ringed Parakeet
Vernal Hanging Parrot

Order: Passeriformes**Family Pittidae**

323. *Pitta brachyuran* (Linnaeus, 1766) Indian Pitta

Family Campephagidae

324. *Pericrocotus cinnamomeus* (Linnaeus, 1766) Small Minivet
325. *Pericrocotus falmmeus* (Forster, JR, 1781) Scarlet Minivet (Orange Minivet)
326. *Pericrocotus divaricatus* (Raffles, 1822) Ashy Minivet
327. *Coracina javensis* (Lesson, 1831) Large Cuckooshrike
328. *Lalage melanoptera* (Ruppell, 1839) Black-headed Cuckooshrike

Family Oriolidae

329. *Oriolus xanthornus* (Linnaeus, 1758) Black-headed Oriole
330. *Oriolus kundoo* (Sykes, 1832) Indian Golden Oriole
331. *Oriolus chinensis* (Linnaeus, 1766) Black-naped Oriole

Family Artamidae

332. *Artamus fuscus* (Vieillot, 1817) Ashy Woodswallow

Family Vangidae

333. *Hemipus picatus* (Sykes, 1832) Bar-winged Flycatcher-shrike
334. *Tephrodornis virgatus* (Raffles, 1822) Large Woodshrike (Malabar Woodshrike)
335. *Tephrodornis pondicerianus* (Gmelin, JF, 1789) Common Woodshrike

Family Aegithinidae

336. *Aegithina tibia* (Linnaeus, 1758) Common Lora

Family Dicruridae

337. *Dicrurus macrocerus* (Vieillot, 1817) Black Drongo
338. *Dicrurus leucophaeus* (Vieillot, 1817) Ashy Drongo
339. *Dicrurus caerulescens* (Linnaeus, 1758) White-bellied Drongo
340. *Dicrurus aeneus* (Vieillot, 1817) Bronzed Dongo
341. *Dicrurus hottentottus* (Linnaeus, 1766) Hair-crested Drongo
342. *Dicrurus paradiseus* (Linnaeus, 1766) Greater Racket-tailed Drongo

Family Rhipiduridae

343. *Rhipidura aureola* (Lesson, 1831) White-browed Fantail

Family Laniidae

344. *Lanius cristatus* (Linnaeus, 1758) Brown Shrike
345. *Lanius vittatus* (Valenciennes, 1826) Bay-backed Shrike
346. *Lanius schach* (Linnaeus, 1758) Long-tailed Shrike

Family Corvidae

347. *Dendrocitta vagabunda* (Latham, 1790) Rufous Treepie
348. *Dendrocitta leucogastra* (Gould, 1833) White-bellied Treepie
349. *Corvus Splendens* (Vieillot, 1817) House Crow
350. *Corvus macrorhynchos* (Wagler, 1827) Large-billed Crow (Indian Jungle Crow)

Family Monarchidae

351. *Hypothymis azurea* (Boddaert, 1783) Black-naped Monarch
352. *Terpsiphone paradise* (Linnaeus, 1758) Indian Paradise-flycatcher (Asian Paradise-flycatcher)

Family Dicaeidae

353. *Dicaeum agile* (Tickell, 1833) Thick-billed Flowerpecker
354. *Dicaeum erythrorhynchos* (Latham, 1790) Pale-billed Flowerpecker
355. *Dicaeum concolor* (Jerdon, 1840) Plain Flowerpecker (Nilgiri Flowerpecker)

Family Nectariniidae

356. *Arachnothera longirostra* (Latham, 1790) Little Spiderhunter
357. *Leptocoma zeylonica* (Linnaeus, 1766) Purple-rumped Sunbird
358. *Leptocoma minima* (Sykes, 1832) Crimson-backed Sunbird
359. *Cinnyris asiaticus* (Latham, 1790) Purple Sunbird
360. *Cinnyris loteni* (Linnaeus, 1766) Loten's Sunbird (Long-billed Sunbird)

Family Irenidae

361. *Irena puella* (Latham, 1790) Asian Fairy-bluebird
362. *Chloropsis aurifrons* (Temminck, 1829) Golden-fronted Leafbird
363. *Chloropsis jerdoni* (Blyth, 1844) Jerdon's Leafbird

Family Ploceidae

364. *Ploceus manyar* (Horsfield, 1821) Streaked Weaver
365. *Ploceus philippinus* (Linnaeus, 1766) Baya Weaver

Family Estrildidae

366. *Amandava amandava* (Linnaeus, 1758) Red Munia (Red Avadavat)
367. *Euodice malabarica* (Linnaeus, 1758) Indian Silverbill (White-throated Munia)
368. *Lonchura striata* (Linnaeus, 1766) White-rumped Munia
369. *Lonchura punctulata* (Linnaeus, 1758) Scaly-breasted Munia
370. *Lonchura kelaarti* (Jerdon, 1863) Black-throated Munia
371. *Lonchura Malacca* (Linnaeus, 1766) Black-headed Munia (Tricoloured Munia)

Family Passeridae

372. *Passer domesticus* (Linnaeus, 1758) House Sparrow
373. *Gymnoris xanthocollis* (Burton, 1838) Yellow-throated Sparrow (Chestnut-shouldered Petronia)

Family Motacillidae

374. *Dendronanthus indicu* (Gmelin, JF, 1789) Forest Wagtail
375. *Anthus trivialis* (Linnaeus, 1758) Tree Pipit
376. *Anthus hodgsoni* (Richmond, 1907) Olive-backed Pipit
377. *Anthus cervinus* (Pallas, 1811) Red-throated Pipit
378. *Anthus nilgiriensis* (Sharpe, 1885) Nilgiri Pipit
379. *Anthus richardi* (Vieillot, 1818) Richard's Pipit
380. *Anthus rufulus* (Vieillot, 1818) Paddyfield Pipit
381. *Anthus godlewskii* (Taczanowski, 1876) Blyth's Pipit
382. *Anthus campestris* (Linnaeus, 1758) Tawny Pipit
383. *Anthus similis* (Jerdon, 1840) Long-billed Pipit
384. *Motacilla flava* (Linnaeus, 1758) Western Yellow Wagtail
385. *Motacilla cinerea* (Tunstall, 1771) Grey Wagtail

386. *Motacilla citreola* (Pallas, 1776) Citrine Wagtail
 387. *Motacilla maderaspatensis* (Gmelin, JF, 1789) White-browed Wagtail
 388. *Motacilla alba* (Linnaeus, 1758) White Wagtail
- Family Fringillidae**
 389. *Erythrura erythrura* (Pallas, 1770) Common Rosefinch
- Family Emberizidae**
 390. *Granativora bruniceps* (von Brandt, JF, 1841) Red-headed Bunting
 391. *Granativora melanocephala* (Scopoli, 1769) Black-headed Bunting
 392. *Emberiza buchanani* (Blyth, 1845) Grey-necked Bunting (Grey-hooded Bunting)
- Family Stenostiridae**
 393. *Culicicapa ceylonensis* (Swainson, 1820) Grey-headed Canary-flycatcher
- Family Paridae**
 394. *Parus cinereus* (Vieillot, 1818) Cinereous Tit (Indian Great Tit)
 395. *Machlolophus xanthogenys* (Vigors, 1831) Black-lored Tit (Indian Black-lored Tit, Indian Tit)
- Family Alaudidae**
 396. *Ammomanes phoenicura* (Franklin, 1831) Rufous-tailed Lark
 397. *Eremopterix griseus* (Scopoli, 1786) Ashy-crowned Sparrow Lark
 398. *Mirafra affinis* (Blyth, 1845) Jerdon's Bushlark
 399. *Calandrella brachydactyla* (Leisler, 1814) Greater Short-toed Lark
 400. *Alauda gulgula* (Franklin, 1831) Oriental Skylark
 401. *Glaeridamalabarica* (Scopoli, 1786) Malabar Lark
- Family Cisticolidae**
 402. *Cisticola juncidis* (Rafinesque, 1810) Zitting Cisticola
 403. *Cisticola exilis* (Vigors & Horsfield, 1827) Golden-headed Cisticola
 404. *Prinia hodgsonii* (Blyth, 1844) Grey-breasted Prinia
 405. *Prinia sylvatica* (Jerdon, 1840) Jungle Prinia
 406. *Prinia socialis* (Sykes, 1832) Ashy Prinia
 407. *Prinia inornata* (Sykes, 1832) Plain Prinia
 408. *Orthotomus sutorius* (Pennant, 1769) Common Tailorbird
- Family Locustellidae**
 409. *Locustella certhiola* (Pallas, 1811) Rusty-rumped Warbler (Palla's Grasshopper Warbler)
 410. *Locustella naevia* (Boddaert, 1783) Grasshopper Warbler
 411. *Schoenicola platyurus* (Jerdon, 1841) Broad-tailed Grass Warbler (Broad-tailed Grassbird)
 412. *Chaetornis striata* (Jerdon, 1841) Bristled Grass Warbler (Bristled Grassbird)
- Family Acrocephalidae**
 413. *Arundinax aedon* (Pallas, 1776) Thick-billed Warbler
 414. *Iduna caligata* (Lichtenstein, MHK, 1823) Booted Warbler
 415. *Iduna rama* (Sykes, 1832) Sykes's Warbler
 416. *Acrocephalus* (Blyth, 1849) Blyth's Reed Warbler
 417. *Acrocephalus Agricola* (Jerdon, 1845) Paddyfield Warbler

418. *Acrocephalus stentoreus* (Hemprich & Ehrenberg, 1833) Clamorous Reed Warbler
- Family Hirundinidae**
419. *Delichon urbicum* (Linnaeus, 1758) Northern House Martin (Common House Martin)
420. *Petrochelidon fluvicola* (Blyth, 1855) Streak-throated Swallow
421. *Cecropis daurica* (Laxmann, 1769) Red-rumped Swallow
422. *Hirundo tabitica* (Gmelin, 1789) Pacific Swallow (Hill Swallow)
423. *Hirundo smithii* (Leach, 1818) Wire-tailed Swallow
424. *Hirunda rustica* (Linnaeus, 1758) Barn Swallow
425. *Ptyonoprogne rufestris* (Scopoli, 1769) Eurasian Crag Martin
426. *Ptyonoprogne concolor* (Sykes, 1832) Dusky Crag Martin
427. *Riparia paludicola* (Gray, JF, 1830) Plain Martin (Grey-throated Martin)
- Family Pycnonotidae**
428. *Hypsipetes leucocephalus* (Gmelin, 1789) Black Bulbul (Square-tailed Bulbul)
429. *Pycnonotus melanicterus* (Gmelin, 1789) Black-crested Bulbul (Flame-throated Bulbul)
430. *Pycnonotus jocosus* (Linnaeus, 1758) Red-Whiskered Bulbul
431. *Pycnonotus cafer* (Linnaeus, 1766) Red-vented Bulbul
432. *Pycnonotus xantholaemus* (Jerdon, 1845) Yellow-throated Bulbul
433. *Pycnonotus luteolus* (Lesson, 1841) White-browed Bulbul
434. *Brachypodius priocephalus* (Jerdon, 1839) Grey-headed Bulbul
435. *Acritillas indica* (Jerdon, 1839) Yellow-browed Bulbul
- Family Phylloscopidae**
436. *Abrornis heumei* (Brooks, WE, 1878) Hume's Leaf Warbler (Hume's Warbler)
437. *Phylloscopus collybita* (Vieillot, 1817) Common Chiffchaff
438. *Phylloscopus tytleri* (Brooks, WE, 1871) Tytler's Leaf Warbler
439. *Phylloscopus affinis* (Tickell, 1833) Tickell's Leaf Warbler
440. *Seicercus nitidus* (Blyth, 1843) Green Leaf Warbler (Green Warbler)
441. *Seicercus trochiloides* (Sundevall, 1837) Greenish Leaf Warbler (Greenish Warbler)
442. *Seicercus magnirostris* (Blyth, 1843) Large-billed Leaf Warbler
443. *Seicercus occipitalis* (Blyth, 1845) Western Crowned Leaf Warbler (Western Crowned Warbler)
- Family Sylviidae**
444. *Curruca crassirostris* (Cretzschmar, 1830) Eastern Orphean Warbler
445. *Curruca curruca* (Linnaeus, 1758) Lesser whitethroat
446. *Chrysomma sinense* (Gmelin, JF, 1789) Yellow-eyed Babbler
- Family Zosteropidae**
447. *Zosterops palpebrosus* (Temminck, 1824) Oriental White-eye
- Family Timallidae**
448. *Pomatorhinus borsfieldii* (Sykes, 1832) Indian Scimitar Babbler

449. <i>Dumentia hyperythra</i> (Franklin, 1831)	Tawny-bellied Babbler
450. <i>Rhopocichla atriceps</i> (Jerdon, 1839)	Dark-fronted Babbler
Family Pellorneidae	
451. <i>Pellorneum ruficeps</i> (Swainson, 1832)	Puff-throated Babbler
Family Leiothrichidae	
452. <i>Alcippe poioicephala</i> (Jerdon, 1841)	Quaker Tit Babbler (Brown-cheeked Fulvetta)
453. <i>Argya malcolmi</i> (Sykes, 1832)	Large Gray Babbler
454. <i>Argya subrufa</i> (Jerdon, 1839)	Rufous Babbler
455. <i>Turdoides striata</i> (Dumont, 1823)	Jungle Babbler
456. <i>Turdoides affinis</i> (Jerdon, 1845)	Yellow-billed Babbler
457. <i>Garrulax delesserti</i> (Jerdon, 1839)	Wynaad Laughing-thrush
458. <i>Trochalopteron fairbanki</i> (Blanford, 1869)	Kerala Laughing-thrush
459. <i>Trochalopteron cachinnans</i> (Jerdon, 1839)	Black-chinned Laughing-thrush
Family Sittidae	
460. <i>Sitta castanea</i> (Lesson, 1830)	Chestnut-bellied Nuthatch (Indian Nuthatch)
461. <i>Sitta frontalis</i> (Swainson, 1820)	Velvet-fronted Nuthatch
Family Sturnidae	
462. <i>Sturnus vulgaris</i> (Linnaeus, 1758)	Common Starling (European Starling)
463. <i>Pastor roseus</i> (Linnaeus, 1758)	Rosy Starling
464. <i>Sturnia pagodarum</i> (Gmelin, JF, 1789)	Brahminy starling
465. <i>Sturnia malabarica</i> (Gmelin, JF, 1789)	Chestnut-tailed Starling
466. <i>Acridotheres tristis</i> (Linnaeus, 1766)	Common Myna
467. <i>Acridotheres fuscus</i> (Wagler, 1827)	Jungle Myna
468. <i>Gracula religiosa</i> (Linnaeus, 1758)	Hill Myna (Southern Hill Myna)
Family Muscicapidae	
469. <i>Saxicoloides fulicatus</i> (Linnaeus, 1766)	Indian Robin
470. <i>Copsychus saularis</i> (Linnaeus, 1758)	Oriental Magpie Robin
471. <i>Kittacincla malabarica</i> (Scopoli, 1786)	White-rumped Shama
472. <i>Muscicapa dauurica</i> (Raffles, 1822)	Asian Brown Flycatcher
473. <i>Muscicapa muttui</i> (Layrad, EL, 1854)	Brown-breasted Flycatcher
474. <i>Muscicapa ruficauda</i> (Swainson, 1838)	Rusty-tailed Flycatcher
475. <i>Cyornis pallidipes</i> (Jerdon, 1840)	White-bellied Blue Flycatcher
476. <i>Cyornis tickelliae</i> (Blyth, 1843)	Tickell's Blue Flycatcher
477. <i>Cyornis rubeculoides</i> (Vigors, 1831)	Blue-throated Blue Flycatcher (Blue-throated Flycatcher)
478. <i>Eumyias thalassinus</i> (Swainson, 1838)	Verditer Flycatcher
479. <i>Eumyias albicaudatus</i> (Jerdon, 1840)	Nilgiri Flycatcher
480. <i>Brachypteryx major</i> (Jerdon, 1844)	White-bellied Shortwing
481. <i>Larvivora brunnea</i> (Hodgson, 1837)	Indian Blue Robin
482. <i>Luscinia svecica</i> (Linnaeus, 1758)	Bluethroat
483. <i>Myophonus horsfieldii</i> (Vigors, 1831)	Malabar's Whistling Thrush
484. <i>Ficedula subrubra</i> (Hartert & Steinbacher, 1934)	Kashmir Flycatcher

485. *Ficedula parva* (Bechstein, 1792) Red-breasted Flycatcher
 486. *Ficedula albicilla* (Pallas, 1811) Taiga Flycatcher
 487. *Ficedula zanthopygia* (Hay, 1845) Yellow-rumped Flycatcher
 488. *Ficedula nigrorufa* (Jerdon, 1839) Black-and-orange Flycatcher
 (Black-and-rufous Flycatcher)
 489. *Phoenicurus ochruros* (Gmelin, SG, 1774) Black Redstart
 490. *Monticola cinclorhyncha* (Vigors, 1831) Blue-capped Rock Thrush
 491. *Monticola solitarius* (Linnaeus, 1758) Blue Rock Thrush
 492. *Saxicola maurus* (Pallas, 1773) Siberian Stonechat
 493. *Saxicola caprata* (Linnaeus, 1766) Pied Bushchat
 494. *Oenanthe oenanthe* (Linnaeus, 1758) Northern Wheatear
 495. *Oenanthe isabellina* (Temminck, 1829) Isabelline Wheatear
 496. *Oenanthe deserti* (Temminck, 1825) Desert Wheatear
- Family Turdidae**
497. *Zoothera dauma* (Latham, 1790) Scaly Thrush (Nilgiri Thrush)
 498. *Geokichla wardii* (Blyth, 1843) Pied Thrush
 499. *Geokichla citrina* (Latham, 1790) Orange-headed Thrush
 500. *Turdus simillimus* (Jerdon, 1839) Indian Blackbird

Checklist of reptiles of Kerala (Marine species included) (Palot.M.J.2015)

Order/Family Species	Common Name
Order: Crocodylia	
Family Crocodylidae	
1. <i>Crocodylus porosus</i> (Schneider, 1801)	Estuarine Crocodile (Salt-water Crocodile)
2. <i>Crocodylus palustris</i> (Lesson, 1831)	Mugger (Marsh crocodile)
Order: Testudines	
Family Geoemydidae	
3. <i>Vijayachelys sylvatica</i> (Henderson, 1912)	Cochin Forest Cane Turtle (Kerala Forest Terrapin, Kavalai Forest Turtle)
4. <i>Melanochelys trijuga</i> (Schweigger, 1812)	Indian Black Turtle (Indian Pond Terrapin)
Family Cheloniidae	
5. <i>Chelonia mydas</i> (Linnaeus, 1758)	Green Sea Turtle
6. <i>Eretmochelus imbricate</i> (Linnaeus, 1766)	Hawksbill Sea Turtle (Hawksbill Turtle)
7. <i>Lepidochelys olivacea</i> (Eschscholtz, 1829)	Olive Ridley Sea Turtle (Pacific Ridley Turtle)
Family Dermochelyidae	
8. <i>Dermochelys coriacea</i> (Vandelli, 1761)	Leatherback Sea Turtle (Luth, Leathery turtle)
Family Testudinidae	
9. <i>Geochelone elegans</i> (Schoepff, 1795)	Indian Star Tortoise (Indian Starred Tortoise)
10. <i>Indotestudo travancorica</i> (Boulenger, 1907)	Travancore Tortoise (Forsten's Tortoise)
Family Trionychidae	
11. <i>Nilsonia leithii</i> (Gray, 1872)	Leith's Softshell Turtle
12. <i>Lissemys punctata</i> (Bonnaterre, 1789)	Indian Flapshell Turtle (Indian flap-shelled Turtle)
13. <i>Pelochelys cantorii</i> (Gray, 1864)	Asian Giant Softshell Turtle (Cantor's Giant Softshell Turtle)
14. <i>Chitra indica</i> (Gray, 1831)	Indian Narrow-headed Softshell Turtle (Narrow-headed Softshell Turtle)
Order: Squamata	
Family Agamidae	
15. <i>Calotes calotes</i> (Linnaeus, 1758)	Common Green Forest Lizard (Southern Green Calotes)

16. *Calotes grandisquamis* (Gunther, 1875) Large-scaled Forest Lizard (Large-scaled Calotes)
17. *Calotes nemoricola* (Jerdon, 1853) Nilgiri Forest Lizard
18. *Calotes ellioti* (Gunther, 1864) Elliot's Forest Lizard
19. *Calotes rouxii* (Dumeril & Binron, 1837) Roux's Forest Lizard (Roux's Forest Calotes)
20. *Calotes versicolor* (Daudin, 1802) Indian Garden Lizard (Oriental Garden Lizard)
21. *Draco dussumieri* (Dumeril & Bibron, 1837) South Indian Flying Lizard (Draco)⁵
22. *Otocryptis beddomei* (Boulenger, 1885) Indian Kangaroo Lizard
23. *Psammophilus blanfordanus* (Stoliczka, 1871) Blanford's Rock Agama
24. *Psammophilus dorsalis* (Gray, 1831) South Indian Rock Agama
25. *Salea anamallayana* (Beddome, 1878) Anamalai Spiny Lizard (Anamalai Salea)
26. *Salea horsfieldii* (Gray, 1845) Horsfield's Spiny Lizard (Nilgiri Salea)
27. *Sitana ponticeriana* (Cuvier, 1829) Fan-throated Lizard
- Family Chamaeleonidae**
28. *Chamaeleo zeylanicus* (Laurenti, 1768) Indian Chameleon
- Family Gekkonidae**
29. *Cnemaspis beddomei* (Theobald, 1876) Beddome's Day Gecko
30. *Cnemaspis gracilis* (Beddome, 1870) Slender Day Gecko
31. *Cnemaspis indica* (Gray, 1846) Indian Day Gecko
32. *Cnemaspis kottiyooensis* (Cyril & Umesh, 2014) Kottiyur Day Gecko
33. *Cnemaspis littoralis* (Jerdon, 1854) Coastal Day Gecko
34. *Cnemaspis monticola* (Manamendra-Arachchi, Batuwita & Pethiyagoda, 2007) Mountain Day Gecko
35. *Cnemaspis nairi* (Inger, Marx & Koshy, 1984) Ponmudi Day Gecko
36. *Cnemaspis nilagirica* (Manamendra-Arachchi, Batuwita & Pethiyagoda, 2007) Nilgiri Day Gecko
37. *Cnemaspis Ornata* (Beddome, 1870) Ornate Day Gecko (Ornate Dwarf Gecko)
38. *Cnemaspis sisparensis* (Theobald, 1876) Sispara Day Gecko
39. *Cnemaspis wynadensis* (Beddome, 1870) Wayanad Day Gecko
40. *Geckoella collegalis* (Beddome, 1870) Kollegal Ground Gecko (Forest Spotted Gecko)
41. *Gehyra mutilate* (Wiegmann, 1834) Four-clawed Gecko (Stump-toed Gecko)
42. *Dravidogecko anamallensis* (Gunther, 1875) Anaimalai Gecko
43. *Hemidactylus brookii* (Gray, 1845) Brook's House Gecko (Spotted House Gecko)
44. *Hemidactylus frenatus* (Schlegel, 1836) Asian House Gecko (Common House Gecko)

45. *Hemidactylus leschenaultii* (Dumeril & Bibron, 1836) Bark Gecko (Lesschenault's Leaf-toed Gecko)
46. *Hemidactylus maculatus* (Dumeril & Bibron, 1836) Spotted House Gecko (Spotted Leaf-toed Gecko)
47. *Hemidactylus prashadi* (Smith, 1935) Prashad's Gecko
48. *Hemidactylus reticulatus* (Beddome, 1870) Reticulated Gecko (Reticulated Leaf-toed Gecko)
49. *Hemidactylus triedrus* (Daudin, 1802) Termite Hill Gecko
- Family Lacertidae**
50. *Ophisops beddomei* (Jerdon, 1870) Beddome's Lacerta
51. *Ophisops leschenaultii* (Milne-Edward, 1829) Leschenault's Lacerta
- Family Scincidae**
52. *Dasia subcaeruleum* (Boulenger, 1891) Blue-bellied Tree Skink (Boulenger's Tree skink)
53. *Eutropis beddomii* (Jerdon, 1870) Beddome's Grass Shink (Beddome's Skink)
54. *Eutropis bibronii* (Gray, 1838) Bibron's Seashore Skink
55. *Eutropis carinata* (Schneider, 1801) Common Keeled Skink
56. *Eutropis clivicola* (Inger, Shaffer Koshy & Bakde, 1984) Mountain Skink (Inger's Ponmudi Skink)
57. *Eutropis macularia* (Blyth, 1853) Bronze Grass Skink (Bronze Skink)
58. *Lygosoma albopunctata* (Gray, 1846) White-spotted Supple Skink
59. *Lygosoma punctata* (Gmelin, 1799) Spotted supple Skink (Common Snake Skink)
60. *Ristella beddomii* (Boulenger, 1887) Beddome's Cat Skink (Beddome's Ristella)
61. *Ristella guentheri* (Boulenger, 1887) Gunther's Cat Skink (Gunther's Ristella)
62. *Ristella rurkii* (Gray, 1839) Rurk's Cat Skink (Rurk's Ristella)
63. *Ristella travancorica* (Beddome, 1870) Travancore Cat Skink (Travancore Ristella)
64. *Kaestlea beddomii* (Boulenger, 1887) Beddome's Ground Skink
65. *Kaestlea bilineata* (Gray, 1846) Two-lined Ground Skink
66. *Kaestlea laterimaculata* (Boulenger, 1887) Side-spotted Ground Skink
67. *Kaestlea travancorica* (Beddome, 1870) Travancore Ground Skink
68. *Kaestlea palnica* (Boettger, 1892) Palni Hills Ground Skink
69. *Sphenomorphus dussumieri* (Dumeril & Bibron, 1839) Dussumier Litter Skink (Dussumier's Forest Skink)
70. *Chalcides pentadactylus* (Beddome, 1870) Earless Skink (Five-fingered Skink)
- Family Varanidae**
71. *Varanus bengalensis* (Daudin, 1802) Bengal Monitor (Indian Monitor)
72. *Indotyphlops braminus* (Daudin, 1803) Brahminy Worm Snake
73. *Grypotyphlops acutus* (Dumeril & Bibron, 1844) Beaked Worm Snake (Beaked Blind Snake)

74. *Gerrhopilus thurstoni* (Boettger, 1890) Thurston's Worm Snake
75. *Gerrhopilus tindalli* (Smith, 1943) Tindall's Worm Snake
76. *Gerrhopilus beddomii* (Boulenger, 1890) Beddome's Worm Snake
- Family Uropeltidae**
77. *Melanophidium punctatum* (Beddome, 1871) Pied-belly Shieldtail (Beddome's Black Earth Snake)
78. *Melanophidium bilineatum* (Beddome, 1870) Yellow-striped Shieldtail (Two-lined Black Earth Snake)
79. *Melanophidium wynaudense* (Beddome, 1863) Wynad Shieldtail (Indian Black Earth Snake)
80. *Platyplectrurus trilineatus* (Beddome, 1867) Three-lined Shieldtail (Lined Thorntail Snake)
81. *Platyplectrurus madurensis* (Beddome, 1877) Three-lined Shieldtail
82. *Teretrurus sanguineus* (Beddome, 1867) Western Shieldtail (Purple-Red Earth Snake)
83. *Plectrurus aureus* (Beddome, 1880) Golden Shieldtail (Kerala Burrowing Snake)
84. *Plectrurus guentheri* (Beddome, 1863) Purple Shieldtail (Gunther's Burrowing Snake)
85. *Plectrurus perroteti* (Dumeril & Blbron, 1854) Perrotet's Shieldtail (Nilgiri Burrowing Snake)
86. *Brachyophidium rhodogaster* (Wall, 1921) Wall's Shieldtail
87. *Uropeltis ellioti* (Gray, 1858) Elliot's Shieldtail (Elliot's Earth Snake)
88. *Uropeltis nitida* (Beddome, 1878) Cochin Shieldtail (Southern Earth Snake)
89. *Uropeltis ocellata* (Beddome, 1863) Nilgiri Shieldtail (Ocellated Shieldtail)
90. *Uropeltis beddomii* (Gunther, 1862) Beddome's Shieldtail (Beddome's Earth Snake)
91. *Uropeltis macrorhyncha* (Beddome, 1877) Anamalai Shieldtail (Anamalai Earth Snake)
92. *Uropeltis woodmalsoni* (Theoblad, 1876) Black-bellied Shieldtail (Woodmason's Earth Snake)
93. *Uropeltis ceylanica* (Cuvier, 1829) Kerala Shieldtail (Ceylon Earth Snake)
94. *Uropeltis arcticeps* (Gunther, 1875) Periyar Shieldtail (Thirunelveli Earth Snake)
95. *Uropeltis rubromaculatus* (Beddome, 1867) Red-spotted Shieldtail (Red-spotted Earth Snake)
96. *Uropeltis rubrolineata* (Gunther, 1875) Red-lined Shieldtail (Red-lined Earth Snake)
97. *Uropeltis myhendrae* (Beddome, 1886) Barred Shieldtail (Boulenger's Earth Snake)

98. *Uropeltis maculate* (Beddome, 1878) Red-sided Shieldtail (Spotted Earth Snake)
99. *Uropeltis petersi* (Beddome, 1878) Peter's Shieldtail (Peter's Earth Snake)
100. *Uropeltis liura* (Gunther, 1875) Ashambu Shieldtail (Gunther's Earth Snake)
101. *Uropeltis pulneyensis* (Beddome, 1863) Palni Shieldtail (Indian Earth Snake)
102. *Uropeltis smithi* (Gans, 1966) Violet Shieldtail (Smith's Earth Snake)
103. *Rhinophis sanguineus* (Beddome, 1863) Red-billed Shieldtail (Beddome's Shieldtail)
104. *Rhinophis fergusonianus* (Boulenger, 1896) Cardamom Shieldtail (Cardamom Hills Earth Snake)
105. *Rhinophis travancoricus* (Boulenger, 1892) Travancore Shieldtail (Tamil Nadu Earth Snake)
- Family Pythonidae**
106. *Python molurus* (Linnaeus, 1758) Indian Rock Python
- Family Erycidae**
107. *Eryx conicus* (Schneider, 1801) Common Sand Boa
108. *Eryx jhonii* (Russel, 1801) Red Sand Boa (Indian Sand Boa)
109. *Eryx whitakeri* (Das, 1991) Whitaker's Boa (Whitaker's Sand Boa)
- Family Acrochordidae**
110. *Acrochordus granulatus* (Schneider, 1799) Marine File Snake (Little Wart Snake)
- Family Colubridae**
111. *Coelognathus helena* (Daudin, 1803) Common Trinket Snake
112. *Ptyas mucosa* (Linnaeus, 1758) Indian Rat Snake (Dhaman)
113. *Argyrogena fasciolata* (Shaw, 1802) Banded Racer
114. *Liopeltis calamaria* (Gunther, 1858) Lesser Stripe-necked Snake (Calamaria Reed Snake)
115. *Oligodon venustus* (Jerdon, 1853) Black-spotted Kukri Snake
116. *Oligodon travancoricus* (Beddome, 1877) Travancore Kukri Snake
117. *Oligodon taeniolatus* (Jerdon, 1853) Russell's Kukri Snake
118. *Oligodon arnensis* (Shaw, 1802) Common Kukri Snake (Banded Kukri Snake)
119. *Oligodon affinis* (Gunther, 1862) Western Kukri Snake
120. *Oligodon brevicauda* (Gunther, 1862) Stripped Kukri Snake (Short-tailed Kukri Snake)
121. *Dendrelaphis ashoki* (Vogel & Van Rooijen, 2011) Ashok's Bronzeback Tree Snake
122. *Dendrelaphis giri* (Vogel & Van Rooijen, 2011) Giri's Bronzeback Tree Snake
123. *Dendrelaphis grandoculis* (Boulenger, 1890) Large-eyed Bronzeback Tree Snake

124. *Dendrelaphis chairecaeos* (Boie, 1827) Southern Bronzeback Tree Snake
 125. *Dendrelaphis tristis* (Daudin, 1803) Common Bronzeback Tree Snake
 126. *Chrysopelea ornate* (Shaw, 1802) Ornate Flying Snake (Golden Tree Snake)
 127. *Lycodon travancoricus* (Beddome, 1870) Travancore Wolf Snake
 128. *Lycodon striatus* (Shaw, 1802) Barred Wolf Snake (Northern Wolf Snake)
 129. *Lycodon aulicus* (Linnaeus, 1754) Common Wolf Snake
 130. *Dryocalamus nympa* (Daudin, 1803) Bridal Snake
 131. *Sibynophis subpunctatus* (Bibron & Dumeril, 1854) Dumeril's Black Headed Snake
 132. *Rhabdops olivaceus* (Beddome, 1863) Olive Forest Snake
 133. *Boiga trigonata* (Schneider, 1802) Common Cat Snake (Indian Gamma Snake)
 134. *Boiga ceylonensis* (Gunther, 1858) Ceylon Cat Snake (Sri Lanka Cat Snake)
 135. *Boiga nuchalis* (Gunther, 1875) Collared Cat Snake
 136. *Boiga forsteni* (Bbron & Dumeril, 1854) Forsten's Cat Snake
 137. *Boiga beddomei* (Wall, 1909) Beddome's Cat Snake
 138. *Boiga dightoni* (Boulenger, 1894) Travancore Cat Snake (Dighton's Cat Snake)
 139. *Ahaetulla perroteti* (Dumeril, Bibron & Dumeril, 1854) Bronze-headed Vine Snake (Perrotet's Vine Snake)
 140. *Ahaetulla dispar* (Gunther, 1864) Gunther's Vine Snake
 141. *Ahaetulla nasuta* (Bonnaterre, 1790) Common Vine Snake
 142. *Ahaetulla pulverulenta* (Dumeril & Bibron, 1854) Brown Vine Snake (Brown-speckled Vine Snake)
Family Xenodermatidae
 143. *Xylophis captaini* (Gower & Winkler, 2007) Captain's Wood Snake
 144. *Xylophis perroteti* (Dumeril, Bibron & Dumeril, 1854) Stripped Narrow-headed Snake
 145. *Xylophis stenorhynchus* (Gunther, 1875) Gunther's Narrow-headed Snake
Family Natricidae
 146. *Amphiesmastolatum* (Linnaeus, 1758) Striped Keelback (Buff-striped Keelback)
 147. *Hebius beddomei* (Gunther, 1864) Beddome's Keelback (Nilgiri Keelback)
 148. *Hebius monticola* (Jerdon, 1853) Hill Keelback (Wayanad Keelback)
 149. *Xenochrophis piscator* (Schneider, 1799) Checkered Keelback (Asiatic Water Snake)
 150. *Macropisthodon plumbicolor* (Cantor, 1839) Green Keelback
 151. *Atretium schistosum* (Daudin, 1803) Olive Keelback Water Snake (Olive Trapezoid Snake)

Family Homalopsidae

152. *Dieurostus dussumieri* (Dumeril, Bibron & Dumeril, 1854) Dussumier's Smooth Scale Water Snake (Kerala Mud Snake)
153. *Cerberus rynchops* (Schneider, 1799) Dog-faced Water Snake (Asian Bockadam)
154. *Gerarda prevostiana* (Eydoux & Gervais, 1837) Glossy Marsh Snake

Family Elapidae

155. *Bungarus caeruleus* (Schneider, 1801) Common Indian Krait
156. *Calliophis melanurus* (Shaw, 1802) Slender Coral Snake
157. *Calliophis nigrescens* (Gunther, 1862) Striped Coral Snake
158. *Calliophis beddomei* (Smith, 1943) Beddome's Coral Snake
159. *Calliophis bibroni* (Jan, 1858) Bibron's Coral Snake
160. *Naja naja* (Linnaeus, 1758) Spectacled Cobra
161. *Ophiophagus hannah* (Cantor, 1836) King Cobra
162. *Hydrophis schistosus* (Daudin, 1803) Hook-nosed Sea Snake
163. *Hydrophis cyanocinctus* (Daudin, 1803) Annulated Sea Snake
164. *Hydrophis ornatus* (Gray, 1842) Cochin-banded Sea Snake
165. *Hydrophis curtus* (Shaw, 1802) Short Sea Snake
166. *Hydrophis platurus* (Linnaeus, 1766) Black and Yellow Sea Snake

Family Viperidae

167. *Daboia russelii* (Shaw & Nodder, 1797) Russel's Viper
168. *Echis carinatus* (Schneider, 1801) Saw-Scaled Viper
169. *Hypnale hypnale* (Merrem, 1820) Common Hump-nosed Pit Viper
170. *Trimeresurus macrolepis* (Beddome, 1862) Large-scaled Green Pit Viper
171. *Trimeresurus malabaricus* (Jerdon, 1854) Malabar Pit Viper
172. *Trimeresurus strigatus* (Gray, 1842) Horseshoe Pit Viper
173. *Trimeresurus gramineus* (Shaw, 1802) Bamboo Pit Viper

Checklist of Amphibians of Kerala (As on July 2021)

SI No	Scientific name	Authority	Common name	Malayalam Name
	CLASS: AMPHIBIA	Gray		
	I. ORDER ANURA	Fischer von Waldheim		
	1. Family BUFONIDAE	Gray		
1	<i>Duttaphrynus beddomii</i>	(Gunther, 1875)	Beddome's Toad	തെക്കൻ ചൊരിത്തവള
2	<i>Duttaphrynus melanostictus</i>	(Schneider, 1799)	Common Indian Toad	ചൊരിത്തവള
3	<i>Duttaphrynus</i>	(Boulenger 1882)	Small-eared Toad	ചെറുചെവിയൻ
4	<i>Duttaphrynus parietalis</i>	(Boulenger, 1882)	Ridged Toad	കാട്ടുചൊരിത്തവള
5	<i>Duttaphrynus scaber</i>	(Schneider, 1799)	Ferguson's Toad	കുഞ്ഞൻ ചൊരി
6	<i>Duttaphrynus</i>	(Linnaeus, 1758)	Silent Valley Toad	സൈലന്റ് വാലി ചെ
7	<i>Blaira ornata</i>	(Gunther, 1876)	Malabar Torrent	തീവയറൻ അരുവി
8	<i>Blaira rubigina</i>	(Pillai & Pattabiraman,	Red Stream Toad	ചെമ്പൻ അരുവിയ
9	<i>Pedostibes tuberculosus</i>	Gunther 1875	Malabar Tree Toad	മരച്ചൊരിയൻ
	2. Family	Anderson		
10	<i>Euphlyctis aloysii</i>	Joshy, Alam, Kurabayashi, Sumida, and Kuramoto, 2009	Aloysius skittering frog	അലോഷി ചാട്ടക്കാ രൻ തവള
11	<i>Euphlyctis cyanophlyctis</i>	(Schneider, 1799)	Indian Skipper Frog	ചാട്ടക്കാരൻ

12	<i>Euphlyctis karaavali</i>	Priti, Naik, Seshadri, Singal, Vidisha, Ravikanth, and	Karaavali Skittering Frog	പൊന്മാൻ തവള
13	<i>Euphlyctis kerala</i>	Dnesh, Channakeshavamurthy, Deepak, Ghosh and Deuti,	Kerala skittering frog	പച്ച ചാട്ടുകോരൻ
14	<i>Hoplobatrachus crassus</i>	(Jerdon, 1853)	Jerdon's Bullfrog	ആട്ടുമടക്കച്ചി
15	<i>Hoplobatrachus tigerinus</i>	(Daudin, 1803)	Indian Bullfrog	നാട്ടുമടക്കച്ചി
16	<i>Minervarya agricola</i>	(Jerdon, 1853)	Common Indian cricket frog	ഇന്ത്യൻ ചിലപ്പൻ
17	<i>Minervarya brevipalmata</i>	(Peters, 1871)	Short-webbed Frog	ചതുപ്പൻ ചിലപ്പൻ
18	<i>Minervarya kadar</i>	(Garg and Biju, 2017)	Kadar Burrowing Frog	കാടൻ ചിലപ്പൻ
19	<i>Minervarya keralensis</i>	(Dubois, 1980)	Kerala Warty Frog	കേരള ചിലപ്പൻ
20	<i>Minervarya manoharani</i>	(Garg and Biju, 2017)	Manoharan's Burrowing Frog	മനോഹരൻ ചിലപ്പൻ
21	<i>Minervarya mudduraja</i>	(Kuramoto, Joshy, Kurabayashi, and Sumida, 2008)	Mudduraja cricket frog	മുട്ടുരാജ ചിലപ്പൻ
22	<i>Minervarya murthii</i>	(Pillai, 1979)	Murthy's frog	മുർത്തി ചിലപ്പൻ
23	<i>Minervarya neilcoxi</i>	(Garg and Biju, 2017)	Neil Cox's Burrowing Frog	നീൽ കോക്സ് ചിലപ്പൻ

24	<i>Minervarya nilagirica</i>	(Jerdon, 1853)	Nilgiris wart frog	നിലഗിരി ചിലപ്പൻ
25	<i>Minervarya parambikulamana</i>	(Rao, 1937)	Parambikulam Wart Frog	പറമ്പികുളം ചിലപ്പൻ
26	<i>Minervarya rufescens</i>	(Jerdon, 1853)	Rufescent Burrowing Frog	ചെങ്കൽ ചിലപ്പൻ
27	<i>Minervarya syhadrensis</i>	(Annandale, 1919)	Minervarya Frog	ബോംബേ ചിലപ്പൻ
28	<i>Minervarya sahyadris</i>	Dubois, Ohler & Biju, 2001	Bombay Wart Frog	ചിലപ്പൻ
29	<i>Sphaerotheca pluvialis</i>	(Jerdon, 1853)	Jerdon's Burrowing Frog	ജെറോൻ കുമ്പളി
	3. Family MICRIXALIDAE	Dubois, Ohler and Biju		
30	<i>Micrixalus adonis</i>	Biju, Garg, Gururaja, Shouche, & Walujkar, 2014	Munnar Torrent Frog	മൂന്നാർ പിരിയൻ
31	<i>Micrixalus elegans</i>	(Rao, 1937)	Elegant Torrent Frog	കുടക് പിരിയൻ
32	<i>Micrixalus frigidus</i>	Biju, Garg, Gururaja, Shouche, & Walujkar, 2014	Cold Stream Torrent Frog	ആനമല പിരിയൻ
33	<i>Micrixalus fuscus</i>	(Boulenger, 1882)	Dusky Torrent Frog	അഗസ്ത്യമല പിരിയൻ
34	<i>Micrixalus gadgili</i>	Pillai & Pattabiraman, 1990	Gadgil's Torrent Frog	ഗാഡ്ജിൽ പിരിയൻ
35	<i>Micrixalus herrei</i>	Myers, 1942	Kallar Torrent Frog	കല്ലാർ പിരിയൻ

36	<i>Micrixalus kurichiyari</i>	Biju, Garg, Gururaja, Shouche, & Walujkar, 2014	Kurichiyar Torrent Frog	കുറിച്ചർ പിലിഗിരിയൻ
37	<i>Micrixalus mallani</i>	Biju, Garg, Gururaja, Shouche, & Walujkar, 2014	Mallan's Torrent Frog	ശൺതുരുണി പിലിഗിരിയൻ
38	<i>Micrixalus nellyampathi</i>	Biju, Garg, Gururaja, Shouche, & Walujkar, 2014	Nellyampathi Torrent Frog	നെല്ലിയാമ്പതി പിലിഗിരിയൻ
39	<i>Micrixalus nigriventris</i>	Biju, Garg, Gururaja, Shouche, & Walujkar, 2014	Black-bellied Torrent Frog	കരിവയറൻ പിലിഗിരിയൻ
40	<i>Micrixalus nudis</i>	Pillai, 1978	Naked Torrent Frog	വയനാട് പിലിഗിരിയൻ
41	<i>Micrixalus phyllophilus</i>	(Jerdon, 1854)	Pink-thighed Torrent Frog	ചെങ്കാലൻ പിലിഗിരിയൻ
42	<i>Micrixalus sairandhri</i>	Biju, Garg, Gururaja, Shouche, & Walujkar, 2014	Sairandhri Torrent Frog	സൈരന്ദ്രി പിലിഗിരിയൻ
43	<i>Micrixalus sali</i>	Biju, Garg, Gururaja, Shouche, & Walujkar, 2014	Sali's Torrent Frog	പൊന്തൂടി പിലിഗിരിയൻ
44	<i>Micrixalus saxicola</i>	(Jerdon, 1854)	Wayanad Torrent Frog	വടക്കൻ പിലിഗിരിയൻ
45	<i>Micrixalus silvaticus</i>	(Boulenger, 1882)	Forest Torrent Frog	കാട് പിലിഗിരിയൻ
46	<i>Micrixalus thampii</i>	Pillai, 1981	Thampi's Torrent Frog	തമ്പി പിലിഗിരിയൻ

	4. Family MICROHYLIDAE	Günther		
47	<i>Melanobatrachus indicus</i>	Beddome, 1878	Black Microhylid Frog	ചൊലകറുന്തി
48	<i>Microhyla darreli</i>	Garg, Suyesh, Das, Jiang, Wijayathilaka, Amarasinghe, Alhadi, Vineeth, Aravind,	Darrel's Chorus Frog	ഡറെലി കുറിമുക്കൻ
49	<i>Microhyla nilphamariensis</i>	Howlader, Nair, Gopalan, and Merilä, 2015	Nilphamarai Narrow-mouthed Frog	നിൽഫമറയ് കുറിമുക്കൻ
50	<i>Microhyla ornata</i>	(Dumeril & Bibron, 1841)	Ornate Narrow-mouthed Frog	സ്വർണ്ണ കുറിമുക്കൻ
51	<i>Microhyla rubra</i>	Jerdon, 1854)	Reddish Narrow-mouthed Frog	ചെമ്പൻ കുറിമുക്കൻ
52	<i>Microhyla sholigari</i>	Dutta & Ray, 2000	Sholigari Microhylid	ഷോളിഗാരി കുറിമുക്കൻ
53	<i>Mysticellus franki</i>	Garg and Biju, 2019	Franky's Narrow-mouthed Frog	നാൽക്കണ്ണൻ കുറിമുക്കൻ
54	<i>Uperodon anamalaiensis</i>	Rao, 1937	Anamalai Dot Frog	ആനമല കുറിവായൻ
55	<i>Uperodon globulosus</i>	(Gunther, 1864)	Indian Balloon Frog	ബലൂൺ തവള
56	<i>Uperodon montanus</i>	(Jerdon, 1854)	Jerdon's Ramanella	ചൊല കുറിവായൻ
57	<i>Uperodon marmoratus</i>	(Rao, 1937)	Indian Dot Frog	ചെങ്കൽ കുറിവായൻ

58	<i>Uperodon systoma</i>	(Schneider, 1799)	Marbled Balloon Frog	വെണ്ണക്കൽ വട്ടിത്തവള
59	<i>Uperodon taprobanicus</i>	Parker, 1934	Painted Frog	ചിത്ര തവള
60	<i>Uperodon triangularis</i>	(Gunther, 1875)	Malabar Ramanella	മലബാർ കുറിവായൻ
61	<i>Uperodon variegatus</i>	(Stoliczka, 1872)	Variegated Ramanella	വർണ കുറിവായൻ
	5. Family NASIKABATRACHIDA	Biju and Bossuyt		
62	<i>Nasikabatrachus sahyadrensis</i>	Biju & Bossuyt, 2003	Purple Frog	പാതാള തവള
	6. Family NYCTIBATRACHIDAE	Blommers-Schlösser		
63	<i>Astrobatrachus kurichiyana</i>	Vijayakumar, Pyron, Dinesh, Torsekar, Srikanthan, Swamy, Stanley, Blackburn, and Shanker, 2019	Starry Dwarf Frog	നക്ഷത്ര കുഞ്ഞൻ
64	<i>Nyctibatrachus acanthodermis</i>	"Biju, Bocxlaer, Mahony, Dinesh, Radhakrishnan, and Shanker, 2019	Spinular Night Frog	മുള്ളൻ രാത്രിതവള
65	<i>Nyctibatrachus aliciae</i>	Inger, Shaffer, Koshy & Bakde, 1984	Aliciae's Night Frog	അലീസി രാത്രിതവള
66	<i>Nyctibatrachus anamallaiensis</i>	(Myers, 1942)	Anamallai Night Frog	ആനമല രാത്രിതവള
67	<i>Nyctibatrachus athirappillyensis</i>	Garg, Suyesh, Sukesan, and Biju, 2017	Athirappilly Night Frog	അതിരപ്പിള്ളി രാത്രിതവള

68	<i>Nyctibatrachus beddomii</i>	(Boulenger, 1882)	Beddome's Night Frog	ബെഡോം രാത്രിവള
69	<i>Nyctibatrachus deccanensis</i>	Dubois, 1984	Anamallai Night Frog	ചോല രാത്രിവള
70	<i>Nyctibatrachus deveni</i>	"Biju, Bocxlaer, Mahony, Dinesh, Radhakrishnan, Zachariah, Giri &	Deven's Night Frog	ദേവനി രാത്രിവള
71	<i>Nyctibatrachus gavi</i>	"Biju, Bocxlaer, Mahony, Dinesh, Radhakrishnan,	Gavi Night Frog	ഗവി രാത്രിവള
72	<i>Nyctibatrachus grandis</i>	"Biju, Bocxlaer, Mahony, Dinesh, Radhakrishnan,	Wayanad Night Frog	വയനാട് രാത്രിവള
73	<i>Nyctibatrachus indraneili</i>	"Biju, Bocxlaer, Mahony, Dinesh, Radhakrishnan,	Indraneil's Night Frog	ഇന്ദ്രനീലി രാത്രിവള
74	<i>Nyctibatrachus kempholeyensis</i>	(Rao, 1937)	Kempholey Night Frog	കെംഫോളേ രാത്രിവള
75	<i>Nyctibatrachus major</i>	Boulenger, 1882	Malabar Night Frog	പെരും രാത്രിവള
76	<i>Nyctibatrachus manalari</i>	Garg, Suyesh, Sukesan, and Biju, 2017	Manalar Night Frog	മണലാർ രാത്രിവള
77	<i>Nyctibatrachus mewasinghi</i>	Krutha, Dahanukar, and Molur, 2017	Mewa Singh's Night Frog	പെരുവണ്ണാമുഴി രാത്രിവള
78	<i>Nyctibatrachus minimus</i>	Biju, Bocxlaer, Giri, Roelants, Nagaraju & Bossuyt, 2007	Miniature Night Frog	കുഞ്ഞൻ രാത്രിവള
79	<i>Nyctibatrachus minor</i>	Inger, Shaffer, Koshy & Bakde, 1984	Kerala Night Frog	കേരളാ രാത്രിവള

80	<i>Nyctibatrachus periyar</i>	"Biju, Bocxlaer, Mahony, Dinesh, Radhakrishnan, Zachariah, Giri & Bossuyt 2011"	Periyar Night Frog	പെരിയാർ രാത്ത്വള
81	<i>Nyctibatrachus pillai</i>	"Biju, Bocxlaer, Mahony, Dinesh, Radhakrishnan,	Pillai's Night Frog	പിള്ള രാത്ത്വള
82	<i>Nyctibatrachus poocha</i>	Biju, Bocxlaer, Mahony, Dinesh, Radhakrishnan,	Meowing Night Frog	പുച്ചുത്തവള
83	<i>Nyctibatrachus pulivijayani</i>	Garg, Suyesh, Sukesan, and Biju, 2017	Vijayan's Night Frog	പുലി രാത്ത്വള
84	<i>Nyctibatrachus sabarimalai</i>	Garg, Suyesh, Sukesan, and Biju, 2017	Sabarimala Night Frog	ശബരിമല രാത്ത്വള
85	<i>Nyctibatrachus vasanthi</i>	Ravichandran, 1997	Kalakad Night Frog	കളക്കാട് രാത്ത്വള
86	<i>Nyctibatrachus vrijeuni</i>	Biju, Bocxlaer, Mahony, Dinesh, Radhakrishnan,	VUB Night Frog	വി യു ബി രാത്ത്വള
87	<i>Nyctibatrachus webilla</i>	Garg, Suyesh, Sukesan, and Biju, 2017	Kadalar Night Frog	വെബ്ബില്ലാത്തവള
	7. Family RANIDAE	Batsch		
88	<i>Clinotarsus curtipes</i>	(Jerdon, 1853)	Bicoloured Frog	കാട്ടുമണവാട്ടി
89	<i>Hydrophylax malabarica</i>	(Tschudi, 1838)	Malabar Hills Frog	മണവാട്ടിത്തവള
90	<i>Indosylvirana aurantiaca</i>	(Boulenger, 1904)	Boulenger's Golden-backed frog	ബൊലെഞ്ചർ സ്വർണത്തവള

91	<i>Indosylvirana doni</i>	(Biju, Garg, Mahony, Wijayathilaka, Senevirathne & Meegaskumbura, 2014)	Don's Golden-backed frog	ഡോണി സ്വർണത്തവള
92	<i>Indosylvirana flavescens</i>	(Jerdon, 1853)	Yellowish Golden-backed frog	മഞ്ഞ സ്വർണത്തവള
93	<i>Indosylvirana indica</i>	(Biju, Garg, Mahony, Wijayathilaka, Senevirathne & Meegaskumbura, 2014)	Indian Golden-backed frog	ഇന്ത്യൻ സ്വർണത്തവള
94	<i>Indosylvirana intermedia</i>	(Rao, 1937)	Rao's intermediate Golden-backed frog	റാവു സ്വർണത്തവള
95	<i>Indosylvirana magna</i>	(Biju, Garg, Mahony, Wijayathilaka, Senevirathne & Meegaskumbura, 2014)	Large Golden-backed Frog	വലിയ സ്വർണത്തവള
96	<i>Indosylvirana sreeni</i>	(Biju, Garg, Mahony, Wijayathilaka, Senevirathne & Meegaskumbura, 2014)	Sreeni's Golden-backed frog	ശ്രീനി സ്വർണത്തവള
97	<i>Indosylvirana urbis</i>	(Biju, Garg, Mahony, Wijayathilaka, Senevirathne & Meegaskumbura, 2014)	Urban Golden-backed frog	നഗര സ്വർണത്തവള
	8. Family RANIXALIDAE	Dubois		
98	<i>Indirana beddomii</i>	(Gunther, 1875)	Beddome's leaping frog	ബെഡ്ഡം പാറത്തവള
99	<i>Indirana brachytarsus</i>	(Gunther, 1875)	Anamallais Leaping frog	ആനമല പാറത്തവള
100	<i>Indirana gundia</i>	(Dubois, 1986)	Gundia Leaping Frog	ഗുണ്ടുണ്ടിയ പാറത്തവള
101	<i>Indirana paramakri</i>	Garg and Biju, 2016	Rocky-terrain Leaping Frog	പാറമുകളി പാറത്തവള

102	<i>Indirana sarojamma</i>	Dahanukar, Modak, Krutha, Nameer, Padhye, and Molur, 2016	Sarojamma's Leaping Frog	പൊന്മുടി പാറത്തവള
103	<i>Indirana semipalmata</i>	(Boulenger, 1882)	South Indian Frog	ചെറുകാലൻ പാറത്തവള
104	<i>Indirana tysoni</i>	Dahanukar, Modak, Krutha, Nameer, Padhye, and Molur, 2016	Tyson's Leaping Frog	റാണിപുരം പാറത്തവള
105	<i>Indirana yadera</i>	Dahanukar, Modak, Krutha, Nameer, Padhye, and Molur, 2016	Yadera's Leaping Frog	ഇടുക്കി പാറത്തവള
106	<i>Walkerana diplosticta</i>	(Gunther, 1875)	Spotted Leaping Frog	പുള്ളി പാറത്തവള
107	<i>Walkerana leptodactyla</i>	(Boulenger, 1882)	Boulenger's Leaping Frog	ബൊലെഞ്ചർ പാറത്തവള
108	<i>Walkerana muduga</i>	Dinesh, Vijayakumar, Ramesh,	Muduga's Leaping Frog	മുദുഗ പാറത്തവള
109	<i>Walkerana phrynoderma</i>	(Boulenger, 1882)	Toad skinned Leaping Frog	ചൊറിയൻ പാറത്തവള
	9. Family RHACOPHORIDAE	Hoffman		
110	<i>Beddomixalus bijui</i>	(Zachariah, Dinesh, Radhakrishnan,	Anamalai Swamp Frog	ആനമല ചതുപ്പൻ
111	<i>Ghatixalus asterops</i>	Biju, Roelants & Bossuyt, 2008	Ghat Tree Frog	ചോല മരത്തവള

112	<i>Ghatixalus magnus</i>	Abraham, Mathew, Cyriac, Zachariah, Raju & Zachariah, 2015	Large Ghats Tree Frog	വലിയ ചോല മരത്തവള
113	<i>Ghatixalus variabilis</i>	(Jerdon, 1853)	Green Tree Frog	പച്ചച്ചോല മരത്തവള
114	<i>Mercurana myristicapalustris</i>	Abraham, Pyron, Ansil, Zachariah & Zachariah, 2013	Myristica Swamp frog	തെക്കൻ ചതുപ്പൻ
115	<i>Polypedates maculatus</i>	(Gray, 1834)	Common Indian Tree Frog	ചുവർത്തവള
116	<i>Polypedates occidentalis</i>	Das & Dutta, 2006	Charpa Tree frog	ചാർപ്പ ചുവർത്തവള
117	<i>Polypedates pseudocruciger</i>	Das & Ravichandran, 1998	False Hour-glass Tree Frog	ഘടികാര തവിട്ടുമരത്തവള
118	<i>Pseudophilautus kani</i>	(Biju & Bossuyt, 2009)	Kani Bush Frog	കാണി ഇലത്തവള
SI No	Scientific name	Authority	Common name	ദേശാഭിമാനം ചോല
119	<i>Pseudophilautus wvnaadensis</i>	(Jerdon, 1853)	Jerdon's Bush Frog	വയനാടൻ ഇലത്തവള
120	<i>Raorchestes agasthyaensis</i>	Zachariah, Dinesh, Kunhikrishnan,	Agasthyamala Bush Frog	അഗസ്ത്യൻ ഇലത്തവള
121	<i>Raorchestes akroparallagi</i>	(Biju & Bossuyt, 2009)	Variable Bush Frog	പച്ച ഇലത്തവള
122	<i>Raorchestes anili</i>	(Biju & Bossuyt, 2006)	Anil's Bush Frog	അനിലി ഇലത്തവള
123	<i>Raorchestes archeos</i>	Vijaykumar, Dinesh, Prabhu & Shanker, 2014	Archaic Bush Frog	പുളി ഇലത്തവള

124	<i>Raorchestes aureus</i>	Vijaykumar, Dinesh, Prabhu & Shanker, 2014	Golden-eyed Frog	സ്വർണ്ണകണ്ഠി ഇലത്തവള
125	<i>Raorchestes beddomii</i>	(Gunther, 1876)	Beddome's Bush Frog	ബെഡോം ബെലത്തവള
126	<i>Raorchestes blandus</i>	Vijaykumar, Dinesh, Prabhu & Shanker, 2014	Pleasant Bush Frog	ബ്ലാണ്ടസ് ഇലത്തവള
127	<i>Raorchestes bobingeri</i>	(Biju & Bossuyt, 2005)	Bob Inger's Bush Frog	ബോബിൻഗർ ഇലത്തവള
128	<i>Raorchestes chalazodes</i>	(Gunther, 1876)	Chalazodes Bubble Nest Frog	പച്ച ഊറ്റത്തവള
129	<i>Raorchestes charius</i>	(Rao, 1937)	Seshachar's Bush Frog	ശേഷാചർ ഇലത്തവള
130	<i>Raorchestes chlorosomma</i>	(Biju & Bossuyt, 2009)	Green-eyed Bush Frog	പച്ചകണ്ഠി ഇലത്തവള
131	<i>Raorchestes chotta</i>	(Biju & Bossuyt, 2009)	Small Bush Frog	കുഞ്ഞൻ ഇലത്തവള
132	<i>Raorchestes chromasynchysi</i>	(Biju & Bossuyt, 2009)	Confusing Green Bush Frog	സമ്മിശ്ര ഇലത്തവള
133	<i>Raorchestes crustai</i>	Zachariah, Dinesh, K unhikrishnan,	Bark Bush Frog	പട്ട ഇലത്തവള
134	<i>Raorchestes drutaahu</i>	Garg, Suyesh, Das, Bee and Biju, 2021	Fast-calling Shrub Frog	ദ്രുതാഹു ഇലത്തവള
135	<i>Raorchestes dubois</i>	(Biju & Bossuyt, 2006)	Kodaikanal Bush Frog	കൊടൈ ഇലത്തവള

136	<i>Raorchestes flavioocularis</i>	Vijayakumar, Dinesh, Prabhu, and Shanker, 2014	Yellow-eyed Reed Frog	മഞ്ഞകണ്ണി ഇലത്തവള
137	<i>Raorchestes flaviventris</i>	(Boulenger, 1882)	Yellow-bellied Bush Frog	മഞ്ഞവയറൻ ഇലത്തവള
138	<i>Raorchestes glandulosus</i>	(Jerdon, 1853)	Glandular Bush frog	മാനന്തവാടി ഇലത്തവള
139	<i>Raorchestes graminirupes</i>	(Biju & Bossuyt, 2005)	Ponmudi Bush frog	പൊന്മുടി ഇലത്തവള
140	<i>Raorchestes griet</i>	(Bossuyt, 2002)	Griet Bush Frog	ഗ്രിയറ്റ് ഇലത്തവള
141	<i>Raorchestes jayarami</i>	(Biju & Bossuyt, 2009)	Jayaram's Bush Frog	ജയറാം ഇലത്തവള
142	<i>Raorchestes johnceei</i>	Zachariah, Dinesh, Kunhikrishnan,	Johnceei's Bush Frog	ജോൺസി ഇലത്തവള
143	<i>Raorchestes kadalarensis</i>	Zachariah, Dinesh, Kunhikrishnan,	Kadalar Bush Frog	കടലാർ ഇലത്തവള
144	<i>Raorchestes kaikatti</i>	(Biju & Bossuyt, 2009)	Kaikatti Bush Frog	കൈകാട്ടി ഇലത്തവള
145	<i>Raorchestes kakachi</i>	Seshadri, Gururaja & Aravind, 2012	Kakachi Bush Frog	കാക്കാച്ചി ഇലത്തവള
146	<i>Raorchestes kakkayamensis</i>	Garg, Suyesh, Das, Bee and Biju, 2021	Kakkayam Shrub Frog	കക്കയം ഇലത്തവള
147	<i>Raorchestes keirasabina</i>	Garg, Suyesh, Das, Bee and Biju, 2021	Keira's Shrub Frog	കെയ്റ ഇലത്തവള

148	<i>Raorchestes lechiya</i>	Zachariah, Cyriac, Chandramohan, Ansil,	Lechiyappan's bush frog	ലെച്ചിയപ്പൻ ഇലത്തവള
149	<i>Raorchestes leucolatus</i>	Vijaykumar, Dinesh, Prabhu & Shanker, 2014	White Patch Bush Frog	പാണ്ടൻ ഇലത്തവള
150	<i>Raorchestes manohari</i>	Zachariah, Dinesh, Kunhikrishnan,	Beautiful Reed Bush Frog	മനോഹരി ഊറ്റത്തവള
151	<i>Raorchestes marki</i>	(Biju & Bossuyt, 2009)	Mark's Bush Frog	മാർക്കി ഇലത്തവള
152	<i>Raorchestes munnarensis</i>	(Biju & Bossuyt, 2009)	Munnar Bush Frog	മൂന്നാർ ഇലത്തവള
153	<i>Raorchestes nerostagona</i>	(Biju & Bossuyt, 2005)	Water Drop Frog	മഴത്തുള്ളി തവള
154	<i>Raorchestes ochlandrae</i>	(Gururaja, Dinesh, Palot, Radhakrishnan & Ramachandra, 2007)	Ochlandrae Reed Bush Frog	ഊറ്റത്തവള
155	<i>Raorchestes ponmudi</i>	(Biju & Bossuyt, 2005)	Large Ponmudi Bush Frog	വലിയ ഇലത്തവള
156	<i>Raorchestes ravii</i>	Zachariah, Dinesh, Kunhikrishnan, Biju & Bossuyt, 2009	Ravi's Bush Frog	രവി ഇലത്തവള
157	<i>Raorchestes resplendens</i>	Biju, Shouche, Dubois, Dutta & Bossuyt, 2010	Resplendent Shrub Frog	ആനമുടി ഇലത്തവള
158	<i>Raorchestes sanjappai</i>	Garg, Suyesh, Das, Bee and Biju, 2021	Sanjappa's Shrub Frog	സഞ്ചപ്പ ഇലത്തവള
159	<i>Raorchestes signatus</i>	(Boulenger, 1882)	Star-eyed Bush Frog	നക്ഷത്രക്കണ്ണി ഇലത്തവള
160	<i>Raorchestes silentvalley</i>	Zachariah, Cyriac, Chandramohan, Ansil,	Silent Valley bushfrog	സൈലന്റ് വാലി ഇലത്തവള

161	<i>Raorchestes sushili</i>	(Biju & Bossuyt, 2009)	Sushil's Bush Frog	സുഷിലി ഇലത്തവള
162	<i>Raorchestes theuerkaufi</i>	Zachariah, Dinesh, Kunhikrishnan, Das, Raju,	Theuerkauf's Bush Frog	തൈർകൊഫ് ഇലത്തവള
163	<i>Raorchestes tinniens</i>	(Jerdon, 1853)	Nilgiri Bush Frog	നീലഗിരി ഇലത്തവള
164	<i>Raorchestes travancoricus</i>	(Boulenger, 1891)	Travancore Bush Frog	നീലക്കണ്ണി ഇലത്തവള
165	<i>Raorchestes tubero humerus</i>	(Kuramoto & Joshy, 2003)	Kudremukh Bush Frog	കുദ്രേമുഖ് ഇലത്തവള
166	<i>Raorchestes uthamani</i>	Zachariah, Dinesh, Kunhikrishnan, Das, Raju,	Uthaman's Reed Bush Frog	ഉത്തമനി ഊറ്റത്തവള
167	<i>Raorchestes vellikkannan</i>	Garg, Suyesh, Das, Bee and Biju, 2021	Silver-eyed Shrub Frog	വെള്ളിക്കണ്ണൻ ഇലത്തവള
168	<i>Rhacophorus calcadensis</i>	Ahl, 1927	Kalakad Tree Frog	കളക്കാട് പച്ചിലപ്പാറൻ
169	<i>Rhacophorus lateralis</i>	Boulenger, 1883	Small Tree Frog	വരയൻ പച്ചിലപ്പാറൻ
170	<i>Rhacophorus malabaricus</i>	Jerdon, 1870	Malabar Gliding Frog	പച്ചിലപ്പാറൻ
171	<i>Rhacophorus pseudomalabaricus</i>	Vasudevan & Dutta, 2000	Malabar False Tree frog	പുളളി പച്ചിലപ്പാറൻ
	II. ORDER GYMNOPTERON	Müller		

	10. Family ICHTHYOPHIIDAE	Taylor		
172	<i>Epicrium beddomei</i>	Peters 1879	Beddome's Caecilian	വരയൻ കുരുടി
173	<i>Epicrium bombayensis</i>	Taylor, 1960	Bombay Caecilian	തടിയൻ കുരുടി
174	<i>Epicrium kodaguensis</i>	Ichthyophis kodaguensis	Kodagu Striped Caecilian	കൊടഗുകുരുടി
175	<i>Epicrium longicephalus</i>	Pillai, 1986	Long-headed Caecilian	മുക്കൻ കുരുടി
176	<i>Epicrium tricolor</i>	Ann&ale, 1909	Three-colored Caecilian	തൂവർണ്ണ കുരുടി
177	<i>Uraeotyphlus interruptus</i>	Pillai & Ravich&ran, 1999	Chengalam Caecilian	ചെങ്ങളം കുരുടി
178	<i>Uraeotyphlus malabaricus</i>	(Beddome, 1870)	Malabar Caecilian	മലബാർ കുരുടി
179	<i>Uraeotyphlus menoni</i>	Ann&ale, 1913	Menon's Caecilian	മേനോൻ കുരുടി
180	<i>Uraeotyphlus narayani</i>	Seshachar, 1939	Narayan's Caecilian	നാരായൺ കുരുടി
181	<i>Uraeotyphlus oommeni</i>	Gower & Wilkinson, 2007	Oommen's Uraeotyphlus	ഉമ്മൻ കുരുടി
182	<i>Uraeotyphlus oxyurus</i>	(Dumeril & Bibron, 1841)	Red Caecilian	ചെമ്പൻ കുരുടി
	11. Family INDOTYPHLYIDAE	Lescure, Renous and Gasc		

183	<i>Gegeneophis carnosus</i>	(Beddome, 1870)	Ramaswami's Caecilian	രാമസ്വാമി കുരുടി
184	<i>Gegeneophis ramaswamii</i>	Taylor, 1964	Malabar cardomom Gegeneophis	ഏലക്കാടൻ കുരുടി
185	<i>Gegeneophis primus</i>	Kotharambath, Gower, Oomen & Wilkinson, 2012	Tejaswini Gegeneophis	തേജസ്വിനി കുരുടി
186	<i>Gegeneophis tejaswini</i>	Kotharambath, Wilkinson, Oommen, and Gower, 2015	Beddome's Caecilian	വരയൻ കുരുടി

Checklist of freshwater fishes of Kerala

Order/Family Species	Common Name
Order: Osteoglossiformes	
Family Notopteridae	
1. <i>Notopterus synurus</i> (Bloch & Schneider 1801)	Bronze Featherback
Order: Anguilliformes	
Family Anguillidae	
2. <i>Anguilla bengalensis</i> (Gray 1831)	Indian Mottled Eel
3. <i>Anguilla bicolor</i> McClelland 1844	Indian Shortfin Eel
Family Ophichthidae	
4. <i>Pisodonophis boro</i> (Hamilton 1822)	Rice Paddy Eel
Order: Clupeiformes	
Family Clupeidae	
5. <i>Dayella malabarica</i> (Day 1873) (MT)	Day's Round Herring
6. <i>Ehirava fluviatilis</i> Deraniyagala 1929 (MT)	Malabar Sprat
Order: Cypriniformes	
Family Cyprinidae	
7. <i>Dawkinsia arulius</i> (Jerdon 1849)	Aruli Barb
8. <i>Dawkinsia austellus</i> Katwate et al. 2020	Southern Filament Barb
9. <i>Dawkinsia exclamatio</i> (Pethiyagoda & Kottelat 2005)	Exclamation Barb
10. <i>Dawkinsia filamentosa</i> (Valenciennes 1844)	Filament Barb
11. <i>Dawkinsia lepida</i> (Katwate et al. 2020)	Lepidus Barb
12. <i>Dawkinsia rubrotinctus</i> (Jerdon 1849)	Three Spot Barb
13. <i>Eechathalakenda ophicephalus</i> (Raj 1941)	Snakehead Barb
14. <i>Garra arunachalami</i> (Johnson & Soranam 2001)	Arunachalam's Stone Sucker
15. <i>Garra emarginata</i> Kurup & Radhakrishnan 2011	Emarginate Stone Sucker
16. <i>Garra hughi</i> Silas 1955	Hughe's Stone Sucker
17. <i>Garra maclellandi</i> (Jerdon 1849)	McClelland's Stone Sucker
18. <i>Garra menoni</i> Rema Devi & Indra 1984	Menon's Stone Sucker
19. <i>Garra mlapparaensis</i> Kurup & Radhakrishnan 2011	Mlappara Stone Sucker
20. <i>Garra mulya</i> (Sykes 1839)	Striped Stone Sucker
21. <i>Garra periyarensis</i> Gopi 2001	Periyar Stone Sucker
22. <i>Garra surendranathanii</i> Shaji, Arun & Easa 1996	Surendran's Stone Sucker
23. <i>Garra stenorhynchus</i> (Jerdon 1849)	Sahyadri Horned Stone Sucker
24. <i>Gymnostomus ariza</i> (Hamilton 1807)	Ariza Carp
25. <i>Haludaria fasciata</i> (Jerdon 1849)	Cauvery Melon Barb
26. <i>Haludaria melanampyx</i> (Day 1865)	Melon Barb
27. <i>Haludaria kannikkattiensis</i> (Arunachalam & Johnson 2003)	Kannikkati Barb
28. <i>Hypselobarbus carnaticus</i> (Jerdon 1849)	Carnatic Carp
29. <i>Hypselobarbus dubius</i> (Day 1867)	Nilgiri Barb
30. <i>Hypselobarbus jerdoni</i> (Day 1870)	Jerdon's Carp
31. <i>Hypselobarbus kurali</i> Menon & Rema Devi 1995	Kurali Barb

32. <i>Hypselobarbus lithopidos</i> (Day 1874)	Canara Barb
33. <i>Hypselobarbus micropogon</i> (Valenciennes 1842)	Korhi Barb
34. <i>Hypselobarbus periyarensis</i> (Raj 1941)	Periyar Barb
35. <i>Hypselobarbus thomassi</i> (Day 1874)	Red Canarese Barb
36. <i>Kantaka brevidorsalis</i> (Day 1873)	Kantaka Barb
37. <i>Labeo dussumieri</i> (Valenciennes 1842)	Malabar Labeo
38. <i>Labeo fimbriatus</i> (Bloch 1795)	Fringe Lipped Carp
39. <i>Labeo kontius</i> (Jerdon 1849)	Pig Mouth Carp
40. <i>Labeo nigrescens</i> (Day 1870)	Black Labeo
41. <i>Lepidopygopsis typus</i> Raj 1941 (MT/EG)	Periyar Hill Barb
42. <i>Neolissochilus wynaadensis</i> (Day 1873)	Wayanad Mahseer
43. <i>Oreochthys incognito</i> Knight & Kumar 2015	Kerala High Fin Barb
44. <i>Oreochthys coorgensis</i> (Jayaram 1982)	Cauvery High Fin Barb
45. <i>Osteochilichthys longidorsalis</i> Pethiyagoda & Kottelat 1994	Long Finned Kerala Barb
46. <i>Osteochilichthys nashii</i> (Day 1869)	Nash's Barb
47. <i>Osteochilichthys thomassi</i> (Day 1877)	Thomas' Barb
48. <i>Osteobrama bakeri</i> (Day 1873)	Baker's Barb
49. <i>Osteobrama neilli</i> (Day 1873)	Nilgiri Patashi
50. <i>Pethia conchoni</i> (Hamilton 1822)	Rosy Barb
51. <i>Pethia nigripinnis</i> Knight et al. 2012	Black Finned Barb
52. <i>Pethia pookodensis</i> (Mercy & Jacob 2007)	Pookode Barb
53. <i>Pethia punctata</i> (Day 1865)	Dotted Sawfin Barb
54. <i>Puntius amphibius</i> (Valenciennes 1842)	Amphibius barb
55. <i>Puntius bimaculatus</i> (Bleeker 1863)	Redside Barb
56. <i>Puntius chola</i> (Hamilton 1822)	Chola Barb
57. <i>Puntius cauveriensis</i> (Hora 1937)	Cauvery Barb
58. <i>Puntius dorsalis</i> (Jerdon 1849)	Dorsalis Barb
59. <i>Puntius madhusoodani</i> Kumar, Pereira & Radhakrishnan 2012	Madhusoodan's Barb
60. <i>Puntius mahecola</i> (Valenciennes 1844)	Mahe Barb
61. <i>Puntius melanostigma</i> (Day 1878)	One spot Barb
62. <i>Puntius parrah</i> (Day 1865)	Parrah Barb
63. <i>Puntius sophore</i> (Hamilton 1822)	Sophore Barb
64. <i>Puntius vittatus</i> (Day 1865)	Green Stripe Barb
65. <i>Sahyadria denisonii</i> (Day 1865)	Denison's Barb
66. <i>Sahyadria chalakudiensis</i> (Menon, Rema Devi & Thobias 1999)	Chalakudy Redline Torpedo Barb
67. <i>Systomus sarana</i> (Hamilton 1822)	Swamp Barb
68. <i>Tariqilabeo periyarensis</i> (Menon & Jacob 1996)	Periyar Latia
69. <i>Tor khudree</i> (Sykes 1839)	Deccan Mahseer
70. <i>Tor malabaricus</i> (Jerdon 1849)	Malabar Mahseer
71. <i>Tor remadevii</i> (Kurup & Radhakrishnan 2011)	Humpbacked Mahseer

Family Danionidae

72. <i>Amblypharyngodon melettinus</i> (Valenciennes 1844)	Silver Carplet
73. <i>Amblypharyngodon microlepis</i> (Bleeker 1853)	Indian Carplet

74. *Danio rerio* (Hamilton 1822) Zebra Fish
75. *Devario malabaricus* (Jerdon 1849) Malabar Danio
76. *Devario neilgherriensis* (Day 1867) Nilgiri Danio
77. *Esomus thermoicos* (Valenciennes 1842) Flying Barb
78. *Horadandia brittani* Rema Devi & Menon 1992 Glass Carplet
79. *Laubuka fasciata* (Silas 1958) Malabar Leaping Barb
80. *Laubuka trevori* Knight 2015 Trevor's Leaping Barb
81. *Neochela dadiburjori* (Menon 1952) (MT/EG) Burjor's Brilliance
82. *Opsarius bakeri* (Day 1865) Baker's Baril
83. *Opsarius bendelisis* (Hamilton 1807) Spotted Baril
84. *Opsarius canarensis* (Jerdon 1849) Canara Baril
85. *Opsarius gatensis* (Valenciennes 1844) Emerald Baril
86. *Opsarius malabaricus* (Jerdon 1849) Malabar Baril
87. *Rasbora dandia* (Valenciennes 1844) Black Line Rasbora
88. *Rasbora neilgherriensis* (Day 1867) Nilgiri Rasbora
89. *Salmostoma acinaces* (Valenciennes 1844) Silver Razorbelly Minnow
90. *Salmostoma boopis* (Day 1874) Boopis Razorbelly Minnow
- Family Cobitidae**
91. *Lepidocephalichthys thermalis* (Valenciennes 1846) Common Spiny Loach
92. *Pangio goaensis* (Tilak 1972) Indian Coolie Loach
93. *Pangio bhujia* Anoop et al. 2019 Bhujia Loach
- Family Balitoridae**
94. *Balitora jalpalli* Raghavan et al. 2012 Silent Valley Stone Loach
95. *Balitora mysorensis* Hora 1941 Mysore Stone Loach
96. *Bhavana annandalei* Hora 1920 Annandale's Stone Loach
97. *Bhavana australis* (Jerdon 1849) Bhavani Stone Loach
98. *Ghatsa menoni* (Shaji & Easa 1995) Menon's Stone Loach
99. *Ghatsa montana* (Herre 1945) Anamalai Stone Loach
100. *Ghatsa pillaii* (Indra & Rema Devi 1981) Pillai's Stone Loach
101. *Ghatsa santhamparaiensis* Arunachalam et al. 2002 Santhampara Stone Loach
102. *Ghatsa silasi* (Kurup & Radhakrishnan 2011) Silas's Stone Loach
103. *Travancoria elongata* Pethiyagoda & Kottelat 1994 (EG) Elongated Stone Loach
104. *Travancoria jonesi* Hora 1941 (EG) Jone's Stone Loach
- Family Nemacheilidae**
105. *Indoreonectes keralensis* (Rita & Nalbant 1978) Cardamom Hills River Loach
106. *Mesonoemacheilus guentheri* (Day 1867) Gunther's Loach
107. *Mesonoemacheilus herrei* (Nalbant & Bănărescu 1982) Anamalai Loach
108. *Mesonoemacheilus menoni* (Zacharias & Minimol 1999) Menon's River Loach
109. *Mesonoemacheilus pambarensis* (Rema Devi & Indra 1994) Pambar Loach
110. *Mesonoemacheilus periyarensis* (Kurup & Radhakrishnan 2005) Periyar Loach
111. *Mesonoemacheilus pulchellus* (Day 1873) Pretty Spotted Loach
112. *Mesonoemacheilus remadevii* Shaji 2002 Remadevi's Loach
113. *Mesonoemacheilus tambaraparniensis* (Menon 1987) Tambaraparini Zodiac Loach
114. *Mesonoemacheilus triangularis* (Day 1865) Zodiac Loach
115. *Nemacheilus monilis* Hora 1921 Black Bead Loach

116. *Paracanthocobitis sinuata* (Day 1870) Wayanad Loach
 117. *Schistura denisoni* (Day 1867) Denison's Loach
 118. *Schistura nilgiriensis* (Menon 1987) Nilgiri Loach
 119. *Schistura semiarmata* (Day 1867) Small-spotted Loach
 120. *Schistura striata* (Day 1867) Long Bodied Striped Loach
- Order: Siluriformes**
- Family Bagridae**
121. *Batasio travancoria* Hora & Law 1941 Travancore Batasio
 122. *Hemibagrus punctatus* (Jerdon 1849) Cauvery Giant Catfish
 123. *Mystus armatus* (Day 1865) Dwarf Mystus Catfish
 124. *Mystus gulio* (Hamilton 1822) Long Whiskered Catfish
 125. *Mystus malabaricus* (Jerdon 1849) Malabar Mystus
 126. *Mystus montanus* (Jerdon 1849) Wayanad Mystus
 127. *Mystus oculatus* (Valenciennes 1840) Spotted Mystus
 128. *Mystus seengtee* (Sykes 1839) Krishna River catfish
 129. *Mystus vittatus* (Bloch 1794) Striped Mystus
- Family Horabagridae**
130. *Horabagrus brachysoma* (Günther 1864) Yellow Catfish
 131. *Horabagrus nigricollaris* Pethiyagoda & Kottelat 1994 Imperial White Collared Catfish
- Family Clariidae**
132. *Clarias dayi* Hora 1936 Malabar Clarid
 133. *Clarias dussumieri* Valenciennes 1840 Valenciennes's Clarid
 134. *Horaglanis abdulkalami* Babu 2012 (EG) Abdulkalam's Blind Catfish
 135. *Horaglanis alikunhii* Babu & Nayar 2004 (EG) Alikunhi's Blind Catfish
 136. *Horaglanis krishnai* Menon 1950 (EG) Kerala Blind Well Catfish
- Family Heteropneustidae**
137. *Heteropneustes fossilis* Bloch 1794 Stinging Catfish
- Family Kryptoglanidae**
138. *Kryptoglanis shajii* Vincent & Thomas 2011 (MT/EG) Shaji's Blind Catfish
- Family Schilbeidae**
139. *Pseudentropius mitchelli* Günther 1864 (EG) Mitchell's River Catfish
- Family Siluridae**
140. *Ompok bimaculatus* (Bloch 1794) Butter Catfish
 141. *Ompok karunkodu* Ng 2013 Cauvery Catfish
 142. *Ompok malabaricus* (Valenciennes 1840) Malabar Butter Catfish
 143. *Pterocryptis wynaadensis* (Day 1873) Wayanad Stream Catfish
 144. *Wallago attu* (Schneider 1801) Freshwater Shark
- Family Sisoridae**
145. *Glyptothorax anamalaiensis* Silas 1952 Anamalai Mountain Catfish
 146. *Glyptothorax annandalei* Hora 1923 Annandale's Mountain Catfish
 147. *Glyptothorax davisinghi* Manimekalan & Das 1998 Nilambur Mountain Catfish
 148. *Glyptothorax elankadensis* Plamoottil & Abraham 2013 Elankadu Mountain Catfish
 149. *Glyptothorax housei* Herre 1942 Valparai Mountain Catfish
 150. *Glyptothorax madraspatanus* Day 1873 Madras Mountain Catfish
 151. *Glyptothorax malabarensis* Gopi 2010 Malabar Mountain Catfish

152. <i>Pseudolaguvia austrina</i> Radhakrishnan, Sureshkumar & Ng 2011	Southern Indian Torrent Catfish
Order: Cyprinodontiformes	
Family Aplocheilidae	
153. <i>Aplocheilus blockii</i> Arnold 1911	Green Panchax
154. <i>Aplocheilus lineatus</i> (Valenciennes 1846)	Striped Panchax
155. <i>Aplocheilus parvus</i> Sundara Raj 1916	Raj's Panchax
Order: Beloniformes	
Family Adrianichthyidae	
156. <i>Oryzias setnai</i> (Kulkarni 1940)	Malabar Ricefish
Family Belonidae	
157. <i>Xenentodon cancila</i> (Hamilton 1822)	Needlefish
Family Hemiramphidae	
158. <i>Hyporhamphus limbatus</i> (Valenciennes 1847)	Congaturi Halfbeak
159. <i>Hyporhamphus xanthopterus</i> (Valenciennes 1847)	Red-Tipped Halfbeak
Order: Synbranchiformes	
Family Mastacembelidae	
160. <i>Macragnathus guentheri</i> (Day 1865)	Malabar Spiny Eel
161. <i>Mastacembelus armatus</i> (Lacepède 1800)	Zig-zag Eel
162. <i>Mastacembelus malabaricus</i> (Jerdon 1849)	Malabar Tyre-Track Eel
Family Synbranchidae	
163. <i>Ophichthys fossorius</i> (Nayar 1951)	Malabar Swamp Eel
164. <i>Ophisternon bengalense</i> (McClelland 1844)	Bengal Swamp Eel
165. <i>Rakthamichthys digressus</i> (Gopi 2002)	Swamp Eel
166. <i>Rakthamichthys indicus</i> (Eapen 1963)	Eapen's Swamp Eel
167. <i>Rakthamichthys roseni</i> (Bailey & Gans 1998)	Rosen's Swamp Eel
Order: Perciformes	
Incertae sedis under Ovalenteria	
Family Ambassidae	
168. <i>Parambassis dayi</i> (Bleeker 1874)	Day's Glassy Perchlet
169. <i>Parambassis thomassi</i> (Day 1870)	Western Ghats Glassy Perchlet
Order: Anabantiformes	
Family Anabantidae	
170. <i>Anabas testudineus</i> (Bloch 1792)	Climbing Perch
Family Aenigmachannidae	
171. <i>Aenigmachanna gollum</i> Britz et al. 2019 (EG)	Gollum Dragon Snakehead
172. <i>Aenigmachanna mahabali</i> Rahul, Basheer & Charan 2019 (EG)	Mahabali Dragon Snakehead
Family Channidae	
173. <i>Channa diplogramma</i> (Day 1865)	Tiger Snakehead
174. <i>Channa gachua</i> (Hamilton 1822) †	Dwarf Snakehead
175. <i>Channa pseudomarulius</i> (Günther 1861)	Peninsular Indian Giant Snakehead
176. <i>Channa punctata</i> (Bloch 1793) †	Spotted Snakehead
177. <i>Channa striata</i> (Bloch 1793)	Striped Snakehead

Family Badidae

178. *Dario neela* Britz, Anoop & Dahanukar 2018 Western Ghats Blue Dario
179. *Dario urops* Britz, Ali & Philip 2012 Western Ghats Dario

Family Nandidae

180. *Nandus nandus* (Hamilton 1822) Gangetic Leaf fish

Family Pristolepididae

181. *Pristolepis marginata* (Jerdon 1849) Common Catopra
182. *Pristolepis rubripinnis* Britz, Kumar & Baby 2012 Red Finned Catopra

Family Osphronemidae

183. *Pseudosphromenus cupanus* (Cuvier 1831) Spike Tailed Paradise Fish
184. *Pseudosphromenus dayi* (Engmann 1909) Day's Paradise Fish

Order: Cichliformes**Family Cichlidae**

185. *Etilopius suratensis* (Bloch 1790) Pearl Spot
186. *Pseudotilopius maculatus* (Bloch 1795) Orange Chromide

Order: Gobiiformes**Family Gobiidae**

187. *Awaous grammepomus* (Bleeker 1849) Scribbled goby
188. *Glossogobius giuris* (Hamilton 1822) Tank Goby
189. *Pseudogobiopsis oligactis* (Bleeker 1875) Stream Goby
190. *Schismatogobius deraniyagalai* Kottelat & Pethiyagoda 1989 Redneck Goby
191. *Sicyopterus griseus* (Day 1877) Clown Goby

Family Eleotridae

192. *Bunaka gyrinoides* (Bleeker 1853) Greenback guavina
193. *Eleotris fusca* (Forster 1801) Dusky Sleeper

Order: Syngnathiformes**Family Syngnathidae**

194. *Ichthyocampus carce* (Hamilton 1822) Freshwater Pipe Fish
195. *Microphis cunocalus* (Hamilton 1822) Crocodile Tooth Pipe Fish

Order: Tetraodontiformes**Family Tetraodontidae**

196. *Carinotetraodon travancoricus* (Hora & Nair 1941) Malabar Puffer Fish

Checklist of Butterflies of Kerala

Order/Family Species	Common Name
Family HesperIIDae	
Subfamily Coeliadinae	
1. <i>Badamia exclamationis</i> (Fabricius, 1775)	Brown Awl
2. <i>Bibasis sena</i> (Moore, [1866])	Orange-tailed Awl
3. <i>Burara gomata</i> (Moore, [1866])	Pale Green Awlet
4. <i>Burara jaina</i> (Moore, [1866])	Common Orange Awlet
5. <i>Choaepes benjaminii</i> (Guérin-Méneville, 1843)	Common Awlking
6. <i>Hasora badra</i> (Moore, [1858])	Common Awl
7. <i>Hasora chromus</i> (Cramer, [1780])	Common Banded Awl
8. <i>Hasora taminatus</i> (Hübner, 1818)	White-banded Awl
9. <i>Hasora vitta</i> (Butler, 1870)	Plain Banded Awl
Subfamily Hesperinae	
Tribe Aeromachini	
10. <i>Aeromachus dubius</i> (Elwes & Edwards, 1897)	Dingy Scrub Hopper
11. <i>Aeromachus pygmaeus</i> (Fabricius, 1775)	Pygmy Scrub Hopper
12. <i>Ampittia dioscorides</i> (Fabricius, 1793)	Bush Hopper
13. <i>Arnetta mercara</i> (Evans, 1932)	Kodagu Forest Hopper
14. <i>Arnetta vindhiana</i> (Moore, [1884])	Vindhyan Bob.
15. <i>Baracus hampsoni</i> (Elwes & Edwards, 1897)	Spotted Hedge Hopper:
16. <i>Baracus subditus</i> (Moore, [1884])	Striped Hedge Hopper
17. <i>Cupitha purreea</i> (Moore, 1877)	Wax Dart
18. <i>Erionota torus</i> (Evans, 1941)	Rounded Palm-redeye
19. <i>Gangara thyrasis</i> (Fabricius, 1775)	Giant Redeye
20. <i>Halpe hindu</i> (Evans, 1937)	Sahyadri Banded Ace
21. <i>Halpe porus</i> (Mabille, [1877])	Bispot Banded Ace
22. <i>Hyarotis adrastus</i> (Stoll, [1780])	Tree Flitter
23. <i>Hyarotis coorga</i> (Evans, 1949)	Kodagu Brush Flitter
24. <i>Iambrix salsala luteipalpis</i> (Plötz, 1886)	Southern Chestnut Bob
25. <i>Matapa aria</i> (Moore, [1866])	Common Branded Redeye
26. <i>Notocrypta curvifascia</i> (C. & R. Felder, 1862)	Restricted Demon
27. <i>Notocrypta parahysos</i> (Wood-Mason & de Nicéville, 1881)	Common Banded Demon
28. <i>Psolos fuligo</i> (Mabille, 1876)	Dusky Partwing
29. <i>Quedara basiflava</i> (de Nicéville, [1889])	Yellow-base Flitter
30. <i>Salanoemia sala</i> (Hewitson, [1866])	Maculate Lancer
31. <i>Halpemorpha hyrtacus</i> (de Nicéville, 1897) [=] Ace]	White-branded Ace [=Bicolour Ace]
32. <i>Suastus gremius</i> (Fabricius, 1798)	Oriental Palm Bob

33. *Suastus minuta* (Moore, 1877)
34. *Thoressa astigmata* (Swinhoe, 1890)
35. *Thoressa evershedii* (Evans, 1910)
36. *Thoressa honorei* (de Nicéville, 1887)
37. *Thoressa sitala* (de Nicéville, 1885)
38. *Udaspes folus* (Cramer, [1775])
39. *Zographetus ogygia* (Hewitson, [1866])

Small Palm Bob
 Unbranded Ace
 Travancore Tawny Ace
 Sahyadri Orange Ace
 Nilgiri Plain Ace
 Grass Demon
 Purple-spotted Flutter

Tribe Baorini

40. *Baoris farri* (Moore, 1878)
41. *Borbo bevani* (Moore, 1878)
42. *Borbo cinnara* (Wallace, 1866)
43. *Caltoris canaraica* (Moore, [1884])
44. *Caltoris kumara* (Moore, 1878)
45. *Caltoris philippina* (Herrich-Schäffer, 1869)
46. *Parnara bada* (Moore, 1878)
47. *Pelopidas agna* (Moore, [1866])
48. *Pelopidas conjuncta* (Herrich-Schäffer, 1869)
49. *Pelopidas mathias* (Fabricius, 1798)
50. *Pelopidas subochracea* (Moore, 1878)
51. *Polytremis lubricans* (Herrich-Schäffer, 1869)

Complete Paint-brush Swift
 Lesser Rice Swift
 Rice Swift
 Karwar Swift
 Blank Swift
 Philippine Swift
 Grey Swift
 Obscure Branded Swift
 Conjoined Swift
 Small Branded Swift
 Large Branded Swift
 Contiguous Swift

Tribe Taractrocerini

52. *Cephrenes acalle* (Höppfer, 1874)
53. *Oriens concinna* (Elwes & Edwards, 1897)
54. *Oriens goloides* (Moore, [1881])
55. *Potanthus diana* (Evans, 1932)
56. *Potanthus pallida* (Evans, 1932)
57. *Potanthus palnia* (Evans, 1914)
58. *Potanthus pava* (Fruhstorfer, 1911)
59. *Potanthus pseudomaesa* (Moore, [1881])
60. *Taractrocera ceramas* (Hewitson, 1868)
61. *Taractrocera maevius* (Fabricius, 1793)
62. *Telicota bambusae* (Moore, 1878)
63. *Telicota colon* (Fabricius, 1775)

Plain Palm-Dart
 Sahyadri Dartlet
 Smaller Dartlet
 Chinese Dart
 Pallid Dart
 Palni Dart
 Pava Dart
 Common Dart
 Tawny-spotted Grass Dart:
 Grey-veined Grass Dart:
 Dark Palm-Dart
 Pale Palm-Dart

Subfamily Pyrginae

Tribe Carcharodini

64. *Gomalia elma* (Trimen, 1862)
65. *Spialia galba* (Fabricius, 1793)

African Marbled Skipper
 Asian Grizzled Skipper

Tribe Celaenorrhinini

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|--|-------------------------|
| 66. <i>Celaenorrhinus ambareesa</i> (Moore, [1866]) | Dakhan Spotted Flat |
| 67. <i>Celaenorrhinus fusca</i> (Hampson, [1889]) | Dusky Spotted Flat |
| 68. <i>Celaenorrhinus leucocera</i> (Kollar, [1844]) | Common Spotted Flat |
| 69. <i>Celaenorrhinus putra</i> (Moore, [1866]) | Restricted Spotted Flat |
| 70. <i>Pseudocoladenia dan</i> (Fabricius, 1787) | Fulvous Pied Flat |
| 71. <i>Sarangesa dasahara</i> (Moore, [1866]) | Common Small Flat |
| 72. <i>Sarangesa purendra</i> (Moore, 1882) | Spotted Small Flat |

Tribe Tagiadini

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| 73. <i>Caprona agama</i> (Moore, [1858]) | Spotted Angle |
| 74. <i>Caprona alida</i> (de Nicéville, 1891) | Alida Angle |
| 75. <i>Caprona ransonnettii</i> (R. Felder, 1868) | Golden Angle |
| 76. <i>Coladenia indrani</i> (Moore, [1866]) | Tricolour Pied Flat |
| 77. <i>Gerosis bhagava</i> (Moore, [1866]) | Common Yellow-breasted Flat |
| 78. <i>Odontoptilum angulata</i> (C. Felder, 1862) | Chestnut Angle |
| 79. <i>Tagiades gana sivia</i> (Evans, 1934) | Dakhan Suffused Snow Flat |
| 80. <i>Tagiades japetus</i> (Stoll, [1781]) | Common Snow Flat |
| 81. <i>Tagiades litigiosa</i> (Möschler, 1878) | Water Snow Flat |
| 82. <i>Tapena thwaitesi</i> (Moore, [1881]) | Black Angle |

Family Lycaenidae

Subfamily Curetinae

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|---|----------------|
| 83. <i>Curetis acuta</i> (Moore, 1877) | Acute Sunbeam |
| 84. <i>Curetis siva</i> (Evans, 1954) | Shiva Sunbeam |
| 85. <i>Curetis thetis</i> (Drury, [1773]) | Indian Sunbeam |

Subfamily Miletina

Tribe Spalgini

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| 86. <i>Spalgis epius</i> (Westwood, [1851]) | Apefly. |
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Subfamily Polyommatae

Tribe Lycaenesthini

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| 87. <i>Anthene emolus</i> (Godart, [1824]) | Common Ciliate Blue |
| 88. <i>Anthene lycaenina</i> (R. Felder, 1868) | Pointed Ciliate Blue |

Tribe Polyommataini

89. <i>Acytolepis lilacea</i> (Hampson, 1889)	Lilac Hedge Blue
90. <i>Acytolepis puspa</i> (Horsfield, [1828])	Common Hedge Blue
91. <i>Azanus jesous</i> (Guérin-Ménéville, 1849)	African Babul Blue
92. <i>Azanus ubaldus</i> (Stoll, [1782])	Bright Babul Blue
93. <i>Caleta decidia</i> (Hewitson, 1876)	Angled Pierrot
94. <i>Castalius rosimon</i> (Fabricius, 1775)	Common Pierrot
95. <i>Catochrysops panormus</i> (C. Felder, 1860)	Silver Forget-me-not
96. <i>Catochrysops strabo</i> (Fabricius, 1793)	Forget-me-not
97. <i>Celatoxia albidisca</i> (Moore, [1884])	White-disc Hedge Blue
98. <i>Celastrina lavenduris</i> (Moore, 1877)	Plain Hedge Blue
99. <i>Chilades lajus</i> (Stoll, [1780])	Lime Blue
100. <i>Chilades pandava</i> (Horsfield, [1829])	Plains Cupid
101. <i>Chilades parrhasius</i> (Fabricius, 1793)	Small Cupid
102. <i>Discolampa ethion</i> (Westwood, [1851])	Banded Blue Pierrot
103. <i>Euchrysops cnejus</i> (Fabricius, 1798)	Gram Blue
104. <i>Everes lacturnus</i> (Godart, [1824])	Orange-crowned Cupid
105. <i>Freyeria putli</i> (Kollar, [1844])	Black-spotted Grass Jewel
106. <i>Freyeria trochylus</i> (Freyer, 1845)	Orange-spotted Grass Jewel
107. <i>Ionolyce helicon</i> (C. Felder, 1860)	Pointed Lineblue
108. <i>Jamides alecto</i> (C. Felder, 1860)	Metallic Cerulean
109. <i>Jamides bochus</i> (Stoll, [1782])	Dark Cerulean
110. <i>Jamides celeno</i> (Cramer, [1775])	Common Cerulean
111. <i>Lampides boeticus</i> (Linnaeus, 1767)	Pea Blue
112. <i>Leptotes plinius</i> (Fabricius, 1793)	Zebra Blue
113. <i>Megisba malaya</i> (Horsfield, [1828])	Malayan
114. <i>Nacaduba beroe</i> (C. & R. Felder, [1865])	Opaque Six-Lineblue
115. <i>Nacaduba berenice</i> (Herrich-Schäffer, 1869)	Rounded Six-Lineblue
116. <i>Nacaduba calauria</i> (C. Felder, 1860)	Dark Six-Lineblue
117. <i>Nacaduba hermus</i> (C. Felder, 1860)	Pale Four-Lineblue
118. <i>Nacaduba kurava</i> (Moore, [1858])	Transparent Six-Lineblue
119. <i>Nacaduba pactolus</i> (C. Felder, 1860)	Large Four-Lineblue
120. <i>Nacaduba sinbala</i> (Ormiston, 1924)	Pale Ceylon Lineblue
121. <i>Neopithecops zalmora</i> (Butler, [1870])	Common Quaker
122. <i>Petrelaea dana</i> (de Nicéville, [1884])	Dingy Lineblue
123. <i>Prosotas dubiosa</i> (Semper, [1879])	Tailless Lineblue
124. <i>Prosotas nora</i> (C. Felder, 1860)	Common Lineblue
125. <i>Prosotas noreia</i> (R. Felder, 1868)	White-tipped Lineblue
126. <i>Pseudozizeeria maha</i> (Kollar, [1844])	Pale Grass Blue
127. <i>Talicauda nysens</i> (Guérin-Ménéville, 1843)	Red Pierrot
128. <i>Tarucus ananda</i> (de Nicéville, [1884])	Dark Pierrot
129. <i>Tarucus callinara</i> (Butler, 1886)	Spotted Pierrot
130. <i>Tarucus nara</i> (Butler, 1886)	Spotted Pierro
131. <i>Udara akasa</i> (Horsfield, [1828])	White Hedge Blue
132. <i>Zizeeria karsandra</i> (Moore, 1865)	Dark Grass Blue
133. <i>Zizina otis</i> (Fabricius, 1787)	Lesser Grass Blue

134. *Zizula hylax* (Fabricius, 1775) Tiny Grass Blue

Subfamily Theclinae

Tribe Amblypodiini

135. *Amblypodia anita* (Hewitson, 1862) Purple Leaf Blue
136. *Iraota timoleon* (Stoll, [1790]) Silverstreak Blue
137. *Thaduka multicaudata* (Moore, [1879]) Many-tailed Oakblue

Tribe Aphnaeini:

138. *Spindasis abnormis* (Moore, [1884]) Abnormal Silverline
139. *Spindasis elima* (Moore, 1877) Scare Shot Silverline
140. *Spindasis ictis* (Hewitson, 1865) Common Shot Silverline
141. *Spindasis lobita* (Horsfield, [1829]) Long-banded Silverline
142. *Spindasis schistacea* (Moore, [1881]) Plumbeous Silverline
143. *Spindasis vulcanus* (Fabricius, 1775) Common Silverline

Tribe Arhopalini

144. *Arhopala absens* (Hewitson, 1862) Aberrant Oakblue
145. *Arhopala alea* (Hewitson, 1862) Sahyadri Rosy Oakblue
146. *Arhopala amantes* (Hewitson, 1862) Large Oakblue
147. *Arhopala bazaloides* (Hewitson, 1878) Dusted Oakblue
148. *Arhopala centaurus* (Fabricius, 1775) Centaur Oakblue
149. *Surendra quercetorum* (Moore, [1858]) Common Acacia Blue
150. *Zinaspa todara* (Moore, [1884]) Silver-streaked Acacia Blue

Tribe Catapaecilmatini

151. *Catapaecilma major* (Druce, 1895) Common Tinsel

Tribe Cheritrini

152. *Cheritra freja* (Fabricius, 1793) Common Imperial

Tribe Deudorigini

153. *Bindahara moorei* (Fruhstorfer, 1904) Blue-bordered Plane
154. *Deudorix epijarbas* (Moore, [1858]) Cornelian
155. *Rapala iarbus* (Fabricius, 1787) Common Red Flash
156. *Rapala lankana* (Moore, 1879) Malabar Flash
157. *Rapala manea* (Hewitson, 1863) Slate Flash
158. *Rapala varuna* (Horsfield, [1829]) Indigo Flash
159. *Virachola isocrates* (Fabricius, 1793) Common Guava Blue.

160. *Virachola perse* (Hewitson, 1863) Large Guava Blue

Tribe Horagini

161. *Horaga onyx* (Moore, [1858]) Common Onyx
162. *Horaga viola* (Moore, 1882) Brown Onyx
163. *Rathinda amor* (Fabricius, 1775) Monkey Puzzle

Tribe Hypolycaenini

164. *Hypolycaena othona* (Hewitson, [1865]) Orchid Tit
165. *Hypolycaena nilgirica* (Moore, [1884]) Nilgiri Tit
166. *Zeltus amasa* (Hewitson, 1865) Fluffy Tit

Tribe Iolaini

167. *Creon cleobis* (Godart, [1824]) Broad-tailed Royal
168. *Pratapa deva* (Moore, [1858]) White Tufted Royal
169. *Rachana jalindra* (Horsfield, [1829]) Banded Royal
170. *Tajuria cippus* (Fabricius, 1798) Peacock Royal
171. *Tajuria jehana* Moore, [1884] Plains Blue Royal
172. *Tajuria maculatus* Hewitson, [1865] Spotted Royal
173. *Tajuria melastigma* de Nicéville, 1887 Branded Royal

Tribe Loxurini

174. *Loxura atymnus* (Stoll, [1780]) Yamfly

Tribe Remelanini

175. *Ancema sudica* (Evans, 1926) Sahyadri Silver Royal

Tribe Zesiini

176. *Zesius chrysomallus* (Hübner, [1819]) Redspot

Family Nymphalidae

Subfamily Apaturinae

Tribe Apaturini

177. *Euripus consimilis* (Westwood, [1851]) Painted Courtesan
178. *Robana parisatis* (Westwood, [1851]) Black Prince

Subfamily Biblidinae

Tribe Biblidini

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| 179. | <i>Ariadne ariadne</i> (Linnaeus, 1763) | Angled Castor |
| 180. | <i>Ariadne merione</i> (Cramer, [1777]) | Common Castor |
| 181. | <i>Byblia ilithyia</i> (Drury, [1773]) | Joker |

Subfamily Charaxinae

Tribe Charaxini

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|------|---|-------------------|
| 182. | <i>Charaxes agrarius</i> Swinhoe, [1887] | Anomalous Nawab |
| 183. | <i>Charaxes bharata</i> C.& R. Felder, [1867] | Indian Nawab |
| 184. | <i>Charaxes psaphon</i> Westwood, 1847 | Plain Tawny Rajah |
| 185. | <i>Charaxes schreiber</i> Godart, [1824] | Blue Nawab |
| 186. | <i>Charaxes solon</i> (Fabricius, 1793) | Black Rajah |

Subfamily Cyrestinae

Tribe Cyrestini

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| 187. | <i>Cyrestis thyodamas</i> Doyère, [1840] | Map Butterfly |
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Subfamily Danainae

Tribe Danaini

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| 188. | <i>Danaus chrysippus</i> (Linnaeus, 1758) | Plain Tiger |
| 189. | <i>Danaus genutia</i> (Cramer, [1779]) | Striped Tiger |
| 190. | <i>Euploea core</i> (Cramer, [1780]) | Common Crow |
| 191. | <i>Euploea klugii</i> Moore, [1858] | King Crow |
| 192. | <i>Euploea sylvester</i> (Fabricius, 1793) | Double-branded Crow |
| 193. | <i>Idea malabarica</i> (Moore, 1877) | Malabar Tree-Nymph |
| 194. | <i>Parantica aglea</i> (Stoll, [1782]) | Glassy Tiger |
| 195. | <i>Parantica nilgiriensis</i> (Moore, 1877) | Nilgiri Tiger |
| 196. | <i>Tirumala limniace</i> (Cramer, [1775]) | Blue Tiger |
| 197. | <i>Tirumala septentrionis</i> (Butler, 1874) | Dark Blue Tiger |

Subfamily Heliconiinae

Tribe Acraeini

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| 198. | <i>Acraea terpsicore</i> (Linnaeus, 1758) | Tawny Coster |
| 199. | <i>Cethosia mabratta</i> Moore, 1872 | Sahyadri Lacewing |

Tribe Argynnini

200. *Argynnis castetsi* Oberthür, 1891 Palni Branded Fritillary
 201. *Argynnis (castetsi) hybrida* Evans, 1912 Nilgiri Branded Fritillary

Tribe Vagrantini

202. *Cirrochroa thais* (Fabricius, 1787) Tamil Yeoman
 203. *Cupha erymanthis* (Drury, [1773]) Rustic
 204. *Phalanta alcippe* (Stoll, [1782]) Small Leopard
 205. *Phalanta phalantha* (Drury, [1773]) Common Leopard
 206. *Vindula erota* (Fabricius, 1793) Cruiser

Subfamily Libytheinae

Tribe Libytheini

207. *Libythea laius* Trimen, 1879 Lobed Beak
 208. *Libythea myrrha* Godart, 1819 Club Beak

Subfamily Limenitidinae

Tribe Adoliadini

209. *Dophla evelina* (Stoll, [1790]) Redspot Duke
 210. *Euthalia aconthea* (Cramer, [1777]) Common Baron
 211. *Euthalia lubentina* (Cramer, [1777]) Gaudy Baron
 212. *Symphaedra nais* (Forster, 1771) Baronet
 213. *Tanaecia lepidea* (Butler, 1868) Grey Count

Tribe Limenitidini

214. *Athyma inara* Westwood, 1850 Color Sergeant
 215. *Athyma perius* (Linnaeus, 1758) Common Sergeant
 216. *Athyma ranga* Moore, [1858] Blackvein Sergeant
 217. *Athyma selenophora* (Kollar, [1844]) Staff Sergeant
 218. *Moduza procris* (Cramer, [1777]) Commander

Tribe Neptini

219. *Lasippa viraja* (Moore, 1872) Yellowjack Sailer
 220. *Neptis clinia* Moore, 1872 Sullied Sailer
 221. *Neptis hylas* (Linnaeus, 1758) Common Sailer
 222. *Neptis jumbab* Moore, [1858] Chestnut-streaked Sailer
 223. *Neptis nata* Moore, [1858] Clear Sailer
 224. *Neptis palnica* Eliot, 1969 Palni Sailer
 225. *Pantoporia bordonia* (Stoll, [1790]) Common Lascar
 226. *Pantoporia sandaka* (Butler, 1892) Extra Lascar

227. *Phaedyma columella* (Cramer, [1780]) Short-banded Sailer

Tribe Parthenini

228. *Parthenos sylvia* (Cramer, [1775]) Clipper

Subfamily Nymphalinae

Tribe Junoniini

229. *Hypolimnas bolina* (Linnaeus, 1758) Great Eggfly
230. *Hypolimnas misippus* (Linnaeus, 1764) Danaid Eggfly
231. *Junonia almana* (Linnaeus, 1758) Peacock Pansy
232. *Junonia atlites* (Linnaeus, 1763) Grey Pansy
233. *Junonia hierta* (Fabricius, 1798) Yellow Pansy
234. *Junonia iphita* (Cramer, [1779]) Chocolate Pansy.
235. *Junonia lemonias* (Linnaeus, 1758) Lemon Pansy
236. *Junonia orithya* (Linnaeus, 1758) Blue Pansy

Tribe Kallimini

237. *Doleschallia bisaltide* (Cramer, [1777]) Autumn Leaf
238. *Kallima borsfieldii* (Kollar, [1844]) Sahyadri Blue Oakleaf

Tribe Nymphalini

239. *Kaniska canace* (Linnaeus, 1763) Blue Admiral
240. *Vanessa cardui* (Linnaeus, 1758) Painted Lady
241. *Vanessa indica* (Herbst, 1794) Indian Red Admiral

Subfamily Satyrinae

Tribe Amathusiini

242. *Amathusia phidippus* (Linnaeus, 1763) Palmking
243. *Discophora lepida* (Moore, [1858]) Blue-banded Duffer

Tribe Elymniini

244. *Elymnias caudata* Butler, 1871 Tailed Palmfly

Tribe Melanitini

245. *Melanitis leda* (Linnaeus, 1758) Common Evening Brown
246. *Melanitis phedima* (Cramer, [1780]) Dark Evening Brown
247. *Melanitis zitenius* (Herbst, 1796) Great Evening Brown

248. *Parantirrhoea marshalli* Wood-Mason, [1881] Travancore Evening Brown

Tribe Satyrini

249. *Lethe drypetis* (Hewitson, 1863) Two-eyed Treebrown
250. *Lethe europa* (Fabricius, 1775) Bamboo Treebrown
251. *Lethe robria* (Fabricius, 1787) Common Treebrown
252. *Mycalesis anaxias* Hewitson, 1862 White-bar Bushbrown
253. *Mycalesis igilia* Fruhstorfer, 1911 Bicoloured Bushbrown
254. *Mycalesis junonia* Butler, 1868 Malabar Glad-eye Bushbrown
255. *Mycalesis mineus* (Linnaeus, 1758) Dark-branded Bushbrown
256. *Mycalesis orcha* Evans, 1912 Travancore Bushbrown
257. *Mycalesis perseus* (Fabricius, 1775) Common Bushbrown
258. *Mycalesis subdita* (Moore, [1890]) Tamil Bushbrown
259. *Mycalesis visala* Moore, [1858] Long-branded Bushbrown
260. *Orsotriaena medus* (Fabricius, 1775) Medus Brown
261. *Telinga adolphei* (Guérin-Méneville, 1843) Red-eye Bushbrown
262. *Telinga davisoni* (Moore, [1891]) Palni Bushbrown
263. *Telinga oculus* (Marshall, 1881) Red-disc Bushbrown
264. *Ypthima asterope* (Klug, 1832) Common Three-ring
265. *Ypthima baldus* (Fabricius, 1775) Common Five-ring
266. *Ypthima ceylonica* Hewitson, [1865] White Four-ring
267. *Ypthima chenu* (Guérin-Méneville, 1843) Nilgiri Four-ring
268. *Ypthima huebneri* Kirby, 1871 Common Four-ring
269. *Ypthima singala* R. Felder, 1868 Sinhalese Five-ring
270. *Ypthima striata* Hampson, [1889] Striated Five-ring
271. *Ypthima tabella* Marshall, 1883 Sahyadri Baby Five-ring
272. *Ypthima ypthimoides* (Moore, 1881) Palni Four-ring
273. *Zipaetis saitis* Hewitson, 1863 Banded Catseye

Family Papilionidae

Subfamily Papilioninae

Tribe Leptocircini

274. *Graphium agamemnon* (Linnaeus, 1758) Tailed Jay
275. *Graphium antiphates* (Cramer, [1775]) Five-bar Swordtail
276. *Graphium doson* (C. & R. Felder, 1864) Common Jay
277. *Graphium nomius* (Esper, 1799) Spot Swordtail
278. *Graphium teredon* (C. & R. Felder, 1865) Narrow-banded Bluebottle

Tribe Papilionini

279. *Papilio buddha* Westwood, 1872 Malabar Banded Peacock

280.	<i>Papilio clytia</i> Linnaeus, 1758	Common Mime
281.	<i>Papilio crino</i> Fabricius, 1793	Common Banded Peacock
282.	<i>Papilio demoleus</i> Linnaeus, 1758	Lime Swallowtail
283.	<i>Papilio dravidarum</i> Wood-Mason, 1880	Malabar Raven
284.	<i>Papilio heleus</i> Linnaeus, 1758	Red Helen
285.	<i>Papilio liomedon</i> Moore, [1875]	Malabar Banded Swallowtail
286.	<i>Papilio paris</i> Linnaeus, 1758	Paris Peacock
287.	<i>Papilio polymnestor</i> Cramer, [1775]	Blue Mormon
288.	<i>Papilio polytes</i> Linnaeus, 1758	Common Mormon

Tribe Troidini

289.	<i>Pachliopta aristolochiae</i> (Fabricius, 1775)	Common Rose
290.	<i>Pachliopta hector</i> (Linnaeus, 1758)	Crimson Rose
291.	<i>Pachliopta pandiyana</i> (Moore, 1881)	Malabar Rose
292.	<i>Troides minos</i> (Cramer, [1779])	Sahyadri Birdwing

Family Pieridae

Subfamily Coliadinae

293.	<i>Catopsilia pomona</i> (Fabricius, 1775)	Lemon Emigrant
294.	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	Mottled Emigrant
295.	<i>Colias nilagiriensis</i> C. & R. Felder, 1859	Nilgiri Clouded Yellow
296.	<i>Eurema andersonii</i> (Moore, 1886)	One-spot Grass Yellow
297.	<i>Eurema blanda</i> (Boisduval, 1836)	Three-spot Grass Yellow
298.	<i>Eurema brigitta</i> (Stoll, [1780])	Small Grass Yellow
299.	<i>Eurema hecabe</i> (Linnaeus, 1758)	Common Grass Yellow
300.	<i>Eurema laeta</i> (Boisduval, 1836)	Spotless Grass Yellow
301.	<i>Eurema nilgiriensis</i> (Yata, 1990)	Nilgiri Grass Yellow

Subfamily Pierinae

Tribe Anthocharidini

302.	<i>Hebomoia glaucippe</i> (Linnaeus, 1758)	Great Orange-tip
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Tribe Leptosiaini

303.	<i>Leptosia nina</i> (Fabricius, 1793)	Oriental Psyche
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Tribe Nepheroniini

304.	<i>Pareronia ceylanica</i> (C. & R. Felder, 1865)	Dark Wanderer
305.	<i>Pareronia hippia</i> (Fabricius, 1787)	Indian Wanderer

Tribe Pierini

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| 306. | <i>Appias albina</i> (Boisduval, 1836) | Common Albatross |
| 307. | <i>Appias indra</i> (Moore, [1858]) | Plain Puffin |
| 308. | <i>Appias lalage</i> (Doubleday, 1842) | Spot Puffin |
| 309. | <i>Appias libythea</i> (Fabricius, 1775) | Indian Striped Albatross |
| 310. | <i>Appias lyncida</i> (Cramer, [1777]) | Chocolate Albatross |
| 311. | <i>Appias wardii</i> (Moore, [1884]) | Sahyadri Albatross |
| 312. | <i>Belenois aurota</i> (Fabricius, 1793) | Pioneer |
| 313. | <i>Cepora nadina</i> (Lucas, 1852) | Lesser Gull |
| 314. | <i>Cepora nerissa</i> (Fabricius, 1775) | Common Gull |
| 315. | <i>Delias eucharis</i> (Drury, 1773) | Indian Jezebel |
| 316. | <i>Pieris canidia</i> (Linnaeus, 1768) | Asian Cabbage White |
| 317. | <i>Prioneris sita</i> (C. & R. Felder, [1865]) | Painted Sawtooth |

Tribe Teracolini

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| 318. | <i>Colotis amata</i> (Fabricius, 1775) | Small Salmon Arab |
| 319. | <i>Colotis aurora</i> (Cramer, [1780]) | Plain Orange-tip |
| 320. | <i>Colotis danae</i> (Fabricius, 1775) | Crimson-tip |
| 321. | <i>Colotis etrida</i> (Boisduval, 1836) | Little Orange-tip |
| 322. | <i>Colotis fausta</i> (Olivier, 1804) | Large Salmon Arab |
| 323. | <i>Ixias marianne</i> (Cramer, [1779]) | White Orange-tip |
| 324. | <i>Ixias pyrene</i> (Linnaeus, 1764) | Yellow Orange-tip |

Family Riodinidae

Subfamily Nemeobiinae

Tribe Abisarini

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|------|---|--------------------|
| 325. | <i>Abisara bifasciata</i> Moore, 1877 | Double-banded Judy |
| 326. | <i>Abisara echerius</i> (Stoll, [1790]) | Plum Judy |

Checklist of Odonata of Kerala

Order/Family Species	Common Name
Suborder: Zygoptera (Damselflies)	
Family Lestidae	
1. <i>Indolestes gracilis davenporti</i> (Fraser, 1930)	Davenport's False Spreadwing
2. <i>Indolestes pulcherrimus</i> (Fraser, 1924)	Coorg False Spreadwing
3. <i>Lestes concinnus</i> (Hagen in Selys, 1862)	Dusky Spreadwing
4. <i>Lestes dorothea</i> Fraser, 1924	Forest Spreadwing
5. <i>Lestes elatus</i> Hagen in Selys, 1862	Emerald Spreadwing
6. <i>Lestes malabaricus</i> Fraser, 1929	Malabar Spreadwing
7. <i>Lestes nodalis</i> Selys, 1891	Spotted Spreadwing
8. <i>Lestes patricia</i> Fraser, 1924	Black-banded Spreadwing
9. <i>Lestes praemorsus</i> Hagen in Selys, 1862	Sapphire-eyed Spreadwing
10. <i>Lestes viridulus</i> Rambur, 1842	Emerald-striped Spreadwing
11. <i>Platylestes kirani</i> Emiliyamma, Palot & Charesh, 2020	Kiran's Spreadwing
12. <i>Platylestes platystylus</i> (Rambur, 1842)	Green-eyed Spreadwing
Family Platystictidae (Shadow damselflies)	
13. <i>Indosticta deccanensis</i> (Laidlaw, 1915)	Saffron Reedtail
14. <i>Protosticta antelopoides</i> (Fraser, 1931)	Spiny Reedtail
15. <i>Protosticta cyanofemora</i> (Joshi, Subramanian & Babu, 2020)	Blue-legged Reedtail
16. <i>Protosticta davenporti</i> (Fraser, 1931)	Anamalai Reedtail
17. <i>Protosticta graveleyi</i> (Laidlaw, 1915)	Pied Reedtail
18. <i>Protosticta hearseyi</i> Fraser, 1922	Little Reedtail
19. <i>Protosticta monticola</i> Emiliyamma & Palot, 2016	Mountin Reedtail
20. <i>Protosticta mortoni</i> Fraser, 1924	Blue-necked Reedtail
21. <i>Protosticta ponmudiensis</i> Kiran, Kalesh & Kunte, 2015	Travancore Reedtail
22. <i>Protosticta rufostigma</i> Kimmins, 1958	Agasthyamalai Reedtail
23. <i>Protosticta sanguinostigma</i> Fraser, 1922	Red Spotted Reedtail
24. <i>Protosticta sholai</i> Subramanian & Babu, 2020	Shola Reedtail
Family Calopterygidae (Broad-winged damselflies)	
25. <i>Neurobasis chinensis</i> (Linnaeus, 1758)	Stream Glory
26. <i>Vestalis apicalis</i> Selys, 1873	Black-tipped Forest Glory
27. <i>Vestalis gracilis</i> (Rambur, 1842)	Clear-winged Forest Glory
28. <i>Vestalis submontana</i> Fraser, 1934	Montane Forest Glory
Family Chlorocyphidae (Stream Jewels)	
29. <i>Calocypha laidlami</i> (Fraser, 1924)	Myristica Sapphire
30. <i>Heliocypha bisignata</i> (Hagen in Selys, 1853)	Stream Ruby
31. <i>Libellago indica</i> (Fraser, 1928)	River Heliodor
Family Euphaeidae (Gossamerwinged damselflies)	
32. <i>Dysphaea ethela</i> Fraser, 1924	Black Torrent Dart
33. <i>Euphaea cardinalis</i> (Fraser, 1924)	Travancore Torrent Dart

34. *Euphaea dispar* Rambur, 1842
 35. *Euphaea fraseri* (Laidlaw, 1920)

Family Platycnemididae (White-legged damselflies)

36. *Caconeura gomphoides* (Rambur, 1842)
 37. *Caconeura ramburi* (Fraser, 1922)
 38. *Caconeura risi* (Fraser, 1931)
 39. *Copera marginipes* (Rambur, 1842)
 40. *Copera vittata* (Selys, 1863)
 41. *Disparoneura apicalis* (Fraser, 1924)
 42. *Disparoneura quadrimaculata* (Rambur, 1842)
 43. *Elattonneura souteri* (Fraser, 1924)
 44. *Elattonneura tetrica* (Laidlaw, 1917)
 45. *Esme cyaneovittata* Fraser, 1922
 46. *Esme longistyla* Fraser, 1931
 47. *Esme mudiensis* Fraser, 1931
 48. *Melanoneura bilineata* Fraser, 1922
 49. *Onychargia atrocyana* Selys, 1865
 50. *Phylloneura westermanni* (Hagen in Selys, 1860)
 51. *Prodasineura verticalis* (Selys, 1860)

Family Coenagrionidae (Narrow-winged damselflies)

52. *Aciagrion approximans krishna* (Fraser, 1921)
 53. *Aciagrion occidentale* (Laidlaw, 1919)
 54. *Agriocnemis keralensis* (Peters, 1981)
 55. *Agriocnemis pieris* (Laidlaw, 1919)
 56. *Agriocnemis pygmaea* (Rambur, 1842)
 57. *Agriocnemis splendidissima* (Laidlaw, 1919)
 58. *Amphiallagma parvum* (Selys, 1876)
 59. *Archibasis oscillans* (Selys, 1877)
 60. *Ceriagrion cerinorubellum* (Brauer, 1865)
 61. *Ceriagrion chromothorax* (Joshi & Sawant 2019)
 62. *Ceriagrion coromandelianum* (Fabricius, 1798)
 63. *Ceriagrion olivaceum aurantiacum* (Fraser, 1924)
 64. *Ceriagrion rubiae* (Laidlaw, 1916)
 65. *Ischnura rubilio* (Selys, 1876)
 66. *Ischnura senegalensis* (Rambur, 1842)
 67. *Mortonagrion varralli* (Fraser, 1920)
 68. *Paracercion calamorum* (Ris, 1916)
 69. *Paracercion malayanum* (Selys, 1876)
 70. *Pseudagrion australasiae* (Selys, 1876)
 71. *Pseudagrion decorum* (Rambur, 1842)
 72. *Pseudagrion indicum* (Fraser, 1924)
 73. *Pseudagrion malabaricum* (Fraser, 1924)
 74. *Pseudagrion microcephalum* (Rambur, 1842)
 75. *Pseudagrion rubriceps* (Selys, 1876)

- Nilgiri Torrent Dart
 Malabar Torrent Dart

- Pale-spotted Bambootail
 Coorg Bambootail
 Wayanad Bambootail
 Yellow Bush Dart
 Blue Bush Dart
 Black-tipped Bambootail
 Black-winged Bambootail
 Red-striped Bambootail
 Black and Yellow Bambootail
 Palani Bambootail
 Nilgiri Bambootail
 Travancore Bambootail
 Malabar Bambootail
 Marsh Dancer
 Myristica Bambootail
 Black Bambootail

- Violet-striped Slender Dartlet
 Green-striped Slender Dartlet
 Kerala Dartlet
 White Dartlet
 Pygmy Dartlet
 Splendid Dartlet
 Azure Dartlet
 Blue-banded Longtail
 Orange-tailed Marsh Dart
 Sindhudurg Marsh Dart
 Coromandel Marsh Dart
 Rusty Marsh Dart
 Orange Marsh Dart
 Golden Dartlet
 Senegal Golden Dartlet
 Brown Dartlet
 Dusky Lilysquatter
 Malayan Lilysquatter
 Short-tipped Grass Dart
 Green-striped Grass Dart
 Yellow-striped Grass Dart
 Jungle Grass Dart
 Blue Grass Dart
 Saffron-faced Grass Dart

Suborder: Anisoptera (Dragonflies)

Family Aeshnidae (Hawkers or Darners)

- | | |
|---|----------------------|
| 76. <i>Anaciaeschna jaspidea</i> (Burmeister, 1839) | Rusty Darner |
| 77. <i>Anaciaeschna martini</i> (Selys, 1897) | Martin's Hawker |
| 78. <i>Anax ephippiger</i> (Burmeister, 1839) | Vagrant Emperor |
| 79. <i>Anax guttatus</i> (Burmeister, 1839) | Pale-spotted Emperor |
| 80. <i>Anax immaculifrons</i> (Rambur, 1842) | Blue Darner |
| 81. <i>Anax indicus</i> (Lieftinck, 1942) | Lesser Green Emperor |
| 82. <i>Anax parthenope</i> (Selys, 1839) | Lesser Emperor |
| 83. <i>Gynacantha dravida</i> (Lieftinck, 1960) | Brown Darner |
| 84. <i>Gynacantha millardi</i> (Fraser, 1920) | Parakeet Darner |

Family Gomphidae (Clubtails)

- | | |
|---|------------------------------|
| 85. <i>Acrogomphus fraseri</i> (Laidlaw, 1925) | Fraser's Clubtail |
| 86. <i>Burmagomphus laidlawi</i> (Fraser, 1924) | Plain Sinuate Clubtail |
| 87. <i>Burmagomphus pyramidalis</i> (Laidlaw, 1922) | Spotted Sinuate Clubtail |
| 88. <i>Cyclogomphus flavoannulatus</i> (Rangnekar et al., 2019) | Yellow Paddled Clubtail |
| 89. <i>Cyclogomphus heterostylus</i> (Selys, 1854) | Paddled Clubtail |
| 90. <i>Davidioides martini</i> (Fraser, 1924) | Syrandiri Clubtail |
| 91. <i>Gomphidia kodaquensis</i> (Fraser, 1923) | Kodagu Clubtail |
| 92. <i>Heliogomphus promelas</i> (Selys, 1873) | Indian Lyretail |
| 93. <i>Ictinogomphus rapax</i> (Rambur, 1842) | Common Clubtail |
| 94. <i>Lamelligomphus nilgiriensis</i> (Fraser, 1922) | Nilgiri Clawtail |
| 95. <i>Macrogomphus nynaadicus</i> (Fraser, 1924) | Wayanad Bowtail |
| 96. <i>Megalogomphus hannyingtoni</i> (Fraser, 1923) | Giant Clubtail |
| 97. <i>Megalogomphus superbus</i> (Fraser, 1931) | Beautiful Clubtail |
| 98. <i>Melligomphus acinaces</i> (Laidlaw, 1922) | Laidlaw's Clawtail |
| 99. <i>Merogomphus longistigma</i> (Fraser, 1922) | Long Legged Clubtail |
| 100. <i>Merogomphus tamaracherriensis</i> (Fraser, 1931) | Malabar Long Legged Clubtail |
| 101. <i>Microgomphus souteri</i> (Fraser, 1924) | Pigmy Clubtail |
| 102. <i>Nychogomphus striatus</i> (Fraser, 1924) | Striated Clawtail |
| 103. <i>Onychogomphus malabarensis</i> (Fraser, 1924) | Malabar Clawtail |
| 104. <i>Paragomphus lineatus</i> (Selys, 1850) | Common Hooktail |

Family Chlorogomphidae

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|--|------------------------|
| 105. <i>Chlorogomphus campioni</i> (Fraser, 1924) | Nilgiri Mountain Hawk |
| 106. <i>Chlorogomphus xanthoptera</i> (Fraser, 1919) | Anamalai Mountain Hawk |

Family Macromiidae (Cruisers)

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|--|-------------------------|
| 107. <i>Epopthalmia frontalis</i> (Selys, 1871) | Spotted Torrent Hawk |
| 108. <i>Epopthalmia vittata</i> (Burmeister, 1839) | Common Torrent Hawk |
| 109. <i>Macromia annaimallaiensis</i> (Fraser, 1931) | Annaimalai Torrent Hawk |
| 110. <i>Macromia bellicosa</i> (Fraser, 1924) | Militant Torrent Hawk |
| 111. <i>Macromia cingulata</i> (Rambur, 1842) | Rambur's Torrent Hawk |
| 112. <i>Macromia ellisoni</i> (Fraser, 1924) | Coorg Torrent Hawk |
| 113. <i>Macromia flavocolorata</i> (Fraser, 1922) | Yellow Torrent Hawk |
| 114. <i>Macromia ida</i> (Fraser, 1924) | Mountain Torrent Hawk |
| 115. <i>Macromia indica</i> (Fraser, 1924) | Indian Torrent Hawk |

116.	<i>Macromia irata</i> (Fraser, 1924)	Fraser's Torrent Hawk
Family Corduliidae (Emeralds or Baskettails)		
117.	<i>Hemicordulia asiatica</i> (Selys, 1878)	Asian emerald
Family: Libellulidae (Skimmers)		
118.	<i>Acisoma panorpoides</i> (Rambur, 1842)	Trumpet Tail
119.	<i>Aethriamanta brevipennis</i> (Rambur, 1842)	Scarlet Marsh Hawk
120.	<i>Brachydiplax chalybea</i> (Brauer, 1868)	Rufous-backed Marsh Hawk
121.	<i>Brachydiplax sobrina</i> (Rambur, 1842)	Little Blue Marsh Hawk
122.	<i>Brachythemis contaminata</i> (Fabricius, 1793)	Ditch Jewel
123.	<i>Bradinyopyga geminata</i> (Rambur, 1842)	Granite Ghost
124.	<i>Bradinyopyga konkanensis</i> (Joshi & Sawant, 2020)	Konkan Rockdweller
125.	<i>Cratilla lineata</i> (Brauer, 1878)	Emerald-banded Skimmer
126.	<i>Crocothemis servilia</i> (Drury, 1773)	Ruddy Marsh Skimmer
127.	<i>Diplacodes lefebvrii</i> (Rambur, 1842)	Black Ground Skimmer
128.	<i>Diplacodes nebulosa</i> (Fabricius, 1793)	Black-tipped Ground Skimmer
129.	<i>Diplacodes trivialis</i> (Rambur, 1842)	Ground Skimmer
130.	<i>Epithemis mariae</i> (Laidlaw, 1915)	Ruby-tailed Hawklet
131.	<i>Hydrobasileus croceus</i> (Brauer, 1867)	Amber Winged Marsh Glider
132.	<i>Hylaeothemis apicalis</i> (Fraser, 1924)	Blue Hawklet
133.	<i>Indothemis carnatica</i> (Fabricius, 1798)	Light-tipped Demon
134.	<i>Indothemis limbata</i> (Selys, 1891)	Restless demon
135.	<i>Lathrecista asiatica</i> (Fabricius, 1798)	Asiatic Blood-tail
136.	<i>Lyrithemis acigastra</i> (Selys, 1878)	Dwarf Blood Tail
137.	<i>Lyrithemis flava</i> (Oguma, 1915)	Tricolour Bloodtail
138.	<i>Macrodiplax cora</i> (Kaup in Brauer, 1867)	Coastal Glider
139.	<i>Neurothemis fulvia</i> (Drury, 1773)	Fulvous Forest Skimmer
140.	<i>Neurothemis intermedia</i> (Rambur, 1842)	Ruddy Meadow Skimmer
141.	<i>Neurothemis tullia</i> (Drury, 1773)	Pied Paddy Skimmer
142.	<i>Onychothemis testacea</i> (Laidlaw, 1902)	Stellate River Hawk
143.	<i>Orthetrum chrysis</i> (Selys, 1891)	Brown-backed Red Marsh Hawk
144.	<i>Orthetrum glaucum</i> (Brauer, 1865)	Blue Marsh Hawk
145.	<i>Orthetrum luzonicum</i> (Brauer, 1868)	Tri-coloured Marsh Hawk
146.	<i>Orthetrum pruinosum</i> (Burmeister, 1839)	Crimson-tailed Marsh Hawk
147.	<i>Orthetrum sabina</i> (Drury, 1770)	Green Marsh Hawk
148.	<i>Orthetrum taeniolatum</i> (Schneider, 1845)	Ashy Marsh Hawk
149.	<i>Orthetrum triangulare</i> (Selys, 1878)	Blue-tailed Forest Hawk
150.	<i>Palpopleura sexmaculata</i> (Fabricius, 1787)	Blue-tailed Yellow Skimmer
151.	<i>Pantala flavescens</i> (Fabricius, 1798)	Wandering Glider
152.	<i>Potamarcha congener</i> (Rambur, 1842)	Yellow-tailed Ashy Skimmer
153.	<i>Rhodothemis rufa</i> (Rambur, 1842)	Rufous Marsh Glider
154.	<i>Rhyothemis triangularis</i> (Kirby, 1889)	Lesser Blue Wing
155.	<i>Rhyothemis variegata</i> (Linnaeus, 1763)	Common Picturewing
156.	<i>Sympetrum fonscolombii</i> (Selys, 1840)	Red-veined Darter
157.	<i>Tetrathemis platyptera</i> (Selys, 1878)	Pigmy Skimmer
158.	<i>Tholymis tillarga</i> (Fabricius, 1798)	Coral-tailed Cloudwing

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| 159. | <i>Tramea basilaris</i> (Palisot de Beauvois, 1817) | Red Marsh Trotter |
| 160. | <i>Tramea limbata</i> (Desjardins, 1832) | Black Marsh Trotter |
| 161. | <i>Trithemis aurora</i> (Burmeister, 1839) | Crimson Marsh Glider |
| 162. | <i>Trithemis festiva</i> (Rambur, 1842) | Black Stream Glider |
| 163. | <i>Trithemis kirbyi</i> (Selys, 1891) | Scarlet Rock Glider |
| 164. | <i>Trithemis pallidinervis</i> (Kirby, 1889) | Long-legged Marsh Glider |
| 165. | <i>Urothemis signata</i> (Rambur, 1842) | Greater Crimson Glider |
| 166. | <i>Zygonyx iris</i> (Selys, 1869) | Iridescent Stream Glider |
| 167. | <i>Zyxomma petiolatum</i> (Rambur, 1842) | Brown Dusk Hawk |

Genera *Incertae sedis*

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|------|---|-----------------------|
| 168. | <i>Idionyx corona</i> (Fraser, 1921) | Mountain Daggerhead |
| 169. | <i>Idionyx galeata</i> (Fraser, 1924) | Minaret Daggerhead |
| 170. | <i>Idionyx gomantakensis</i> (Subramanian,
Rangnekar & Naik, 2013) | Goan Daggerhead |
| 171. | <i>Idionyx minima</i> (Fraser, 1931) | Little Daggerhead |
| 172. | <i>Idionyx rhinocerooides</i> (Fraser, 1934) | Rhinoceros Daggerhead |
| 173. | <i>Idionyx saffronata</i> (Fraser, 1924) | Saffron Daggerhead |
| 174. | <i>Idionyx travancorensis</i> (Fraser, 1931) | Travancore Daggerhead |
| 175. | <i>Macromidia donaldi</i> (Fraser, 1924) | Dark Daggerhead |

Checklist of Mygalomorph Spiders of Kerala

Order/Family Species	Common Name
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Family Barychelidae Simon, 1889

1. *Sason robustum* (O. Pickard-Cambridge, 1883)
2. *Sasonichus sullivanii* Pocock, 1900

Family Idiopidae Simon, 1889

3. *Heligmomerus maximus* Sanap & Mirza, 2015

Family Theraphosidae Thorell, 1869

4. *Annandaliella ernakulamensis* Jose & Sebastian, 2008
5. *Annandaliella travancorica* Hirst, 1909
6. *Haploclastus devamatha* Prasanth & Jose, 2014
7. *Haploclastus kayi* Gravely, 1915
8. *Haploclastus nilgirinus* Pocock, 1899
9. *Neobeterophriectus bhorii* (Gravely, 1915)
10. *Neobeterophriectus chimminiensis* Jose, 2020
11. *Neobeterophriectus crurofulvus* Siliwal *et al.*, 2012
12. *Poecilotheria regalis* Pocock, 1899
13. *Poecilotheria rufilata* Pocock, 1899
14. *Poecilotheria striata* Pocock, 1895
15. *Sahydroaraneus hirsti* Mirza & Sanap, 2014
16. *Sahydroaraneus raja* (Gravely, 1915)
17. *Sahydroaraneus sebastiani* Jose, 2017
18. *Thrigmopoeus trunculentus* Pocock, 1899

Checklist of Freshwater Crabs of Kerala

Order/Family Species	Common Name
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1. *Arcithelphusa cochleariformis* Pati & Sudha Devi, 2015
2. *Arcithelphusa tumpikkai* Pati, Sujila & Sudha Devi, 2019
3. *Baratha peena* Bahir & Yeo, 2007
4. *Baratha pushta* Bahir & Yeo, 2007
5. *Barytelphusa cunicularis* (Westwood in Sykes, 1836)
6. *Cylindrotelphusa breviphallus* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017
7. *Cylindrotelphusa granulata* (Pillai, 1951)
8. *Cylindrotelphusa longiphallus* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017
9. *Cylindrotelphusa steniops* (Alcock, 1909)

10. *Kani maranjandu* Kumar, Raj & Ng, 2017
11. *Karkata ghanarakta* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017
12. *Karkata kusumbha* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017
13. *Lamella lamellifrons* (Alcock, 1909)
14. *Oziotelphusa biloba* Bahir & Yeo, 2005
15. *Oziotelphusa kerala* Bahir & Yeo, 2005
16. *Oziotelphusa magrakarowensis* (Rathbun, 1904)
17. *Pilarta anuka* Bahir & Yeo, 2007
18. *Pilarta aroma* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017
19. *Pilarta punctatissima* Pati, Rajesh, Raj, Sheeja, Kumar & Sureshan, 2017
20. *Snaba aruna* Bahir & Yeo, 2007
21. *Spiralothelphusa gibberosa* Pati & Sudha Devi, 2015
22. *Travancoriana charu* Bahir & Yeo, 2007
23. *Travancoriana convexa* (Roux, 1931)
24. *Travancoriana granulata* Pati & Sharma, 2013
25. *Travancoriana kuleera* Bahir & Yeo, 2007
26. *Travancoriana pollicaris* (Alcock, 1909)
27. *Travancoriana schirnerae* Bott, 1969
28. *Vanni ashini* Bahir & Yeo, 2007
29. *Vanni deepta* Bahir & Yeo, 2007
30. *Vanni giri* Bahir & Yeo, 2007
31. *Vanni malabarica* (Henderson, 1912)

Checklist of Non-Marine Molluscs of Kerala

Order/Family Species	Common Name
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Family Streptaxidae

1. *Streptaxis footei* (W. & H. Blanford 1860)
2. *Streptaxis watsoni* (W. & H. Blanford 1860)
3. *Streptaxis beddomii* (Blanford 1899)
4. *Streptaxis personatus* (Blanford 1880)
5. *Huttonella bicolor* (Hutton 1834)

Family Ariophantidae

6. *Ariophanta thyrens* (Benson 1852)
7. *Ariophanta belangeri* (Desh. 1834)
8. *Ariophanta basilessa* (Blanford, 1880)
9. *Ariophanta basileus* (Benson, 1861)
10. *Ariophanta beddomii* (Blanford 1874)

11. *Ariophanta grassii* (Blanford 1901)
12. *Indrella ampulla* (Godwin-Austen, 1901)
13. *Euplecta semidecussata* (Pfeiffer, 1851)
14. *Euplecta subcastor* (Beddome, 1891)
15. *Euplecta travancorica* (Benson, 1865)
16. *Euplecta indica* (Pfeiffer, 1846)
17. *Euplecta acuducta* (Benson 1850)
18. *Euplecta orbiates* (Blanford 1901)
19. *Macroblamys indica* Godwin-Austen, 1883
20. *Macroblamys woodiana* (Pfeiffer 1851)
21. *Macroblamys vallicola* (Pfeiffer, 1854)
22. *Macroblamys prava* (Blanford, 1904)

Family Helicarionidae

23. *Mariaella dussumieri* (Gray 1855)
24. *Mariaella beddomei* (Godwin-Austen, 1888)
25. *Pseudostenia atra* (Godwin-Austen, 1888)
26. *Satiella dekhanensis* (Godwin-Austen, 1898)
27. *Satiella levidensis* (Godwin-Austen, 1898)
28. *Satiella compressa* (Blanford and Godwin Austen, 1908)
29. *Satiella pertenuis* (Blanford and Godwin Austen, 1908)
30. *Sitala injussa* (W. and H. Blanford, 1861)

Family Chronidae

31. *Kaliella barrakporensis* (Pfeiffer, 1852)

Family Charopidae

32. *Philalanka pirrieana* (Pfeiffer 1854)

Family Corillidae

33. *Corilla anax* (Benson 1865)

Family Camaenidae

34. *Trachia crassicostata* (Benson 1848)
35. *Trachia vittata* (Müller 1774)
36. *Beddomea calcadensis* (Blanford 1870)
37. *Apatetes bourdilloni* (Theobald 1876)

Family Cerastidae

38. *Cerastus densus* (Pfeiffer 1856)
39. *Rachisellus pulcher* (Gray 1825)

Family Subulinidae

40. *Glessula tornensis* (Blanford 1870)
41. *Glessula textilis* (Blanford 1866)
42. *Glessula subserena* (Beddome 1906)
43. *Glessula senator* (Hanley 1875)
44. *Glessula subperrotteti* (Beddome 1906)
45. *Glessula anamullica* (Blanford 1866)
46. *Glessula subinornata* (Beddome 1906)
47. *Glessula travancorica* (Gude 1914)
48. *Glessula malabarica* (Gude 1914)

49. *Glessula filosa* (Blanford 1870)

Family Cyclophoridae

50. *Craspedotropis bilirata* (Beddome 1875)
51. *Micralaux scabra* (Theobald 1876)
52. *Ditropis beddomei* (Blanford 1869)
53. *Ditropis convexa* (Blanford 1869)
54. *Ditropis planorbis* (Blanford 1869)
55. *Cyclophorus nilagiricus* (Besnson 1852)
56. *Pterocyclus pseudocumingi* (Möllendorff 1897)
57. *Pearsonia travancorica* (Blanford 1880)
58. *Cyathopoma latilabre* (Beddome 1875)
59. *Cyathopoma travancoricum* (Beddome 1875)
60. *Cyathopoma wynaadense* (Blanford 1868)
61. *Cyathopoma procerum* (Blanford 1868)
62. *Mychopoma hirsutum* (Blanford 1869)
63. *Dicharax footei* (Blanford 1861)
64. *Nicida nitidula* (Blanford 1868)
65. *Opisthostoma macrostoma* (Blanford 1869)
66. *Cyclotropis subdiscoidea* (Sowerby 1850)

Family Achatinidae

67. *Lissachatina fulica*

Family Verocinidae

68. *Laevicanalis alte*

Freshwater Molluscs

Family Neritidae

69. *Neripteron violaceum* (Gmelin, 1791)

Family Viviparidae

70. *Filopaludina bengalensis* (Lamarck, 1882)
71. *Filopaludina bengalensis* (Lamarck, 1882)

Family Ampullariidae

72. *Pila virens* (Lamarck, 1822)

Family Bithinidae

73. *Gabbia stenothyroides* (Dohrn, 1857)
74. *Gabbia stenothyroides* (Dohrn, 1857)

Family Thiaridae

75. *Mieniplotia scabra* (Mueller, 1774)
76. *Thiara riqueti* (Grateloup, 1840)
77. *Melanoides tuberculata* (Mueller, 1774)
78. *Paracrostoma huegeli* (Philippi, 1841)

Family Paludominae

79. *Paludomus inflatus* (Brot, 1880)
80. *Paludomus rotunda* (Blanford, 1870)
81. *Paludomus transchauricus* (Gmelin, 1771)
82. *Paludomus sulcatus* (Reeve, 1847)
83. *Paludomus stomatodon* (Benson, 1862)

Family Lynimidae

84. *Radix rufescens* (Lamarck, 1822)

85. *Racesina luteola* (Lamarck, 1822)

Family Ancyclidae

86. *Ferrissia tenuis* (Bourguignat, 1862)

87. *Ferrissia verruca* (Benson, 1855)

Family Planorbidae

88. *Indoplanorbis exustus* (Deshayes, 1834)

89. *Gyraulus convexiusculus* (Hutton, 1849)

Family Unionidae

90. *Lamellidens consobrinus* (Lea, 1859)

91. *Lamellidens corrianus* (Lea, 1834)

92. *Lamellidens marginalis* (Lamarck, 1819)

Family Corbiculidae

93. *Corbicula annandalei* (Prashad, 1928)

94. *Corbicula striatella* (Deshayes, 1854)

95. *Villorita cyprinoides* (Gray, 1825)