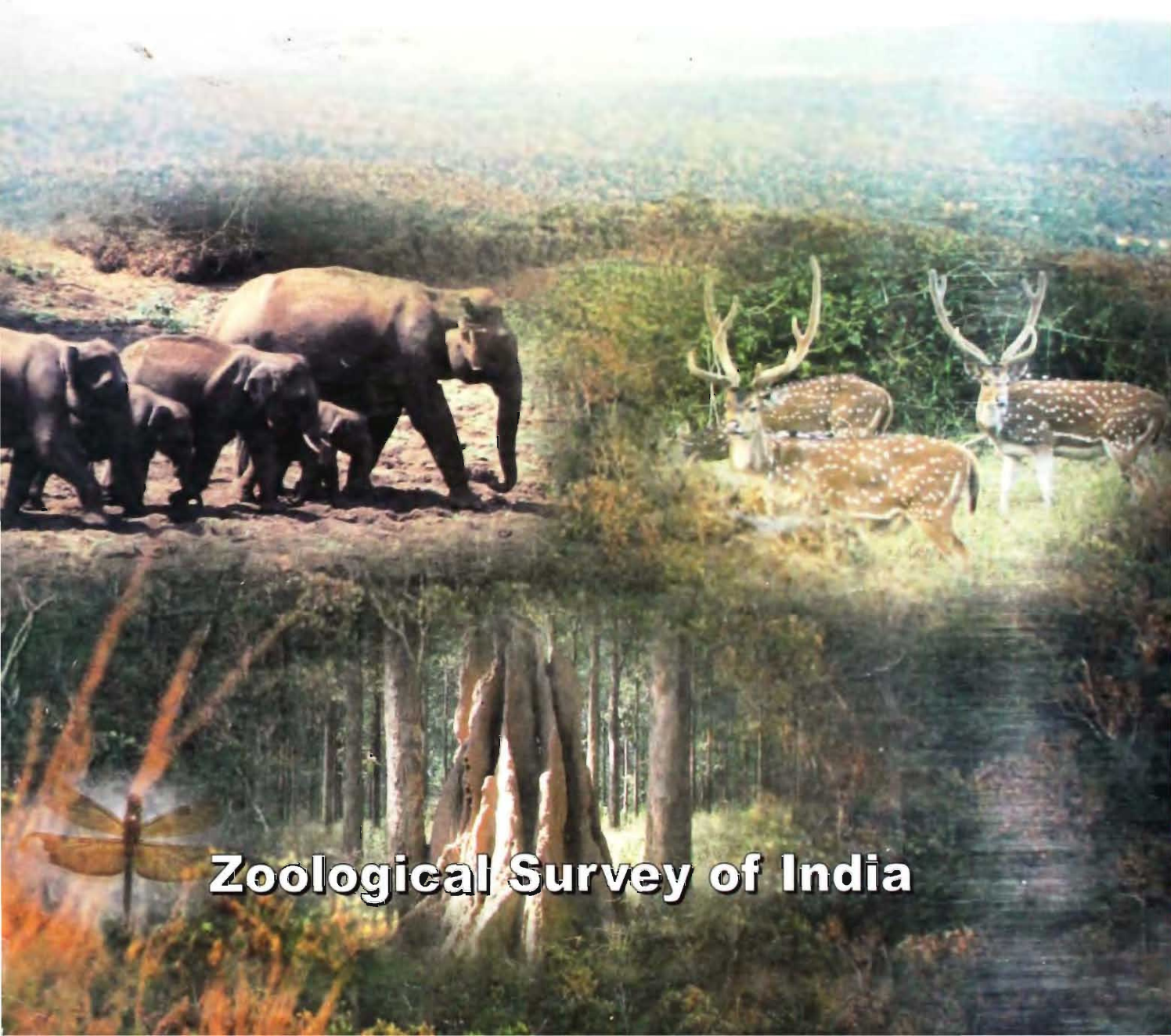


Fauna of Conservation Area Series 11

***Fauna
of
Nilgiri Biosphere Reserve***



Zoological Survey of India

Fauna of Conservation Area Series 11

FAUNA
of
NILGIRI BIOSPHERE RESERVE

Edited by
The Director, Zoological Survey of India, Kolkata



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NILGIRI BIOSPHERE RESERVE—AN OVERVIEW

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INTRODUCTION

Biodiversity has been described as the world's most fundamental capital stock. It represents the very foundation of human existence. Biodiversity refers to the variety and variability of all animals, plants and micro-organisms on earth and can be considered at three levels - genetic diversity, species diversity and habitat diversity. The middle of the road assumption places world's total biodiversity at 13.6 million species of which hardly an eighth have so far been named. Recent estimates suggest that more than half the habitable surface of the planet has already been significantly altered by human activity (Hannah and Bowles, 1995). Humans manipulate approximately 70% of the world's temperate and tropical ecosystems to produce 98% of their food and all of their wood products (Pimentel, 1992) and only 5% of the temperate and tropical land area is totally uninhabited and unmanaged. By our heedless actions we are eroding this biological capital at an alarming rate. The more we learn of the workings of the natural world, the clearer it becomes that there is a limit to the disruption that the environment can endure. Besides, the profound ethical and aesthetic implications, the loss of biodiversity has severe economic and social costs. Biodiversity is part of our daily lives and livelihoods and constitute the resources upon which families, communities, nations and future generations depend.

Accelerating rates of biodiversity loss and the signing of International agreements such as the Convention on Biological Diversity and Agenda 21, have called for the world's biodiversity to be inventorised and monitored. Yet to date, so few

organisms have been collected and named and their distribution recorded that the scale of the task is enormous.

ESTABLISHMENT OF NILGIRI BIOSPHERE RESERVE

Biodiversity and its distribution are the product of a long history of evolution, diversification and extinction in a complex and changing geographical and ecological setting. India is rich in its biodiversity heritage. With only 2.2% of the total land surface of the globe, India is home for probably 8% of the world's fauna. No other land mass of comparable size surpasses it in the richness of its flora and fauna. Biogeographic regionalization based on attributes of climate, geology, landform, vegetation, flora, fauna and land use (Margules *et al.* 1994) recognizes ten well-defined zones in India. Of these the Western Ghats is home for a rich diversity of flora and fauna and is recognized as one of the 18 'Hot Spots' of the world.

Resultant to the concept of Biosphere Reserve initiated by the UNESCO in 1973-74 as an international conservation programme, the Man and Biosphere Committee (MAB), Govt. of India, identified 13 potential Biosphere Reserves in India, including one in the Western Ghats. Five major representative ecosystems were identified as potential Reserves in the Western Ghats. Of these, because of the richness of biodiversity and other considerations, Nilgiri Biosphere Reserve was chosen and declared in September, 1986, the first of eleven Biosphere Reserves so far declared in India.

ORIGIN OF THE FAUNA OF NILGIRI BIOSPHERE RESERVE

The Indian Peninsula which in the geological past was part of the Gondwana mass *per se* is biogeographically *India vera* (true India), the largest and oldest region of differentiation of the original flora and fauna of India. The northward movement of the peninsula resulting in the Himalayan uplift brought about block-fracturing of the western parts of the peninsula and marine subsidence of the fragments in the Arabian sea, giving rise to the scraps of the Western Ghats of which the Nilgiri Biosphere Reserve is a part.

The faunal complex of the Reserve as also the whole of the Peninsula arose from the ancient stock of Lemuria and the still older Gondwana faunas (Mani, 1974). These evolved throughout the Palaeozoic, Mesozoic and Tertiary, right nearly upto the Pleistocene times. This was a tropical humid forest fauna and was widely and continuously distributed until perhaps relatively recent times. The affinities of this fauna were mainly with Madagascar and South Africa but to some extent also with Australia and South America, especially in the more ancient groups.

The physiognomy of this fauna, before it was modified by the influx of the Oriental elements from the Assam gateway and before it was impoverished by the elimination of habitats under the influence of man, can only be partially reconstructed by the present day relic character of the fauna. The evolutionary stagnation of the original fauna gave place to rapid and complex changes with the influx of exotic elements when the Assam contact with Asia was established as an early phase of the Himalayan uplift.

The present day fauna of the Nilgiri Biosphere Reserve, as also that of the Indian Peninsula, is at present characterised by its remarkable wealth of phylogenetic (Gondwana) and geographical (Asiatic) relicts, Pleistocene relicts of the Himalaya, endemics, ancient and phylogenetically older groups and by the presence of ecologically anomalous (Habitat-fermede forms) groups (Khajuria, 1924). The fauna is on the whole at present remarkable for its greatly impoverished

remnants that are also rapidly vanishing. Some of the fauna of the peninsula exposed to extensive regression, degradation, impoverishment and the resultant extinction are still preserved in this Reserve in the 'refugial pockets'

GENERAL OBSERVATIONS ON THE PRESENT DAY FAUNA OF NBR

A comprehensive picture of the present day fauna of NBR may emerge only on the completion of studies on various groups of invertebrates yet to be initiated. Apart from the groups dealt with in this document, there are many others represented in the collections of the ZSI and also other repositories on which cursory information is available in the published records.

The N.B.R. falls mainly under the 'Malabar Rain Forest' and is extremely rich in its faunal resources as evidenced by the faunal diversity of the Silent Valley which is an important component of this Reserve (Pillai, 1981). According to a recent publication, the fauna of the reserve is said to contain 100 species of mammals, 550 species of birds, 80 species of reptiles and amphibians and an unknown number of invertebrates (Ministry of Environment & Forests, Govt. of India, 1987). Some of the species, especially many birds listed in this paper, it appears, may at best be found in areas beyond the limits of the reserve. As mentioned earlier, the "refugial pockets" in the NBR today are home for many rare and unique forms which originally inhabited vast stretches of the peninsula but have disappeared from many areas due to development pressure, over exploitation, market failure and intervention failure.

The present document, based on studies of materials collected through recent and earlier surveys and published records incorporates information on the occurrence and distributional pattern of 2028 species which includes all the vertebrate and some selected invertebrate groups.

A. Invertebrate Fauna

Only a few selected groups represented by 1273 species of invertebrates are dealt with in

this volume. On the basis of fairly detailed information available on the vertebrate groups represented by more than 602 species in NBR and the diversity of the fauna of selected groups of lower forms studied, it is reasonable to presume that the invertebrate fauna in this reserve may comprise more than a quarter million species.

A species diverse habitat performs valuable ecological processes because of the interactions between species and environment (WRI, 1989). Ecological processes include biogeochemical recycling, the maintenance of soil fertility, water quality and climatic regulations. Besides, large scale deforestation carried out for raising monoculture plantations have driven out many species, especially insects, to the plains turning them into pests. Hence for any successful biological control programme of crop pests in Peninsular India, one has to seek the natural enemies in the forest ecosystems of Western Ghats, especially of the NBR which is home for many of the rare species.

Because of their small sizes and modest needs most of the invertebrates occupy ecological niches that are more numerous and smaller in all dimensions (space, time and so on) and therefore more sensitive than those of vertebrates. Furthermore, the needs of invertebrates do not always coincide with those of vertebrates. So it is not safe to assume that protection of large areas for vertebrates will automatically safeguard the diversity of lower forms also. For every species of higher form of life disappearing, there are thousands of invertebrates that travel the road to extinction. We ignore them at our peril. Hence concerted efforts at revealing the faunal diversity of all the groups of invertebrates of NBR is called for.

The invertebrate groups studied are the following : Protozoa, Rotifera, Ostracoda, Chilopoda, Diplopoda, Scorpionida, Orthoptera, Odonata and some families of Hemiptera, Lepidoptera, Diptera and Hymenoptera.

111 species of protozoans have been reported from the NBR of which 69 are rare. A few of the species are hitherto known only from the NBR,

which include 2 species of *Gregarina* from the insect *Lepisma saccharina* Linn., some ciliates inhabiting the stomach of ruminants and the caecum of Indian elephant. Very little is so far known about the groups Rotifera and Ostracoda of NBR. All the 13 species of the former and 6 of the latter studied from the area enjoy very wide distribution and none is endemic to the area.

Cladocerans are represented by 31 species of which *Alona inreticulata* is known only from NBR in India while *Simocephalus exspinosus* and *Pleuroxus aduncus* have their range of distribution confined only to this reserve in southern India. The rest of the species are widely distributed.

Though the 16 species of Centipedes and most of the 41 species of Millipedes recorded from NBR are rather widely distributed, yet 9 of the latter group are endemic to NBR. Only 13 species of Scorpions are so far known from this reserve of which 2, *Heterometrus (Chersonesometrus) collinus* Pocock and *Heterometrus (Heterometrus) keralensis* Tikader & Bastawade are NBR endemics.

The insect fauna of NBR is rather little known. There is no consolidated account available on many of the speciose orders and families. One can easily visualise the richness of this group by the diversity of the few groups incorporated in this inventory.

Only 82 species of Orthoptera including Grylloidea are so far known from the reserve which may represent only a fraction of the diversity of the group. Most of the species recorded are widely distributed beyond the limits of this reserve.

Because of the many reservoirs, streams and other water bodies, NBR harbours a large Odonate fauna. 71 species of this group have been recorded from this reserve some of which are endemic to the Western Ghats including a few confined only to NBR.

106 species of leafhoppers included in this inventory represents 7% of the fauna of this group reported from India. 37 species representing 35.5% of those recorded are endemic to NBR which

accounts for 2.5% of the Indian fauna so far known.

NBR is very rich in its aquatic and semi-aquatic Heteropteran fauna. 74 of the 262 species (28.3%) known from India are available in this reserve. Of these many are rare and 11 species accounting for about 15% of the total are endemic to this reserve.

The reserve harbours a rich fauna of Scarabid beetles, only a few of which are restricted in their distribution to areas of NBR.

Western Ghats is endowed with a rich and diverse fauna of butterflies. Many of these are endemic to the Ghats. 300 species have been recorded from this reserve of which some belong to the various threatened IUCN Categories.

There is paucity of consolidated information on the distribution of many of the Dipteran families. Study of a few selected groups reveals that Dipteran fauna is very rich in this biosphere. While a few of the Gallmidges known from this reserve are confined to NBR and only 1 of the 16 species of Agromyzidae is endemic to the area, 53% of the genera and 11.4% of the species of the latter family recorded from India are represented here. As for another Acalypterate family Chloropidae, 63 species representing more than 25% of the species known from India and 3% reported from the world are distributed here which include 15 species endemic to NBR, accounting for 6.25 % of the Indian fauna so far known. Besides, 32 genera and all the five subfamilies of Chloropidae are represented in this reserve.

Of the 187 species of Family Tephritidae known from India, 35 species are present in this reserve which include many Indian endemics of which 4 are confined in their distribution to NBR.

The study of superfamilies Chalcidoidea and Proctotrupoidea representing mostly parasitic Hymenoptera of the reserve revealed the occurrence of 130 species of the former and 15 of the latter group. Many of the Chalcidoidea studied are endemic to India. 12 species, accounting for 17% of those recorded from NBR

are endemic to the reserve. Though Proctotrupoidea is a large group, only 15 species could be recorded from this biosphere of which 5 are endemic to NBR.

B. Vertebrate Fauna

The vertebrates are represented in this volume by 601 species belonging to all the 5 major groups.

- a. **Fishes** : Fishes are a dominant group in NBR. Of the 446 species of primary freshwater fishes known from India, 239 species, including 127 endemics are represented in the Western Ghats. The NBR Ichthyofauna comprises 116 species under 46 genera and 20 families. Of these 12 species are endemic to NBR and four are exotics. The endemics belong to the genera *Danio*, *Osteochilichthys*, *Neolissochilus*, *Puntius*, *Garra*, *Homaloptera*, *Noemacheilus*, *Glyptothorax* and *Clarias*. 63% of the species known from the Western Ghats are distributed here which include 12% which are endemic to NBR.
- b. **Amphibia** : NBR harbours a rich amphibian fauna. 55 species representing 27% of the Indian species are represented here. Of these 38 are endemic to India, 9 are found in India and Sri Lanka and the remaining 8 are widely distributed. 5 of the Indian endemics are strictly restricted to NBR and these are *Ansonia rubigina* Pillai & Pattabiraman, *Bufo silentvalleyensis* Pillai, *Micrixalus thampii* Pillai, *Rana murthii* Pillai and *Ichthyophis longicephalus* Pillai.
- c. **Reptilia** : Much is yet to be known about the reptiles of NBR. Based on a small collection it is seen that 21 species are distributed in this Reserve. Though none of the species recorded is endemic to NBR, 10 of the Indian endemics, including 7 having their range of distribution restricted to the Western Ghats, are represented here. 5 others are common to India and Sri Lanka while 6 have a wider distribution.
- d. **Birds** : On the basis of published records and recent observations 313 species of birds

are known to be distributed in NBR. Of these 183 species are distributed in other areas of the subcontinent which include 104 species found also in Sri Lanka and 40 limited to the political boundaries of India and Sri Lanka.

All the rest of the 130 species are endemic to India of which 32 are widely distributed, 39 are restricted to the peninsula and 59 are found only in the Western Ghats. Among the Western Ghats endemics, 13 species/subspecies have a range limited to NBR and adjoining hills. These are: Grey Fronted Green Pigeon (*Treron pompadora* Gmelin), Nilgiri Wood Pigeon (*Columba elphinstonii* Sykes), Kerala Broad Billed Roller (*Eurystomus orientalis laetior* Sharpe), Nilgiri laughing Thrush (*Garrulax cachinnaus* Jerdon) Nilgiri Quaker Babbler *Alcippe poioicephala* Jerdon), Bland and Orange Flycatcher (*Muscicapa nigrorufa* Jerdon) Nilgiri Verditer Flycatcher (*M. albicaudata* Jerdon), Nilgiri Plain Wren-warbler (*Prinia subflava* Gmelin), Rufous bellied Shortwing (*Brachypteryx major* Jerdon), Nilgiri Pied Bush Cat (*Saxicola caprata nilgiriensis* Whistler), Nilgiri Blackbird (*Turdus merula similimus* Jerdon), Nilgiri White eye (*Zosterops palpebrosa nilgiriensis* Ticehurst), and white backed Munia (*Lonchura striata* Lin.). Besides, 6 species distributed in the reserve belong to the endangered or rare categories.

Mammals : As in almost all other groups, mammalian diversity in NBR is very rich. 97 species, representing 26% of the 373 species of mammals known from India are distributed here. These include about 30 species belonging to the various threatened/endangered IUCN categories. 20 of these species are Indian endemics, of which Savis pigmy shrew, *Suncus etruscus perrotteti* (Duvernoy) and *Suncus murinus niger* (Horsefield) are confined in their distribution to NBR.

NBR harbours large known populations of two endangered species, namely Nilgiri Tahr *Hemitragus hylocrius* (Ogilby) and the lion-

tailed macaque *Macaca silemus* (Lin.) and probably the largest South Indian populations of Indian elephant *Elephas maximus*, tiger *Panthera tigris*, gaur *Bos gaurus*, Sambar *Cervus unicolor* and chital *Axis axis* as well as many lesser known groups of mammals. The rare bats include Peshwas bat *Myotis peshwa* and the hairy winged bat *Harpiocephalus harpia*.

CONCLUSION

Inventories give a snapshot of the state of biodiversity and identify key variables and bioindicators. They also provide baseline information for the assessment of change and they apply to all ecosystems from fully natural to intensively managed.

No inventory is ever complete as there will always be additions of new entities and new variations (through immigration, birth or mutation) and disappearances of entities (emigration, death or extinction) as well as changes in abundances.

Biodiversity management is not simply a question of establishing biosphere reserves, parks or sanctuaries as islands of protection in a sea of unregulated agriculture, forestry, fisheries and urban development. Rather it includes steps required to incorporate conservation and sustainable use practices within all components of the overall landscape, supported by policies, agreements and institutional arrangements that foster co-operation. Biodiversity has to be managed within an integrated frame work.

Ecosystem approaches for identifying conservation priorities use multiple criteria such as species richness, endemism, abundance, uniqueness and representativeness as well as considerations of physical environment, ecological processes and disturbance regimes that help to define ecosystems. Ecosystem based approaches are favoured because they can be used as a surrogate for detailed species knowledge. Besides, they can protect habitats that might never be considered by species based approaches.

The richness and diversity of the fauna, the degree of endemism observed among the faunal components, the presence of many 'refugial pockets' in the area which serve as home for many of the species which are rare or face various levels of threat to their existence in peninsular India, and even in other parts of the Western Ghats, due to developmental pressure and intervention failure, amply qualifies the NBR

to be considered one of the 'hottest of the hot spots' of the world today.

Intensive exploration of the still unexplored areas of NBR and study and inventorisation of groups, especially the invertebrates, on which no comprehensive information is available today are called for, especially when 'centinelan extinction' (Wilson, 1992) is happening all around us.

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PHYSIOGRAPHY, CLIMATE, VEGETATION AND FAUNAL EXPLORATION

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INTRODUCTION

Ecologically and biogeographically the Indian subcontinent is one of the most fascinating regions in the world. It possesses a very rich diversity of living organisms and no other land mass of comparable size in the world surpasses it in richness of its biological heritage. In India, ten well-defined biogeographic zones can be recognised *viz.*, (i) Trans Himalayan, (ii) Himalayan, (iii) Indian Desert, (iv) Semi Arid, (v) Western Ghats, (vi) Deccan Peninsula (vii) Gangetic Plain (viii) North-east India, (ix) Islands and (x) Coasts (Map 1). Of these, the Western Ghats, located between the Tropical African (Ethiopian) and the Indo-Malayan biogeographic regions, possesses a very rich repository of fauna and flora.

The UNESCO initiated the concept of Biosphere Reserve in 1973-74 as an international conservation programme to preserve representative typical ecosystems all over the world. Accordingly, the Govt. of India formed the Indian Man and Biosphere (MAB) Committee for identifying the potential Biosphere Reserves in India. Thus, thirteen sites, representing different biogeographical regions, were proposed for

designation and constitution as biosphere reserves. They are (i) Nilgiri in Karnataka, Kerala and Tamil Nadu States, (ii) Namdapha in Arunachal Pradesh, (iii) Nanda Devi in Uttar Pradesh, (iv) Uttar Khand (Valley of flowers) in Uttar Pradesh, (v) North Andamans in Andaman and Nicobar Islands, (vi) Gulf of Mannar in Tamil Nadu, (vii) Kaziranga in Assam, (viii) Sunderbans in West Bengal, (ix) Thar Desert in Rajasthan, (x) Manas in Assam, (xi) Kanha in Madhya Pradesh, (xii) Nokrek (Tura Range) in Meghalaya and (xiii) Ranna of Kutch in Gujarat. Of these, the areas belonging to serial Nos. (viii), (ix) and (xi) are in the process of demarcation and delineation.

Amongst these above named Biosphere reserves, the Nilgiri Biosphere Reserve (NBR), was the first to be established in September, 1986 (Map 2). It is located in the Western Ghats between the coordinates of 76° 76° 45' E and 11° 15' 12° 15' N lying at the trijunction of three states, namely Tamil Nadu, Kerala and Karnataka and covering an area of around 5,520 sq. km.

The NBR includes a large area not only encompassing the Nilgiri district (Tamil Nadu) in its entirety but also contain surrounding regions of the Silent Valley in Kerala in the West, the Biligiri

The break up of the NBR area is as follows (area in sq.km.)

State	Area in N.B.R.	Core Zone	Manupulation Forestry	Tourism Zone	Restoration Zone
Kerala	1,455.4	264.5	945.0	00	245.9
Karnataka	1,527.4	701.8	212.2	269.2	344.2
Tamil Nadu	2,537.6	274.0	2,081.5	65.8	116.3
	5,520.4	1240.3	3,238.7	335.0	706.4

Rangan Hills to the north-east, parts of Mysore district and of Kodagu of Karnataka in the north-west. Thus, the NBR represents the junction of the Western Ghats and the Eastern Ghats, topographically plains, plateaus and mountainous terrain with Dodabetta at 2600 m constituting one of the highest peaks, south of the Himalaya.

The faunistic survey of Nilgiri Biosphere Reserve was conducted by three Regional Stations of the Zoological Survey of India, viz. Western Regional Station, Pune, Southern Regional Station, Chennai and Western Ghat Regional Station, Calicut, during the period between 1987-1991. Dr. R.S. Pillai, Scientist 'SF' & Officer in-Charge, Southern Regional Station, Madras was the first coordinator of this project. On his superannuation, Dr. G. U. Kurup, Scientist 'SE' & Officer-in-Charge, Western Ghat Regional Station, Calicut, took over as Coordinator and later Dr. G. M. Yazdani, Scientist 'SF' and Officer-in-Charge, Western Regional Station was appointed the Coordinator. Subsequently Dr. P. T. Cherian, Scientist 'SG' and Officer-in-Charge, Southern Regional Station, was designated the coordinator during whose tenure the manuscripts were made ready for the press.

PHYSIOGRAPHY

The Nilgiri Biosphere Reserve (NBR) falling under Western Ghats, is around 5520.4 km² in area lying in three states, namely, Tamil Nadu, Kerala and Karnataka in the Indian peninsula. The NBR area within the limits of Karnataka State comprises of Bandipur Tiger Reserve and Nagarhole National Park and covers a total area of about 1527.4 km². Kabini river separates Nagarhole National Park from Bandipur National Park. The terrain is undulating and broken at places by valleys. A number of seasonal water holes are available in Bandipur Tiger Reserve. The park is drained by rivers and streams such as Kabini, Nugu, Moyar, Bavali, Moole hole, Kekkan Halla and Waranchi. The Nagarhole National Park lies between 11°45' and 12°45' N latitudes and 76°5' and 12°54'77" N latitudes and 76°7' and 76°52'40" E longitudes.

The Nilgiri Biosphere Reserve area included within Tamil Nadu and consisting of Nilgiri, Wynad, Upper Nilgiri plateau, Nilgiri South eastern slopes, Nilgiri eastern slopes and Sigur plateau extends to 2537.60 km². Mudumalai wild life sanctuary having an area of about 300 km² and Nilgiri Tahr sanctuary (now called Mukurthi National Park) are the prime wild life conservation areas in the Tamil Nadu part of Nilgiri Biosphere Reserve. Benne Reserve forest within Nilgiri Wynad has some very good semi-evergreen forest. The reservoirs on Pykara river formed in the upper Nilgiri Plateau are Parthimund Parson's valley reservoir, Mukurthi lake and Pykara lake. The southern edge of Nilgiris descends abruptly to the Attapadi plateau near the confluence of Kunda and Bhawani rivers. The Pillur reservoir is situated below the confluence of Kunda with Bhavani. On the eastern slopes of Nilgiri, the Bhavani river has been dammed near its confluence with Moyar river, resulting in the formation of Bhavani sagar with a water spread of 80 km². The eastern slopes of Nilgiri and a portion of Talamala reserve forest immediately opposite to it beyond Moyar and the Moyar Reserve Forest of Sigur plateau constitute a very rich area having biota of the driest tracts within the Biosphere Reserve. This area is being treated as core zone for preservation of dry scrub forest biota of peninsular India. The Sigur plateau stretches all along the northern boundary of Nilgiris from near Markandurai betta in Theppakadu area where the Nilgiri Wynad and Kerala Wynad meet and it passes through Masinagudi, Anaikatti and Tenkamarda villages and ends near Gazalathi where the Talamalai - Billigiri Rangan Hills, Satyamangalam plateau and Coimbatore plains meet. Sigur plateau is a dry rain shadow area with extensive scrub jungle. The slope forests are xerophytic scrubs gradually changing through dry deciduous forest to semi-evergreen and stunted sholas on the crest. The absence of road links and scattered human settlements have encouraged concentration of wild life on the Sigur plateau.

Nilgiri Biosphere Reserve area included within Kerala State is around 1455.4 km² and comprises broadly forests of Kerala Wynad, Nilambur vested forests, New Amarambalam Reserve Forests, Silent valley, Attapaddi valley Reserve Forest, Attapaddy plateau and Siruvani Hills. Kerala

Wynad is an extensive table land containing Wynad Wild Life Sanctuary. The northern half of Wynad Wild Life Sanctuary contains Begur, Kudrekode, Edakode and Kattikulam Reserve Forests, separated from the southern half by Pulpalli encroachments. The southern half of the sanctuary includes Kurchiyat, Kuppadi, Rampur and Noolpuzha reserve forests. This forest belt is along the interstate boundary and forms a valuable buffer area for the Bandipur Tiger Reserve and Mudumalai Wild Life Sanctuary. The floral complex stretching from Nilgiri slopes to Kerala plains on the one hand and the Mysore plateau on the other, used to provide optimal habitat conditions for all wild life species, especially elephants. The natural vegetation exists only upto the Gudalur Taluka boundary towards the north western corner of Nilambur forests along the Chalipuzha drainage. New Amarambalam Reserve Forests are the slope forests drained by Punnapuzha, Talipuzha, Karimpuzha and Cherupuzha, all tributaries of Chaliyar. The evergreen and semi-evergreen areas of New Amarambalam are undisturbed while moist deciduous portions have been brought under monoculture of teak. The Silent valley National Park having an area of about 90 Km² is mostly covered by west coast tropical evergreen forest and hold all the basic attributes required of a biosphere reserve. The southern limits of Kerala State part of Nilgiri Biosphere include the tropical evergreen forests of Muthikulam Reserve Forest and moist deciduous Chenat Nayar Reserve Forest.

CLIMATE

The NBR contains a variety of climate types. From west to east a gradual change in regime *i.e.* seasonal occurrence of rains is observed from the typical tropical type to the dissymmetric type passing through the transitional stages of three peaks regime at Udhagamandalam and two peaks regime at Hulatti and Dodabetta. The three peaks at Udhagamandalam are in April (due to convection rains), in July (due to S.W. monsoon) and in October (due to the depressions associated with the N.E. monsoon). At Hulatti the two peaks are in April and October but at Dodabetta in July

and October. Other places like Mudumalai in the North and Nariadubetta in the south present a main peak in July and a secondary peak in October.

TEMPERATURE

The temperature varies considerably in different areas of NBR, the hottest month being May and the coldest December-January. The highest temperature recorded at Udhagamandalam in the Tamil Nadu part of NBR is 24.6°C (May) and the least 1.2°C in January. In the Karnataka part, the temperature varies from 30°C to 18°C in the Bandipur and from 32°C to 12°C in the Nagarhole National Park.

RAINFALL

The probable period of onset of rain is between 31st May and 9th June. Rainfall varies considerably within the area included in the NBR. In Karnataka part of NBR, the bulk of the rainfall is received from South-west monsoon between June and August. The southern parts adjoining Moyar river receive less rainfall. However, rainfall gradually improves as we proceed north-west into Coorg district. The average rainfall in Bandipur is 900 mm and at Nagerhole it is 1778 mm.

VEGETATION

The NBR possesses a very wide floristic diversity with inclusion of a series of ecosystems ranging from the thorn forests in the NE part of the Nilgiri district to the deciduous forests of Nagerhole and Kakankote, Savanna-woodlands of Mudumalai, Bandipur, Ainurmarigudi pristine evergreen forests like those of the Silent valley, relict evergreen patches of the Biligiri Rangan Hills and Montane forests (sholas) and grasslands of the hill tops.

Among the flora, there are about 3,500 species of flowering plants, of which 1,500 are endemic to western ghats.

FAUNAL EXPLORATION

Altogether 25 faunistic surveys have been conducted by the three Regional Stations of Zoological Survey of India to various forest areas included within the Nilgiri Biosphere Reserve. The details are given below :

By Southern Regional Station, ZSI, Chennai

1. Mudumalai Wild Life Sanctuary Survey from 6th to 17th October, 1987 by Dr. R. S. Pillai, Scientist-SE & Party.
2. Mudumalai Wild Life Sanctuary survey from 19th February to 1st March 1985 by Dr. M. Vasanth, Asstt. Zoologist & party.
3. Mudumalai Wild Life Sanctuary survey from 20th September to October 1988 by Dr. G. Thirumalai, Scientist-B & party.
4. Siruvani Wilderness Zone survey from 6th to 17th February 1989 by Dr. G. Thirumalai, Scientist-SD & party.
5. Sathyamangalam Minchikuli Core Zone survey from 24th May to 4th June, 1989 by Dr. G. Thirumalai, Scientist-SD & party.
6. Lower Bhavani Area, Coonur, Kothagiri, Mettupalayam Survey from 6th November to 23rd November, 1989 by Dr. G. Thirumalai, Scientist SD & party.
7. Upper Bhavani Area Survey from 20th to 31st August, 1990 by Dr. G. Thirumalai, Scientist-SD & party.

By Western Ghat Regional Station, Z.S.I., Calicut

1. Mudumalai Wild Life Sanctuary survey from 6th December 1987 to 4th January 1988 by Shri K. N. Nair, Scientist-SD & party.
2. Silent Valley National Park Survey from 3rd to 12th February, 1988 by Dr. G.U. Kurup, Scientist-SE & party.
3. Nilambur Forest Survey from 14th to 21st September, 1988 by Dr. G. U. Kurup, Scientist-SE & party.

4. Malappuram and Palghat Survey from 23rd December 1988 to 1st January, 1989 by Dr. M. B. Raghunathan, Asstt. Zoologist & party.
5. Wynad and Palghat Districts Survey from 20th February to 1st March, 1989 by Shri K. N. Nair, Scientist-SE & party.
6. Muthanga, Wynad Wild Life Sanctuary Survey on 1st November, 1989 by Dr. G. U. Kurup, Scientist-SE & party.
7. Palghat District Survey from 8th to 19th January, 1990 by Dr. M. B. Raghunathan, Asstt. Zoologist & party.
8. Wynad and Palghat Districts Survey from 3rd to 16th March, 1990 by Shri K. N. Nair, Scientist-SD & party.
9. Palghat District Survey from 16th to 25th November, 1990 by Dr. M.B. Raghunathan, Asstt. Zoologist & party.
10. Wynad District Survey from 4th to 15th January, 1991 by Shri K. N. Nair, Scientist-SD & party.

By Western Regional Station, Z.S.I. Pune

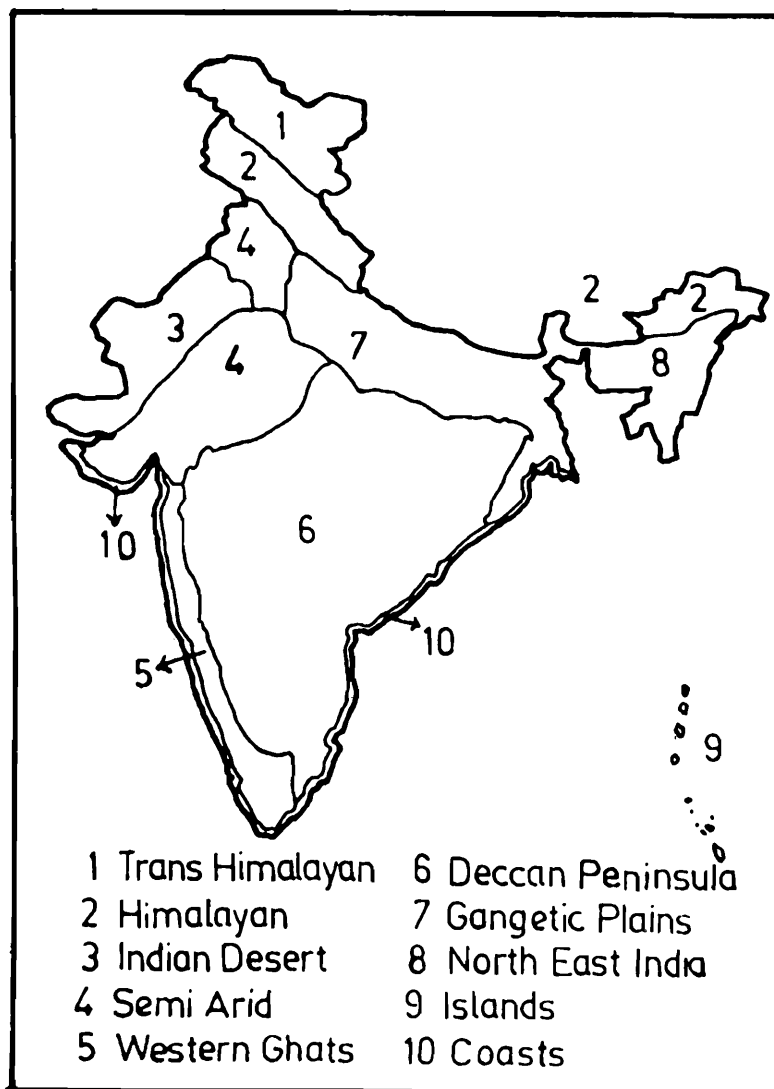
1. Bandipur Tiger Reserve and Nagarhole National Park Survey from 21st Sept - 2nd Oct, 1988 by Dr. M.S. Pradhan, Scientist-SD & party.
2. Bandipur Tiger Reserve and Nagarhole National Park Survey from 18th to 30th December, 1988 by Dr. G. M. Yazdani, Scientist-SE & party.
3. Bandipur Tiger Reserve Survey from 16-26 February, 1989 by Dr. G.M. Yazdani, Scientist-SE & party.
4. Nagarhole National Park Survey from 9th to 18th May, 1989 by Dr. R. M. Sharma, Asstt. Zoologist & party.
5. Bandipur Tiger Reserve and Nagarhole National Park Survey from 15th September to 8th October, 1989 by Dr. G. M. Yazdani, Scientist 'SE' & Dr. M. S. Pradhan, Scientist 'SD' and party.

6. Nagarhole National Park Survey from 13th to 26th December, 1989 by Shri S. V. Mulay, Sr. Zool. Asstt. and party.
7. Nagarhole National Park Survey from 14th to 28th September, 1990 by Dr. S. G. Patil, Asstt. Zoologist & party.
8. Nagarhole National Park Survey from 7th March to 28th March, 1991 by Dr. M. S. Pradhan, Scientist 'SD' and party.
2. Western Regional Station, Z.S.I., Pune. : 08 Field Surveys (Karnataka part).
3. Western Ghat Regional Station, Z.S.I., Calicut : 10 Field Surveys (Kerala State part).

The Station-wise surveys are as follows :-

1. Southern Regional Station Z.S.I., Chennai. : 07 Field Surveys (Tamil Nadu part).

Many examples of zoological specimens representing various groups of fauna were collected from the Nilgiri Biosphere Reserve area as a result of 25 faunistic surveys carried out by the three Regional Stations of the Zoological Survey of India. Visual identification has been done for the larger reptiles, birds and mammals and data were recorded on the current status of the fauna within the Biosphere Reserve.



Map 1. Biogeographic Zones of India



Map 2. Showing location of Nilgiri Biosphere Reserve

PROTOZOA

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INTRODUCTION

The protozoa are cosmopolitan and occur in nature as freeliving, commensal, symbiotic and parasitic forms. Many species of protozoa are devoured by the various formative stages of aquatic and soil metazoa and thus form a part of the food chain. Presence of certain species of protozoa serve as indicators of the quality of aquatic environment. The knowledge of parasitic protozoa of man, animals and plants, their life cycles and means of transmission are of considerable importance to discover preventive medicines. In this paper, 111 species of protozoa from Nilgiri Biosphere Reserve are listed, including those reported earlier. Classification of Flagellates and sporozoans is based on Kudo (1986). Ogden and Hedley (1980) is followed for classification of testate Amoebae. Corliss (1979) is followed for classification of ciliated protozoa.

Previous work

Cornwall (1915) described two unnamed species of *Gregarina* from the insect, *Lepisma saccharina* Linnaeus collected from Coonoor, Nilgiri District. Soil inhabiting protozoa of Nilgiri Hills are listed in the works of Chaudhuri (1929), Madhava Rao (1928) and Sandon (1927). Symbiotic ciliates inhabiting the stomach of ruminants of Nilgiri Hills were described by Kofoid & Mac Lennan (1930, 1932, 1933). Kofoid (1935) reported two symbiotic ciliates from the caecum of Indian elephant from Nilgiris. Bhatia (1936, 1938) included in his works the protozoa recorded from the localities within the Nilgiri Biosphere Reserve.

SYSTEMATIC ACCOUNT

(*Species collected during current surveys)

A. Flagellates :

Class MASTIGOPHORA
Order CRYPTOMONADIDA
Family CRYPTOMONADIDAE

*1. *Chilomonas paramecium* Ehrenberg

Locality : Wayanad, Muthikulam-Palghat Dist.,
Mudumalai-Nilgiri Dist.

Habitat : Freeliving in freshwater.

Status : Very common.

Order EUGLENOIDIDA
Family ANISONEMIDAE

*2. *Entosiphon sulcatum* (Dujardin)

Locality : Wayanad, Muthikulam-Palghat Dist.,
Mudumalai-Nilgiri Dist.

Habitat : Free living in freshwater.

Status : Very common.

B. Rhizopods :

Class LOBOSIA
Order ARCELLINIDA
Family ARCELLIDAE

*3. *Arcella vulgaris* Ehrenberg

Locality : Wayanad, Dhoni-Palghat Dist.,
Moyar river-Nilgiri Dist.

Habitat : Freelifving in fresh water.

Status : Common.

***4. *Arcella discoides* Ehrenberg**

Locality : Wayanad, Moyar river-Nilgiri Dist.,

Habitat : Free living in fresh water.

Status : Common.

***5. *Arcella gibbosa* Penad**

Locality : Wayanad, Muthikulam-Palghat Dist.

Habitat : Freelifving in freshwater.

Status : Rare.

Family CENTROPYXIDAE

***6. *Centropyxis aculeata* (Ehrenberg)**

Locality : Wayanad, Dhoni-Palghat Dist.,
Mudumalai-Nilgiri Dist.

Habitat : Freelifving in freshwater.

Status : Common.

***7. *Centropyxis ecornis* (Ehrenberg)**

Locality : Wayanad, Kalladikode-Palghat Dist.,
Masinagudi-Nilgiri Dist.

Habitat : Freelifving in freshwater.

Status : Common.

Family DIFFLUGIIDAE

***8 *Diffflugia acuminata* Ehrenberg**

Locality : Wayanad, Muthikulam-Palghat Dist.,
Moyar river Nilgiri District.

Habitat : Freelifving in freshwater.

Status : Common.

***9. *Diffflugia corona* Wallich**

Locality : Kuthirakode, Begur-Wayanad Dist.,
Benne Reserve Forest Nilgiri Dist.

Habitat : Freelifving in freshwater.

Status : Rare.

***10. *Diffflugia lobostoma* Leidy**

Locality : Mavanahalla, Rampur-Wayanad
Dist.

Habitat : Freelifving in freshwater.

Status : Rare.

***11. *Diffflugia oviformis* Cash**

Locality : Masinagudi-Nilgiri Dist., Noolpuzha
Reserve forest-Wayanad Dist.

Habitat : Freelifving in freshwater.

Status : Common.

C. Sporozoans :

Class SPOROZOA

Order GREGARINIDA

Family GREGARINIDAE

12. *Gregarina aciculata* Bhatia

Locality : Coonoor, Nilgiri District.

Habitat : Parasite in midgut of *Lepisma
saccharina*.

Status : Rare.

***13. *Gregarina cornwalli* Bhatia**

Locality : Coonoor, Nilgiri Dist.

Habitat : Parasite in midgut of *Lepisma
saccharina*.

Status : Rare.

Order HAEMOSPORIDA

Family PLASMODIIDAE

***14. *Plasmodium malariae* Laveran**

Locality : Ottacamund - Nilgiri Dist., Wayanad
Dist.

Habitat : Parasite in erythrocytes of Human beings.

Status : Rare.

*15. *Plasmodium vivax* (Grassi & Feletti)

Locality : Nilgiri Dist., Wayanad Dist.

Habitat : Parasite in erythrocytes of Human beings.

Status : Rare.

16. *Plasmodium falciparum* Welch

Locality : Nilgiri Dist.

Habitat : Parasite in erythrocytes of Human beings.

Status : Rare.

17. *Plasmodium cynomolgi* Mayer

Locality : Nilgiri Dist.

Habitat : Parasite in erythrocytes of *Macaca silenus*.

Status : Rare.

18. *Plasmodium ratufoe* Donovan

Locality : Nilgiri Hills.

Habitat : Parasite in erythrocytes of *Ratufa indica*.

Status : Rare.

Order EUCOCCIIDIIDA

Family EIMERIIDAE

19. *Eimeria acervulina* Tyzzer

Locality : Nilgiri Dist.

Habitat : Parasite in small intestine of *Gallus* sp.

Status : Rare.

20. *Eimeria bovis* (Zublin)

Locality : Kodagu Dist.

Habitat : Parasite in alimentary canal of *Bubalus bubalis* Linn.

Status : Rare.

Remarks : Reported as *E. smithi* earlier (Mandal, 1987).

21. *Eimeria zuerni* (Rivolta)

Locality : Kodagu Dist.

Habitat : Parasitic in alimentary canal of *Bubalus bubalis* Linn.

Status : Rare (Sen. 1932).

D. Ciliates :

Class KINETOFRAGMINOPHORA

Order PROSTOMATIDA

Family PRORODONTIDAE

*22. *Prorodon teres* Ehrenberg

Locality : Begur, Kuthirakode - Wayanad Dist.,

Habitat : Freelifving in freshwater.

Status : Rare.

Family : COLEPIDAE

*23. *Coleps hirtus* (Muller)

Locality : Kattikulam, Begur-Wayanad Dist.

Habitat : Freelifving in freshwater.

Status : Common.

Order HAPTORIDA

Family ENCHELYIDAE

*24. *Enchelys* sp.

Locality : Nilgiri Hills.

Habitat : Farm and Garden soil.

Status : Rare.

*25. *Lacrymaria olor* (Muller)

Locality : Wayanad Dist., Kalladikode-Palghat Dist., Moyar river Nilgiri Dist.

Habitat : Freelifving in freshwater.

Status : Common.

Family DIDINIIDAE

*26. *Didinium nasutum* (Muller)

Locality : Noolpuzha, Mavanahalla - Wayanad Dist.

Habitat : Freelifving in freshwater.

Status : Rare.

Order TRICHOSTOMATIDA

Family ISOTRICHIDAE

27. *Dasytricha ruminatum* Schuberg

Locality : Nilgiri Hills.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Common.

28. *Isotricha prostoma* Stein

Locality : Nilgiri Hills.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

29. *Isotricha Intestinalis* Stein

Locality : Bandipur Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

Order ENTODINIOMORPHIDA

Family OPHRYOSCOLECIDAE

30. *Diplodinium dentatum* (Stein)

Locality : Coonoor, Nilgiri Dist.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare

31. *Diplodinium ceylonicum* Kofoid & Christenson

Locality : Nilgiri District

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

32. *Diplodinium monocanthum* (Dogiel)

Locality : Bandipur - Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

33. *Diplodinium diacanthum* (Dogiel)

Locality : Bandipur-Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

34. *Diplodinium triacanthum* (Dogiel)

Locality : Bandipur-Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

35. *Diplodinium tetracanthum* (Dogiel)

Locality : Bandipur Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

36. *Diplodinium pentacanthum* (Dogiel)

Locality : Bandipur Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

37. *Diplodinium anisacanthum* da Cunha

Locality : Bandipur - Mysore Dist.

Habitat : Symbionat in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

38. *Diplodinium psittaceum* (Dogiel)

Locality : Coonoor Nilgiri Dist.

Habitat : Symbionat in stomach of *Bos indicus* Linn.

Status : Rare.

39. *Diplodinium minor* (Dogiel)

Locality : Bandipur - Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

40. *Diplodinium flabellum* Kofoid & MacLennan

Locality : Coonoor Nilgiri Dist.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

41. *Elytroplastron hubali* (Dogiel)

Locality : Coonoor Nilgiri Dist.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

42. *Entodinium acutonucleatum* Kofoid & MacLennan

Locality : Nilgiri Dist. and Bandipur - Mysore Dist.

Habitat : Symbiont in stomach of *Bos indicus* Linn. and *Bos gaurus* (H. Smith).

Status : Common.

43. *Entodinium curtum* Kofoid & Christenson

Locality : Bandipur - Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Common.

44. *Entodinium ellipsoideum* Kofoid & MacLennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

45. *Entodinium longinucleutum* Dogiel

Locality : Bandipur-Mysore Dist. and Nilgiri Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith) and *Bos indicus* Linn.

Status : Rare.

46. *Entodinium pisciculum* Kofoid & Lennan

Locality : Nilgiri District

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

47. *Entodinium rostratum* Fiorentini

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare

48. *Entodinium acutum* Kofoid & MacLennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

49. *Entodinium bifidum* (Dogiel)

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Common.

50. *Entodinium biconcavum* Kofoid & MacLennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

51. *Entodinium laterale* Kofoid & MacLennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Common.

52. *Entodinium bimastus* Dogiel

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

53. *Entodinium brevispinum* Kofoid & MacLennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

54. *Entodinium contractum* Kofoid & Christenson

Locality : Bandipur - Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Common.

55. *Entodinium gibberosum* Kofoid & MacLennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

56. *Entodinium indicum* Kofoid & MacLennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

57. *Entodinium laterospinum* Kofoid & MacLennan

Locality : Nilgiri District and Bandipur-Mysore Dist.

Habitat : Symbiont in stomach of *Bos indicus* Linn. and *Bos gaurus* (H. Smith).

Status : Common.

58. *Entodinium nanellum* Dogiel

Locality : Nilgiri District and Bandipur-Mysore Dist.

Habitat : Symbiont in stomach of *Bos indicus* Linn. and *Bos gaurus* (H. Smith).

Status : Common.

59. *Entodinium evoideum* Kofoid & Mac Lennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

60. *Entodinium rhomboideum* Kofoid & Mac Lennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

61. *Entodinium tricostatum* Kofoid & Mac Lennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

62. *Eodinium bilobosum* (Dogiel)

Locality : Bandipur - Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Common.

63. *Eodinium lebatum* Kofoid & Mac Lennan

Locality : Nilgiri Dist.

Habitat : Symbiont in Stomach of *Bos indicus* Linn.

Status : Rare.

64. *Eodinium rectangulatum* Kofoid & Mac Lennan

Locality : Nilgiri Dist.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

65. *Epidinium caudatum* (Fiorentini)

Locality : Bandipur - Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Common.

66. *Epidinium quardricaudatum* (Sharp)

Locality : Bandipur-Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

67. *Epidinium parvicaudatum* (Averinzew & Mutafova)

Locality : Bandipur - Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

68. *Epidinium cattanei* (Fiorentini)

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

69. *Epidinium eberleini* (da Cunha)

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

70. *Eremoplastron bovis* (Dagiel)

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

71. *Eremoplastron magnodentatum* Kofoid & MacLennan
Locality : Bandipur - Mysore Dist.
Habitat : Symbiont in stomach of *Bos indicus* Linn.
Status : Common.
72. *Eremoplastron rostratum* (Fiorentini)
Locality : Bandipur - Mysore Dist.
Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).
Status : Common.
73. *Eremoplastron rotundum* Kofoid & MacLennan
Locality : Nilgiri Dist.
Habitat : Symbiont in stomach of *Bos indicus* Linn.
Status : Rare.
74. *Eudiplodinium maggi* (Fiorentini)
Locality : Nilgiri Dist. and Bandipur-Mysore Dist.
Habitat : Symbiont in stomach of *Bos indicus* Linn. and *Bos gaurus* (H. Smith).
Status : Common.
75. *Metadinium medium* Anexinzew & Mutafova
Locality : Nilgiri Dist. and Bandipur-Mysore Dist.
Habitat : Symbiont in stomach of *Bos indicus* Linn. and *Bos gaurus* (H. Smith).
Status : Common.
76. *Metadinium rotundatum* Kofoid & Christenson
Locality : Bandipur-Mysore Dist.
- Habitat* : Symbiont in stomach of *Bos gaurus* (H. Smith).
Status : Rare.
77. *Ophryoscolex spinosus* Kofoid & MacLennan
Locality : Nilgiri Dist.
Habitat : Symbiont in stomach of *Bos indicus* Linn.
Status : Rare.
78. *Ostracodineum clipeolum* Kofoid & MacLennan
Locality : Nilgiri Dist.
Habitat : Symbiont in stomach of *Bos indicus* Linn.
Status : Rare.
79. *Ostracodinium gauri* Kofoid & Christenson
Locality : Bandipur - Mysore Dist.
Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).
Status : Rare.
80. *Ostracodinium gracile* (Dagiel)
Locality : Nilgiri Dist. & Bandipur-Mysore Dist.
Habitat : Symbiont in stomach of *Bos indicus* Linn. and *Bos gaurus* (H. Smith).
Status : Common.
81. *Ostracodinium mammosum* (Railliet)
Locality : Nilgiri District.
Habitat : Symbiont in stomach of *Bos indicus* Linn.
Status : Rare.

82. *Ostracodinium mysorei* Kofoid & Christenson

Locality : Bandipur-Mysore Dist.

Habitat : Symbiont in stomach of *Bos gaurus* (H. Smith).

Status : Rare.

83. *Ostracodinium quadrivesiculatum* Kofoid & MacLennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Common.

84. *Ostracodinium rugoloricatum* Kofoid & MacLennan

Locality : Nilgiri Dist.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Common.

85. *Ostracodinium trivesiculatum* Kofoid & Machennan

Locality : Nilgiri Dist. and Bandipur - Mysore Dist.

Habitat : Symbiont in stomach of *Bos indicus* Linn. and *Bos gaurus* (H. Smith).

Status : Common.

86. *Ostracodinium venustum* Kofoid & MacLennan

Locality : Nilgiri District.

Habitat : Symbiont in stomach of *Bos indicus* Linn.

Status : Rare.

87. *Polydiniella mysoreum* (Kofoid)

Locality : Nilgiri District and Bandipur-Mysore Dist.

Habitat : Symbiont in Colon and caecum of *Elephas maximus* Cuvier.

Status : Rare.

88. *Elephantophilus zeta* Kofoid

Locality : Nilgiri Dist. and Bandipur - Mysore Dist.

Habitat : Symbiont in Colon and Caecum of *Elephas maximus* Cuvier.

Status : Rare.

Order COLPODIDA

Family COLPODIDAE

***89. *Colpoda cucullus* O.F.Muller**

Locality : Nilgiri District, Bandipur-Mysore Dist., Wayanad Dist., Dhoni-Palghat Dist. and Nilambur-Malappuram Dist.

Habitat : Freelifving in freshwater and soil.

Status : Very common.

***90. *Colpoda maupasi* Enriques**

Locality : Nilgiri Hills, Bandipur - Mysore Dist., Wayanad Dist. Nilambur-Malappuram Dist. and Kalladikode-Palghat Dist.

Habitat : Freelifving in fresh water and soil.

Status : Common.

***91. *Colpoda steinii* Maupas**

Locality : Nilgiri Dist., Bandipur-Mysore Dist., Wayanad, Nilambur-Malappuram Dist., and Dhoni-Palghat Dist.

Habitat : Freelifving in freshwater and soil.

Status : Common.

Family CYRTOLOPHOSIDAE

92. *Cyrtolophosis elongatus* (Schewiakoff)

Locality : Nilgiri Hills and Mavanahalla forest Wayanad Dist.

Habitat : Freelifving in moist soil.

Status : Common.

93. *Cyrtolophosis minutus* (Schewiakoff)

Locality : Nilgiri Hills.

Habitat : Freelifving in moist soil.

Status : Common.

Order CYRTOPHORIDA

Family CHILODONELLIDAE

*94. *Chilodonella uncinata* Ehrenberg

Locality : Mayar river Nilgiri Dist., Noolpuzha river Wayanad Dist.

Habitat : Freelifving in freshwater.

Status : Very common.

Class OLIGOTLYMENOPHORA

Order HYMENOSTOMATIDA

Family TETRAHYMENIDAE

95. *Colpidium Striatum* Stokes

Locality : Bandipur - Mysore Dist.

Habitat : Freelifving in freshwater and moist soil.

Status : Rare.

Family PARAMECIIDAE

*96. *Paramecium caudatum* Ehrenberg

Locality : Nilambur - Malappuram Dist., Muthikulam - Palghat District, Begur Wayanad and Mudumalai - Nilgiri Dist.

Habitat : Freelifving in freshwater.

Status : Common.

*97. *Paramecium aurelia* Ehrenberg

Locality : Begur-Wayanad District, Kalladikode-Palghat District, Benne - Nilgiri District.

Habitat : Freelifving in fresh water.

Status : Common.

Family UROCENTRIDAE

*98. *Urocentrum turbo* (Muller)

Locality : Rampur reserve forest - Wayanad District.

Habitat : Freelifving in freshwater.

Status : Rare.

Order SCUTICOCILIATIDA

Family URONEMATIDAE

*99. *Uronema acuminatum* Madhawa Rao

Locality : Bandipur - Mysore District.

Habitat : Freelifving in moist soil and fresh water.

Status : Common.

100. *Uronema marinum* Dujardin

Locality : Bandipur - Mysore District and Nilgiri Dist.

Habitat : Freelifving in freshwater and soil.

Status : Common.

Family CYCLIDIIDAE

*101. *Cyclidium glaucoma* Muller

Locality : Kurichiad Reserve forest - Wayanad District, Muthikulam - Palghat Dist.

Habitat : Freelifving in freshwater.

Status : Common.

Order PERITRICHIDA
Family VORTICELLIDAE

102. *Carchesium polypinum* (Linnaeus)

Locality : Bandipur - Mysore District.
Habitat : Freelifving in freshwater and soil.
Status : Rare.

*103. *Verticella microstoma* Ehrenberg

Locality : Nilgiri Dist., Bandipur - Mysore Dist. and Dhoni - Palghat Dist. and Wayanad.
Habitat : Freelifving in freshwater and soil.
Status : Common.

Class POLYHYMENOPHORA
Order HETEROTRICHIDA
Family SPIROSTOMIDAE

104. *Spirostomum* sp.

Locality : Nilgiri District.
Habitat : Freelifving in freshwater and soil.
Status : Rare.

Family CONDYLOSTOMATIDAE

105. *Condylostoma patens* (Muller)

Locality : Bandipur - Mysore District.
Habitat : Freelifving in freshwater and moist soil.
Status : Rare.

Family NYCTOTHERIDAE

106. *Nyctotherus cordiformis* (Ehrenberg)

Locality : Nilgiri District.
Habitat : Parasite in intestine and cloaca of *Bufo melanostictus* Schneider.
Status : Common.

Order HYPOTRICHIDA
Family HOLOSTICHIDAE

107. *Gonostomum affine* (Stein)

Locality : Nilgiri Dist. and Bandipur.
Habitat : Freelifving in freshwater and soil.
Status : Rare.

108. *Uroleptus mobilis* Engelmann

Locality : Nilgiri District.
Habitat : Freelifving in freshwater and soil.
Status : Rare.

109. *Uroleptus piscis* (Muller)

Locality : Nilgiri District.
Habitat : Freelifving in freshwater and soil.
Status : Rare.

Family OXYTRICHIDAE

110. *Pleurotricha lanceolata* (Ehrenberg)

Locality : Nilgiri District.
Habitat : Freelifving in freshwater and soil.
Status : Rare.

Family EUPLOTIDAE

111. *Euplotes patella* (O.F.Muller)

Locality : Bandipur Mysore District.
Habitat : Freelifving in freshwater and soil.
Status : Rare.

SUMMARY

A comprehensive account of the protozoan fauna of Nilgiri Biosphere Reserver is given in the paper. One hundred and eleven species of protozoa, comprising flagellates, rhizopods, sporozoans and ciliates are reported from the

Nilgiri Biosphere Reserve area. Two species of flagellates, nine species of rhizopods, ten species of sporozoans and ninety species of ciliates are included in the paper.

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ROTIFERA

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INTRODUCTION

Rotifers are small microscopic organisms, ranging from 40 microns to 2.5 mm in size. Usually they are elongated and spherical in shape. They can be identified from other groups by the presence of their anterior ciliated wheel like structure called "Corona". The body is unsegmented and can be divided into three parts, head, trunk and foot, having superficial segments. The rotifers secrete a cuticle, a thin layer of syncytial hypodermis which is later thickened into a case called "lorica". The well developed lorica is rigid and box-like and heavily sculptured. It consists of a dorsal arched and a ventral flat plate, cemented together at the edges. Some Rotifers, sessile and free swimming, develop a gelatinous tube with bits of pellets or debris for their protection in nature. Foot, if present, is with one or two toes which help in locomotion.

The food taken in, goes into pharynx, where is situated a masticatory apparatus called Mastax having cuticular plates which forms a trophi. The muscle moves the trophi parts. This structure consists of seven cuticularised plates, the unpaired fulcrum, paired rami, unci and manubria. Fulcrum and rami together are called incus, unci and manubria as malleus. These trophi of rotifers are important systematic features (Edmondson 1940). Not only major variations are useful in separating class, order and family but some types of trophi vary in such a way that species can be recognised on the basis of data on trophi alone.

In all there are eight types of trophi as follows :

1. Malleate trophi.
2. Virgate trophi.

3. Cardate trophi
4. Forcipate trophi.
5. Incudate trophi.
6. Malleoramate trophi.
7. Remate trophi.
8. Uncinate trophi.

To study the trophi, the animal should be treated in sodium hydrochloride (commercial chlorox). It must be observed quickly under high magnification, before the soft part is dissolved.

DISTRIBUTION

Many species are worldwide in their distribution but some are distinctly limited in geographical distribution.

SIGNIFICANCE

1. They form an integral link in the aquatic food chain.
2. Play an important role in biological productivity (debris and bacteria).
3. They form part of the freshwater zooplankton and hence contribute significantly to freshwater productivity.
4. Comprise food of fry, fingerlings and adult fishes.
5. Used as supplementary food in aquaculture.
6. Serve as bioindicators to assess water quality and in toxicological and bioassay experiments.

HISTORICAL RESUME

In India, studies on this group was first initiated by Anderson (1889) who dealt with 47 species from in and around Calcutta. Edmondson and Hutchinson (1934) studied Yale-North India expedition collections from Punjab and Northwest Frontier province, Kashmir basin, Indian Tibet, Tibet proper and 9 localities from Nilgiri in Southern India. Later, a number of workers like Pasha (1961); Arora (1966); Chandra Mohan & Rao (1976); Das and Akthar (1976); Sharma and Michael (1980) and Patil (1976, 1978, 1988) have contributed in this field.

Plankton samples especially from the comparatively undisturbed water bodies were collected with the help of a bolting silk conical net (200 mesh/cm). Only qualitative samples were obtained and preserved in 5% formalin. Some samples were isolated and studied in live condition.

In this study, only collections of WRS/ZSI, were examined.

SYSTEMATIC ACCOUNT

Class	ROTIFERA
Subclass	EUROTATORIA
Superorder	MONOGONONTA
Order	PLOIMIDA
Family	LECANIDAE

1. *Lecane (M) clostercerca* (Schmarda)

Locality : Nilgiri Hills.

Altitude : 2133 to 2316 m.

Status : Locally common.

External distribution : Punjab, Ladak, Nagpur, Baroda, Rajasthan, N.W. India, West Bengal, Orissa, Meghalaya.

Source : Edmondson and Hutchinson (1934).

2. *Lecane (M) hamata* Stoke

Locality : Nilgiri Hills.

Altitude : 2133 M to 2316 M.

Status : Locally common.

Habitat : Small ponds.

External distribution : Kashmir, Punjab, Nilgiri, Madras, Baroda, Rajasthan, N.W.India.

Source : Edmondson & Hutchinson (1934).

3. *Lecane (M) quadridentata* (Ehrenberg)

Locality : Nilgiri Hills.

Altitude : 2133 M to 2316 M.

Status : Locally common.

Habitat : Freshwater tanks.

External Distribution : Punjab, Kashmir, Nilgiri, Madras, Rajasthan, North West India & West Bengal.

Source : Edmondson and Hutchinson (1934).

Family TRICHOTRIDAE

4. *Trichotria tetractis* Ehrenberg

Locality : Nilgiri Hills.

Altitude : 2133 M.to 2316 M.

Status : Locally common.

External distribution : Nagpur, Baroda, Kerala, Andhra Pradesh, North West India, West Bengal, Orissa, Meghalaya.

Source : Edmondson & Hutchinson (1934).

Family BRACHIONIDAE

5. *Brachionus angularis* Gosse*

Locality : Nagarhole-Peacock tank, Doddla tank*.

Altitude : 300 M to 1500 M.

Habitat : Small waterhole.

Status : Common.

External distribution : Madras, Punjab, Kashmir, Rajasthan, Kerala, North West India,

Bihar, Andhra Pradesh, West Bengal, Maharashtra, Orissa, Meghalaya and Manipur.

Source : Patil (1988).

6. *Brachionus calyciflorus* Pallas*

Locality : Nagarhole Peacock tank*.

Altitude : 300 M. to 1500 M.

Habitat : Small waterhole.

Status : Common.

External distribution : Punjab, Kashmir, Delhi, Nagpur, Rajasthan, Bihar, Chandigarh, Orissa, North West India, Meghalaya, Assam and Manipur.

Source : Patil (1988).

7. *Brachionus caudatus* Barrois & Dadday*

Locality : Nagarhole Peacock tank*

Altitude : 300 M to 1500 M.

Habitat : Small waterhole.

Status : Common.

External distribution : Madras, Rajasthan, Chandigarh, Nagpur, Bihar, Orissa, Meghalaya.

Source : Patil (1988).

Remarks : Very common.

8. *Brachionus unceolaris* Muller*

Locality : Nagarhole Peacock tank*.

Altitude : 300 M. to 1500 M.

Habitat : Small tank without vegetation.

Status : Common.

External distribution : Nagpur, Maharashtra, Andhra Pradesh, West Bengal & Assam.

Source : Patil (1988).

9. *Brachionus patulus* (Muller)

Locality : Nilgiri Hills.

Altitude : 2133 to 2316.

Status : Locally common.

External distribution : Kashmir, Nagpur, Maharashtra, Baroda, Gujarat.

Source : Edmondson and Hutchinson, (1934).

10. *Keratella tropica* (Apstein)

Locality : Nilgiri Hills.

Altitude : Not known.

Status : Locally common.

External distribution : West Bengal, Nagpur, Baroda, N.W. India, Kerala and Andhra Pradesh.

Source : Edmondson & Hutchinson (1934).

11. *Lepadella rhomboides* (Gosse)

Locality : Nilgiri Hills.

Altitude : 2133 M to 2316 M.

Status : Locally common.

External distribution : Punjab, Baroda and West Bengal.

Source : Edmondson and Hutchinson (1934).

Order GNESIOTROCHA

Family FILINIDAE

12. *Filinia longiseta* (Ehrenberg*)

Locality : Nagarhole Peacock Tank.

Altitude : 300 M to 1500 M.

Habitat : Small temporary tank without vegetation.

Status : Locally common.

External distribution : Nagpur, Baroda, Chandigarh, Bihar, Rajasthan, West Bengal, Orissa and Meghalaya.

13. *Filinia terminalis* (Plate*)

Locality : Nagarhole Peacock Tank.

Altitude : 800 M. to 850 M.

Habitat : Small tank without vegetation.

External distribution : Meghalaya.

Status : Not very common.

Source : Patil (1978, 1988).

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OSTRACODA

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INTRODUCTION

The sub-class Ostracoda belongs to class Crustacea and Phylum Arthropoda. Ostracods of the world especially of the temperate zones of only a few areas have so far been studied in detail. Studies on Ostracods of the Indian subcontinent were made and their status was critically evaluated by Victor and Fernando (1979). In India, freshwater Ostracods are common among benthic collections, vegetations, algal mat and plankton collections. They form an important link in the food chain of aquatic micro-organisms (Forbes, 1988). Some Ostracods are also parasitic in the gills of various species of fresh water crayfishes (Rioja 1943). In Geology they are used as Stratigraphic Markers (Moore, 1961).

Mention must be made of the earlier workers in this field by Gurney (1916), Klie (1927), Hartmann (1964) and Victor (1976).

SYSTEMATIC ACCOUNT

(*species collected and studied)

CLASSIFICATION

Class	CRUSTACEA
Sub-class	OSTRACODA
Suborder	PODOCOPA
Family	CYPRIDIDAE
Sub Family	CYPRIDINAE

**Cypris subglobosa* Sowerby

Locality : Nagarhole, Peacock tank, Doddla tank.

Altitude : 300 m. to 1500 m.

Habitat : A small waterhole.

Status : Locally common.

External distribution : Nagpur, Bombay & Pandharpur in Maharashtra. Bhopal in Madhya Pradesh, Chitoor, Guntoor area & Yanam Godavari delta in Andhra Pradesh, Madurai dist. Trichy dist. and Kanyakumari in Tamil Nadu, Trivandrum in Kerala.

Source : Victor and Fernando (1979).

**Strandesia indica* Hartmann

Locality : Nagarhole, Peacock tank, Doddla tank.

Altitude : 300 m to 1500 m.

Habitat : Small waterhole.

Status : Locally common.

External distribution : Ginar Hill reservoir in Kathiawar, Gujarat, Madras and vicinity. Pondicherry. Trivandrum and vicinity in Kerala and Calcutta in West Bengal.

Source : Victor and Michael (1979).

Strandesia labiata Hartmann.

Locality : Nilgiri Hills.

Habitat : Freshwater Hill tanks.

Status : Not known.

External distribution : Bombay in Maharashtra; Travancore, Kerala, Palni Hills, Kodaikanal Hill, Nilgiri Hills, South Madras in Tamil Nadu, Hyderabad, Andhra Pradesh and Sikkim.

Source : Victor & Fernando (1979).

Sub Family CYPRETTINAE

Altitude : 300 m. to 1500 m.

**Cypretta fontinalis* Hartmann

Habitat : A small tank.

Status : Not known.

Locality : Nagarhole Peacock tank.

External distribution : Ernakulam in Kerala.

Altitude : 300 m. to 1500 m.

Habitat : A small waterhole.

Status : Locally common.

External distribution : Palni Hills, Tamil Nadu, Travancore Maharashtra : mountainous terrains.

Source : Victor & Fernando (1979).

**Oncocypris pustulosa* Gurney

Locality : Nagarhole Peacock tank

Altitude : 300 m to 1500 m.

Habitat : A small waterhole.

Status : Locally common.

External distribution : Coastal ponds of Kerala.

Sub Family CYPRIDOPSINAE

**Oncocypris voeltzkowi* Muller

Locality : Nagarhole Peacock tank.

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CLADOCERA (CRUSTACEA)

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INTRODUCTION

Materials studied include those from Karnataka, Kerala and Tamil Nadu part of Nilgiri Biosphere Reserve. Plankton samples were collected during 4 surveys in which the senior author covered areas of Kerala and Tamilnadu. The junior author conducted a survey of Nagerhole National Park, Karnataka part of N.B.R. (1989).

A 0.25 m. nylon net (0.3 mm mesh size) was utilized with an attached rope of 2.5 m. for collecting plankton samples. For each sample four throws were made. The collected samples were preserved in 5% formalin.

CLADOCERA

Cladocerans mostly inhabit freshwaters. Some live in open water, some among weeds and some are littoral. The number of species present in the marine waters are very few. More than half of the eight hundred living species of subclass Branchiopoda (Crustacea) are cladocerans, popularly known as waterfleas due to hops and leaps taken by them.

Studies on planktonic cladocerans were made by Raghunathan (1983, 1985, 1990). This study included taxonomy, ecology, population analysis and correlation with primary productivity. Venkataraman and Krishnaswamy (1984, 1985) made two new records from Tamil Nadu. Venkataraman and Krishnaswamy (1985) also made laboratory culture studies on *Diaphanosoma senegal* Pertaining to cyclomorphosis, studies were made by Venkataraman and Krishnaswamy (1986) and Manimegalai *et al.* (1986). A new

species of *Moina* was described by Hudec (1987) from Tamil Nadu.

A review of the Cladocera of Kerala indicates that practically very little information is available on this group from this area. Raghunathan (1988) made studies on the planktonic Cladocera of Kerala with reference to Kozhikode and Trichur districts. Further Raghunathan (1988 b) made studies on the Cladocera of Wynad district. With reference to Karnataka, Cladocera of Dharwad region were studied by Patil and Gowder (1982). Also Raghunathan (1988c) made listing of Cladocera from Coorg district.

SYSTEMATIC ACCOUNT

(* species collected and studied)

Phylum	ARTHROPODA
Class	CRUSTACEA
Order	CLADOCERA
Suborder	EUCLADOCERA
Superfamily	SIDOIDEA
Family	SIDIDAE

*1. *Diaphanosoma excisum* Sars

Locality : Tamilnadu : Nilgiri district : Mudumalai; Kerala : Palghat district.

Altitude : Upto 1500 m.

Status : Not common.

External distribution : Rajasthan; West Bengal : Calcutta; Andhra Pradesh : Guntur.

Source : Sewel, 1934., Raghunathan, 1983.

*Western Regional Station, Zoological Survey of India, Pune.

2. *Diaphanosoma sarsi* Richard

Locality : Tamil Nadu.

Altitude : Upto 500m.

Status : Rare.

External distribution : Meghalaya : Shillong; Rajasthan; Andhra Pradesh : Guntur.

Source : Raghunathan, 1983.

*3. *Latonopsis australis* Sars

Locality : Karnataka : Nagerhole National Park : Malkeri tank, Totahalla tank, Dodalla tank.

External distribution : Rajasthan; Tamilnadu Madurai; Maharashtra : Bombay.

Source : Michael and Sharma, 1988.

Family DAPHNIIDAE

*4. *Daphnia carinata* King

Locality : Tamil Nadu : Nilgiri district : Mudumalai.

Altitude : Upto 1000m.

Status : Not rare.

External distribution : Rajasthan; Bihar; West Bengal.

Source : Michael and Sharma, 1988.

*5. *Daphnia lumholtzi* Sars

Locality : Tamil Nadu : Nilgiri district.

Altitude : Upto 2000m.

Status : Rare.

External distribution : West Bengal; Orissa; Andhra Pradesh; Rajasthan; Bihar; Meghalaya, Punjab; Haryana.

Source : Brehm, 1950., Raghunathan, 1983.

*6. *Daphnia cephalata* (King)

Locality : Karnataka : Nagarhole National Park : Peacock waterhole.

External distribution : Tamilnadu : Madurai; Karnataka : Bangalore.

Source : Michael and Sharma, 1988.

*7. *Ceriodaphnia cornuta* Sars

Locality : Tamil Nadu : Nilgiri district : Mudumalai; Kerala : Palghat district, Malappuram district; Karnataka : Nagerhole National park : Peacock waterhole, Kumtar waterhole, Ulipatte tank, Tolhalla tank, Nagasara waterhole, Marpas tank, Murkal tank, Kalhal tank, Dodalla tank, Paktupore tank.

Status : Common.

External distribution : West Bengal; Bihar; Kerala; Rajasthan; Meghalaya.

Source : Brehm, 1950., Raghunathan, 1983., Michael and Sharma, 1988.

*8. *Ceriodaphnia laticaudata* Muller

Locality : Tamil Nadu; Kerala : Palghat district.

Altitude : Upto 1500m.

Status : Not common

External distribution : Tamil Nadu, Andhra Pradesh.

Source : Raghunathan, 1983.

9. *Ceriodaphnia pulchella* Sars

Locality : Tamil Nadu : Nilgiri district : Mudumalai.

Altitude : Above 1000m.

Status : Rare.

External distribution : Jammu and Kashmir, Srinagar.

Source : Raghunathan, 1983; Michael & Sharma, 1988.

10. *Ceriodaphnia quadrangula* (Muller)

Locality : Tamil Nadu : Nilgiri district.

External Distribution : Jammu and Kashmir.

Source : Brehm 1950.

*11. *Simocephalus acutirostratus* King

Locality : Tamil Nadu : Nilgiri district : Madurai district, Karnataka : Coorg district : Nagerhole National Park : Pakshipore tank.

External distribution : South India.

Source : Michael & Sharma, 1988.

*12. *Simocephalus vetulus* (Muller)

Locality : Karnataka: Coorg district; Nagerhole National Park : Dodallatank, Kalhalla tank, Nagasara waterhole.

External distribution : Bihar, Karnataka, Punjab, Rajasthan, West Bengal, Jammu and Kashmir.

Source : Brehm, 1950; Michael & Sharma, 1988.

*13. *Simocephalus exspinosus* (Koch)

Locality : Karnataka : Coorg district : Nagerhole National Park : Nagerhole river.

External distribution : Meghalaya, West Bengal, Rajasthan.

Source : Michael & Sharma, 1988.

*14. *Scapholeberis Kingi* Sars

Locality : Tamil Nadu : Nilgiri district; Kerala : Palghat district, Malappuram district; Karnataka : Coorg district : Nagerhole National Park : Murkal tank, Marapas tank, Totahalla tank, Dodalla tank.

External distribution : West Bengal, Jammu and Kashmir, Rajasthan, Meghalaya, Assam.

Family MOINIDAE

*15. *Moina micrura* Kurz

Locality : Tamil Nadu : Nilgiri district : Mudumalai; Kerala : Palghat district, Malappuram district; Karnataka : Coorg district; Nagerhole

National park : Peacock waterhole, Kuntar waterhole, Totahalla tank, Nagersara waterhole, Marpas tank, Murkal tank, Kalhalla tank, Ammutikuppa tank, Dodalla tank, Pakshipore tank.

Status : Common.

External distribution : West Bengal, Rajasthan, Kerala, Punjab, Haryana, Assam.

16. *Moina macrocopa* (Straus)

Locality : Tamil Nadu : Nilgiri district.

External distribution : Rajasthan, Maharashtra, New Delhi.

Source : Michael & Sharma 1988.

Family BOSMINIDAE

*17. *Bosmina longirostris* (Muller)

Locality : Tamil Nadu : Nilgiri district.

Status : Not common.

External distribution : Jammu and Kashmir, Meghalaya, Assam.

Source : Raghunathan, 1983.

Family MACROTHRICIDAE

*18. *Macrothrix spinosa* King

Locality : Tamil Nadu : Nilgiri district; Kerala : Palghat district, Malappuram district; Karnataka : Bandipur National park : Waterhole of Bandipur rest house.

Status : Not common.

External distribution : Rajasthan, Manipur.

Source : Raghunathan, 1983; Michael & Sharma, 1988.

19. *Macrothrix laticornis* (Jurine)

Locality : Tamil Nadu : Nilgiri district.

External distribution : Kerala.

Source : Brehm, 1936; Michael & Sharma, 1988.

***20. *Echainisca triserialis* (Brady)**

Locality : Karnataka : Coorg district : Nagerhole National Park, Ammutekuppe tank, Murkal tank, Dodalla tank.

External distribution : West Bengal, Kerala, Rajasthan.

Source : Michael & Sharma, 1988.

Family CHYDORIDAE
Subfamily CHYDORINAE

21. *Pleuroxus aduncus* (Jurine)

Locality : Karnataka : Coorg district : Nagerhole National park : Kalhalla tank, Malkeri tank.

External distribution : Punjab, Rajasthan, Jammu and Kashmir.

Source : Michael & Sharma, 1988.

***22. *Chydorus reticulatus* Daday**

Locality : Tamil Nadu : Nilgiri district; Kerala : Palghat district, Malappuram district.

External distribution : Rajasthan.

Source : Raghunathan, 1983.

23. *Chydorus sphaericus* (Muller)

Locality : Tamil Nadu : Nilgiri district.

External distribution : West Bengal, Bihar, Jammu & Kashmir and Meghalaya.

Source : Gurney, 1906; Sharma, 1978.

24. *Chydorus ventricosus* (Daday)

Locality : Tamil Nadu : Nilgiri district.

External distribution : Gujarat, Rajasthan, Kerala, Maharashtra,

Source : Petkovski, 1966; Michael & Sharma, 1988.

***25. *Chydorus kallipygos* Brehm**

Locality : Karnataka : Coorg district : Nagerhole National park: Kalhalla tank.

External distribution : Tamil Nadu.

Source : Michael & Sharma, 1988.

***26. *Dunhevedia crassa crassa* King**

Locality : Karnataka : Coorg district : Nagerhole National Park; Pakshipore tank, Ammutekuppa tank, Kalhalla tank.

External distribution : West Bengal, Gujarat, Rajasthan, Kerala.

Source : Michael & Sharma, 1988.

Subfamily ALONINAE

***27. *Alona guttata* Sars**

Locality : Tamil Nadu : Nilgiri district; Kerala : Palghat district.

External distribution : Meghalaya, Shillong.

Source : Raghunathan, 1983.

***28. *Alona davidi punctata* (Daday)**

Locality : Karnataka : Coorg district : Nagerhole National park : Ulipella tank.

External distribution : Tamil Nadu, West Bengal.

Source : Michael & Sharma, 1988.

***29. *Leydigia australis* Sars**

Locality : Karnataka : Coorg district : Nagerhole National Park : Murkal tank, Peacock waterhole, Dodalla tank.

External distribution : Tamil Nadu, Maharashtra, Rajasthan.

Source : Michael & Sharma, 1988.

***30. *Biapertura verrucosa* (Sars)**

Locality : Karnataka : Coorg district : Nagerhole National Park : Kuntal waterhole, Malkeri tank,

External distribution : Gujarat, Kerala.

Source : Michael & Sharma, 1988.

***31. *Biapertura karua* (King)**

Locality : Karnataka : Coorg district : Nagerhole National park : Pakshipore tank, Dodalla tank, Kalhalla tank, Marpas tank, Totahalla tank, Utipatte tank.

External distribution : Meghalaya, West Bengal.

Source : Michael & Sharma, 1988.

ECONOMIC IMPORTANCE

Cladocerans constitute one of the major groups of small microscopic animals of great economic importance in freshwater ecosystem. They are the primary consumers, directly utilising primary producers and hence determine to a large extent the energy flow of the ecosystem. The systematic knowledge and mechanisms influencing their ecological efficiency are of great importance. They occupy a definite ecological niche in the freshwater ecosystem. They feed on green unicellular or filamentous algal matter and in turn become a major food source for animals like copepods and insect larvae. Some aquatic adult insects and almost all fishes feed heavily on cladocera. Some cladocerans are filter feeders and mainly feed on small microscopic bacteria which are one of the major components of polluted water bodies. It was determined by Leodolff (1965) that cladocera like *Moina* and *Daphnia* play an important role in the reduction of bacterial number in polluted oxidation ponds of South Africa. Cladocera like *Moina* are also of great significance as these species are used as experimental animals in the physiological embryological and genetic studies (Banta, 1939). Cladoceran species belonging to family Chydorida

grow periodically, shedding their chitinous exoskeleton. These exuviae rapidly disarticulate into its constituent parts, which are preserved in the superficial sediments of freshwater bodies. These remains can give considerable insight into past conditions of lakes and other large and ancient water bodies. Thus cladocerans are important ecological markers and significant in paleoecological studies.

In measuring the effects of industrial effluents and metallic poisons one of the widespread microcrustacean, *Daphnia* has long been employed and is particularly a suitable indicator in laboratory studies. The value of *Daphnia* is further supported by the fact that it is more susceptible to many poisons than any other larger and higher animals including fishes. Laboratory and field studies on other cladocerans like *Moina rectirostris* and *Simocephalus exspinosus* have confirmed the high sensitivity of this group of microcrustaceans to organophosphorus compounds. Cardiac mechanisms of cladocera provide a very sensitive physiological index for noting the effects of toxic materials.

SUMMARY

According to Sharma and Michael (1987) cladoceran fauna of India appears to be reasonably rich and diversified. As per their estimate 60 to 65 species are in tropical and subtropical water bodies in India and 15 to 20 species from altitudinal lakes and northern latitudes.

Out of 31 species of Cladocera inventorised during the present investigation 24 species have been recorded from various parts of Nilgiri Biosphere Reserve. Further, *Simocephalus exspinosus* and *Pleuroxus aduncus* have been recorded for the first time from southern India. While *Moina micrura* and *Daphnia carinata* are comparatively common, species like *Latanopsis australis*, *Ceriodaphnia laticaudata*, *Bosmina longirostris*, *Alona guttata*, *Leydigia australis* and *Biapertura karua* which are not common have been recorded during the present study.

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CENTIPEDES (CHILOPODA : SCOLOPENDRIDAE)

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INTRODUCTION

The centipedes are solitary, cryptic, nocturnal, cannibalistic, venomous Myriapods of diverse colours. They play a valuable role in the terrestrial ecosystem by devouring insect pests. Centipedes inhabit various habitats below stones, rotten barks, damp places and dry cowdung. Lewis (1973) noticed them in the deserted termite mounds.

With its semi-evergreen, evergreen and deciduous forests and diverse climatic conditions, NBR is natural home for a diverse fauna of centipedes.

Centipedes face a problem of water retention and hence avoid light and prefer optimum temperature below 35°C in humid crevices. The mother centipede exhibits immense parental care by holding eggs and embryos in a curled position below her belly. The life span of centipede varies from 1-6 years (Lewis 1973, Lawrence 1984).

Centipedes are widely distributed in the tropical, sub-tropical, temperate regions and oceanic islands. Genera like *Scolopendra*, *Cormocephalus* and *Otostigmus* are world-wide in their distribution. *Rhysida* and *Ethmostigmus* are known from America, Africa, Asia and Australia. The comparatively rare group *Scolopendra* (*Trachycormocephalus*) occurs in Ethiopian Africa, Caucasus, Middle East, Korea, Manchuria and Indo-Gangetic belt, while *Arthrorhabdus*, known from America, Africa and Australia, is rare in Asia. *Asanada*, an evolutionary divergent group, shows local homogeneity in India. It also occurs in Africa, the Oriental Region and Australia. Further, *Digitipes* of Congo inhabits Western Ghats, Maharashtra and South India

(Attems 1930; Jangi and Dass 1984, Lewis 1981 & Koch 1983.)

Being entomophagous, centipedes biologically control harmful insect pests like cockroaches, meal worms, larvae of butterflies and moths, termites and spiders, millipedes, etc. Similarity of the niches results in their association with arachnids and hence their presence is indicative of the related fauna.

Centipede bite is harmful to human beings, causing local swelling, oedema, irritation, inflammation and pain. It is like a bee-sting. The poison is an acidic liquid, which contains proteinase, esterase, serotonin, etc. Toxicological importance of these organisms is high, as there is no antidote so far developed against the centipede-bite. Ethology of the centipedes may prove rewarding for the soil Zoologists, Horticulturists and in Agriculture. Recent studies reveal that some species secrete HCN.

PREVIOUS SURVEYS

Information on the Scolopendrids of Nilgiri Biosphere Reserve is very scanty. Pocock (1892) noted *Heterostoma tristis* Meinert from Nilgiri hills. Attems (1930) systematically arranged and recorded *Ethmostigmus tristis* (Meinert), *E. coonooranus* Chamberlin and *Rhysida longipes simplicior* Chamberlin from Nilgiri district, Tamil Nadu. Further, Jangi & Dass (1984) discovered *Digitipes coonoorensis*, *D. gravelyi* and *D. indicus* from Palghat, Kerala. *Scolopendra amazonica* Bucherl was recorded from Palghat and Ootacamund, *Asanada sokotrana* (Pocock) from Palghat and *D. barnabasi* Jangi & Dass from Ootacamund.

In the present study the sub-family Otostigminae forms the dominant group in the well preserved, less explored Nilgiri Biosphere (Fig. 1). *S. morsitans* Linn. which occurs sympatrically with *S. amazonica* Bucherl could not be collected. *Otostigmus (O.) politus* (Karsch) is represented by a single specimen.

SYSTEMATIC ACCOUNT

(*Species collected and studied)

**Collection localities

Phylum	ARTHROPODA
Sub phylum	MYRIAPODA
Class	CHILOPODA
Sub class	EPIMORPHA
Order	SCOLOPENDROMORPHA
Family	SCOLOPENDRIDAE
Sub family	SCOLOPENDRINAE
Tribe	SCOLOPENDRINI

*1. *Scolopendra amazonica* Bucherl

Locality : Palghat : Agali**, Attakatti**, Tamil Nadu : Ootacamund,

Altitude : 450-2500 mtrs.

Habitat : Below stones in dry deciduous and semi-evergreen forests.

Status : Common.

External distribution : Peninsular India; South America; Africa; Australia.

Source : Jangi (1966); Jangi & Dass (1984); Khanna & Tripathi (1985); Ahmed (1980, 1983); Lewis (1968).

Remarks : One male was found having the tergites 19 & 20 with sclerotized border.

*2. *Cormocephalus* Sp.

Locality : Palghat; Attakatti**

Altitude : 450-1100 m.

Habitat : Below stones in the mixed to evergreen forests.

Status : Common.

Tribe ASANADINI

3. *Asanada sokotrana* (Pocock)

Locality : Kerala : Palghat Dt.

Altitude : 450-1100 m

Habitat : Below small stones,

Status : Locally common.

External distribution : Tamil Nadu : Coimbatore, Salem; Maharashtra; Africa.

Source : Jangi & Dass (1984), Lewis (1973).

Sub-family OTOSTIGMINAE

Tribe OTOSTIGMINI

*4. *Otostigmus (O.) politus* Karsch

Locality : Silent valley**

Altitude : 655-1100 m

Habitat : Tropical evergreen forests.

Status : Locally rare.

External distribution : Himachal Pradesh : Simla; Assam; West Bengal : Darjeeling; Orissa : Ganjam district; U.P. : Nainital, Pithoragarh; Sumatra; China; Myanmar (Burma); New Guinea; Australia.

Source : Gravely (1910), Jangi and Dass (1984), Khanna & Tripathi (1986).

Remarks :

*5. *Digitipes gravelyi* Jangi & Dass

Locality : Kerala : Palghat : Singapara, Muthikulam Rest house**

Altitude : 450-1100 m.

Habitat : Tropical evergreen forests.

Status : Restricted.

External distribution : Kerala.

Source : Jangi & Dass (1984).

6. *Digitipes indicus* Jangi & Dass

Locality : Palghat : Tyamway forest.

Altitude : 450-1100 m.

Habitat : Tropical rain forests.

Status : Locally common.

External distribution : Kerala : Trichur; Maharashtra.

Source : Jangi & Dass (1984).

7. *Digitipes coonoorensis* Jangi & Dass

Locality : Coonoor : 6 Kms N. of Rly. Stn.

Altitude : 1000 2500 m.

Habitat : Mixed to evergreen forests

Status : Locally common.

External distribution : Tamil Nadu : Madurai; Maharashtra.

Source : Jangi & Dass (1984).

*8. *Digitipes barnabasi* Jangi & Dass

Locality : Bandipur : Kadamthus, Katter*, Tamil Nadu : Ootacamund.

Altitude : 800-2500 m.

Habitat : Mixed deciduous forests.

Status : Locally common.

External distribution : Tamil Nadu : Kotagiri; Maharashtra.

Source : Jangi & Dass (1984).

Remarks : The specimen was of uniform bluish colour.

*9. *Digitipes* sp.

Locality : Palghat : Agali*.

Altitude : 450-1100 m.

Habitat : Tropical evergreen forests.

Status : Locally common.

Source : Jangi & Dass (1984).

10. *Ethmostigmus tristris* (Meinert)

Locality : Nilgiri hills.

Altitude : 2200-2400 m.

Habitat : Mixed to evergreen forests.

Status : Not recently recorded.

External distribution : Madras.

Source : Pocock (1892), Khanna & Kumar (1984).

11. *Ethmostigmus coonooranus* Chamberlin

Locality : Tamil Nadu : Nilgiri dist.

Altitude : 1000-1830 m.

Habitat : Mixed to evergreen forests.

Status : Restricted.

Source : Jangi & Dass (1984).

*12. *Ethmostigmus platycephalus platycephalus* (Newport)

Locality : Wynad : Kurichiyad*.

Altitude : 300 1500 m.

Habitat : Mixed deciduous forest.

Status : Locally common.

External distribution : Kerala : Malabar coast, Maharashtra.

Source : Jangi & Dass (1984).

Remarks : The spermatophore-like white mass was found attached to the coxopleura of a specimen collected in January 1991 from the buffer zone of B.T.R. and Mudumalai W.L.S.

*13. *Rhysida nuda subnuda* Jangi

Locality : Kerala : Malapuram : Nilambur, Vazhikadav*, Palghat : Dhonichappal*.

Altitude : 450-1800 m.

Habitat : Tropical evergreen to mixed deciduous forests.

Status : Common.

External distribution : Maharashtra :
Kolhapur, Pune, Nagpur.

Source : Jangi (1955).

Remarks : Length 70 mm.

*14. *Rhysida lithobioides trispinosus*

Jangi & Dass

Locality : Mudumalai : Jaydeve Avenue*.

Altitude : 1000 - 1100 m.

Habitat : Mixed to evergreen forests.

Status : Common.

External distribution : Tamil Nadu :
Trichirapalli, Salem; Karnataka : Kolar;
Maharashtra; Uttar Pradesh.

Source : Jangi & Dass (1984), Khanna &
Tripathi (1985).

Remarks : Length 65 mm.

*15. *Rhysida longipes longipes* (Newport)

Locality : Karnataka : Nagarhole National
Park, Peacock tank*.

Altitude : 800-850 m.

Habitat : Below stones.

Status : Common.

External distribution : Tamil Nadu; Karnataka;
Maharashtra; Goa; Madhya Pradesh; Uttar
Pradesh; West Bengal; Andaman & Nicobar
islands; Sri Lanka.

Source : Pocock (1892), Ahmed (1980, 83),
Jangi (1955), Jangi & Dass (1984), Khanna &
Tripathi (1985).

16. *Rhysida longipes simplicior* Chamberlin.

Locality : Tamil Nadu : Coonoor dist.

Altitude : 1000 - 1800 m.

Habitat : Mixed to evergreen forests.

Status : Comparatively rare.

External distribution : Tamil Nadu :
Coimbatore; Maharashtra.

Source : Attems (1930), Jangi & Dass (1984),
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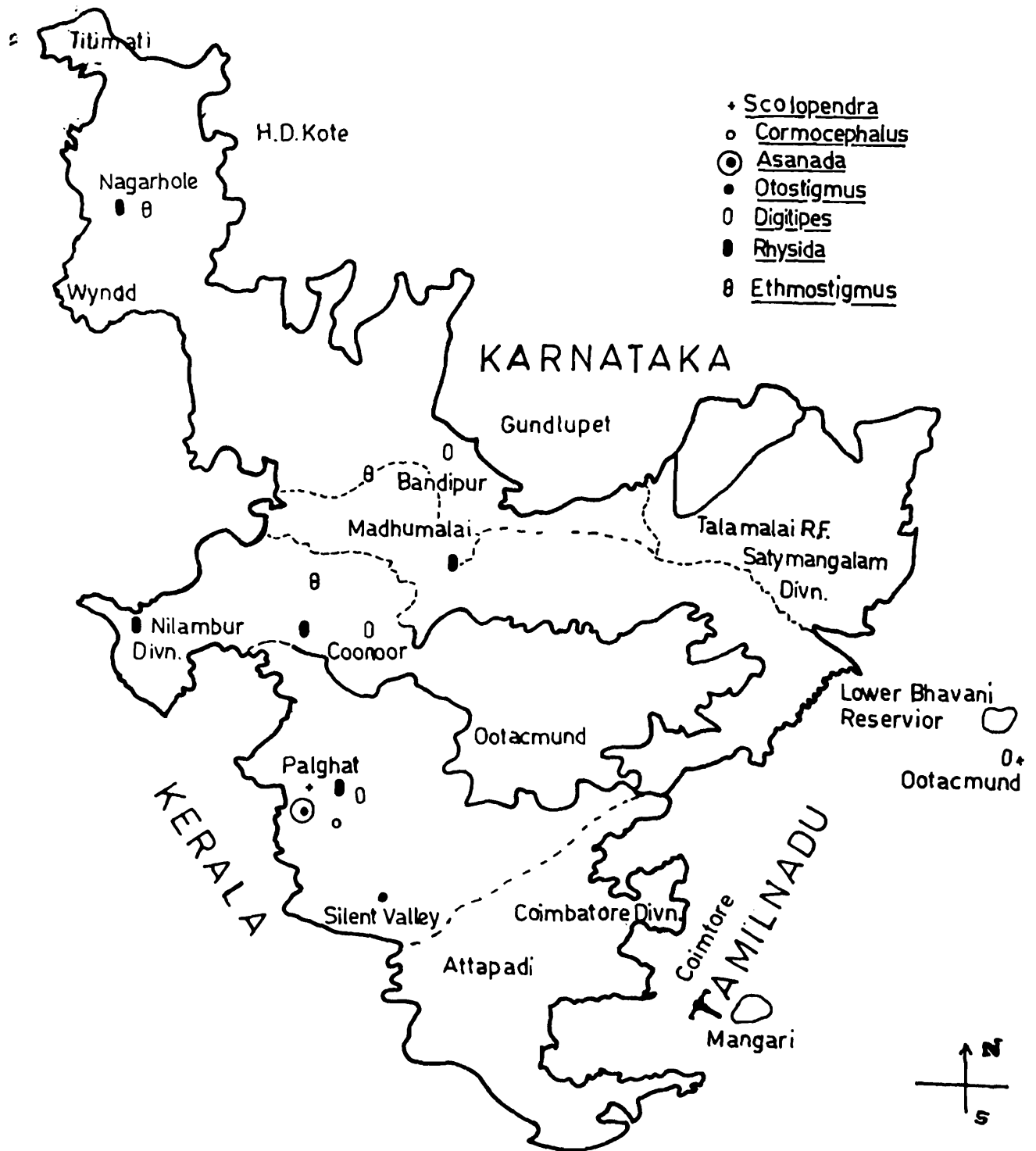


Fig. 1. The Centipede Genera occuring in NBR

MILLIPEDE (DIPLOPODA)

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INTRODUCTION

Millipedes are joint-footed, many segmented animals having double pairs of legs on each body segment. The body is divisible into the head and the trunk, the trunk segments are being formed by the fusion of two originally separate somites. Due to the presence of diplosegment these are grouped as the Class Diplopoda of the Phylum Arthropoda, though all the body segments are not always diplosegmented. The head bears only three pairs of appendages, namely antennae, mandibles and maxillae. The first post-cephalic segment forms a large collar behind the head and is devoid of any legs, while the second and fourth segments carry only a pair of legs. Body terminates in telson on which the arms open ventrally. The body coils when disturbed or exudes some odorous fluids for self defence. The exoskeleton is hard, strengthened by calcium salts.

Millipedes prefer damp, humid and shady places. Usually they are found beneath fallen leaves, stones, barks, rotten logs and in the soil. They show a wide choice of food preference. They are primarily herbivorous, mostly feed on decaying plant tissues, including leaf, litter, fungi, fruiting bodies and the excrement of herbivorous mammals. A large number of species also consume food of animal origin; some are obviously omnivores. Sexes are separate. They are oviparous.

Economically the millipedes are important both as friend and foe. A good number of millipedes are found in the agricultural fields, such as jute, cotton, banana, guava, etc. where they help in soil aeration, soil formation as well as humification of the soil. The millipedes play a prominent role in

the ecosystem and can be easily called as "Maerodegrader" Millipedes also damage a wide range of horticultural and field crops including beans, peas, cucumbers, cabbage, cereals, potatoes, sugarbeet, etc. Some millipedes are bioluminescent. The luminous material, Luciferin (an acid), in *Geophilus carpophagus* (Airth, Rhodes and MC Elroy, 1958) is a viscous fluid practically colourless with a characteristic fruity odour. This, in the presence of the enzyme luciferase is oxidised to form products plus light.

The atmospheric pollution as well as ground water, and soil pollution make the millipedes disappear from such habitats (Brade Birks, 1974).

Diplopoda have hitherto received comparatively less attention from scientists than other groups of arthropods. Our knowledge on the Indian forms of Millipedes are fragmentary and scattered. Achar (1981), Pocock (1892 and 1899), Silvestri (1917 and 1920), Carl (1932), Attems (1936), Krishnan (1968), Rangaswamy and Channabasavanna (1969), Swapna Bandyopadhyay and Mukhopadhyaya (1988) have recorded millipede species from different parts of India. So far only 162 species belonging to 59 genera, under 12 families are recorded from India. 41 species belonging to 16 genera under 5 families are reported in this inventory. Species represented in the collection of N.B.R. have been marked with asterisks.

SYSTEMATIC LIST

Phylum	ARTHROPODA
Super class	MYRIAPODA

- | | | | |
|-------------|---|-------|--|
| Class | DIPLOPODA | Genus | <i>Ootacodesmus</i> Carl |
| Subclass | CHILOGNATHA | *20. | <i>Ootacodesmus humilis</i> Carl |
| Super order | PENTAZONIA | Genus | <i>Pseudosphaeroparia</i> Carl |
| Order | SPHAEROTHERIIDA | *21. | <i>Pseudosphaeroparia palnensis</i> Carl |
| Family | SPHAEROTHERIIDAE | *22. | <i>Pseudosphaeroparia nilgirensis</i> Carl |
| Genus | <i>Arthrosphaera</i> | Genus | <i>Coonorophilus</i> Carl |
| *1. | <i>Arthrosphaera lutescens</i> (Butl.) | 23. | <i>Coonorophilus monstruosus</i> Carl |
| 2. | <i>Arthrosphaera heterosticta</i> (Newp.) | Genus | <i>Archandrodesmus</i> Carl |
| *3. | <i>Arthrosphaera thurstoni</i> (Poc.) | 24. | <i>Archandrodesmus tuberculatus</i> Carl |
| 4. | <i>Arthrosphaera carinata</i> (Attems) | 25. | <i>Archandrodesmus riparius</i> Carl |
| *5. | <i>Arthrosphaera davisoni</i> Pocock | Genus | <i>Pagodesmus</i> Carl |
| 6. | <i>Arthrosphaera fumosa</i> Pocock | 26. | <i>Pagodesmus biporus</i> Carl |
| *7. | <i>Arthrosphaera craspedota</i> Attems | 27. | <i>Pagodesmus sulcifer</i> Carl |
| Family | PARADOXOSOMATIDAE | Genus | <i>Akreiodesmus</i> Carl |
| Genus | <i>Strongylosomid</i> | 28. | <i>Akreiodesmus simulans</i> Carl |
| *8. | <i>Orthomorpha coonoorensis</i> Carl | 29. | <i>Akreiodesmus minutus</i> Carl |
| 9. | <i>Orthomorpha ursula</i> Attems | Genus | <i>Propyrgodesmus</i> Carl |
| *10. | <i>Orthomorpha dentata</i> Carl | *30. | <i>Propyrgodesmus frater</i> Carl |
| Genus | <i>Anoplodesmus</i> Pocock | 31. | <i>Klimakodesmus gravelyi</i> Carl |
| 11. | <i>Anoplodesmus athopus</i> Chamb | Genus | <i>Thyropygus</i> Pocock |
| 12. | <i>Anoplodesmus indus</i> Chamb | *32. | <i>Thyropygus poseidon</i> Attems |
| Genus | <i>Chondromorpha</i> Silv. | *33. | <i>Thyropygus cuisinierli</i> Carl |
| 13. | <i>Chondromorpha severini</i> Silv. | *34. | <i>Thyropygus induratus</i> Attems |
| *14. | <i>Chondromorpha severini</i> Robustior | Genus | <i>Ktenostreptus</i> Attems |
| Genus | <i>Paranedyopus</i> Carl | *35. | <i>Ktenostreptus debilis</i> Attems |
| 15. | <i>Paranedyopus subcylindricus</i> Carl | *36. | <i>Spirostreptus asthenes</i> Pocock |
| Genus | <i>Sundanina</i> Attems | 37. | <i>Spirostreptus caudiculatus</i> Karsch |
| *16. | <i>Sundanina bimontana</i> (Carl) | Genus | <i>Aulacobolus</i> Pocock |
| Genus | <i>Telodrepanum</i> Carl | *38. | <i>Aulacobolus levissimus</i> Attems |
| 17. | <i>Telodrepanum badaga</i> Carl | Genus | <i>Eucentrobolus</i> Pocock |
| Genus | <i>Xiphidiogonus</i> Carl | *39. | <i>Eucentrobolus maindroni</i> (Bouv.) |
| 18. | <i>Xiphidiogonus spinipleurus</i> Carl | *40. | <i>Eucentrobolus hamulus</i> Pocock |
| 19. | <i>Xiphidiogonus dravidus</i> Carl | 41. | <i>Trigoniulus uncopygus</i> Chamb |

SYSTEMATIC ACCOUNT

***1. *Arthrosphaera lutescens* (Butl.)**

Locality : Tamil Nadu : Nilgiri district : Western face of Western Ghats.

Altitude : 500 900m.

Habitat : Under the stones and dead barks.

Status : Common.

External distribution : Maddathoray, Kulattupuzha, Travancore.

Source : Attems (1936).

2. *Arthrosphaera heterosticta* (Newp.)

Locality : Maharashtra : Poona, Panchgani.

Altitude : 800 1000m.

Habitat : On the soil near rocks.

Status : Rare.

External distribution : South India.

Source : Pocock (1899).

***3. *Arthrosphaera thurstoni* Pocock**

Locality : Nilgiri dist: Nilgiri hills.

Altitude : 2500m.

Habitat : Under the stones and barks.

Status : Rare.

External distribution : South India.

Source : Pocock (1899).

4. *Arthrosphaera carinata* Attems

Locality : Kaddur district : Bababudan Hills.

Altitude : 1500 2500m.

Habitat : Under the stones.

Status : Rare.

External distribution : Jungle between Kemmangundi and Kalhattigiri, Karnataka : Mysore.

Source : Attems (1936).

***5. *Arthrosphaera davisoni* Pocock**

Locality : Tamil Nadu : Coimbatore district : Kunjapanai, Siruvani; Nilgiris : Mudumalai.

Altitude : 580 - 960m.

Habitat : Under the decayed barks.

Status : Common.

External distribution : Anamalai Hills, Madras.

Source : Pocock (1899).

Remarks : A widely distributed species in Indo-Australian region.

6. *Arthrosphaera fumosa* Pocock

Locality : Coimbatore district : Siruvani; Nilgiri : Mudumalai.

Altitude : 400-1100m.

Habitat : Under the stones.

Status : Rare.

External distribution : Coimbatore, Madras.

Source : Pocock (1899)

Remarks : Mostly occurs among vegetation.

***7. *Arthrosphaera craspedota* Attems**

Locality : Karnataka : Nagerhole National Park.

Altitude : 500-800m.

Habitat : Under the stones and dead barks.

Status : Common.

External distribution : Cochin, Kerala.

Source : Attems (1936).

Remarks : A widely distributed species in Kerala.

***8. *Orthomorpha coonoorensis* Carl.**

Locality : Nilgiri district: Coonoor, Kotagiri, Gudalur.

Altitude : 1000 1200m.

Habitat : In the crevices of the soil.

Status : Rare.

External distribution : South Indian Hills.

Source : Attems (1936).

Remarks : A species so far known from evergreen forest habitats of Kerala and Tamil Nadu.

9. *Orthomorpha ursula* Attems

Locality : Kaddur district : Kalhattigiri. Palghat : Silent Valley.

Altitude : 860-1000m.

Habitat : Under the stones and barks.

Status : Rare.

External distribution : India (Kerala, Karnataka).

Source : Attems (1936).

Remarks : Apparently endemic to Western Ghats.

*10. *Orthomorpha dentata* Carl.

Locality : Nilgiri district : Coonoor.

Altitude : 590-2300m.

Habitat : Under the rocks and stones.

Status : Common.

External distribution : India, Tamil Nadu.

Source : Attems (1936).

Remarks : Commonly seen in the forest.

11. *Anoplodesmus athopus* Chamb

Locality : Nilgiri district : Coonoor.

Altitude : 590-2300m.

Habitat : Under the decayed leaves.

Status : Rare.

External distribution : S. India.

Source : Attems (1936).

Remarks : Restricted to southern part of India.

12. *Anoplodesmus indus* Chamb

Locality : Nilgiri district: Coonoor.

Altitude : 600-2300m.

Habitat : Under the stones.

Status : Common.

External distribution : Nil.

Source : Attems (1936).

Remarks : This species has not been so far reported from outside Tamil Nadu.

*13. *Chondromorpha severini* Silv.

Locality : Coimbatore district : Tenmalai, Westernside of Western Ghats, Mettupalayam.

Altitude : 900-1200m.

Habitat : On the soil in the shady region.

Status : Common.

External distribution : Gokak, Belgaum district, Coromandel.

Source : Attems (1936).

Remarks : Widely distributed in India.

*14. *Chondromorpha severini* Robustior

Locality : Kaddur district; jungle between Kammangundi and Kalhattigiri.

Altitude : 1500-2000m.

Habitat : Under the decayed barks.

Status : Rare.

External distribution : Mysore.

Source : Attems (1936).

Remarks : Widely distributed in Mysore.

15. *Paranedyopus subcylindricus* Carl

Locality : Nilgiri district : Nilgiris.

Altitude : 800-1500m.

Habitat : Under the decayed barks.

Status : Common.

External distribution : South India, Palanis, Kukkal.

Source : Attems (1936).

Remarks : Most common in elevated parts in South India.

***16. *Sundanina bimontana* (Carl)**

Locality : Nilgiri district: Kartery Valley near Coonoor 1600 m.

Altitude : 1600m.

Habitat : Under the stones and barks.

Status : Rare.

External distribution : South India, Anamalai, Valparai.

Source : Attems (1936).

Remarks : Species known from evergreen forests of these areas.

17. *Teledrepanum badaga* Carl

Locality : Nilgiri district: Kotagiri.

Altitude : 1000-1200m.

Habitat : Under the decayed leaves and barks.

Status : Rare.

External distribution : South India.

Source : Carl (1932).

Remarks : Restricted to this area.

18. *Xiphidiogonus spinipleurus* Carl

Locality : Coimbatore dist. : Mangari.

Altitude : 640 m.

Habitat : Under the barks and stones.

Status : Rare.

External distribution : South India, Palanis, Shola near Kodaikanal, Mariyanshola and Vandaravu.

Source : Carl (1932).

Remarks : Recorded from Eastern Ghats.

19. *Xiphidiogonus dravidus* Carl

Locality : Palghat : Silent Valley.

Altitude : 870-950 m.

Habitat : Under the decayed leaves and barks.

Status : Rare.

External distribution : South India, North Travancore, Upper Vatavadai Valley, between Anamalais and Palanis.

Remarks : Restricted to the valleys.

***20. *Ootacodesmus humilis* Carl**

Locality : Nilgiri district: Dodabetta Reserved Forest.

Altitude : 2500m.

Habitat : Under the stones.

Status : Common.

External distribution : South India.

Remarks : Restricted to Western Ghats.

***21. *Pseudosphaeroparia palnensis* Carl**

Locality : Palghat : Vattavadai valley.

Altitude : 1850m.

Habitat : Under the decayed leaves.

Status : Common.

External distribution : South India : Upper Palanis, Shola near Kodaikanal, Shola near Pumbarai.

Source : Carl (1932).

Remarks : Commonly seen in the above mentioned places.

***22. *Pseudosphaeroparia nilgirensis* Carl**

Locality : Nilgiri district : Coonoor. Dodabetta Reserved Forest.

Altitude : 1600-2400m.

Habitat : Under the decayed leaves and barks.

Status : Rare.

External distribution : Nil.

Source : Carl (1932).

Remarks : Endemic to Western Ghats.

23. *Coonorohilus monstruosus* Carl

Locality : Nilgiri district : Jungle near Coonoor.

Altitude : 1500-2400m.

Habitat : On the soil.

Status : Common.

External distribution : Nilgiris, Dodabetta Reserved Forest, Avalanche.

Source : Carl (1932).

Remarks : Endemic to Western Ghats.

24. *Archandrosesmus tuberculatus* Carl

Locality : Nilgiri district : Coonoor, Kareri valley.

Altitude : 1000-2400 m.

Habitat : Under the decayed leaves and stones.

Status : Common.

External distribution : Dodabetta Reserve Forest, Elk-Hill Reserved Forest.

Source : Attems (1936).

Remarks : Endemic to Western Ghats.

25. *Archandrosesmus riparius* Carl

Locality : Nilgiri district, Nilgiris hills, Mudumalai.

Altitude : 1000 m.

Habitat : Under the stones and rotten wood.

Status : Rare.

External distribution : South India.

Remarks : This species has not been so far reported from outside Tamil Nadu.

26. *Pagodesmus biporus* Carl

Locality : N.B.R. : Kerala Part.

Altitude : 2350 m.

Habitat : Under the logs.

Status : Rare.

External distribution : South India, Palanis, Vandaravu Shola, Maryian Shola, Pumbarai Shola, Vattavadai Valley between Palani and Anamalai.

Source : Attems (1936).

Remarks : Common in hilly regions.

27. *Pagodesmus sulcifer* Carl

Locality : Nilgiri district: Coonoor.

Altitude : 1500 m.

Habitat : Under the stones and barks.

Status : Common.

External distribution : South India.

Source : Attems (1936).

Remarks : Restricted to hilly regions.

28. *Akreiodesmus simulans* Carl

Locality : Nilgiri district: Coonoor.

Altitude : 1700 m.

Habitat : Under the stones and barks.

Status : Rare.

External distribution : South India, Lower Palanis Maryland.

Source : Attems (1936).

Remarks : Recorded from Eastern Ghats also.

29. *Akreiodesmus minutus* Carl

Locality : Nilgiri district; Coonoor.

Altitude : 1700 m.

Habitat : In the bushy plants.

Status : Rare.

External distribution : Nil.

Source : Attems (1936).

Remarks : Endemic to Western Ghats.

***30. *Propyrgodesmus frater* Carl**

Locality : Nilgiri district : Coonoor, Lady Cunnings.

Altitude : 1700 m.

Habitat : Under the rocks and stones.

Status : Rare.

External distribution : Nil.

Source : Attems (1936).

Remarks : Endemic to Coonoor.

31. *Klimakodesmus graveliji* Carl

Locality : Nilgiri district; Forests near Coonoor.

Altitude : 1600 m.

Habitat : In the Forest soil.

Status : Rare.

External distribution : South India, Mudumalai.

Source : Attems (1936).

Remarks : Common in the hilly regions.

***32. *Thyropygus poseidon* Attems**

Locality : Nilgiri district: Kotagiri.

Altitude : 1400 m.

Habitat : Under the stones and logs.

Status : Locally common.

External distribution : South India, Madras.

Source : Attems (1936).

***33. *Thyropygus cuisinieri* Carl**

Locality : Nilgiri District : Mudumalai.

Altitude : 1000-1800 m.

Habitat : Under the decayed leaves and wood.

Status : Rare.

External distribution : Cochin, Kerala.

Source : Attems (1936).

***34. *Thyropygus induratus* Attems**

Locality : Karnataka : Nagerhole National Park.

Altitude : 500-800 m.

Habitat : Under rotting wood.

Status : Locally common.

External distribution : Nilgiris, Mudumalai.

Source : Attems 1936.

Remarks : Common in Nilgiris.

***35. *Ktenostreptus debilis* Attems**

Locality : Nilgiri district; Nilgiri hills.

Altitude : 1700 m.

Habitat : Under rotten wood,

Status : Rare.

External distribution : South India, Benhope.

Source : Attems (1936).

Remarks : Recorded from NBR by Attems in 1936.

***36. *Spirostreptus asthenes* Pocock**

Locality : Nilgiri district; Nilgiri hills, Mudumalai hills.

Altitude : 1000-1800 m.

Habitat : Under rotten wood.

Status : Common.

External distribution : South India, Madras.

Source : Attems (1936).

Remarks : Common in Tamil Nadu.

37. *Spirostreptus caudiculatus* Karsch

Locality : Coimbatore : Siruvani; Nilgiris : Kotagiri.

Altitude : 400-1000 m.

Habitat : Under the rocks and stones.

Status : Locally common.

External distribution : S. India, Madras.

Source : Attems (1936).

Remarks : Not so far reported from outside Tamil Nadu.

***38. *Aulacobolus levissimus* Attems**

Locality : Nilgiri district : Nilgiris.

Altitude : 500-1200 m.

Habitat : Under the barks.

Status : Common.

External distribution : Nil.

Source : Attems (1936).

Remarks : Endemic to Nilgiris.

***39. *Eucentrobolus maindroni* (Bouv.)**

Locality : Nilgiri district : Western ghats.

Altitude : 800-1200 m.

Habitat : Under the rotten wood.

Status : Rare.

External distribution : Nil.

Source : Attems (1936).

Remarks : Endemic to Western Ghats.

40. *Eucentrobolus hamulus* Pocock

Locality : Nilgiri district : Nilgiris, Trivandrum.

Altitude : 1500 m.

Habitat : Under the logs.

Status : Rare.

External distribution : South India, Tinnevely; Travancore.

Source : Attems (1936).

Remarks : This species is recorded also from Eastern Ghats.

41. *Trigoniulus uncopygus* Chamb

Locality : Nilgiri district, Nilgiris, Coonoor.

Altitude : 1200-1500 m.

Habitat : Under the rotten wood.

Status : Rare.

External distribution : Nil.

Source : Attems (1936).

Remarks : Restricted to Nilgiris.

SUMMARY

Out of the 41 species of millipedes recorded from Nilgiri Biosphere Reserve, nine are endemic.

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SCORPION

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INTRODUCTION

Scorpions comprise a diverse and highly successful order of Arachnids. They are the oldest known terrestrial metazoans, occurring in Silurian fossils. With all the evolutionary changes in the terrestrial environment it is remarkable that scorpions have changed little in basic external morphology over geological times.

The scorpion body is divided into a prosoma covered by an unsegmented carapace, a broad mesosoma consisting of seven segments, a narrow tail-like metasoma consisting of five sclerites and a telson modified into a stinging apparatus. The body is protected by a sclerotized exoskeleton which efficiently retards water loss and set with a variety of sensory setae and other sophisticated sensillae. Scorpions are adapted for surviving long periods, between feeding. Females are viviparous and show maternal association with the young.

Scorpions occupy a great range of habitats than is generally recognised. They are the most abundant and diverse in arid environments of lower temperate latitudes. There are reports of its occurrence on littoral rock and rock slides, burrows in soil, rock crevices and cracks, vegetation, under stones, barks of trees, surface debris and cattle dung. Some scorpions are adapted for cave existence.

Scorpions are venomous Arachnids which comprise the order Scorpionida. Scorpions are found all over the world except in very cold northern countries. Scorpions in general are strictly nocturnal in habits.

Order Scorpiones under Class Arachnida is composed of 9 living families of which five are

represented in the Indian subcontinent. It is estimated (Stahnke, 1974) that there are about 1500 described living species under 112 recognised genera (Williams, 1987). Pocock (1900) compiled all previous works on Indian scorpions. Tikader (1973) published a list of scorpions of the Deccan Peninsula. Couzijn 1981 made significant contributions to Indian scorpions by revising the genus *Heterometrus* of the family Scorpionidae. Tikader and Bastawade (1983) made a valuable publication on the group.

SOCIO-ECONOMIC ASPECTS

Scorpions are potentially attractive prey, by their large body size, rich nutrient content, abundant populations, wide distribution, relative lack of defence and predictable surface behaviour. At least 124 vertebrates and 26 invertebrates prey on scorpions (Williams, 1987). Some of these predators protect themselves from scorpion sting by removing the telson at the time of capture.

SYSTEMATIC LIST

(*Species collected and studied)

Phylum	ARTHROPODA
Superclass	CHELICERATA
Class	ARACHNIDA
Order	SCORPIONIDA
Family	BUTHIDAE
Sub Family	BUTHINAE

*1. *Lychas (Endotrichus) tricarinatus* Simon

*2. *Mesobuthus tamulus tamulus* (Fab.)

- *3. *Mesobuthus hendersoni* (Pocock)
Sub Family CENTRURINAE
- *4. *Isometrus (Closotrichus) sankeriensis*
(Tikader & Bastawade)
- *5. *Isometrus (Reddyanus) thrustoni* Pocock
Family ISCHNURIDAE
- *6. *Iomachus laeviceps laeviceps* Pocock
7. *Iomachus punctulatus* Pocock
Family SCORPIONIDAE
Sub Family SCORPIONINAE
- *8. *Heterometrus (Heterometrus) keralensis*
(Tikader & Bastawade)
- *9. *Heterometrus (Heterometrus) malapuramensis* (Tikader & Bastawade)
- *10. *Heterometrus (Gigantometrus) swammerdami* (Simon)
- *11. *Heterometrus (Srilankametrus) gravimanus* (Pocock)
12. *Heterometrus (Chersonesometrus) collinus* Pocock
13. *Heterometrus (Chersonesometrus) palekomanus* Couzijn

SYSTEMATIC ACCOUNT

1. **Lychas (Endotrichus) tricarinatus* (Simon)
Locality : Kerala : Wynaad : Kuppadi; Palghat; Tamil Nadu : Anamooli, Nellipathi, Nilgiri, Mudumalai, Doddahatti, Coimbatore, Kunjapani, Kinnakovai, Kovai Coutralam.
Altitude : 400 to 1100 m.
Habitat : Found under stones and rocks.
Status : Common in plains and lower altitudes.
External distribution : India : Bhopal, Belgaum, Mangalore, Kannara, Trivandrum, Nellore, Tanjore, Yercaud.
Source : Tikader and Bastawade (1983).
Remarks : Most common *Lychas* species of South India.

2. **Mesobuthus tamulus tamulus* (Fabricius)

Locality : Coimbatore : Vannanthurai.

Altitude : 590 m.

Habitat : Found under stones.

Status : Not very common.

External distribution : India : Nasik, Dhule, Nanded, Bhir, Aurangabad, Bombay, Poona, Ahmadnagar, Sholapur, Satara, Sangli, Kohlapur, Hyderabad, Bhavani Town.

Source : Tikader & Bastawade (1983).

Remarks : New record from NBR.

3. **Mesobuthus hendersoni* (Pocock)

Locality : Tamil Nadu, Coimbatore : Vannanthurai, Oddanthurai, Kunjapanai; Nilgiri: Mudumalai, Peddikutta.

Altitude : 400 m to 800 m.

Habitat : Found under rocks in the plains and forests.

Status : Common in S. India.

External Distribution : India : Cuddapah, Yercaud, Trichirapally, Tanjore and Madras.

Source : Tikader & Bastawade (1983).

Remarks : New record from NBR.

4. **Isometrus (Closotrichus) sankeriensis*
(Tikader & Bastawade)

Locality : Karnataka : Mysore Dist : Nagarhole National Park; Kerala : Wynaad Dist.: Kattikulam.

Altitude : 500 m to 850 m.

Habitat : Found under forest litter and rocks.

Status : Rare.

External distribution : India : Sankeri, Karwar, Karnataka.

Source : Tikader & Bastawade (1983).

Remarks : New record from Wynaad and Nagarhole National Park. Thus the distribution of this species is extended to lower and upper localities of NBR.

5. *Isometrus (Reddyanus) thrustoni* Pocock

Locality : Tamil Nadu : Nilgiri : Coonoor.

Altitude : 1500 m.

Habitat : Found under forest litters and rocks.

Status : Rare.

External distribution : India : Bhopal, Kolhapur, Belgaum, Cuddapah, Yercaud in Shevaroy hills, Trichinopoly and Tirunelvely.

Source : Tikader & Bastawade (1983).

***6. *Iomachus laeviceps laeviceps* Pocock**

Locality : Tamil Nadu : Periyar : Hassanur; Coimbatore : Kunjapanai; Nilgiri; Nilgiri hills.

Altitude : 500 m to 2100 m.

Habitat : Under stones near rivers or water bodies at higher altitudes.

Status : Common in S. India at higher altitude.

External distribution : India : Yercaud in Shevaroy hills.

Source : Tikader & Bastawade (1983).

Remarks : Endemic to Peninsular India. So far known only from Yercaud in Shevaroy hills and Nilgiri hills in Tamil Nadu & Kerala.

7. *Iomachus punctulatus* Pocock

Locality : Tamil Nadu : Nilgiri hills; Coimbatore.

Altitude : 1200 m.

Habitat : Under stones and rocks at higher altitudes.

Status : Rare.

External distribution : India : Anamalai hills, Coimbatore, Nilgiri hills, Madras.

Source : Tikader & Bastawade (1983).

Remarks : Endemic to S. India.

***8. *Heterometrus (Heterometrus) keralensis* Tikader & Bastawade.**

Locality : Kerala : Palghat : Meenumutty; New Amarambalam.

Altitude : 1000 m.

Habitat : Found under stones in higher altitudes.

Status : Rare.

External distribution : Nil.

Source : Tikader & Bastawade (1983).

Remarks : There was no report of this species subsequent to its original report by Tikader & Bastawade in 1983. Endemic to NBR.

***9. *Heterometrus (Heterometrus) malapuramensis* Tikader & Bastawade**

Locality : Karnataka : Mysore : Nagarhole National Park; Kerala : Palghat : Korma Dohney; Tamil Nadu : Coimbatore : Kunjapani; Nilgiri; Mudumalai; Periyar : Hassanur.

Altitude : 500 m to 1200 m.

Habitat : Occurs in forest areas.

Status : Not every common.

External distribution : India : Kerala : Malapuram, Poonur estate, Kozhikode dist.

Remarks : By the present collection, distribution of this species is extended to the upper portions of NBR.

***10. *Heterometrus (Gigantometrus) swammerdami* Simon.**

Locality : Nilgiri : Annur.

Altitude : 1200 m.

Habitat : Under forest litters.

Status : Rare.

External distribution : India : Satar, Nagpur, Dehra Dun, Dharwar, Ramnad, Tanjore, Burdwan, Midnapore. Sri Lanka : Trincomali and Chilan.

Remarks : New record from NBR.

***11. *Heterometrus (Srilankametrus) gravimanus* (Pocock)**

Locality : Palghat : Sayivala, New Amarambalam.

Status : Rare.

External distribution : India : Thanjavur; Sri Lanka.

Source : Tikader and Bastawade (1983).

Remarks : New record from NBR.

12. *Heterometrus (Chersonesometrus) collinus* Pocock

Locality : Tamil Nadu : Nilgiri : Nilgiri hills.

Status : Rare.

External distribution : Nil.

Source : Tikader & Bastawade (1983).

Remarks : Endemic to NBR.

13. *Heterometrus (Chersonesometrus) palekomanus* Couzijn

Locality : Tamil Nadu : Nilgiri : Nilgiri hills.

Status : Not very common.

External distribution : India : Mysore, Bangalore, Tirupathi and near Bombay.

SUMMARY

Of the 102 species and subspecies of scorpions known from India, 33 are reported from Deccan, of which 27 are endemic. But only 9 species were reported from the areas under Nilgiri Biosphere Reserve (Tikader & Bastawade, 1983). The present collections yielded four species viz., *Mesobuthus tamulus tamulus* (Fab.), *Mesobuthus hendersoni* (Pocock), *Heterometrus (Gigantometrus) swammerdami* Simon and *Heterometrus (Srilankametrus) gravimanus* (Pocock) so far not reported from NBR. The distributional range of *Heterometrus (Heterometrus) malapuramensis* Tikader and Bastawade has been extended to upper parts of NBR and likewise that of *Isometrus (Closotrichus) sankeriensis* Tikader and Bastawade has been extended to upper and lower localities of NBR by the present collections.

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INSECTA : ORTHOPTERA

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INTRODUCTION

Order Orthoptera includes the insects popularly known as grasshoppers, crickets and locusts. These insects are of moderate to large size. They are always provided with strong mandibles and are generally vegetable feeders. The fore wings are thick and are known as tegmina, while the hind wings are membranous. The antennae are either short i.e. having less than 30 segments (short horned grasshoppers); or long i.e. more than 30 segments (long horned grasshoppers). The hind legs are strongly developed and used for leaping. The hind femora are much thickened.

Females are generally with well developed ovipositor, not concealed by 7th or 8th abdominal sternite. Male external genitalia symmetrical, concealed at rest. Cerci usually short and unsegmented. Specialized auditory and stridulatory organs frequently developed.

Grasshoppers occur throughout the world, mainly in open grasslands, where they eat leafy vegetation. Pigment in and under the cuticle provides a protective colouration by which grasshoppers resemble their environment.

An inventory of the Orthoptera species recorded earlier from Nilgiri Biosphere Reserve and its environs has been prepared, mainly through the work of Kirby (1914). Taxonomic arrangement of the group is followed after Uvarov (1966) for Acridoidea; Kevan, *et. al.* (1964) for Pyrgomorpha and Beier (1962, 1966) for Tettigonoidea. The species recorded by Hebard (1929), Henry (1940), Kevan (1952, 1964), Singh and Kevan (1965) and Shishodia and Hazra (1986) have also been included.

A total of 37 species of Orthoptera could be inventoried here which are distributed under 3 families and 34 genera. The species marked by an asterisk (*) are collected during the present survey. We believe that there may still be a large number of species of Orthoptera in the Nilgiri Biosphere Reserve which have not been collected during the surveys. Distribution of the species treated here also indicates external distribution.

SYSTEMATIC ACCOUNT

(*Species collected and studied)

Order	ORTHOPTERA
Super family	ACRIDOIDEA
Family	ACRIDIDAE
Sub family	ACRIDINAE

*1. *Acrida exaltata* (Walker)

Locality : Mudumalai Wild Life Sanctuary.

Distribution : India : Arunachal Pradesh, Bihar, Goa, Himachal Pradesh, Jammu & Kashmir, Kerala, Madhya Pradesh, Orissa, Rajasthan, Tamil Nadu and West Bengal. Afghanistan, Arabia, Bangladesh, Iran, Pakistan, S.E. Persia, S.E. Tibet, Sri Lanka, W. Aden, Yemen.

*2. *Phlaeoba infumata* Brunner

Locality : Kalkeri.

Distribution : India : Arunachal Pradesh, Bihar, Delhi, Himachal Pradesh, Madhya Pradesh, Meghalaya, Orissa, Rajasthan, West Bengal, Bangladesh, Myanmar, Hainan, Kuangtung,

Kwangsi, Malacca, South China, Tenasserim and Yunnan.

3. *Zygophlaeoba collina* Uvarov.

Distribution : India : Tamil Nadu Nilgiris - Elk hill, 2400 m.

4. *Paraduronia carinata* (Bolivar)

Distribution : India : Tamil Nadu (Anamalai, Upper Plains, Madurai).

Sub family GOMPHOCERINAE

*5. *Leva cruciata* Bolivar

Locality : Molehole Forest Range.

Distribution : India : Bihar, Karnataka, Orissa, Tamil Nadu, West Bengal, Sri Lanka.

6. *Bababuddinia bizonata* Bolivar.

Distribution : India : Karnataka, Tamil Nadu (Attakatti, Gudalur, Mudumalai).

7. *Madurea cephalotes* Bolivar.

Distribution : India : Tamil Nadu (Madurai, Anamalai, Donavur, Nilgiri, Tirunelveli).

Sub family OEDIPODINAE

8. *Aiolopus thalassinus tamulus* (Fabricius)

Distribution : Throughout India; Cosmopolitan in Asia and Australia.

*9. *Gastrimargus africanus africanus* (Thunberg)

Locality : Nagarsa Waterhole.

10. *Pternoscirta cinctifemur* (Walker)

Distribution : India : Meghalaya (Khasi Hills), Tamil Nadu (Lower Palni, Nilgiris, Shevaroy), West Bengal; E. Nepal; Sri Lanka.

*11. *Oedaleus abruptus* (Thunberg)

Locality : Bandipur Tiger Reserve.

Distribution : India : Andhra Pradesh, Bihar, Goa, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Orissa, Pondicherry, Rajasthan, Uttar Pradesh, Tamil Nadu, West Bengal; Bangladesh; Burma; China; Indo-China; E. Nepal; Pakistan; Sri Lanka; Taiwan, Vietnam.

*12. *Trilophidia annulata* (Thunberg)

Locality : Bandipur Tiger Reserve.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Bihar, Goa, Karnataka, Kerala, Himachal Pradesh, Madhya Pradesh, Orissa, Rajasthan, Tamilnadu, Uttar Pradesh; Bangladesh; Borneo; Myanmar; Hongkong; Japan; Java; Korea; Malaya; Mongolia; Pakistan; Philippines; Sarawak; Singapore; Sri Lanka; Sumatra; Taiwan.

Sub Family HEMIACRIDINAE

*13. *Spathosternum prasiniferum prasiniferum* (Walker)

Locality : Nagarhole National Park, Bandipur Tiger Reserve.

Distribution : India : Arunachal Pradesh, Bihar, Goa, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan; Myanmar; S.E. China; Thailand; Vietnam.

Sub family OXYINAE

*14. *Oxya hyla hyla* Serville.

Locality : Mudumalai Wildlife Sanctuary.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Goa, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Meghalaya, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal; Afghanistan; Africa; Bangladesh; Nepal; Pakistan; Persia and Sri Lanka.

***15. *Oxya fuscovittata* (Marshall)**

Locality : Mudumalai Wildlife Sanctuary.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Bihar, Goa, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh; Afghanistan; Pakistan; U.S.S.R. (South West).

16. *Chitaura indica* Uvarov.

Distribution : India : Karnataka (Coorg, Sidapur 3000 ft.; Ebenda 3000 ft.), Tamil Nadu (Gudalur, Wynaad, 4000 ft.; Mudumalai 1000 m.).

Sub family COPTACRIDINAE

17. *Coptacra ensifera* Bolivar

Distribution : India : Karnataka (Belgaum), Kerala (Silent Valley), Tamil Nadu (Madurai).

18. *Coptacra punctaria* (Walker)

Distribution : India : Kerala (Silent Valley along Kuntipuzha), Tamil Nadu (Coonoor).

19. *Eucoptacra binghami* Uvarov.

Distribution : India : Kerala (1 Km. from Mukkali towards dam site); Burma; Malaysia; Thailand; Tonkin.

Sub family TROPIDOPOLINAE

20. *Calamippa prasina* (Bolivar)

Distribution : India : Kerala (Silent Valley), Tamil Nadu.

21. *Oxyrrhepes obtusa* (De Hann)

Distribution : India : Karnataka, Kerala (Valiyaparathodu, Silent Valley), Madhya Pradesh, Rajasthan, Sikkim, Tamil Nadu; Burma; Ceram; China; Vietnam; Gilolo Island; Lombok; Sri Lanka; Sulawesi; Taiwan; Palawan.

Sub family EYPREPOCNEMIDINAE

22. *Eyprepocnemis alacris alacris* (Serville)

Distribution : India : Andhra Pradesh, Bihar, Goa, Kerala (Road to Mukkali), Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh; Afghanistan; Pakistan; E. Persia; Sri Lanka.

Sub family CATANTOPINAE

***23. *Xenocatantops humilis* (Serville)**

Locality : Nilgiri Biosphere Reserve.

Distribution : India : Arunachal Pradesh, Assam, Andaman Island, Bihar, Kerala, Madhya Pradesh, Meghalaya, Tamil Nadu, West Bengal; Bangladesh; Burma; Borneo; Vietnam; Java; Lombok; Malaya; New Guinea; Philippines; Sumatra; Sri Lanka; Thailand; Tibet; Yunnan.

Sub family CYRTACANTHACRIDINAE

***24. *Cyrtacanthacris tatarica* (Linnaeus)**

Locality : Kerala : Silent Valley.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Bihar, Himachal Pradesh, Haryana, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Orissa, Rajasthan, Tripura, Uttar Pradesh, West Bengal; Africa except North Africa & Sahara; Arabia; Bangladesh; Central America; Hainan; Madagascar; Mediterranean Region; Nepal; Pakistan; Philippines; Seychelles; S. W. Asia; Sri Lanka; Sumatra; Thailand; Western Asia.

***25. *Patanga succincta* (Johansson)**

Locality : Nagarhole National Park, Nilgiri Biosphere Reserve.

Distribution : India : Arunachal Pradesh, Delhi, Goa, Himachal Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal; Burma; China; Hainan Island; Japan; S.E. Asia; South Arabian desert; Sri Lanka; Taiwan.

26. *Nilgiracris raoi* (Kevan)

Distribution : India : Tamil Nadu : Nilgiris : Dodabetta, 8640 ft., Snowdon Peak, 8000 ft., Elk Hill, 7-8000 ft., Ooty; Somerdale.

27. *Orthacris (Pseudorthacris) incongruens* Carl.

Distribution : India : Tamil Nadu : Nilgiri Hills, 1500-6000 ft.; Gudalur, Burliyar, Coonoor, Chant, Kotagiri & Hill Grove.

*28. *Poikilocerus pictus* (Fabricius)

Locality : Attapadi Valley.

Distribution : India : Andhra Pradesh, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, West Bengal; Pakistan.

*29. *Atractomorpha crenulata crenulata* (Fabricius)

Locality : Mudumalai, Wild Life Sanctuary.

Distribution : India : Andhra Pradesh, Andaman Islands, Arunachal Pradesh, Assam, Bihar, Delhi, Goa, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal; Bangladesh; Myanmar; Malaya; Pakistan; Sri Lanka; Sumatra; Thailand.

Family TETRIGIDAE

Sub family SCELIMENINAE

30. *Gavialidium carli* Hebard

Distribution : India : Tamil Nadu (Gudalur, Nilgiris).

31. *Criotettix latifrons* Hebard.

Distribution : India : Andhra Pradesh, Tamil Nadu, Mudumalai, Coimbatore.

32. *Eucriotettix exsertus* (Bolivar)

Distribution : India : Karnataka (Attakatti), Tamil Nadu (Kodaikanal, Shevaroy, Coonoor, below kukkal Palnis).

33. *Eucriotettix maculatus* (Kirby)

Distribution : India : Karnataka (Sidapur), Tamil Nadu (Mudumalai, Shembaganur, Gudalur); Burma.

Sub family TETRIGINAE

*34. *Paratettix cingalensis* (Walker).

Locality : Nilgiri Biosphere Reserve, Bandipur Tiger Reserve.

Distribution : India : Tamilnadu.

Family TETTIGONIIDAE

Sub family PHANEROPTERINAE

*35. *Lentana inflata* (Brunner).

Locality : Mudumalai Wild Life Sanctuary.

Distribution : India : South India (Tamil Nadu); Sri Lanka.

Sub family MECOPODINAE

*36. *Mecopoda elongata* (Linne)

Locality : Mudumalai Wild Life Sanctuary.

Sub family LISTROSCELIDINAE

*37. *Euhexacentrus annulicornis* (Stål)

Locality : Mudumalai Wild Life Sanctuary.

Distribution : India; Philippine Islands.

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INSECTA : GRYLLOIDEA

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INTRODUCTION

The superfamily Grylloidea includes crickets, mole-crickets etc. These insects are essentially characterized by long, slender antennae, large ovipositor, auditory organs placed in the anterior tibiae and a large part of male tegmen transformed into a stridulatory organ. The body size ranges from moderately large (approximately 6 cm) to very small (adults are 2 mm, without appendages), and is coloured black, brown, yellowish, gray, or green. The majority of crickets are found in tropical, though a fairly large number occur in temperate regions throughout the world. However, they do not occupy very high altitudes. They are found in all terrestrial environment from desert and savannas to bogs and swamps, some even being subaquatic and from subterranean burrows and caves to tree tops. Some species are associated with ants, termites etc. Crickets are omnivorous but some are more inclined to a plant or insect diet than others. A number of species are crop pests and, under certain circumstances, population increases suddenly and causes considerable damage not only to foodstuffs but also to furnishings.

The Grylloidea is divided into 2 families Gryllotalpidae (not discussed here), and Gryllidae. The Gryllidae is again divided into 14 subfamilies of which 9 are discussed here. About 325 genera and more than 2,300 species of Gryllidae are recorded from the world (Kevan, 1982), of which 64 genera and 225 species are known from India.

The present paper deals with 45 species from the Nilgiri Biosphere Reserve (NBR), which are distributed under 30 genera and 9 subfamilies.

Oecanthus henryi is recorded here for the first time from India.

SYSTEMATIC ACCOUNT

(*Species collected and Studied)

Order	ORTHOPTERA
Superfamily	Grylloidea
Family	GRYLLIDAE
Subfamily	Gryllinae

1. **Brachytrupes* sp.

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 1050 m, Abhayaranyam Forest Rest House.

Habitat : Nocturnal, and lives in deep burrows, extending even more than a metre in length. It produces sound of high intensity during night.

External Distribution : The genus is distributed in India, in Karnataka, Tamilnadu, Orissa, West Bengal, Bihar, Uttar Pradesh, and Assam; and also in Sicily; Arabia; Africa; Pakistan; Bangladesh; Myanmar; Malaysia and Sri Lanka.

Status : The identity of the species could not be established, hence the distribution of the genus is given.

2. **Gymnogryllus humeralis* (Walker)

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 1050 m, Game Hut & Vicinity.

Habitat : Polyphagous and attacking *Casuarina* seedlings.

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External Distribution : India : U.P. : Maharashtra, Karnataka, Tamil Nadu, Goa, Kerala; Sri Lanka; Malaysia and Tonkin.

Status : Not common.

3. *Gryllus bimaculatus* De Geer

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 800-1050 m, Coonoor, Game Hut & Vicinity, Chemmanatham tank & below, Sand Road Check Dam.

External Distribution : India : Jammu & Kashmir, Himachal Pradesh, Punjab, Uttar Pradesh, Rajasthan, Maharashtra, Gujarat, Madhya Pradesh, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Pondichery, Bihar, West Bengal, Meghalaya, Sikkim, Arunachal Pradesh and Andaman & Nicobar Islands : Pakistan; Nepal; Myanmar; Malaysia and Singapore.

Status : Very common in India.

4. **Teleogryllus gravelyi* (Chopard)

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 1050-1130 m, along Mandradiar Avenue, Bidarhalla & around.

External Distribution : India; Kerala : Travancore; Cochin, forest tramway, mile 10 to 14; Parambikulam.

Status : Not common.

5. **Teleogryllus occipitalis* (Serville)

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 1050-1180 m, Game Hut & Vicinity, Around Circular Road, Along Thorapalli-Mudumalai Road, Mudumalai-Kakkanhalla Road.

Habitat : Deciduous forest, marshy areas.

External Distribution : India : Maldives and Laccadive Archipelagoes, H.P., Karnataka, Tamil Nadu, Orissa, Madhya Pradesh, Uttar Pradesh, Arunachal P., Meghalaya, Sikkim, Manipur, West Bengal, Bihar and Andaman Islands; Sri Lanka; Nepal; Bhutan; Tibet; Bangladesh; Malaysia; Philippines; Java; Sumatra; Borneo; Sulawesi; Thailand; Vietnam and Japan.

Status : Common.

6. *Teleogryllus mitratus* (Burmeister)

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 800-1, 100m, Abharanyam Forest Rest House, Chemmanatham tank & below.

Distribution : *Teleogryllus mitratus* is common throughout most of the Oriental Region upto Wallace's Line. However, it is distributed in India, in Madhya Pradesh, Orissa, Karnataka, Tamil Nadu, Kerala, Bihar, Uttar Pradesh, West Bengal, Assam, Meghalaya and Andaman & Nicobar Islands; and also Sri Lanka, Nepal; Myanmar; Malaysia; Singapore; Java, Sumatra; Borneo; Indo-China; Philippines; China and Vietnam.

Status : Very common.

7. *Teleogryllus flavovittatus* (Chopard)

Locality : Nilgiri Hills.

External Distribution : India (Tamil Nadu-Nilgiris).

Status : Very rare known from literature only.

8. **Plebeiogryllus guttiventris* (Walker)

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 900-1, 100m, Forest Log House, Game Hut & Vicinity. Along Thorapalli-Mudumalai Road, Abharanyam Forest Garden, along Bombax Road, Bidarhalla & around.

External Distribution : India (Goa, Maharashtra, Uttar Pradesh, Madhya Pradesh, Bihar, Orissa, West Bengal, Karnataka, Tamil Nadu, Kerala, Pondichery and Manipur); Sri Lanka; Myanmar.

Status : Very common.

9. **Platygryllus brunneri* (Saussure)

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 800-900 m. Masinagudi Log House, Chemmanatham tank and below.

External Distribution : India: Gujarat, Rajasthan, Uttar Pradesh, Himachal Pradesh, Bihar, Madhya Pradesh, Orissa, West Bengal, Tamil Nadu, Bangladesh and Morocco. Chopard (1969) stated that it is almost cosmopolitan in tropical region.

Status : Very common.

10. *Modicogryllus confirmatus* (Walker)

Localities : Nilgiris : Mudumalai Sanctuary, alt. C 1050 - 1180 m, Masinagudi, along Mandradiar Avenue, along Thorapalli-Mudumalai road, Game Hut & around, Mudumalai - Kakkanhalla road, Abhayaranyam Forest Rest House, Bidarhalla & around; around Circular road.

External Distribution : India: Maharashtra, Rajasthan, Haryana, Himachal Pradesh, Uttar Pradesh, Madhya Pradesh, Bihar, Orissa, West Bengal, Karnataka, Tamil Nadu, Assam, Arunachal Pradesh, Meghalaya, Manipur and Andaman Islands; Pakistan; Sri Lanka; Nepal; Bangladesh; Myanmar; Malaysia; Thailand; Indo-China; and Iran.

Status : Very common.

11. *Modicogryllus ehsani* Chopard

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 1050- 1150m, along Mandradiar Avenues, Off ombetta Road, Game Hut & around, Abhayaranyam Forest Rest House garden.

External Distribution : India (Assam, Karnataka and Tamil Nadu); Pakistan.

Status : Not common.

12. **Turanogryllus maculithorax* (Chopard)

Localities : Nilgiris: Mudumalai Sanctuary, alt. C 1100 m, Around Circular Road, Abhayaranyam Forest Rest House garden.

External Distribution : Karnataka.

Status : Very rare.

13. **Turanogryllus histrio* (Saussure)

Locality : Nilgiris : Coonoor.

External Distribution : India (Himachal Pradesh, Punjab, Bihar, Assam, Meghalaya, West Bengal and Tamil Nadu).

Status : Not very common.

14. *Turanogryllus virgulatus* (Bolivar)

Locality : Nilgiris : Coonoor, Kotagiri, Soperdale, Ootacamund.

External Distribution : India (Tamil Nadu).

Status : Rare known from literature only.

15. *Grylloides sigillatus* (Walker)

Localities : Nilgiri Hills : Mudumalai Sanctuary, alt. C 800-1,000m, Chemmanathan tank & below; Boaligutta.

External Distribution : India (Himachal Pradesh, Punjab, Jammu & Kashmir, Uttar Pradesh, Madhya Pradesh, Rajasthan, Maharashtra, Karnataka, Tamil Nadu, Kerala, Andhra Pradesh, Orissa, Bihar, West Bengal, Assam, Meghalaya, Manipur and Andaman & Nicobar Islands); Pakistan; Sri Lanka and Malaysia.

Status : Very common in houses and almost domestic in all tropical countries.

16. *Cophogryllus brevipes* Chopard

Locality : Nilgiris : Ooty, alt. C 6,700 8,000 Ft.

External Distribution : India (Tamil Nadu Kallar, 1,500 Ft.)

Status : Not common known from literature only.

17. **Scapsipedoides macrocephalus* Chopard

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 1,000 m, Around Circular Road.

External Distribution : India (Tamil Nadu and Kerala); Sri Lanka.

Status : Not common.

18. **Velarifictorus aspersus* (Walker)

Localities : Nilgiris : Mudumalai Sanctuary, alt. C 1,050 - 1,180 m, off Ombetta Road, Abhayaranyam Forest Rest House garden, Along Mandradiar avenue, Along Bombax Road, Mudumalai - Kakkanhalla Road.

External Distribution : India (Jammu & Kashmir, Uttar Pradesh, Maharashtra, Karnataka, Andhra Pradesh, West Bengal, Assam, Meghalaya, Arunachal Pradesh); Sri Lanka; Myanmar; Malaysia; Singapore; Java; Borneo; Annam; Hong Kong; and China.

Status : Common in India.

19. *Velarifictorus maindroni* (Chopard)

Locality : Nilgiris : Coonoor.

External Distribution : India (Tamil Nadu).

Status : Very rare, known from Type-locality only.

20. *Loxoblemmus equestris* Saussure

Localities : Nilgiris : Mudumalai Sanctuary, alt. C 1,050-1,100 m, Off Ombetta Road, Bidarhalla & Vicinity, Abhayaranyam Forest Rest House garden.

External Distribution : India (Uttar Pradesh, Jammu & Kashmir, Madhya Pradesh, Bihar, Orissa, West Bengal, Karnataka, Tamil Nadu, Meghalaya, Arunachal Pradesh, Manipur and Andaman Islands); Sri Lanka; Myanmar; Malaysia; Java; and Celebes.

Status : Common in India.

21. *Landreva hemiptera* (Bolivar)

Locality : Nilgiris.

External Distribution : India : Tamil Nadu Madurai.

Status : Rare. Known from above said localities only.

Subfamily NEMOBIINAE

22. *Pteronemobius fascipes* (Walker)

Localities : Nilgiris : Mudumalai Sanctuary, alt. C 800 m, Avarahalla stream, Chemmanathan tank & below.

External Distribution : India (Goa, Maharashtra, Himachal Pradesh, Jammu & Kashmir, Haryana, Uttar Pradesh, Bihar, Orissa, West Bengal, Karnataka, Tamil Nadu, Kerala, Madhya Pradesh, Assam, Meghalaya, Sikkim, Arunachal Pradesh and Manipur); Sri Lanka; Myanmar; Malaysia; Singapore; and Java.

Status : Very common.

23. *Pteronemobius taprobanensis* (Walker)

Localities : Nilgiris : Coonoor, Mudumalai Sanctuary, alt. C 1050-1,100 m, Bidarhalla & around, Abhayaranyam Forest Rest House garden, along Bombax Road.

External Distribution : India (Rajasthan, Maharashtra, Karnataka, Tamil Nadu, Madhya Pradesh, Orissa, Bihar, West Bengal, Assam, Meghalaya, Arunachal Pradesh, Manipur, and Andaman & Nicobar Islands); Sri Lanka; Bangladesh; Myanmar; Malaysia; Java; and Sumatra.

Status : Very common.

24. **Pteronemobius concolor* (Walker)

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 1,180 m, Mudumalai - Kakkanhalla Road.

External Distribution : India (Goa, Maharashtra, Rajasthan, Uttar Pradesh, Bihar, Orissa, Karnataka, Tamilnadu, Madhya Pradesh, West Bengal, Assam, Meghalaya, Arunachal Pradesh, Manipur, Mizoram, and Andaman & Nicobar Islands); Sri Lanka; Myanmar; and Malaysia.

Status : Common.

25. *Pteronemobius pantelchopardorum*

Shishodia & Varshney

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 100 m, off Ombetta Road.

Habitat : Deciduous forest.

External Distribution : India (Tamil Nadu - Silent Valley, West Bengal and Meghalaya).

Status : Not common.

26. *Paranemobius pictus* (Saussure)

External Distribution : India (Jammu & Kashmir, Bihar, Maharashtra, Madhya Pradesh, Karnataka, Tamil Nadu and Kerala); Sri Lanka.

Status : Not common. Known from literature only.

27. *Paranemobius vicinus* Chopard

Locality : Western Ghats (Nilgiri ?).

Distribution : India (Maharashtra, Karnataka and Kerala).

Status : Not common. Known from literature only.

Subfamily MOGOPLISTINAE

28. *Ornebius guerini* (Bolivar)

Locality : Nilgiris (Coonoor).

External Distribution : India (Tamil Nadu Palni Hills, Salem); Sri Lanka.

Status : Not common. Known from literature only.

29. *Derectaotus maindroni* (Chopard)

Locality : Nilgiris : Coonoor.

External Distribution : India (Uttar Pradesh, and Tamil Nadu).

Status : Rare. Known from literature only.

Subfamily SCLEROPTERINAE

30. *Acanthoplistus birmanus* Saussure

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 1,080 m, along Bombax Road.

External Distribution : India (Himachal Pradesh, Uttar Pradesh, West Bengal, Assam, Karnataka and Tamil Nadu); Myanmar; Peninsular Thailand; Tonkin and Annam.

Status : Not common.

31. **Scleropterus coriaceus* (Haan)

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 1,100, off Ombetta road.

External Distribution : India (Uttar Pradesh, Karnataka, Kerala, Assam, and Arunachal Pradesh); Myanmar; Java; Sumatra; Taiwan; Malaysia; Vietnam; Annam; Thailand; Japan; and Sarawak.

Status : Not common.

Subfamily PHALANGOPSINAE

32. *Aspidogryllus singularis* Chopard

Locality : Nilgiris : Ooty, alt. C 6,700 8,000 Ft.

External Distribution : Nil.

Status : Rare. Known only from literature.

Subfamily OECANTHINAE

33. *Oecanthus indicus* Saussure

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 810 m, Avarahalla stream.

Habitat : This species lives on shrubs.

Distribution : India (Maharashtra, Karnataka, Tamil Nadu, Orissa, Madhya Pradesh, West Bengal, Bihar, Assam, Meghalaya, Arunachal Pradesh and Andaman Islands); Sri Lanka; Malaysia; Penang; Philippines; Malaya Archipelago.

Status : Not common.

34. **Oecanthus henryi* Chopard.

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 810 m, Avarahalla stream.

Habitat : Live on shrubs.

Distribution : Sri Lanka.

Status : Very rare.

Remarks : Recorded for the first time from India.

Subfamily TRICONIDIINAE

35. *Homoeoxipha lycoides* (Walker)

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 840 m, Sand Road Check Dam.

Distribution : India (Maldive and Laccadive Archipelagoes, Karnataka, Tamil Nadu, West Bengal, Bihar, Uttar Pradesh, Assam, Meghalaya, Arunachal Pradesh, and Andaman Islands); Bangladesh; Sri Lanka; Myanmar; Malaysia; and Singapore.

Status : Common. Widely distributed in the Indo-Australian region.

36. **Anaxipha nigrithorax* Chopard

Locality : Nilgiris : Theppakadu.

Distribution : India (Tamil Nadu).

Status : Very rare. Known from Type locality only.

37. *Amusurgus unicolor* (Chopard)

Locality : Nilgiris : Gudalur.

External Distribution : India (Uttar Pradesh, Karnataka, Tamil Nadu); Sri Lanka; Sumatra.

Status : Not common. Known from literature only.

38. **Amusurgus lateralis* Chopard

Localities : Nilgiris : Mudumalai Sanctuary, alt. C 1,100 - 1,180 m, Off Ombetta road, Mudumalai - Kakkanhalla Road.

External Distribution : India (Karnataka, Tamil Nadu and West Bengal); Sri Lanka; Malaysia; and Sumatra.

39. **Trigonidium cicindeloides* Rambur

Localities : Nilgiris : Mudumalai Sanctuary, alt. C 810-1,180 m, Mudumalai - Kakkanhalla road, Avarahalla stream.

Distribution : India (Maldive & Laccadive Archipelagoes, Goa, Maharashtra, Karnataka, Tamil Nadu, Orissa, Bihar, Himachal Pradesh, West Bengal, Assam, Meghalaya, Arunachal Pradesh, Manipur, Mizoram and Andaman Islands); Sri Lanka; Nepal; Myanmar; Malaysia.

Status : Common. Widely distributed from South Europe to South Asia and all over Africa.

40. **Trigonidium humbertianum* (Saussure)

Localities : Nilgiris : Mudumalai Sanctuary, alt. C 810-840 m, Avarahalla stream, Sand Road Check Dam.

Distribution : India (Maharashtra, Gujarat, Madhya Pradesh, Bihar, Orissa, West Bengal, Tamil Nadu, Kerala, Assam, Arunachal Pradesh, Meghalaya, Manipur); Sri Lanka; Iran; Malaysia.

Status : Common.

41. **Metiochodes* sp.

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 950-1,000 m, Stream above Singara Power House.

Distribution : India; Sri Lanka; Malaya; Malaya Archipelago; N. Australia.

Remarks : Specific identification could not be done, hence diagnostic characters and distribution are given for the genus only.

Subfamily ITARINAE

42. *Itara microcephala* (Haan)

Locality : Nilgiris : Gudalur.

Distribution : India (West Bengal, Tamil Nadu); Myanmar; Malaysia; Singapore; Sumatra; and Borneo.

Status : Not common. Known through literature only.

Subfamily PODOSCIRTINAE

43. *Mnesibulus andrewesi* Chopard

Locality : Nilgiri Hills, alt. C 5,500 Ft.

Distribution : India (Tamilnadu).

Status : Not common. Known from Type locality only.

44. **Euscyrtus hemelytrus* (Haan)

Locality : Nilgiris : Mudumalai Sanctuary, alt. C 1,100 m, Off Ombetta Road.

Distribution : India (Uttar Pradesh, West Bengal, Assam, and Nicobar Islands); Sri Lanka; Myanmar; Malaysia; Java; Batavia; Moluccas; Philippines; Japan and North Australia.

45. *Euscyrtus concinnus* (Haan)

Locality : Nilgiris : Mudumalai.

Distribution : India (Karnataka, Tamil Nadu, West Bengal, Assam, Arunachal Pradesh, Meghalaya, and Great Nicobar Island); Sri Lanka; Myanmar; Malaysia; Singapore; Selangor; Moluccas; Java; Thailand; Cochin; China.

Status : Common. Known from literature only.

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INSECTA : ODONATA

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INTRODUCTION

Odonata, popularly known as dragon and damsel flies, are noted for beauty and brilliance of their colouration. Perhaps, they rank next to the butterflies in their prominence. These graceful and swift flying insects are commonly found darting and dancing actively near ponds, pools, rivers, streams and also marshy places. Though this group appears staying close to water sources, some species are also seen perching high on trees and shrubs considerably away from water and in dense forests. They occur almost all over the world in various niches extending from the sea level to over 3,600 m and from brackish marshy areas to desert lands. Altogether, more than 5,000 species of Odonata, belonging to 630 genera under 3 sub orders and 37 families are known from the world of which 491 species belonging to 139 genera under 17 families representing all the three suborders are known from India (Prasad and Varshney 1995).

In the Nilgiri Biosphere Reserve the availability of perennial water bodies, water holes and streams provide suitable habitats for odonates.

The present inventory prepared mostly based on available literature, contains 71 species, including 22 species collected during recent surveys which carry* mark, recorded from Nilgiri Biosphere Reserve and its environs, Fraser 1933, 1934 and 1936, Kumar and Prasad (1981), Rao and Lahiri (1983), Prasad et. al (1987) Lahiri (1987) and Prasad and Varshney (1988) were consulted during the studies. The taxonomic arrangement of the species listed here is in accordance with the check-list of the Indian Odonates (Prasad and Varshney 1995).

SYSTEMATIC ACCOUNT

Order	ODONATA
Suborder	ZYGOPTERA
Super family	COENAGRIONOIDEA
Family	COENAGRIONIDAE
Sub family	PSEUDAGRIONINAE

Archibasis oscillans (Selys)

Locality : Wynaad.

Habitat : Along the banks of the brooks running through dense jungle.

Status : Not Common.

External Distribution : Coorg, South Kanara, South Malabar.

**Ceriagrion coromandelianum* (Fabr.)

Locality : Nilgiri Biosphere Reserve, Mudumalai Wildlife Sanctuary, off Omletta Road, Imperralla, Chemnathan Tank, Kanchigutta; Nagar hole National Park; Bandipur Tiger Reserve, Dodonkatte Tank, near Kutte.

Habitat : Breeds in weedy ponds and tanks, in scrub jungle near water source.

Status : Common.

External Distribution : Throughout India, Sri Lanka, Myanmar, Indo-China and South China.

Ceriagrion rubiae Laidlaw

Locality : Coorg.

Habitat : Occurs in swampy localities, weedy ponds, marshy spots etc.

* Zoological Survey of India, Western Regional Station, Sector. 29, Ravet Road, Akurdi, Pune - 411 044 (Maharashtra).

Status : Common.

External Distribution : South Kanara, Khandala, Bombay and Western India.

***Ceriagrion olivaceum* Laidlaw**

Locality : Nilgiri, Wynaad.

Habitat : Away from water, in dry grasses, but breeds in streams.

Status : Common.

External Distribution : Many parts of India, Western Ghats, Poona and also Assam and Bengal.

***Ceriagrion cerinorubellum* (Brauer)**

Habitat : Swarming over grassy tanks and ponds.

Status : Common.

External Distribution : Throughout India, Sri Lanka, Myanmar, Malaysia and Indonesia.

***Pseudagrion malabaricum* Fraser**

Locality : Silent valley.

Habitat : Around ponds, lakes and water bodies.

Altitude : Upto 2300 m.

Status : Common.

External Distribution : Throughout Southern Western Ghats from South Kanara and also Sri Lanka.

***Pseudagrion decorum* (Rambur)**

Locality : Ootacamand, Nilgiris.

Habitat : Found along water bodies.

Altitude : Upto 2,200 m.

Status : Common.

External Distribution : Throughout continental India and Myanmar.

***Pseudagrion indicum* Fraser.**

Locality : Nilgiris

Habitat : Along the streams and banks of water bodies.

Altitude : 600 to 1,200 m.

Status : Locally Common.

External Distribution : Coorg and Malabar.

Sub family COENAGRIONINAE

***Cercion calamorum* (Ris)**

Habitat : On vegetation on the sides of tanks and water bodies.

Status : Common.

External Distribution : Throughout Peninsular India.

Sub family ISCHNURINAE

***Aciagrion occidentale* Laidlaw**

Habitat : Found in the foot hills in marshes and jungles in early months of the year. Migratory.

Status : Common.

External Distribution : Throughout South India and Sri Lanka.

Remarks : Though delicate and lightly built, known to migration. Specimens recorded to be collected over 40 miles out at sea off the Western Shores of India and Sri Lanka.

***Ischnura senegalensis* (Rambur)**

Habitat : Widely distributed.

Altitude : From sea level to over 2,200 m.

Status : Common.

External Distribution : Throughout India, Myanmar, Sri Lanka, Japan, Phillipines and African continent.

****Ischnura aurora* (Brauer)**

Locality : Bandipur Tiger Reserve, Balloguda Hill, Mudumalai Wildlife Sanctuary, Avarahalla stream; Bandipur Tiger Reserve, Dodankatte Tank, Kalkeri Moleyur Road, Honali Masinagudi.

Altitude : From plains upto 2,300 m.

Habitat : Widely distributed.

Status : Common.

External Distribution : Widely distributed throughout Southern Asia, India, Sri Lanka, Indonesia, Australia, Phillipines, Myanmar and Samoa.

Sub family AGRIOCNEMIDINAE

***Agriocnemis pieris* Laidlaw**

Locality : Nilgiri Silent Valley, and Wynaad.

Habitat : Found in marshy lands.

Status : Common.

External Distribution : Western Ghats of India, Poona, Khandala, North and South Kanara, Malabar, Coorg.

***Agriocnemis splendidissima* Laidlaw**

Locality : Nilgiri, Wynaad, Silent Valley.

Habitat : It is found near beds where the grasses project above water. Only found during dry season.

Status : Common.

External Distribution : Western Ghats of India, Poona, Khandala, North Kanara, Malabar, Coorg.

****Agriocnemis pygmaea* (Rambur)**

Locality : Nilgiri Biosphere Reserve, Kalaru; Nagarhole National Park, Laxmantirth, Oddnadu Tea estate.

Habitat : Widely distributed.

Status : Common.

External Distribution : Throughout the Oriental Region, Australia and Pacific Islands.

Subfamily AGRINIINAE

***Onychargia atrocyana* Selys**

Habitat : Colonies occur in wet sub-montane area.

Status : Common.

External Distribution : Throughout India, Myanmar and Sri Lanka.

Family PLATYCNEMIDIDAE

Sub family PLATYCNEMIDINAE

****Copera marginipes* (Rambur)**

Locality : Nagarhole National Park, Nagarhole River, Pujakkal, Kakinhal, Marapos Tank, Kutte Road, Laxmantirth.

Altitude : From plains to 600 m.

Status : Common.

External Distribution : Throughout Western Asia and Sondaic Islands.

Remarks : Fraser (1933) described specimens from Sri Lanka, Coorg, West Coast Poona, Mahabaleshwar, Bombay Presidency, Deccan (Poona, Mhow), Assam and Bengal with differences in colour pattern and size.

***Copera vittata* (Selys)**

Locality : Nilgiris.

Altitude : From plains to 600 m.

Status : Common.

External Distribution : Throughout Southern Asia.

Remarks : Fraser (1933) recorded a degree of variation in colouration and melanism in forms occurring in different localities.

Family PLATYSTICTIDAE
Subfamily PLATYSTICTINAE

***Protosticta gravelyi* Laidlaw**

Locality : Nilgiris.

Habitat : Occurs in ravines of Western Ghats. Can be found lurking amongst rocks and ferns or in the dark tunnels formed by trees and shrubs. Flies forward and backward with equal ease.

Status : Common.

Altitude : 600 to 1200 m.

External Distribution : Southern India.

***Protosticta hearseyi* Fraser**

Locality : Nilgiris.

Habitat : Small brooks, valleys and rocky hill side jungles near rivers.

Altitude : 900 m.

Status : Locally common.

External Distribution : Anamalai Hills and Travancore.

Family PROTONEURIDAE
Sub family CACONEURINAE

***Caconeura gomphoides* (Ramb.)**

Locality : Nilgiri Hills.

Habitat : Gregarious in habit. Large colonies found clinging to ferns on banks of small streams.

Status : Locally Common.

External Distribution : Confined to the grassy uplands of the Nilgiri Hills.

***Caconeura ramburi* (Fraser)**

Locality : Nilgiris.

Habitat : Breeding at low altitude.

Altitude : Upto 1,800 m.

Status : Rare in South of Palghat gap.

External Distribution : Widely distributed throughout the Western Ghats from Kanara to Malabar, Mysore, Coorg.

***Caconeura T-coeruleas* (Fraser)**

Locality : Nilgiris.

Altitude : Upto 600 m.

Status : Rare.

External Distribution : South eastern aspects of the Nilgiris (Mettupalayam).

***Caconeura risi* (Fraser)**

Locality : Wynaad.

Habitat : Found in dense jungles in densely shaded streams.

Status : Not common.

External Distribution : Foot hills of Malabar and Western Ghats.

***Phylloneura westermanni* (Selys)**

Locality : Nilgiri Hills & Wynaad.

Habitat : In the bed of rivers.

Status : Confined to Western Ghats.

External Distribution : Coorg Malabar and Western Ghats.

Sub family DISPARONEURINAE

***Disparoneura quadrimaculata* (Rambur)**

Locality : Coorg.

Habitat : Near ponds and rivers.

Altitude : Above 450 m.

Status : Common.

External Distribution : South Kanara, Central India, Mahabaleshwar, Poona and Western Ghats.

***Prodasineura verticalis annandalei* (Fraser)**

Locality : Nilgiris and Wynaad.

Altitude : Upto 1,200 m.

Status : Locally Common.

External Distribution : Western Ghats, Mahabaleshwar, Coorg Malabar.

Super family LESTOIDEA
Family LESTIDAE
Sub family LESTINAE

**Lestes viridulus* (Rambur)

Locality : Nilgiri Biosphere Reserve.

Habitat : Among long dry grasses, common during the dry season.

Status : Common.

External Distribution : Peninsular India and Western India.

Super family CALOPTERYGOIDEA
Family CALOPTERYGIDAE
Sub family CALOPTERYGINAE

**Neurobasis chinensis chinensis* (Linn.)

Locality : Nagarhole National Park, Dodankatte Tank, Pujakkal River on Sarathi Road, Laxmantirth; Wynaad, Niolpuzha; Amborthi.

Habitat : Found in streams.

Altitude : Upto 4,000 m.

Status : Common. Occurs in colonies.

External Distribution : Throughout India.

**Vestalis gracilis gracilis* (Rambur)

Locality : Nilgiri, Valiyapanthodu; Silent Valley; Malakkom Reserve Forest, Vaniyampazha; Anakatti Palghat Dist.; Wynaad, Kanie higab; Rampur.

Habitat : Along the streams.

Status : Common.

External Distribution : Coorg, Western and Eastern Ghats, Bengal, Sikkim, Assam, Myanmar, Thailand.

Vestalis gracilis montana Fraser

Locality : Nilgiris.

Habitat : Along streams.

Altitude : About 1,066 m.

Status : Not Common.

External Distribution : Coorg.

Family CHLOROCYPHIDAE
Genus RHINOCYPHA
Subgenus HELIOCYPHA

**Rhinocypha (Heliocypha) bisignata* (Selys)

Locality : Nilgiris and Silent valley, on Kutte Road, Pujakkal River on Sarathi Road; Palghat, Bhavanipuram; Wynaad, Maranhalla.

Habitat : Found around ponds. Females are seen on bushes and twigs.

Altitude : Between 600 to 1,670 m.

Status : Common.

External Distribution : Coorg. Khandala, Bombay and South India.

Family EUPHAEIDAE

Euphaea fraseri (Laidlaw)

Locality : Nilgiris

Habitat : Near streams on herbs, upto 12' height.

Altitude : From sea level to 1,066 m.

Status : Common.

External Distribution : North and South Kanara, Malabar, Coorg.

Suborder ANISOPTERA
Super family AESHNOIDEA
Family GOMPHIDAE
Subfamily GOMPHINAE

***Burmagomphus pyramidalis* Laidlaw**

Locality : Nilgiris.

Habitat : Found near river banks settling on rocks in midstream and also on surrounding vegetation in bright sunshine.

Status : Common.

External Distribution : Western Ghats, Malabar, Coorg, Kanara, Coimbatore and Poona.

***Burmagomphus laidlawi* Fraser.**

Locality : Nilgiris.

Habitat : Similar to that of *B. pyramidalis* Laidlaw.

Altitude : Upto 1,066 m.

Status : Not rare.

External Distribution : Western Ghats only.

***Heliogomphus promelas* (Selys)**

Locality : Nilgiri Hills.

Habitat : Found in mountain streams.

Status : Common.

External Distribution : Southern India.

***Asiagomphus nilgircus* (Laidlaw)**

Locality : Nilgiris.

Habitat : Found along streams. Rests on rocks in mid streams. Females oviposit in quiet shaded places.

Altitude : Upto 1,200 m.

Status : Rare.

External Distribution : Western Ghats only.

***Merogomphus longistigma longistigma* (Fraser)**

Locality : Nilgiris

Habitat : Found in mountain streams.

Altitude : Upto 900 m.

Status : Uncommon.

External Distribution : Southern India.

Subfamily MEGALOGOMPHINAE

***Megalogomphus superbus* Fraser.**

Locality : Nilgiris, Malabar.

Habitat : Similar to that of *Megalogomphus hannyngtoni* (Fraser).

Status : Common.

External Distribution : Southern India.

Subfamily ONYCHOGOMPHINAE

***Onychogomphus nilgiriensis nilgiriensis* (Fraser)**

Locality : Nilgiris, Wynaad.

Habitat : This species is found in shady mountain streams with clear bottoms. Some times settles on rocks and nearby vegetation.

Status : Locally common.

External Distribution : Southern India.

Family AESHNIDAE

Subfamily AESHNINAE

***Anaciaeschna jaspidea* (Burm.)**

Locality : Nilgiris, Ootakmand.

Habitat : In marshy spots and bamboo jungle.

Altitude : 900 to 2,200 m.

Status : Common.

External Distribution : India and Pacific Islands.

Subfamily BRACHYTRONINAE

***Oligaeschna martini* (Laidlaw)**

Locality : Nilgiris,

Habitat : Breeds in mountain lakes, in jungles along river beds.

Status : Common.

External Distribution : Palni Hills, Anamalai Hills and Java.

****Anax immaculifrons* Rambur**

Locality : Mudumalai wild life sanctuary, Around circular road, Nilgiri Biosphere Reserve, Coonur-Burliyar confluence; Palakad, Chappal.

Habitat : Breeds in all mountain streams, Larvae found in muddy bottoms.

Altitude : 450 to 2,280 m.

Status : Common.

External Distribution : India : Western and Eastern Ghats, Himalaya; Sri Lanka and Hong Kong.

***Gynacantha dravida* Liefstinck**

Locality : Nilgiris.

Altitude : 660 to 2,000 m.

Status : Common.

External Distribution : Coorg, Coimbatore, Bihar, Darjeeling, Shillong, Assam, Myanmar, Indonesia, China and Japan.

Superfamily LIBELLULOIDEA

Family CORDULIIDAE

Subfamily CORDULIINAE

***Hemicordulia asiatica* Selys.**

Locality : Nilgiris.

Habitat : Along rivers and breeding in still pools.

Altitude : Upto 1,800 m.

Status : Not rare.

External Distribution : Western Ghats, Assam and Shillong.

Subfamily IDIONYCHINAE

***Idionyx nadganiensis* Fraser**

Locality : Wynaad.

Habitat : Not Known.

Status : Rare.

External Distribution : Only two females known so far from Nadgani Ghat.

***Idionyx nilgiriensis* (Fraser)**

Locality : Nilgiri Hills.

Habitat : Along the river.

Status : Rare.

External Distribution : Only from Burliyar River.

Subfamily : MACROMIINAE

***Macromia indica* Fraser**

Locality : Nilgiris.

Habitat : Breeds in the river and stays in the vicinity of water.

Status : Rare.

External Distribution : Coorg and Western Ghats.

***Macromia ellisoni* Fraser**

Locality : Nilgiri Hills.

Habitat : Always in the vicinity of water.

Status : Locally Common.

External Distribution : Coorg.

***Macromia ida* Fraser**

Locality : Nilgiri, Wynaad.

Habitat : Near streams with clear bottoms.

Status : Common.

External Distribution : Coorg and South Kanara.

***Macromia irata* Fraser**

Locality : Wynaad.

Habitat : On forest roads in the neighbourhood of streams.

Status : Common.

External Distribution : Coorg, South Kanara, Malabar.

Family LIBELLULIDAE

Subfamily LIBELLULINAE

****Orthetrum sabina sabina* (Drury)**

Locality : Nilgiri Biosphere Reserve, Nagarhole National Park, Barkada Stream in Chipakala Forest; Nagaria; Tank near Kutte.

Habitat : In scrub jungle along the hills.

Altitude : From sea level to over 2,130 m.

Status : Common.

External Distribution : Widely distributed from Somali land, Mesopotamia, Persia to Samoa and Australia, India, Myanmar, Sri Lanka and Thailand.

***Orthetrum triangulare triangulare* (Selys)**

Locality : Nilgiris.

Habitat : Breeds in brooks flowing through marshes.

Altitude : Above 1,500 m.

Status : Common.

External Distribution : Himalaya, Hills of India and Sri Lanka.

****Orthetrum glaucum* (Brauer)**

Locality : Nilgiri Biosphere Reserve.

Habitat : Very common near hill streams.

Altitude : From plains to 1,200 m.

External Distribution : From West Coast of India to the Philippines.

****Orthetrum taeniolum* (Schneider)**

Locality : Nilgiri Biosphere Reserve, Nilamber, Malapoocum, Vazhikadavu.

Habitat : Found on beds of rivers, perched on rocks or sandy shores, Breeds in deep pools.

Status : Common.

External Distribution : Common in plains of India.

***Orthetrum chrysis* (Selys)**

Locality : Kotagiri, Nilgiris, Silent valley.

Habitat : Usually occurs along small streams and ponds.

Status : Common.

External Distribution : Travancore, West Coast of India, Sri Lanka.

****Orthetrum pruinosm neglectum* (Rambur)**

Locality : Bandipur Tiger Reserve, on Kutte Road; Barkada stream, Olepat Tank, Laxmantirth; Mudumalai Wildlife Sanctuary, Silent valley and Ooty; Wynaad, Kutirakoda, Nilambur; Kurichigad.

Habitat : Breeds in small tanks and also river beds and pools.

Altitude : From plains upto 2,200 m.

Status : Most Common.

External Distribution : Throughout plains of India; Sri Lanka; Tibet; Myanmar and Hong Kong.

****Potamarcha congener* (Rambur)**

Locality : Mudumalai Wild Life Sanctuary Doddanati chikkld Stream, Imperalla; Nilgiri Biosphere Reserve, Sikkalab palayam, Kallur; Palghat.

Habitat : Breeds in small weedy ponds and marshes.

Status : Common.

External Distribution : West Coast of India to Philippines, Sri Lanka.

Sub family SYMPETRINAE.

****Brachythemis contaminata* (Fabr.)**

Locality : Nilgiri Biosphere Reserve, Sigu Falls, Moyar River; Mudumalai Wildlife Sanctuary.

Masingudi Forest, Doddanalla, Imperalla, Munderi Reserve Forest; Malappuram; Bandipur Tiger Reserve, Marapos Tank, Peacock Tank.

Habitat : Sluggish streams, over weedy ponds, tanks and lakes.

Status : Common.

External Distribution : Throughout plains of India, Sri Lanka, Myanmar, China, Taiwan, The Philippines and Indonesia.

****Crocothemis servilia servilia* (Drury)**

Locality : Mudumalai Wildlife Sanctuary, Nilambur, Malapuram, Vazhikadavu; Kanchigutta, Bandipur Tiger Reserve, Barkada Stream; Sikkulib Palayam, Kalhala Tank in Murukul Forest; Coonoor Berliyar Confluence.

Habitat : Found in reeds and grasses along water bodies.

Status : Common.

External Distribution : India, Sri Lanka, Myanmar, South Asia to Japan, The Philippines and Australia.

****Diplacodes trivialis* (Rambur)**

Locality : Silent valley, Nilgiri Biosphere Reserve, Nagarhole National Park, Pujakkal Stream, Kalhala Tank in Murukul Forest, Dodambi River, Bandipur Tiger Reserve, Nugu River, Tank near Kutte, Peacock Tank, Olipatte Tank, Kunther Tank.

Habitat : Also found far from water.

Altitude : From plains to 2,140 m.

Status : Very Common.

External Distribution : India, Sri Lanka, Myanmar and South Asia to Taiwan.

***Indothemis carnatica* (Fabr.)**

Locality : Silent valley, Nilgiris, Masnagudi

Habitat : Found near water bodies.

Status : Common.

External Distribution : Peninsular India, Bangkok.

****Neurothemis fulvia* (Drury)**

Locality : Nilgiri Biosphere Reserve; Nagarhole National Park, Barkada Stream, Chipakala Forest, Kutte Road, Pujakkal river on Sarathi Road.

Habitat : Near weedy ponds and marshes.

Altitude : Upto 900 m.

Status : Common.

External Distribution : Throughout India, Sri Lanka, Myanmar, West Malaysia and Thailand.

****Neurothemis tullia tullia* (Drury)**

Locality : Silent Valley, Nilgiri Biosphere Reserve, Manderi Reserve Forest; Bandipur Tiger Reserve, Tank near Kutte; Muigapana Anonali; Wynaad; Kattu Kulam.

Habitat : Near water bodies and marshy ponds.

Altitude : Found mainly on plains.

Status : Common.

External Distribution : Peninsular India, Myanmar, West Malaysia and Hongkong.

***Rhodothemis rufa* (Rambur)**

Locality : Nilgiris.

Habitat : Around weedy tanks and lakes.

Status : Common.

External Distribution : Throughout India, Myanmar, Sri Lanka, Indonesia, Malaysia, New Guinea.

Sub family TRITHEMISTINAE

****Trithemis aurora* (Burmeister)**

Locality : Silent Valley, Mudumalai Wildlife Sanctuary; Bandipur Tiger Reserve.

Altitude : From plains upto 1,200 m.

Status : Common.

External Distribution : Throughout India, Myanmar, Philippines and Indonesia.

****Trithemis festiva* (Rambur)**

Locality : Nilgiri Biosphere Reserve, Mudumalai Wildlife Sanctuary, Nagarhole National Park.

Habitat : Around still waters.

Status : Common.

External Distribution : India (Plains), Sri Lanka and Myanmar.

****Trithemis pallidinervis* (Kirby)**

Locality : Nilgiri Biosphere Reserve; Wynaad, Kattukulum.

Habitat : Breeds in stagnant water. The imagoes are found perched on top of tall reeds.

Status : Common.

External Distribution : Throughout India, Sri Lanka and Myanmar.

Sub Family ONYCHOTHEMISTINAE

***Onychothemis testacea ceylanica* Ris.**

Locality : Nilgiri Hills.

Habitat : Away from source of water in forests.

Status : Common.

External Distribution : Southern India, Bengal and Sri Lanka.

Subfamily PALPOPLEURINAE

***Palpopleura sexmaculata sexmaculata* (Fabricius)**

Locality : Nilgiri Hills.

Status : Common.

External Distribution : Southern India, Western India, Sri Lanka, Tibet and Malaysia to China.

Sub family TRAMEINAE

****Pantala flavescens* (Fabricius)**

Locality : Mudumalai Wildlife Sanctuary, Baoli Guda; Bandipur Tiger Reserve, Pond near Choddapura; Nagarhole National Park, Peacock Tank; Odanthurai.

Habitat : Marshy tanks among foot hills.

Status : Common.

External Distribution : Throughout India, Sri Lanka, Myanmar and Tibet.

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INSECTA : LEAFHOPPERS (HOMOPTERA : CICADELLIDAE)

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INTRODUCTION

Leafhoppers are numerous and exhibit a rich diversity of forms. They vary in size from 2mm to 30mm and constitute the largest family in the entire order Hemiptera. Several species are oligophagous or polyphagous feeding on leaves, shoots and stems of a variety of vegetation. Most of the leafhoppers are phloem feeders and many are exclusively xylem feeders such as Cicadellinae. A few of them also feed on mesophyl of plants.

GENERAL OBSERVATIONS

Leafhoppers are found all over the globe and they are of various colours, the predominant one being brown.

All leafhoppers exhibit sexual reproduction except *Agallia quadripunctata* (Prov.) which is parthenogenetic.

Dispersal of leafhoppers is usually by directional flights. Several species occur in temperate regions and over winter either as eggs or adults. In India species of *Nephotettix* were collected in thousands during the post monsoon period around electric lamps in Eastern India. Leafhoppers exhibit a wide range of variation with regard to external form, acoustic signals, nutritional behaviour, seasonal variation and show genetic variation in relation to the type of vegetation they feed on. They also exhibit variation due to photoperiodicity and geographical position of the concerned groups.

SYSTEMATICS

Metcalf (1962 to 68), Knight (1987) and Oman *et. al.* (1990) estimated more than 16,000 species of leafhoppers in 2,500 genera from the world. From India Distant (1908, 1918), Sing-Pruthi (1930-36), Sohi (1983-84), Ramachandra Rao (1973-90) and Viraktamath (1976-90), among others have contributed to nearly 1,500 species in 250 genera. In the present paper 106 species belonging to 64 genera have been recorded from the Nilgiri Biosphere Reserve. Classification into various subfamilies and tribes as adopted by Evans (1947), Knight and Nielson (1986) and Rao (1990) has been followed in this inventory.

ECONOMIC IMPORTANCE OF LEAFHOPPERS

Leafhoppers are an important group of insects from the economic point of view as they attack many plants and cause damage by sucking plant sap, injecting toxins while sucking the sap, by laying eggs and covering the leaf surfaces and also act as vectors to transmit viruses and mycoplasma-like organisms into the plant. It is estimated that 130 known leafhopper species transmit about 71 disease agents all over the world. Ramachandra Rao (1990) listed 24 pest species and 11 important vectors from India. The study of leafhoppers is therefore important.

EFFECT OF HUMAN ACTIVITY

Human activity in the area has resulted in habitat destruction and loss of forest cover,

threatening the existence of many endemic species of leafhoppers. It is also noticed that indiscriminate use of pesticides has resulted in developing resistance and subsequent formation of biotypes in green leafhoppers. It is therefore necessary to adopt integrated pest management for a steady yield of product from the crops.

SYSTEMATIC LIST

- | | | |
|--------------|-----------------|------------------------|
| Family | CICADELLIDAE | Latrielle |
| 1. Subfamily | HYLICINAE | Distant |
| 2. " | ULOPINAE | Le Peletier & Serville |
| 3. " | LEDRINAE | Fairmaire |
| 4. " | APHRODINAE | Haupt |
| 5. " | EVACANTHINAE | Crumb |
| 6. " | CICADELLINAE | Latrielle |
| 7. " | NIRVANINAE | Baker |
| 8. " | MACROPSINAE | Evans |
| 9. " | AGALLINAE | Kirkaldy |
| 10. " | IDIOCERINAE | Baker |
| 11. " | COELIDIINAE | Dohrn |
| 12. " | IASSINAE | Walker |
| 13. " | PENTHIMIINAE | Kirschbaum |
| 14. " | KRISNINAE | |
| 15. " | PARABOLOPONINAE | Ishihara |
| 16. " | DRABESCINAE | Stål |
| 17. " | HECALINAE | Distant |
| 18. " | DELTOCEPHALINAE | Fieber |
| 19. " | XESTOCEPHALINAE | Baker |
| 20. " | TYPHLOCYBINAE | Kirschbaum |
| 21. " | SIGNORETINAE | Baker |

Family : CICADELLIDAE Latrielle, 1825

Subfamily I : HYLICINAE Distant, 1908

Tribe : SUDRINI Schmidt, 1920

Genus 1 : *Balala* Distant, 1908.

1. *Balala fulviventris* (Walker, 1851)

Genus 2 *Traiguma* Distant, 1908.

2. *Traiguma nasuta* Distant, 1908

Subfamily II ULOPINAE Lepeletier and Serville, 1825.

Genus 3 *Moonia* Distant, 1908

3. *Moonia capitata* Distant, 1916.

4. *Moonia variabilis* Distant, 1916.

Subfamily III LEDRINAE Fairmaire 1855.

Tribe PETALOCEPHALINI Metcalf, 1962

Genus 4 *Petalocephala* Stål, 1853.

5. *Petalocephala cephalotes* Distant, 1916

6. *Petalocephala granulosa* Distant, 1910.

7. *Petalocephala nigrilinea* (Walker, 1857)

8. *Petalocephala umbrosa* Distant, 1908

9. *Petalocephala uniformis* Distant, 1908

Genus 5 *Tituria* Stål 1865

10. *Tituria acutangulata* Distant, 1908

Subfamily IV APHRODINAE Haupt, 1927.

Tribe APHRODINI

Genus 6 *Gurawa* Distant, 1908

11. *Gurawa vexillum* Distant, 1908

Tribe ANOTEROSTEMMINI Haupt, 1929

Genus 7 *Leofa* Distant, 1918

12. *Leofa pedestris* Distant, 1918

Subfamily V EVACANTHINAE Crumb, 1911

Genus 8 *Dussana* Distant, 1908

13. *Dussana quaerenda* Distant, 1908

Subfamily VI CICADELLINAE Latreille, 1825

Genus 9 *Anatikana* Young, 1986.

14. *Anatikana infecta* (Distant, 1908)

15. *Anatikana kotagiriensis* (Distant, 1908)
 Genus 10 *Atkinsoniella* Distant, 1908
16. *Atkinsoniella opponens* (Walker) 1851
 Genus 11 *Bothrogonia* Melichar, 1926
17. *Bothrogonia ferruginea* (Fabricius, 1787)
18. *Bothrogonia sclerotica* Young, 1986
 Genus 12 *Cofana* Melichar, 1926
19. *Gofana spectra* (Distant, 1908)
20. *Cofana unimaculata* (Signoret, 1854)
 Genus 13 *Genuga* Melichar, 1914
21. *Genuga quadrilineata* Signoret, 1853
 Genus 14 *Kolla* Distant, 1908
22. *Kolla paulula* (Walker, 1858)
23. *Kolla pronotalis* Distant, 1918
 Genus 15 *Teltigella* China & Fennah, 1945
24. *Teltigella habilis* Distant, 1908
25. *Teltigella indica* Distant, 1908
26. *Teltigella sandaracata* Distant, 1908
 Genus 16 *Ujna* Distant, 1908
27. *Ujna delicatula* Distant, 1908
28. *Ujna* sp.
- Subfamily VII NIRVANINAE, Baker, 1923.
 Tribe NIRVANINI
 Genus 17 *Kana* Distant
29. *Kana modesta* Distant, 1918
 Genus 18 *Nirvana* Kirkaldy, 1900
30. *Nirvana pallida* Melichar, 1903
31. *Nirvana suturalis* Melichar, 1903.
 Genus 19 *Mukaria* Distant, 1908
32. *Mukaria penthimioides* Distant, 1908
- Subfamily VIII MACROPSINAE Evans, 1935
 Tribe MACROPSINI
 Genus 20 *Macropsis* Lewis, 1834
33. *Macropsis garuda* (Distant, 1916)
34. *Macropsis lovedalensis* (Distant, 1916)
35. *Macropsis orientalis* (Distant, 1916)
- Subfamily IX AGALLINAE Kirkaldy, 1901
 Tribe AGALLINI Kirkaldy, 1906.
 Genus 21 *Gunhilda* Distant, 1918
36. *Gunhilda noctua* Distant, 1918
 Genus 22 *Igerna* Kirkaldy, 1903
37. *Igerna bimaculicollis* (Stål, 1855)
- Subfamily X IDIOCERINAE Baker, 1915
 Genus 23 *Amritodus* Anufriev, 1970
38. *Amritodus brevistylus* Viraktamath
 Genus 24 *Idioscopus* Baker, 1915
39. *Idioscopus clypealis* (Lethierry, 1889)
40. *Idioscopus niveosparsus* (Lethierry, 1889)
- Subfamily XI COELIDIINAE Dohrn, 1859
 Tribe COELIDIINI
 Genus 25 *Calodia* Nielson, 1982
41. *Calodia kirkaldyi* Nielson, 1982
42. *Calodia ostenta* (Distant, 1982)
43. *Calodia rama* (Kirkaldy, 1910)
44. *Calodia sparsispinulata* Nielson, 1982
 Genus 26 *Londiana*, Nielson, 1982
45. *Londiana nocturna* (Distant, 1908)
 Genus 27 *Mahellus* Nielson, 1982
46. *Mahellus distanti* Nielson, 1982
 Tribe THAGRIINI
 Genus 28 *Thagria* Melichar

47. *Thagria capitata* Distant, 1918
 48. *Thagria coonoorensis* (Distant, 1918)
 49. *Thagria singularis* Nielson, 1977

Subfamily XII IASSINAE Walker, 1870

Genus 29 *Iassus* Fabricius, 1803

50. *Iassus indicus* (Lethierry, 1892)
 51. *Iassus magnus* (Distant, 1916)

Subfamily XIII PENTHIMIINAE
 Kirschbaum, 1868.

Tribe PENTHIMINI

Genus 30 *Haranga* Distant, 1908

52. *Haranga decutata* Distant, 1918

Genus 31 *Neodartus* Melichar, 1903

53. *Neodartus acocephaloides* Melichar, 1903.

Genus 32 *Penthimia* Germar, 1821

54. *Penthimia flavocapitata* Distant, 1918.
 55. *Penthimia funebris* Distant, 1918.
 56. *Penthimia montana* Distant, 1918.
 57. *Penthimia nilgiriensis* Distant, 1918.
 58. *Penthimia subnigra* Distant, 1908.

Genus 33 *Tambila* Distant, 1908.

59. *Tambila* sp.

Subfamily XIV KRISNINAE

Tribe KRISININI Evans, 1947.

Genus 34 *Krisna* Kirkaldy, 1900.

60. *Krisna strigicollis* (Spinola, 1852).

Subfamily XV PARABOLOPONINAE
 Ishihara, 1953.

Genus 35 *Carvaka* Distant, 1918

61. *Carvaka modesta* Distant, 1918
 62. *Carvaka picturata* Distant, 1918
 63. *Carvaka thoracica* Distant, 1918

Subfamily XVI DRABESCINAE Ishihara,
 1953.

Genus 36 *Drabescus* Stål, 1870

64. *Drabescus stramineous* Distant, 1908.

Subfamily XVII HECALINAE Distant, 1908

Tribe HECALINI

Genus 37 *Hecalus* Stål, 1864.

65. *Hecalus apicalis* (Matsumura, 1912)
 66. *Hecalus arcuatus* (de Motschulsky, 1854)
 67. *Hecalus lutescens* (Distant, 1918)
 68. *Hecalus porrectus* (Walker, 1858)

Subfamily XVIII DELTOCEPHALINAE
 Fieber, 1869.

Tribe ATHYSANINI Van duzee, 1892.

Genus 38 *Divitiacus* Distant, 1918

69. *Divitiacus primus* Distant, 1918

Genus 39 *Lampridius* Distant, 1918.

70. *Lampridius spectabilis* Distant, 1918.

Genus 40 *Parallygus* Melichar, 1903.

71. *Parallygus divaricatus* Melichar, 1903.

Tribe BALCLUTHINI Baker, 1915

Genus 41 *Balclutha* Kirkaldy, 1900

72. *Balclutha indica* (Singh-Pruthi, 1930)
 73. *Balclutha saltuella* (Kirschbaum, 1868)

Tribe COLLADONINI Bliven, 1955.

Genus 42 *Galerius* Distant, 1918

74. *Galerius indicatrix* Distant, 1918.

Genus 43 *Maximianus* Distant, 1918

75. *Maximianus cephalicus* Distant, 1918

Tribe DELTOCEPHALINI Dallas, 1870

Genus 44 *Recilia* Edwards, 1860

Tribe TYPHLOCYBINI

Genus 63 *Typhlocyba* Germar, 1833

104. *Typhlocyba cardinalis* Distant, 1918

105. *Typhlocyba guttula* Distant, 1918

Subfamily XXI SIGNORETIMAE, Baker, 1915

Genus 64 *Signoretia* Stål

106. *Signoretia* sp.

SYSTEMATIC ACCOUNT

(*Species collected during current NBR Surveys)

Family CICADELLIDAE Latrielle

Subfamily HYLICINAE Distant

Genus *Balala* Distant

1. *Balala fulviventris* (Walker)

Locality : Nilgiri Hills.

Altitude : 1000 m.

Habitat : Grasslands to Deciduous forests.

Status : Rare locally.

Source : Metcalf (1962).

Distribution : India : Assam; Nilgiri; Borneo; Burma; Formosa; Fukien; Sumatra.

Remarks : This species is of rare occurrence locally as well as in Assam.

Genus *Traiguma* Distant

2. *Traiguma nasuta* Distant

Locality : Nilgiri Hills : Ooty.

Altitude : 2700 m.

Habitat : Grasslands; evergreen forests.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1962).

Distribution : Nilgiri Hills

Remarks : This species has not been reported from any other place since 1918. It is endemic to Nilgiri Hills.

Subfamily ULOPINAE

Genus *Moonia* Distant

3. *Moonia capitata* Distant

Locality : Nilgiri Hills.

Altitude : Ca 900 m.

Habitat : Shrubs, trees.

Status : Rare to Nilgiri Hills.

Source : Sing - Pruthi (1934).

Distribution : India : Nilgiri Hills, Chikkabalapura.

Remarks : It is a rare species for Nilgiri and South India.

4. *Moonia variabilis* Distant

Locality : Nilgiri Hills.

Altitude : Ca 900 m.

Habitat : Shrubs, trees evergreen forests.

Status : Rare in South India.

Source : Rao and Ramakrishnan (1978)

Distribution : South India : Nilgiri, Kodaikanal.

Remarks : It is absent in North India and other places. It is rare in Nilgiri.

Subfamily LEDRINAE

Genus *Petalocephala* Stål

5. *Petalocephala cephalotes* Distant

Locality : Nilgiri Hills : Coonoor.

Altitude : Ca 1100 m.

Habitat : Grasslands, deciduous to evergreen forests.

Status : Endemic to Nilgiri Hills.

Distribution : India : Nilgiri Hills.

Remarks : Endemic to Nilgiris.

6. *Petalocephala granulosa* Distant

Locality : Nilgiri Hills : Ooty.

Altitude : 900 to 1100 m.

Habitat : Grasslands, deciduous to evergreen forests.

Status : Fairly common in South India.

Distribution : India : Bengal, Bihar, S. India: Chikkabalapura, Coorg, Mysore.

Remarks : This is rare in South India.

7. *Petaloccephala nigrilinea* (Walker)

Locality : Nilgiri Hills.

Altitude : 910 to 1100 m.

Habitat : Semi evergreen forests, grasslands.

Status : Rare in India.

Source : Metcalf (1962).

Distribution : India : Bombay, Coorg, Salem, Burma, Singapore, Sri Lanka.

Remarks : It occurs only in a few places in India.

8. *Petaloccephala umbrosa* Distant

Locality : Nilgiri Hills : Ooty.

Altitude : 2700 m.

Habitat : Grasslands, deciduous forests.

Status : Rare in its place of occurrence.

Source : Metcalf (1962)

Distribution : India : Assam, Bombay, Nilgiri.

Remarks : It is not common in its occurrence.

9. *Petaloccephala uniformis* Distant

Locality : Nilgiri Hills.

Altitude : Ca 1100 m.

Habitat : Deciduous forests grasslands.

Status : Rare in South India.

Source : Metcalf (1962).

Distribution : India : Bombay, Coorg, Mysore, Singapore; Sri Lanka.

Remarks : This is a rare species having been

reported from South India only.

Genus *Tituria* Stål

10. *Tituria acutangulata* (Distant)

Locality : Nilgiri Hills.

Altitude : Ca 910 m.

Habitat : Grasslands, Shrubs.

Status : Rare in India.

Source : Metcalf (1962).

Distribution : It is supposed to be present in North India according to Distant (1918) besides Nilgiris. It is also reported from Java.

Remarks : In South India it occurs in Nilgiri only.

Subfamily APHRODINAE

Genus *Gurawa* Distant

11. *Gurawa vexillum* Distant*

Locality : Nilgiri, Pykara, Mullakorai.

Altitude : 2160 m.

Habitat : Semi evergreen forests.

Status : Rare in India.

Source : Evans (1947) and Rao (1990)

Distribution : India : Eastern Himalaya; South India; Kodaikanal; Sikkim.

Remarks : Recorded from Nilgiri Biosphere Reserve for the first time.

Genus *Leofa* Distant.

12. *Leofa pedestris* Distant

Locality : Nilgiri Hills.

Altitude : 1000 m.

Habitat : Grasslands, herbage.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1963).

Distribution : Reported only from Nilgiri Hills so far.

Remarks : These are small insects with abbreviated tegmen and ranging upto 4mm in length.

Subfamily EVACANTHINAE

Genus *Dussana* Distant

13. *Dussana quaerenda* Distant*

Locality : Nilgiri : Ithalur.

Altitude : 2000 m.

Habitat : Mountain forests, Evergreen vegetation.

Status : Rare in North India.

Source : Sing-Pruthi (1934) and Rao (1990).

Distribution : India : Meghalaya : Ranikhor; Palni Hills; Sri Lanka.

Remarks : From North India it is reported from Meghalaya only. First record for Nilgiris.

Subfamily CICADELLINAE Latreille

Genus ANATIKANA Young

14. *Anatikana infecta* (Distant)*

Locality : Periyar : Gethesal, Hassanur; Coimbatore; Kunjapani.

Altitude : 1200 to 1250 m.

Habitat : Semi evergreen forests.

Status : Rare in India.

Source : Young (1986)

Distribution : W. Bengal; Calcutta; S.India; Tamil Nadu; Kodaikanal.

Remarks : Recorded for the first time from Nilgiri Biosphere Reserve Area.

15. *Anatikana kotagiriensis* (Distant)

Locality : Nilgiri Hills : Kotagiri.

Altitude : 1740 m.

Habitat : Evergreen forests.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1962).

Distribution : Restricted to Kotagiri only.

Remarks : It is endemic to Kotagiri. It as first described from there in 1908 by Distant and since then it has not been reported from anywhere else.

Genus *Atkinsoniella* Distant

16. *Atkinsoniella opponens* (Walker)*

Locality : Nilgiri : Long wood shola forest, Kotagiri, Pykara, Naduvattam; Coimbatore, Siruvani; Periyar : Gethesal, Hassanur.

Altitude : 1040 to 2160 m.

Habitat : Semi evergreen to evergreen forests.

Status : Common in North India.

Source : Young (1986)

Distribution : Nepal, Sikkim, India : Darjeeling, Kumaon, Punjab, Utter Pradesh, Bengal, Assam, S. India; Burma; Laos; China; N. W. Thailand; Vietnam; Indonesia; Sumatra; Java; Kangeon IS; Malaysia; Philippines.

Remarks : Widely distributed in Southeast Asia.

Genus *Bothrogonia* Melichar

17. *Bothrogonia ferruginea* (Fabricius)

Locality : Palghat; Silent Valley, Valiyaparathodu.

Habitat : Lush green forests.

Status : Not common.

Source : Rao (1986), Young (1986).

Distribution : North India, Assam, Khasi Hills, Manipur; Burma and Indonesia.

Remarks : It is a new record for Nilgiri Biosphere Reserve area and to Southern India.

18. *Bothrogonia sclerotica* Young*

Locality : Periyar : Gethesal.

Altitude : 1250 m.

Habitat : Mountain forests; Deciduous to evergreen.

Status : Fairly common in South India.

Source : Young (1986).

Distribution : S. India; Anamalai Hills, Coorg, Coimbatore, Gudalur, Marcara, Malabar, Nallampatti Hills, Tanjore, Travancore.

Remarks : It is widely distributed in Southern India.

Genus *Cofana* Melichar

19. *Cofana spectra* (Distant)*

Locality : Nilgiri : Kinnakorai, Kakkanalla, Kodanadu; Periyar : Karapalyam, Hassanur, Dhimbam; Coimbatore; Kodangarai, Siruvani; Kunjapani, Palghat; Silent Valley-Kuntipuzha.

Altitude : 500-2300 m.

Habitat : Grasslands along the course of waterbodies.

Status : Common.

Source : Young (1979), Rao (1990)

Distribution : India, Sri Lanka, Burma, Philippines, Japan, Australia, Africa, Burma, Borneo; Celebes; Formosa, Java; Laos; Malaya; Nepal; Pakistan, Sarawak, Sumatra; New Guinea; New Caledonia; Fiji Islands.

Remarks : A widely distributed species and can be distinguished by its pristine white colour extremely.

20. *Cofana unimaculata* (Signoret)*

Locality : Bandipur: Maddur, Chodapur; Coorg.

Altitude :

Habitat : Deciduous to semi evergreen vegetation.

Status : Common in North India.

Source : Mathur (1953), Young (1979)

Distribution : India : Assam, Bengal, Mysore-Coorg, U.P.; Africa; Australia; Burma; Borneo; Cambodea; China; Java; Luzon; Malaya; Nepal; Pakistan; Philippines.

Remarks : It is rare in South India.

Genus *Genuga* Melichar

21. *Genuga quadrilineata* (Signoret)

Locality : Nilgiri Hills.

Altitude : 910-1100 m.

Habitat : Deciduous vegetation, shrubs.

Status : Rare in South India.

Source : Metcalf (1965)

Distribution : Madras.

Remarks : Although its distributional record is not very clear, it appears to occur only in Nilgiri.

Genus *Kolla* Distant

22. *Kolla paulula* (Walker)*

Locality : Periyar : Dhimbam, Gethesal, Hassanur; Nilgiri; Kakanalla, Kallaru.

Altitude : 460 to 1250 m.

Habitat : Dense green forests.

Status : Common.

Source : Metcalf (1965)

Distribution : India : Bengal; Burma; Flores; Java; Lambok; Malacca; Philippines; Sri Lanka; Sumatra.

Remarks : First record from Nilgiri.

23. *Kolla pronotalis* Distant

Locality : Nilgiri Hills : Lovedale

Altitude : Ca 1000 m.

Habitat : Grasslands to evergreen forests.

Status : Endemic to Evergreen forests.

Source : Metcalf (1965).

Distribution : India : Nilgiri.

Remarks : This is known from Nilgiri Hills and is endemic to the area.

Genus : *Tettigella* China and Fennah

24. *Tettigella habilis* Distant

Locality : Nilgiri Hills.

Altitude : 910 to 1100 m.

Habitat : Deciduous to evergreen forests.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1965).

Distribution : India : Nilgiri Hills.

Remarks : This is restricted to Nilgiri Hills.

25. *Tettigella indica* Distant

Locality : Nilgiri Hills.

Altitude : 910-1100 m.

Habitat : Deciduous to evergreen forests.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1965).

Distribution : Restricted to Nilgiri only.

Remarks : Not reported from any other area so far.

26. *Tettigella sandaracata* (Distant)

Locality : Nilgiri Hills.

Altitude : 910 to 1100 m.

Habitat : Deciduous to evergreen forests.

Status : Rare.

Source : Metcalf (1965)

Distribution : India : Eastern Himalayas : Darjeeling; Nilgiri.

Remarks : It is rare species not reported from anywhere after 1918.

Genus *Ujna* Distant

27. *Ujna delicatula* Distant*

Locality : Periyar : Dhimbam

Altitude : 840 m.

Habitat : Semi evergreen forests

Status : Rare in India.

Source : Distant (1918)

Distribution : Sri Lanka

Remarks : It is a new record to India. The specimen has been collected for the first time after 1918.

28. *Ujna* sp.*

Locality : Periyar : Gethesal

Altitude : 1250 m.

Habitat : Deciduous to evergreen forests

Remarks : There is only a female specimen, but it is a new species. However it will be described when males are obtained.

Subfamily NIRVANINAE Baker

Genus *Kana* Distant

29. *Kana modesta* Distant

Locality : Nilgiri Hills, Coonoor

Altitude : Ca 1800 m.

Habitat : Deciduous to evergreen forest.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1963)

Distribution : Restricted to Nilgiri Hills.

Remarks : This has not been collected from other areas.

Genus NIRVANA Kirkaldy

30. *Nirvana pallida* Melichar*

Locality : Periyar : Dhimbam; Coimbatore; Kunjapani, Siruvani.

Altitude : 740-1200 m.

Habitat : Grasslands, semi-evergreen forests.

Status : Common in India.

Source : Rao (1990)

Distribution : Well distributed in the Oriental Region especially in the Indo-Chinese Sub-region.

Remarks : A new record for the Nilgiri Biosphere Reserve. A linear line on the vertex is very pale.

31. *Nirvana suturalis* Melichar

Locality : Nilgiri Hills : Lovedale.

Altitude : 800 – 1100 m.

Habitat : Grasslands, deciduous and evergreen forests.

Status : Rare in North India.

Source : Mathur (1953); Metcalf (1963).

Distribution : India : Darjeeling, Fraserpet, Kodaikanal, Salem; Burma; China; Formosa; Japan; Lombok.

Remarks : This species is fairly common in South India, whereas in the north it appears to be rare.

Genus *Mukaria* Distant

32. *Mukaria penthimioides* Distant*

Locality : Nilgiri : Kakanalla.

Altitude : 1000 m.

Habitat : Scrub vegetation, grasses.

Status : Rare, locally.

Source : Evans (1991), Metcalf (1963).

Distribution : S. India, Palni Hills, Sri Lanka.

Remarks : It is being reported from Nilgiri Biosphere area for the first time.

Subfamily MACROPSINAE

Genus *Macropsis* Lewis

33. *Macropsis garuda* Distant

Locality : Nilgiri Hills

Altitude : Ca 1000 m.

Habitat : Dry deciduous to montane rain forests.

Status : Endemic

Source : Metcalf (1966)

Distribution : Nilgiri Hills.

Remarks : This is endemic to Nilgiri Hills.

34. *Macropsis lovedalensis* Distant

Locality : Nilgiri Hills.

Altitude : Ca 900 m to 1000 m.

Habitat : Dry deciduous to montane rain forests.

Status : Endemic

Source : Metcalf.

Distribution : Nilgiri Hills.

Remarks : It is endemic to Nilgiri Hills.

35. *Macropsis orientalis* Distant

Locality : Nilgiri Hills.

Altitude : 1000 m.

Habitat : Grasslands, deciduous and evergreen forests.

Status : Rare in South India; not recorded from North India.

Source : Mathur (1953), Metcalf (1966)

Distribution : India : Kodaikanal and Nilgiri Hills.

Remarks : It is not widely distributed in South India.

Subfamily ACALLINAE

Genus *Gunhilda* Distant

36. *Gunhilda noctua* Distant

Locality : Nilgiri Hills.

Altitude : Ca 900 m.

Habitat : Semi evergreen vegetation

Status : Endemic

Source : Metcalf (1966)

Distribution : It is known only from Nilgiri Hills.

Remarks : It is endemic and very rare. Pruthi (1934) reports that only female specimens of the species were described by Distant 1918. Males are yet to be found.

Genus *Igera* Kirkaldy.

37. *Igera bimaculicollis* (Stål)

Locality : Nilgiri Hills.

Altitude : Ca 1000 m.

Habitat : Grasslands to evergreen forests.

Status : Rare in South India.

Source : Metcalf (1966)

Distribution : India : Kodaikanal, Nilgiri, Bihar, Punjab, Mahe Islands; Congo; Flores; Fukien; Lambok; Seychelles islands; South Africa; Sumbawa.

Remarks : This species is absent in North India and in the South it is rare and occurs in a few places only.

Subfamily IDIOCERINAE Baker

Genus *Amritodes*

38. *Amritodes brevistylus* Viraktamath*

Locality : Coimbatore; Siruvani.

Altitude : 740 m.

Habitat : Mango trees.

Status : Common.

Source : Viraktamath (1983)

Distribution : India.

Remarks : It is a minor pest of mango.

Genus *Idioscopus* Baker

39. *Idioscopus clypealis* (Lethierry)*

Locality : Coimbatore : Kovai Courtalam.

Altitude : 500 m.

Habitat : Mango trees.

Status : Common in India.

Source : Capriles (1964), Viraktamath (1983)

Distribution : India : Assam, Bihar, Bengal, Bombay, Coorg, Mysore, Punjab, U.P.; Burma; China; Formosa; Java; Singapore; Sri Lanka.

Remarks : It is known as a serious pest on mango trees.

40. *Idioscopus niveosparsus* (Lethierry)*

Locality : Coimbatore : Kovai Courtalam.

Altitude : 500 m.

Habitat : Mango trees.

Status : Common.

Source : Carpriles (1964), Viraktamath (1983).

Distribution : Widely distributed in India and Sri Lanka.

Remarks : It is a serious pest on Mango.

Subfamily COELIDIINAE Dohrn

Genus *Calodia* Nielson

41. *Calodia kirkaldyi* Nielson

Locality : Nilgiri Hills.

Altitude : 900 m.

Habitat : Semi evergreen forests; Sandal forests.

Status : Common in South India

Source : Nielson (1982)

Distribution : Coimbatore, Nilgiri, Malabar.

Remarks : It does not occur in North India. It is a vector of sandal spike disease in Sandal wood trees.

42. *Calodia ostenta* (Distant)*

Locality : Coimbatore, Kovai Courtalam; Nilgiri, Coonoor.

Altitude : 600 m.

Habitat : Montane forests.

Status : Rare in North India.

Source : Nielson (1982)

Distribution : India : Coorg, Mysore, Travancore, Eastern Himalaya; Sri Lanka.

Remarks : It is not reported from North India so far.

43. *Calodia rama* (Kirkaldy)

Locality : Nilgiri Hills.

Altitude : 1100 m.

Habitat : Semi evergreen forests.

Status : Rare in North India.

Source : Nielson (1982).

Distribution : India : Bombay, Malabar, Nandi Durg, Nilgiri Hills, Velayar forests of Kerala.

Remarks : Fairly well represented in South India, but rare in North India.

44. *Calodia sparsispinulata* Nielson

Locality : Nilgiri Hills.

Altitude : 1100 m.

Habitat : Montane forests.

Status : Rare in South India, absent in North.

Source : Nielson (1982)

Distribution : India : Nilgiri, Malabar (610 m), Shevarey Hills (1500 m).

Remarks : Not represented in North India.

Genus *Londiana* Nielson

45. *Londiana nocturna* (Distant)

Locality : Nilgiri.

Altitude : 1200 m.

Habitat : Semi evergreen vegetation.

Status : Rare in South India.

Source : Nielson (1982)

Distribution : India : Assam, Nilgiri; Nepal (2135 m).

Remarks : It is a rare species occurring in a few places only.

Genus *Mahellus* Nielson

46. *Mahellus distanti* Nielson

Locality : Nilgiri Hills.

Altitude : Ca 1000 m.

Habitat : On leaves, Shrubs

Status : Rare and endemic to Nilgiris.

Source : Nielson (1982)

Distribution : It is an endemic species, being confined to Nilgiri Hills.

Genus *Thagria* Melichar

47. *Thagria capitata* Distant

Locality : Nilgiri, Coonoor, Burliar.

Altitude : 914-1525 m.

Habitat : Semi evergreen forests.

Status : Endemic.

Source : Nielson (1977).

Distribution : Nilgiri Hills.

Remarks : This is an endemic species not occurring anywhere else.

48. *Thagria coonoorensis* (Distant)

Locality : Nilgiri Hills : Coonoor.

Altitude : 1100 m.

Habitat : Semi evergreen forests.

Status : Endemic.

Source : Nielson (1977).

Distribution : Nilgiri Hills.

Remarks : This is not reported from any other area. It is an endemic species.

49. *Thagria singularis* Nielson*

Locality : Nilgiri : Kodanadu TE.

Altitude : 1600 m.

Habitat : Forest trees, semi evergreen forest.

Status : Common in South India.

Source : Nielson (1977).

Distribution : India : Travancore, Tenmalai, Periyar, Thekkadi, Coimbatore, Bolampath.

Remarks : This species has been described by Nielson from the Nilgiri area.

Subfamily IASSINAE Walker

Genus *Iassus* Fabricius

50. *Iassus indicus* (Lethierry)

Locality : Nilgiri Hills, Coorg.

Altitude : 800-1100m.

Habitat : Dry Deciduous forests, trees and herbage.

Status : Rare in India.

Source : Mathur (1953), Metcalf (1966).

Distribution : India : Calcutta, Coorg, Kodaikanal, Pusa; Africa; Burma; Formosa; Flores; Java; Lambok; Luzon; Sri Lanka; Seychelles; Sumatra.

Remarks : Not widely distributed in India.

51. *Iassus magnus* (Distant)

Locality : Nilgiri Hills.

Altitude : 800-1100 m.

Habitat : Grasslands shrubs and forests.

Status : Rare in South India. Absent in North.

Source : Mathur (1953).

Distribution : India : Coorg, Kodaikanal, Nilgiri, Mysore.

Remarks : Not widely distributed.

Subfamily PENTHIMI!NAE

Genus *Haranga* Distant

52. *Haranga decurvata* Distant

Locality : Nilgiri Hills.

Altitude : Ca 900 m.

Habitat : Grasslands, Green vegetation.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1962)

Distribution : India : Nilgiri.

Remarks : It has not been reported from anywhere else since 1908.

Genus *Neodartus* Melichar

53. *Neodartus acocephaloides* (Melichar)*

Locality : Coimbatore : Siruvani; Nilgiri; Kondanur; Coorg : Fraserpet.

Altitude : 500-1500 m.

Habitat : Semi evergreen forests.

Status : Common locally.

Source : Rao (in press), Mathur (1953).

Distribution : India : Bengal, Punjab and Tamil Nadu.

Remarks : It is widely distributed in Tamil Nadu. It breeds on forest trees and horticultural plants.

Genus PENTHIMIA Germar

54. *Penthimia flavocapitata* Distant

Locality : Nilgiri Hills.

Altitude : Ca 1000m.

Habitat : Mountain forests, evergreen vegetation.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1962).

Distribution : India : Nilgiri Hills.

Remarks : Restricted to the area of Nilgiri Hills only and hence endemic.

55. *Penthimia funebris* Distant

Locality : Nilgiri Hills : Lovedale.

Altitude : Ca 1000 m.

Habitat : Mountain trees, evergreen forests.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1962).

Distribution : India : Nilgiri Hills.

Remarks : This is endemic species to Nilgiri Hills.

56. *Penthimia montana* Distant

Locality : Nilgiri Hills : Lovedale

Altitude : Ca 1000m.

Habitat : Mountain trees, evergreen forest.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1962).

Distribution : India : Nilgiri

Remarks : This species is endemic to Nilgiri and it has not been reported from anywhere else.

57. *Penthimia nilgiriensis* Distant

Locality : Nilgiri Hills.

Altitude : Ca 1000 m.

Habitat : Deciduous to Evergreen forests.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1962).

Distribution : India : Nilgiri.

Remarks : This has not been recorded from any other area so far.

58. *Penthimia subnigra* Distant

Locality : Nilgiri Hills.

Altitude : 1000 m.

Habitat : Shrubs, low vegetation.

Source : Metcalf (1962).

Status : Endemic to Nilgiri Hills.

Distribution : India : Nilgiri.

Remarks : It has not been reported from anywhere else since 1908.

Genus *Tambila* Distant

59. *Tambila* sp.*

Locality : Nilgiri, Kodgarai.

Altitude : 500 m.

Habitat : Montane forests.

Status : Rare.

Remarks : Only a female specimen is available in the collections. It is a new species, but will be described after obtaining male specimens.

Subfamily KRISNINAE

Genus *Krisna* kirkaldy

60. *Krisna strigicollis* (Spinola)

Locality : Nilgiri Hills.

Altitude : Ca 900 m.

Habitat : Grasslands, semi decidious forest.

Status : Rare locally.

Source : Mathur (1953).

Distribution : India : Bengal, Bihar, Bombay, Uttar Pradesh, Nilgiri; Borneo; Burma; Celebes; Cambodia; China; Java; Japan; Malay; Singapore.

Remarks : It is widely distributed in South east Asia.

Subfamily PARABOLOPONINAE Ishihara

Genus *Carvaka* Distant

61. *Carvaka modesta* Distant

Locality : Nilgiri Hills, Lovedale

Altitude : Ca 900 m.

Habitat : Shrubs trees and herbage.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1966)

Distribution : Nilgiris only

Remarks : This is endemic to Nilgiris.

62. *Carvaka picturata* Distant

Locality : Nilgiri Hills.

Altitude : 1000 m.

Habitat : Grass fields; decidious to evergreen forests.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1966).

Distribution : Restricted to Nilgiri Hills.

Remarks : This is an endemic species. It has not been recorded anywhere else.

63. *Carvaka thoracica* Distant

Locality : Nilgiri Hills.

Altitude : 1000 m.

Habitat : Grass fields, deciduous to evergreen forest.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1966).

Distribution : It is known only from Nilgiri Hills.

Remarks : This happens to be another species endemic to Nilgiri Hills.

Subfamily DRABESCINAE Ishihara

Genus *Drabescus* Stål

64. *Drabescus stramineous* Distant

Locality : Nilgiri Hills.

Altitude : 900-1000 m.

Habitat : Deciduous to semi evergreen forests.

Status : Rare locally

Source : Metcalf (1966).

Distribution : India : Nilgiri Hills; Burma; Sri Lanka; Sumatra; Philippines.

Remarks : In India it is rare and has not been reported other than Nilgiri Hills.

Subfamily HECALINAE Distant

Genus *Hecalus* Stål

65. *Hecalus apicalis* (Matsumura)

Locality : Palghat : Silent Valley Eastern side of Advance camp.

Altitude : 840 m.

Habitat : Green vegetation and weeds.

Status : Rare in India.

Source : Morrison (1973), Rao (1986).

Distribution : India : Raipur; Sri Lanka; Formosa.

Remarks : Reported for the first time from the Nilgiri Biosphere Reserve Area.

66. *Hecalus arcuatus* (de Motschulsky)*

Locality : Bandipur-Maddur; Nilgiri : Nandidurg.

Habitat : Deciduous scrub forests.

Status : Rare in India.

Source : Morrison (1973), Rao (1990).

Distribution : India : Poona, Shillong; Maldives; Sri Lanka; Queensland.

Remarks : It is a rare species and first time collected from Nilgiri Biosphere Reserve.

67. *Hecalus lutescens* (Distant)

Locality : Nilgiri Hills.

Altitude : Ca 910 m.

Habitat : Grasslands shrubs, trees.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1963), Morrison (1973).

Distribution : India : Nilgiri.

Remarks : It is not reported from any other area.

68. *Hecalus porrectus* (Walker)*

Locality : Nilgiri : Longwood Forest - Kotagiri, Bikkati, Emerald, Kumtha, Kodanadu T.E. Lovedale : Silent Valley, Kumatanthodu.

Altitude : 1740 - 2000 m.

Habitat : Moist deciduous forest to evergreen forest.

Status : Common in India.

Source : Morrison (1973), Rao (1986).

Distribution : Well distributed in India; Maldive islands; Australia.

Remarks : A new record to Nilgiri Biosphere Reserve.

Subfamily DELTOCEPHALINAE Fieber

Genus *Divitiacus* Distant

69. *Divitiacus primus* Distant

Locality : Nilgiri Hills : Ooty Doddabetta.

Altitude : 2500 - 2700 m.

Habitat : Grasslands to evergreen forests.

Status : Endemic to Nilgiri Hills.

Source : Viraktamath and Viraktamath (1980).

Distribution : Restricted to Nilgiri Hills.

Remarks : Viraktamath (1980) reports that this is a distinct species and cannot be synonymised with *Deltocephalus Coranifer* Marshall.

Genus *Lampridius* Distant

70. *Lampridius spectabilis* Distant*

Locality : Nilgiri : Ooty.

Altitude : 2700 m.

Habitat : Mountain trees, Semi evergreen forests.

Status : Rare in South India.

Source : Viraktamath and Viraktamath (1980).

Distribution : India : Karnataka, Yellapur; Nilgiri; Burma.

Remarks : It is not reported in North India, and very little is known from South India.

Genus *Parallogus* Melichar

71. *Parallogus divaricatus* Melichar*

Locality : Nilgiri : Siruvani.

Altitude : 740 m.

Habitat : Mountain forests, trees.

Status : Rare in South India. Absent in North.

Source : Mathur (1953).

Distribution : India : Kodaikanal, Nilgiri Hills; Formosa; Sri Lanka.

Remarks : Reported from Nilgiri Hills as early as 1918. It is not reported from North India.

Genus *Balclutha* Kirkaldy

72. *Balclutha indica* (Singh-Pruthi)*

Locality : Palghat : Silent Valley, Pathanthodu.

Altitude : 860 m.

Habitat : Forest trees.

Status : Rare in South India.

Source : Knight (1987), Rao (1990).

Distribution : India : Himalayas, Madhya Pradesh, Madras.

Remarks : Recorded for the first time from Nilgiri Biosphere.

73. *Balclutha saltuella* (Kirschbaum)*

Locality : Nilgiri : Avalanchi, Kodanadu T.E.

Altitude : 1080-1600 m.

Habitat : Forest trees.

Status : Rare

Source : Knight (1987), Rao (1990).

Distribution : India : Khasi hills, Mairang, Shillong, Egypt and Europe.

Remarks : Reported for the first time from South India and Nilgiri.

Genus *Galerius* Distant

74. *Galerius indicatrix* Distant

Locality : Nilgiri Hills.

Altitude : 800 1100 m.

Habitat : Grasslands to deciduous forest.

Status : Rare in South India.

Source : Metcalf (1967).

Distribution : South India : Chikkabalapura, Kodaikanal and Nilgiri Hills.

Remarks : It is absent in North India and rare in South India.

Genus *Maximianus* Distant

75. *Maximianus cephalicus* Distant

Locality : Nilgiri Hills : Lovedale.

Altitude : Ca 1100 m.

Habitat : Semi evergreen forests.

Status : Endemic

Source : Metcalf (1967).

Distribution : Nilgiri Hills.

Remarks : Distribution is only in Nilgiri Hills. It is endemic to the area.

Genus *Recilia* Edwards

76. *Recilia dorsalis* (de Motschulsky)*

Locality : Nilgiri: Doddahathi, Kakanalla, Kinnakorai.

Altitude : 1040 - 2300 m.

Habitat : Paddy fields and grasslands.

Status : Common in India.

Source : Rao (1990)

Distribution : India : Bengal, Assam, Tamil Nadu, Kerala; Borneo; China; Formosa; Korea; Lamby islands; Luzon; Malay; Philippines.

77. *Recilia intermedia* (Melichar)*

Locality : Periyar : Dhimbam.

Altitude : 840 m.

Habitat : Scrub jungle, deciduous forests.

Status : Rare in India.

Source : Rao (1990)

Distribution : India : Meghalaya; Sri Lanka.

Remarks : Reported first time from South India.

Genus *Paramesodes* Ishihara

78. *Paramesodes lineaticollis* (Distant)*

Locality : Nilgiri : Mudumalai.

Altitude : 1100 m.

Habitat : Occurs on grasses, weeds and shrubs.

Status : Common in North India.

Source : Wilson (1983).

Distribution : India : Bengal; Bihar; Pusa, Manipur; U.P., Dehra Dun, Kathgodam; Java; Luzon; Formosa; Philippines.

Remarks : Recorded for the first time from South India.

Genus *Nephotettix* Matsumura

79. *Nephotettix nigropictus* (Stål)*

Locality : Nilgiri : Kumtha, Doddahathi; Palghat: Silent Valley; Kunthipuzha; Coimbatore.

Altitude : 1040 - 2000 m.

Habitat : Grasslands; Semi evergreen forests.

Status : Common in India.

Source : Ghauri (1971), Rao (1990).

Distribution : Widely distributed in the Indian sub continent and South-east Asia.

Remarks : It is a major pest of rice transmitting rice Thungro virus and causing damage to the crops.

80. *Nephotettix virescens* (Distant)*

Locality : Periyar: Bhavanisagar; Nilgiri: Kumtha; Coimbatore; Atupalani; Palghat: Kunthipuzha.

Altitude : 440 to 2000 m.

Habitat : Low vegetation in Semi evergreen forests.

Status : Very common in India.

Source : Ghauri (1971), Rao (1990)

Distribution : Indian sub continent and South East Asia.

Remarks : It is a pest of rice. It is also a vector transmitting Rice Tungro virus and Rice yellow dwarf.

Genus *Exitianus* Ball

81. *Exitianus indicus* (Distant)*

Locality : Nilgiri: Bikkati, Emerald, Long wood

Shola Forest - Kotagiri, Kumtha, Mukuriti, Kodanadu T.E., Kakanalla, Kinnakorai, Pykara, Naduvattom; Coimbatore; Kodugaru, Siruvani; Periyar: Dhimbam, Hassanur, Karapalayam, Mysore: Bandipur - Maddur, Palghat: Silent Valley - Kuntipuzha, Valiaparathodu.

Altitude : 220 to 2300 m.

Habitat : Scrub jungle to evergreen forests.

Status : Common in India.

Source : Rose (1968), Rao (1986).

Distribution : Bombay, Poona, Pusa, Madras; Java; Bali; Lampok; Philippines; Australia.

Remarks : This species is widely distributed and can be distinguished by the dark line on the vertex.

82. *Exitianus ootacamundus* Distant

Locality : Nilgiri Hills : Ooty.

Altitude : 2700 m.

Habitat : Mainly grasslands and shrubs

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1967).

Distribution : Restricted to Ooty only.

Remarks : This species has not been reported from any other area. It is endemic to Nilgiri Hills.

Genus *Hishimonus* Ishihara

83. *Hishimonus phycitis* (Distant)*

Locality : Nilgiri: Araikotta.

Altitude : 800 m.

Habitat : Shrubs, Crops and Vegetation.

Status : Common in India.

Source : Knight (1970)

Distribution : India : Bengal, Bihar, Tamil Nadu, Australia; China; Sri Lanka.

Remarks : This species is economically important as it transmits the little leaf virus in egg plants.

Genus *Changwhania* Kwon

84. *Changwhania ceylonensis* (Baker)*

Locality : Periyar : Gethesal; Coimbatore: Siruvani.

Altitude : 740m - 1250m.

Habitat : Deciduous to semi evergreen.

Status : Rare in India.

Source : Webb & Heller (1990), Rao (in press).

Distribution : India; Sri Lanka; South East Asia.

Remarks : The species exhibits discontinuous distribution occurring in North East India and Southern India only.

Genus *Paralimnus* Matsumura

85. *Paralimnus albomaculatus* Distant

Locality : Nilgiri Hills and Coorg

Altitude : 900-1000 m.

Habitat : Deciduous to semi evergreen forest.

Status : Rare in North India.

Source : Mathur (1953).

Distribution : Bengal, Bombay, Mysore, Coorg, Cargo; Java; Sri Lanka.

Remarks : This species is quite rare in the north of our country, although it is not very common in the South.

86. *Paralimnus lateralis* (Walker)*

Locality : Nilgiri: Kallaru; Periyar, Gethesal.

Altitude : 460-1250 m.

Habitat : Semi evergreen forests.

Status : Common in North India.

Source : Mathur (1953).

Distribution : India : Bengal, Bihar, Bombay, Nilgiri; Africa; Java; Formosa; Tanganyika; Sarawak.

Remarks : This has been first reported from Nilgiris in 1918.

Genus *Platyretus* Melichar

87. *Platyretus marginatus* Melichar*

Locality : Nilgiri; Kakanalla.

Altitude : 1000 m.

Habitat : Forest trees, semi evergreen forests.

Status : Rare in India.

Source : Evans (1947), Mathur (1953).

Distribution : India, Bengal, Salem, Burma; Flores; Sri Lanka; Sambawa.

Remarks : It is reported from Nilgiri Biosphere area for the first time.

Genus *Scaphoideus* Uhler

88. *Scaphoideus* sp.*

Locality : Nilgiri : Mudumalai.

Altitude : 1090 m.

Habitat : Semi evergreen vegetations.

Remarks : This species is new to science and will be described in due course.

89. *Scaphoideus* sp.*

Locality : Nilgiri : Mudumalai.

Altitude : 1090 m.

Habitat : Forest trees, semi evergreen vegetations.

Remarks : This species is new to science and will be described in course of time.

90. *Scaphoideus redundans* Distant

Locality : Nilgiri Hills.

Altitude : Ca 910 m.

Habitat : Montane forests.

Status : Rare in South India.

Source : Metcalf (1967).

Distribution : Kodaikanal, Nilgiri.

Remarks : This is a rare species occurring in Kodaikanal besides Nilgiri.

Genus *Nandidurg* Distant

91. *Nandidurg speciosum* Distant*

Locality : Nilgiri : Mudumalai.

Altitude : 1040 m.

Habitat : Semi evergreen vegetation.

Status : Rare in South India.

Source : Sing and Pruthi (1934).

Distribution : South India; Nandidurg.

Remarks : It is so far known from Nandidurg only. Hence it is a new record for Nilgiri Biosphere area.

Genus *Doratulina* Melichar

92. *Doratulina jacosa* Melichar*

Locality : Silent Valley: along Kunthipuzha.

Altitude : 900 m.

Habitat : Evergreen vegetation.

Status : Rare in locally.

Source : Rao (1986).

Distribution : India : Silent valley; Japan; Sri Lanka.

Remarks : This species was recorded in Silent Valley in 1986 by the author. This is not represented in North India.

93. *Doratulina laetus* (Melichar)*

Locality : Coimbatore; Kunjapani; Silent valley.

Altitude : 1200 m.

Habitat : Occurs on low grasses and shrubs.

Status : Rare locally.

Source : Rao (1986)

Distribution : India : Silent valley - dam site: Sri Lanka.

Remarks : It is a rare species. Recorded from Nilgiri Biosphere reserve area for the second time. Earlier it was recorded by the author in 1986, from Silent Valley.

94. *Doratulina notata* (Distant)

Locality : Nilgiri : Ooty - Doddabetta.

Altitude : 2500 - 2700m.

Habitat : Grasslands to evergreen forests.

Status : Endemic to Nilgiri Hills.

Source : Viraktamath & Viraktamath, (1980).

Distribution : Nilgiri Only.

Remarks : This is an endemic species to Nilgiri and has not been so far reported anywhere else.

Genus *Thamnotettix* Zetterstedt

95. *Thamnotettix paraveinatus* Singh-Pruthi*

Locality : Silent valley - Valiyaparathodu

Altitude : 860 m.

Habitat : Grasslands; Shrubs.

Status : Rare locally.

Source : Rao (1986).

Distribution : India : Bengal, Kodaikanal, Mysore, Sikkim.

Remarks : It is reported from Nilgiri Biosphere area for the first time.

96. *Thamnotettix veinatus* Singh-Pruthi.

Locality : Nilgiri Hills.

Altitude : Ca 1090 m.

Habitat : Grasslands to semi evergreen forest.

Status : Rare in North India.

Source : Singh-Pruthi (1930).

Distribution : India : M.P. : Rewa, Mysore, Shimoga, Tuppur.

Remarks : Although rare in North India, it is not common in South India.

Sub family XESTOCE PHAEINAE Baker

Genus *Ootacamundus* Distant

97. *Ootacamundus typicus* Distant

Locality : Ooty.

Altitude : 3000 m.

Habitat : Dense evergreen forest.

Status : Endemic.

Source : Metcalf (1967).

Distribution : Ooty.

Remarks : It is not recorded anywhere else. It is endemic to Nilgiri Biosphere area.

Genus *Xestocephalus* Van Duzee

98. *Xestocephalus nilgiriensis* Distant

Locality : Nilgiri Hills.

Altitude : Ca 1000 m.

Habitat : Low bushes, Green vegetation.

Status : Endemic.

Source : Metcalf (1967).

Distribution : Nilgiri Hills: Love Dale.

Remarks : This is endemic to Nilgiri.

Subfamily TYPHLOCYBINAE Kirschbaum

Genus *Empoasca* Walsh

99. *Empoasca radha* Distant

Locality : Nilgiri Hills.

Altitude : Ca 1000 m.

Habitat : Forest trees, deciduous to evergreen forest.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1968).

Distribution : Nilgiri Hills.

Remarks : It is not reported from any other region so far.

Genus *Amrasca* Ghauri

100. *Amrasca biguttula biguttula* (Ishida)*

Locality : Coimbatore: Siruvani.

Altitude : 740 m.

Habitat : Cotton, cereals and Horticulture crops.

Status : Common in India.

Source : Sohi (1983)

Distribution : India : Bengal, Bihar, Bombay, Delhi, Hyderabad, Madhya Pradesh, Mysore, Punjab, U.P.; Burma; Sudan; Sind.

Remarks : It is a serious pest of cotton, and it also attacks many economic plants and horticultural crops.

Genus *Empoascanara* Distant

101. *Empoascanara indica* (Datta)*

Locality : Coimbatore : Kovai Courtalam.

Altitude : 600 m.

Habitat : Large grasses and green vegetations.

Status : Common in North India.

Source : Sohi (1983).

Distribution : India : Delhi, Warangal, Raipur, Mandiia; Pakistan.

Remarks : It is a mild pest on rice and Maize.

Genus *Empoanara* Distant

102. *Empoanara militaris* Distant

Locality : Nilgiri Hills.

Altitude : Ca 1000 m.

Habitat : Evergreen forests.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1968).

Distribution : It is recorded from Nilgiri; Love Dale.

Remarks : This species has not been recorded from anywhere else.

Genus *Seriana* Dwora kowska

103. *Seriana jaina* (Distant)*

Locality : Periyar : Gethesal, Hassanur.

Altitude : 1100 1250 m.

Habitat : Grasslands, forest trees.

Status : Rare locally.

Source : Metcalf (1968).

Distribution : India : Bengal, Bihar.

Remarks : Recorded for the first time from Nilgiri Biosphere area.

Genus *Typhlocyba* Germar

104. *Typhlocyba cardinalis* Distant

Locality : Nilgiri Hills.

Altitude : Ca 1000 m.

Habitat : Forest trees, evergreen vegetation.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1968)

Distribution : This species is endemic to the area. It has not been collected from anywhere else.

105. *Typhlocyba quttula* Distant

Locality : Nilgiri Hills.

Altitude : Ca 1000 m.

Habitat : Forest leaves; deciduous to evergreen vegetation.

Status : Endemic to Nilgiri Hills.

Source : Metcalf (1968)

Distribution : Restricted to Nilgiri only.

Remarks : This is endemic to the area.

Subfamily SIGNORETINAE Baker

Genus *Signoretia* Stål

106. *Signoretia* sp.*

Locality : Nilgiri : Doddahathi.

Altitude : 1040 m.

Habitat : Montane forests, deciduous to semi-evergreen.

Status : Rare locally.

Source : Rao (1990)

Distribution : This is the only representative collected from the subfamily signoretinae. It is a female specimen collected and will be further identified after getting males.

SUMMARY

Studies on leafhoppers of Nilgiri Biosphere Reserve have provided as many as 106 species out of which 45 species represent the number actually collected from various surveys in the area. This includes three interesting species coming from genera *Scaphoideus* Uhler and *Ujna* Distant. One new record for India has been established in *Ujna delicatula* Distant.

A cursory glance at the inventory will also reveal that 37 species are endemic to Nilgiri Biosphere and 17 species are recorded from here for the first time. 4 species are also rare to the area. Besides, 26 species are rare to India as a whole and 23 are common. Quantitatively the leafhopper fauna of Nilgiri Biosphere Reserve is of 7-9 per cent of the total Indian Cicadellidae. It is significant that 21 subfamilies are recorded in this paper out of 25 subfamilies reported from India (Rao, 1990).

With regard to zoogeography the NBR provides a theatre for projecting a random admixture of all zoogeographical elements. Genera like *Balclutha*

Kirkaldy, *Exitianus* Ball and *Scaphoideus* Uhler are cosmopolitan. Genera like *Nephotettix* Matsumura, *Doratulina* Melichar, *Nirvana* Kirkaldy, *Dussana* Distant, *Calodia* Nielson, *Londiana* Nielson, *Thagria* Melichar are oriental in distribution, *Nephotettix* also being Ethiopian.

On the economic front many leafhoppers which are major pests on *Gossypium*, *Mangifera* and *Oryza* represented by genera like *Amrasca* Ghauri, *Idioscopus* Baker and *Nephotettix* Matsumura are recorded. Other leafhopper of importance are from *Cofana* Melichar, *Empoasca* Walsh, *Exitianus* Ball, *Hecalus* Stål, *Balclutha* Kirkaldy, *Recilia* Edwards, *Neodartus* Melichar *Hishimonus* Ishihara etc. which attack a variety of agri and horticultural plants.

Human activity, of late, in the area is causing habitat destruction and damage to ecosystem resulting in eventual loss of biodiversity of the area. Many endemic species listed in this paper are not available or being lost in a phased manner.

It is therefore of utmost importance to plan for biological productivity in a sustainable manner protecting the ecological heritage and biological diversity at the same time. We should therefore turn an attention to sacred grooves such as that of "Ilangudipatti village" in Tamil Nadu to poster management and maintenance. Such undisturbed little forests are also found in Western Ghats and all our efforts should be directed towards retaining them and not erasing them out of this planet.

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INSECTA : AQUATIC AND SEMI-AQUATIC HETEROPTERA

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INTRODUCTION

The aquatic and semi-aquatic heteropterans play an important role in fresh water ecosystems. Jansson (1977) has shown that corixids can be used as indicators of water quality. There are nine families of water bugs which can be utilised in the biological control of mosquito larvae. Of the nearly fiftyone families of Hemiptera known, as many as seventeen families are associated with aquatic and semi-aquatic habitats.

Our knowledge on the aquatic and semi-aquatic Heteroptera of India is limited to the taxonomic preliminaries such as recording of species from different parts of the country and describing them. No comprehensive studies on the Indian aquatic and semi-aquatic bugs seem to have been conducted so far. Of 282 genera and about 3556 species of aquatic and semi-aquatic bugs known from all over the world, the aquatic bug fauna in India is represented by 76 genera and about 262 species included in 15 major families.

Almost all the 15 families recorded from India are represented in the Nilgiri Biosphere Reserve. Of these 33 genera and 74 species contained in 10 families are reported in this inventory.

SYSTEMATIC LIST

Phylum ARTHROPODA
Class INSECTA
Order HETEROPTERA
Family OCHTERIDAE

1. **Ochterus marginatus marginatus* (Latreille)

*Collected in the current NBR surveys

Family CORIXIDAE

Subfamily CORIXINAE

2. **Agraptocorixa (Agraptocorixa) hyalinipennis* (Fabricius)
3. **Sigara (Tropocorixa) graveleyi* (Hutchinson)
4. **S. (Tropocorixa) horana* (Hutchinson)
5. **S. (Tropocorixa) nilgrica* (Hutchinson)
6. **S. (Tropocorixa) pruthiana* (Hutchinson)

Subfamily MICRONECTINAE

7. **Micronecta desertana dravida* Hutchinson
8. **M. flavens* Wroblewski
9. **M. janssoni* Thirumalai
10. **M. prashadana* Hutchinson
11. **M. quadristrigata* Breddin
12. **M. scutellaris* (Stal)
13. **M. thyesta* Distant
14. **M. sp.*

Family NOTONECTIDAE

Subfamily NOTONECTINAE

15. **Enithares ciliata* (Fabricius)
16. **E. fusca* Brooks
17. **E. hungerfordi* Brooks
18. **E. triangularis* (Guerin-Meneville)
19. **Nychia prox marshalli* (Scott)

Subfamily ANISOPINAE

20. **Anisops barbatus* Brooks

Subfamily RHAGADOTARSINAE

63. **Rhagadotarsus kraepelini* Breddin (*Rhagadotarsus*)

Source : Kormilev (1971).

Remarks : A widely known species recorded from Europe, Africa, Ethiopia, Syria, Orient & China.

Subfamily TREPOBATINAE

64. **Naboandelus* sp

Family CORIXIDAE

Subfamily CORIXINAE

Family VELIIDAE

Subfamily PERITTOPINAE

65. **Perittopus horvathi* Lundblad

2. **Agraptocorixa (Agraptocorixa) hyalinipennis* (Fabricius)

Locality : Nilgiris : Mudumalai, Thepakadu; Sathyamangalam : Hassanur, Minchikuli.

Altitude : 830-1130 m.

Habitat : Stagnant pools rich in organic contents.

Status : Common.

Distribution : India (Himachal Pradesh, Orissa, Punjab, Tamil Nadu); Myanmar; New Guinea; Pakistan; Taiwan.

Source : Thirumalai (1989).

Subfamily RHAGOVELIINAE

66. **Rhagovelia (Rhagovelia) tibialis* Lundblad
67. **R. (Neorhagovelis) nilgiriensis* Thirumalai
68. **Tetraripis asymmetricus* Polhemus and Karunaratne

3. **Sigara (Tropocorixa) graveleyi* (Hutchinson)

Locality : Nilgiris : Avalanchi, Coonur, Getha, Gudalur, Kodanadu, Kothagiri, Kuntha, Mudumalai, Naduvattam, Upper Bhavani; Sathyamangalam: Minchikuli.

Altitude : 900-2120 m.

Habitat : Lakes, ponds, swampy pools reservoirs etc.

Status : Locally common.

Distribution : India (Madhya Pradesh, Maharashtra, Tamilnadu).

Source : Thirumalai (1989).

Remarks : Most common in elevated parts in Peninsular India.

Subfamily MICROVELIINAE

69. **Microvelia annandalei* Distant
70. **M. diluta* Distant
71. **M. douglasi* Scott
72. **M.* sp. 1
73. **M.* sp. 2

Subfamily HALOVELIINAE

74. **Strongylovelia formosa* Esaki

Family OCHTERIDAE

1. **Ochterus marginatus marginatus* (Latreille)

Locality : Coimbatore : Siruvani; Nilgiris : Mudumalai.

Altitude : 400-1100 m.

Habitat : Shores of rivers, streams, lakes or ponds.

Status : Common.

Distribution : Abyssinia; China; France; India (Assam, Maharashtra, Pondicherry, Tamilnadu); Indonesia; Japan; Myanmar; Spain; Syria, Philippines; Taiwan, Thailand, Vietnam.

4. **Sigara (Tropocorixa) horana* (Hutchinson)

Locality : Sathyamangalam : Minchikuli.

Altitude : 1000m.

Habitat : Lentic.

Status : Rare.

Distribution : India (Tamilnadu).

Source : Hutchinson (1940).

Remarks : Described and known from Nilgiris; this is the first record of this species after 50 years.

5. **Sigara (Tropocorixa) nilgirica*
(Hutchinson)

Locality : Nilgiris : Upper Bhavani.

Altitude : 2000-2400 m.

Habitat : Lentic.

Status : Locally common.

Distribution : India (Tamilnadu).

Source : Hutchinson (1940).

Remarks : This is an endemic species to Nilgiris.

6. **Sigara (Tropocorixa) pruthiana*
(Hutchinson)

Locality : Nilgiris : Mudumalai, Upper Bhavani; Satyamangalam : Minchikuli.

Altitude : 840-1100m.

Habitat : Lentic.

Status : Common.

Distribution : India (Karnataka, Tamilnadu, Uttar Pradesh); Pakistan.

Source : Thirumalai (1989).

Remarks : The present report is the first record of this species from Western Ghats.

Subfamily MICRONECTINAE

7. **Micronecta desertana dravida* Hutchinson

Locality : Nilgiris : Gudalur, Nadugani, Naduvattom, Upper Bhavani; Coimbatore : Siruvani.

Altitude : 1000-2000 m.

Habitat : Lotic.

Status : Locally common.

Distribution : India (Karnataka, Maharashtra, Tamilnadu); Iran; Sri Lanka.

Source : Hutchinson (1940).

Remarks : A species with different geographical races.

8. **Micronecta flavens* Wroblewski

Locality : Coimbatore : Kondanur; Satya mangalam : Minchikuli.

Altitude : 520-1000m.

Habitat : Lentic waterbodies.

Status : Common.

Distribution : Sri Lanka.

Source : Wroblewski (1960).

Remarks : Recorded for the first time from India.

9. **Micronecta janssoni* Thirumalai

Locality : Coimbatore : Kodungari river, Mangari; Nilgiri : Mudumalai.

Altitude : 500-1040m.

Habitat : Lentic waterbodies.

Status : Common.

Distribution : India (Tamilnadu).

Source : Thirumalai (1980).

Remarks : Species earlier described from Eastern Ghats; recorded for the first time from Western Ghats.

10. **Micronecta prashadana* Hutchinson

Locality : Coimbatore : Kodanur, Kodungari river; Sathyamangalam : Hassanur.

Altitude : 500-1100 m.

Habitat : Lotic.

Status : Common.

Distribution : India (Karnataka, Tamilnadu, Uttar Pradesh).

Source : Thirumalai (1989)

Remarks : This is found in running water.

11. **Micronecta quadririgata* Breddin

Locality : Nilgiris : Mudumalai; Sathya mangalam : Hassanur.

Altitude : 1040-1100.

Habitat : Lentic & lotic.

Status : Locally rare, common elsewhere.

Distribution : India (widely distributed); Indonesia; Iran; Malaysia; Philippines; Sri Lanka.

Source : Thirumalai (1994a).

Remarks : A very common species in Southern and Eastern India; also recorded from brackish water.

12. **Micronecta scutellaris* (Stal)

Locality : Nilgiris : Mudumalai; Sathya mangalam : Minchikuli.

Altitude : 900-1040m.

Habitat : Lentic.

Status : Common.

Distribution : Africa; China, India (very widely distributed); Indonesia; Malaysia; Saudi Arabia; Sri Lanka; Vietnam.

Source : Thirumalai (1989).

Remarks : The largest and the commonest Indian species of the genus.

13. **Micronecta thyesta* Distant

Locality : Nilgiris : Mudumalai; Sathya mangalam : Hassanur.

Altitude : 910-1100m.

Habitat : Lentic.

Status : Common.

Distribution : China; India (Andhra Pradesh, Bihar, Karnataka, Orissa, Tamilnadu, West Bengal), Japan; Taiwan; Vietnam.

Source : Thirumalai (1994a).

Remarks : Known to occur in flooded paddy fields; attracted towards light.

14. **Micronecta* n. sp.

Locality : Nilgiris : Gudalur-Naduvattom, Upper Bhavani.

Altitude : 1620-1980 m.

Habitat : Lentic.

Status : Locally common & endemic.

Family NOTONECTIDAE

Subfamily NOTONECTINAE

15. **Enithares ciliata* (Fabricius)

Locality : Coimbatore : Kunjapani; Nilgiris : Coonur-Briiyar; Mudumalai; Sathyamangalam : Minchikuli.

Altitude : 460-1130m.

Habitat : Lentic.

Status : Common.

Distribution : Bhutan; India (Andaman Islands, Andhra Pradesh, Bihar, Goa, Kerala, Maharashtra, Tamilnadu, West Bengal); Indonesia; Malaysia; Mauritius; Sri Lanka; Vietnam.

Source : Lansbury (1968).

Remarks : A very common species widely distributed in South East Asia.

16. **Enithares fusca* Brooks

Locality : Sathyamangalam : Kallukadavu, Minchikuli; Palghat : Silent Valley.

Altitude : 870-1100 m.

Habitat : Lentic.

Status : Fairly common.

Distribution : India (Kerala, & Tamilnadu).

Source : Thirumalai (1994a).

Remarks : So far known from high altitudes of Kerala & Tamilnadu.

17. **Enithares hungerfordi* Brooks

Locality : Coimbatore : Siruvani; Nilgiris : Getha, Kinnakorai, Avalanchi; Palghat : Silent Valley.

Altitude : 440-2300 m.

Habitat : Lentic waterbodies.

Status : Locally common.

Source : Thirumalai (1986).

Distribution : India (Kerala & Tamilnadu).

Remarks : Restricted to Southern parts of India.

18. **Enithares triangularis* (Guerin-Meneville)

Locality : Coimbatore : Kunjapani; Nilgiris : Avalanchi, Kothagiri, Sinkara; Sathyamangalam : Minchikuli.

Altitude : 960-1740 m.

Habitat : Lentic waters.

Status : Common.

Distribution : India (Kerala, Tamilnadu, West Bengal).

Source : Lansbury (1968).

Remarks : The type locality of this species is Nilgiris. In Southern India, distribution is confined to Western Ghats. Members of this genus are not known from the plains.

19. **Nychia prox marshalli* (Scott).

Locality : Nilgiris : Naduvattom-Gudalur.

Altitude : 1620-1800 m.

Habitat : Calm waters.

Status : Rare.

Distribution : Africa; Australia; Europe; India (West Bengal); Sri Lanka. (Poorly known).

Source : Lundblad (1934).

Remarks : Genus with only a few poorly known species; recorded for the first time from Southern India.

Subfamily ANISOPINAE

20. **Anisops barbatus* Brooks

Locality : Nilgiris : Mudumalai.

Altitude : 830-1130 m.

Habitat : Running stream.

Status : Rare.

Distribution : China; India (Andhra Pradesh, Himachal Pradesh, Karnataka, Orissa, Tamilnadu, West Bengal); Indonesia; Malaysia; Myanmar; Sri Lanka; Taiwan; Vietnam.

Source : Thirumalai (1989).

Remarks : The largest species of the genus reported from India; distribution includes plains to base of Western Himalaya.

21. **Anisops bouvieri* Kirkaldy

Locality : Sathyamangalam : Thalaimalai, Hassanur, Minchikuli.

Altitude : 840-1000m.

Habitat : Stagnant stream.

Status : Locally rare, common in plains.

Distribution : Bangladesh; China; India (very widely distributed including Andaman Islands); Malaysia; Myanmar; New Guinea; Thailand.

Source : Thirumalai (1989).

Remarks : A very common species found in lakes, ponds, pools, streams etc. attracted to light also.

22. **Anisops breddeni* Kirkaldy

Locality : Nilgiris : Mudumalai.

Altitude : 980 m.

Habitat : Stagnant pool with rich organic contents.

Status : Locally scarce, common elsewhere.

Distribution : India (Bihar, Kerala, Orissa, Tamilnadu, West Bengal); Indonesia; Malaysia; Myanmar; New Guinea; Sri Lanka; Vietnam.

Source : Thirumalai (1994a)

Remarks : Commonly seen in lentic water bodies in the plains; also recorded from brackish waters.

23. **Anisops campbelli* Brooks

Locality : Sathyamangalam : Thalaimalai, Hassanur.

Altitude : 840 m.

Habitat : Lentic.

Status : Locally rare, common elsewhere.

Distribution : India (widely distributed).

Source : Thirumalai (1994a)

Remarks : A species almost entirely confined to the Indian sub-continent.

24. **Anisops cavifrons* Brooks

Locality : Nilgiris : Mudumalai; Sathyamangalam : Minchikuli, Thalaimalai.

Altitude : 840-1100 m.

Habitat : Lentic.

Status : Common

Distribution : India (Himachal Pradesh, Kerala, Maharashtra, Punjab, Tamilnadu, West Bengal); Pakistan.

Source : Thirumalai (1994a).

Remarks : A common species found in all types of lentic habitats; recorded from backwaters also.

25. **Anisops exigua* Horvath

Locality : Sathyamangalam : Thalaimalai, Minchikuli.

Altitude : 840 m.

Habitat : Stagnant water body.

Status : Rare.

Distribution : India (Kerala, Madhya Pradesh, Tamilnadu); Malaysia; New Guinea; Sri Lanka; Vietnam.

Source : Thirumalai (1994a).

Remarks : A small species exhibiting discontinuous distribution in India; also recorded from backwaters of Kerala.

26. **Anisops nivea* (Fabricius)

Locality : Nilgiris : Mudumalai; Sathyamangalam : Minchikuli.

Altitude : 840-1100 m.

Habitat : Lentic.

Status : Common.

Distribution : India (Orissa, Tamilnadu); Indonesia; Malaysia; Myanmar; Singapore; Sri Lanka; Vietnam.

Source : Thirumalai (1989).

Remarks : Distributed over a large part of the Oriental Region; also recorded from Eastern Palaearctic Region & North Africa.

27. **Anisops paranigrolineatus* Brooks

Locality : Coimbatore : Kunjapani; Nilgiris: Mudumalai; Sathyamangalam : Minchikuli.

Altitude : 980-1100 m.

Habitat : Lotic (mountain streams).

Status : Locally common, rare elsewhere.

Distribution : India (Maharashtra, Tamilnadu & Uttar Pradesh).

Source : Thirumalai (1994a).

Remarks : So far known only from Eastern Ghats, Western Ghats & Western Himalaya.

28. **Anisops sardeus* Herrich-Shaffer

Locality : Nilgiris : Coonur-Brilyar confluent.

Altitude : 720 m.

Habitat : Slow moving mountain streams.

Status : Locally rare, common elsewhere.

Distribution : Afghanistan; Africa; Albania; Canary Islands; India (widely distributed) Myanmar; Syria; Turkey.

Source : Thirumalai (1989).

Remarks : Known to occur in the Mediterranean countries and Western Asia and also widely distributed in the Ethiopian, Oriental & Southern Palaearctic Regions.

29. **Anisops waltirensis* Brooks.

Locality : Nilgiris : Kodanadu.

Altitude : 1600 m.

Habitat : Lentic & lotic.

Status : Locally rare common elsewhere,

Distribution : India (Andhra Pradesh, Himachal Pradesh, Tamilnadu, West Bengal).

Source : Thirumalai (1994a).

Remarks : Commonly available in lentic & lotic habitats of the plains and not known from outside Indian Peninsula.

Family NEPIDAE

Subfamily NEPINAE

30. **Laccotrephes griseus* (Guerin)

Locality : Coimbatore : Siruvani; Nilgiris : Moyar, Mudumalai, Satyamangalam : Thalavadi.

Altitude : 580-1100 m.

Habitat : Lentic.

Status : Common.

Distribution : India (widely distributed); Malaysia; Myanmar; Seychelles; Sri Lanka; Thailand.

Source : Thirumalai (1989).

Remarks : A very common sluggish species, found at the bottom of the water.

31. **Laccotrephes ruber* (Linnaeus)

Locality : Coimbatore : Kunjapani, Siruvani; Nilgiris : Mudumalai; Satyamangalam: Minchikuli; Palaghat : Silent Valley.

Altitude : 400-1100 m.

Habitat : Lentic and lotic.

Status : Common.

Distribution : China; India (widely distributed); Japan; Nepal; Pakistan; Taiwan.

Source : Thirumalai (1994a).

Remarks : A large species, reported from a wide variety of habitats like rivers, streams, tank etc.

Subfamily RANATRINAE

32. **Cercotmetus fumosus* Distant

Locality : Nilgiri : Mudumalai; Satyamangalam : Karapalayam; Wynad : Rampur.

Altitude : 880-900m.

Habitat : Lentic.

Status : Rare.

Distribution : India (Orissa); Sri Lanka.

Source : Hafiz & Pradhan (1947).

Remarks : Reported for the first time from southern India.

33. **Ranatra elongata* Fabricius

Locality : Coimbatore : Kunjapani, Siruvani; Nilgiris : Mudumalai; Satyamangalam : Hassanur; Wynad : Dasanghatta.

Altitude : 400-1100 m.

Habitat : Deeper parts of temporary pools, puddles.

Status : Common.

Distribution : Australia; India (widely distributed); Nepal; Sri Lanka.

Source : Thirumalai (1994a).

Remarks : Reported to feed on tadpoles, nymphs of dragonflies, mayflies, aquatic heteropterans etc.; migrates to suitable aquatic medium during unfavourable seasons.

34. **Ranatra filiformis* Fabricius

Locality : Coimbatore : Siruvani; Nilgiris : Mudumalai.

Altitude : 580-960 m.

Habitat : Lentic and lotic.

Status : Common.

Distribution : India (widely distributed); Nepal; Pakistan; Philippine Islands; Sri Lanka.

Source : Thirumalai (1989).

Remarks : Mostly occurs among vegetation fringing the shallower parts of water bodies, clinging to submerged vegetation and is scarce in deeper areas.

Family : BELOSTOMATIDAE

Subfamily : BELOSTOMATINAE

35. **Diplonychus rusticus* (Fabricius)

Locality : Nilgiris : Mudumalai.

Altitude : 605 m.

Habitat : Lentic.

Status : Locally rare, common elsewhere.

Distribution : Australia; China; India (widely distributed); Indonesia; Japan; Malaysia; Myanmar; New Guinea; New Zealand; Sri Lanka; Thailand.

Source : Thirumalai (1994a).

Remarks : Commonly found in fish ponds and are voracious feeders on fish fry.

Subfamily LETHOCERINAE

36. **Lethocerus indicus* (Lepeletier & Serville)

Locality : Wyanad : Kurichiyad.

Habitat : Lentic & lotic.

Status : Locally scarce.

Distribution : India (Widely distributed); Indonesia; Malaysia; Myanmar; Philippine Islands; Sri Lanka.

Source : Lundblad (1934).

Remarks : This giant water bug is known to feed on large sized insects; known to be attracted towards light.

Family MESOVELIIDAE

Subfamily MESOVELIINAE

37. **Mesovelia horvathi* Lundblad

Locality : Coimbatore : Siruvani; Nilgiris : Gudalur, Mudumalai, Naduvattom; Satya mangalam : Minchikuli.

Altitude : 580-1500 m.

Habitat : Stagnant and slow running water.

Status : Common.

Distribution : India (widely distributed); Indonesia; Malaysia; Sri Lanka; Thailand; Vietnam.

Source : Andersen & Polhemus (1980).

Remarks : Commonly available in the plains & the mountains.

38. **Mesovelia vittigera* Horvath

Locality : Coimbatore : Siruvani; Nilgiris : Mudumalai; Satyamangalam : Hassanur, Minchikuli.

Altitude : 740-110 m.

Habitat : Lentic & lotic.

Status : Common.

Distribution : Africa; Australia; Egypt; India (widely known); Indonesia, Malaysia; Palestine; Philippines; Syria; Samoa Islands; Sri Lanka.

Source : Thirumalai (1989).

Remarks : This species has an extraordinarily wide distributional range unmatched by any other species of semi-aquatic bugs.

Family HEBRIDAE

Subfamily HEBRINAE

39. **Neotimasius orientalis* Andersen

Locality : Satyamangalam : Minchikuli.

Altitude : 1240 m.

Habitat : Stagnant pool.

Status : Rare.

Distribution : India (Karnataka).

Source : Andersen (1981).

Remarks : Species described based on one female; male recorded for the first time; endemic to the Western Ghats.

40. **Timasius splendens* Distant

Locality : Nilgiris : Gudalur-Nadugani.

Altitude : 1000 m.

Habitat : Lotic.

Status : Rare.

Distribution : Sri Lanka.

Source : Andersen (1981).

Remarks : Species recorded for the first time from India.

Family HYDROMETRIDAE

Subfamily HYDROMETRINAE

41. **Hydrometra bifurcata* Hungerford & Evans

Locality : Nilgiris : Gudalur-Nadugani.

Altitude : 1000 m.

Habitat : Lentic.

Status : Rare & endemic.

Distribution : Madagascar.

Source : Hungerford & Evans (1934).

Remarks : Recorded for the first time from India.

42. **Hydrometra butleri* Hungerford & Evans

Locality : Coimbatore : Mangari, Siruvani; Nilgiris : Mudumalai.

Altitude : 500-1000 m.

Habitat : Lentic & lotic.

Status : Common.

Distribution : India (Tamilnadu).

Source : Thirumalai (1994a).

Remarks : This species is so far not reported from outside the Indian subcontinent.

43. **Hydrometra greeni* Kirkaldy

Locality : Coimbatore : Kunjapani, Mangarai, Siruvani; Nilgiris : Mudumalai, Mukkuriti; Satyamangalam: Minchikuli.

Altitude : 420-2200 m.

Habitat : Lentic & lotic.

Status : Common.

Distribution : India (widely known); Japan; Malaysia; Myanmar; Philippines; Sri Lanka.

Source : Thirumalai (1994a).

Remarks : Widely distributed all over India and reported to be attracted towards light.

Family GERRIDAE

Subfamily GERRINAE

44. **Aquarius adelaidis* (Dohrn)

Locality : Nilgiris : Mudumalai.

Altitude : 960 m.

Habitat : Permanent waterbodies.

Status : Not very common on higher altitudes.

Distribution : Bangladesh; China; India (widely distributed); Indonesia; Myanmar; Nepal; Philippine Islands; Sri Lanka; Thailand; Vietnam.

Source : Andersen (1990).

Remarks : Very common in lentic water bodies; tropical in distribution mainly in South and Southeast Asia.

45. **Limnogonus (Limnogonus) nitidus* (Mayr)

Locality : Coimbatore : Kunjapanai, Kovaicourtalam, Kondanur, Siruvani; Nilgiris : Gudalur, Kuntha, Mudumalai, Nadugani; Satyamangalam : Minchikuli.

Altitude : 400-2000 m.

Habitat : Lentic.

Status : Very common.

Distribution : India (widely distributed); Indonesia; Malaysia; Maldives; Myanmar; Nepal; Singapore; Sri Lanka; Thailand; Vietnam.

Source : Thirumalai (1989).

Remarks : Recorded for the first time from above 1000 m.; known to be attracted to light; reported as a predator of paddy brown plant hopper.

46. **Neogerris parvula* (Stal)

Locality : Coimbatore : Anaikatti; Nilgiris : Gudalur, Kuntha, Mudumalai, Naduvattom; Satyamangalam : Minchikuli.

Altitude : 800-2000 m.

Habitat : Lentic and lotic.

Status : Common.

Distribution : China; India (widely distributed);

Indonesia; Iran; Japan; Malaysia; Myanmar; New Guinea; Oman; Philippines; Pakistan; Solomon Islands; Sri Lanka; Taiwan; Thailand; Vietnam.

Source : Andersen (1975).

Remarks : A widely distributed species in Indo-Australian Region; recorded for the first time from above 1500 m.

47. **Limnometra anadyomene* (Kirkaldy)

Locality : Coimbatore : Anamalai, Kunjapani, Siruvani; Nilgiris: Gudalur; Mudumalai, Naduvattom, Sathyamangalam : Minchikuli.

Altitude : 420-1500 m.

Habitat : Lentic streams.

Status : Very common.

Distribution : India (very widely distributed in high altitudes); Indonesia; Malaysia; Myanmar; Philippines; Sri Lanka.

Source : Thirumalai (1989).

Remarks : Restricted to forest streams; not so far known from plains.

48. **Limnometra fluviorum* (Fabricius)

Locality : Coimbatore : Kondanur, Mulli-Pillur; Nilgiris : Kallaru, Mudumalai; Sathyamangalam : Minchikuli, Talavadi; Wynad : Kuppadi.

Altitude : 420-1140 m.

Habitat : Lentic & lotic.

Status : Common.

Distribution : India (very common in Southern India); Philippine Islands; Sri Lanka.

Source : Thirumalai (1994a).

Remarks : A very common species occurring in a wide variety of freshwater habitats in the plain hills of Southern India.

Subfamily CYLINDROSTETHINAE

49. **Cylindrostethus productus* (Spinola)

Locality : Nilgiris : Mudumalai; Malapuram : Malakkam.

Altitude : 1000 m.

Habitat : Lotic.

Status : Locally not very common.

Distribution : India (Karnataka, Kerala, Maharashtra, Tamilnadu); Sri Lanka.

Source : Hungerford & Matsuda (1962).

Remarks : The largest species of the genus so far known from the eastern Hemisphere.

Subfamily EOTRECHINAE

50. **Amemboa (Amemboa) kumarai* (Distant)

Locality : Coimbatore : Kunjapanai, Siruvani; Nilgiris : Mudumalai; Sathyamangalam : Hassanur, Minchikuli.

Altitude : 460-1100m.

Habitat : Lentic.

Status : Common.

Distribution : India (Karnataka, Kerala, Orissa, Tamilnadu).

Source : Polhemus & Andersen (1984).

Remarks : Not reported from outside the Indian Peninsula; apterous forms are more common than macropterous ones.

51. **Onychotrechus rhexenor* Kirkaldy

Locality : Coimbatore : Kunjapanai, Mangarai, Siruvani; Nilgiris : Avalanchi, Gudalur, Getha, Ithalar, Naduvattom, Singara; Kerala : Silent Valley.

Altitude : 420-2400 m.

Habitat : Hygropetric.

Status : Very common.

Distribution : India (Karnataka, Kerala, Maharashtra, Rajasthan, Tamilnadu); Africa.

Source : Andersen (1980).

Remarks : Only genus of the family known from hygropetric habitats; recorded from the Eastern Ghats.

52. **Onychotrechus rupestris* Andersen

Locality : Nilgiris : Pykara to Naduvattom.

Altitude : 2160 m.

Habitat : Wet vertical surface of cliffs.

Status : Scarce.

Distribution : India (Karnataka).

Source : Andersen (1980).

Remarks : Endemic to Western Ghats.

53. **Onychotrechus spinifer* Andersen

Locality : Sathyamangalam : Hassanur, Minchikuli; Wynad : Chembra

Altitude : 1240 m.

Habitat : Wet perpendicular rocks.

Status : Very rare.

Distribution : India (Karnataka, Kerala, Maharashtra).

Source : Andersen (1980).

Remarks : Apparently endemic to Western Ghats.

Subfamily PTILOMERINAE

54. *Pleciobates indicus* Thirumalai

Locality : Palghat : Silent Valley.

Altitude : 860 m.

Habitat : Lotic.

Status : Rare.

Distribution : India (Kerala).

Source : Thirumalai (1986).

Remarks : Species known from evergreen forests of Silent Valley.

55. *Stridulobates nostras* (Thirumalai)

Locality : Palghat : Silent Valley.

Altitude : 860-871 m.

Habitat : Lotic.

Status : Rare.

Distribution : India (Karnataka and Kerala).

Source : Zettel and Thirumalai (2000).

Remarks : Forest stream in semi-wet evergreen forest.

56. *Stridulobates andersoni* Zettel & Thirumalai

Locality : Nilgiris : Gudalur-Nadugani, Kinnakorai, Upper Bhavani.

Altitude : 1000-1100 m.

Habitat : Lotic.

Status : Rare.

Distribution : India (Karnataka and Kerala).

Source : Zettel and Thirumalai (2000).

Remarks : Endemic to Western Ghats.

57. **Ptilomera (Ptilomera) agroides* Schmidt

Locality : Coimbatore : Kodungari, Mulli-Pillur; Nilgiris : Avalanchi, Getha, Kothagiri, Kuntha, Moyar, Mudumalai, Singara; Malapuram : Poonchakalli, Palghat : Silent Valley; Wynad : Poonchakalli.

Altitude : 420-2000 m.

Status : Locally very common.

Distribution : India (Karnataka, Kerala, Maharashtra & Tamilnadu).

Source : Hungerford & Matsuda, (1960).

Remarks : A very common gerrid found in flowing mountain streams, rivers etc. in the Western Ghats; endemic to Western Ghats.

Subfamily HALOBATINAE

58. *Metrocoris communis* (Distant)

Locality : Nilgiri : Ooty.

Altitude : Not recorded.

Habitat : Not known

Status : Indeterminate.

Distribution : Afghanistan; India (Assam, Orissa, Punjab, Tamilnadu, Uttar Pradesh); Iran; Oman.

Source : Den Boer (1965).

Remarks : A common species in Northwestern & Northeastern India.

59. *Metrocoris malabaricus* Thirumalai.*Locality* : Palaghat : Silent Valley.*Altitude* : 871-1060 m.*Habitat* : Lotic.*Status* : Rare and endemic.*Distribution* : India (Karnataka and Kerala).*Source* : Thirumalai (1986).*Remarks* : An endemic species found in the evergreen forests.60. **Metrocoris indicus* Chen and Nieser*Locality* : Coimbatore : Kunjapanai, Siruvani; Nilgiris : Avalanchi, Bednadu, Kodanadu, Kothagiri, Gudalur, Mukuriti, Mudumalai, Naduvattom, Pykara, Upper Bhavani; Sathyamangalam : Minchikuli.*Altitude* : 420-2400 m.*Habitat* : Lentic & lotic.*Status* : Very common.*Distribution* : India (Kerala and Tamilnadu).*Source* : Thirumalai (1994a).*Remarks* : The most common of gerrids available in mountains and higher altitudes, also recorded from reservoirs, rivers, etc.61. *Metrocoris variegans* Thirumalai*Locality* : Palaghat : Silent Valley.*Altitude* : 871-910 m.*Habitat* : Lotic.*Status* : Rare & endemic.*Distribution* : India (Karnataka and Kerala).*Source* : Thirumalai (1986).*Remarks* : Same as that of *M. malabaricus*.62. **Ventidius (Ventidius) aquarius* Distant*Locality* : Coimbatore: Siruvani; Nilgiris : Gudalur, Mudumalai, Naduvattom; Palaghat : Silent Valley.*Altitude* : 400-2160 m.*Habitat* : Lotic.*Status* : Locally common.*Distribution* : India (Kerala).*Source* : Thirumalai (1986).*Remarks* : In India, the distribution is restricted to lower Western Ghats; recorded for the first time from Tamilnadu State.

Subfamily RHAGADOTARSINAE

63. **Rhagadotarsus (Rhagadotarsus) kraepelini* Breddin*Locality* : Nilgiris : Mudumalai.*Altitude* : 960-1040 m.*Habitat* : Lentic.*Status* : Fairly uncommon.*Distribution* : China; India (Kerala, Tamilnadu); Indonesia; Malaysia; Myanmar.*Source* : Polhemus and Karunarathe (1993).*Remarks* : Predominantly known from Orient Region; found on the calm surface of water.

Subfamily TREPOBATINAE

64. **Naboandelus* sp.*Locality* : Nilgiris : Gudalur - Nadugani.*Altitude* : 1000 m.*Habitat* : Hygropetric.*Status* : Very rare.*Remarks* : May represent a new sp. 2nd sp. of the genus reported from India.

Family VELIIDAE

Subfamily PERITTOPINAE

65. **Perittopus horvathi* Lundblad*Locality* : Coimbatore : Kunjapani, Mangarai; Nilgiris : Coonur, Kothagiri, Kunjapanai, Upper Bhavani; Sathyamangalam : Minchikuli.*Altitude* : 590-2300 m.

Habitat : Lentic.

Status : Common & rare elsewhere.

Distribution : India (Tamilnadu).

Source : Thirumalai (1989).

Remarks : This species has not been so far reported from outside Tamilnadu.

Subfamily RHAGOVELIINAE

66. **Rhagovelia (Rhagovelia) tibialis* Lundblad

Locality : Coimbatore : Siruvani; Nilgiris : Kothagiri; Palaghat : Silent Valley.

Altitude : 980-1740 m.

Habitat : Lotic.

Status : Locally common.

Distribution : India (Anamalai, Tamilnadu, type locality).

Source : Thirumalai (1994b).

Remarks : Endemic to Western Ghats.

67. **Rhagovelia (Neorhagovelia) nilgiriensis*
Thirumalai

Locality : Coimbatore : Siruvani; Nilgiris : Gudalur-Nadugani.

Altitude : 400-1000 m.

Habitat : Slow moving mountain streams.

Status : Locally common & endemic.

Distribution : Philippine Islands.

Source : Thirumalai (1994b).

Remarks : This subgenus is recorded for the first time from India.

68. **Tetraripis asymmetricus* Polhemus &
Karunaratne

Locality : Coimbatore : Kovai courtalam, Siruvani.

Altitude : 600 m.

Habitat : Running stream.

Status : Rare & endemic.

Distribution : Sri Lanka.

Source : Thirumalai and Dam (1996).

Remarks : An Oriental genus, recorded for the first time from India.

Subfamily : MICROVELIINAE

69. **Microvelia annandalei* Distant

Locality : Nilgiris : Kotagiri.

Altitude : 1740.

Habitat : Lentic.

Status : Common.

Distribution : India (Tamilnadu & West Bengal).

Source : Thirumalai (1989).

Remarks : This species is so far known only from India.

70. **Microvelia diluta* Distant

Locality : Coimbatore : Siruvani; Nilgiris : Gudalur, Mudumalai, Naduvattom; Satya mangalam : Minchikuli.

Altitude : 600-1800 m.

Habitat : Lentic.

Status : Common.

Distribution : India. (Bihar, Tamilnadu, West Bengal); Indonesia.

Source : Thirumalai (1989)

Remarks : This is one of the commonest species of *Microvelia* found in India.

71. **Microvelia douglasi* Scott

Locality : Coimbatore : Mangaraj, Mulli-Pillur, Peddikuta, Siruvani; Nilgiris : Gudalur, Kuntha, Mudumalai, Nadugani, Naduvattom Upper Bhavani; Satyamangalam : Minchikuli.

Altitude : 400-2300 m.

Habitat : Lentic & lotic.

Status : Very common.

Distribution : India (Orissa, Tamilnadu); Indonesia; Japan; Sri Lanka.

Source : Thirumalai (1989).

Remarks : The most common species of genus found in India.

72. *Microvelia* sp. 1

Locality : Nilgiris : Kinnakorai, Upper Bhavani.

Altitude : 1600-2300 m.

Habitat : Lentic.

Status : Rare & endemic.

73. **Microvelia* sp. 2

Locality : Nilgiris : Mudumalai.

Altitude : 1000-1040 m.

Habitat : Stagnant streams.

Status : Rare & endemic.

Subfamily HALOVELIINAE

74. **Strongylovelia formosa* Esaki

Locality : Nilgiris : Doddahatti; Mudumalai; Satyamangalam : Harachalla, Minchiluli.

Altitude : 1040-1100 m.

Habitat : Lentic.

Status : Lundblad (1934).

Distribution : Indonesia; Sri Lanka; Taiwan.

Remarks : The subfamily is recorded for the first time from India.

asymmetricus, *Strongylovelia formosa* from the NBR is zoogeographically important since these species were known earlier only from Myanmar, Malaysia, Sri Lanka, Madagascar and thus they are significant and interesting to the faunal list of Indian Heteroptera, being new records. Besides, males of *Neotismasius orientalis* which was hitherto not recorded, discovered from the biosphere reserve as a result of the current studies. Also four new species belonging to families Corixidae and Veliidae have been discovered. The rediscovery of three species of Corixids namely, *Sigara horana*, *S. nilgirica* and *Micronecta desertana dravida* after nearly half a century since their original description, indicates that these species are endemic to the NBR. The biosphere's rich and varied fauna of both the aquatic and semi-aquatic heteropterans which are closely allied to the fauna of Indo-Chinese and Malayan regions focusses our attention on the uniqueness of the fauna of the Reserve and underlines the fact that the NBR is a unique reserve in nature, harbouring several geographically isolated genera and species which are endemics or biogeographical relicts.

The overall faunal richness and diversity of the aquatic and semi-aquatic heteropterans of the NBR indicate that the reserve provides an ideal habitat in its geographical ranges and offers optimum conditions for habitat selection by many of the families of aquatic bugs.

The conservation of areas like the NBR is vital for preserving very valuable biological treasures which will serve as a source of reference for carrying out comparative studies on environmental degradation elsewhere.

SUMMARY

The records of *Micronecta flavens*, *Timasius splendens*, *Hydrometra bifurcata*, *Rhagovelia (Neorhagovelia) nilgiriensis*, *Tetraripis*

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INSECTA : SCARABID (COLEOPTERA)

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INTRODUCTION

Scarabaeidae are found in all the parts of the world and are present in very large number. They vary from small to large size. These beetles collect the waste matter of all kinds and roll them into round balls or pellets and bury them under the ground. Therefore, they are also called 'dung rollers'. Against their usefulness on the debit side are some species which are harmful to crops, plantations and some cause scarabiasis in young children which cause intestinal disorders as species like *Onthophagus bifasciatus*, *Caccobius unicornis* and *Caccobius mutans* which belong to the subfamily Coprinae. Some are known to act as intermediate hosts for parasitic worms of the genus *Gongylonema* which cause diseases in cattle.

Subfamily Dynastinae includes some of the largest and most striking of all Coleoptera. The majority of the species are black and being nocturnal or crepuscular in habit they are not very often seen in large number. They also exhibit extreme development of sexual dimorphism. Usually, they possess frontal horn. Most of the Dynastinae are tropical or neotropical. Many species are pest on plants like Sugarcane, palms (leaves) and coconut (plantation) destroying the tissue of the leaf base. They also live on decomposing vegetable matter.

In subfamily Centoniinae, mouth parts are adopted for dealing with soft or liquid food and labrum is membranous and concealed. They are generally phytophagous, their larvae are generally found among roots, decaying wood and dried leaves.

The Rutelinae is also a large subfamily and the majority of the species belonging to this subfamily are brightly coloured. They resemble Melolonthinae but differ from it because of their movable claws which are unequal in size. Some species of Rutelinae are destructive to the plants.

The subfamily Aphodinae are generally oblong, convex beetles and are associated with dung; a few are phytophagous. They attack roots.

Members of the subfamily Scarabaeidae are oval round and often convex beetles. They live in dung and their mandibles are membranous.

They are incapable of biting and are well known as dung rollers.

The inventory of the Scarabaeid beetles is given on the basis of previous work from the area and collections made and represents 127 species belonging to 36 genera and five subfamilies.

SYSTEMATIC ACCOUNTS

Subfamily CETONINAE

1. *Mycleristes auritus* Arrow

Locality : Nilgiri Hills; silent valley.

Attitude : Found upto 2500 feet above sea level.

Habitat : Deciduous Forest.

Status : Rare.

External distribution : South India, North India; Burma; Malaya.

2. *Macromota albonotata* Blanch

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Deciduous Forest.

External distribution : South India.

Source : Arrow, 1925.

3. *Macronota flavomaculata* G. and P.

Locality : Nilgiri Hills (Naduvatom).

Altitude : 2500' to 7000'.

Habitat : Deciduous forest.

Status : Rare.

Ext. distribution : Pondichery, South India; Ceylon.

Source : Arrow, 1925.

4. *Macronota bufo* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Deciduous forest.

Status : Rare.

Ext. Distribution : Travancore, South India.

Source : Arrow, 1924.

5. *Macronota waterhousei* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Deciduous Forest.

Status : Rare.

Ext. distribution : South India.

Source : Arrow, 1925.

6. *Macronota flavosparsa* Waterhouse

Locality : Silent valley.

Habitat : Tropical forest.

Status : Rare.

Ext. distribution : South India.

7. *Macronota perraudieri* Fair maire

Locality : Silent valley.

Habitat : Tropical forest.

Status : Rare.

Ext. distribution : South India.

8. *Cyphonocephalus olivaceus* Dupont

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Trees plantations Forest.

Status : Rare.

Ext. distribution : South India.

Source : Arrow, 1925.

9. *Narycius palus* Dupont

Locality : Nilgiri Hills, Coorg.

Altitude : 2500'.

Habitat : Trees plantations, Deciduous forests.

Status : Rare.

Ext. distribution : Travancore, Mercara.

Source : Arrow, 1925.

10. *Heterorrhina elegans* (Fabricius)

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Forested areas, Hot climatic regions.

Status : Rare.

Ext. distribution : Bengal, Chopra Maldah, Chotanagpur, Madras, Mysore, Trichnopolli; Ceylon.

Source : Arrow, 1925.

11. *Heterorrhina planata* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Deciduous Forest.

External distribution : Bombay, Kanara.

Source : Arrow, 1925.

Remarks : This species is found in bamboo jungle at 3000' to 4000' altitude.

12. *Heterorrhina micans* Guerin

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Hot climatic forested areas.

Status : Rare.

Ext. distribution : Bombay, Kanara, Western Ghats, Madras, Travancore, Trichnopolli, Shevroy Hills, Bengal, Chotanagpur.

Source : Arrow 1925.

13. *Heterorrhina graeillis* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Deciduous Forest.

Status : Rare.

Ext. distribution : South India.

Source : Arrow, 1925.

14. *Trigonophorus delesserti* (Guerin)

Locality : Nilgiri Hills.

Altitude : 2500' to 4000'.

Habitat : Deciduous/Semiduous Forests, Trees.

Status : Common.

Ext. distribution : South India, Tamil Nadu, Kerala.

Source : Arrow, 1925.

Remarks : It is usually found in *Eucalyptus globulus* trees feeding upon the sap which exudes from the trunks.

15. *Oxycetonia andrewesi* (Jonson)

Locality : Nilgiri hills.

Altitude : 2500'.

Habitat : Forested area.

Ext. distribution : Tamil Nadu : Shembaganar.

Source : Arrow, 1925.

16. *Clineteria auronotata* (Blanchard)

Locality : Nilgiri hills.

Altitude : 2500'.

Habitat : Forested area.

Ext. distribution : Tiruchirapalli, Bangalore, Kodaikanal.

Source : Arrow, 1925.

17. *Clineteria truncata* Arrow

Locality : Nilgiri Hills, Naduvatam.

Altitude : 7000'

Habitat : Tropical forest.

Source : Arrow, 1925.

18. *Coenochilus trabecula* Schanm

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest.

Ext. distribution : Bombay, Madras, Malabar, Bangalore, Pondicherry.

Source : Arrow, 1925.

19. *Oreoderus argillaceus* (Hope)

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Tropical forest.

Ext distribution : South India.

Source : Arrow, 1925.

20. *Oreoderus gravis* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Tropical forest.

Ext. distribution : Travancore, Pirmed.

Source : Arrow, 1925.

21. *Dasyvalgus militaries* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Tropical forest.

22. *Eophileurus nilgirensis* Arrow

Locality : Nilgiri Hills.

Altitude : 6000'

Habitat : Interior of decayed tree, soil.

Ext. distribution : Shemangur near Madura.

Source : Arrow, 1925.

23. *Xylotrupes gideon* (Linnaeus)

Locality : Silent valley.

Habitat : Vegetation, vegetable debris.

Ext. distribution : India : Bengal, Sikkim, Assam, Bombay, Kerala; Sri Lanka.

Remarks : Larva injure sugar cane roots.

24. *Parastertia basalis* Candeze

Locality : Coorg.

Altitude : 4000'-4500'.

Habitat : Deciduous/semi deciduous forest.

Ext. distribution : Sanivarsandi, Shevroy hills, Yercaud.

25. *Popillia Pokhripes* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Semi deciduous forest.

Source : Arrow, 1917.

26. *Popillia lucida* Newman

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Deciduous/semi deciduous forests.

Source : Arrow, 1917.

27. *Popillia clara* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Animal dung/soil.

Ext. distribution : South India.

Source : Arrow, 1917.

28. *Popillia eximia* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Deciduous/semi deciduous forests.

Source : Arrow, 1917.

29. *Popillia chlorion* Newn

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Ground/dung.

Ext. distribution : South India.

Source : Arrow, 1917.

30. *Popillia complanata* Newn

Locality : Nilgiri Hills : Nadgani.

Altitude : 2500'.

Habitat : Deciduous/semi deciduous forests.

Ext. distribution : Malabar, Bombay, North Kanara.

Source : Arrow, 1917.

31. *Popillia schizonycha* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Soil/dung/vegetation.

Ext. distribution : Bangalore.

Source : Arrow 1917.

32. *Anoplanomala globulosa* (Sharp)

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Deciduous forest, soil vegetation.

Source : Arrow, 1917.

33. *Anoplanomala carneola* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Deciduous forest.

Ext. distribution : South India.

Source : Arrow, 1917.

34. *Mimela xanthorrhina* Hope

Locality : Nilgiri Hills, Coonoor.

Altitude : 2000' to 6000'.

Habitat : Deciduous/semideciduous forests.

Ext. distribution : South India.

Source : Arrow, 1917.

35. *Anomala polymorpha* Arrow

Locality : Nilgiri Hills.

Altitude : 4000'.

Habitat : Deciduous forest/soil.

Source : Arrow, 1917.

36. *Anomala Olivieri* Sharp

Locality : Nilgiri Hills.

Altitude : 4000'

Habitat : Evergreen forest, tropics.

Ext. distribution : Kerala: Cochin

Source : Arrow, 1917.

37. *Anomala elata* Fabricius

Locality : Coorg.

Altitude : 5400'

38. *Anomala Nilgiriensis* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Deciduous/semideciduous forest.

Source : Arrow, 1917.

39. *Anomala pellucida* Arrow

Locality : Nilgiri Hills.

Altitude : 4000'

Habitat : Evergreen forest.

Ext. distribution : Tamil Nadu : Madurai

Source : Arrow, 1917.

40. *Anomala communis* Burmeister

Locality : Nilgiri Hills Coorg.

Altitude : 2000' to 5000'.

Habitat : Deciduous/semideciduous forest.

Ext. distribution : Tamil Nadu, Kerala.

Source : Arrow, 1917.

41. *Anomala ignicollis* Blanchard

Locality : Nilgiri Hills.

Altitude : 4000'.

Habitat : Evergreen forest.

Ext. distribution : Pondicherry.

Source : Arrow, 1917.

42. *Anomala mus* Arrow

Locality : Nilgiri Hills.

Altitude : 6000'.

Habitat : Deciduous forest.

Ext. distribution : Tamil Nadu : Shembaganur.

Source : Arrow, 1917.

43. *Anomala semiaenea* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest.

Source : Arrow, 1925.

44. *Anomala conjuga* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest.

Ext. distribution : South Kanara, Nagody, Bombay.

Source : Arrow, 1917.

45. *Anomala regina* (Newman)

Locality : Nilgiri Hills : Naduvattom.

Altitude : 3000'.

Habitat : Deciduous forest.

Source : Arrow, 1917.

46. *Anomala rugilatera* Arrow

Locality : Nilgiri Hills.

Altitude : 3000'.

Habitat : Evergreen forest.

Ext. distribution : South India.

Source : Arrow, 1917.

47. *Anomala armata* Arrow

Locality : Nilgiri Hills, Silent valley.

Altitude : 3000'.

Habitat : Tropical forest.

Ext. distribution : South India.

Source : Arrow, 1917.

48. *Anomala vitilatera* Arrow

Locality : Silent valley.

Altitude : 3000'.

Habitat : Tropical forest foliage.

Source : Arrow, 1917.

49. *Adoretus nephriticus* Ohaus

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Tropical evergreen forest, foliage.

Ext. distribution : Shevory hills, Yercaud, Pondicherry, Tiruchirapalli, Shembaganur, Kodaikanal.

Source : Arrow, 1917.

50. *Adoretus ovalis* Blanchard

Locality : Nilgiri Hills.

Altitude : 2500' to 7000.

Habitat : Tropical forest, Foliage.

Source : Arrow, 1917.

51. *Adoretus latirostris* Ohaus.

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical Forest.

Ext. distribution : Bombay, Belgaum.

Source : Arrow, 1917.

52. *Adoretus caliginosus* Burneister

Locality : Nilgiri Hills.

Altitude : 3500'.

Habitat : Tropical forest vegetation.

Ext. distribution : Punjab, Kangra, Vatley; Burma (Myanmarh), Rangoon.

Source : Arrow, 1917.

Sub-family COPRINAE.

53. *Scarabaeus sanctus* (Fabricius)

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest, soil.

Ext. distribution : Belgaum, Bihar, Orissa, Sholapur, Bangalore.

Source : Arrow, 1931.

54. *Gymnopleurus spilotus* (Macleay)

Locality : Nilgiri Hills

Altitude : 2500' to 5000'.

Habitat : Tropical evergreen forest/soil.

Ext. distribution : Bengal, Behrampur, Bihar, Kodaikanal, Palni Hills, Madura, Bangalore.

Source : Arrow, 1931.

55. *Gymnopleurus aethiops* Sharp*Locality* : Nilgiri Hills, Nilambur.*Altitude* : 2500'*Habitat* : Tropical evergreen forest/soil.*Ext. distribution* : India : Madras, Cochin; Formosa; Thailand; Hongkong.*Source* : Arrow, 1931.56. *Gymnopleurus sinuatus* (Olivier)*Locality* : Nilambur.*Altitude* : 1750' to 2500'*Habitat* : Tropical evergreen forest/soil inhabitant.*Ext. distribution* : Maharashtra, Karnataka.*Source* : Arrow, 1931.57. *Sisyphus araneolus* Arrow.*Locality* : Nilgiri Hills.*Altitude* : 2500'*Habitat* : Tropical evergreen forest/soil.*Source* : Arrow, 1931.58. **Sisyphus hirtus* Wiedemann.*Locality* : Nilgiri Hills.*Altitude* : 1000' to 3000'*Habitat* : Tropical evergreen forest/soil.*Ext. distribution* : India : Bangalore, Mysore, Bombay, Belgaum; Sri Lanka.*Source* : Arrow, 1931.59. *Heliocopris bucephalus* (Fabricius)*Locality* : Hassanur.*Altitude* : 900' metres.*Habitat* : Tropical region, forested area.*Status* : Common.*Ext. distribution* : India : Bihar, Maharashtra, Bengal; Burma; Thailand; Malay Peninsula; Java.*Source* : Arrow, 1925.*Remarks* : Recorded from South India for the first time. The pupae of this beetle known as shew-po much esteemed as food in Burma.60. **Catharsius sagax* Quens*Locality* : Nilgiri Hills.*Altitude* : 6000'.*Habitat* : Tropical forest/dung/soil.*Status* : Common.*Ext. distribution* : India : Bengal, Bihar, M.P., Maharashtra, Tamil Nadu, Kerala; Bhutan.*Source* : Arrow, 1931.*Remark* : *Recorded during present survey.61. *Catharsius granulatus* Sharp*Locality* : Silent valley, Kerala.*Habitat* : Tropical forest.*Status* : Common.*Ext. distribution* : India : Bihar, Uttar Pradesh, Sikkim, Kerala; Sri Lanka; Pakistan.*Source* : Arrow, 1931.*Remarks* : Widely distributed.62. **Copris repertus* Walk*Locality* : Nilgiri Hills.*Altitude* : 2000' to 5000'.*Habitat* : Soil inhabitant.*Status* : Common in tropics.*Ext. distribution* : India : Bihar, Maharashtra, Madhya Pradesh; Sri Lanka; Burma.*Source* : Arrow, 1931.*Remark* : *Recorded in present survey.63. *Copris indicus* Gillet*Locality* : Silent valley, Kerala.*Habitat* : Tropical forest.*Status* : Common.*Ext. distribution* : India : Bangalore, Mysore, Tamil Nadu, Karnataka; Sri Lanka.

Source : Arrow, 1931.

64. *Copris davisoni* Waterhousei

Locality : Nilgiri Hills.

Altitude : 3000'

Habitat : Soil.

Status : Common.

Source : Arrow, 1931.

Remark : Collected from decaying ficus tree trunk.

65. *Caccobius gallinus* Arrow

Locality : Nilgiri Hills.

Altitude : 3000'.

Habitat : Soil/decaying wood/under soil.

Status : Common.

Source : Arrow, 1931.

66. *Caccobius indicus* Harold

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Soil/dung.

Source : Arrow, 1931.

67. *Caccobius unicornis* (Fabricius)

Locality : Silent Valley, Kerala.

Habitat : Tropical forest.

Ext. distribution : India : Bihar, Uttar Pradesh, Sikkim, Kerala; Sri Lanka; Pakistan.

68. *Onthophagus cavia* Boucomont

Locality : Nilgiri Hills, Coonoor.

Altitude : 4500' to 6000'

Habitat : Soil/dung.

Source : Arrow, 1931.

69. *Onthophagus pacificus* Lansberge

Locality : Nilgiri Hills.

Altitude : 3000'.

Habitat : Soil/filth inhabiting.

Status : Common.

Ext. distribution : India : Karnataka, Assam, Bengal, Dehradun; Burma; Thailand; Bangladesh; Vietnam; Malaya; Borneo; Indonesia.

Source : Arrow, 1931.

70. *Onthophagus imperator* Castelnau

Locality : Nilgiri Hills.

Altitude : 3000'.

Habitat : Tropical Forest/soil-dung.

Status : Common.

Ext. distribution : Karnataka, Belgaum.

Source : Arrow, 1931.

71. *Onthophagus tarandus* (Fabricius)

Locality : Nilgiri Hills.

Altitude : 3000'.

Habitat : Tropical forest (found in flowers of *Typhonius trilobatum*).

Status : Common.

Ext. distribution : U.P., Maharashtra, Karnataka, Bengal, Bihar, C. India, Reva ghat.

Source : Arrow, 1931.

72. *Onthophagus griseosetosus* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest (decaying wood/soil).

Status : Common.

Ext. distribution : Karnataka, Madhya Pradesh, Uttar Pradesh.

Source : Arrow, 1931.

73. *Onthophagus bronzeus* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest/soil dung.

Status : Common.

Ext. distribution : Maharashtra, Karnataka.

Source : Arrow, 1931.

74. *Onthophagus amphinusus* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Tropical forest/decaying wood/animal matter.

Status : Common.

Ext. distribution : Talewadi, near castle rock.

Source : Arrow, 1931.

75. *Onthophagus spinifex* (Fabricius)

Locality : Nilgiri Hills.

Altitude : 2000' to 3000'.

Habitat : Tropical forest/decaying matter.

Status : Common.

Ext. distribution : India : Bombay, Pune, Belgaum, Pusa; Sri Lanka.

Source : Arrow, 1931.

76. *Onthophagus bisectus* Arrow

Locality : Nilgiri Hills.

Altitude : 5000'.

Habitat : Tropical forest (decaying vegetable matter/dung).

Ext. distribution : Snow down peak, South India.

Source : Arrow, 1931.

77. *Onthophagus coorgensis* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Tropical forest/decaying vegetable matter, also found in rotting papaya.

Status : Common.

Source : Arrow, 1931.

78. *Onthophagus pygmaeus* Schaller

Locality : Nilambur.

Altitude : 2000'.

Ext. distribution : Bangalore.

Source : Arrow, 1931.

79. *Onthophagus castetsi* Lansberge

Locality : Silent valley (Kerala).

Habitat : Tropical forest.

Ext. distribution : Tamil Nadu, Kerala, Trivandrum.

80. *Onthophagus bifasciatus* (Fabricius)

Locality : Silent valley (Kerala).

Habitat : Tropical forest.

Ext. distribution : India : West Bengal, Assam, Sikkim, Bihar, Tamil Nadu, Kerala (silent valley); Burma.

81. *Onthophagus keralicus* Biswas and Chatterjee

Locality : Silent valley.

Source : Biswas and Chatterjee, 1986.

82. *Onthophagus sahai*, Biswas and Chatterjee

Locality : Silent valley, Kerala.

Habitat : Tropical forest.

Source : Biswas and Chatterjee, 1986

83. *Onthophagus taruni* Biswas and Chatterjee

Locality : Silent Valley.

Source : Biswas and Chatterjee, 1986.

84. *Onthophagus brevicollis* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest/soil/filth.

Status : Common.

Ext. distribution : Madhya Pradesh.

Source : Arrow, 1931.

85. *Onthophagus rectecornutus* Lansberge

Locality : Nilgiri Hills.

Altitude : Upto 7000'.

Habitat : Tropical forest soil.

Status : Common.

Ext. distribution : India : Assam, Naga hills, Bihar, Bengal; Burma; Bhutan; Sri Lanka.

Source : Arrow, 1931.

86. *Onthophagus niligirensis* Gillet

Locality : Nilgiri Hills.

Altitude : 2500' to 3000'.

Habitat : Decaying wood/soil.

Source : Arrow, 1931.

87. *Onthophagus vividus* Arrow

Locality : Nilgiri Hills.

Altitude : 2500' to 3000'.

Habitat : Tropical forest/elephant dung.

Status : Common in tropics.

Ext. distribution : Bangalore, Nandidurg, Jawalgi, N. Salem, Trivandrum.

Source : Arrow, 1925.

Remark : *Collected during the present survey from Nagarhole N.B.R.

88. *Onthophagus kchatriya* Boucomont

Locality : Nilambur, Nilgiri Hills,

Altitude : 2500'.

Habitat : Tropical forest/decaying matter/soil.

Status : Common.

Ext. distribution : Yercaud.

Source : Arrow, 1931.

89. *Onthophagus modogua* Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest/soil burrowing.

Source : Arrow, 1931.

90. *Onthophagus discedens* Sharp

Locality : Nilgiri Hills.

Altitude : Upto 3300'.

Habitat : Tropical forest (decaying plants).

Status : Common.

Ext. distribution : Bengal, Darjeeling, Sikkim, Uttar Pradesh.

Source : Arrow, 1931.

91. *Onthophagus ampicoma* Boucomont

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest/decaying matter/under soil.

Ext. distribution : South Kerala.

Source : Arrow, 1931.

92. *Onthophagus tritinctus* Boucomont

Locality : Coonoor.

Altitude : Found upto 1600'.

Habitat : Forest area, with decaying plants.

Ext. distribution : India : Maharashtra, Karnataka; Sri Lanka

Source : Arrow, 1931.

93. *Onthophagus mauritii* Boucomont

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest animal dung/soil.

Status : Common.

Ext. distribution : Chickaballapur, Pusa, Bombay, Dharwad.

Source : Arrow, 1931.

94. *Onthophagus dama* (Fabricius)

Locality : Nilgiri Hills, Nilambur.

Altitude : 5000'.

Habitat : Tropical evergreen forest.

Status : Common.

Ext. distribution : India : Sikkim, Bengal, Darjeeling, Bihar, Pune, Bombay, South India; Sri Lanka; Nepal; Bhutan.

Source : Arrow, 1931.

95. *Onthophagus quadridentatus* (Fabricius)

Locality : Nilgiri Hills.

Altitude : 3000' - 5000'.

Habitat : Tropical forest.

Status : Common.

Ext. distribution : India : Assam, Bengal, Maharashtra, C. India, South India; Sri Lanka.

Source : Arrow, 1931.

96. *Onthophagus pardalis* (Fabricius)

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest/decaying organic mater.

Status : Common in tropics.

Ext. distribution : Tiruchirapally, Karnataka, Belgaum.

Source : Arrow, 1931.

97. *Onthophagus bengalensis* Horold

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Tropical forest/soil, filth inhabitant.

Source : Arrow, 1931.

98. *Onthophagus ephippioderus* Arrow

Locality : Nilgiri Hills.

Altitude : 3000'.

Habitat : Tropical forest-humus/soil, inhabitant.

Ext. distribution : Chikkangulur, Bangalore, South India.

Source : Arrow, 1931.

99. *Onthophagus urettus* Boucomont

Locality : Nilgiri Hills.

Altitude : 3000'.

Habitat : Tropical forest/soil inhabitator.

Source : Arrow 1931.

100. *Onthophagus fasciatus* Boucomont

Locality : Nilgiri Hills, Coorg, Coonor.

Altitude : 3000'.

Habitat : Tropical forest/under soil.

Status : Common.

Ext. distribution : Shembaganur, Palni Hills, South India, Dehradun, C. India, Reva State, Bengal, Chittagong, Hill track, Maharashtra.

Source : Arrow, 1931.

101. *Onthophagus truncaticornis* Schall

Locality : Nilgiri Hills.

Altitude : 3000'.

Habitat : Tropical forest (under soil).

Status : Common.

Ext. distribution : Bombay, Dharwar, Belgaum, Mangalore,

Source : Arrow, 1931.

102. *Onthophagus andrewesi* Arrow

Locality : Nilgiri Hills, Silent Valley

Altitude : 2400'.

Habitat : Decaying matter/Tropical forest.

Status : Common

Ext. distribution : Karnataka.

103. *Onthophagus socialis* Arrow

Locality : Nilgiri Hills, Coorg.

Altitude : 2500'.

Habitat : Tropical forest/soil inhabitant.

Ext. distribution : Belgaum, Fraserpet.

Source : Arrow, 1931.

Status : Common.

Ext. distribution : India : Bengal, Bihar, Bombay, Pune, Madras, Karnataka; Sri Lanka.

104. *Onthophagus turbatus* Walker

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest/soil/dung.

Status : Common.

Ext. distribution : India : Bombay, Pune, Belgaum, Mahe, Malabar, Pondichery, Kotte; Sri Lanka

Source : Arrow, 1931.

108. *Onthophagus centricornis* (Fabricius)

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest/under ground.

Status : Common.

Ext. distribution : India : Central India, Nagpur, Balaghat, Raigarh, Bombay, Kanara, Belgaum; Sri Lanka.

Source : Arrow, 1931.

109. *Onthophagus ludio* Boucomont

Locality : Nilgiri Hills, Coorg.

Altitude : 3500'.

Habitat : Tropical forest/under soil.

Status : Common.

Ext. distribution : India : Nagpur, Bombay, Belgaum, Madras; Ceylon.

Source : Arrow, 1931.

105. *Onthophagus ensifer* Boucomont

Locality : Nilgiri Hills, Coonoor.

Altitude : 5000'.

Habitat : Tropical forest (in soil/dung)

Ext. distribution : Palni hills, Shembaganur, Kodaikanal.

Source : Arrow, 1931.

110. *Onthophagus cervus* Fabricius

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Tropical forest/soil inhabitant.

Status : Common.

Ext. distribution : India : Bengal, Dehradun, U.P., C. India, Maharashtra, South India, Pondicherry, Calicut, Andaman; Sri Lanka.

Source : Arrow, 1931.

106. *Onthophagus bifasciatus* (Fabricius)

Locality : Nilgiri Hills.

Altitude : Upto 4000'

Habitat : Tropical forest (Carrion feeder).

Status : Common.

Ext. distribution : India : Bengal, Bihar, Assam; Burma.

Source : Arrow, 1931.

111. *Onthophagus duporti* Boucomont

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest.

Status : Common.

Ext. distribution : Bihar, Karnataka; Burma.

107. *Onthophagus unifasciatus* (Schaller)

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest (soil, dung).

Source : Arrow, 1931.

112. *Phacosoma triste*, Arrow

Locality : Nilgiri Hills.

Altitude : 2500'

Habitat : Tropical forest.

Source : Arrow, 1925.

113. *Phacosoma latum*, Arrow

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest.

Status : Common.

Ext. distribution : Assam, Bengal, Darjeeling, Madras.

Source : Arrow, 1931.

114. *Liatongus indicus* Arrow

Locality : Nilgiri Hills.

Altitude : 3000' to 6000'

Habitat : Tropical forest.

Source : Arrow, 1931.

115. *Cassolus humeralis* Arrow

Locality : Nilgiri Hills.

Altitude : Found upto 4000'.

Habitat : Tropical forest.

Ext. distribution : Assam, Bengal, Darjeeling, Madras.

Source : Arrow, 1931.

116. *Oniticellus pallipes* Fabricius

Locality : Nilambur.

Altitude : 6000'.

Habitat : Tropical region.

Status : Common.

Ext. distribution : Kodaikanal, South India, Arcot, Gizapur, Bengal, Bombay city, Madras city; Bangladesh.

Source : Arrow, 1931.

117. *Oniticellus spinipes* Roth

Locality : Nilambur.

Altitude : 6000'.

Habitat : Tropical region.

Status : Common.

Ext. distribution : India: Punjab, Almora, Sitapur, Dehradun, Massoorie, Nagpur, Bombay, Belgaum, Calcutta, Madras; West Africa; East Africa; Rhodesia.

Source : Arrow, 1925.

118. *Oniticellus cinctus* (Fabricius)

Locality : Nilgiri Hills.

Altitude : 3000' to 4500'.

Habitat : Tropical forest and Tropical region.

Status : Common.

Ext. distribution : India : U.P., Dehradun, West Almora, Bengal, Darjeeling, Assam; Burma; Malaya Peninsula; South China; Bangladesh; Thailand.

Source : Fauna of India, Arrow 1925.

Remark : Found in large numbers.

119. *Drepancerus setosus* Wiedemann

Locality : Nilambur.

Altitude : Upto 3200'.

Habitat : Tropical region.

Status : Common.

Ext. distribution : India : Dehradun, Almora, Umarid, Rewah, Nagpur; Sri Lanka.

Source : Arrow, 1925.

120. **Onitis siva* Gillet

Locality : Nilgiri Hills.

Altitude : 3500'.

Habitat : Tropical forest (elephant dung.).

Status : Common.

Ext. distribution : Nagarhole, Karnataka.

Source : Arrow, 1925.

Remark : *Collected during the present survey from Nagarhole National Park.

121. **Onitis philemon* Fabricius

Locality : Nilambur.

Habitat : Tropical region.

Status : Common.

Ext. distribution : India : Bengal, Bihar, Uttar Pradesh, Punjab, Maharashtra, Karnataka, Tamil Nadu; Sri Lanka.

Source : Arrow 1925.

Remarks : Collected during present survey.

122. *Onitis singhalensis* Lansberge

Locality : Nilgiri Hills, Coorg.

Altitude : 2500'.

Habitat : Tropical forest.

Ext. distribution : Yercaud.

Source : Arrow, 1925.

123. *Onitis virens* Lansberge

Locality : Nilgiri Hills.

Altitude : 2500'.

Habitat : Tropical forest area.

Status : Common.

Ext. distribution : Bombay, Belgaum, Supkhar, Balaghat, Chkalda, Berar, Nowegoan, Bhandara dist. Bastar, Dehradun, South Kerala.

Source : Arrow, 1931.

124. *Autoserica atratula* Dalla Torre

Locality : Silent valley

Habitat : Tropical forest.

Ext. distribution : Kerala, Tamil Nadu.

125. *Autoserica brevis* (Blanchard)

Locality : Silent valley

Habitat : Tropical forest.

Ext. distribution : Kerala, Tamil Nadu.

126. *Autoserica mutabilis* (Olivier)

Locality : Silent valley

Ext. distribution : Kerala (silent valley)

127. *Autoserica tranquebarica* Brenske

Locality : Silent valley, Kerala.

Habitat : Tropical evergreen forest.

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INSECTA : LEPIDOPTERA : RHOPALOCERA

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INTRODUCTION

There are more than 10,000 species of Butterflies known to science. About 1500 species are represented in India. Some of the species rich areas in India are the North eastern India with about 835 species, south India with 315 and Andaman-Nicobars with 217.

Indian Butterflies were studied by Linnaeus as early as 1758. The first systematic account of the Nilgiri Butterflies is that of Sir George Hampson (1888 (1889)). Subsequently, major contributions were made by Evans (1932), Yates (1935, 1946), Wynter-Blyth (1943, 1944, 1946, 1947, 1957) and Larsen (1987, 1988).

The recent studies on the Butterfly fauna carried out by Larsen (*op. cit*) in the Nilgiris of Western Ghats reveal that the Nilgiri Mountains harbour almost all the species recorded from southern India. Out of the 315 species of Butterflies known from south India, Larsen recorded 300 species from Nilgiris and also provided a list of Butterflies, some of which may eventually be found also in the Nilgiris. Further, according to Larsen there is probably no other area of similar size in India harbouring that many species partly because those areas which have true rain forests will not simultaneously house the montane and temperate element that is found in the Nilgiris. Low land rain forests closely followed by wet evergreen forests of Nilgiris are thus the richest habitats of Butterflies in the Peninsular India. It is interesting to note that two localities namely Kallar and Nadugani ghat house a large number of Butterfly species recorded by Larsen in the Nilgiris.

Out of the 300 species of Butterflies recorded by Larsen, 64 species are rare in the Nilgiris. Of these the species endemic to Western Ghats are particularly important from the conservation point of view.

A systematic list of Butterflies of Nilgiri mountains recorded by Larsen is given below followed by an inventory of 88 species collected during recent faunistic surveys.

SYSTEMATIC LIST

(Treated upto Species Level)

Family PAPILIONIDAE

Subfamily PAPILIONINAE

- *1. *Triodes minus* Cramer
2. *Pachliopta Pandiana* (Moore) EN-WG
- *3. *Pachliopta aristolochiae* (Fabricius)
- *4. *Pachliopta hector* (Linne')
- *5. *Chilasa clytia* (Linne') R
- *6. *Papilio demoleus* Linne'
7. *Papilio liomedon* Moore EN-WG
8. *Papilio dravidarum* Wood-Mason EN-WG
- *9. *Papilio helenus* Linne'
- *10. *Papilio polytes* Linne'
11. *Papilio polymnestor* Cramer
12. *Papilio paris* Linne'
- *13. *Papilio crino* Fabricius
14. *Papilio buddha* Westwood EN-WG

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* Recorded from Nilgiri Biosphere Reserve through Z.S.I. surveys, EN-WG: Endemic to Western Ghats, R : Rare in

- *15. *Graphium sarpedon* (Linne')
16. *Graphium doson* (Felder & Felder)
- *17. *Graphium agamemnon* (Linne')
- *18. *Pathysa nomius* (Esper)
19. *Pathysa antipathes alcibiates* Fabricius
- *20. *Delias eucharis* (Drury)
- *21. *Leptosia nina* (Fabricius)
22. *Prioneris sita* (Felder & Felder)
23. *Artogeia canidia* (Sparrmann)
- *24. *Cepora nerissa* (Fabricius)
- *25. *Cepora nadina* (Lucas)
- *26. *Anaphaeis aurota* (Fabricium)
- *27. *Appias indra* (Moore)
28. *Appias libythea* (Fabricius)
- *29. *Appias lyneida* (Cramer)
- *30. *Appias albina* (Boisduval)
31. *Appias wardii* (Moore)
- *32. *Colotis amata* (Fabricius)
- *33. *Colotis etrida* (Boisduval)
- *34. *Colotis eucharis* (Fabricius)
- *35. *Colotis danae* (Fabricius)
36. *Madais fausta* (Olivier)
- *37. *Ixias marianne* (Cramer)
- *38. *Ixias pyrene* (Linne')
- *39. *Hebomoia glaucippe* (Linne')
40. *Pareronia valeria* (Cramer) R
41. *Pareronia ceylonica* (Felder & Felder)
- Subfamily COLIADINAE
- *42. *Catopsilia pomona* (Fabricius)
- *43. *Catopsilia pyranthe* (Linne')
- *44. *Eurema brigitta* (Cramer).
45. *Eurema laeta* (Boisduwal)
- *46. *Eurema hecabe* (Linne')
- *47. *Eurema blanda* (Boisduval)
48. *Eurema andersonii* (Moore) R
- *49. *Colias nilagiriensis* (Felder & Felder)
- Family LYCAENIDAE
- Subfamily MILENTINAE
50. *Spalgis epeus* (Westwood)
- Subfamily POLYOMMATINAE
- *51. *Castalius rosimon* (Fabricius)
52. *Caleta caleta* (Hewitson)
- *53. *Discolampa ethion* (Doubledey & Hewitson)
54. *Tarucus ananda* (de Niceville)
55. *Tarucus nara* Kollar
56. *Tarucus callinara* Butler
- *57. *Syntarucus plinius* (Fabricius)
58. *Azanus ubaldus* (Cramer)
59. *Azanus Jesus* (Guerin)
60. *Everes lacturnus* (Fruhstorfer)
61. *Udara akasa* (Horsfield)
62. *Acytolepis puspa* (Horsfield)
63. *Acytolepis liliacea* (Hampson)R
64. *Celatoxia albidisca* (Moore)
65. *Celastrina lavendularis* (Moore)
- *66. *Neopithecops zalmora* (Butler)
67. *Megisba malaya* (Horsfield) R
68. *Zizeeria maha* (Kollar)
69. *Zizeeria karsandra* Moore
- *70. *Zizina otis* (Fabricius)
- *71. *Zizula hylax* (Fabricius)
- *72. *Chilades laius* (Cramer)
73. *Chilades parrhasius* (Fabricius)
74. *Chilades pandava* (Horsfield)
75. *Freyeria trochylus* - putli (Kollar)
- *76. *Euchrysops cnejus* (Fabricius)
77. *Catochrysops strabo* (Fabricius)
78. *Lampides boeticus* (Linne')

79. *Jamides bochus* (Cramer)
 *80. *Jamides celeno* (Cramer)
 *81. *Jamides alecto* (Felder) R
 82. *Nacaduba pactolus* (Felder)
 83. *Nacaduba hermus* (Felder & Felder) R
 84. *Nacaduba kurava* (Moore)
 85. *Nacaduba calauria* (Felder) R
 86. *Nacaduba beroe* (Felder)
 87. *Nacaduba berenice* (H. Schaffer)
 88. *Ionolyce helicon* (Moore) R
 89. *Prosotas nora* (Felder)
 90. *Prosotas dubiosa indica* (Evans)
 91. *Prosotas noruia* (Felder) R
 92. *Petrolaea dana* (de Niceville.)
 93. *Anthene emolus* (Godart) R
 *94. *Anthene lycaenina* (Felder)
 *95. *Talicada nyseus* (Guerin)
- Subfamily THEELINAE
96. *Arhopala pseudocentaurus* (Doubleday)
 97. *Arhopala amantes* (Hew itson)
 98. *Arhopala canaraica* (Moore) EN-WG/R
 99. *Arhopala abseus* (Hewitson) R
 100. *Thaduka multicaudata* Moore
 101. *Surendra quercetorum* (Moore)
 102. *Zinaspa todara* (Moore)
 103. *Iraota timoleon* (Stoll) R
 104. *Amblypodia anita* (Hewitson)R
 *105. *Spindasis vulcanus* (Fabricius)
 106. *Spindasis schistacea* (Moore)
 107. *Spindasis ictis* (Hewitson)
 108. *Spindasis elima* (Moore)
 109. *Spindasis abnormis* (Moore) EN-WG/R
 110. *Spindasis lohita* (Moore)
111. *Catapaecilma major* (Druce)
 112. *Loxura atymnus* (Cramer)
 *113. *Cheritra freja* (Fabricius)
 114. *Rathinda amor* (Fabricius)
 115. *Horaga anyx* (Moore) R
 116. *Horaga viola* Moore R
 117. *Zezius chrysomallus* Hubner
 118. *Ancema blanda* (de Niceville) R
 119. *Creon cleobis* (Godart)
 120. *Pratapa deva* (Moore)
 121. *Tajuria maculata* (Hewitson)
 122. *Tajuria cippus* (Fabricius) R
 123. *Tajuria jehana* Moore
 124. *Tajuria melastigma* de Niceville R
 125. *Rachana jalindra* (Horsfield) R
 126. *Hypolycaena nilgirica* Moore R
 127. *Chliaria othona* (Hewitson) R
 128. *Zeltus amasa* (Hewitson) R
 129. *Deudorix epijarbas* (Moore)
 130. *Deudorix isocrates* (Fabricius) R
 131. *Deudorix perse* (Hewitson) R
 132. *Bindahara phocides* (Fabricius)
 133. *Rapala jarbus* (Fabricius)
 134. *Rapala lankana* (Moore)
 135. *Rapala manea schistacea* (Moore)
 136. *Rapala varuna* (Hewitson)
- Subfamily CURETINAE
137. *Curetis thetis* (Drury)
 138. *Curetis dentata* Moore
 139. *Curetis siva* Evans R
- Subfamily RIODININAE
140. *Abisara echerius* (Stoll)

- Family NYMPHALIDAE
- Subfamily DANAINAE
- *141. *Danaus chrysippus* (Linne')
- *142. *Danaus genutia* (Cramer)
- *143. *Tirumala limniace* (Cramer)
- *144. *Tirumala septentrionis* (Butler)
- *145. *Parantica aglea* (Stoll)
- *146. *Parantica nilgiriensis* (Moore)
- *147. *Idea malabarica* (Moore) EN-WG
- *148. *Euploea core* (Cramer)
- *149. *Euploea sylvester* (Fabricius)
150. *Euploea klugii* Moore R
- Subfamily SATYRINAE
- *151. *Melanitis leda* (Drury)
152. *Melanitis zitenius* (Herbst)
- *153. *Melanitis phedima* Cramer
154. *Elymnias hypermnestra* Linne'
155. *Lethe europa* (Fabricius)
156. *Lethe drypetis* (Hewitson)
- *157. *Lethe rohria* (Fabricius)
158. *Mycalesis anaxias* (Hewitson)
- *159. *Mycalesis perseus* (Fabricius)
- *160. *Mycalesis mineus* (Linne')
161. *Mycalesis subdita* (Moore)
- *162. *Mycalesis igilia* Fruhstorfer EN-WG
163. *Mycalesis visala* Moore
164. *Mycalesis khasia* Evans
165. *Mycalesis adolphe* (Guerin) EN-WG
- *166. *Mycalesis patnia* Moore
- *167. *Orsotrioena medus* (Fabricius)
168. *Zipoetis saitis* (Hewitson)
169. *Ypthima asterope* (Kluger) R
- *170. *Ypthima ceylonica* (Hewitson)
171. *Ypthima huebneri* (Kirby)
172. *Ypthima avanta* (Moore)
- *173. *Ypthima baldus* (Fabricius)
174. *Ypthima chenui* (Guerin)
175. *Ypthima philomela* (Johanssen)
- Subfamily AMATHUSIIDAE
176. *Discophora lepida* (Moore) R
177. *Byblia ilithyia* (Drury)
- *178. *Ariadne ariadne* (Linne')
- *179. *Ariadne merione* (Cramer)
180. *Cupha erymanthis* (Drury)
- *181. *Phalanta phalantha* (Drury)
- *182. *Cirrochroa thais* (Fabricius)
- *183. *Vindula erota* (Fabricius)
184. *Argyreus hyperbius* (Johanssen)
185. *Cethosia nietneri* Felder
- *186. *Junonia hierta* (Fabricius)
187. *Junonia orithyia* (Linne')
- *188. *Junonia lemonias* (Linne')
189. *Junonia almana* (Linne')
190. *Junonia atlites* (Linne')
- *191. *Precis iphita* (Cramer)
- *192. *Vanessa cardui* (Linne')
193. *Vanessa indica* (Herbst)
194. *Kaniska canace* (Linne')
- *195. *Hypolimnas misippus* (Linne')
- *196. *Hypolimnas bolina* (Linne')
197. *Doleschallia bisaltide* (Cramer) R
198. *Kallima horsfieldi* (Boisduval) E-WG/R
199. *Cyrestis thyodamas* (Boisduval)
- *200. *Neptis jumbah* Moore
- *201. *Neptis hylas* Moore
202. *Neptis clinia* Moore
203. *Neptis nata* Moore

258. *Sovia hyrtacus* (de Niceville) R
 258. *Sovia hyrtacus* (de Niceville) R
 259. *Thoressa honorei* (de Niceville) R
 260. *Thoressa astigmata* Swinhoe
 261. *Thoressa sitala* (de Niceville) R
 262. *Thoressa evershedi* Evans
 263. *Iambrix salsala* (Moore)
 264. *Psolos fuligo* (Mabille)
 265. *Notocrypta paralysos* (Wood-Mason)
 266. *Notocrypta curvifascia* (Felder)
 267. *Udaspes folus* (Cramer)
 268. *Arnetta mercara* Evans EN-WG
 269. *Arnetta vindhiana* (Moore)
 270. *Suastus gremius* (Fabricius) R
 271. *Suastus minuta* (Moore)
 272. *Cupitha purreea* (Moore) R
 273. *Baracus vittatus* (Felder & Felder)
 274. *Hyarotis adrastus* (Stoll.)
 275. *Quedara basiflava* de Niceville R
 276. *Gangara thyrsis* (Fabricius) R
 277. *Matapa aria* (Moore)
 278. *Tarautrocera maevius* (Fabricius)
 279. *Taractrocera ceramas* (Hewitson)
 280. *Oriens concinna* (Elwes & Edwards) R
 *281. *Oriens goloides* (Moore)
 282. *Potanthus pallida* Evans R
 283. *Potanthus pseudomaesa* (Moore)
 284. *Potanthus confucius* - diana Evans
 285. *Potanthus pava* Fruhstorfer
 *286. *Potanthus palnia* Evans
 287. *Telicota colon* (Fabricius)
 288. *Telicota ancilla* (Herrich Schaffer)
 289. *Parnara naso - badra* Moore
 290. *Borbo cinnara* (Wallace)

291. *Borbo bevani* (Moore)
 292. *Pelopidas agna* Moore
 293. *Pelopidas subochracea* Moore R
 294. *Pelopidas mathias* (Fabricius)
 295. *Pelopidas conjuneta* (Herrich -Schaffer)
 296. *Polytremis lubricans* (Herrich -Schaffer)
 *297. *Baoris farri* (Moore) R
 298. *Caltoris kumara* (Moore)
 299. *Caltoris canaraica* (Moore) R
 300. *Caltoris philippina* (Herrich-Schaffer)

SYSTEMATIC ACCOUNT

Family PAPILIONIDAE

1. *Troides minos* Cramer

Locality : Chemboty (Silent valley N.P.) : Palghat district; Mavanahalla : Wynad district; Lakmanthirth (Nagarhole N.P.).

Habitat : Lowland evergreen forests, mixed deciduous forests, subtropical evergreen forests and agricultural lands.

Status : Not rare.

Distribution : Southern India.

2. *Pachliopta aristolochiae* (Fabricius)

Locality : Vazhikadavu (Nilambur) : Malappuram district; Silent valley N.P., Kummarkundu, Muthikulam, Mrigapara, Anamooli : Palghat district; Kovai - courtalam, Siruvani, Samyarpallam; Coimbatore district; Hassanur : Periyar district.

Habitat : Most types of habitats with the exception of dense, wet forests.

Status : Common, widespread.

Distribution : Throughout the Oriental Region.

3. *Pachliopta hector* (Linne')

Locality : Kalkant, Mrigapara, Anamooli, Korma-Dohney, Nellipathi : Palghat district : Vaniyampuzha, Malakom R. F. : Malappuram

district; Bannari, Hassanur : Periyar district; Anaikatti : Coimbatore district.

Habitat : Open dry deciduous forest and ill kept agricultural land at low elevation.

Status : Very common.

Distribution : India (Bengal, South Bihar, Orissa, South India), Sri Lanka.

4. *Chilasa clytia* (Linne')

Locality : Kummarkundu, Muthikulam: Palghat district; Kuppadi R. F. : Wynad district; Kallar: Nilgiri district.

Habitat : Mixed dry deciduous forests at low elevations and the low land evergreen forests.

Status : Generally not rare, but local. However, in Nilgiris this species is quite rare.

Distribution : Throughout the Oriental Region.

5. *Papilio demoleus* Linne'

Locality : Bhavanipuzha, Mrigapara, Anamooli, Attapadi: Palghat district; Odanthurai, Kallar, Mulli Pillur: Nilgiri district; Nagarhole N.P.

Habitat : All kinds of habitat, generally a butterfly of the plains seen visiting garden flowers.

Status : Common

Distribution : India to Malaya, southern China and Australian Region.

6. *Papilio helenus* Linne'

Locality : Kovai-courtalam : Coimbatore district.

Habitat : Subtropical evergreen forests.

Status : Common.

Distribution : Oriental Region, Southern fringes of Palaearctic in China and Japan.

7. *Papilio polytes* Linne'

Locality : Silent valley, Attapadi, Agali : Palghat district; Kattikulam : Wynad district; Vaniyampuzha : Malappuram district; Kallar : Nilgiri district; Siruvani, Kovaicourtalam : Coimbatore district.

Habitat : All kinds of habitats of lower and middle elevations excluding deep virgin evergreen forests.

Status : Common.

Distribution : India, Sri Lanka, Burma.

8. *Papilio crino* Fabricius

Locality : Kondanur, Kallar, Briliyar confluence : Nilgiri district.

Habitat : Hot, dry jungle regions.

Status : Common in the Nilgiris

Distribution : India (Bengal, parts of South India); Sri Lanka

9. *Graphium sarpedon* (Linne'.)

Locality : Muthikulam : Palghat district; Briliyar confluence : Nilgiri district; Kovai - courtalam : Coimbatore district.

Habitat : Wetter and heavily wooded regions but frequents open country, often in gardens and open places near forests.

Status : Common.

Distribution : India (South India, Kashmir to Assam); Sri Lanka; Burma.

10. *Graphium agamemnon* (Linne')

Locality : Muthikulam : Palghat district.

Habitat : Wooded, wet regions.

Status : Common.

Distribution : India; Sri Lanka; Burma.

11. *Graphium nomius* (Esper)

Locality : Nagarhole N.P.

Habitat : Hilly and forested country.

Status : Not rare.

Distribution : India; Sri Lanka; Burma.

Family PIERDAE

12. *Delias eucharis* (Drury)

Locality : Rampur R.F. Dasanghatta,

Kurichiyad : Wynad district; Hassanur : Periyar district.

Habitat : Almost everywhere where there are trees.

Status : Common.

Distribution : India., Sri Lanka., Burma.

13. *Leptosia nina* (Fabricius)

Locality : Bannari, Hassanur, Karapalayam, Gethesal : Periyar district.

Habitat : Undergrowth of scrub jungle.

Status : Common.

Distribution : India; Sri Lanka; Burma.

14. *Cepora nerissa* (Fabricius)

Locality : Nellipathi : Palghat district; Mullipillur : Nilgiri district; Kunjapanai : Coimbatore district; Bannari, Hassanur : Periyar district.

Habitat : Warmer plains and open or scrub country.

Status : Common.

Distribution : India; Sri Lanka; Burma.

15. *Cepora nadina* (Lucas)

Locality : Kunthipuzha forest, Silent Valley N.P. : Palghat district.

Habitat : Hilly regions with heavy rainfall.

Status : Locally common.

Distribution : India (Western Ghats, Sikkim to Assam); Sri Lanka; Burma.

16. *Anaphaeis aurota* (Fabricius)

Locality : Hassanur : Periyar district; Mullipillur : Nilgiri district.

Habitat : Dry open country.

Status : Common.

Distribution : India except Assam; Sri Lanka.

17. *Appias indra* (Moore)

Locality : Agali, Silent valley N.P. : Palghat district.

Habitat : Forest and open country.

Status : Rare in South India.

Distribution : India (South India, Assam); Nepal; Sri Lanka; Burma.

18. *Appias lyncida* (Cramer)

Locality : Mavanahalla : Wynad District; Bhavanipuzha : Palghat district.

Habitat : Wet hilly forest, jungle clearings and along woodland streams.

Status : Local and scarce.

Distribution : India (S. India, Sikkim to Assam, Lucknow, Orissa); Sri Lanka; Burma.

19. *Appias albina* (Boisduval)

Locality : Vaniyampuzha, Munderi : Malappuram district; Bhavanipuzha, Kummarkundu, Muthikulam : Palghat district; Mullipillur, Peddikutta, Kallar, Briliyar confluence : Nilgiri district; Siruvani, Kovai - courtalam, Kunjapanai : Coimbatore district.

Habitat : Wooded country.

Status : Common.

Distribution : India; Sri Lanka; Burma.

20. *Colotis amata* (Fabricius)

Locality : Hassanur : Periyar district.

Habitat : Open, waste lands.

Status : Common.

Distribution : India except N.E.; Sri Lanka.

21. *Colotis etrida* (Boisduval)

Locality : Hassanur, Karapalayam : Periyar district; Molluholle forest : Bandipur Tiger Reserve.

Habitat : Grassy and bushy land.

Status : Common.

Distribution : All over the plains of India except Bengal and N. E.; Sri Lanka.

22. *Colotis eucharis* (Fabricius)

Locality : Bannari : Periyar district.

Habitat : Scrub jungles and dry waste places.

Status : Common.

Distribution : India (South India to central India); Sri Lanka.

23. *Colotis danae* (Fabricius)

Locality : Mullipillur: Nilgiri district.

Habitat : Open spaces.

Status : Not rare.

Distribution : India; Pakistan; Sri Lanka.

24. *Ixias marianne* (Cramer)

Locality : Vannanthurai : Nilgiri district; Kunjapanai : Coimbatore district; Bannari, Hassanur: Periyar district.

Habitat : Open plains and scrub jungle of foot hills.

Status : Common.

Distribution : India; Sri Lanka.

25. *Ixias pyrene* (Linne')

Locality : Peddikutta, Kallar, Mullipillur : Nilgiri district; Bannari, Hassanur : Periyar district.

Habitat : Scrub jungle at the foot hills.

Status : Common.

Distribution : India; Sri Lanka; Pakistan; Burma.

26. *Hebomoia glaucippe* (Linne')

Locality : Vaniyampuzha : Malappuram district; Kunjapanai : Coimbatore district.

Habitat : Forested, hilly terrain where rain fall is fairly heavy.

Status : Common.

Distribution : India (Peninsular India, N.E.); Nepal; Sri Lanka; Burma.

27. *Catopsilia pomona* (Fabricius)

Locality : Nilambur : Malappuram district; Vannanthurai, Mudumalai : Nilgiri district;

Hassanur : Periyar district; Bandipur Tiger Reserve; Nagarhole N.P.

Habitat : All kinds of terrain and in the hills.

Status : Very common.

Distribution : India; Sri Lanka; Burma.

28. *Catopsilia pyranthe* (Linne')

Locality : Attapadi village : Palghat district; Peddikuta, Odanthurai, Mullipillur, Kodungarai : Nilgiri district; Dhimbam : Periyar district; Anaikatti : Coimbatore district.

Habitat : All kinds of terrain and in the hills.

Status : Very common

Distribution : India; Sri Lanka; Burma.

29. *Eurema brigitta* (Cramer)

Locality : Kunjapanai : Coimbatore district; Odanthurai : Nilgiri district: Dihimbam, Hassanur, Karapalayam : Periyar district; Nagarhole N.P.; Bandipur Tiger Reserve.

Habitat : Bushy and grassy places.

Status : Very common.

Distribution : India; Sri Lanka; Burma.

30. *Eurema hecabe* (Linne')

Locality : Kuppadi, Kattikulam : Wynad district; Agali, Silent Valley N.P. : Palghat district; Upper Bhavani, Mukkurty, Kallar, Mullipillur, Vannanthurai : Nilgiri district; Bannari, Hassanur, Gethesal: Periyar district; Nagarhole N.P., Bandipur Tiger Reserve.

Habitat : All kinds of terrain.

Status : Very common.

Distribution : India; Sri Lanka; Burma.

31. *Eurema blanda* (Boisduval)

Locality : Mullipillur, Kodungarai, Vannanthurai : Nilgiri district.

Habitat : Low altitudes.

Status : Common.

Distribution : India (Peninsular India to Sikkim and the N.E.); Sri Lanka; Burma.

32. *Colias nilagiriensis* (Felder & Felder)

Locality : Upper Bhavani: Nilgiri district.

Habitat : Open hilly country.

Status : Common.

Distribution : India (hills of S. India).

Family LYCAENIDAE

33. *Castalius rosimon* (Fabricius)

Locality : Rampur: Wynad district; Bandipur Tiger Reserve; Nagarhole N.P.

Habitat : Open country and jungle.

Status : Common

Distribution : Throughout the Oriental Region

34. *Discolampa ethion* (Doubleday & Hewitson)

Locality : Mullipillur : Nilgiri district.

Habitat : Thick jungles in regions of heavy rainfall.

Status : Not rare, locally common in S. India.

Distribution : India (S. India, N.E. India, Kumaon); Sri Lanka; Burma; New Guinea.

35. *Syntarucus plinius* (Fabricius)

Locality : Agali : Palghat district.

Habitat : Open dry areas, but occasionally in wet jungle regions.

Status : Common.

Distribution : India; Sri Lanka; Burma.

36. *Neopithecops zalmora* (Butler)

Locality : Kuppadi R.F. : Wynad district; Siruvani : Coimbatore district.

Habitat : Evergreen forest at low elevations in regions of heavy rainfall.

Status : Common.

Distribution : India (South India, Kumaon to east); Sri Lanka; Burma.

37. *Zizina otis* (Fabricius)

Locality : Hasanur : Periyar district; Bandipur Tiger Reserve.

Habitat : Open grass lands.

Status : Common.

Distribution : Throughout the Oriental Region.

38. *Zizula hylax* (Fabricius)

Locality : Siruvani : Coimbatore district.

Habitat : Open grass lands.

Status : Common.

Distribution : Throughout Africa, Arabia; from India throughout the Oriental region and through New Guinea to the New Hebrides.

39. *Chilades laius* (Cramer)

Locality : Kuppadi : Wynad district; Nagarhole N.P.

Habitat : All types of country at low elevations.

Status : Common.

Distribution : India; Sri Lanka; Burma; Northern part of the Oriental Region to the Philippines.

40. *Euchrysops cnejus* (Fabricius)

Locality : Agali : Palghat district; Bandipur Tiger Reserve.

Habitat : Dry zones.

Status : Common.

Distribution : Whole of the Oriental Region extending to Australia and into the Pacific.

41. *Jamides celeno* (Cramer)

Locality : Siruvani : Coimbatore district.

Habitat : Driest to the wettest low tracts, jungles, plains.

Status : Common.

Distribution : Whole of the Oriental Region to New Guinea.

42. *Jamides alecto* (Felder)

Locality : Kallar : Nilgiri district.

Habitat : Wetter low land tracts and hilly jungle regions.

Status : Common.

Distribution : India (S. India, Sikkim, N.E. India); Sri Lanka; Nepal to Malaya.

43. *Anthene lycaenina* (Felder)

Locality : Nagarhole N.P.

Habitat : Most types of low land forests, hillier jungle regions.

Status : Common.

Distribution : India; Sri Lanka; Nepal east to Philippines and Sundaland.

44. *Talicauda nyceus* (Guerin)

Locality : Dhimbam, Hassanur : Periyar district.

Habitat : Shady areas of thick jungle and scrub jungle in plains.

Status : Locally abundant.

Distribution : India; Sri Lanka; Burma.

45. *Spindasis vulcanus* (Fabricius)

Locality : Siruvani : Coimbatore district.

Habitat : Open lowland country.

Status : Common.

Distribution : India; Sri Lanka.

46. *Cheritra freja* (Fabricius)

Locality : Vazhikadavu : Malappuram district.

Habitat : Wetter tracts of low land evergreen forests and hills.

Status : Locally common.

Distribution : India; Sri Lanka; Burma.

Family NYMPHALIDAE

Subfamily DANAINAE

47. *Danaus chrysippus* (Linne')

Locality : Agali, Silent valley N.P., Kuppadi : Palghat district; Mudumalai : Nilgiri district; Anaikatti : Coimbatore district; Hassanur : Periyar district; Nagarhole N.P.; Bandipur Tiger Reserve.

Habitat : Along the forest edges, plain areas, villages, agricultural land and disturbed forest areas.

Status : Very common.

Distribution : All the old world tropics with some penetration into the Palearctic of China, the Middle east and the Mediterranean.

48. *Danaus genutia* (Cramer)

Locality : Mrigapara : Palghat district; Mavanahalla : Wynad district; Kovai-Courtalam : Coimbatore district; Nagarhole N.P.

Habitat : Most types of country, wetter forests and on plateau.

Status : Very common.

Distribution : Throughout the Oriental Region, Australia.

49. *Tirumala limniace* (Cramer)

Locality : Bhavanipuzha, Silent valley N.P. : Palghat district; Siruvani : Coimbatore district; Masinagudi : Nilgiri district; Nagarhole N.P.

Habitat : Lightly wooded areas of plains and hills.

Status : Generally common.

Distribution : Most of the Oriental Region.

50. *Tirumala septentrionis* (Butler)

Locality : Kallar, Masinagudi, Coonoor-Briliyar confluence : Nilgiri district; Bannari : Periyar district; Siruvani : Coimbatore district.

Habitat : Forests of the low land and subtropical zones.

Status : Very common.

Distribution : India; Sri Lanka; Burma.

51. *Parantica aglea* (Stoll)

Locality : Silent valley N.P. : Palghat district; Kunjapanai : Coimbatore district; Nagarhole N.P.

Habitat : Forests and open country.

Status : Not rare in the Nilgiris.

Distribution : India; Sri Lanka; Burma.

52. *Parantica Nilgiriensis* (Moore)

Locality : Hassanur : Periyar district.

Habitat : Evergreen sholas, open country and subtropical evergreen forests.

Status : Common.

Distribution : Nilgiris and hills to the south of them.

53. *Idea malabarica* (Moore)

Locality : Muthikulam : Palghat district; Rampur R.F. : Wynad district; Siruvani : Coimbatore district.

Habitat : Wet evergreen forests.

Status : Common.

Distribution : Western Ghats.

54. *Euploea core* (Cramer)

Locality : Vazhikadavu : Malappuram district; Silent valley N.P. : palghat district; Kunjapanai, Kovai-Courtalam : Coimbatore district; Kallar : Nilgiri district; Nagarhole N.P.

Habitat : Lower and middle heights of all types of terrain.

Status : Very common.

Distribution : Sri Lanka to most of the Oriental Region and Australia to Pacific.

55. *Euploea sylvester* (Fabricius)

Locality : Vaniyampuzha : Malappuram district; Singapara : Palghat district; Coonoor ghat, Kallar : Nilgiri district; Siruvani: Coimbatore district; Bannari : Periyar district.

Habitat : Similar to *E. core* but less at home in the drier habitat than *E. core*.

Status : Common.

Distribution : Sri Lanka, South India, Nepal to most of the Oriental Region, the Papuan sub region and the Pacific.

Subfamily SATYRINAE

56. *Melanitis leda* (Drury)

Locality : Kurichiyad, Mavanahalla, Rampur R.F. : Wynad district; Silent valley N.P. : Palghat district; Munderi R.F. : Malappuram district; Kallar : Nilgiri district; Dhimbam, Hassanur, Gethesal : Periyar district.

Habitat : All types of country.

Status : Very common.

Distribution : India; Sri Lanka; Burma.

57. *Melanitis phedima* Cramer

Locality : Gethesal : Periyar district.

Habitat : Jungles.

Status : Not rare.

Distribution : India; Sri Lanka; Burma.

58. *Lethe rohria* (Fabricius)

Locality : Dhimbam: Periyar district.

Habitat : Subtropical evergreen, moist deciduous forests.

Status : Common.

Distribution : India; Sri Lanka; Burma.

59. *Mycalesis perseus* (Fabricius)

Locality : Dohny : Palghat district.

Habitat : Wet and wooded country.

Status : Very common.

Distribution : India; Sri Lanka; Burma.

60. *Mycalesis mineus* (Linne')

Locality : Mavanahalla : Wynad district; Siruvani : Coimbatore district; Nagarhole N.P., Bandipur Tiger Reserve.

Habitat : Hills and plains.

Status : Very common.

Distribution : India; Sri Lanka; Burma.

61. *Mycalesis igilia* Fruhstorfer

Locality : Nagarhole N.P.

Habitat : Jungles.

Status : Common.

Distribution : Coorg, Nilgiri-Wynad, Mysore.

62. *Mycalesis patnia* Moore

Locality : Hssanur : Periyar district.

Habitat : Jungles and shady road sides.

Status : Common.

Distribution : India (south India to Mysore and north Kanara); Sri Lanka.

63. *Orsotrioena medus* (Fabricius)

Locality : Munderi R.F. : Malappuram district; Bandipur Tiger Reserve.

Habitat : Densely shaded areas of jungles.

Status : Common.

Distribution : India (S. India, M.P., Sikkim to N.E. India); Sri Lanka; Burma.

64. *Ypthima ceylonica* (Hewitson)

Locality : Kallar, Vannanthurai, Mullipillur : Nilgiri district; Hassanur, Gethesal : Periyar district; Nagarhole N.P.; Bandipur Tiger Reserve.

Habitat : Fairly open hill country and in thick forests.

Status : Common.

Distribution : India; Sri Lanka; Burma.

65. *Ypthima baldus* (Fabricius)

Locality : Agali : Palghat district; Kuppadi R.F. : Wynad district; Mudumalai W.L.S. : Nilgiri district; Nagarhole N.P.

Habitat : Open country and forest areas.

Status : Very common.

Distribution : India; Burma.

Subfamily NYMPHALINAE

66. *Ariadne ariadne* (Linne')

Locality : Attapadi village : Palghat district; Mullipillur, Doddahatti : Nilgiri district; Dhimbam : Periyar district; Chamanahalla, Berambadi forest.

Habitat : Drier open plains and lower elevations.

Status : Common.

Distribution : India; Sri Lanka; Burma.

67. *Ariadne merione* (Cramer)

Locality : Gethesal : Periyar district; Kunjapanai : Coimbatore district.

Habitat : Hills and forested country.

Status : Common.

Distribution : India; Sri Lanka; Burma.

68. *Phalanta phalantha* (Drury)

Locality : Muthikulam : Palghat district; Dhimbam, Hassanur : Periyar district; Nagar hole N.P.

Habitat : Edges of jungles on the plains and in garden.

Status : Common.

Distribution : India; Sri Lanka; Burma.

69. *Cirrochroa thais* (Fabricius)

Locality : Chembotty, Silent valley N.P. : Palghat district; Kuppadi R.F. : Wynad district.

Habitat : Evergreen regions of the hills and also at the foot of ghats and in the open country above them.

Status : Common.

Distribution : India (South India-Western Ghats, Coorg, Wynad, Nilgiris, Palnis); Sri Lanka.

70. *Vindula erota* (Fabricius)

Locality : Vazhikadavu : Malappuram district.

Habitat : Evergreen forests.

Status : Not rare.

Distribution : India (Western Ghats, Nilgiris, Palnis, Sikkim to N.E. India); Sri Lanka; Burma.

71. *Junonia hierta* (Fabricius)

Locality : Rampur R.F. : Wynad district; Chembotty, Silent valley N.P. : Palghat district; Mullipillur : Nilgiri district; Bandipur Tiger Reserve.

Habitat : Hills, lower elevations and on the plains.

Status : Very Common.

Distribution : India; Sri Lanka; Burma.

72. *Junonia lemonias* (Linne')

Locality : Kuppadi R.F. : Wynad district; Anaikatti : Coimbatore district; Mullipillur, Peddikutta, Briliyar confluence: Nilgiri district; Hassanur: Periyar district; Chamanahalla, Berambadi R.F., Nagarhole N.P.

Habitat : Jungles and gardens.

Status : Common.

Distribution : India; Sri Lanka; Burma.

73. *Precis iphita* (Cramer)

Locality : Muthikulam, Anamooli, Puzhamkundu, Chembooty, Silent valley N.P. : Palghat district; Mavanahalla, Kuppadi, R.F. : Wynad district : Mullipillur, Vannanthurai: Nilgiri district : Dhimbam, Hassanur, Gethesal : Periyar district; Siruvani, Kovai-courtalam : Coimbatore district; Nagarhole N.P.

Habitat : Wet, well wooded shady regions in the hills

Status : Common.

Distribution : India; Sri Lanka; Burma.

74. *Vanessa cardui* (Linne')

Locality : Gethesal : Periyar district; Upper Bhavani, Ithalar : Nilgiri district.

Habitat : Hills and plains.

Status : Common.

Distribution : India; Sri Lanka; Burma.

75. *Hypolimnas misippus* (Linne')

Locality : Singapara, Muthikulam : Palghat district; Peddikutta : Nilgiri district; Siruvani : Coimbatore district; Nagarhole N.P.

Habitat : Regions of moderate rainfall and fairly open country.

Status : Common.

Distribution : India; Sri Lanka; Burma.

76. *Hypolimnas bolina* (Linne')

Locality : Mrigapara, Anamooli, Agali : Palghat district; Vazhikadavu : Malappuram district; Siruvani : Coimbatore district; Dhimbam : Periyar district.

Habitat : Wetter, well-forested regions as well as plains.

Status : Common.

Distribution : India; Sri Lanka; Burma.

77. *Neptis jumbah* Moore

Locality : Hassanur : Periyar district.

Habitat : Jungle country and its vicinity.

Status : Common.

Distribution : India (South India, Bengal); Sri Lanka; Burma.

78. *Neptis hylas* Moore

Locality : Mavanahalla : Wynad district; Munderi R.F : Malappuram district; Attapadi village : Palghat district; Hassanur : Periyar district; Kallar : Nilgiri district; Siruvani, Kunjapanai : Coimbatore district; Nagarhole N.P.

Habitat : Woods and gardens.

Status : Very common.

Distribution : India; Sri Lanka; Burma.

79. *Neptis columella* (Cramer)

Locality : Kunjapanai : Coimbatore district.

Habitat : Evergreen and deciduous forest in South India.

Status : Rare in South India.

Distribution : India; Burma.

Family HESPERIIDAE

80. *Athyma perius* (Linne')

Locality : Nagarhole N.P. : Karnataka.

Habitat : Fairly open country.

Status : Generally uncommon, but locally fairly abundant.

Distribution : India; Burma.

81. *Euripus consimilis* (Westwood)

Locality : Kunjapanai : Coimbatore district.

Habitat : Jungle regions of lower elevations enjoying moderate to heavy rainfall.

Status : Rare.

Distribution : India; Burma.

Subfamily ACRAEINAE

82. *Acraea terpsicore* (Linne')

Locality : Vaniyampuzha, Malakom R.F. : Malappuram district; Peddikutta : Nilgiri district; Bandipur Tiger Reserve.

Habitat : Forest clearings and open country at low elevations.

Status : Common.

Distribution : India; Sri Lanka.

Subfamily LIBYTHEINAE

83. *Libythea lepita* (Moore)

Locality : Agali : Palghat district.

Habitat : Evergreen forest edges and around forest streams.

Status : Rare in South India.

Distribution : India; N. Burma.

84. *Badamia exclamationis* (Fabricius)

Locality : Nagarhole N.P.

Habitat : All types of country especially thicker jungle.

Status : Locally common.

Distribution : India; Sri Lanka; Burma.

85. *Caprona ransonnetti* (Felder)

Locally : Anamooli : Palghat district.

Habitat : Thick Jungle at low elevation.

Status : Locally common.

Distribution : India; Sri Lanka; Burma.

86. *Oriens goloides* (Moore)

Locality : Hassanur, Getheral : Periyar district.

Habitat : Jungle in regions of heavy rainfall.

Status : Common.

Distribution : India; Sri Lanka; Burma.

87. *Potanthus palnia* Evans

Locality : Gudalur-Nadugani : Nilgiri district.

Habitat : Sunny forest glades and along paths.

Status : Common.

Distribution : South Indian hills.

88. *Baoris farri* (Moore)

Locality : Munderi R.F. : Malappuram district.

Habitat : Wet low land evergreen forest.

Status : Relatively rare.

Distribution : India; Sri Lanka; Burma.

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INSECTA : GALLMIDGES (DIPTERA : CECIDOMYIIDAE)

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INTRODUCTION

The name gall midge comes from the ability of the larvae to produce galls or abnormal growths on various organs of plants and the family name is derived from the latin word '*Cecidium*' meaning 'gall'

Gall midges are small, fragile flies which usually go unnoticed except by the specialist, but the large number of species, wide variety of plants they attack and their role in various ecosystems make them much more important than their appearance might suggest. They are widely distributed on many herbaceous and woody plants.

The family Cecidomyiidae is one of the largest families of order Diptera, not only from the point of view of regional fauna but also from the stand point of global distribution (Skuhrava, Skuhravy and Brewer, 1984).

The Family is divided into three sub-families viz. Lestremiinae, Porricondylinae and Cecidomyiinae. Gall midges show markedly four different biological groups based on the larval feeding habits. The first, Phytophagous that feed upon plants; comprises gall forming species. The second group consists of Zoophagous or predatory species; the third group is composed of Saprophagous or Mycophagous species whose larvae develop in soil, forest litter, rotten stumps, decaying wood, mushroom, etc. or are associated in various ways with fungi. In this the so called xylophagous species should also be included whose larvae inhabit ligneous tissues in various stages of decay since such decay is partly produced by a number of fungal species.

The fourth group is formed by so called inquiline gall midges. Such species develop in galls made

by other insect species especially by gall midges and gall wasps without causing damage to their hosts. These gall midges have some times been called symbionts or commensals. So far it is known that inquiline species do not benefit the host species in any way.

ECONOMIC IMPORTANCE OF THE GROUP

About 5-10% of known gall midge species occur in large numbers on plants that are important to man, including cereals, fodder, oil seeds, vegetable and root crops. They also attack trees and shrubs cultivated by man. The damage caused by gall midges is most extensive in agriculture where man has created the best condition for population growth of pests by planting monocultures over large acreage. The injury in such cases may cause yield losses of upto 50%. In forest conditions gall midges may occur in great numbers but the damage is not so important because the insects usually attack buds, leaves or seeds rather than the main trunk of the tree. Gall midges that attack trees and shrubs are important mainly in nurseries because they reduce growth of young seedlings.

Zoophagous or predatory species of gall midges have attracted the attention of biologists over the years due to their role as biocontrol agents and possible use in integrated pest control methods.

Gall midges and their associate plant hosts can make excellent model systems for the study of ecological principles. Since galls provide extremely favourable breeding conditions with their localized concentration of highly nutritive substances and marked succulence. Studies have also been

conducted on host range of insects using wild and cultivated grasses and the gall midges that attack them. Such studies have revealed much about the intimate association of the host, its plant chemicals, the gall midges and the environment.

PREVIOUS SURVEYS

Indian peninsular cecidomyiid fauna owes a great deal to the sustained efforts of Mani (1934-1974) and Nayar (1947-1949) who assiduously collected, catalogued and described a large number of gall midge species and their galls from peninsular India. Despite their monumental works and barring three records (*viz.* *Asphondylia phyllanthi* (Felt) *Streptodiplosis indica* Felt and *Planetella subaptera* (Felt) vast areas of Nilgiri Biosphere Reserve, remain a *terra incognita* as far as the cecidomyiid fauna is concerned.

The present study is based on the gall midge collections made by the author during the survey of Nagarhole National Park (Karnataka State) of Nilgiri Biosphere Reserve and from earlier records. This resulted in the enumeration of 23 species belonging to 16 genera spread over three subfamilies. Of these 20 were collected during recent surveys, of which three are new to science and have been described elsewhere. The remaining 17 species constitute new records for the Nilgiri Biosphere Reserve. As mentioned earlier, only 3 species have been recorded in the past from Nilgiri. But the actual number of gall midges inhabiting the entire biosphere reserve is certainly much higher than the one reported here and further explorations will surely yield a rich diversity of species.

SYSTEMATIC ACCOUNT

Phylum	ARTHROPODA
Class	INSECTA
Order	DIPTERA
Suborder	NEMATOCERA
Superfamily	MYCETOPHYLOIDEA
Family	CECIDOMYIIDAE

Subfamily LESTREMIINAE

Tribe LESTREMIINI

1. **Anarete allahabadensis* Grover

Locality : Nagarhole National Park, Karnataka.

Distribution : Allahabad (Uttar Pradesh).

Source : Grover (1981).

2. **Conarete calcuttaense* (Nayar)

Locality : Nagarhole National Park, Karnataka, India.

Distribution : Calcutta (West Bengal); Andaman Islands (author's unpublished data).

Source : Nayar (1949).

3. **Xylopriona nilgiriensis* Sharma

Locality : Nagarhole National Park, Karnataka.

Distribution : Known from type locality only.

Source : Sharma (1993).

Subfamily PORRICONDYLINEAE

4. **Asynapta aurangabadensis* Sharma

Locality : Nagarhole National Park, Karnataka.

Distribution : Aurangabad (Maharashtra).

Source : Sharma (1987a).

5. **Claspettomyia indica* Rao and Sharma

Locality : Nagarhole National Park, Karnataka.

Distribution : Aurangabad (Maharashtra).

Source : Rao and Sharma (1978).

6. **Parepidosis trilobata* Sharma and Rao

Locality : Nagarhole National Park, Karnataka.

Distribution : Aurangabad (Maharashtra).

Source : Sharma and Rao (1979).

7. **Porricondyla longiptera* (Nayar)

Locality : Nagarhole National Park, Karnataka, India.

Distribution : Calcutta (West Bengal).

*(asterick indicates the species collected from Nilgiri Biosphere Reserve)

Source : Nayar (1949).

Subfamily CECIDOMYIINAE

Supertribe OLIGOTROPHIDI

8. **Rabindrodiplosis orientalis* Sharma & Rao

Locality : Nagarhole National Park, Karnataka, India.

Distribution : Aurangabad (Maharashtra).

Source : Sharma and Rao (1980).

Supertribe ASPHONDYLIDI

9. *Asphondylia phyllanthi* (Felt)

Locality and distribution : Nilgiris (5300 ft.), Coimbatore, Thanjavur (Tamilnadu), Allahabad (Uttar Pradesh); Maymyo (Myanmar).

Source : Gagne (1973) and Grover (1981).

Hosts : *Phyllanthus emblica* L. (Euphorbiaceae); *Emblia officinalis* Faerth (Euphorbiaceae); *Lantana indica* Roxb. and *L. camara* L. (Verbenaceae). *Ipomoea staphylina* Boem and Schult (Convolvulaceae). *Morinda tinctoria* Roxb (Rubiaceae); *Rivea hypocrateriformis* choisy (Convolvulaceae).

10. **Asphondylia tectonae* Mani

Locality : Nagarhole N.P.& Bandipur.

Distribution : Top slip (Anamalai Hills) Tamilnadu. The gall midge seems to be widely distributed throughout the Western Ghat and parts of the Vindhya Satpura ranges where teak forests occur.

Source : Mani (1974).

Super tribe STOMATOSEMATIDI

11. **Stomatosema vanchii* (Nayar)

Locality : Nagarhole National Park, Karnataka, India.

Distribution : Trivandrum (Kerala), Agra (Uttar Pradesh), Andaman Islands (author's unpublished data).

Source : Nayar (1949) and Grover (1981).

Super tribe CECIDOMYIIDI

12. **Blastodiplosis longipennis* Sharma

Locality : Nagarhole National Park, Karnataka, India.

Distribution : Known from type locality only.

Source : Sharma (1998).

13. **Clinodiplosis championi* (Mani)

Locality : Nagarhole National Park, Karnataka, India.

Distribution : Mundali (8600 ft.) Chakrata, (Uttar Pradesh).

Host : *Quercus dilotata* Lind (Fagaceae).

Source : Grover (1981).

14. **Clinodiplosis indica* (Rao)

Locality : Nagarhole National Park, Karnataka, India.

Distribution : Agra (Uttar Pradesh).

Source : Grover (1981).

15. **Coquilletomyia longipalpi* (Rao)

Locality : Nagarhole National Park, Karnataka.

Distribution : Agra (U.P.).

Source : Rao (1953).

16. **Giardomyia indica* Grover and Bakshi

Locality : Nagarhole National Park, Karnataka.

Distribution : Allahabad (Uttar Pradesh).

Source : Grover & Bakshi (1977-78).

17. **Lestodiplosis jonesi* (Nayar)

Locality : Nagarhole National Park, Karnataka.

Distribution : Trivandrum (Kerala).

Source : Grover (1981).

18. **Octodiplosis brevipalpis* Sharma

Locality : Nagarhole National Park, Karnataka.

Distribution : Known from type locality only.

Source : Sharma (1987b - 1998).

19. **Odontodiplosis raoi* Sharma.

Locality : Nagarhole National Park, Karnataka.

Distribution : Aurangabad (Maharashtra).

Source : Sharma (1986).

20. **Orseolia apludae* (Felt)

Locality : Nagarhole National Park, Karnataka.

Distribution : Coimbatore, Tamil Nadu.

Host : *Apluda varia* Hack (Graminaea).

Source : Gagne (1985).

21. **Parallelodiplosis artocarpi* (Felt)

Locality : Nagarhole National Park, Karnataka, India.

Distribution : Godavari (Maharashtra).

Host : *Artocarpus* sp. (Urticaceae).

Source : Grover (1981).

22. *Planetella* (= *Hormomyia*) *subaptera* (Felt)

Locality and distribution : Snowdown peak (8300 ft), Ootacamund, Nilgiri.

Host : Presumably *Carex* sp.

Source : Grover (1981).

23. *Streptodiplosis indica* Felt

Locality and distribution : Kusti Kalan Estate, North Wynaad : South India.

Host : *Mytilaspis piperis* Green (= *Lepidosaphes piper* (Green) (Coccoidea).

Source : Grover (1981).

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INSECTA : AGROMYZIDAE (DIPTERA)

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INTRODUCTION

The Agromyzidae (Diptera), popularly known as 'leaf miners', comprise an interesting and economically very important group of small to minute flies. These flies cause extensive damage to agricultural and ornamental plants through their feeding habits during their immature stages. The larvae tunnel through and feed on the substance of leaf, stem, root, flower bud, fruit and developing seed and leave behind signs of their attack, the mines. These mines may be linear, serpentine or of the blotch type. Third instar larva pupates within the mines or on the soil. At times, the infestation is so immense that the leaf wilts and dies. The adults choose specific parts of the plants for egg-laying.

Flies of the family may be found almost anywhere on low vegetation in the forests, in grass lands, in agricultural fields, vegetable gardens and on ornamental plants. The immature stages of many of the species can be collected from the field from infested plants. Adults emerging from infested parts of plants kept in the laboratory can also be collected for study.

The biosystematics of the family had made marked progress in foreign countries in the past because of its economic importance but not so in India, where intensive studies commenced only in the sixties of this century. Since then a clearer picture of the distributional pattern and faunal diversity of the group within the Indian limits has emerged. About 140 species have so far been reported from India. The immature stages of many of these species are also known.

GENERAL OBSERVATIONS

Only one species, *Phytomyza nilgiriensis* Ipe of Agromyzidae has so far been known from this Biosphere Reserve, before the present study was undertaken. This group was not represented in the collections made by some of the survey parties that had visited certain stretches of this reserve before 1989, probably due to the inadequate attention the group received because of the small size of the flies and the niches they occupy. Collections made from four survey tours to a few of the areas of the biosphere in recent years were more successful in revealing the faunal picture of this family in the area. But specimens from species rich areas of Silent Valley, Nilambur, Waynad and some areas of Mysore plateau are not represented in the collections as these places could not be visited since 1989 when the present study was initiated. Hence the species dealt with here is not claimed to reveal a comprehensive picture of the faunal diversity of this family in this biosphere.

SOCIO-ECONOMIC ASPECTS OF THE GROUP

Flies of the family Agromyzidae are known for their immense economic value. The important crops attacked by Agromyzids include the mustard plant *Brassica campestris* Linnaeus, *Cajanus indicus* Spreng, *Phaseolus radiatus* L., *P. mungo* L., *Dolichos lablab* L., besides many cultivated as well as wild plants belonging to various natural orders. It is estimated that in northern India upto 40% of the yield of *Cajanus indicus* is lost

annually due to the attack of *Melanagromyza obtusa*. Similarly the yields of pulses named above too are greatly affected by Agromyzid flies. *Phytomyza horticola* is the worst enemy of ornamental plants. While most of the species are host specific a few attack many species of plants. Detailed information is yet to be made available on the extent of damage these flies cause to the crops in Southern India.

EFFECT OF HUMAN ACTIVITY ON THE GROUP

As it normally happens in the case of most of the insect groups deforestation and degradation of the natural habitats and bringing more virgin areas under the plough and under monoculture enhances the possibility for turning at least some of the species of Agromyzids into serious pests as built-in control measures of nature are lost. Even in the Nilgiri Biosphere it was observed that while a few species associated with agricultural crops were found in large numbers in the fields cultivated for the first time in recent years, in the forest ecosystems near by these species were represented by very small numbers, a condition not far different from what occurs in practically undisturbed large stretches of forests in other areas.

Many of the rare species of Agromyzids are known to be found only in undisturbed special niches in the forests. Deforestation and related activities can wipe out such species even before their existence is known. This is happening in some areas of the Biosphere even today.

SYSTEMATIC ACCOUNT

Adults of 17 genera of Agromyzidae belonging to the subfamilies Agromyzinae and Phytomyzinae have been reported from India. The immature stages of most of the species coming under 12 genera recorded from India have been studied. Of these, only one species, *Phytomyza nilgiriensis* is so far known from within the limits of the Nilgiri Biosphere Reserve. This species is also endemic to the Biosphere.

Subfamily I. AGROMYZINAE

1. *Agromyza sahyadriae* Ipe

Locality : Coimbatore Dist., Kovaicurtalam.

Altitude : 600 m.

Habitat : Grass.

Status : Very rare; collected for the first time from the Biosphere.

Distribution : India : Kerala, Tamil Nadu.

Remarks : This is the first record of the species from Tamil Nadu and the first report after the original description.

2. *Japanagromyza indica* Ipe

Locality : Nilgiri Dist., Moyar Valley.

Habitat : Leaves of shrubs.

Host plant : *Pueraria phaseoloides* Benth.

Status : Very rare; collected for the first time from the Biosphere.

Distribution : India : Kerala, Tamil Nadu.

Remarks : This is the first record of the species from Tamil Nadu and after the original description.

3. *Melanagromyza alternata* Spencer

Locality : Coimbatore Dist., Siruvani Hills.

Host Plant : *Pongamia* sp.

Status : Very rare; collected for the first time from the Biosphere.

Distribution : India : Coimbatore Dist., Coimbatore, Siruvani Hills; Formosa, Pasoe.

Remarks : The larvae of this species is a leaf miner of *Pongamia* sp.

4. *Melanagromyza atomella* (Malloch)

Locality : Coimbatore Dist., Kovaicurtalam.

Host plants : A wide variety of plants.

Status : Common; collected for the first time from the Biosphere.

Distribution : India : U.P., Kerala, Tamil Nadu, Maharashtra; Australia; Formosa; Indonesia;

Micronesia; New Britain; New Guinea; Palawan; Soloman Islands; Sri Lanka.

Remarks : The species is widely distributed in the plains. Infestation is observed from July to October. The larva tunnels through the epidermis and makes a linear, silvery white epidermal mine.

5. *Melanagromyza coffeae* (Koningsberger)

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs.

Host plant : *Coffeae arabica* L.

Status : Rare; collected for the first time from the Biosphere.

Distribution : India : Karnataka, Tamil Nadu; Java; Kenya; Tanzania.

Remarks : The larvae of this species makes epidermal leaf mines on the host plant which in serious cases of infestation affects the yield. This is the first record of the species from Tamil Nadu.

6. *Melanagromyza metallica* (Thomson)

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Leaves of shrubs.

Host plant : *Ageratum conyzoides* Linnaeus.

Status : Common; collected for the first time from the Biosphere reserve.

Distribution : India; Bihar, Kerala, Tamil Nadu, U.P., West Bengal; Abyssinia; Australia; Congo; Flores; Formosa; Indonesia, Melanesia; Micronesia; Nepal; New Britain; New Guinea; New Ireland; Philippines; Seychelles; Solomon Islands; Thailand; Vietnam.

Remarks : The larvae are internal stem feeders on *Ageratum conyzoides* Linn. (Compositae). The eggs are laid in the stem and larvae feed on the pith of the stem. Pupation takes place at the base of the stem. Infestation in many cases is reported to be almost cent percent.

7. *Melanagromyza obtusa* (Malloch)

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of grass and shrubs.

Host plant : *Cajanus indicus* Spreng.

Status : Common; collected for the first time from the Biosphere reserve.

Distribution : India : Bihar, Maharashtra, Meghalaya, Tamil Nadu, U.P.; Formosa; Indonesia; Japan; Malaysia; New Guinea; Sri Lanka.

Remarks : The female deposits eggs inside the pod of *Cajanus indicus* Spreng (Leguminosae). The larvae feed on the seed tissue causing extensive damage. This is the first record of the species from Southern India.

8. *Melanagromyza theae* (Green)

Locality : Coimbatore Dist. Siruvani Hills.

Habitat : From grass and leaves of shrubs.

Status : Rare; collected for the first time from the Biosphere reserve.

Distribution : India : Tamil Nadu; Indonesia; Japan; Sri Lanka.

Remarks : From India this species was earlier recorded only from Madras.

9. *Ophiomyia lantanae* (Froggatt)

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs.

Status : Common; collected for the first time from the Biosphere reserve.

Distribution : India : Himachal Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu, U.P.; Australia; Cuba; Hawaii; Kenya; Naivasha; Nakuru; New Guinea; Panama; Singapore; Society Islands; Sri Lanka; Tahiti; Tawi.

Remarks : Eggs are laid in the thalamus of *Lantana camara* Linn. (Verbenaceae) and the larvae feed on the thalamic tissue. The infestation is seen during October to March. Pupation lasts about two weeks. This is the first record of the species from Tamil Nadu.

10. *Cerodontha (Cerodontha) versicolor* Ipe

Locality : Nilgiri Dist., Mudumalai.

Habitat : Leaves of shrubs.

Host plant : *Setaria glauca* Beauv.

Status : Very rare; collected for the first time from the Biosphere reserve.

Distribution : India : Kerala, Tamil Nadu.

Remarks : This is the first record of the species from Tamil Nadu and the first record after original description.

11. *Cerodontha (Poemyza) walarai* (Singh & Ipe)

Locality : Coimbatore Dist., Kovaicurtalam.

Habitat : Grass.

Status : Very rare; collected for the first time from the Biosphere reserve.

Distribution : India : Kerala, Tamil Nadu.

Remarks : This is the first record of the species from Tamil Nadu and first record after original description.

12. *Liriomyza brassicae* (Riley)

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs.

Host plant : *Tropaeolum* sp.

Status : Rare collected for the first time from the Biosphere reserve.

Distribution : India : Maharashtra, New Delhi, Punjab, Tamil Nadu; Philippines; Sri Lanka; U.S.A.

Remarks : This the first record of the species from Southern India.

13. *Liriomyza compositella* (Malloch)

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs.

Host plant : *Xanthium strumarium* Linn.

Status : Common; collected for the first time from the Biosphere reserve.

Distribution : India : Delhi, Maharashtra, Tamil Nadu, U.P.; Formosa; New Guinea; Sri Lanka.

Remarks : The larvae make linear serpentine mines on the leaves of *Xanthium strumarium* Linn (Compositae). Eggs are laid on either side

of the leaf. Pupation takes place in the soil. This is the first record of the species from southern India.

14. *Phytomyza courtalamensis* Beri & Ipe

Locality : Coimbatore Dist., Kovaicurtalam.

Habitat : Leaf of shrub.

Status : Very rare; collected for the first time from the Biosphere reserve.

Distribution : India : Tamil Nadu.

Remarks : This is the first record of the species after its original description.

15. *Pseudonapomyza alternantherae* (Seguy)

Locality : Coimbatore Dist., Siruvani hills.

Habitat : Grass and leaves of shrubs.

Host plant : *Achyranthes aspera*.

Status : Rare; collected for the first time from the Biosphere reserve.

Distribution : India : Maharashtra, Punjab, Tamil Nadu, West Bengal; Cameroon; Madagascar; Sri Lanka.

Remarks : This is the first record of the species from Southern India.

16. *Phytomyza nilgiriensis* Ipe

Locality : Nilgiri Dist., Coonoor.

Host plant : *Bidens pilosa* L.

Status : Very rare.

Distribution : India : Tamil Nadu.

Remarks : This species has not so far been reported since the type specimen was collected from the biosphere reserve in 1968. This is the only species recorded from the biosphere before the present study was initiated.

SUMMARY

Both the subfamilies of Agromyzidae, namely Agromyzinae and Phytomyzinae are represented in the Nilgiri Biosphere Reserve. Out of 17 genera and about 140 species of the family known from

India 16 species under 9 genera are found here. This represents about 53% of the genera and 11.4% of the species known from India. Of these only one species, *Phytomyza nilgiriensis* Ipe is so far known to be endemic to this biosphere reserve. This species was not represented in the collections made during recent surveys and has not been reported since it was originally described

in 1971.

Four species dealt with here are being recorded for the first time from southern India and twelve for the first time from Tamil Nadu. But for the one endemic species mentioned earlier all the rest of the fifteen species have been recorded for the first time from the biosphere reserve.

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INSECTA : CHLOROPIDAE (DIPTERA)

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INTRODUCTION

Chloropidae is one of the fairly large families of Diptera, so far known by more than 2100 species. The members are usually small flies, averaging about 2 mm in length. They are smooth, rather small bristled flies, usually predominantly black or basically yellow with black to brown stripes and maculae. They are recognized by the presence of large, platelike frontal triangle, parallel or convergent postvertical bristles, sharply margined ridge on propleuron, often peculiar flexure on vein m_{3+4} at the middle of the discal cell and absence of anal cell.

Flies of the family may be observed almost anywhere in grasslands, marshes, moors and low vegetation in forests and are frequently collected in large numbers in studies of grain and pasture grass insects, mostly through sweeping grass and low vegetation. The larvae are mainly phytophagous or saprophagous, sometimes carnivorous and rarely exoparasitic.

Though this group had received the attention it deserved in most of the zoogeographical regions of the world yet not much was known about its faunal composition in India till the middle of the sixties of the present century. Till then our knowledge on the Indian fauna was confined to the description of a dozen species or so. Through intensive studies spanning over the last more than two and half decades much of the fauna of this group and its distribution in India has been brought to the light.

Family Chloropidae is divided into five subfamilies namely, Siphonellopsinae, Rhodesiellinae, Oscinellinae, Hippelatinae and

Chloropinae. All these subfamilies are represented in India.

GENERAL OBSERVATIONS

The Western Ghats is perhaps the richest biogeographic province of the Indian subcontinent. The flora and fauna of the Western Ghats is well known for its species diversity and high degree of endemism. The Western Ghats endemics numbering 315 species out of a world total of 32678 species represent 0.96% of the world's known species of vertebrates. Though the vertebrate fauna of the Western Ghats is fairly well known our information on the invertebrate fauna, especially of species rich groups like insects, is rather scanty.

But for three species practically nothing was known about the occurrence of Chloropidae in this biosphere reserve before the present study was undertaken. Chloropids were not represented in collections made by different survey parties of the Zoological Survey of India which had visited some stretches of this biosphere like Silent Valley, Nilambur and some areas of Mysore plateau in earlier years i.e. before intensive studies were undertaken under the present programme, probably because inadequate attention was paid to this group because of their small size and the special niches they occupy. Collections made since 1987 by the author and members of other survey parties from the Southern Regional Station were more fruitful. Even then all the areas could not be covered. Hence the species dealt with are based on the collections made mostly from Upper Nilgiri Plateau, Nilgiri Southeastern slopes, Nilgiri eastern slopes, Siruvani hills, Attapadi plateau and

areas of Mysore plateau. Intensive studies covering the rest of the areas of the biosphere reserve are expected to reveal more taxa from the area.

SOCIO-ECONOMIC ASPECTS OF THE GROUP

Members of Chloropidae are known for their economic value. The larvae are mainly phytophagous, or saprophagous, sometimes carnivorous and rarely exoparasitic. The saprophagous forms feed especially on grass damaged by other insects. Some of the phytophagous species are known pests of cereals in many regions. These include the rice stem maggots, *Chlorops oryzae*, barley stem maggots, *Meromyza nigriventris* and *Meromyza saltatrix*, the wheat stem maggot *Chlorops mugivorous* and the European fritfly, *Oscinella frit*, some of which are also found in India. A few carnivorous species are predators of root aphids and species like *Pseudogaurax signatus* are egg predators of black widow spider.

Some of the adults are known for their annoying habits. The eye fly *Siphunculina funicola* of India and the Orient, the eye gnats *Hippelates* spp. are important because of the tremendous number of individuals, their persistently annoying habits and their relation to the transmission of yaws and several epidemic diseases, including diseases of eye. Some like *Siphunculina ulcera* feed on the wounds of man.

EFFECT OF HUMAN ACTIVITY ON THE GROUP

Being a group of small flies Chloropids do not play a very major role in the biodiversity of an ecosystem though they contribute in no small measure, especially because of the large number of individuals of some of the species, to the richness and variety of it. As happens in the case of most insect groups, bringing new areas under cultivation enhances the chances for species belonging to genera like *Pachylophus*, *Oscinella*, *Cadrema*, *Conioscinella*, *Chlorops*, *Incertella*, *Meijerella* and their relatives to develop and multiply. Species of genera like *Siphunculina*

come to inhabit new areas cleared and occupied by man. But it is the destruction through deforestation and degradation of forest habitats that affect them adversely the most. Often species of Genera like *Rhodesiella*, *Elachiptera*, *Gampsocera*, *Pseudonomba*, *Paracamarota* and a variety of others occupy small niches in the forest ecosystem. Often the species of most of these are represented by very small numbers in small stretches. For instance from one such niche in Mizoram a day's collection yielded more than 40 species, belonging to some new and very rare genera. This also included 25 new species. Such concentration of species was observed in the Nangpo forest in Meghalaya and Andharicola in Darjeeling District of West Bengal. In the Nilgiris also a few such areas of concentration could be observed during the recent surveys. When such areas are cleared as is happening in many stretches of the biosphere even today, many hitherto even unknown species disappear. Hence deforestation and degradation of forests in the Nilgiri Biosphere as also in other areas of our land have very adverse effects on the species richness and diversity of Chloropids.

SYSTEMATIC ACCOUNT

Species of all the five subfamilies of Chloropidae so far known from the world were represented in the collections made from the Nilgiri Biosphere Reserve. Some of the species dealt with below belong to hitherto unknown taxa. None of the new species is described here but is dealt with giving a number under the given genus.

Subfamily 1 SIPHONELLOPSINAE

1. *Apotropina obscuripes* (Brunetti)

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Low vegetation in the forests.

Status : Rare, collected for the first time from the biosphere during recent surveys.

Distribution : India : West Bengal, Assam, Mizoram, Tamil Nadu; Sri Lanka.

Remarks : This is the first record of the species and the only record of the subfamily from Tamil Nadu.

Subfamily 2 RHODESIELLINAE

Tribe 1 SCOLIOPHTHALMINI

2. *Scoliophthalmus micans* Lamb

Locality : Periyar Dist, Gathesal.

Habitat : Grass and leaves of shrubs.

Status : Common; collected for the first time from the biosphere area during recent surveys.

Distribution : India : Tamil Nadu, Karnataka; Malaysia; Malaya; Sri Lanka; Philippines.

Remarks : This is so far the only species of the genus reported from India.

3. *Scoliophthalmus* sp. 1

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Leaves of shrubs in the forest.

Status : Rare; collected for the first time.

Distribution : Not recorded so far from any other area.

Remarks : New to science and endemic to the Biosphere.

Tribe 2 RHODESIELLINI

4. *Dactylothyrea distincta* Cherian

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs in the forest.

Status : Rare; collected for the first time from the biosphere area during recent surveys.

Distribution : India : West Bengal, Meghalaya, Mizoram and Tamil Nadu.

Remarks : This is the first record of the genus from Tamil Nadu.

5. *Rhodesiella quadriseta* de Meijere

Locality : Nilgiris : Kothagiri.

Altitude : 1740 m.

Habitat : Leaves of shrubs in the forest.

Status : Rare; collected for the first time from the biosphere area during a recent survey.

Distribution : India : West Bengal, Tamil Nadu;

Indonesia; Java; Malaysia; Malaya.

Remarks : This is the first record of the species from Southern India.

6. *Rhodesiella elegantula* (Becker)

Locality : Nilgiris, eastern slopes.

Habitat : Leaves of grass.

Status : Rare; collected for the first time from the Biosphere.

Distribution : Formosa; Hawaiian Islands; India : Tamil Nadu, Mizoram.

Remarks : This is the first record of the species from Southern India.

7. *Rhodesiella scutellala* (de Meijere)

Locality : Nilgiris; Periyar Dist., Gathesal.

Habitat : Grass and leaves of shrubs.

Status : Common but collected for the first time from the Biosphere.

Distribution : India : Orissa, Kerala, Tamil Nadu; Formosa; Indonesia; Malaysia; Philippines; New Guinea; Hawaiian Islands.

Remarks : It is the first record of the species from Tamil Nadu.

8. *Rhodesiella sanctijohani* Cherian

Locality : Coimbatore Dist., Siruvani.

Habitat : Leaves of shrubs.

Status : Very rare, collected for the first time from the Biosphere.

Distribution : India : Uttar Pradesh, Tamil Nadu, Goa, Madhya Pradesh and Maharashtra.

Remarks : This is the first record of the species from Southern India.

9. *Rhodesiella nigritibia* Cherian

Locality : Coimbatore Dist., Kovaicurtalam.

Habitat : Leaves of shrubs.

Status : Rare; collected for the first time from the Biosphere.

Distribution : India : West Bengal, Tamil Nadu.

Remarks : It is the first record of the species from Southern India.

10. *Rhodesiella himalayensis* Cherian

Locality : Periyar Dist., Gathesal; Coimbatore Dist., Siruvani Hills.

Habitat : Leaves of shrubs in the forest.

Status : Rare; collected for the first time from the Biosphere.

Distribution : India : West Bengal, U.P., Assam, Tamil Nadu.

Remarks : This species was not reported from Southern India before.

11. *Rhodesiella hirtimana* (Malloch)

Locality : Coimbatore Dist., Kunjaparai.

Altitude : 1200 m.

Habitat : Leaves of shrubs in the forest.

Status : Very rare, recorded for the first time from India.

Distribution : Indonesia; Java; India : Tamil Nadu.

Remarks : Recorded for the first time from India.

12. *Rhodesiella indica* Cherian

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs in the forest.

Status : Rare; collected for the first time from the Biosphere.

Distribution : India : West Bengal, Tamil Nadu.

Remarks : This is the first record of the species from Southern India and also the first record after the original description.

13. *Rhodesiella longicosta* Cherian

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs in the forest.

Status : Rare; collected for the first time from the Biosphere.

Distribution : India : Assam, West Bengal, U.P., Arunachal Pradesh, Manipur and Tamil Nadu.

Remarks : This is the first record of the species from Southern India.

14. *Rhodesiella manii* Cherian

Locality : Nilgiris : Mudumalai.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : West Bengal, Tamil Nadu.

Remarks : This species is being reported for the first time from Southern India.

15. *Rhodesiella typica* Cherian

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Leaves of grass and rarely from shrubs.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : U.P., Kerala, Tamil Nadu.

Remarks : This is the first record of the species from Tamil Nadu.

16. *Rhodesiella* sp. 1

Locality : Coimbatore Dist., Kovaicurtalam.

Altitude : 600 m.

Habitat : From grass.

Status : Rare, collected for the first time.

Distribution : Not recorded so far from any other area.

Remarks : New to science and endemic to the biosphere.

17. *Rhodesiella* sp. 2

Locality : Coimbatore Dist., Kunjaparai.

Altitude : 1200 m.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time.

Distribution : Not recorded so far from any other area.

Remarks : New to science and endemic to the biosphere.

18. *Rhodesiella* sp. 3

Locality : Nilgiris : Daddhahalli.

Altitude : 1040 m.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time.

Distribution : Not recorded so far from any other area.

Remarks : New to science and endemic to the biosphere.

19. *Rhodesiella* sp. 4

Locality : Nilgiris : Mukkuriti.

Altitude : 2200 m.

Habitat : From grass.

Status : Rare, only one specimen collected for the first time.

Distribution : Not recorded before from any other area.

Remarks : New to science and endemic to the biosphere.

20. *Rhodesiella* sp. 5

Locality : Coimbatore Dist., Kovaicurtalam.

Altitude : 600 m.

Habitat : From leaves of shrubs in the forest.

Status : Rare, collected for the first time.

Distribution : Not recorded from any other area.

Remarks : New to science and endemic to the biosphere.

21. *Rhodesiella* sp. 6

Locality : Nilgiri dist., Mudumalai.

Habitat : Leaves of shrubs in the forest.

Status : Very rare; collected for the first time.

Distribution : Not recorded before from any other area.

Remarks : New to science and endemic to the biosphere.

Subfamily 3 : OSCINELLINAE

Tribe 3 : BOTANOBINI

22. *Gaurax* sp. 1

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs in the forest.

Status : Very rare; collected for the first time.

Distribution : Not recorded before from any other area.

Remarks : New to science and endemic to the biosphere.

23. *Gampsocera mutata* Becker

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Grass.

Status : Common; collected for the first time from the Biosphere.

Distribution : India : Assam, West Bengal, Tamil Nadu; Malaysia; Burma; Formosa; Indonesia; Thailand.

Remarks : Recorded for the first time from Southern India.

Tribe 4 : ELACHIPTERINI

24. *Elachiptera* sp. 1

Locality : Nilgiri Dist., Connoor.

Altitude : 1780 m.

Habitat : Grass.

Status : Very rare; collected for the first time.

Distribution : Not recorded before from any other area.

Remarks : New species, endemic to the Biosphere.

25. *Melanochaeta indistincta* (Becker)

Locality : Nilgiri Dist., Connoor.

Altitude : 1780 m.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : Himachal Pradesh, Tamil Nadu; China; Sri Lanka.

Remarks : Recorded for the first time from Southern India.

26. *Anatrichus pygmaeus* Lamb

Locality : Periyar Dist., Gathesal; Coimbatore Dist., Siruvani, Nilgiri Dist., Mudumalai.

Habitat : Grass and vegetable gardens.

Status : Common.

Distribution : India : Assam, Tamil Nadu, Orissa, Rajasthan, West Bengal; Indonesia; Nepal; Pakistan; Philippines; Thailand; Japan; Sri Lanka.

27. *Disciphus peregrinus* Becker

Locality : Coimbatore Dist, Siruvani Hills.

Habitat : Leaves of shrubs in the forest.

Status : Rare, recorded for the first time from the Biosphere.

Distribution : India : Tamil Nadu; Indonesia, Formosa.

Remarks : Recorded for the first time from India.

Tribe 5 FIEBRIGELLINI

28. *Anacamptoneurum obliquum* Becker

Locality : Coimbatore Dist, Siruvani Hills.

Habitat : Grass and leaves of shrubs.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : Tamil Nadu; Egypt; Israel; Nigeria; Sudan; Tanzania.

29. *Anacamptoneurum* sp. 1

Locality : Nilgiri Dist., Naduvattam.

Altitude : 2160 m.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time.

Distribution : India : Tamil Nadu.

Remarks : New to science and endemic to the Biosphere.

30. *Polyodaspis compressiceps* Duda

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Grass.

Status : Rare, collected for the first time from the Biosphere.

31. *Polyodaspis ruficornis* (Macquart)

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs in the forest.

Status : Common but rare in India.

Distribution : India : Himachal Pradesh, Karnataka, Tamil Nadu; Sri Lanka; Pakistan; Afghanistan; Europe; Japan; Korea.

Remarks : Recorded for the first time from Tamil Nadu.

Tribe 6 LIPARINI

32. *Pseudeurina maculata* de Meijere

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : Andhra Pradesh, Tamil Nadu, West Bengal; Cambodia; Sri Lanka; Formosa; Indonesia; Malaysia; Philippines.

Remarks : This is the only species of the genus recorded from the Oriental Region.

Tribe 7 TRICIMBINI

33. *Tricimba aequisetata* Nartshuk

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs in the forest.

Status : Common, collected for the first time from the Biosphere.

Distribution : India : West Bengal, Manipur, Tripura, Meghalaya, Kerala, Tamil Nadu.

Remarks : This is the first record of the species from Tamil Nadu.

34. *Tricimba confusa* Cherian

Locality : Periyar Dist., Gathesal.

Habitat : Grass.

Status : Very rare, collected for the first time from the Biosphere

Distribution : India : Kerala, Tamil Nadu.

Remarks : Recorded for the first time from Tamil Nadu and the first record after original description.

35. *Aprometopsis minima* Lamb

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Grass.

Status : Very rare, collected for the first time from the Biosphere.

Distribution : India : Tamil Nadu.

Remarks : This is the first record of the species after it was originally described from Coimbatore in 1918.

36. *Siphunculina funicula* (de Meijere)

Locality : Coimbatore Dist. Siruvani Hills; Nilgiri Dist.

Habitat : Hanging ropes and debris, eye of man and animals.

Status : very common, collected for the first time from the Biosphere.

Distribution : India : Andhra Pradesh, Assam, Kerala, Karnataka, Maharashtra, West Bengal, Tamil Nadu; Malaysia; Cambodia; Sri Lanka; South Vietnam; Indonesia; Thailand.

Remarks : This species is believed to be associated with the spread of eye disease in man.

37. *Siphunculina striolata* (Wiedemann)

Locality : Periyar Dist., Gathesal.

Habitat : Usually near human habitations.

Status : Common, collected for the first time from the Biosphere.

Distribution : India : Assam, West Bengal, Tamil Nadu; Burma; China; Formosa; Indonesia; Malaysia; Pakistan; Philippines; Thailand. Widespread in Mediterranean subregion, Ethiopian Region and in Pacific islands.

Tribe 8 INCERTELLINI

38. *Meijerella inaequalis* (Becker)

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Grass.

Status : Common, collected for the first time from the Biosphere and outside North Bengal in India.

Distribution : India : North Bengal, Tamil Nadu; Malaysia; China; Formosa; Indonesia; Thailand.

Remarks : Recorded for the first time from Southern India.

39. *Meijerella indica* Cherian

Locality : Coimbatore Dist., Gathesal.

Habitat : Grass in vegetable gardens.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : Maharashtra, Tamil Nadu.

Remarks : Recorded for the first time from Tamil Nadu and the first record of the species after original description.

40. *Incertella indica* (Cherian)

Locality : Periyar Dist, Gathesal.

Habitat : Grass.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : U.P., Tamil Nadu.

Remarks : Recorded for the first time from Southern India and first record after original description.

Tribe 9 OSCINELLINI

41. *Oscinella fusidentata* Cherian

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Grass.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : U.P., Tamil Nadu.

Remarks : First recorded from Southern India and after original description.

42. *Conioscinella semimaculata* (Becker)

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Grass.

Status : Common, collected for the first time from the Biosphere.

Distribution : India : Assam, Bihar, Maharashtra, West Bengal, Tamil Nadu; Cambodia; Sri Lanka; Formosa; Malaysia; Philippines; New Guinea.

Remarks : Recorded for the first time from Southern India.

43. *Conioscinella* sp. 1

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Grass.

Status : Rare, collected for the first time.

Distribution : Nilgiri Biosphere Reserve.

Remarks : New species, endemic to the Biosphere.

44. *Oscinimorpha breviclypeata* Cherian

Locality : Periyar Dist., Gathesal.

Habitat : Grass.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : Tamil Nadu.

Remarks : This is the first record of the species after the original description based on two specimens.

Subfamily 4 HIPPELATINAE

45. *Cadrema minor* (de Meijere)

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Grass.

Status : Common, collected for the first time from the Biosphere.

Distribution : India : Assam, Maharashtra, Tamil Nadu, West Bengal; China; Formosa; Indonesia; Malaysia; Sri Lanka; Thailand.

Remarks : Recorded for the first time from Southern India.

46. *Cadrema ocellata* (Lamb)

Locality : Nilgiri Dist., Mukkuriti.

Altitude : 2200 m.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time from India.

Distribution : India : Tamil Nadu; Sri Lanka.

Remarks : This is the first record of the species since it was described in 1918 from Sri Lanka.

Subfamily 5 CHLOROPINAE

Tribe 10 MEPACHYMERINI

*47. *Mepachymerus moirangus* Cherian

Locality : Periyar Dist., Gathesal.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : Assam, Kerala, Tamil Nadu.

Remarks : This is the first record of the species after it was originally described in 1973 and also the first record for Tamil Nadu.

48. *Steleocerellus crucifer* (de Meijere)

Locality : Mysore plateau.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time from the biosphere.

Distribution : India : Assam, Himachal Pradesh, Karnataka, Maharashtra; Indonesia; Philippines; Thailand.

Remarks : Recorded for the first time from Tamil Nadu.

49. *Steleocerellus ensifer* (Thomson)

Locality : Coimbatore Dist., Gathesal, Nilgiri Dist., Kothagiri.

Altitude : 1740 m.

Habitat : Grass.

Status : Common, collected for the first time from the Biosphere.

Distribution : India : Assam, Bihar, Tamil Nadu, West Bengal; China; Japan; Indonesia; Malaysia; Nepal; Philippines; Sri Lanka; South Vietnam; Thailand; Russia.

Remarks : Recorded for the first time from Southern India.

Tribe 11 MEROMYZINI

50. *Pachylophus rufescens* (de Meijere)

Locality : Nilgiri Dist., Moyar Valley, Coimbatore Dist.; Siruvani.

Habitat : Grass and vegetable gardens.

Status : Very common, collected for the first time from the Biosphere.

Distribution : India : Assam, Bihar, Himachal Pradesh, Maharashtra, Orissa, U.P., Tamil Nadu, West Bengal; Bangladesh; Cambodia; China; Formosa; Indonesia; Myanmar; Nepal; Philippines; Sri Lanka; Thailand; Vietnam; Australia; Queensland.

Remarks : This is the most common of all the species of the family in the Oriental Region.

51. *Platycephala gigantea* Cherian

Locality : Coorg Dist.

Habitat : Leaves of shrubs in the forest.

Status : Rare, not collected since original

description.

Remarks : Endemic to the Biosphere.

52. *Cordylosomides valparainus* Duda

Locality : Nilgiri Dist., Valparai.

Habitat : Not known.

Status : Very rare.

Distribution : India : Tamil Nadu.

Remarks : Endemic to the Biosphere, not reported since 1936 after original description.

53. *Merochlorops cinctus* (de Meijere)

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : Kerala, N. Bengal, Tamil Nadu, Tripura; Philippines, Indonesia.

Remarks : This is the first record of the species from Tamil Nadu.

54. *Merochlorops flavipes* (Malloch)

Locality : Nilgiri Dist., Valparai.

Habitat : Larvae is a stem borer of ginger plant.

Status : Rare, was not recorded during recent surveys.

Distribution : India : Kerala, Meghalaya, Tamil Nadu.

Remarks : It is a rare species associated with stem of Cardamom trees and ginger plants.

55. *Thaumatomyia nigrifemur* Duda

Locality : Nilgiri Dist., Mukkuriti.

Altitude : 2200 m.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : Kerala, Mizoram, Tamil Nadu, W. Bengal.

Remarks : This is the first record of the species from Tamil Nadu.

56. *Thaumatomyia notata* (meigen)

Locality : Coimbatore Dist, Kovaicurtalam.

Altitude : 600 m.

Habitat : Leaves of shrubs in the forest.

Status : Common, collected for the first time from the Biosphere.

Distribution : India : Kerala, Tamil Nadu, U.P., West Bengal; Formosa; Myanmar; Pakistan; Japan; widespread in the Palaearctic Region.

Remarks : This is the first record of the species from Tamil Nadu.

57. *Thressa articornis* (Malloch)

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Leaves of shrubs in the forest.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : Kerala, Tamil Nadu; Malaysia.

Remarks : First report of the species from India since it was originally published in 1927.

Tribe 12 CHLOROPINI

58. *Chlorops oculatus* (Lamb)

Locality : Nilgiri Dist., Kotagiri.

Altitude : 1740 m.

Habitat : Grass.

Status : Rare, collected for the first time from the Biosphere.

Distribution : India : Tamil Nadu.

Remarks : This is the first record of the species after it was originally published in 1917 from Hagari in Tamil Nadu.

59. *Chlorops zeylanicus* Lamb

Locality : Nilgiri Dist., Mukkuriti.

Altitude : 2200 m.

Habitat : Leaves of shrubs in the forest.

Status : Very rare, collected for the first time from India.

Distribution : India : Tamil Nadu; Sri Lanka.

Remarks : This is the first record of the species after it was originally described from Sri Lanka in 1917.

60. *Chlorops* sp. 1

Locality : Periyar Dist., Gathesal.

Habitat : Grass in the forest.

Status : Rare, collected for the first time.

Distribution : India : Tamil Nadu.

Remarks : New species; endemic to the Biosphere.

61. *Chlorops* sp. 2

Locality : Nilgiri Dist., Mukkuriti.

Altitude : 2200 m.

Habitat : Grass.

Status : Very rare; collected for the first time.

Distribution : India : Tamil Nadu.

Remarks : New species; endemic to the Biosphere.

62. *Parectecephala* sp. 1

Locality : Nilgiri Dist., Naduvattam.

Altitude : 2160 m.

Habitat : Grass.

Status : Very rare, collected for the first time from India.

Distribution : India : Tamil Nadu.

Remarks : New species; endemic to the Biosphere; first record of the genus from India.

Tribe 13 LASIOSININI

63. *Lagaroceras tenuicorne* Malloch

Locality : Coimbatore Dist., Siruvani Hills.

Habitat : Leaves of shrubs in the forest.

Status : Very rare, recorded for the first time from the Biosphere.

Distribution : India : Tamil Nadu.

Remarks : This is the first record of the species after it was originally described from Coimbatore in Tamil Nadu in 1927.

SUMMARY

An analysis of the data presented reveals that all the five known subfamilies of Chloropidae are occurring in the Nilgiri Biosphere Reserve. Altogether 63 species belonging to 32 genera coming under 13 tribes are represented in the biosphere. All these 63 species have been identified upto the species level of which 13, which

are new to science are being published elsewhere. All these 13 species are endemic to the Biosphere as also two more species namely *Platycephala giganta* Cherian and *Cordylosomides valparainus* (Duda). Besides the two species named above, only *Merochlorops flavipes* Malloch was recorded from the Biosphere before the present study was undertaken. Of the 63 species dealt with above 60 have been reported for the first time from the Biosphere Reserve and 36 for the first time from Tamil Nadu. 23 of the species were not known from Southern India before and 7 are recorded for the first time from India. 14 of the above named species have been recorded for the first time after their original description, which include many species described in the second and third decades of the present century.

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INSECTA : TEPHRITIDAE : DIPTERA

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INTRODUCTION

Tephritidae (Diptera : Insecta) commonly known as fruitflies are represented in all Zoogeographical Regions. They are distributed throughout the temperate, sub tropical and tropical parts of the world; however, predominance of species is found in the tropics and sub-tropics. Their common name is derived from the habits of many species breeding in fruits of different kinds. In the tropics, a large assemblage of species are associated with primary forests and it is highly probable that many or most species are canopy breeders and inhabitants. Several species of Tephritidae are known to breed in stems, flowers, leaves and even roots and decaying wood of various groups of plants. Obviously, the common name "Fruitflies" is inappropriate for Tephritidae (Hardy, 1986).

Of the approximately more than 130 families of Diptera, Tephritidae cause by far the most extensive damage to plants. Many of the 'Fruitflies' (*Dacus*, *Ceratitis*) are serious pests of economic fruits and vegetables while some of the cecidogenous members (*Procecidochares*, *Urophora*, *Eutreta*, *Tephritis*) are beneficial in the bio-control of weeds.

Tephritidae is a fairly large family of Diptera with a world figure of about 4000 species. About 829 species are known from the Oriental Region of which 327 are known from the Indian Subcontinent and 187 from India proper. Out of the 187 species known till date from India, about 77 species are endemic to India, 6 of Palaeartic and 5 of Ethiopian influence and the rest belong to the Indo-chinese, Malayan complex of the Oriental.

Of the 187 species known from India, about 43 are recorded from Southern India and out of the 77 endemic Indian species, 16 are confined to Southern India.

There has been no major work on the diversity of Tephritidae occurring in Western Ghats and the information available (Hering, 1951, Hardy 1973) is restricted to only four species viz., *Acanthonevra imparata* Hering, *A. inermis* Hering, *Carpophthorella scutellomaculata* Hering from Anamalai hills and *Galbifascia sexpunctata* Hardy - from Idukki, all from areas outside Nilgiri Biosphere Reserve, that none of the Tephritid fauna was known earlier from areas within the limits of Nilgiri Biosphere Reserve.

Current studies[†] conducted has yielded information on the occurrence of 35 species of Tephritidae under 25 genera and 4 sub families in various localities of Nilgiri Biosphere Reserve, out of which 9 species are apparently new to science and 4 genera new records for India.

A systematic list and an inventory of the species of Tephritidae currently studied together with general information on the locality and altitude of collection, habitat of the species, their status, known distribution, sources of published literature and remarks on the species are provided.

SYSTEMATIC LIST

Class	INSECTA
Order	DIPTERA
Family	TEPHRITIDAE
Subfamily	DACINAE

[†] The taxonomic arrangement and nomenclature followed are after Hardy (1973, 1974, 1986, 1987 & 1988).

1. **Callantra crabroniformis* (Bezzi)
2. **Dacus (Bactrocera) correctus* (Bezzi)
3. **Dacus (Bactrocera) dorsalis* Hendel
4. **Dacus (Bactrocera) latifrons* (Hendel)
5. **Dacus (Bactrocera) nigrotibialis* (Perkins)
6. **Dacus (Hemigymnodacus) diversus* Coquillett
7. **Dacus (Hemigymnodacus) Sp.*
8. **Dacus (Parazeugodacus) bipustulatus* (Bezzi)
9. **Dacus (Zeugodacus) cucurbitae* Coquillett
10. **Dacus (Zeugodacus) tau* (Walker)

Subfamily TRYPETINAE
 Tribe ACANTHONEVRINI
 Subtribe ACANTHONEVRINA

11. **Acanthonevra* sp.
12. **Acanthonevra* sp.
13. **Diarrhegma modestum* (Fabricius)
14. **Ectopomyia* sp.
15. **Hexacinia radiosa* (Rondani)
16. **Rioxa sexmaculata* (Vander Wulp)

Subtribe GASTROZONINA

17. **Acroceratitis striata* (Froggatt)
18. **Anoplomus* sp.
19. **Dietheria fasciata* Hardy
20. **Gastrozona fasciventris* (Macquart)
21. **Phaeospilodes bambusae* Hering

Tribe ACIURINI

22. **Sphaeniscus quadrincisus* (Wiedemann)

Tribe TRYPETINI

23. **Acidoxantha* sp.

Subfamily TEPHRITINAE

Tribe PLATENSININI

24. **Platensina acrostacta* (Wiedemann)

25. **Platensina* sp.

Tribe TEPHRELLINI

26. **Spathulina acroleuca* (Schiner)

27. **Isoconia reinhardi* (Wiedemann)

Tribe TEPHRITINI

28. **Acanthophilus lugubris* Hering

29. **Dioxyna sororcula* (Wiedemann)

30. **Elaphromyia pterocallaeformis* (Bezzi)

31. **Scedella spilopectera* (Bezzi)

32. **Trupanea asteria* (Schiner)

33. *Campiglossa* sp.

Tribe XYPHOSIINI

34. **Xyphosia* sp. near *malaisei* Hering

Subfamily OEDASPINAE

Tribe OEDASPINI

35. **Procecidochoares utilis* Stone

SYSTEMATIC ACCOUNTS

Subfamily DACINAE

1. **Callantra crabroniformis* (Bezzi)

Locality : Gethesal : Periyar District.

Altitude : 1250 m.

Habitat : Semi evergreen forest.

Status : Rare.

Distribution : India : Yercaud (Shevroy hills, Salem district).

Source : Delfinado and Hardy, 1977.

Remarks : Re discovered after 1914.

2. **Dacus (Bactrocera) correctus* (Bezzi)

Locality : Karapalayam : Periyar district, Ooty : Nilgiri dist.

Altitude : 1100 to 2700 m.

*Recorded from Nilgiri Biosphere Reserve during recent Surveys.

Habitat : Fruit and sandalwood growing areas.

Status : Common.

Distribution : India : Bihar, M.P., Punjab, Tamil Nadu; Nepal; Pakistan; Sri Lanka; Thailand.

Source : Hardy, 1973.

Remarks : Injurious to mango, peach, bael, ber and orange.

3. **Dacus (Bactrocera) dorsalis* Hendel

Locality : Gudalur - Ooty road : Nilgiri district, Kunjapanai, Coimbatore district, Dhimbam : Peiryar district.

Altitude : 840 to 1200 m.

Habitat : Fruit and vegetable growing areas and secondary scrub vegetation near forest patches.

Status : Common.

Distribution : Widespread over Oriental Region, Micronesia and Hawaiian Islands.

Source : Hardy, 1973.

Remarks : Known as the 'Oriental Fruit-fly' and the 'Mango fruit-fly', this species is considered to be the most injurious fruit-fly in the Oriental Region. The species has a very wide host range and apparently attacks all types of fleshy fruits. It is especially injurious to mango, guava, carambola, *Eugenia* spp., papaya etc.

4. **Dacus (Bactrocera) latifrons* (Hendel)

Locality : Mudumalai : Nilgiri district, Kunjapanai : Coimbatore district, Gethesal : Periyar district.

Altitude : 1040 to 1250 m.

Habitat : Vegetable growing areas and semi evergreen forests.

Status : Locally common.

Distribution : India : West Bengal, South India; Laos; Malaysia; Sri Lanka; Taiwan; Formosa; Thailand.

Source : Hardy, 1973.

Remarks : Known to breed in fruits of

Solanaceae including chili, capsicum, certain tomatoes and also snake gourd and cucumber of cucurbitaceae.

5. **Dacus (Bactrocera) nigrotibialis* (Perkins)

Locality : Kunjapanai : Coimbatore district.

Altitude : 1200 m.

Habitat : Coffee growing areas.

Status : Locally common.

Distribution : India : South India; Laos; Malaysia; Sri Lanka; Thailand.

Source : Narayan and Batra, 1960, Kapoor *et al.*, 1980.

Remarks : Recorded from coffee-growing areas of South-India and infests *Coffea robusta*.

6. **Dacus (Hemigymnodacus) diversus* Coquillett

Locality : Kunjapanai : Coimbatore district.

Altitude : 1200 m.

Habitat : Fruit and vegetable growing areas and secondary vegetation near forest patches.

Status : Common.

Distribution : India (Widespread); Myanmar; Nepal; Pakistan; Sri Lanka; Thailand.

Source : Hardy, 1973.

Remarks : Infests a wide range of fruits like mango, plantain, sour orange, jamun and cucurbits.

(7) **Dacus (Hemigymnodacus) sp.*

Locality : Gethesal : Periyar district.

Altitude : 1250 m.

Habitat : Semi evergreen forest.

Status : Indeterminate.

Distribution : Collected only from Gethesal.

Source : (Z.S.I./S.R.S. Survey data).

Remarks : Species apparently new. Possibly breeds in fruits of forest plants.

8. **Dacus (Parazeugodacus) bipustulatus*
(Bezzi)

Locality : Gethesal : Periyar district, Coonoor, Nilgiri dt.

Altitude : 1250 m.

Habitat : Semi evergreen forest.

Status : Rare.

Distribution : India; Mysore; Sri Lanka.

Source : Delfinado and Hardy, 1974.

Remarks : Rediscovered after 1914.

9. **Dacus (Zeugodacus) cucurbitae* Coquillett

Locality : Kunjapanai : Coimbatore district.

Altitude : 1200 m.

Habitat : Fruit and vegetable growing areas and occasionally Semi evergreen forest patches.

Status : Common.

Distribution : Widespread throughout the Oriental Region including China, Japan, Ryukyu Islands, Thailand and surrounding countries, much of the Pacific including New Guinea, Solomon and Bismarck Islands and early records from Darwin, Northern Territories and Australia; also known from Mauritius, E. Africa, Kenya and Tanzania.

Source : Hardy, 1973.

Remarks : Commonly known as the Melonfly, this species has a wide host range and is a serious pest of several vegetable crops especially members of the plant family cucurbitaceae and tomato and pepper.

10. **Dacus (Zeugodacus) tau* (Walker)

Locality : Karapalayam : Periyar district.

Altitude : 1100 m.

Habitat : Fruit and vegetable growing areas.

Status : Common.

Distribution : Oriental (Widespread).

Source : Hardy, 1973.

Remarks : Infests several genera of cucurbits and a wide range of fleshy fruits such as jackfruit, star fruit, guava, mango, chico (sapodilla) and wax apple.

Subfamily TRYPETINAE

Tribe ACANTHONEVRINI

Subtribe ACANTHONEVRINA

11. **Acanthonevra* sp. 1

Locality : Gethesal : Periyar district.

Altitude : 1250 m.

Habitat : Semi evergreen forest.

Status : Locally common.

Distribution : Collected only from Gethesal.

Source : (Z.S.I./S.R.S. Survey data).

Remarks : Species apparently new. A large genus of about 4 dozen species from the Oriental, Australasian and Pacific Regions. 9 species are presently recognised from India.

12. **Acanthonevra* sp. 2

Locality : Gethesal : Periyar district.

Altitude : 1250 m.

Habitat : Semi evergreen forest.

Status : Indeterminate.

Distribution : Collected only from gethesal.

Source : (Z.S.I./S.R.S. Survey data).

Remarks : Species apparently new.

13. **Diarrhegma modestum* (Fabricius)

Locality : Gethesal : Periyar District.

Altitude : 1250 m.

Habitat : Semi evergreen forest.

Status : Common.

Distribution : Widespread throughout the Oriental Region.

Source : Hardy, 1973.

Remarks : In India, this species has been recorded breeding in decaying wood.

14. **Ectopomyia* sp.

Locality : Gethesal : Periyar district.

Altitude : 1250 m.

Habitat : Semi evergreen forest.

Status : Indeterminate.

Distribution : Collected only from Gethesal.

Source : (Z.S.I./S.R.S. survey data).

Remarks : Species apparently new and genus a new record for India. This genus is hitherto known only by *E. baculigera* Hardy (1973), from Laos.

15. **Hexacinia radiosa* (Rondani)

Locality : Kovai-courtalam, Kunjapani : Coimbatore district.

Altitude : 440 to 1200 m.

Habitat : Semi evergreen forest.

Status : Locally common.

Distribution : India : Namdapha Biosphere Reserve, Arunachal Pradesh; Sri Lanka and Widespread over Southeast Asia.

Source : Radhakrishnan, 1984.

Remarks : Genus and species are new records for Southern India. The genus so far known by four species mostly range over Southeast Asia through New Guinea and the Bismarcks.

16. **Rioxa sexmaculata* (van der Wulp)

Locality : Gethesal : Periyar District.

Altitude : 1250 m.

Habitat : Semi evergreen forests. Canopy inhabitator.

Status : Common.

Distribution : Widespread throughout the Oriental Region from India to Indonesia.

Source : Hardy, 1986.

Remarks : Suspected to be breeding in rotting wood.

Subtribe GASTROZONINA

17. **Acroceratitis striata* (Froggatt)

Locality : Dhimbam : Periyar district.

Altitude : 840 m.

Habitat : Bamboo vegetation; semi evergreen forest.

Status : Indeterminate.

Distribution : Sri Lanka.

Source : Delfinado and Hardy, 1977.

Remarks : The species collected on bamboo is a new record for India. Members of this genus may possibly be all bamboo breeders; several species have been reared from bamboo shoots.

18. **Anoplomus* sp.

Locality : Kunjapanai : Coimbatore district.

Altitude : 1200 m.

Habitat : Semi evergreen forest.

Status : Indeterminate.

Distribution : Collected only from Kunjapanai.

Source : (ZSI/SRS survey data).

Remarks : Species apparently new. The genus is known only from the Oriental Region. Four species are recognised to data.

19. **Dietheria fasciata* Hardy

Locality : Anaikatti : Coimbatore district.

Altitude : 800 m.

Habitat : Secondary vegetation, adjacent to semi evergreen forest.

Status : Locally common.

Distribution : Thailand; South Vietnam.

Source : Hardy, 1973.

Remarks : Genus and species new Record for India.

20. **Gastrozona fasciventris* (Macquart)

Locality : Anaikatti : Coimbatore district.

Altitude : 840 to 1250 m.

Habitat : Bamboo vegetation. Semi evergreen forest.

Status : Common.

Distribution : Widespread over Oriental Region.

Source : Hardy, 1988.

Remarks : Breeds in shoots of Bamboo.

21. **Phaeospilodes bambusae* Hering

Locality : Dhimbam : Periyar district.

Altitude : 840 m.

Habitat : Bamboo vegetation, semi evergreen forest.

Status : Rare, perhaps common locally.

Distribution : India (Coimbatore).

Source : Hardy, 1973.

Remarks : Rediscovered after 1940. Breeds in shoots of Bamboo.

Tribe ACIURINI

22. **Sphaeniscus quadrincisus* (Wiedemann)

Locality : Kondanur : Nilgiri district, Bhavanisagar : Periyar district, Anaikatti and Kovai courtalam; Coimbatore district.

Altitude : 440 to 800 m.

Habitat : Secondary scrub jungle.

Status : Common

Distribution : Widespread over the Oriental Region.

Source : Hardy, 1987.

Remarks : Breeds in flower heads of Asteraceae (Compositae) and Labiatae.

Tribe TRYPETINI

23. **Acidoxantha* sp.

Locality : Mudumalai : Nilgiri district.

Altitude : 1040 m.

Habitat : Bamboo vegetation, semi evergreen forest.

Status : Indeterminate.

Distribution : Collected only from Mudumalai.

Source : Hardy, 1987.

Remarks : Species apparently new and genus new record for India. This genus, with its 12 recognized species has been recorded earlier from Indonesia, Malaysia, New Guinea, Philippines, Singapore and Taiwan. Members of this genus breeds in the buds of large flowers such as *Bombax*, *Hibiscus*, *Bauhinia* and *Tiliceus*.

Subfamily TEPHRITINAE

Tribe PLATENSININI

24. **Platensina acrostacta* (Wiedemann)

Locality : Gethesal : periyar district.

Altitude : 1250 m.

Habitat : Secondary vegetation near waterbodies and semi evergreen forests.

Status : Common.

Distribution : India : Kampuchea; Pakistan; Sri Lanka and Thailand.

Source : Hardy, 1973.

Remarks : Specimens of this species in British Museum from Southern India are labelled, "larvae causing galls on *Jussiaea*" Approximately 17 species have been named under *Platensina* from the Oriental Region and New Guinea and 6 from Africa. 5 are represented in India.

25. **Platensina* sp.

Locality : Mukuriti : Nilgiri district.

Altitude : 220 m.

Habitat : Same as the preceding species.

Status : Indeterminate.

Distribution : Collected only from Mukuriti.

Source : (Z.S.I./S.R.S. Survey data).

Remarks : Species apparently new.

Tribe TEPHRELLINI

26. **Spathulina acroleuca* (Schiner)

Locality : Hassanur, Gethesal, Dhimbam : Periyar district. Anaikatti : Coimbatore district.

Altitude : 800 to 1250 m.

Habitat : Secondary vegetation.

Status : Common.

Distribution : Widespread throughout Africa and Asia, extending to Australia through much of the Pacific, Indonesia, Bonin Islands, Japan, Taiwan, Ryukyu Islands, Solomon Islands, New Guinea, New Caledonia, Philippines, Fiji and Micronesia.

Source : Hardy, 1973.

Remarks : Breeds in the flower heads of various compositae.

27. **Isoconia reinhardi* (Widemann)

Locality : Karapalayam : Periyar district.

Altitude : 1100 m.

Habitat : Scrub jungle : secondary vegetation.

Status : Common.

Distribution : India; East Africa; Kampuchea; Myanmar; Pakistan; Sri Lanka; Thailand.

Source : Hardy, 1973.

Remarks : Probably breeds in the fruits of *Lantana*.

Tribe : TEPHRITINI

28. **Acanthophilus lugubris* Hering

Locality : Pykara : Nilgiri district.

Altitude : 2160 m.

Habitat : Scrub jungle associated with gigantic thistle.

Status : Locally common.

Distribution : India : Trichinapalli, Kodaikanal.

Source : Kapoor *et al.*, 1980.

Remarks : Breeds in the flower heads of gigantic thistle (compositae = Asteraceae). Rediscovered after 1939.

29. **Dioxyna sorocula* (Widemann)

Locality : Dhimbam, Karapalayam : Periyar district, Kunjapanai : Coimbatore district, Naduvattom-Gudalur Road : Nilgiri district.

Altitude : 1100 to 1600 m.

Habitat : Scrub jungle associated with members of compositae (=Asteraceae).

Status : Common.

Distribution : Widespread throughout the tropics and subtropics of the world.

Source : Hardy 1973, 1974.

Remarks : Seed infester, in the flower heads of Compositae (=Asteraceae) and possibly other plants.

30. **Elaphromyia pterocallaeformis* (Bezzi)

Locality : Siruvani ; Coimbatore district.

Altitude : 740 m.

Habitat : Semi evergreen forest.

Status : Common.

Distribution : Widespread through India, South east Asia to the Philippines and Taiwan.

Source : Hardy, 1973, 1974.

Remarks : 7 species and 1 subspecies are presently known under this genus, 3 from Africa and 4 species and 1 subspecies from the Oriental Region.

31. **Scedella spilopectera* (Bezzi)

Locality : Naduvattom - Gudalur Road, Kodanadu tea estate: Nilgiri district., Bhavanisagar: Periyar district, Silent valley : Palghat district.

Altitude : 400 to 1620 m.

Habitat : Secondary vegetation.

Status : Common.

Distribution : India; Nepal; Sri Lanka.

Source : Kapoor *et al.*, 1980.

Remarks : Probably breeds in the flower heads of compositae (=Asteraceae). Breeds in the flower heads of *Wedelia biflora* in the Philippines.

32. **Trupanea asteria* (Schiner)

Locality : Karapalayam : Periyar district.

Altitude : 1100 m.

Habitat : Scrub jungle.

Status : Possibly common.

Distribution : India : Bihar; Indonesia; Java.

Source : Kapoor *et al.*, 1980.

Remarks : New record for Southern India.

33. *Campiglossa* sp.

Locality : Silent Valley : Palghat district.

Altitude : 860 m.

Habitat : Evergreen to semi evergreen forest.

Status : Indeterminate.

Distribution : The genus is reported from West Bengal and U.P. in India and Kathmandu in Nepal.

Source : Kapoor *et al.*, 1980.

Remarks : Specimen was not available for study. The genus has been recorded in the Report of Fauna of Silent Valley (Pillai, 1981).

Tribe XYPHOSIINI

34. **Xyphosia* sp. near *malaisei* Hering

Locality : Hassanur; Periyar district.

Altitude : 1100 m.

Habitat : Secondary scrub jungle near semi evergreen forest.

Status : Indeterminate.

Distribution : The species *malaisei* Hering is known from Myanmar.

Source : (Z.S.I./S.R.S. survey data).

Remarks : The genus is a new record for India.

Subfamily OEDASPINAE

Tribe OEDASPINI

35. **Procecidochares utilis* Stone

Locality : Siruvani : Coimbatore district,
Gethesal : Periyar district, Upper Bhavani, Nilgiri dist.

Altitude : 460 to 2400 m.

Habitat : Scrub jungle associated with *Eupatorium* weed,

Status : Locally common.

Distribution : Endemic to Mexico; introduced in India, Nepal, New Zeland and Hawaii.

Source : Kapoor *et al.*, 1980.

Remarks : A Mexican species, introduced in India by the Commonwealth Institute of Biological control, Bangalore for the control of the crofton weed (*Eupatorium adenophorum* Sprengel).

SUMMARY

It is well known that the Diptera of India present an interesting admixture of autochthonous endemic forms of the Peninsula, Indo-Chinese and Malayan derivatives often distributed discontinuously in the Peninsula and in the eastern border lands, Palaeartic elements on the Himalaya and found discontinuously as Pleistocene relicts in Southern India, Mediterranean and Ethiopian forms widely and continuously distributed in the Peninsula and often also occurring as isolates in Assam (Santokh Singh, 1974). An analysis of the data collected so far on Tephritidae from Nilgiri Biosphere Reserve shows that four species are endemic to the peninsula (*Callantra crabroniformis* (Bezzi), *Dacus* (*Parazeugodacus*) *bipustulatus* (Bezzi), *Acroceratitis striata* (Froggatt), *Acanthophilus lugubris* Hering), two species are Indo-Chinese, Malayan derivatives, discontinuously distributed in the Peninsula and eastern border lands (*Dietheria fasciata* Hardy, *Hexacinia radiosa* (Rondani) as also the genus *Ectopomyia*), one genus (*Campiglossa*), representing Palaeartic element, two species of Ethiopian affinity (*Spathulina acroleuca* (Schiner), *Isoconia reinhardi* (Wiedemann), one species introduced from the Neotropical Region (*Procecidochares utilis* Stone) and majority of the rest, of Indo-Chinese - Malayan assemblage.

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INSECTA : CHALCIDOIDEA (HYMENOPTERA)

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INTRODUCTION

Among the various groups of Parasitic Hymenoptera, the Superfamily Chalcidoidea is the largest, taxonomically the most difficult and economically the most important. These minute wasps play an important role in biological and integrated control of serious insect pests of agricultural crops, and many species have been used successfully in the biological control programmes all over the world. Chalcids are cosmopolitan in distribution and according to the most recent classification by Boucek 1988, the superfamily is divided into 21 families. The number of valid genera most recently was estimated at about 2000 (Noyes, 1990) and world species approximately 19,000.

The chalcids have great diversity in form and colour. The adults often appear like beautifully coloured microscopic jewels, having colour generally sombre black or brown, but often also vivid yellow, red or bright metallic-green-blue. Their size ranges from less than 0.25 mm to more than 10 mm, but most species are 4-5 mm long. The adult chalcids are free living insects, but their larvae have diverse and often highly specialised feeding habits. Most chalcid larvae are entomophagous parasites, but phytophagy is also met with. The parasitic chalcids attack the eggs, larvae and pupae of diverse insects including other chalcids, of which the preferred ones are the Lepidoptera, Coleoptera, Diptera, Orthoptera, Hymenoptera, Heteroptera and Homoptera. Some species are parasitic on spiders and ticks. Parasitism among insects attain perhaps its maximum development and diversification in Chalcids.

In India *Trichospilus pupivora* (Eulophidae) has been utilised for biological control of *Opisina arenosella* (Walker) a serious pest of coconut palm. *Aphelinus mali* (Aphelinidae) was also successfully utilised for the control of woolly aphid *Eriosoma lanigera*, a serious pest of apple in Conoor (Tamil Nadu) (Nair *et. al.* 1976). Many other parasites of scales are also found in the family Aphelinidae. *Prospaltella berleseii* How. has justifiably been used to control the silk (Mulberry) scale (Nikolskaya, 1952).

Phytophagous chalcids are important gall inducers, seed eaters and they may even become pests. *Harmolita* sp. (Eurytomidae) forms galls, damage cereals and reduce crop yield by impairing the stems, conductive functions. The stems become lignified and brittle, snapping easily in the wind. Chalcid seed eaters inflict considerable damage to agricultural crops. The beneficial activities of phytophagous chalcids are manifested in the cultivation of figs. The members of the family Agaonidae, living in the receptacles of wild fig carry pollen from them to the receptacles of the cultivars and fertilise them. (Nikolskaya, 1952).

Mani & Saraswat (1972), Mani *et. al.* (1973), Mukerjee (1981), Narendran (1984, 1985, 1989, 1994), Narendran & Padmasenan (1989, 1990, 1991), Narendran & Sureshan (1989) Sureshan & Narendran 1994 (a,b), 1995, 1997, 1998 and Noyes & Hayat (1994) reported a few species of Chalcids from the Nilgiri Biosphere Reserve area. Mani (1989) in his fauna of Chalcidoidea from India and adjacent countries provided information on the distribution of various chalcids from Nilgiri Biosphere Reserve area. Narendran (1989 and 1994) reported the occurrence of several species of chalcids from the biosphere reserve.

SYSTEMATIC ACCOUNT

Class INSECTA

Order HYMENOPTERA

Super family CHALCIDOIDEA

Family ELASMIDAE

1. *Elasmus hyblaeae* Ferriere

Locality : Nilambur.

External distribution : India (Kerala).

Source : Ferriere, 1929.

2. *Elasmus binocellatus* Mani & Saraswat

Locality : Nilgiri hills.

External distribution : India (Anamalai hills).

Source : Mani, M.S. 1989, Mani & Saraswat, 1972.

3. *Elasmus cyanomontanus* Mani & Saraswat

Locality : Nilgiri hills.

Source : Mani, M.S. 1989; Mani & Saraswat, 1972.

Family ORMYRIDAE

4. *Ormyrus orientalis* Walker

Locality : Nilgiri hills, Anakatty (Palghat).

External distribution : India, Sri Lanka.

Source : Mani, M.S. 1989.

Family ENCYRTIDAE

5. *Adektitopus gordhi* Noyes & Hayat

Locality : Mudumalai Sanctuary.

External distribution : India (Maharashtra, Tamil Nadu).

Source : Noyes & Hayat, 1984.

6. *Anathrix thailandicus* Myartseva

Locality : Anakkatti, Agali.

External distribution : India : (Assam, Kerala, Tamil Nadu); China; Thailand; Vietnam; Malaysia; Indonesia; Philippines; Papua New Guinea; New

Britain; Australia.

Source : Noyes & Hayat, 1994.

7. *Anagyrus gracilis* (Hayat)

Locality : Mudumalai sanctuary.

External distribution : India (Himachal Pradesh, Andhra Pradesh, Delhi, Maharashtra, Rajasthan, U.P. Karnataka, Tamil Nadu, Kerala); Madagascar.

Source : Noyes & Hayat, 1994.

8. *Anagyrus subflaviceps* (Girault)

Locality : Silent valley.

External distribution : India; Spain; Portugal; Nepal; Papua New Guinea; Australia.

Source : Noyes & Hayat, 1994.

9. *Anagyrus elizabethae* Noyes & Hayat.

Locality : Mudumalai sanctuary.

External distribution : India (Karnataka, Kerala, Tamil Nadu).

Source : Noyes & Hayat, 1994.

10. *Anagyrus obodas* Noyes & Hayat

Locality : Mudumalai sanctuary.

External distribution : India (Karnataka, Tamil Nadu, Andhra Pradesh).

Source : Noyes & Hayat, 1994.

11. *Anagyrus tricolor* (Girault)

Locality : Mudumalai sanctuary, Silent valley.

External distribution : India; Nepal; Thailand; Vietnam; Laos; Malaysia; Indonesia; Hongkong; China; Australia.

Source : Noyes & Hayat, 1994.

12. *Anagyrus jenniferrae* Noyes & Hayat

Locality : Silent valley.

External distribution : India (Kerala, Karnataka); Thailand; Indonesia; China.

Source : Noyes & Hayat, 1994.

13. *Anagyrus aceris* Noyes & Hayat.
Locality : Mudumalai sanctuary.
External distribution : India (Tamil Nadu); China; Indonesia.
14. *Anagyrus theon* Noyes & Hayat
Locality : Silent Valley.
Source : Noyes & Hayat, 1994.
15. *Rhopus atys* Noyes & Hayat
Locality : Mudumalai sanctuary.
External distribution : India (Delhi, Uttar Pradesh, Karnataka, Hyderabad, Tamil Nadu, Kerala).
Source : Noyes & Hayat, 1994.
16. *Rhopus somos* Noyes & Hayat
Locality : Mudumalai sanctuary.
External distribution : India (Delhi, Tamil Nadu).
Source : Noyes & Hayat, 1994.
17. *Rhopus milo* Noyes & Hayat
Locality : Mudumalai sanctuary.
External distribution : India (Tamil Nadu, Karnataka, Kerala):
Source : Noyes & Hayat, 1994.
18. *Rhopus nigriclavus* (Girault)
Locality : Mudumalai sanctuary.
External distribution : India; Spain; Bangladesh; Nepal; Malaysia; Australia; Hawaii.
Source : Noyes & Hayat, 1994.
19. *Rhopus gramineus* Hayat
Locality : Mudumalai sanctuary.
External distribution : India; Pakistan; Malaysia.
Source : Noyes & Hayat, 1994.
20. *Callipteroma testacea* Motschulsky
Locality : Mudumalai sanctuary.
External distribution : India; Africa; Madagascar; Pakistan; Sri Lanka; Bangladesh; Papua New Guinea; Australia.
Source : Noyes & Hayat, 1994.
21. *Leptomastix kirkleyae* Noyes & Hayat
Locality : Nilambur.
External distribution : India (Kerala, Tamil Nadu, Karnataka).
Source : Noyes & Hayat, 1994.
22. *Leptomastix tsukumiensis* Tachikawa.
Locality : Mudumalai sanctuary; silent valley.
External distribution : India; Laos; Hongkong; Philippines; China; Japan.
Source : Noyes & Hayat, 1994.
23. *Gyranusoidea flava* Shafee, Alam & Agarwal.
Locality : Wynad.
External distribution : India; Malaysia; Philippines; Indonesia.
Source : Noyes & Hayat, 1994.
24. *Leptomastidea minyas* Noyes & Hayat.
Locality : Mudumalai sanctuary.
External distribution : India (Tamil Nadu); China.
Source : Noyes & Hayat, 1994.
25. *Leptomastidea shafeei* Hayat & Subba Rao
Locality : Mudumalai sanctuary.
External distribution : India (Kerala, Tamil Nadu, Karnataka).
Source : Noyes & Hayat, 1994.

Family LEUCOSPIDAE

26. *Leucospis guzeratensis* Westwood

Locality : Nilgiri.

Source : Mani, M.S. 1989.

27. *Leucospis petiolata* Fabricius

Locality : Nilgiri.

Source : Mani, M.S. 1989.

Family EUPELMIDAE

28. *Metaplema strychnocola* Mani & Kaul

Locality : Nilambur.

External distribution : India (Tamil Nadu, Kerala).

Source : Mani & Kaul 1973.

Family MYMARIDAE

29. *Gonatocerus udakamandus* Mani & Saraswat

Locality : Nilgiri hills.

Source : Mani & Saraswat, 1973.

30. *Ooctonus nigrotesticus* Subba Rao.

Locality : Mudumalai sanctuary.

Source : Subba Rao, 1989.

Family PERILAMPIDAE

31. *Perilampus nilamburensis* Mani & Kaul

Locality : Nilambur.

Source : Mani & Kaul, 1973.

Remarks : Parasitic on *Lygropia* sp.

32. *Perilampus manii* (Mani & Kaul)

Locality : Nilambur.

External distribution : India (Tamil Nadu, Kerala).

Source : Mani & Kaul 1973.

33. *Perilampus microgastris* Ferriere

Locality : Nilambur.

External distribution : Dehra Dun, Coimbatore, Bombay.

Source : Mani, M.S. 1989.

34. *Coccophagus narendrani* Hayat & Zeya.

Locality : Silent valley.

Source : Hayat & Zea, 1993.

Family EURYTOMIDAE

35. *Eurytomocharis dubeyi* Mukerjee

Locality : Nilambur.

External distribution: India (Kerala).

Source : Mukerjee 1981.

36. *Eurytomocharis nilamburensis* Mukerjee

Locality : Nilambur.

External distribution : India (Kerala).

Source : Mukerjee, 1981.

37. *Mesoeurytoma nigriscaposa* Narendran & Padmasenan

Locality : Silent valley.

External distribution : Kerala.

Source : Narendran & Padmasenan, 1991.

38. *Neobephrata petiolata* Narendran & Padmasenan

Locality : Wynad; Sultan's Battery.

External distribution : Tamil Nadu.

Source : Narendran & Padmasenan, 1989.

39. *Plutarchia indefensa* (Walker)

Locality : Kalkandi, Mukkali, Silent valley.

External distribution : India (Tamil Nadu, U.P.); Sri Lanka.

Source : Narendran and Padmasenan, 1990.

Remarks : Parasitic on *Melanagromyza* sp.

40. *Plutarchia Keralonsis* Narendran & Padmasenan
Locality : Silent Valley.
External distribution : Kerala.
Source : Narendran & Padmasenan, 1990.
41. *Prodecatoma nilamburensis* Mukerjee
Locality : Nilambur.
External distribution : India (Kerala).
Source : Mukerjee, 1981.
42. *Prodecatoma postmarginalis* Mukerjee
Locality : Nilambur.
External distribution : Hogenakal.
Source : Mani, M.S. 1989.
43. *Prodecatoma fusciscapa* Mukerjee
Locality : Nilambur.
Source : Mukerjee, 1981.
44. *Ramdasoma zandanus* Narendran
Locality : Silent valley.
Source : Narendran, 1994.
45. *Bruchophagus natheni* Narendran.
Locality : Nilgiri Hills.
Source : Narendran, 1994.
46. *Bruchophagus grassius* Narendran.
Locality : Nilambur, Silent valley, Agali.
External distribution : India (Kerala).
Source : Narendran, 1994.
47. *Bruchophagus tagorei* Narendran
Locality : Agali, Anakkatti.
External distribution : India (Tamil Nadu, U.P., Delhi).
Source : Narendran, 1994.
48. *Bruchophagus mandelai* Narendran.
Locality : Sultan's Battery (Wynad), Silent Valley.
External distribution : India (Kerala).
Source : Narendran, 1994.
49. *Risbecoma mohandasi* Narendran.
Locality : Nilambur.
Source : Narendran, 1994.
50. *Tetramesa zerovae* Narendran.
Locality : Kalkandi (Agali), Silent Valley.
External distribution : India (U.P. West Bengal, Kerala).
Source : Narendran, 1994.
51. *Prodecatoma cheriani* Narendran.
Locality : Nilambur.
External distribution : India (Kerala); Taiwan.
Source : Narendran, 1994.
52. *Prodecatoma nilamburensis* Mukerjee
Locality : Nilambur.
External distribution : India (Kerala).
Source : Narendran, 1994.
53. *Prodecatoma modesta* Narendran
Locality : Nilambur.
External distribution : India (Kerala); Malaysia.
Source : Narendran, 1994.
54. *Philolema maleena* Narendran
Locality : Nilambur.
External distribution : India (Kerala, Tamil Nadu, Karnataka).
Source : Narendran, 1994.
55. *Acantheurytoma spinifera* Cameron
Locality : Silent Valley.

External distribution : India (Tamil Nadu).

Source : Narendran, 1994.

56. *Acantheurytoma albitarsis* (Motschulsky)

Locality : Sultan's Battery, Nilambur;

External distribution : India (Kerala, Karnataka).

Source : Narendran, 1994.

57. *Eurytoma risa* Narendran

Locality : Nilambur.

External distribution : India (Kerala).

Source : Narendran 1994.

58. *Eurytoma quadrispina* Narendran

Locality : Nilambur, Silent Valley.

External distribution : India (Kerala).

Source : Narendran, 1994.

59. *Eurytoma poroensis* Mukerjee

Locality : Nilambur.

External distribution : India (Kerala).

Source : Narendran, 1994.

60. *Eurytoma emarginata* Narendran

Locality : Nilambur.

External distribution : India (Kerala).

Source : Narendran, 1994.

61. *Eurytoma nalanda* Narendran.

Locality : Silent Valley.

External distribution : India (Kerala); Nepal.

Source : Narendran, 1994.

62. *Eurytoma punctifronta* Narendran

Locality : Nilambur.

External distribution : India (Kerala, Andhra Pradesh).

Source : Narendran, 1994.

63. *Eurytoma agalica* Narendran

Locality : Agali.

External distribution : India (Kerala, Tamil Nadu).

Source : Narendran, 1994.

64. *Eurytoma udara* Narendran

Locality : Nilambur.

External distribution : India (Kerala).

Source : Narendran, 1994.

65. *Eurytoma peethapada* Narendran.

Locality : Sultan's Battery.

External distribution : India (Kerala, Tamil Nadu).

Source : Narendran, 1994.

66. *Eurytoma manilensis* Ashmead

Locality : Kalkandi (Agali).

External distribution : Philippines.

Source : Narendran, 1994.

Family TORYMIDAE

67. *Ecdamua indica* Walker

Locality : Nilambur.

Source : Narendran, 1984.

68. *Palachia punctifronta* Narendran & Sureshan

Locality : Agali; Chindaki.

Source : Narendran & Sureshan, 1989.

69. *Palachia punctigastra* Narendran & Sureshan

Locality : Attappadi, Agali, Chindakki.

Source : Narendran & Sureshan, 1989.

70. *Torymoides keralensis* Narendran

Locality : Kalkandi (Agali), Attappadi.

External distribution : India (Kerala).

Source : Narendran, 1994.

71. *Podagrion keralensis* Narendran

Locality : Silent Valley, Agali.

External distribution : India (Kerala).

Source : Narendran, 1994.

72. *Podagrion dineni* Narendran

Locality : Anakkatty.

Source : Narendran, 1994.

73. *Podagrion indiensis* Narendran.

Locality : Silent valley.

Source : Narendran, 1994.

74. *Podagrion noyesi* Narendran

Locality : Silent valley.

External distribution : India (Kerala).

Source : Narendran, 1994.

75. *Podagrion prionomerum* Masi

Locality : Agali, Silent Valley, Nilambur.

External distribution : India (Kerala).

Source : Narendran, 1994.

Family CHALCIDIDAE

76. *Antrocephalus bicolor* (Masi)

Locality : Nilambur.

External distribution : Taiwan; Sri Lanka; Singapore.

Source : Sureshan & Narendran, 1994.

77. *Antrocephalus cariniceps* (Cameron)

Locality : Nilambur.

External distribution : India; Malaya; Singapore.

Source : Narendran, 1985.

Remarks : Parasitic on *Opisina arenosella* Walker (Oecophoridae).

78. *Antrocephalus cariniaspis* (Cameron)

Locality : Nilambur.

External distribution : India (Kerala, Tamil Nadu, Himachal Pradesh); Hongkong; Philippines; Borneo.

Source : Narendran, 1985.

79. *Antrocephalus nasuta* (Holmgren)

Locality : Nilgiris, Sultan's Battery (Wynad).

External distribution : All over the Oriental Region, West Iran, Papua New Guinea.

Source : Narendran, 1989.

80. *Antrocephalus fascicornis* (Walker)

Locality : Nilgiri Hills; Silent valley.

External distribution : Indian sub-continent, China, Java, Philippines and Malaya.

Source : Narendran, 1989.

81. *Antrocephalus lugubris* (Masi)

Locality : Nilambur; Sultan's Battery (Wynad).

External distribution : India, Taiwan, Vietnam, Singapore, Java, Indonesia and Philippines.

Source : Narendran, 1989.

82. *Brachymeria salinae* Narendran

Locality : Sultan's Battery.

Source : Narendran, 1989.

83. *Bucekia differens* (Boucek)

Locality : Nilambur.

External distribution : Europe, Africa, Mediterranean region and Asia.

Source : Narendran, 1989.

84. *Dirhinus himalayanus* Westwood

Locality : Nilambur.

External distribution : India, Saudi Arabia, Iraq, Turkemenia, Pakistan, Malaysia, China, Philippines, Japan, Cocos Island, Sumatra and Hawaii.

Source : Narendran, 1989.

85. *Dirhinus claviger* Boucek & Narendran

Locality : Nilambur.

External distribution : India, Sri Lanka.

Source : Narendran, 1989.

86. *Dirhinus auratus* Ashmead

Locality : Silent valley; Nilambur.

External distribution : India, Sri Lanka, Thailand, Laos, Vietnam, Taiwan, Philippines, Pakistan.

Source : Narendran, 1989.

87. *Dirhinus bakeri* (Crawford)

Locality : Wynad: Sultan's Battery, Nilambur.

External distribution : India, Sri Lanka, Malaysia, Philippines, Japan.

Source : Narendran, 1989.

88. *Proconura orientalis* (Husain *et al.*)

Locality : Nilambur.

External distribution : India (U.P., Kerala, West Bengal).

Source : Narendran, 1989.

89. *Rhyncochalcis thresiae* Narendran

Locality : Sultan's Battery.

Source : Narendran, 1989.

90. *Rhyncochalcis brevicornutus* (Strand)

Locality : Sultan's Battery,

External distribution : India (A.P., Tamil Nadu, W.Bengal, Pondicherry); Sri Lanka.

Source : Narendran, 1989.

91. *Stenochalcis quadridendata* Masi

Locality : Coorg.

External distribution : India (Tamil Nadu); Malaysia.

Source : Narendran, 1989.

92. *Trigonura steffani* Narendran

Locality : Nilgiris.

External distribution : India (Kerala, Tamil Nadu).

Source : Narendran, 1989.

93. *Epitranus parvidens* (Strand)

Locality : Nilgiri hills; Nilambur, Silent valley.

External distribution : India, Sri Lanka, W. Malaysia, W. Indonesia, Vietnam, N.Borneo, Philippines.

Source : Narendran, 1989.

94. *Epitranus ramnathi* (Mani & Dubey)

Locality : Nilambur.

External distribution : India (U.P., Karnataka), Nepal.

Source : Narendran, 1989.

95. *Epitranus elongatulus* (Mot.)

Locality : Nilambur.

External distribution : All over Oriental Region, S. Japan, S. China.

Source : Narendran, 1989.

96. *Haltichella clavicornis* (Ashmead)

Locality : Nilambur; Silent valley.

External distribution : India, Japan, Vietnam, Laos, Malaysia, Nepal, Philippines.

Source : Narendran, 1989.

97. *Hockeria callipteroma* Narendran

Locality : Nilgiris.

Source : Narendran, 1989.

98. *Hockeria atra* Masi

Locality : Nilambur.

External distribution : India, Philippines, Java.

Source : Narendran, 1989.

99. *Hockeria tristis* (Strand)

Locality : Nilgiri hills; Sultan's Battery, Silent valley, Nilambur.

External distribution : All over Indian subcontinent.

Source : Narendran, 1989.

100. *Hockeria argentigera* Holmgren

Locality : Nilgiri hills.

External distribution : India, Java, Singapore, Sarawak.

Source : Narendran, 1989.

101. *Kriechbaumerella kraussi* Narendran

Locality : Nilambur.

External distribution : Cambodia, Philippines.

Source : Narendran, 1989.

102. *Kriechbaumerella pulvinatus* (Masi)

Locality : Nilgiris.

External distribution : India, Philippines, Taiwan, Singapore, Malaya, Sri Lanka, Hainan Island, Nepal, Java.

Source : Narendran, 1989.

103. *Kriechbaumerella ornatipennis* (Cameron)

Locality : Nilgiris.

External distribution : India (U.P., W. Bengal, Pondicherry, Kerala and Tamil Nadu).

Source : Narendran, 1989.

104. *Kriechbaumerella titusi* Narendran

Locality : Nilambur.

External distribution : India (Kerala, Pondicherry), Java.

Source : Narendran, 1989.

105. *Kriechbaumerella rufimanus* (Walker)

Locality : Nilambur.

External distribution : India, Pakistan, Sri Lanka, Nepal, Philippines, Indonesia, Java.

Source : Narendran, 1989.

106. *Lasiochalcidia pilosella* (Cameron)

Locality : Nilambur.

External distribution : India (Karnataka, Kerala, Pondicherry, Hariyana, and Tamil Nadu).

Source : Narendran, 1989.

107. *Neohaltichella nilgirica* Narendran

Locality : Nilgiri.

Source : Narendran, 1989.

108. *Neochalcis breviceps* (Masi)

Locality : Silent valley, Nilgiri hills.

External distribution : Oriental region, Japan.

Source : Narendran, 1989.

Family EULOPHIDAE

109. *Tetrastichus malabarensis* Saraswat

Locality : Nilgiri hills.

External distribution : India (Kerala).

Source : Saraswat & Mukerjee, 1975.

110. *Tetrastichus nilamburensis* Saraswat

Locality : Nilambur.

External distribution : India (Kerala).

Source : Saraswat & Mukerjee, 1975.

111. *Tetrastichus polyseta* Saraswat

Locality : Nilgiri hills.

External distribution : India (Tamil Nadu).

Source : Saraswat & Mukerjee, 1975.

112. *Tetrastichus ootyensis* Saraswat

Locality : Nilgiri hills.

Source : Saraswat & Mukerjee, 1975.

Family PTEROMALIDAE

113. *Anisopteromalus calandrae* (Howard)

Locality : Nilambur, Anakatty (Palghat Dist.).

External distribution : Cosmopolitan.

Source : Boucek *et. al.* (1978).

114. *Chlorocythus xanthopus* (Cameron)

Locality : Silent valley, Agali, Kalkandi (Nr. Silent valley).

External distribution : India (Kerala, Delhi), Pakistan.

Source : Mani, M.S. 1989, Farooqi & Subba Rao 1986, Boucek *et. al.* (1978)

115. *Metastenus concinnus* Walker

Locality : Nilambur, Anakatty, Agali (Palghat Dist.).

External distribution : India (Kerala), Europe.

Source : Mani, M.S. (1989), Farooqi & Subba Rao 1986. Boucek *et. al.* (1978).

116. *Norbanus acuminatus* Dutt & Ferriere

Locality : Silent valley, Wynad; Sultan's Battery.

External distribution : India (Kerala, West Bengal).

Source : Farooqi & Subba Rao, 1986. Mani, M.S. (1989), Boucek *et. al.* (1978)

117. *Trichomalopsis apanteloctena* (Crawford)

Locality : Kerala : Anakatty, Silent Valley, Mukali.

External distribution : India (Kerala, Karnataka, Tamil Nadu); Bangladesh; Korea; Malaysia; China; Japan; Taiwan; Philippines and Formosa.

Source : Farooqi & Subba Rao (1986); Boucek *et. al.* (1978).

118. *Sphegigaster stepicola* Boucek

Locality : Palghat (Anakatty).

External distribution : India (Kerala, Delhi, Bihar, U.P.); Australia; Czechoslovakia; Moldavian SSR; Algeria.

Source : Farooqi & Subba Rao, 1986, Sureshan, 1993.

119. *Notoglyptus scutellaris* (Dodd & Girault)

Locality : Nilambur.

External distribution : India (Delhi, Kerala, U.P.); Italy; Seychelles Island; Japan; S.Africa.

Source : Farooqi & Subba Rao, 1986, Sureshan, 1993.

120. *Oxysychnus coimbatorensis* (Ferriere)

Locality : Anakatty.

External distribution : India (Kerala, Coimbatore, Delhi); Pakistan.

Source : Mani, M.S., 1989, Boucek, *et. al.* 1978, Sureshan, 1993.

121. *Propicroscythus mirificus* (Girault)

Locality : Agali, Chindaki, Mukali, Silent valley, Nilambur.

External distribution : India, Sri Lanka, Australia, S. China, East Malaysia;

Source : Boucek, *et. al.* 1978. Farooqi & Subba Rao, 1986, Sureshan, 1993.

Remarks : Parasitic on gall midges in rice and other grasses.

122. *Pteromalus puparum* (Linnaeus)

Locality : Mukali, Wynad (Sultan's Battery).

External distribution : Cosmopolitan.

Source : Boucek, *et. al.* 1978, Mani, M.S. 1989, Sureshan, 1993.

123. *Trichomalus kannurensis* Sureshan & Narendran

Locality : Wynad.

- External distribution* : India (Kerala).
Source : Sureshan & Narendran, 1994 b.
124. *Uniclypea kumarani* Sureshan & Narendran.
Locality : Nilambur.
External distribution : India (Kerala).
Source : Sureshan & Narendran, 1994 b.
125. *Psilocera vinayaki* Sureshan & Narendran
Locality : Wynad.
External Distribution : India (Kerala).
Source : Sureshan & Narendran, 1995.
126. *Sphegigaster brunneicornis* (Ferriere)
Locality : Agali, Silent valley, Wynad, Anakkatty.
External Distribution : India (Kerala), Sri Lanka.
Source : Sureshan & Narendran, 1997.
127. *Paraiemea vishnuae* Sureshan & Narendran
Locality : Silent valley, Wynad.
External Distribution : India (Kerala).
Source : Sureshan & Narendran, 1998.
128. *Oxysychus nupserhae* (Dutt & Ferriere)
Locality : Wynad.
External Distribution : India (Kerala, West Bengal, Delhi).
Source : Sureshan, 1993.
- Family EUPELMIDAE
129. *Eupelmus (E) licinus* Narendran & Anil
Locality : Anakkatti.
Source : Narendran & Anil, 1995.
130. *Calymmochilus nilamburicus* Narendran
Locality : Nilambur.
Source : Narendran, 1996.

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INSECTA : PROCTOTRUPOIDEA (HYMENOPTERA)

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INTRODUCTION

The Proctotrupeoidea constitutes one of the important superfamilies of parasitic hymenoptera.

They are entomophagous parasites in the eggs or larvae of other insects, mainly Orthoptera, Heteroptera, Coleoptera, Lepidoptera, Hymenoptera and Diptera. Besides insects, some members are parasites in the eggs of spiders. Many species are hyperparasites that develop in the larvae of Chalcidoidea, Braconidae and Ichneumonidae.

The study of Proctotrupoid fauna is of importance because of their diverse host relationships and because many of their hosts are pest insects, both of forest and agricultural crops and some are of importance in public health. The biological use of these parasitoids is an important means of control methods against pests. To cite an example, *Telenomus beneficiens* (Zehnt.) has been successfully introduced for the control of lepidopterous borers in Java, West-Indies, Formosa, Philippines, Colombia, Japan, Hawaii and India.

Proctotrupeoidea occur in all continents and at present about 4000 species are known from the world (Mani & Sharma, 1982). In India Mani (1941) published a catalogue on this group and also summarised the knowledge on their biology in 1942. Further, Sharma (1979), Mani & Sharma (1982) Rajmohana & Narendran (1997) and Narendran (1998) contributed towards the systematics of Proctotrupeoidea from India which included records of species from N.B.R.

SYSTEMATIC ACCOUNT

Class INSECTA

Order HYMENOPTERA

Superfamily PROCTOTRUPOIDEA

Family DIAPRIIDAE

1. *Aneuropria nilgiriensis* Sharma

Locality : Nilgiri hills.

Source : Sharma, 1979.

2. *Spilomicrus nilgiriensis* Sharma

Locality : Nilgiri hills.

Source : Sharma, 1979.

3. *Spilomicrus nilamburensis* Sharma

Locality : Nilambur, Chindaki (Agali).

Source : Sharma, 1979.

4. *Paramesius nilamburensis* Sharma

Locality : Nilambur.

External distribution : Mahabaleshwar.

Source : Sharma, 1979.

Family MEGASPILIDAE

5. *Dendrocerus* sp.

Locality : Nilgiri hills.

Source : Mani & Sharma, 1982.

Family PLATYGASTERIDAE

6. *Inostemma dalhousianus* Mukerjee

Locality : Nagerhole.

External distribution : Dalhousie.

Source : Mukerjee, 1981.

7. *Synopeas indopeninsularis* Mani

Locality : Nilgiri hills.

External distribution : India : Karnataka, Tamil Nadu; Nepal.

Source : Mani & Sharma, 1982.

8. *Synopeas nepalensis* Mukerjee

Locality : Nilgiri hills.

External distribution : India : Kollimalai (Salem); Nepal.

Source : Mukerjee, 1981.

Family SCELIONIDAE

9. *Scelio bengalensis* Mukerjee

Locality : Nilambur.

External distribution : India : Kerala, North Bengal.

Source : Mukerjee, 1979.

10. *Scelio nilamburensis* Mukerjee

Locality : Nilambur.

External distribution : Kerala.

Source : Mukerjee, 1979.

11. *Scelio satpurus* Mukerjee

Locality : Nilambur.

External distribution : Kerala, Pachmarhi, Bombay.

Source : Mani & Sharma, 1982.

12. *Calotelea tanugatra* Narendran

Locality : Agali.

External distribution : Kerala.

Source : Narendran, 1998.

13. *Trimorus scutellospinosus* Rajmohana & Narendran

Locality : Muthanga (Wynad).

Source : Rajmohana & Narendran, 1997.

14. *Trimorus nilamburensis* Mukerjee

Locality : Nilambur.

Source : Mukerjee, 1981.

15. *Baryconus* sp.

Locality : Nilambur.

Source : Mani & Sharma, 1982.

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PISCES

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INTRODUCTION

The Nilgiri Biosphere Reserve (NBR) covers an area of 5520.40 km² and is spread over the states of Karnataka, Kerala and Tamil Nadu in the Indian Peninsula. This area is drained by both east and west flowing rivers and streams. The east flowing rivers form part of Cauvery river system which is much older than the Ganga, Indus & Brahmaputra systems of the Himalayas. The economy of Karnataka and Tamil Nadu is largely dependent on the water supply and natural resources of the river Cauvery. But the ecology of this river has undergone change due to interference by human agencies in the course of time and as a result the natural resources, such as fish, have been adversely affected. In addition, the introduction of exotic species into this river system has also threatened the existence of native species.

Day (1989) recorded 50 spp. from the Nilgiri Hills and adjoining areas. Jayaram *et al.* (1982), based on intensive ichthyofaunistic survey of the river Cauvery, gave a detailed account of fishes of this river system and reported 142 species under 27 families. Raghunathan (1989, 1992) gave an account of fish fauna of Coorg district of Karnataka and Wynaad district of Kerala, respectively. Rema Devi & Indra (1986) recorded 9 spp. belonging to 5 families, of which 2 species were new to science from the Silent Valley (Kerala).

We report in this paper 116 species belonging to 46 genera and 20 families from the NBR covering areas under Karnataka, Kerala and Tamil Nadu. This is based on inventorisation of fish species of this area from published literature as

well as on fish material collected during 25 faunistic surveys conducted by parties of Western Regional Station, ZSI, Pune, Southern Regional Station, ZSI, Chennai and Western Ghats Regional Station, Calicut. The fish material from Karnataka part of NBR has been worked out jointly by Drs. G.M. Yazdani, Scientist-SF and D.F. Singh, formerly Asstt. Zoologist, ZSI, Pune; from Tamil Nadu part by Dr. Rema Devi, Scientist-D and from Kerala part by Dr. M.B. Raghunathan, Asstt. Zoologist. The sequence of families is phylogenetic, following the scheme proposed by Nelson (1984) as adopted by Talwar & Jhingran (1991). However, a few modification based on recent studies and generic groupings have also been incorporated (Menon, 1992, 1999). The status of species given is restricted to NBR and it is based on visual observation in the field. This may not be found in conformity with the IUCN definition.

Drainage

The NBR area within the limits of Karnataka State contains Bandipur National Park (BNP), now known as Bandipur Tiger Reserve (BTR) and Nagarhole National Park (NNP). The river Kabini which is a tributary of river Cauvery separates the BNP from NNP. The rivers/streams such as Kabini, Taraka, Nagarhole, Lakshmanteertha, Hebbula and Sarathi flow through the NNP. The rivers/streams such as Kabini, Nugu, Moyar, Bavali, Moolehole, Kakkanhalla and Waranchi drain the area under BTR.

The NBR area included within the Tamil Nadu State contains Mudumalai Wild Life Sanctuary (MWS) and Mukurthi Wild Life Sanctuary (MWS)

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or Nilgiri Tahr Sanctuary (NTS). The river Bhavani - a tributary of the river Cauvery flows on the eastern slopes of the Nilgiri and forms the Bhavani Sagar owing to the dam constructed near its confluence with river Moyar.

The NBR area included within the Kerala State contains Wynaad Wildlife Sanctuary (WWS) and Silent Valley National Park (SVNP). The forest slopes of this part are drained by rivers such as Punnapuzha, Talipuzha, Karimpuzha (Kunthi river) - a tributary of Bharathapuzha takes its origin from the outer run of Nilgiris in the Silent valley and runs all along the centre of this valley in a north-south direction. All its major tributaries originate from the eastern slopes. The Kunthipuzha (Kunthi river) drainage is separated from the Bhavani drainage to the east by a north-south ridge from Anginda and terminating at Mukkali.

SYSTEMATIC LIST

Order OSTEGLLOSSIFORMES

Family I NOTOPTERIDAE

1. *Notopterus notopterus* (Pallas)

Order ANGUILLIFORMES

Family II ANGUILLIDAE

2. *Anguilla bengalensis* (Gray & Hardw.)

Order CYPRINIFORMES

Family III CYPRINIDAE

3. *Cirrhinus fulungee* (Sykes)

4. *Cirrhinus reba* (Hamilton)

5. *Cyprinus carpio* Linnaeus

6. *Hypselobarbus curmuca* (Hamilton)

7. *Hypselobarbus dubius* (Day)

8. *Hypselobarbus jerdoni* (Day)

9. *Hypselobarbus lithopidos* (Day)

10. *Hypselobarbus mussullah* (Sykes)

11. *Labeo ariza* (Hamilton)

12. *Labeo bata* (Hamilton)

13. *Labeo boggut* (Sykes)

14. *Labeo calbasu* (Hamilton)

15. *Labeo dussumieri* (Valenciennes)

16. *Labeo kontius* (Jerdon)

17. *Labeo pangusia* (Hamilton)

18. *Labeo rohita* (Hamilton)

19. *Neolissochilus wynaadensis* (Day)

20. *Oreochilichthys cosuatis* (Hamilton)

21. *Osteobrama neilli* (Day)

22. *Osteochilichthys brevidorsalis* (Day)

23. *Osteochilichthys nashii* (Day)

24. *Puntius amphibius* (Valenciennes)

25. *Puntius arulius arulius* (Jerdon)

26. *Puntius bimaculatus* (Bleeker)

27. *Puntius chola* (Hamilton)

28. *Puntius conchoni* (Hamilton)

29. *Puntius dorsalis* (Jerdon)

30. *Puntius fasciatus* (Jerdon)

31. *Puntius filamentosus* (Valenciennes)

32. *Puntius mahecola* (Valenciennes)

33. *Puntius mudumalaiensis* Menon & Rema Devi

34. *Puntius melanostigma* (Day)

35. *Puntius narayani* Hora

36. *Puntius parrah* Day

37. *Puntius sarana sarana* (Hamilton)

38. *Puntius sarana subnasutus* (Valenciennes)

39. *Puntius sophore* (Hamilton)

40. *Puntius ticto* (Hamilton)

41. *Puntius vittatus* (Day)

42. *Barbodes bovanicus* (Day)

43. *Barbodes carnaticus* (Jerdon)

44. *Tor khudree* (Sykes)

45. *Chela cachi* (Hamilton)

46. *Salmostoma acinaces* (Valenciennes)

47. *Salmostoma boopis* (Day)

48. *Salmostoma clupeioides* (Bloch)
 49. *Salmostoma horai* (Silas)
 50. *Salmostoma untrahi* (Day)
 51. *Barilius bendelisis* (Hamilton)
 52. *Barilius canarensis* (Jerdon)
 53. *Barilius gatensis* (Valenciennes)
 54. *Barilius vagra* (Hamilton)
 55. *Danio aequipinnatus* (McClelland)
 56. *Danio neilgherriensis* (Day)
 57. *Danio rerio* (Hamilton)
 58. *Esomus danricus* (Hamilton)
 59. *Esomus thermoicos* (Valenciennes)
 60. *Parluciosoma daniconius* (Hamilton)
 61. *Rasbora caverii* (Jerdon)
 62. *Crossocheilus latius latius* (Hamilton)
 63. *Garra bicornuta* Rao
 64. *Garra gotyla stenorhynchus* (Jerdon)
 65. *Garra hughi* Silas
 66. *Garra mcClellandi* (Jerdon)
 67. *Garra menoni* Rema Devi & Indra
 68. *Garra mullya* (Sykes)
- Family IV BALITORIDAE
69. *Balitora mysorensis* Hora
 70. *Bhavana australis* (Jerdon)
 71. *Homaloptera pillaii* Indra & Rema Devi
 72. *Nemacheilus denisoni denisoni* Day
 73. *Nemacheilus guentheri* Day
 74. *Nemacheilus kodaguensis* Menon
 75. *Nemacheilus monilis* Hora
 76. *Nemacheilus moreh* (Sykes)
 77. *Nemacheilus nilgiriensis* Menon
 78. *Nemacheilus semiarmatus* Day
 79. *Nemacheilus striatus* Day
 80. *Nemacheilus triangularis* Day

Family V. COBITIDAE

- 81.
- Lepidocephalus thermalis*
- (Valenciennes)

Order SILURIFORMES

Family VI. BAGRIDAE

82. *Mystus armatus* (Day)
 83. *Mystus bleekeri* (Day)
 84. *Mystus cavasius* (Hamilton)
 85. *Mystus malabaricus* (Jerdon)
 86. *Mystus montanus* (Jerdon)
 87. *Mystus oculatus* (Valenciennes)
 88. *Mystus punctatus* (Jerdon)
 89. *Mystus vittatus* (Bloch)

Family VII. SILURIDAE

90. *Ompok bimaculatus* (Bloch)
 91. *Silurus wynaadensis* Day
- Family VIII. SISORIDAE
92. *Glyptothorax annandalei* Hora
 93. *Glyptothorax lonah* (Sykes)
 94. *Glyptothorax madraspatnam* (Day)

Family IX. CLARIIDAE

95. *Clarias batrachus* (Linn.)
 96. *Clarias dussumieri dayi* (Hora)

Family X. HETEROPNEUSTIDAE

- 97.
- Heteropneustes fossilis*
- (Bloch)

Order SALMONIFORMES

Family XI. SALMONIDAE

- 98.
- Oncorhynchus nerka*
- (Walbaum)

Order CYPRINODONTIFORMES

Family XII. BELONIDAE

- 99.
- Xenentodon cancila*
- (Hamilton)

Family XIII. APLOCHEILIDAE

- 100.
- Aplocheilus lineatus*
- (Valenciennes)

Family XIV. ORYZIIDAE

- 101.
- Oryzias melastigma*
- (McClelland)

Family XV. POECILIDAE

102. *Gambusia affinis* (Baird & Girard)

Order CHANNIFORMES

Family XVI. CHANNIDAE

103. *Channa orientalis* (Schneider)

104. *Channa punctatus* (Bloch)

105. *Channa marulius* (Hamilton)

106. *Channa striatus* (Bloch)

Order PERCIFORMES

Family XVII. NANDIDAE

107. *Nandus nandus* (Hamilton)

108. *Pristolepis marginata* Jerdon

Family XVIII. CICHLIDAE

109. *Etroplus canarensis* Day

110. *Etroplus maculatus* (Bloch)

111. *Etroplus suratensis* (Bloch)

112. *Oreochromis mossambica* (Peters)

Family XIX. GOBIIDAE

113. *Glossogobius giuris* (Hamilton)

Suborder : MASTACEMBELOIDEI

Family XX. : MASTACEMBELIDAE

114. *Macrogathus aral* (Bloch)

115. *Macrogathus malabaricus* (Jerdon)

116. *Mastacembelus armatus* (Lacepede)

SYSTEMATIC ACCOUNT

The Systematic account of fishes of Nilgiri Biosphere Reserve (NBR) is based on both published records as well as collection of specimens during the surveys. Species represented in the collections of NBR have been marked with asterisks. Certain species occurring in the adjoining areas, as per published records, have also been included in the list, considering their known geographical range of distribution. Areas shown under 'Locality' pertain to NBR and those given under 'External distribution' are known range of distribution of species.

Order OSTEOGLOSSIFORMES

Family NOTOPTERIDAE

1. *Notopterus notopterus* (Pallas)*
(Feather back)

Locality : Kabini river at Begur (Karnataka), Bhavani Sagar dam (Tamil Nadu).

Status : Common.

External distribution : Large freshwater rivers of India, Nepal, Pakistan, Bangladesh, Burma, Malaya, Thailand and Indonesia.

Order ANGUILLIFORMES

Family ANGUILLIDAE

2. *Anguilla bengalensis* (Gray & Hardw.)*
(Freshwater eel)

Locality : Silent Valley (Kerala).

Status : Common.

External distribution : Inhabits freshwaters of India, Pakistan, Sri Lanka and Burma. A catadromous species, occurring in estuaries and in the sea during early life and near maturity.

Order CYPRINIFORMES

Family CYPRINIDAE

3. *Cirrhinus fulungee* (Sykes)*
(Deccan White carp)

Locality : River Kabini river (Karnataka).

Status : Common.

External distribution : Maharashtra and Karnataka states (Krishna and Cauvery river systems) of Peninsular India.

4. *Cirrhinus reba* (Hamilton)*
(Reba carp)

Locality : Kabini river (Karnataka), Moyar and Bhavani (Tamil Nadu), Wynaad district (Kerala).

Status : Common.

External distribution : Throughout India, Nepal, Bangladesh, Burma and Pakistan (Indus plain and adjoining hill areas).

5. *Cyprinus carpio* Linnaeus*
(Common Carp)

Locality : Moyar river (Tamil Nadu).

Status : Common : An introduced species.

External distribution : Naturally found all through China, Korea, Japan, Taiwan, Europe and America.

Remarks : Two subspecies, namely, *Cyprinus carpio cummunis* Lin. and *Cyprinus carpio specularis* Lacep. occur in the NBR.

6. *Hypselobarbus curmuca* (Hamilton)
(Kolus)

Locality : Cauvery river system.

Status : Common.

External distribution : Krishna, Godavari and Cauvery river systems in Peninsular India.

7. *Hypselobarbus dubius* (Day)*
(Nilgiri barb)

Locality : Moyar river near Moyar Power House and Bhavani Sagar dam (Tamil Nadu).

Status : Common : It is endemic to Cauvery river system.

External distribution : Cauvery river system in Peninsular India.

8. *Hypselobarbus jerdoni* (Day)
(Jerdon's carp)

Locality : Bhavani river, Nilgiri Hills (Tamil Nadu).

Status : Threatened.

External distribution : Karnataka, Kerala, Tamil Nadu and Maharashtra States of India.

9. *Hypselobarbus lithopidos* (Day)
(Canara barb)

Locality : South Canara (Karnataka), close to NBR.

Status : Rare.

External distribution : Western Ghats, from South Canara (Karnataka) to Kerala in India.

10. *Hypselobarbus mussullah* (Sykes)
(Mussullah mahseer or High backed mahseer)

Locality : Cauvery river system.

Status : Rare.

External distribution : Krishna, Cauvery and Godavari river systems in Peninsular India.

11. *Labeo ariza* (Hamilton)
(Ariza Labeo)

Locality : Cauvery and Bhavani rivers and Wynaad district (Kerala).

Status : Rare.

External distribution : Nilgiri Hills (Tamil Nadu), Wynaad (Kerala) and Cauvery river system in Peninsular India.

12. *Labeo bata* (Hamilton)
(Bata Labeo)

Locality : Moyar & Cauvery rivers.

Status : Common.

External distribution : Throughout India, except Kerala, Bangladesh and Nepal (Introduced).

13. *Labeo boggut* (Sykes)
(Boggut Labeo)

Locality : Cauvery river.

Status : Common.

External distribution : Northern India and upto Cauvery river system in Peninsular India; Pakistan; Bangladesh.

14. *Labeo calbasu* (Hamilton)
(Kalbasu, Black rohu)

Locality : Cauvery river, Canara district (Karnataka).

Status : Common.

External distribution : Throughout India; Pakistan, Nepal, Bangladesh, Burma, Thailand, Also South West China.

15. *Labeo dussumieri* (Valenciennes)
(Malabar labeo)

Locality : Cauvery headwaters.

Status : Rare.

External distribution : Western face of Western Ghats from Bombay (Maharashtra) to Travancore Hills (Kerala); Sri Lanka.

16. *Labeo kontius* (Jerdon)
(Pig mouth carp)

Locality : Cauvery and Bhavani rivers.

Status : Threatened.

External distribution : Cauvery river system in Tamil Nadu and Karnataka.

17. *Labeo pangusia* (Hamilton)
(Pangusia labeo)

Locality : Cauvery river.

Status : Common.

External distribution : All along the Himalayas, including Kashmir, Chotanagpur, Vindhya-Satpura ranges, Deccan and South as far as the Cauvery; Pakistan; Nepal; Bangladesh.

18. *Labeo rohita* (Hamilton)
(The rohu)

Locality : Cauvery river, Mettur reservoir (Tamil Nadu).

Status : Common.

External distribution : Northern India, Introduced into Peninsular India; Pakistan, Nepal, Bangladesh, Burma, Sri Lanka (introduced).

19. *Neolissochilus wynaadensis* (Day)*

Locality : Moyar river and its tributary - Kakkanhala stream in Tamil Nadu.

Status : Common.

External distribution : It is restricted to NBR i.e. Wynaad (Kerala) and headwaters of Cauvery.

20. *Oreochthys cosuatis* (Hamilton)
(Cosuatis barb)

Locality : Rivers of Karnataka and Kerala.

Status : Common.

External distribution : Assam, West Bengal, Madhya Pradesh, Maharashtra, Karnataka and Kerala States of India; Bangladesh and Thailand.

21. *Osteobrama neilli* (Day)
(Nilgiri osteobrama)

Locality : Bhavani river at the base of Nilgiri Hills (Tamil Nadu).

Status : Common.

External distribution : Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu states of India.

22. *Osteochilichthys brevidorsalis* (Day)
(Kantaka barb)

Locality : Cauvery river, Nilgiri Hills (Tamil Nadu).

Status : Common.

External distribution : Tamil Nadu State, India.

23. *Osteochilichthys nashii* (Day)*
(Nash's Konti barb)

Locality : Mudumalai (Tamil Nadu), Wynaad (Kerala), South Canara (Karnataka).

Status : Rare.

External distribution : Deccan (Krishna and Godavary), Coorg, Dakshina Kannada, Nilgiri and Anamalai Hills.

24. *Puntius amphibius* (Valenciennes)*
(Scarlet-banded barb)

Locality : Cauvery, Bhavani, Kabini and Shimsha rivers, Wynaad & Palghat districts (Kerala).

Status : Common.

External distribution : Peninsular India; Sri Lanka.

25. *Puntius arulius arulius* (Jerdon)*
(Aruli barb, Long fin barb)

Locality : Cauvery & Bhavani rivers, Wynaad & Palghat districts (Kerala), Nilgiri (Tamil Nadu).

Status : Common.

External distribution : Peninsular India.

26. *Puntius bimaculatus* (Bleeker)*
(Two spot barb)

Locality : Kakkan halla stream, Chikkala stream, Imperalla, foot hills of Kalkothimalai, Balae Baduga Palla & Thalavadi forest in the Nilgiris.

Status : Common.

External distribution : Peninsular India; Sri Lanka.

27. *Puntius chola* (Hamilton)*
(Swamp barb, Chola barb)

Locality : Cauvery, Moyar, Kulithalai & Bhavani river, Mudumalai (Tamil Nadu).

Status : Common.

External distribution : Throughout India; Pakistan, Nepal, Bangladesh, Burma and Sri Lanka.

28. *Puntius conchoni* (Hamilton)*
(Rosy barb, Red barb)

Locality : Bhavani, Kabini rivers & streams, Mudumalai (Tamil Nadu).

Status : Common.

External distribution : Ganga, Brahmaputra, Mahanadi and Cauvery river systems of India; Afghanistan, Pakistan, Nepal and Bangladesh.

29. *Puntius dorsalis* (Jerdon)*
(Long snouted barb)

Locality : Cauvery, Kabini, Bhavani & Kodungarai rivers; Palghat district (Kerala), Sigur falls, Nilgiris.

Status : Common.

External distribution : Cauvery, Krishna, Godavary, Mahanadi, Narmada river systems of Peninsular India; Sri Lanka.

30. *Puntius fasciatus* (Jerdon)*
(Melon barb)

Locality : Nilgiris (Kalkothimalai and foot hills of Kalkothimalai, Siruvani dam site, Kunjaparai - Kozhikara river, Gudalur-Nadugeni); Punjakolli, Sayvala, New Amarambalam.

Status : Common.

External distribution : Upper reaches of Cauvery drainage, southward to Cape, Western watersheds draining south Kanara (Karnataka), Malabar and Travancore - Cochin (Kerala) of Peninsular India.

31. *Puntius filamentosus* (Valenciennes)*
(Black spot barb, Indian tiger barb)

Locality : Cauvery, Kabini, Bhavani rivers/streams Bhavanisagar (Tamil Nadu).

Status : Common.

External distribution : Goa, Karnataka, Kerala, Andhra Pradesh and Tamil Nadu states of India; Sri Lanka.

32. *Puntius mahecola* (Valenciennes)
(Black spot barb)

Locality : Bhavani river, Nilgiris (Tamil Nadu).

Status : Common.

External distribution : Goa, Karnataka, Kerala and Tamil Nadu States of India.

33. *Puntius mudumalaiensis* Menon & Rema Devi*

Locality : Nilgiris (Mudumalai-Kakkanhalla).

Status : Rare.

External distribution : Endemic to Nilgiris (Western Ghats).

34. *Puntius melanostigma* (Day)*
(Wynaad barb)

Locality : Bhavani & Cauvery rivers; Anarahalli and Kakkanhalla streams (Nilgiris), Wynaad (Kerala).

Status : Not common.

External distribution : Wynaad & Nilgiri of Peninsular India.

35. *Puntius narayani* Hora
(Narayan barb)

Locality : Kabini river (Karnataka).

Status : Common.

External distribution : Cauvery & Tungabhadra river systems of Peninsular India.

36. *Puntius parrah* Day*
(Parrah barb)

Locality : Cauvery, Bhavani, Lakshmantirtha and Kodungarai rivers, Mudumalai in Nilgiris (Tamil Nadu).

Status : Not common.

External distribution : Godavari & Krishna (Maharashtra State), Hemvati (Karnataka State), Godavari (Andhra Pradesh), Cauvery river (Kerala & Tamil Nadu) rivers of India.

37. *Puntius sarana sarana* (Hamilton)*
(Olive barb)

Locality : Cauvery & Kabini rivers; Palghat, Wynaad and Malappuram districts of Kerala.

Status : Common.

External distribution : Throughout India, Afghanistan, Pakistan, Nepal, Bangladesh and Bhutan.

38. *Puntius sarana subnasutus* (Valenciennes)*
(Peninsular olive barb)

Locality : Cauvery & Bhavani rivers.

Status : Common.

External distribution : Krishna and Cauvery river systems and Kerala State of Peninsular India.

39. *Puntius sophore* (Hamilton)*
(Spot fin swamp barb)

Locality : Cauvery & Bhavani rivers; Bhavani sagar dam (Tamil Nadu); Wynaad district (Kerala).

Status : Common.

External distribution : Throughout India; Bangladesh, Nepal, Pakistan, Burma and Yunnan (China).

40. *Puntius ticto* (Hamilton)*
(Ticto barb, Firefin barb, Two spot barb)

Locality : Cauvery, Bhavani & Moyar rivers, Mudumalai Wildlife Sanctuary in Nilgiris (Tamil Nadu) and Wynaad district of Kerala.

Status : Common.

External distribution : Throughout India; Pakistan, Nepal, Bangladesh, Burma, Thailand and Sri Lanka.

41. *Puntius vittatus* (Day)
(Kooli barb)

Locality : Coorg district (Karnataka).

Status : Common.

External distribution : Goa, Karnataka, Kerala, Tamil Nadu, Gujarat (Kutch), Bihar and Rajasthan States of India, Sri Lanka.

42. *Barbodes bovanicus* (Day)*
(Bowany barb)

Locality : Cauvery & Bhavani rivers, Mudumalai in Nilgiris (Tamil Nadu).

Status : Not common.

External distribution : Bhavani and Cauvery river systems of Peninsular India.

43. *Barbodes carnaticus* (Jerdon)*
(Karnatic carp)

Locality : Cauvery, Kabini, Moyar and Mulli rivers; Mudumalai in Nilgiris (Tamil Nadu),

Status : Threatened.

External distribution : Cauvery river system in Nilgiri; Wynaad and Canara Hills of Peninsular India.

44. *Tor khudree* (Sykes)
Yellow Mahseer, Deccan Mahseer

Locality : Cauvery & Moyar rivers.

Status : Common.

External distribution : Deccan and entire Peninsular India; Sri Lanka.

45. *Chela (Chela) cachius* (Hamilton)
(Silver hatchet chela)

Locality : Cauvery, Bhavani and Hemavati rivers.

Status : Common.

External distribution : Throughout India; Pakistan, Bangladesh and Burma.

46. *Salmostoma acinaces* (Valenciennes)
(Silver razorbelly minnow)

Locality : Cauvery, Kabini, Bhavani and Lakshmantirtha.

Status : Common.

External distribution : Cauvery river system and Tungabhadra river in Peninsular India.

47. *Salmostoma boopis* (Day)*
(Boopis razorbelly minnow)

Locality : Cauvery river (Karnataka), Wynaad & Palghat district (Kerala).

Status : Common.

External distribution : Western Ghat areas of Karnataka (South Canara) and Maharashtra (Poona) states of India.

48. *Salmostoma clupeoides* (Bloch)
(Bloch razorbelly minnow)

Locality : Cauvery river (Tamil Nadu).

Status : Common.

External distribution : Narmada, Godavari, Krishna and Cauvery rivers in Madhya Pradesh, Gujarat, Maharashtra, Karnataka & Tamil Nadu State of India.

49. *Salmostoma horai* (Silas)
(Hora razorbelly minnow)

Locality : Cauvery river (Coorg, Karnataka).

Status : Not common.

External distribution : India (Karnataka).

50. *Salmostoma untrahi* (Day)
(Mahanadi razorbelly minnow)

Locality : Cauvery & Bhavani rivers (Tamil Nadu).

Status : Common.

External distribution : Mahanadi (Orissa) and Cauvery (Karnataka) rivers of India.

51. *Barilius bendelisis* (Hamilton)
(Hamilton's baril)

Locality : Cauvery & Bhavani rivers (Tamil Nadu).

Status : Common.

External distribution : Throughout India, Pakistan, Nepal, Bangladesh and Sri Lanka.

52. *Barilius canarensis* (Jerdon)
(Jerdon's baril)

Locality : Palghat district (Tamil Nadu).

Status : Rare.

External distribution : South Canara district of Karnataka (India).

53. *Barilius gatensis* (Valenciennes)*
(River carp baril)

Locality : Cauvery, Nugu, Hemavati, Moyar, Kodungarai, Kozhikara rivers; Wynaad & Palghat district (Kerala) and Mudumalai (Nilgiri district, Tamil Nadu).

Status : Common, Endemic to Western Ghats.

External distribution : Western Ghats (Southern Karnataka, Tamil Nadu (Nilgiri Hills) and Kerala of India.

54. *Barilius vagra* (Hamilton)
(Vagra baril)

Locality : Cauvery river (NBR).

Status : Not common.

External distribution : Himalayan and sub-Himalayan rivers of India; Nepal, Bangladesh, Sri Lanka, Pakistan & Afghanistan.

55. *Danio aequipinnatus* (McClelland)*
(Giant danio)

Locality : Cauvery, Bhavani, Hemavati, Moyar, Mulli, Kodungarai rivers, Chikkala stream, Sigur falls; Wynaad & Palghat districts (Kerala).

Status : Common.

External distribution : Throughout Northern India, Nepal, Bangladesh, Burma and Thailand.

56. *Danio neilgherriensis* (Day)
(Peninsular danio)

Locality : Moyar river, Nilgiri (Tamil Nadu).

Status : Common.

External distribution : Endemic to Nilgiri Hills.

57. *Danio rerio* (Hamilton)

Locality : Cauvery river system (NBR).

Status : Common.

External distribution : Throughout India; Pakistan, Nepal, Bangladesh and Burma.

58. *Esomus danricus* (Hamilton)
(Flying barb)

Locality : Lakshmantirtha and Cauvery river system.

Status : Common.

External distribution : Throughout Northern India; Pakistan, Nepal, Sri Lanka and Burma.

59. *Esomus thermoicos* (Valenciennes)
(South Indian flying barb)

Locality : Cauvery and Bhavani rivers.

Status : Common.

External distribution : Godavari and Krishna River systems to as far south as the tip of peninsular India; Sri Lanka.

60. *Parluciosoma daniconius* (Hamilton)*
Blackline rasbora

Locality : Cauvery, Kabini, Moyar, Mulli rivers; Chikkala stream, Wynaad & Palghat districts (Kerala), Mudumalai (Nilgiri district, Tamil Nadu).

Status : Common.

External distribution : Throughout India; Pakistan, Sri Lanka, Nepal, Bangladesh, Burma and Thailand.

61. *Rasbora caverii* (Jerdon)
(Cauvery rasbora)

Locality : Cauvery, Kabini and Hemavati rivers.

Status : Rare.

External distribution : Cauvery drainage (Karnataka) or Peninsular India.

62. *Crossocheilus latius latius* (Hamilton)
(Gangetic latia)

Locality : Kabini river (Bagur, Karnataka).

Status : Common.

External distribution : Drainages of the Ganga and Brahmaputra in Northern India. Mahanadi river drainage in Orissa and Western Ghats, South to the headwaters of Krishna.

63. *Garra bicornuta* Rao*
(Tunga garra)

Locality : Wynaad district (Kerala).

Status : Not common.

External distribution : Thunga river system (Karnataka) and Maharashtra State of India.

64. *Garra gotyla stenorhynchus* (Jerdon)*
(Nilgiris garra)

Locality : Moyar river, Wynaad and Palghat districts (Kerala), Nilgiri district (Tamil Nadu).

Status : Not common.

External distribution : Cauvery and Krishna drainages of Western Ghats of India.

65. *Garra hughi* Silas
(Cardamom garra)

Locality : Cardamom and Palani Hills, Kerala, close to NBR.

Status : Common.

External distribution : Western Ghats (Peninsular India).

66. *Garra mcClellandi* (Jerdon)*
(Cauvery garra)

Locality : Cauvery, Kabini, Bhavani and Kodungarai rivers.

Status : Not common.

External distribution : Throughout India, except Assam and the Himalaya.

67. *Garra menoni* Rema Devi & Indra*

Locality : Kunthi river, Silent valley (Kerala).

Status : Rare.

External distribution : Endemic to Silent valley (Kerala).

68. *Garra mullya* (Sykes)*
(Mullya garra)

Locality : Cauvery, Bhavani, Kabini, Moyar rivers, Sigur falls, Mettur reservoir; Wynaad & Palghat districts (Kerala).

Status : Common.

External distribution : Throughout Peninsular India.

Family IV BALITORIDAE

69. *Balitora mysorensis* Hora*
(Slender stone loach)

Locality : Thunga river, Cauvery river system, Palghat district (Kerala).

Status : Not common.

External distribution : Cauvery & Tungabhadra river system of Karnataka State of India.

70. *Bhavana australis* (Jerdon)*
(Western Ghat loach)

Locality : Wynaad, Sayivala, Poochapara and New Amarambalam in Kerala, Mysore in Karnataka and Nilgiri district in Tamil Nadu.

Status : Common.

External distribution : Extreme south of Western Ghats covering Karnataka, Tamil Nadu and Kerala states of India.

71. *Homaloptera pillaii* Indra & Rema Devi*

Locality : Kunthi river, Silent valley in Kerala; Sayivala & New Amarambalam (Kerala).

Status : Rare.

External distribution : Endemic to Silent valley (Kerala).

72. *Nemacheilus denisoni denisoni* Day*

Locality : Moyar river in Mudumalai Wildlife Sanctuary, Kakkanhalla stream, Wynaad (Kerala), Nilgiri district (Tamil Nadu).

Status : Common.

External distribution : Rajasthan, Madhya Pradesh, Maharashtra, Karnataka and Kerala states of peninsular India.

73. *Nemacheilus guentheri* Day*

Locality : Cauvery, Kallar, Pamba, Periyar, Bharathapuzha and Laxmantirtha rivers, Erpu falls; Palghat district (Kerala).

Status : Common.

External distribution : Western Ghats of Peninsular India.

74. *Nemacheilus kodaguensis* Menon

Locality : Cauvery river system; Nilgiris (Tamil Nadu).

Status : Common.

External distribution : Cauvery basin and Nilgiri of Western Ghats of Peninsular India.

75. *Nemacheilus monilis* Hora

Locality : Bhavani river, Nilgiri (Tamil Nadu).

Status : Not common.

External distribution : It is known to occur in Nilgiris and in Anamalai Hills.

76. *Nemacheilus moreh* (Sykes)

Locality : Nilgiris (Tamil Nadu).

Status : Not common.

External distribution : Maharashtra (Poona), Andhra Pradesh and Tamil Nadu (Nilgiris) states of Peninsular India.

77. *Nemacheilus nilgiriensis* Menon

Locality : Palghat district (Kerala), Nilgiri (Tamil Nadu).

Status : Rare.

External distribution : Pykara dam, Nilgiris (Tamil Nadu).

78. *Nemacheilus semiarmatus* Day*

Locality : Kabini and Laxmantirth rivers, Erpu falls, Wynaad & Palghat districts of Kerala, Nilgiris (Tamil Nadu).

Status : Common.

External distribution : Karnataka (Mysore), Kerala (Wynaad) and Tamil Nadu (Nilgiris) states of Peninsular India.

79. *Nemacheilus striatus* Day

Locality : Wynaad (Kerala).

Status : Rare.

External distribution : Western Ghat of Kerala & Karnataka (Shimoga) states of India.

80. *Nemacheilus triangularis triangularis* Day

Locality : Wynaad, Palghat district and Silent valley (Kunthipuzha river) of Kerala.

Status : Common.

External distribution : Western Ghats of Kerala.

Family V COBITIDAE

81. *Lepidocephalus thermalis* (Valenciennes)*
(Malabar loach)

Locality : Cauvery, Moyar, Mulli & Kodungarai rivers, streams & dams in Nilgiris (Tamil Nadu),

Silent valley and Sultan battery (Kerala).

Status : Common.

External distribution : Peninsular India, Sri Lanka.

Order SILURIFORMES

Family VI BAGRIDAE

82. *Mystus armatus* (Day)
(Kerala mystus)

Locality : Wynaad, Palghat & Malappuram districts (Kerala).

Status : Not common.

External distribution : Peninsular India.

83. *Mystus bleekeri* (Day)
(Day's mystus)

Locality : Cauvery river.

Status : Common.

External distribution : Northern India (Southern limit upto Mahanadi River); Pakistan; Nepal; Bangladesh and Burma.

84. *Mystus cavasius* (Hamilton)
(Gangetic mystus)

Locality : Cauvery, Kabini and Bhavani rivers.

Status : Common.

External distribution : India; Pakistan, Nepal, Bangladesh, Burma, Malaya, Thailand, Java, Borneo, Sumatra.

85. *Mystus malabaricus* (Jerdon)
(Jerdon's mystus)

Locality : Wynaad (Kerala).

Status : Not common.

External distribution : Western Ghats of Kerala, Karnataka and Maharashtra States of Peninsular India.

86. *Mystus montanus* (Jerdon)
(Wynaad mystus)

Locality : Kabini river, Wynaad (Kerala).

Status : Not common.

External distribution : Kerala (Wynaad range of hills), Karnataka, Maharashtra, Madhya Pradesh (Hoshangabad district) and Assam states of India.

**87. *Mystus oculatus* (Valenciennes)
(Malabar mystus)**

Locality : Kabini river, Wynaad (Kerala).

Status : Not common.

External distribution : Kerala & Tamil Nadu states of India.

**88. *Mystus punctatus* (Jerdon)
(Nilgiri mystus)**

Locality : Cauvery and Bhavani rivers, Nilgiri Hills (Tamil Nadu).

Status : Not common.

External distribution : Western Ghats of Kerala, Tamil Nadu and Karnataka states of India.

**89. *Mystus vittatus* (Bloch)
(Striped dwarf catfish)**

Locality : Cauvery river.

Status : Not common.

External distribution : Throughout India, Pakistan, Nepal, Bangladesh, Sri Lanka, Burma and Thailand.

Family VII SILURIDAE

**90. *Ompok bimaculatus* (Bloch)*
(Indian Butter catfish)**

Locality : Kabini, Bhavani & Mulli rivers, Wynaad district (Kerala).

Status : Common.

External distribution : Throughout India; Pakistan, Nepal, Bangladesh, Sri Lanka, Burma, Thailand, Java, Sumatra, Borneo, China (Yunnan).

**91. *Silurus wynaadensis* (Bloch)
(Malabar silurus)**

Locality : Wynaad district (Kerala).

Status : Rare.

External distribution : Western Ghats of Kerala and Karnataka.

Family VIII SISORIDAE

92. *Glyptothorax annandalei* Hora*

Locality : Bhavani river at the base of Nilgiri Hills (Tamil Nadu), Silent valley (Kerala).

Status : Rare.

External distribution : Western Ghats (Cauvery shed).

93. *Glyptothorax lonah* (Sykes)

Locality : Laxmantirtha river, Erpu falls (Karnataka).

Status : Common.

External distribution : Deccan Plateau, the Vindhyas and Orissa Hills of India.

94. *Glyptothorax madraspatnam* (Day)*

Locality : Kabini & Bhavani rivers, Nilgiri Hills (Tamil Nadu).

Status : Rare.

External distribution : Cauvery river system in the Nilgiris, Western Ghats, India.

Family IX CLARIIDAE

**95. *Clarias batrachus* (Linn.)
(Magur)**

Locality : Cauvery river.

Status : Common.

External distribution : India, Pakistan, Nepal, Bangladesh, Burma, Indonesia, Singapore, Borneo and the Philippines.

**96. *Clarias dussumieri dayi* (Hora)
(Malabar clariid)**

Locality : Wynaad (Kerala).

Status : Rare.

External distribution : Wynaad Hills, Kerala, India.

Family X HETEROPNEUSTIDAE

97. *Heteropneustes fossilis* (Bloch)
(Stinging catfish)

Locality : Cauvery river system.

Status : Common.

External distribution : India including the Andaman Islands; Pakistan, Nepal, Bangladesh, Sri Lanka, Burma, Thailand and Laos.

Order SALMONIFORMES

Family XI SALMONIDAE

98. *Oncorhynchus nerka* (Walbaum)*
(Sockeye salmon)

Locality : Nilgiri district (Tamil Nadu).

Status : Introduced species.

External distribution : Hakkaido, through Kamchatka and Alaska, to northern California.

Order CYPRINODONTIFORMES

Family XII BELONIDAE

99. *Xenentodon cancila* (Hamilton)*
(Freshwater garfish)

Locality : Cauvery & Bhavani rivers. Palghat district (Kerala).

Status : Common

External distribution : Throughout India; Sri Lanka, Bangladesh, Pakistan, Burma, Malay Peninsula & Thailand.

Family XIII APLOCHEILIDAE

100. *Aplocheilus lineatus* (Valenciennes)
(Malabar killie)

Locality : Cauvery and Chaliyar rivers. Wynaad (Kerala), Nilgiri (Tamil Nadu).

Status : Not common.

External distribution : Widely distributed in peninsular India.

Family XIV ORYZIATIDAE

101. *Oryzias melastigma* (McClelland)
(Estuarine rice fish)

Locality : Wynaad (Kerala).

Status : Not common.

External distribution : India; Bangladesh, Burma & Sri Lanka.

Family XV POECILIIDAE

102. *Gambusia affinis* (Baird & Girard)*
(Mosquito fish)

Locality : Nilgiris, Pontiadaï village of Ithalar; Naduvattam, Gudalur, Pykara, Mullakorai, Ooty lake.

Status : Common. introduced into India.

External distribution : South-eastern United States of America; introduced into India in several states.

Order CHANNIFORMES

Family XVI CHANNIDAE

103. *Channa orientalis* (Bloch & Schneider)
(Asiatic snake head)

Locality : Moyar river at Mudumalai (Nilgiris), Silent valley (Kerala).

Status : Common.

External distribution : India; Afghanistan, Pakistan, Nepal, Sri Lanka, Bangladesh, Burma, Thailand, Yunnan, Malaya, Malay Archipelego, Hainan and Taiwan.

104. *Channa punctatus* (Bloch)*
(Spotted snakehead)

Locality : Cauvery & Bhavani rivers. Wynaad district (Kerala), Nilgiri (Tamil Nadu).

Status : Common.

External distribution : India, Afghanistan, Pakistan, Nepal, Sri Lanka, Bangladesh, Burma, Yunnan.

105. *Channa marulius* (Hamilton-Buchanan)*
Giant Snakehead

Locality : Cauvery river system.

Status : Common.

External distribution : India; Pakistan, Sri Lanka, Bangladesh, Nepal, Burma, Thailand, Sumatra, Borneo and China.

106. *Channa striatus* (Bloch)
(Striped or Banded snakehead)

Locality : Cauvery & Coleroon rivers (Tamil Nadu).

Status : Common.

External distribution : India; Sri Lanka, Pakistan, Bangladesh, Nepal, Burma, Malaya, Malay Archipelago, Thailand upto Philippines.

Order PERCIFORMES

Family XVII NANDIDAE

107. *Nandus nandus* (Hamilton)
(Mottled Nandus)

Locality : Chaliyar river (Kerala).

Status : Common.

External distribution : Throughout India, Pakistan, Nepal, Bangladesh and Thailand.

108. *Pristolepis marginata* Jerdon*
(Malabar Catopra)

Locality : Nilgiri (Tamil Nadu), Palghat district (Kerala).

Status : Not common.

External distribution : Western Ghats of Kerala, Peninsular India.

Family XVIII CICHLIDAE

109. *Eetroplus canarensis* Day
(Canara pearlspot)

Locality : South Karnataka (close to NBR).

Status : Common.

External distribution : South Karnataka, India.

110. *Eetroplus maculatus* (Bloch)*
(Spotted etroplus, orange chromide)

Locality : Cauvery (Tamil Nadu), Palghat district (Kerala).

Status : Common.

External distribution : Peninsular India & Sri Lanka.

111. *Eetroplus suratensis* (Bloch)*
(Banded pearlspot, striped chromide)

Locality : Cauvery & Bhavani rivers (Tamil Nadu), Palghat district (Kerala).

Status : Common.

External distribution : Peninsular India, Sri Lanka.

112. *Oreochromis mossambica* (Peters)
(Mozambique cichlid, Tilapia)

Locality : Cauvery, Moyar & Kabini rivers, Mudumalai, Nilgiris (Tamil Nadu), Palghat district (Kerala).

Status : Common.

External distribution : East Africa; an introduced species in India, Pakistan, Sri Lanka, etc.

Family XIX GOBIIDAE

113. *Glossogobius giuris* (Hamilton)*
(Tank Goby)

Locality : Cauvery, Bhavani and Kabini rivers, Palghat district (Kerala).

Status : Common.

External distribution : India; East coast of Africa, Ceylon, Pakistan, Bangladesh, Andamans, Malay Peninsula, Thailand, China, Japan, Philippines, Australia, the Indo-Australian Archipelago and South Pacific Islands.

Suborder MASTACEMBELOIDEI
Family XX MASTACEMBELIDAE

114. *Macrogathus aral* (Bloch & Schneider)
(One-stripe spinyeel)

Locality : Cauvery river.

Status : Common.

External distribution : India, Pakistan, Sri Lanka, Bangladesh, Nepal and Burma, Thailand, Vietnam, Laos, Malaya and East Indies (Borneo & Mollucas).

115. *Macrogathus malabaricus* (Jerdon)
(Malabar spiny eel)

Locality : Palghat district (Kerala).

Status : Rare.

External distribution : Kerala state of India.

116. *Mastacembelus armatus* (Lacepede)*
Tire-track spiny eel

Locality : Moyar river. Nilgiris (Tamil Nadu), Wynaad district (Kerala).

Status : Common.

External distribution : India; Pakistan; Sri Lanka, Nepal, Burma, Thailand, Malay to South China.

SUMMARY

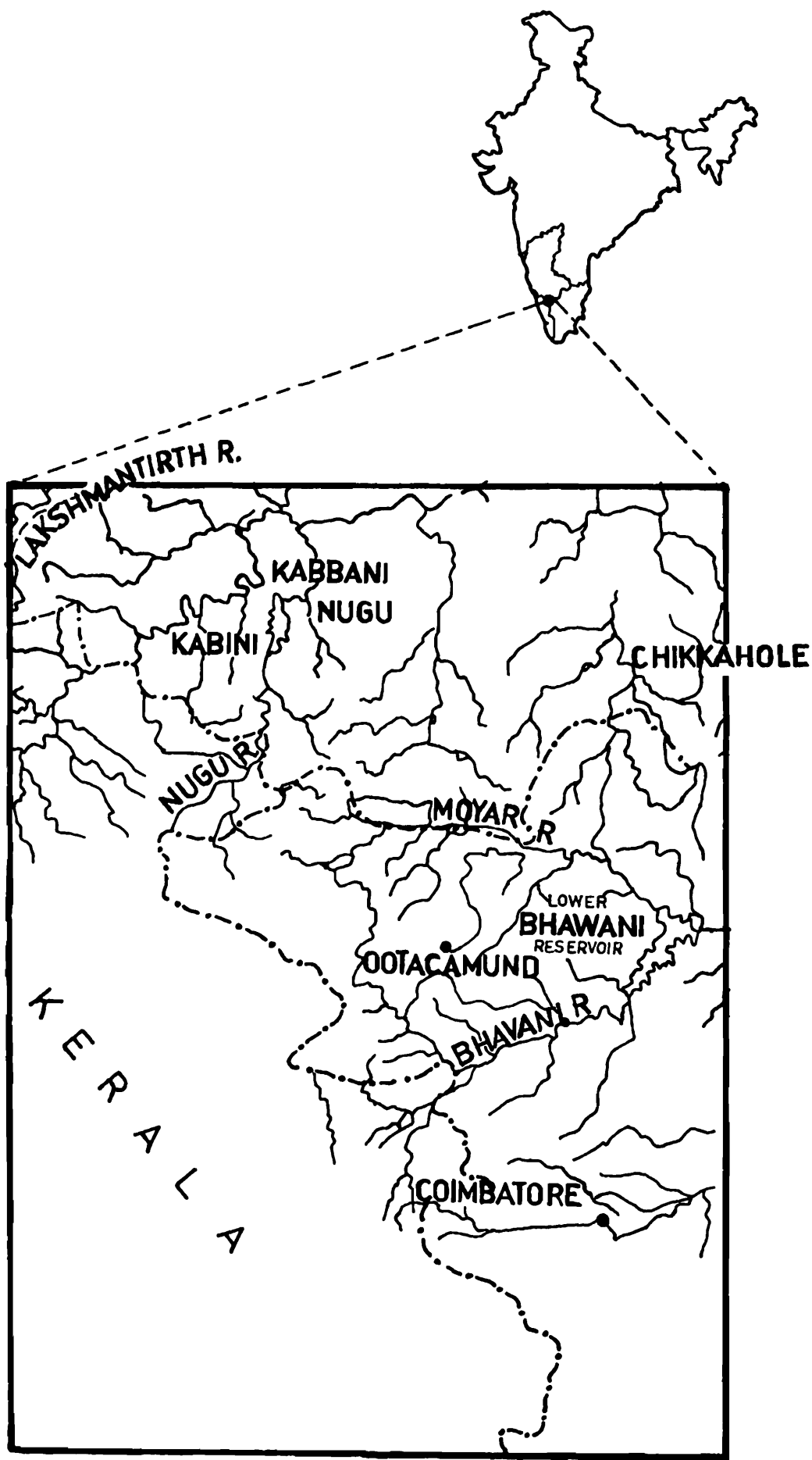
The Western Ghats exhibit a rich biodiversity and endemism. Of the 446 primary freshwater fishes known from India (Menon, 1993), 188 species are found in the western Ghats, which accounts for about 42% of the freshwater fishes and of these 108 species are endemic to this region. The Nilgiri Biosphere Reserve which falls mainly under Cauvery drainage system, has varied topography and diverse habitats and hence

harbours a rich variety of species. The ichthyofauna of NBR is dominated by cyprinid fishes and bears close resemblance that of mountainous course as well as plateau course as shown by Jayaram *et al* (1982). A total of 116 species belonging to 46 genera and 20 families are reported from NBR and of these the following 11 species are endemic to this region viz. *Danio neilgherriensis* (Day), *Osteochilichthys brevidorsalis* (Day), *Neolissochilus wynaadensis* (Day), *Puntius melanostigma* (Day), *Puntius mudumalaiensis* Menon and Rema Devi, *Garra menoni* Rema Devi and Indra, *Garra mcClellandi* (Jerdon), *Homaloptera pillaii* Indra and Rema Devi, *Nemacheilus nilgiriensis* Menon, *Glyptothorax annandalei* Hora and *Clarias dussumieri dayi* Hora. Four species *Cyprinus carpio* Linnaeus, *Oncorhynchus nerka* (Walbaum), *Gambusia affinis* (Baird & Girard) and *Oreochromis mossambica* (Peters) are exotic species. Since 63% of the species and 12% of the endemic forms recorded from the Western Ghats are represented here, the Nilgiri Biosphere is veritably a 'hot-spot' of evolution and biological diversity.

In recent times, fishes especially freshwater fishes of the high ranges are threatened due to loss of habitats, as rivers are being dammed or diverted and wetlands are cleared for agriculture and for other purposes. Deleterious effects also result from over fishing, catching of breeding fish and fry, pollution of rivers and streams and introduction of fast growing, rapidly multiplying exotic species which soon wipe out the indigenous varieties. Thus species that have evolved through millions of years are lost for ever. The indigenous species of the Western Ghats also throw light on the origin and distribution of freshwater fish fauna of India. As has been pointed out by earlier workers the noteworthy features of the fishes of Western Ghats are their close affinity to fishes of the Malay Peninsula and richness of endemic forms. Important among the NBR fishes showing Malayan affinity are *Balitora*, *Bhavana*, *Osteochilus*, *Silurus* & *Pristolepis*. Hence it is all the more imperative that this rich biodiversity is conserved and the harmony of the megadiversity centre is left undisturbed.

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Map 1. Showing drainage pattern of Nilgiri Biosphere Reserve

AMPHIBIA

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INTRODUCTION

The Nilgiri Biosphere Reserve (NBR) with substantial areas of unspoilt vegetation types ranging from scrub, moist deciduous, semievergreen, wet evergreen forests, evergreen sholas, grassy area and swamps constitute an ideal abode for a rich and varied Amphibian fauna.

Available information on the Amphibia of NBR is rather meagre and what is available lies scattered in some earlier publications, mostly of Boulenger (1882, 1890, 1920), Wall (1922), Parker (1934), Daniel (1963 a, b, 1975), Satyamurthi (1967), Taylor (1968) and Daniel and Sekar (1989).

The pioneering studies on Silent Valley which falls under NBR has yielded large and varied amphibian material. A number of papers have been published by Pillai (See references). Five species new to Science have been described by him from the NBR area.

It may, however, be stated that the current programme of surveys and studies on the faunal groups of NBR has further augmented our knowledge on Amphibia. A consolidated report of studies of all the collections, past and present, which truly highlights the richness of Amphibia of NBR is presented below.

In all 55 species of Amphibians falling under two orders, 5 families and 17 genera are listed below in the format designed for the same. 29 species which were collected during the current NBR programme are indicated by asterisks.

SYSTEMATIC ACCOUNT

Class AMPHIBIA
Order ANURA
Family BUFONIDAE
Genus *Ansonia* Stoliczka

1. *Ansonia rubigina* Pillai & Pattabiraman.

Locality : Palghat : Silent Valley, (Type).

Altitude : 1000 m.

Habitat : Rocks by the side of torrential waters, well shaded by tall trees in evergreen forest.

Status : Not common.

External distribution : Known hitherto only from the type locality.

Source : Pillai and Pattabiraman (1981).

Remarks : After its original discovery not reported from anywhere else.

Genus *Bufo* Laurenti

2. *Bufo beddomii* Gunther (Beddome's Toad)

Locality : Nilgiri : Adderly estate; Wynad : Chundale.

Altitude : 310-1500m.

Habitat : Wet evergreen forests.

Status : Not common.

External distribution : Kerala and Maharashtra.

Source : Boulenger (1882). Inger *et. al.* (1984).

3. **Bufo melanostictus* Schneider
(Common Indian Toad)

Locality : Mysore : Nagarhole*; Wynad: Muthanga; Kambamala; Palghat : Agali*; Silent Valley; Nilgiri : Kothagiri, Ooty, Coonoor, Mudumalai*; Coimbatore : Siruvani*.

Altitude : Both in plains and higher altitudes (2000 m.).

Habitat : On land among dry litter.

Status : Very common.

External distribution : Throughout Southern Asia to Sri Lanka, Sumatra, Java, Borneo, Bali, South Western and Southern China (Including Taiwan).

Source : Daniel (1963).

Remarks : Very common species inhabiting areas of a dry type.

4. **Bufo microtypanum* Boulenger
(Southern Hill Toad)

Locality : Palghat : Gulikadvu*, Silent Valley; Nilgiri Hills.

Altitude : 700-1100 m.

Habitat : Moist deciduous and evergreen forests.

Status : Not common.

External distribution : Kerala : Eravikulam National Park, Trichur, Malabar (Type locality); Tamil Nadu : Courtalam, Kalakkad Wildlife Sanctuary, Kodaikanal and Sri Lanka.

Source : Boulenger (1882), Kirtisinghe (1957), Pillai (1986).

Remarks : Being nocturnal, it hides in holes at the base of tree trunks, under stones or other convenient places during day.

5. *Bufo parietalis* Boulenger

Locality : Palghat : New Amarambalam, Silent Valley.

Altitude : 200-1000 m.

Habitat : Semi evergreen to evergreen forests.

Status : Locally common.

External distribution : Kerala : Kakkayam (Calicut), Ponmudi, Sabarigiri, Malabar (Type locality)

Source : Boulenger (1882), Pillai (1986).

Remarks : Endemic to Southern part of Western Ghats.

6. *Bufo silentvalleyensis* Pillai

Locality : Palghat : New Amarambalam, Silent Valley.

Altitude : 800 m.

Habitat : Forest litter, under stone from evergreen forests.

Status : Not common.

External distribution : Nil.

Source : Pillai (1981).

Genus *Pedostibes* Gunther

7. *Pedostibes tuberculosus* Gunther
(Malabar Tree Toad)

Locality : Palghat : Silent Valley.

Altitude : 260-1000 m.

Habitat : Moist deciduous, moistsemi-evergreen and evergreen forests.

Status : Indeterminate.

External distribution : Kerala : Ponmudi, Malabar (Type locality).

Source : Gunther (1875), Inger *et. al.* (1984) and Pillai (1986).

Remarks : Rare tree toad, endemic to Southern part of Western Ghats.

Family MICROHYLIDAE

Genus *Kaloula* Gray

8. **Kaloula pulchra* Gray
(Narrow-mouthed Frogs)

Locality : Sathyamangalam : Minchikuli*.

Altitude : Plains-1140 m.

Habitat : Plains as well as hill forests.

Status : Common.

External distribution : Assam, Karnataka, Orissa, Madhya Pradesh, West Bengal; Southern China to Singapore; Borneo and Celebes.

Source : Parker (1934) and Dutta (1986).

Remarks : Specimens collected. Although known from India South of Ganges, constitutes a new record from Southern part of Western Ghats, Ravichandran (Ph. D. Thesis).

Genus *Microhyla* Tschudi

9. **Microhyla ornata* (Dumeril & Bibron)
(Ornate Microhylid)

Locality : Wynad; Nilgiri : Mudumalai*; Sathyamangalam : Minchikuli*, Bandipur*.

Altitude : Plains to 1140 m.

Habitat : Adapted for life in a variety of biotopes (both dry and areas with heavy rainfall).

Status : Common.

External distribution : All over India; Sri Lanka; Southeast Asia to Malay Peninsula; Southern China (including Taiwan and Haina) and Ryukyu Island (Japan).

Source : Parker (1934).

Remarks : It is one of the commonest species of the family.

10. **Microhyla rubra* Jerdon
(Red Microhylid)

Locality : Nilgiri : Mudumalai*; Palghat; Malabar; Forest near by Coimbatore; Sathyamangalam : Minchikuli*.

Altitude : Plains to 1100 m.

Habitat : Wet open glades with tangled grass.

Status : Common.

External distribution : Assam, Kerala, Tamil Nadu, West Bengal and Sri Lanka.

Source : Parker (1934) and Daniel (1963).

Remarks : It is one of the burrowing frogs.

Genus *Ramanella* Rao & Ramanna

11. *Ramanella montana* (Jerdon).
(Jerdon's *Ramanella*)

Locality : Palghat: Silent Valley.

Altitude : 900-1040m.

Habitat : Semi evergreen and evergreen forests.

Status : Not common. According to Sekar (1987) it is fairly common in Borivli, Bombay during the monsoon.

External distribution : Kerala, Maharashtra and Tamil Nadu : Kalakkad Wildlife Sanctuary (Tirunelveli).

Source : Parker (1934), Pillai (1986), and Sekar (1987).

12. *Ramanella triangularis* (Gunther)
(Triangle-spotted *Ramanella*)

Locality : Nilgiri : Ootacamund.

Altitude : 950-2300 m.

Habitat : Ferguson (1904) collected them from the hills of Travancore under stones and logs. Satyamurti (1967) considers them to be common in the plains under fallen leaves very close to pools of rain water.

Status : Not common.

External distribution : Karnataka, Kerala and Tamil Nadu.

Source : Parker (1934), Satyamurti (1967), and Inger *et. al.* (1984).

Remarks : Endemic to Western Ghats.

Genus *Uperodon* Dumeril & Bibron

13. *Uperodon systoma* (Schneider)
(Marbled Balloon Frog)

Locality : Nilgiri : Kothagiri, Mudumalai; Palghat : Walayar Dam.

Altitude : plains to 1700 m.

Habitat : Found in areas with moist, loose soil.

Status : Common in plains.

External distribution : Karnataka, Kerala, Orissa, Himachal Pradesh, Tamil Nadu, Uttar Pradesh, West Bengal and Sri Lanka.

Source : Parker (1934) and Dutta (1985).

Remarks : It is entirely nocturnal, highly adapted for burrowing mode of life.

Family RANIDAE

Genus *Micrixalus* (Boulenger)

14. *Micrixalus fuscus* (Boulenger)

Locality : Nilgiri : Mudumalai.

Altitude : 200-870 m.

Habitat : Found on rocks in the middle of hill streams, on moist forest floor among dead leaves.

Status : Common in moist evergreen forests.

External distribution : Karnataka, Kerala and Tamil Nadu : Courtallam, Palani hills, Kalakkad Wildlife Sanctuary (Tirunelveli), Maramalai (Kanyakumari) and Srivilliputtur Reserve forest.

Source : Inger *et. al.* (1984) and Ravichandran (Ph. D. Thesis).

Remarks : Inger *et. al.* (1984) synonymised *Micrixalus herrei* with this species. It is endemic to Western Ghats.

15. **Micrixalus nudis* Pillai

Locality : Wynad : Chedleth (Type locality); Palghat : Silent Valley; Coimbatore : Siruvani*, Nilgiri : Hannty Shola Forest*, Kothagiri.

Altitude : 250-1000m.

Habitat : Evergreen forest, in the vicinity of small streams with shallow water.

Status : Common.

External distribution : Kerala : Idukki, Ponmudi; Tamil Nadu : Kalikasam (Kanya Kumari).

Source : Pillai (1978).

Remarks : Inger *et. al.* (1984) reported from Ponmudi after its original description. Endemic to Western Ghats.

16. *Micrixalus opisthorhodus* (Gunther).

Locality : Nilgiri : Coonoor, Kothagiri.

Altitude : 850-1000m.

Habitat : Prefers moist rock surfaces jutting out of fast flowing waters in well shaded forests.

Status : Locally Common.

External distribution : Kerala; Tamil Nadu : Kalakkad Wildlife Sanctuary (Tirunelveli).

Source : Boulenger (1890) and Wall (1922).

Remarks : Endemic to Southern part of Western Ghats, its type locality stated as Nilgherries (Nilgiri hills).

17. *Micrixalus saxicolus* (Jerdon)

Locality : Wynad; Palghat : New Amarambalam, Silent Valley.

Altitude : 850-1200 m.

Habitat : Evergreen forests, found among stones and boulders of hill streams, often clinging to rocks, particularly in fast flowing waters.

Status : Not common.

External distribution : Kerala.

Source : Boulenger (1882) and Pillai (1986).

Remarks : Collected after a gap of about 100 years, Pillai (1986) reported it from Silent Valley.

18. *Micrixalus silvaticus* (Boulenger)

Locality : Nilgiri : Naduvattam; Palghat: Silent Valley.

Altitude : 1500 m.

Habitat : It inhabits rivulets in evergreen and moist deciduous forests.

Status : Not Common.

External distribution : Kerala and Tamil Nadu.

Source : Satyamurti (1967).

Remarks : Endemic to Southern Western Ghats.

19. *Micrixalus thampii* Pillai

Locality : Palghat : Silent Valley.

Altitude : 900m.

Habitat : Evergreen forests.

Status : Not Common.

External distribution : Nil.

Source : Pillai (1981).

Remarks : Known only from the type locality viz., Silent Valley.

20. **Micrixalus gadgili* Pillai and Pattabiraman.

Locality : Coimbatore : Siruvani*.

Altitude : 440-1000 m.

Habitat : On forest floors in moist deciduous and evergreen forests.

Status : Not common.

External distribution : Kerala : Sabarigiri (Type locality), Periyar Wildlife Sanctuary.

Source : Pillai & Pattabiraman (1991).

Remarks : After its original description it was reported by Ravichandran and Pillai (1991).

Genus *Nannobatrachus* Boulenger

21. **Nannobatrachus beddomii* Boulenger.

Locality : Palghat : Silent Valley; Coimbatore: Siruvani*.

Altitude : 260-900 m.

Habitat : Evergreen, moist deciduous and semi-evergreen forests, prefers moist litter.

Status : Not common.

External distribution : Kerala : Parambikulam, Periyar Wildlife Sanctuary, Ponmudi, Sabarigiri; Tamil Nadu : Keeriparai (Kanyakumari) and Valparai (Coimbatore).

Source : Inger *et. al.* (1984) and Pillai (1986).

Remarks : Endemic to Southern part of Western Ghats. Inger *et. al.* (1984) consider *N. anamallaiensis* as a junior synonym of *N. beddomii*.

Genus *Nyctibatrachus* Boulenger

22. **Nyctibatrachus aliciae* Inger, Shaffer, Koshy & Bakde.

Locality : Coimbatore : Siruvani*.

Altitude : 840-1100 m.

Habitat : Among boulders and under stones in moist deciduous and evergreen forests, always in association with water.

Status : Not common.

External distribution : Kerala : Ponmudi (Type locality); Tamil Nadu : Kalakkad Wildlife Sanctuary (Tirunelveli), Mylarodai (Kanyakumari).

Source : Inger *et. al.* (1984).

Remarks : After its original description, reported from Mylarodai (Kanyakumari), Siruvani (Coimbatore) by Ravichandran (Ph. D. Thesis).

23. **Nyctibatrachus major* Boulenger.

Locality : Wynad; Palghat: Silent Valley; Coimbatore : Siruvani*, Nilgiri: Longwood shola*, Kothagiri.

Altitude : 100-900 m.

Habitat : Shallow stagnant and slushy water with lot of decomposing organic matter in well shaded forest areas.

Status : Common.

External distribution : Kerala, Tamil Nadu : Kalakkad Wildlife Sanctuary, Srivilliputtur Reserve forest, Mylarodai (Kanya Kumari), Palani hills.

Source : Boulenger (1882), Pillai (1978).

Remarks : Endemic to Western Ghats.

Genus *Rana* Linnaeus

24. **Rana beddomii* (Gunther) (Beddome's Frog)

Locality : Palghat : Silent Valley, New Amarambalam; Wynad*; Coimbatore : Siruvani*.

Altitude : 700 m and above.

Habitat : Evergreen and moist evergreen forests. They avoid open glades preferring the undergrowth in canopied forests, not essentially in close proximity to streams.

Status : Common.

External distribution : Western Ghats areas of Kerala, Tamil Nadu, Karnataka and Maharashtra.

Source : Boulenger (1920), Inger *et. al.* (1984).

Remarks : Common in Western Ghats. Ferguson (1904) reported it from plains.

25. *Rana brevipalmata* Peters

Locality : Wynad.

Altitude : 600-700 m.

Habitat : Sholas and moist deciduous forests, mostly in stagnant waters, temporary pools and in slow moving water.

Status : Not common.

External distribution : Kerala; Tamil Nadu.

Source : Boulenger (1920), Pillai (1980).

Remarks : Endemic to Southern part of Western Ghats.

26. **Rana curtipes* Jerdon
(Bicoloured Frog)

Locality : Wynad; Begur; Nilgiri : Mudumalai*, Mysore : Nagarhole*.

Altitude : 1000-1500m.

Habitat : On the floor in evergreen and semi-evergreen forests.

Status : Common.

External distribution : Kerala, Karnataka, Tamil Nadu.

Source : Boulenger (1920), Daniel and Sekar (1989).

Remarks : Endemic to Western Ghats.

27. **Rana cyanophlyctis* Schneider
(Skipper Frog)

Locality : Mysore : Nagarhole*; Bandipur*; Palghat : New Amarambalam, Silent Valley; Wynad : Muthanga; Nilgiri : Coonor, Kothagiri*, Mudumalai*, Ooty; Coimbatore : Mettupalayam*, Siruvani*, Sathyamangalam : Minchikuli*

Altitude : Plains to 1600 m.

Habitat : Plains to higher altitudes.

Status : Very common.

External distribution : All over India, Sri Lanka, Malaya, Afghanistan, Pakistan and Southern Iran.

Source : Boulenger (1920), Daniel (1975).

Remarks : Annandale (in Boulenger, 1920) has noticed that specimens living in higher elevations are smaller than those living in plains. Tolerates brackish as well as water polluted by toxic effluents.

28. **Rana hexadactyla* Lesson
(Indian Pond Frog)

Locality : Mysore: Nagarhole*.

Altitude : 1500 m.

Habitat : It is one of the most aquatic Indian amphibia, and always hides amidst water plants where its green colour merges admirably.

Status : Very common in plains.

External distribution : Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra, Orissa, Rajasthan, Tamil Nadu, West Bengal; Sri Lanka and Nepal.

Source : Boulenger (1920), Daniel (1975).

Remarks : *R. hexadactyla* has so far not been reported from higher elevations. Its record from Nagarhole under Nilgiri Biosphere Reserve is interesting. This species was being commercially exploited alongwith *R. tigerina* for frog legs.

29. **Rana keralensis* Dubois

Locality : Palghat : New Amarambalam, Malappuram*, Silent Valley; Nilgiri : Coonor, Mudumalai*; Sathyamangalam : Minchikuli*.

Altitude : Up to 2000 m.

Habitat : Evergreen forest of moderate to higher altitudes. Found in stagnant water close to streams, muddy slow-moving waters, on forest floors away from water and on banks of hill-streams.

Status : Common.

External distribution : Kerala, Maharashtra, Tamil Nadu and Andamans.

Source : Boulenger (1920), Inger *et. al.* (1984), Pillai (1991).

30. **Rana leptodactyla* Boulenger

Locality : Palghat : Silent Valley.*

Altitude : 900m.

Habitat : Essentially a forest species, found in slow moving hill streams and near by moist areas.

Status : Not common.

External distribution : Karnataka, Kerala and Tamil Nadu.

Source : Boulenger (1920), Satyamurthi (1967), Daniel and Sekar (1989).

31. **Rana limnocharis* Boie
(Indian Cricket Frog)

Locality : Mysore: Nagarhole*, Bandipur*; Wynad; Palghat : New Amarambalam, Silent Valley; Nilgiri : Avalanche*, Coonoor, Ooty, Mudumalai*; Coimbatore : Mettupalayam, Siruvani*; Sathyamangalam : Minchikuli*.

Altitude : Plains to 1600 m.

Habitat : It is the commonest species of frog found in plains as well as in higher altitudes, living mostly in the vicinity of tanks and streams.

Status : Very common.

External distribution : All over India, China (Taiwan, Sichuan, and South of Chuanche =Yangtze), River and North to Shandong to Nepal, Pakistan, Sri Lanka, Southern Japan, Philippines, Greater Sunda Is., and the Lesser sundas as far east as Flores.

Source : Boulenger (1920) and Daniel (1975).

Remarks : With a very wide range of distribution and inhabiting many habitats in plains as well as hills, *R. limnocharis* exhibits considerable intraspecific variations particularly in respect of its colour pattern.

32. *Rana malabarica* Tschudi
(Fungoid Frog)

Locality : Wynad : Begur; Palghat : Silent Valley; Nilgiris.

Altitude : 900-1900 m.

Habitat : Semi-evergreen and evergreen forests of forest floor.

External distribution : Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu : Kalakkad Wildlife Sanctuary (Tirunelveli).

Source : Boulenger (1920), Daniel (1975).

Remarks : It is essentially a forest species. McCann (1932) states that they are semi-arboreal.

Status : Common.

33. **Rana murthii* Pillai

Locality : Nilgiri : Naduvattom (Gudallur), Kothagiri*

Altitude : 900-1200 m.

Habitat : Evergreen forests.

Status : Not common.

External distribution : Nil.

Source : Pillai (1979).

Remarks : After its original description it was reported by Ravichandran (Ph.D. Thesis). Type locality is Nilgiris.

34. *Rana nilagirica* Jerdon

Locality : Nilgiris.

Altitude : Not Known.

Habitat : On the edges of small springs, ditches and marshy grounds on the hill-side.

Status : Not known,

External distribution : Kerala, Tamil Nadu.

Source : Boulenger (1920) and Inger and Dutta (1986).

Remarks : Though *R. nilagirica* is recognised as a subspecies of *R. limnocharis* by Boulenger (1920), it has not been possible to segregate them.

35. **Rana semipalmata* Boulenger.

Locality : Coimbatore : Siruvani*.

Altitude : 100-900 m.

Habitat : Evergreen forests. Found in moist, decaying litter near hill streams.

Status : Not common.

External distribution : Kerala and Tamil Nadu.

Source : Boulenger (1920), Inger *et. al.* (1984).

Remarks : Fisher (1915) has noticed their arboreal habit at Anaimalai Hills.

36. **Rana temporalis* (Gunther)
(Bronzed Frog)

Locality : Bandipur; Wynad*, Palghat: New Amarambalam, Silent Valley; Nilgiri : Coonoor, Kothagiri*; Coimbatore : Siruvani*; Sathya mangalam : Minchikuli*.

Altitude : 100-1100 m.

Habitat : It is essentially a forest frog and found near hill streams on wet exposed rocks shaded by trees.

Status : Common.

External distribution : Karnataka, Kerala, Maharashtra, Tamil Nadu and Sri Lanka.

Source : Boulenger (1920), Daniel and Sekar (1989) and Kirtisinghe (1957).

37. **Rana tigerina* Daudin
(Indian Bull Frog)

Locality : Wynad : Chedleth, Muthanga; Palghat : New Amarambalam; Nilgiri : Mudumalai*.

Altitude : Plains to 2000 m.

Habitat : Always found in the immediate vicinity of water, on the edges of ponds and lakes, in permanent and temporary pools.

Status : Common.

External distribution : All over India, Sri Lanka, Malaya, Southern China (North to Hubei and including Taiwan; introduced to Madagascar).

Source : Boulenger (1920), Daniel (1975).

Remarks : *R. tigerina* acts as an important agent for biological control of agricultural pests since it feeds on insects and insect larvae. Their removal on a large scale for frog leg industry was felt as a matter of concern which prompted inclusion of all species of *Rana* under the Wildlife (protection) act 1972. A ban has also been imposed on collection and killing of *R. tigerina* and *R. hexadactyla* which were the two main species supporting frog leg export.

Genus *Tomopterna* Dumeril and Bibron.

38. **Tomopterna breviceps* (Schneider)

Locality : Wynad : Nilambur valley; Palghat : Walayar Dam; Nilgiri : Mudumalai*; Sathya mangalam : Minchikuli*.

Altitude : Plains to 1200 m.

Habitat : It is an excellent burrower, found both in hills and plains.

Status : Common.

External distribution : Bihar, Himachal Pradesh, Kerala, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal; Nepal; Burma and Sri Lanka.

Source : Boulenger (1920), Daniel (1975), Pillai (1976) and Dutta (1985).

Remarks : Variation in the colour pattern has been noticed between populations.

39. **Tomopterna rufescens* (Jerdon)
(Rufescent Burrowing Frog)

Locality : Sathyamangalam : Minchikuli*.

Altitude : 500-1100 m.

Habitat : Very little is known about it. Found burrowing into loose soil or under litter.

Status : Not common.

External distribution : Kerala and Maharashtra.

Source : Boulenger (1920) and Daniel (1975).

Remarks : It is an uncommon frog, 13 Juveniles collected from Minchikuli, Sathyamangalam constitute its first record from Tamil Nadu. Ravichandran (Ph.D. Thesis).

Family RHACOPHORIDAE

Genus *Philautus* Gistel

40. *Philautus chalazodes* (Gunther)

Locality : Nilgiri Hills.

Altitude : 1400 m.

Habitat : Found mostly in evergreen forests, away from water, under logs, stones and in moist litter.

Status : Not common.

External distribution : Kerala.

Source : Boulenger (1890).

Remarks : No record of this species is available in literature in the last 78 years. The last collection was two examples available with BNHS from Nilgiri Hills.

41. **Philautus charius* Rao

Locality : Coimbatore : Siruvani*; Nilgiri : Avalanche.

Altitude : 290 to 650 m.

Habitat : Reported from both evergreen and deciduous forests. Found in moist forest floor under leaf litter and logs.

Status : Not common.

External distribution : Kerala : Ponmudi, Achankovil, Quilon; Tamil Nadu : Kodaikanal and Kottigehar, Kadur, Karnataka (Type locality).

Source : Rao (1937) and Inger *et. al.* (1984).

Remarks : After its original description by Rao (1937) it was reported by Inger *et. al.* (1984) at Ponmudi, and recently collected from Siruvani (Coimbatore), Avalanche (Nilgiri), Kodaikanal by Ravichandran (Ph. D. Thesis).

42. **Philautus femoralis* (Gunther)

Locality : Nilgiri : Ooty, Honnatty Shola Forest*, Kothagiri.

Altitude : 840-1300 m.

Habitat : Evergreen forests. Hides under leaf litter, stones etc.

Status : Not common.

External distribution : Kerala; Tamil Nadu : Anaimalai Wildlife Sanctuary, Valparai, Kodaikanal and Sri Lanka.

Source : Boulenger (1920), Inger *et. al.* (1984) and Kirtisinghe (1957).

43. *Philautus glandulosus* (Jerdon)

Locality : Nilgiris.

Altitude : 1100-1500 m.

Habitat : Both evergreen and semi-evergreen forests close to stagnant water in ground litter. Recorded from tea and coffee estates also.

Status : Not common.

External distribution : Kerala, Maharashtra and Tamil Nadu : Anaimalai Hills.

Source : Boulenger (1882) and Wall (1922).

44. **Philautus leucorhinus* (Lichtenstein & Martens)

Locality : Palghat : New Amarambalam; Wynad: Rampur Reserve Forest; Coimbatore : Siruvani*; Nilgiri : Long Wood Shola Forest, Kothagiri*.

Altitude : 500-1300 m.

Habitat : Inhabits open grassy plains or secondary forests.

Status : Not common.

External distribution : Goa, Karnataka (north Kanara), Kerala, Tamil Nadu : Kodaikanal and Sri Lanka.

Source : Boulenger (1890), Kirtisinghe (1957).

Remarks : According to Annandale (1913) it is fairly common at the base of the Western Ghats in Travancore. Reported to live away from water in litter and under stones.

45. **Philautus nasutus* (Gunther).

Locality : Nilgiri : Avalanche; Coimbatore : Siruvani*.

Altitude : 800-1500 m.

Habitat : Evergreen forests, under decaying logs, away from water.

Status : Not common.

External distribution : Kerala, Tamil Nadu : Kalakkad Wildlife Sanctuary and Sri Lanka.

Source : Boulenger (1890), Kirtisinghe (1957), Ravichandran and Pillai (1991).

Remarks : Annandale (1990) reported this species as very common in Tenmalai (Kerala).

46. *Philautus pulcherrimus* (Ahl)

Locality : Wynad; Palghat : Silent Valley.

Altitude : 1800-2300 m.

Habitat : Evergreen forests mostly in moist litter, under stones and bark of fallen trees.

Status : Not common.

External distribution : Kerala; Tamil Nadu : Anaimalai Forest, Kalakkad Wildlife Sanctuary and Valparai (Coimbatore).

Source : Boulenger (1882), Pillai (1986).

Remarks : After its original discovery it was reported by Pillai (1986) from Silent Valley. Endemic to Southern part of Western Ghats.

47. *Philautus signatus* (Boulenger)

Locality : Nilgiri : Avalanche, Coonoor, Ooty; Palghat: Silent Valley.

Altitude : 900-2300 m.

Habitat : Mostly found near hill streams though some were collected far away from water, in tea plantations, under stones, logs and debris.

Status : Not common.

External distribution : Kerala; Tamil Nadu.

Source : Boulenger (1882), Wall (1922), Inger *et al.* (1984) and Pillai (1986).

Remarks : Endemic to Southern part of Western Ghats.

48. **Philautus variabilis* (Gunther).

Locality : Nilgiri : Coonoor, Kothagiri*, Ooty; Wynad : Begur; Palghat : Silent Valley.

Altitude : 850-2900 m.

Habitat : Forest floor under leaf litter, dead wood and among bushes.

Status : Not common.

External distribution : Andhra Pradesh, Kerala, Tamil Nadu and Sri Lanka.

Source : Gunther (1958), Inger *et al* (1984) and Kirtisinghe (1957).

Remarks : Wall (1922) has given good account and recorded its call at Nilgiris. This is the only *Philautus* species recorded from Andhra Pradesh.

Genus *Polypedates* Tschudi

49. **Polypedates maculatus* (Gray) (Common Tree frog)

Locality : Mysore : Nagarhole*; Wynad : Nilambur Valley; Palghat : New Amarambalam, Dohney*, Chappd*, Silent Valley; Nilgiri : Ooty.

Altitude : Plains to 2500 m.

Status : Common.

External distribution : All over India except Haryana, Punjab, Rajasthan and Sri Lanka.

Source : Boulenger (1890) and Daniel and Sekar (1989).

Remarks : It is one of the commonest species widely distributed in India both in plains as well as in higher altitudes.

50. *Polypedates pleurostictus* (Gunther)

Locality : Coimbatore : Bhavani River Bank, Mettupalayam; Nilgiri : Coonoor, Kothagiri, Nadukani,

Altitude : Up to 2000 m.

Habitat : Arboreal species, mostly found in evergreen and deciduous forests.

Status : Not common.

External distribution : Kerala and Tamil Nadu.

Source : Boulenger (1890), Satyamurti (1967), Daniel and Sekar (1989).

Remarks : Though Bulenger (1882) placed

pleurostictus under *Rhacophorus* Ravichandran (1997) on the basis of recent studies transferred it to the genus under which it was originally described by Gunther (1864). The species was not collected from the reserve during recent surveys, though Satyamurti (1967) reported of its common occurrence here.

Genus *Rhacophorus* Kuhl and van Hasselt

51. *Rhacophorus malabaricus* Jerdon
(Malabar Gliding Frog)

Locality : Palghat : Silent Valley; Nilgiri : Kilkothagiri.

Altitude : 350-2400 m.

Habitat : Highly adapted for an arboreal mode of life. It is restricted to the evergreen and moist deciduous forests of Western Ghats.

Status : Not very common.

External distribution : Karnataka, Kerala, Goa and Tamil Nadu,

Source : Ayyanger (1915), Satyamurti (1967), Inger *et. al.* (1984), Pillai (1986), Abdulali and Sekar (1988).

Remarks : Reported from lower elevations also. Ferguson (1904) states that it is a common frog in the low country.

Order GYMNOPIHIONA

Family ICHTHYOPHIDAE

Genus *Ichthyophis* Fitzinger

52. *Ichthyophis beddomei* Peters

Locality : Nilgiri Hills.

Altitude : Plains to 1500 m.

Habitat : In moist soil rich in organic contents.

Status : Not common.

External distribution : Southern India.

Source : Taylor (1968).

Remarks : Type locality is Nilgiri hills.

53. *Ichthyophis longicephalus* Pillai

Locality : Palghat : Silent Valley.

Altitude : 1050-1500 m.

Habitat : Evergreen forests.

Status : Not common.

External distribution : Tamil Nadu: Kalakkad Wildlife Sanctuary (Tirunelveli).

Source : Pillai (1986).

Remarks : After its erection a single example was collected from Kalakkad Wildlife Sanctuary. Ravichandran (Ph. D. Thesis).

54. *Ichthyophis tricolor* Annandale

Locality : Nilgiris.

Altitude : Plains to about 1500 m.

Habitat : Mostly found in forest, under decaying litter.

Status : Not common.

External distribution : Kerala, Tamil Nadu : Peermed, Varagaliyar (Anamalai Wildlife Sanctuary).

Source : Taylor (1968) and Ravichandran (Ph. D. Thesis).

Remarks : Seen only during rainy season.

Genus *Uraeotyphlus* Peters

55. *Uraeotyphlus malabaricus* (Beddome)

Locality : Nilgiri : Ootacamund.

Altitude : About 1600 m.

Habitat : Subterranean.

Status : Not common.

External distribution : Tamil Nadu : Kalakkad Wildlife Sanctuary. (Tirunelveli).

Source : Taylor (1968) and Ravichandran (Ph. D. thesis).

GENERAL OBSERVATIONS

A perusal of the faunal inventory of Nilgiri Biosphere reveals the following.

- (1) The fauna is rich and diverse. 55 species in 17 genera, 5 families and two orders have been identified.

- (2) While 21 species are commonly found others are not so.
- (3) One species viz., *Pedostibes tuberculosus* which is threatened has been collected.
- (4) A number of species which have become rare (known by one or two examples) and not collected in the last 75 years have now been collected and reported from NBR, these are :
- (i) *Bufo microtypanum* Boulenger
(ii) *Bufo parietalis* Boulenger
(iii) *Pedostibes tuberculosus* Gunther
(iv) *Kaloula pulchra* Gray (New record to NBR)
(v) *Ramanella triangularis* (Gunther)
(vi) *Micrixalus saxicolus* (Jerdon)
(vii) *Nannobatrachus beddomii* Boulenger
(viii) *Rana brevipalmata* Peters
(ix) *Rana hexadactyla* Lesson (Even though it is common in plains, so far not reported from NBR)
- (x) *Rana semipalmata* Boulenger (Reported first time in the NBR area)
- (xi) *Tomopterna rufescens* (Jerdon) (New record for NBR area)
- (xii) *Philautus chalazodes* (Gunther)
- (xiii) *Philautus femoralis* (Gunther)
- (xiv) *Philautus leucorhinus* (Lichtenstein & Martens)
- (xv) *Philautus nasutus* (Gunther) (New Record for NBR)
- (xvi) *Philautus pulcherrimus* (Ahl)
- (xvii) *Philautus variabilis* (Gunther)
- (5) Five new species have been described from Nilgiri Biosphere Reserve.
- These are *Ansonia rubigina* Pillai and Pattabiraman; *Bufo silentvalleyensis* Pillai; *Micrixalus thampii* Pillai; *Rana murthii* Pillai and *Ichthyophis longicephalus* Pillai. Most of these have not been collected from any where outside the biosphere which only highlights the importance of NBR and justifies its establishment.

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REPTILIA

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INTRODUCTION

Reptiles are a major conspicuous component of the fauna of the Nilgiri Biosphere. The pioneering work on the reptiles of the Nilgiris which constitute the major hill ranges of the Western Ghats, was published by Col. Frank Wall (1919). Although Malcolm Smith's (1931, 1935, 1943) volumes in the *Fauna of British India* series continue to be the major source of reference, our knowledge of the rich and diversified reptile fauna of the Nilgiris has been enhanced by the recent publications by Murthy (1981-1992a). The paper under discussion is based upon 21 species of reptiles collected during the current surveys, but it is probable that the Nilgiri Biosphere might harbour many more species of reptiles. A definitive inventory of the reptile fauna of the Biosphere should, therefore, await further exploration based on a larger series of specimens.

While some of the reptiles like the Dwarf Forest Gecko (*Cnemaspis indica*) and the rough-tailed snake (*Plectrurus perroteti*) are the commonest species found throughout the Biosphere, some other reptiles mainly the lizards of the *Calotes* complex i.e. *Calotes nemericola* and *Calotes grandisquamis* are represented by few specimens. It is surprising that in all the phases of the faunistic exploration no single specimen of the 'Flying' Lizard (*Draco dussumieri*) was sighted. Similarly the 'Flying' Snake (*Chrysopelea ornata*) was not observed. The Nilgiris are supposed to be the abode of the world's largest venomous snake - the King Cobra (*Ophiophagus hannah*) but there were no reports of its being sighted by the locals or tribals of the Biosphere. The occurrence of the Wolf Snake (*Lycodon flavomaculatus*) is, however, an interesting record.

Although the reptiles as a group are much feared among the world of animals, the locals and tribals do not seem to dread every reptile they encounter. It is a well known fact that the meat of the giant snakes like the Indian Python and the Rat snake are much relished by the inhabitants of the hilly tracts. Likewise the common monitor lizard is much sought after for its delicious flesh and valuable skin as well. The land tortoise and the freshwater turtles also constitute a major item of food.

REPTILES OF THE NBR

A. Turtles and Tortoises

Class	REPTILIA
Order	TESTUDINES
Family	EMYDIDAE

1. *Melanochelys trijuga trijuga* (Schweigger)

B. Lizards

Order	SQUAMATA
Sub order	SAURIA
Family	GEKKONIDAE

2. *Cyrtodactylus collegalensis* (Beddome)
3. *Cnemaspis indica* (Gray)
4. *C. sisparensis* (Theobald)
5. *Hemidactylus triedrus* (Daudin)

Family	AGAMIDAE
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6. *Calotes versicolor* (Daudin)

7. *Calotes nimericola* Jerdon

8. *Psammophilus dorsalis* (Gray)

Family CHAMAELEONIDAE

9. *Chamaeleo zeylanicus* Laurenti

Family SCINCIDAE

10. *Mabuya carinata* (Schneider)

11. *Riopa punctata* (Gmelin)

C. Snakes

Sub order SERPENTES

Family UROPELTIDAE

12. *Plectrurus perroteti* Dum. & Bib.

13. *Uropeltis rubrolineatus* (Gunther)

Family BOIDAE

14. *Eryx conicus* (Schneider)

Family COLUBRIDAE

15. *Dendrelaphis tristis* (Daudin)

16. *Lycodon flavomaculatus* Wall

17. *Xenochrophis piscator* (Schneider)

18. *Amphiesma stolata* (Linn.)

19. *Amphiesma beddomei* (Gunther)

20. *Macropisthodon plumbicolor* (Cantor)

Family ELAPIDAE

21. *Bungarus caeruleus* (Schneider)

SYSTEMATIC ACCOUNT

Turtles

1. *Melanochelys trijuga trijuga* (Schweigger)
(Madras pond Tortoise)

Locality : Mudumalai.

Altitude : 1100 M.

Habitat : Generally slowflowing and stagnant waters.

Status : Common; the most widespread of the emydid turtles of the Peninsular India.

Distribution : Andhra Pradesh, Goa, Maharashtra, Karnataka, Kerala, and Tamil Nadu.

Lizards

2. *Cyrtodactylus collegalensis* (Beddome)
(Collegial Rock-gecko)

Locality : Mudumalai.

Altitude : 1180 M.

Habitat : Mainly a forest species where it is found under stone or on bark of dead trees.

Status : Rare.

Distribution : Hills of Southern India and Sri Lanka.

3. *Cnemaspis indica* (Gray)
(Nilgiri Dwarfed Gecko)

Locality : Emerald; Ithalar; Lakkidi.

Altitude : 2100 M.

Habitat : Crevices of rocks or under stones in hill forests.

Status : Commonest dwarfed gecko of the Nilgiris.

Distribution : Nilgiris and Coorg.

4. *Cnemaspis sisparensis* (Theobald)

Locality : Naduvattam, Off Gudalur.

Altitude : 2100 M.

Habitat : Same as given for the above.

Status : Rare.

Distribution : Sispara Ghat (Nilgiris); Kavalai, Silent Valley and New Amarambalam Reserve Forest, Kerala.

5. *Hemidactylus triedrus* (Daudin)
(Blotched Gecko)

Locality : Naduvattam, Off Gudalur.

Altitude : 2100 M.

Habitat : Rodent holes or termite hills in semi-arid tracks.

Status : Common but secretive.

Distribution : India, Pakistan and Sri Lanka.

6. *Calotes versicolor* (Daudin)
(Indian Garden Lizard)

Locality : Mudumalai.

Altitude : 1130 M.

Habitat : Bushes and trees.

Status : Very common.

Distribution : From Sumatra (Indonesia) to South China and West through most of the Indian subcontinent and Sri Lanka.

7. *Calotes nemericola* Jerdon

Locality : Mudumalai and Kinnakarni.

Altitude : 1650 M.

Habitat : Forested regions.

Status : Not uncommon in the Nilgiri but appears to be scarce in other hill ranges of the Western Ghats.

Distribution : Restricted to the Western Ghats, India.

8. *Psammophilus dorsalis* (Gray)
(Peninsular Rock Lizard)

Locality : Mudumalai.

Altitude : 1050 M.

Habitat : On rocks in hills and forsaken buildings at elevated places.

Status : A common hill lizard.

Distribution : From Bihar in the east through the eastern Ghats to Kanyakumari, South India.

9. *Chameleo zeylanicus* Laurenti
(Indian Chameleon)

Locality : Kodungari River side.

Altitude : 1700 M.

Habitat : Trees.

Status : Common in the wooded regions.

Distribution : Kutch (Gujarat) through South Gangetic plains to Peninsular India.

10. *Mabuya carinata* (Schneider)
(Common Skink)

Locality : Siruvani.

Altitude : 750 M.

Habitat : Found among the decaying vegetation/litter/decaying logs/under stones.

Status : Common.

Distribution : The whole of India except the extreme northwest.

11. *Riopa punctata* (Gmelin)
(Dotted Garden Skink)

Locality : Boali gutta.

Altitude : 1130 M.

Habitat : Found in damp, shaded and grassy areas.

Status : Common but secretive.

Distribution : India and Sri Lanka.

Snakes

12. *Plecturus perroteti* Dum. & Bibr.
(Rough tailed snake)

Locality : Emerald, Kinnakarai and Ithalar.

Altitude : 2100 M.

Habitat : Underneath muddy or softsoil/under dead wood or rotting vegetation; a burrowing form.

Status : Commonest uropelt of the Nilgiris.

Distribution : Restricted to the Western Ghats, mainly found in Nilgiris and Anaimalais.

13. *Uropeltis rubrolineatus* (Gunther)
(Red Striped Uropelt)

Locality : Kallaru.

Altitude : 460 M.

Habitat : Same as that of *P. perroteti*.

Status : Uncommon in the Nilgiris.

Distribution : Anaimalais and hills of South Kerala; Pune (Maharashtra).

14. *Eryx conicus* (Schneider)
(Common Sand Boa)

Locality : Kunjapanai.

Altitude : 850 M.

Habitat : Sandy soil and rat holes.

Status : Rare in the hills but common in the plains.

Distribution : Throughout India barring most of West Bengal and Assam; Pakistan; Sri Lanka.

15. *Dendrelaphis tristis* (Daudin)
(Common Bronze-back Tree Snake)

Locality : Iruttupallam forest.

Altitude : 750 M.

Habitat : Trees.

Status : Common.

Distribution : From Sri Lanka through Peninsular India to Pakistan. Abundant in the foothills of Himalaya.

16. *Lycodon flavomaculatus* Wall
(Yellow-spotted Wolf Snake)

Locality : Mangarai.

Altitude : 560 M.

Habitat : Under stones, in crevices of masonry or thatched roofs of houses.

Status : Rare. First record from the Nilgiris.

Distribution : Recorded so far from a few pockets in Maharashtra and Karnataka.

17. *Xenochrophis piscator* (Schneider)
(Chekered Keelback)

Locality : Mudumalai.

Altitude : 1050 M.

Habitat : Aquatic snake, frequenting paddy fields, ditches, stagnant pools and rivers.

Distribution : Throughout the Indian subcontinent; Malaysia; South China; Taiwan.

18. *Amphiesma stolata* (Linn.)
(Buff-striped Keelback)

Locality : Mudumalai.

Altitude : 1180 M.

Habitat : Holes in the ground or crevices of rocks.

Status : Common.

Distribution : Throughout India, Pakistan and Sri Lanka. Also reported from South China and Indo-China.

19. *Amphiesma beddomei* (Gunther)
(Forest Keelback)

Locality : Kunjaparai.

Altitude : 850 M.

Habitat : Forested areas along the streams and rivers in the forests at higher elevations.

Status : A forest snake, rare in the plains.

Distribution : Restricted to Western Ghats, being found from Maharashtra to Kerala.

20. *Macropisthodon plumbicolor* (Cantor)
(Green Keelback)

Locality : Mudumalai.

Altitude : 1100 M.

Habitat : Grassy Vegetation in the low hills.

Status : Not uncommon in the hills but rare in the plains.

Distribution : Throughout India excepting the Ganges valley and the extreme northwest; Sri Lanka.

21. *Bungarus caeruleus* (Schneider)
(Common Krait)

Locality : Mudumalai.

Altitude : 1130 M.

Habitat : Secluded spots such as under stones, heaps of rubbish or termite mounds.

Status : Primarily a snake of the plains but infrequently met within the hills.

Distribution : The Indian subcontinent and Sri Lanka.

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AVES

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INTRODUCTION

The NBR offers a wide variety of ecological habitats and biotopes with altitudinal variations. Hence it is home for a wide variety of avian fauna. The birds occurring here represented by mostly Oriental and Palearctic elements include some rare, endangered and species endemic to this area.

The birds of South India, Nilgiris and associated hills have been studied from 115 years ago by various naturalists, Davison (1883), Cardew (1895), Dewar (1904), Primrose (1904), Baker and Inglis (1930), Betham (1931, 1938), Nichols (1937), Ali (1942-43) and Betts (1951, 1952). Thereafter, Jackson (1962) and Ali (1969) made some significant contributions to the bird fauna of South India and Kerala respectively. Recently, Khan (1980-a) has accounted 118 bird species particularly from Sholas and neighbouring tea, *Eucalyptus* and *Acacia* plantations in the Nilgiris. Besides Khan (1978, 1980-b) studied the wintering habits of Blue Chat and ecology of Black-and-Orange Flycatcher from Nilgiris. Suganthan (1981) has studied an endangered species - Ceylon Frogmouth-from Western Ghats. Recently, Kumar (1992) and Unnikrishan (1993) have listed 75 and 41 species of birds respectively from Nilgiris.

The present studies deal with information based on recent and earlier surveys. The data on the status, distribution and habitats of all the recorded birds of NBR have been compiled from Ali and Ripely (1983) and to a certain extent from Khan (1980 a). The identification of birds in the field was based on Ali and Ripely (1983 a, b).

GENERAL OBSERVATIONS

In India 1200 species belonging to 77 families (and 257 subfamilies) of 20 orders have been recorded by Ali and Ripely (1983a). Of these 17 orders, 48 families (and 18 subfamilies) comprising 313 species of birds partly based on earlier records are reported here. Their status, altitudinal distribution and habitats are given in Table 1. The relative percentage of the status was then derived and plotted in Fig. 1.

Table 1 indicates that families like Accipitridae, Falconidae, Columbidae, Cuculidae, Strigidae, Bucerotidae, Motacillidae, Nectariniidae, etc. are better represented in NBR. However, the distribution of different bird species in families and subfamilies such as Ciconiidae, Anatidae, Phasiandiae, Charadriidae, Timalinae, Turdinae, Paridae, Fringillidae and Emberizidae was noticed to be uneven and poor as compared with that of the number of bird species recorded from other areas of the Indian subcontinent.

Further, from Table 1 and Fig. 1. it can be pointed out that out of the total bird species recorded from NBR, 50% are residents; 30.8% are residents with local and or seasonal movements, mainly governed by SW monsoon, water conditions, withdrawal from heavy rainfall areas and fruiting season and the remaining 19.2% are found to be winter visiting birds from the Himalayan ranges, Central Asia and Europe on their seasonal and annual migration, spending their winter quarters in the valleys and hill tracts of Nilgiris.

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The resident birds such as Crested Hawk-Eagle, Longbilled and Whitebacked Vultures, Bush Quail, Jungle Fowl, Green Pigeon, Nilgiri Wood Pigeon, Little Brown Dove, Bluewinged Parakeet, Cuckoos, Spotted Owlet, Scops Owl, Southern Roller, Blue-tailed Bee-eater, Goldenbacked and Maharatta Woodpeckers, Whiteheaded and Jungle Mynas, Wood Shrike, Chloropsis, Rufous Babblers, most of the Bulbul species, Flowerpeckers, Ioras and Sunbirds were observed most commonly throughout the areas of NBR. An Indo-Malayan form like Jerdon's Maroonbacked Imperial Pigeon is also a commonly occurring species in the area. However, the occurrence of resident species like Peafowl, Malabar Trogon, Blue-eared kingfisher, Pied Hornbill, Nilgiri Sky lark, Blackheaded Oriole, Whitebellied Minivet, Malabar Shama and Rufous Rock Pipit was rare and their distribution was also discontinuous & patchy within the localities of NBR.

The winter migratory water birds such as Ducks, Teals, Pochards, Gulls were not noticed in the study area except for a few species of Sandpipers. However, winter visitors like Pale Harrier, Lesser Kestrel, Large Brown Shrike, Rosy Pastors, Brown Flycatcher, Reed and Tree-Warblers, Blue chat, different species of Wagtails, and Rosefinches occurred in substantial numbers. Red-legged Falcon, Indian Pitta and Red breasted Flycatcher were some of the passage migrants (Spring/Autumn) through the Nilgiris.

Further, there are many species of birds which breed in Ladakh and upper ranges of Himalaya in summer and in winter they descend to south India including the Nilgiris. Of these Large Hawk-Cuckoo, Grey Drongo, Western Swallow, Verditer Flycatcher, Leaf Warblers, Black Redstart and Rock Thrushes were recorded from the study area. Woodcock *Scolopax rusticola* may even fly non-stop from Himalayas to the hills of Western Ghats Complex and particularly to the Nilgiris in the winter season.

Endemic Birds

Table 1 indicates that 13 species of birds are confined to Nilgiris and closely associated hills in the Western Ghats Complex. Most of the species like Greyfronted Green Pigeon, Black-and-Orange Flycatcher, Nilgiri Plain-Wren Warbler, Nilgiri Verditer Flycatcher, Nilgiri Blackbird, Nilgiri White-eye were rather common while Kerala Broadbilled Roller has become rare in NBR. All these endemic species are found in dense, evergreen well-wooded sholas, grasslands, ravines and plantations between 1500m and 2100m.

Endangered Birds

Shaheen Falcon, Ceylon Frogmouth and Malabar Hornbill have become rare and endangered. This is mainly because of human interference, illegal shooting for food and traditional medicine purposes (particularly the Hornbills), deforestation and expansion of plantations in Nilgiris. A list of such endangered bird species from NBR is given in Table 2.

Food habits

The data compiled from Ali and Repley (1983a) on the food habits of different species of birds recorded from NBR has been plotted in Fig. 2. The figure clearly shows that out of 313 species, 146 are insectivorous. It is followed by frugivorous, carnivorous and graminivorous. Nectar eaters and scavengers are comparatively less in number. Under insectivorous food habit apart from birds which are mainly insect eaters some feed on vegetable matter, fruits etc. Likewise, birds exclusively eating fishes or amphibians have also been grouped under aquatic animal eaters.

Effects of Human Activity

Developmental pressure, habitat loss and human intervention are adversely affecting the ecosystems of NBR. These should be prevented to save and conserve the avian fauna.

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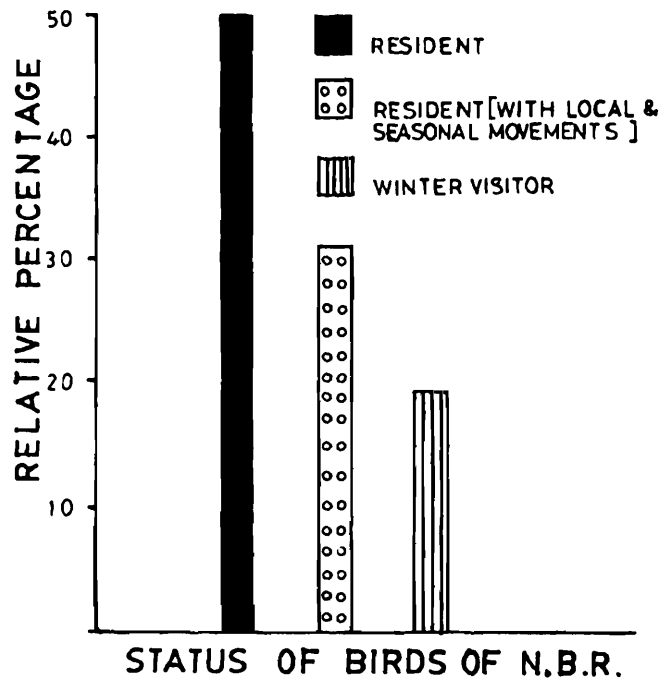


Fig. 1 Status of birds of Nilgiri Biosphere Reserve

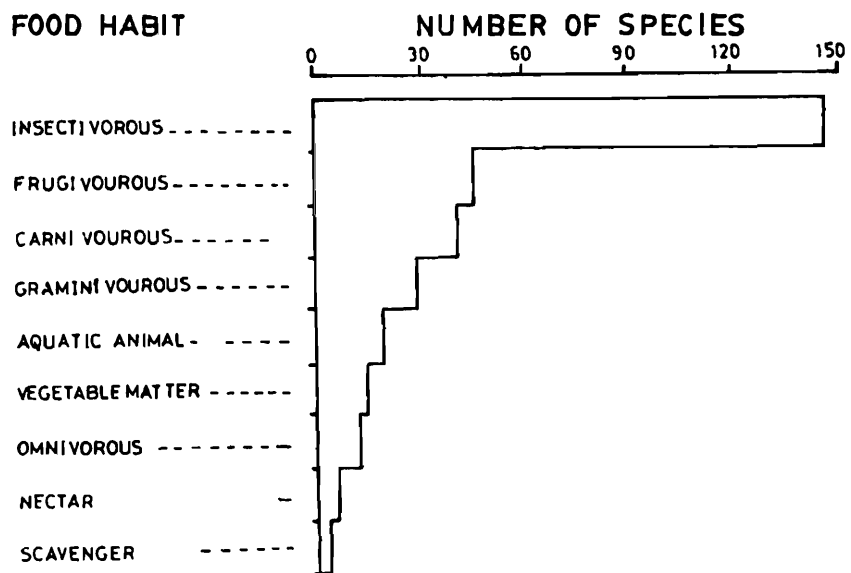


Fig. 2 Food habits of birds of Nilgiri Biosphere Reserve

Table -1. Birds of N.B.R. showing Status, Distribution and Habitat

Sl. No.	Name of Species	Common Name	Status	Altitude	Locality	External Distribution (Outside Survey Area)	Habitat
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Order	PELECANIFORMES					
	Family	PHALACROCORACIDAE					
1.	<i>Phalacrocorax fuscicollis</i> Stephens	Indian Shag	R/LM (with water condition)	—	Indian Peninsular hills	India, Pakistan and Sri Lanka.	Jheels, rivers, reservoirs & estuaries. Lives in association with cormorant.
2.	<i>Phalacrocorax niger</i> (Vieillot)	Little Cormorant	R/LM ("—)	—	Indian sub-continent	Pakistan; Sri Lanka	— " —
3.	<i>Anhinga rufa melanogaster</i> Pennant	Darter or Snake bird.	R/LM ("—)	Upto 300 m.	Indian sub-continent	India : E. Assam; Pakistan; Sri Lanka	Inland waters-ponds, rivers etc.
	Order	CICONIIFORMES					
	Family	ARDEIDAE					
4.	<i>Ardeola grayii</i> (Sykes)	Indian Pond Heron or Paddy Bird	R/LM ("—)	Upto 1200m in Peninsular hills.	Peninsular hills Nilgiris, Mudumalai and Masinagudi.	Indian subcontinent Andaman, Nicobar & Lacadive Islands; Sri Lanka	Jheels, marshes paddyfields, tanks, tidal mud flats.
5.	<i>Bubulcus ibis</i> (Boddaert)	Cattle Egret	R/SM (in Winter) (possibly higher)	("—)	Peninsular hills including Nilgiris	("—)	Associated with grazing animals wild or domestic.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
6. <i>Egretta garzetta</i> (Linnaeus)	Little Egret	R/LM (with water conditions)	900 m in peninsular hills.	(--)	(--)	Paddy fields, jheels, marshes, back waters.
7. <i>Nycticorax nycticorax</i> (Linnaeus)	Night Heron	R/LM (--)	upto 1900m in Kashmir.	Indian sub- continent. Moving southward in winter.	Kashmir & Nepal Valley in summer; A. & N. Islands.	(--)
8. <i>Gorsachius melanolophus</i> (Raffles)	Malay or Tiger Bittern	R	Foothills upto 800m in SW India.	Southwestern Ghats including Nilgiris.	Kerala, W. Karnataka, Assam, Manipur & Sri Lanka (upto 1800 m)	Streams and Marshy patches in evergreen rain forests.
9. <i>Ixobrychus cinnamomeus</i> (Gmelin)	Chesnut Bittern	R/LM (--) with migratory populations.	upto 900m in peninsular hills.	South India	Indian subconti- nent, A.& N. Islands; Nepal; Sri Lanka.	Reed beds in inland jheels, swamps, paddy fields, tidal mangroves. Associated with Yellow Bittern.
10. <i>Ixobrychus sinensis</i> (Gmelin)	Yellow Bittern	R/LM (--) with migratory populations.	(--)	Peninsular hills, Kerala.	(--)	(--) Associated with Chestnut Bittern.
11. <i>Dupetor flavicollis</i> (Latham)	Black Bittern	R/LM (--)	Upto 1200m in hills.	Common in heavy rainfall zone of S.W. India	Indian subconti- nent, A.& N. Islands; Pakistan; Bangladesh	Reedy inland swamps, seep age nallahs in Jungle, tidal mangroves.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Family CICONIIDAE						
12. <i>Ciconia episcopus</i> (Boddaert)	Whitenecked Stork	R	upto 650m in peninsular hills.	Indian Peninsular hills	Throughout well- watered parts of India, Pakistan, Nepal and Sri Lanka	Flooded grass land, fallows irrigated fields, streams, seepage marshes, tidal creeks.
Order ANSERIFORMES						
Family ANATIDAE						
13. <i>Anas querquedula</i> Linnaeus	Garganey or Bluewinged Teal	WV (commonest)	upto 400m on migration	India including Kerala	India; Pakistan; Nepal; Sri Lanka.	All types of water bodies.
Order FALCONIFORMES						
Family ACCIPITRIDAE						
14. <i>Elanus caeruleus</i> (Desfontaines)	Blackwinged kite	R	1200m in peninsular hills	Peninsular hills upto Kanyakumari	India; Pakistan; Nepal; Sri Lanka; Bangladesh.	Deciduous biotope, secondary scrub, grassland with cultivation, riverine tamarisk, semi-deserted areas.
15. <i>Aviceda jerdoni</i> <i>ceylonensis</i> (Legge)	Legge's Baza or Southern Brown Lizard Hawk.	R (scattered rare)	150-900m	S.of 12°N. lat., Southwest India, Coorg & Wynad area of Karnataka & Kerala.	Sri Lanka	Evergreen forest biotope in the foothills.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
16. <i>Pernis ptilorhynchus ruficollis</i> Lesson	Crested Honey Buzzard	R/LM-on food supply.	—	South India	India; Pakistan; Bangladesh; Sri Lanka.	Deciduous & semievergreen hills, forest glades, towns and villages.
17. <i>Milvus migrans</i> (Boddaert)	Pariah kite	R, (Common)	2200m in peninsular hills.	Mudumalai Sanctuary.	— " —	Urban localities and country side.
18. <i>Haliastur indus</i> (Boddaert)	Brahminy kite	R/LM/SM-governed by monsoon and water conditions.	—	Nilgiris	— " —	Well-watered localities inland and sea coast.
19. <i>Accipiter badius</i> (Gmelin)	Indian Shikra and/or Ceylon Shikra	R	1500m in Kerala	Nilgiris, Kerala low country, Mudumalai, Masinagudi	India : Assam; Sri Lanka; Nepal.	Open deciduous biotope, groves near villages.
20. <i>Accipiter trivirgatus</i>	South Indian (Temminck)	R Crested Goshawk	1100m in W. Ghats & Nilgiri hills.	S. of 16°N lat, Karnataka to Kerala, Nilgiri hills.	Goa	Moist deciduous and evergreen forested foothills.
22. <i>Accipiter virgatus besra</i> Jerdon	Southern Besra Sparrow-Hawk	R	600-1200m	W. Ghats including Nilgiri.	Kerala, Mumbai, E.Ghats in Tamil Nadu; Sri Lanka.	Confined to evergreen and moist-deciduous biotopes.
23. <i>Buteo buteo japonicus</i> Temminck & Schlegel	Japanese Buzzard	WV	Upto 2000m in all zones	Peninsular India	India, Nepal, Sri Lanka.	—

(1)	(2)	(3)	(4)	(5)	(6)	(7)
24. <i>Butastur teesa</i> (Franklin)	White-eyed Buzzard Eagle.	R	1200m	Peninsular India	India; Pakistan; Bangladesh; Nepal.	Open deciduous forest, scrub, bush and cultivated country. Avoids moist forest biotopes.
25. <i>Spizaetus cirrhatus</i> (Gmelin)	Indian Crested Hawk-Eagle	R (common)	—	Peninsular India	India : S. of line of Mount Abu (Rajasthan) to Eastern U.P.; Sri Lanka.	Deciduous & semi-evergreen forests.
26. <i>Hieraaetus fasciatus</i> <i>fasciatus</i> (Viellot)	Bonelli's or Slender Hawk- Eagle	R, (widespread but not common)	—	India from Kashmir to Kanyakumari	Nepal.	Well-wooded country, hills and plains.
27. <i>Hieraaetus pennatus</i> (Gmelin)	Booted Hawk- Eagle	WV/partly R (fairly common)	—	Throughout India	Pakistan; Nepal; Sri Lanka.	Well-wooded and open country- sides.
28. <i>Hieraaetus kienerii</i> (E. Geoffroy)	Rufousbellied Hawk-Eagle	R	Upto 1200m in Kerala.	W. Ghats strip in S. India (N. Karnataka through Kerala).	India : Goa, Manipur, Sikkim; Nepal; Sri Lanka; Bangladesh.	Evergreen and moist deciduous forest biotopes.
29. <i>Ictinaetus malayensis</i> <i>perniger</i> (Hodgson)	Black Eagle	R	2000m	Nilgiri hills	India : Southern India, Assam, E. Ghats, Orissa, M.P., Goa; Nepal; Pakistan; Bangladesh.	Wide but patchy distribution in evergreen and moist deciduous forest biotopes.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
30. <i>Sarcogyps calvus</i> (Scopoli)	Black or King Vulture	R	—	Throughout the Indian Union.	Pakistan, Nepal, Bangladesh	Open country side- chiefly deciduous and semi-desert biotope.
31. <i>Gyps indicus</i> (Scopoli)	Indian Longbilled Vulture	R	—	Peninsular India (except extreme SW)	Rajasthan, Gujarat	No perceptible habitat preferences.
32. <i>Gyps bengalensis</i> (Gmelin)	Indian White- backed Vulture	R (very common)	—	Throughout Indian peninsula	India : Assam, Manipur, along Himalaya; Pakistan	Open country side.
33. <i>Neophron percnopterus</i> (Linnaeus)	Scavenger Vulture	R	upto 2000m in the drier peninsular hills.	Peninsular hills (Nilgiri hills)	India: Along Himalayas, South to Kanyakumari; Nepal.	Hills and plains near human habitations.
34. <i>Circus microurus</i> (S. G. Gmelin)	Pale Harrier	WV (common)	2600m in hilly areas Doddabetta and Nilgiris.	Peninsular hills including Bangladesh.	India; Pakistan; Nepal; Sri Lanka;	Varied habitats excluding wooded tracts.
35. <i>Circus pygargus</i> (Linnaeus)	Montagu's Harrier	WV (less common)	—	Peninsular India	Widely distributed in Indian subconti- nent, including Andaman & Laksh- adweep Islands; Sri Lanka.	— " —

(1)	(2)	(3)	(4)	(5)	(6)	(7)
36. <i>Circus melanoleucos</i> (Pennant)	Pied Harrier	WV	2100m in Kodaikanal.	Nilgiri hills	India: Manipur, Assam, Bihar, W.Bengal, Orissa, A.P.; Bangladesh.	Open expanses of grassland, plains and hills, also paddy fields and grassy margins of jheels.
37. <i>Circaetus gallicus</i> (Gmelin)	Short-toed Eagle	R	2100m	Nilgiris.	Throughout Indian Union; Pakistan; Nepal.	Open cultivated plains, story, deci- duous scrub and foothills, country & semi-desert.
38. <i>Spilornis cheela</i> (Latham)	Lesser or Peninsular Crested Serpent Eagle	R	—	Peninsular India	Arbitrarily S. of lat. 25°N from Gujarat eastward to Bengal.	Inhabits well watered, well wooded plains and foot- hills country.
39. <i>Pandion haliaetus</i> (Linnaeus)	Osprey	WV (September- March)	Upto 1800m	S.India.	Throughout Indian subcontinent. Breeding along Himalayas; Nepal; Sri Lanka.	Large water bodies rivers, lagoons and estuaries.
Family FALCONIDAE						
40. <i>Falco biarmicus</i> Temminck	Laggar Falcon	R/LM (partially rare)	—	S. India.	Practically throu- ghout the Indian subcontinent; Pakistan; Nepal; Bangladesh.	Open country and jungle, avoids humid forests.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
41. <i>Falco peregrinus japonensis</i> Gmelin	Eastern Peregrine Falcon	WV	—	Throughout Indian subcontinent in winter.	Nepal valley; Sri Lanka.	Neighbourhood of rivers, jheels, coastal lagoons and marshes.
42. <i>Falco peregrinus peregrinator</i> Sundevall	Shaheen Falcon	R	Upto 1800m.-2000m.	Throughout Indian peninsula.	India: Kashmir Punjab, H.P., U.P., Assam; NW Pakistan; Nepal	Hills and foothills.
43. <i>Falco chicquera</i> Daudin	Redheaded Merlin	R	—	Throughout Indian peninsula.	India: Rajasthan, Assam; Pakistan; Bangladesh.	Plains, foothills and villages.
44. <i>Falco vespertinus amurensis</i> Radde	Redlegged Falcon	Passage migrant (mainly)/partly R.	—	Nilgiris	N.E. and Peninsular India.	Open country and grazing land.
45. <i>Falco naumanni</i> Fleischer	Lesser Kestrel	Uncertain, WV (apparently)	—	Nilgiris (Coonoor)	Punjab, Delhi, U.P., Bihar to Manipur, Maharashtra	Open savannahs.
46. <i>Falco tinnunculus</i> Linnaeus	Indian Kestrel	R/migrant	1200m-2500m	Nilgiris, Mudumalai Sanctuary and Bandipur National Park	India : Khandesh South to Kanyakumari, E.Ghats; Sri Lanka.	Grassland, hills & plains.
	Order GALLIFORMES					
	Family PHASIANIDAE					
47. <i>Francolinus pondicerianus</i> (Gmelin)	South Indian Grey Partridge	R	—	Southern peninsular India.	India: Introduced in Andaman Islands in 1890; Sri Lanka.	Dry plains and xerophytic thorny scrub land.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
48. <i>Coturnix coturnix</i> (Linnaeus)	Grey Quail	R/WV (partly) Abundant locally.	Upto 2500m in Kashmir	Indian subcon- tinent. South to Kanyakumari in winters.	Pakistan.	Affects standing crops (cotton, wheat gram) paddy stubbles and grassland, undulating country.
49. <i>Coturnix coroman- delica</i> (Gmelin)	Blackbreasted or Rain Quail	R/LM-during SW monsoon, nomadic.	Upto 2000m in Himalayas	Peninsular hills.	India; Pakistan; winter visitor to Sri Lanka.	Grass and scrub jungle, open moist grassland, standing crops and paddy stables.
50. <i>Perdicula asiatica</i> (Latham)	Konkan Jungle Bush Quail	R	Upto 1500m in the hills.	S.Konkan to Kerala.	Other races in N. India, Orissa, A.P., Maharashtra.	Inhabits dry scrub bush country.
51. <i>Perdicula ery- throrhyncha</i> (Sykes)	Painted Bush Quail	R	600m to 2000m	Western Ghats strip from Khan- dala to Kerala including asso- ciated hill ranges in coorg.	Hill ranges in Mysore and Salem Dists. Shevaroy hills. Other races in Northern India.	Foothills with cultivation, open hill sides and moist deciduous forest.
52. <i>Galloperdix spadicea</i> (Gmelin)	Red Spurfowl	R	below 1000m	Nilgiris, Coorg, and N.Kerala (Wynaad).	Peninsular India; Nepal terai.	Inhabits stony, scrubbed foothill, bamboo jungle cut by water courses in dry & moist deciduous biotope.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
53. <i>Gallus sonneratii</i> Temminck	Grey Junglefowl	R	2400 m in W. Ghat Complex highest Sholas.	Nilgiris (Dodabetta) Tamil Nadu and Kerala.	Mysore and rest of the peninsular India.	Mixed bamboo jungle close to villages & cultivation.
54. <i>Pavo cristatus</i> Linnaeus	Indian Peafowl	R	upto 1800m	Nilgiris (Mudu- malai Sanctuary, Korgudi Road, Theppakadu, Masingudi Moyar Road; Bandipur N.P.	Outer Himalayas and throughout Indian subconti- nent; Sri Lanka.	Moist-and dry- deciducus biotope, near streams.
Order	GRUIFORMES					
Family	TURNICIDAE					
55. <i>Turnix sylvatica</i> <i>dussumier</i> (Temminck)	Little Bustard- Quail	R (seasonally nomadic)	2400m in Himalayas	Peninsula (hills and plains) and upto Kerala.	India: Himalayas, Kutch, Rajasthan to NE states; Nepal; Bangladesh.	Inhabits grass and scrub jungle bordering cultivation.
56. <i>Turnix suscitator</i> <i>taigoor</i> (Sykes)	Indian Bustard- Quail	R (nomadic in rains)	Upto 2500m	South of 23°N latitude.	Whole of penin- sular India.	—"– and deci- duous forests.
Family	RALLIDAE					
57. <i>Rallina eurizonoides</i> (Lafresnaye)	Indian or Slaty- legged Banded Crake (Khandala)	R/LM	1600m in Himalayas and (Khandala) W.Ghats	Hills of Coorg and Mysore Dists. and Kerala State.	Practically whole of India; Pakistan; Nepal.	Found in well- wooded, well- watered tracts, and plains.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
58. <i>Gallinula chloropus</i> Blyth	Indian Moorhen	R/partly WV shifts locally with water condition.	2100m in Kashmir, 2000m in Nilgiris.	Peninsular hills	Whole of India; Nepal; Pakistan; Bangladesh; Sri Lanka.	Low lands with jheels, swamps and floating vegetation.
59. <i>Porphyrio porphyrio</i> (Linnaeus)	Indian Purple Moorhen	R/LM	—	Throughout Indian peninsular terai and plains.	India: Assam N.E. States; Pakistan; Bangladesh; Sri Lanka.	Inhabits dense reedbeds around large, swamps and jheels.
60. <i>Fulica atra</i> Linnaeus	Coot	R as well as WV; (abundant, common)	2500m for breeding in Himalayas	S.India.	Whole of India; Pakistan; Nepal; Bangladesh; Sri Lanka.	Gathers in large congregations at weedy jheels.
Order	CHARADRIIFORMES					
Family	CHARADRIIDAE					
Subfamily	CHARADRIINAE					
61. <i>Vanellus indicus</i> (Boddaert)	Redwattled Lapwing	R, (altitudinal migration in spring & autumn)	1800m in Kashmir, Kerala	Mudumalai Sanctuary : Masinagudi,	India; Pakistan; Bangladesh; Nepal Valley;	Neighbourhood of waterbodies in open country.
62. <i>Vanellus malabaricus</i> (Boddaert)	Yellow-wattled Lapwing	R/LM (monsoon)	—	Mudumalai Sanctuary: Masinagudi, Nilgiris.	India; Pakistan; Nepal; Sri Lanka; Bangladesh.	Barren wasteland, stubbles, fallow fields, less depen- dent on water.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Subfamily SCOLOPACINAE						
63. <i>Tringa ochropus</i> Linnaeus	Green Sandpiper	WV	2000m in peninsular hills.	Nilgiris and other peninsular hills.	India; Nepal; Bhutan; Sri Lanka; Pakistan; Bangladesh.	Jheels, village tanks, puddles, streams; also tidal creeks, lagoons and salt pans.
64. <i>Tringa glareola</i> Linnaeus	Wood or Spotted Sandpiper	WV, (common & wide-spread)	2000m	Nilgiris, Mudu- malai Sanctuary (one sighting- only; solitary bird)	India; Nepal.	Jheels, wet paddy fields, marshes near irrigation tanks, also mud flats along tidal creeks on the sea board.
65. <i>Tringa hypoleucos</i> Linnaeus	Common Sandpiper	WV (also breeds in Kashmir, Ladakh)	upto 3200m (may be higher)	Nilgiris.	India	Inhabits inland water-streams, tanks, ditches, puddles-as well as rocky sea shores, harbours and docks, coastal lagoons, tidal creeks and mangroves.
66. <i>Capella stenura</i> (Bonaparte)	Pintail Snipe	WV	upto 2500m	South India.	India	Inhabits marshy jheels, wet paddy stubbles, seepage marshes, dampy areas like harvested paddy fields.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
67. <i>Capella gallinago</i> (Linnaeus)	Common or Fantail Snipe	WV (common & abundant) partly R (in Himalayas)	—	South India	Indian subconti- nent including Andaman & Maldiv islands; Nepal terai.	Swampy edges of jheels, seepages, marshes, har- vested paddy fields and exposed village ponds.
68. <i>Scolopax rusticola</i> Linnaeus	Woodcock	Breeds in Himalayas,	2000m & 3800m	Across Peninsula to Nilgiris and associated hill ranges.	In winter migrates to Assam & NE States, W.Ghats in Karnataka and Kerala; Sri Lanka.	Swampy glades of Rhododendrons and fir in Himalayas; sholas, evergreen forest, coffee plantations.
Family BURHINIDAE						
69. <i>Burhinus oedicnemus</i> (Linnaeus)	Indian Stone Curlew	R/LM	1000m in Himalayas & peninsular hills	Peninsular hills.	Whole of India; Nepal; Pakistan; Bangladesh; Sri Lanka.	Restricted to deci- duous biotope and orchards and gardens in Urban areas.
Order COLUMBIFORMES						
Family CLUMBIDAE						
70. <i>*Treron pompadora</i> (Gmelin)	Greyfronted Green Pigeon	R/LM, (depend upon fruiting season)	1200m	Western Ghats complex including Nilgiris, Palnis & associated hill ranges, thro' W. Karnataka upto Kerala.	Western, South Western India.	Inhabits forests and well-wooded country in ever- green and wet deciduous biotope.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
71. <i>Treron bicincta</i> (Jerdon)	Indian Orange-breasted Green Pigeon	R/LM/SM	1500m in Himalayas	W.Ghats and associated hill ranges upto 1000m Karnataka, Kerala	U.P. terai, lower Himalayas, Assam, Bengal, Manipur, E. Ghats, Belgaum; Nepal; Bangladesh.	Inhabits forests and well-wooded country inland as well as coastal tracts, evergreen and moist deciduous biotopes.
72. <i>Treron phoenicoptera</i> (Latham)	Southern Green Pigeon	R/LM (depend on fruiting season)	—	Peninsular India.	Rajasthan, Gujarat, Gangetic plain.	Affects dry-and moist-deciduous forest with <i>Ficus</i> and other fruiting trees; open countryside, villages, cultivation and jungly gardens in towns, roadside avenues.
73. <i>Ducula aenea</i> (Linnaeus)	Southern Green Imperial Pigeon	R/LM (depend upon ripening of wild fruits)	300m	Peninsular India upto 20°N latitude Western Ghats and associated hill ranges.	Eastern Ghats, Sri Lanka.	Inhabits ever-green and moist deciduous plains and foothills forest; Partial to secondary jungle with large <i>Ficus</i> and other wild fruits trees.
74. <i>Ducula badia</i> (Raffles)	Jerdon's or Southern Maroonbacked Imperial Pigeon.	R/SM/(depending upon wild fruit ripening)	upto 2000m	Western Ghats and associated hills like Nilgiris, Palni etc. in Kerala W. Karnataka.	Belgaum, Goa upto 16°N latitude.	Inhabits ever-green forest upto 2000 metres. (peculiar Indo-Malayan forms)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
75. <i>Columba livia</i> Gmelin	Indian Blue Rock Pigeon	R (abundant locally)	upto 3000m in Himalayas.	Nilgiri hills.	Whole of India including Laccadive Inlands; Nepal; Bhutan; Sri Lanka; Bangladesh.	Inhabits rocky cliffs and gorges in the hills, old ruins, ancient forts, factories warehouse sheds, residential commercial buildings, temple, railway station in cities.
76. * <i>Columba elphinstonion</i> (Sykes)	Nilgiri Wood Pigeon	R/LM (upto fruit ripening)	2000m in Shola forests.	Nilgiris.	South of 19°N latitude in Western Ghats including Sahyadris and Anamalai Hills. Also hills in Western Karnataka.	Inhabits moist evergreen forest from the foothills to highest Sholas at 2000m. In Kerala cardamom sholas with their tall shade trees.
77. <i>Streptopelia orientalis</i> (Latham)	Western Turtle Dove	R (migrates South in winter)	upto 4000m in Himalayas.	Peninsular India South to Mysore Dist.	Indian sub-continent.	Inhabits open mixed forest, moist deciduous biotope, bamboo jungle.
78. <i>Streptopelia decaocta</i> (Frivaldszky)	Indian Ring Dove	R/SM	upto 2000m in western Himalayas	Entire Indian Union	Pakistan; Bangladesh; Sri Lanka; Nepal.	Inhabits open, cultivated, dry deciduous country (also semidesert) with groves, Acacia, Butea and similar types of trees. Avoid moist evergreen tracts.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
79. <i>Streptopelia tranquebarica</i> (Hermann)	Indian Red Turtle-Dove	R/LM (summer visitor to Himalayan dunes, foothills.)	upto 800m	South through Peninsula India, Tamil Nadu, Karnataka.	India: U.P. and North India; Pakistan; Nepal.	Inhabits open scrub jungle and cultivation in deciduous biotope.
80. <i>Streptopelia chinensis</i> (Scopoli)	Indian Spotted Dove	R/LM (in some areas)	1500m in peninsular hill, 2400m & above in Himalayas.	Nilgiris, Mudumalai Sanctuary, Theppakadu, Masinagudi, Thorapalli in good numbers.	Throughout Indian Union in appropriate biotope; Pakistan; Nepal; Bhutan.	Inhabits better wooded, better watered areas, gardens, groves, cultivations, moist deciduous jungle.
81. <i>Streptopelia senegalensis</i> (Linnaeus)	Little Brown or Senegal Dove	R (migratory movements to some extent)	1500m in peninsular hills, 1000m in Himalayas.	Nilgiris, Mudumalai Sanctuary Masinagudi.	Throughout India; Pakistan.	Inhabits Village environs, stony, scrub-bush country, cultivation.
82. <i>Chalcophaps indica</i> (Linnaeus)	Indian Emerald Dove	R (with some sort of migratory movements.)	1800m in lower Himalayas.	Peninsular India	Patchy distribution throughout India; Nepal; Bhutan.	Inhabits thick secondary and mixed bamboo jungle forest clearings, chiefly in foothills country.
Order PSITTACIFORMES						
Family PSITTACIDAE						
83. <i>Psittacula eupatria</i> (Linnaeus)	Large Indian Parakeet	R/LM	Upto 900m	Peninsular India	India; Sri Lanka.	Inhabits forests and well-wooded country.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
84. <i>Psittacula krameri manillensis</i> Bechstein	Roseringed Parakeet	R/LM	—	Peninsular India	Peninsular India; Sri Lanka.	Inhabits mostly moist and dry-deciduous biotopes and cultivated lands.
85. <i>Psittacula cyanocephala</i> (Linnaeus)	Southern Blossom-headed Parakeet	R/LM	Upto 1300m	Mudumalai, Thorapalli, Masinagudi.	Peninsular India; Sri Lanka.	Inhabits low lands and hills.
86. <i>Psittacula columboides</i> (Vigors)	Bluewinged Parakeet	R.	500m to 1500m	Nilgiris and associated hills	Peninsular India	Restricted to mostly evergreen biotope but wandering into intermediate zones.
87. <i>Loriculus vernalis</i> (Sparman)	Indian Lorikeet	R/LM	Upto 1800m	Nilgiris.	India; Nepal; Bhutan.	Inhabits wooded countryside in evergreen and moist deciduous biotopes.
Order CUCULIFORMES						
Family CUCULIDAE						
88. <i>Clamator jacobinus jacobinus</i> (Boddaert)	Ceylon Pied Crested Cuckoo	R	Upto 2000m in Nilgiris.	Mudumalai Sanctuary	Peninsular India; Sri Lanka.	Inhabits lightly-wooded countryside low lands and hills.
89. <i>Cuculus sparverioides sparverioides</i> Vigors	Large Hawk-Cuckoo	WV	Breeds in Himalaya between 900m & 2700m.	Peninsular India	Himalaya (Garhwal to N.E. Hill States); Nepal; Sikkim.	Wooded hill sides and valleys.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
90. <i>Cuculus varius</i> Vahl	Common Hawk-Cuckoo or Brain-fever Bird	R/LM	Upto 1000m in the Himalaya.	Mudumalai, Masinagudi	Entire subcontinent; Nepal; Bhutan; Bangladesh.	Well-wooded deciduous and semievergreen biotopes, hills and plains.
91. <i>Cuculus micropterus</i> Gould	Indian Cuckoo	R/SM seasonally nomadic.	upto 2800m	Subcontinent	Kashmir to NEFA. Andaman & Nicobar islands; Bangladesh, Sri Lanka.	Inhabits fairly wooded country in deciduous and evergreen biotopes.
92. <i>Cuculus canorus</i> Linnaeus	Cuckoo	R/SM/LM.	Breeding between 600-4100m in Himalaya.	Indian peninsula	Indian peninsula, Himalaya; Nepal.	Hilly regions.
93. <i>Cuculus poliocephalus</i> Latham	Small Cuckoo	WV	In Himalaya between 1500m & 3200m	Nilgiris	Indian peninsula, Himalaya, Southern parts of Andaman islands; Nepal.	Inhabits well-wooded country.
94. <i>Cacomantis sonneratii</i> Latham	Indian Baybanded Cuckoo	R/LM/SM	Upto 2400m in the Himalaya.	Nilgiris, Mudumalai Sanctuary.	Throughout India; Nepal; Bangladesh	Deciduous and evergreen forests and lightly wooded countryside.
95. <i>Cacomantis merulinus passerinus</i> Vahl	Indian Plaintive Cuckoo	R (in some part) nomadic or LM in other parts.	upto 2700m in Himalaya, 1800m in Nilgiris & peninsular hills.	Nilgiri	Indian subcontinent; Nepal, Bhutan.	Open forests, gardens, groves etc.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
96. <i>Surniculus lugubris dicruroides</i> (Hodgson)	Indian Drongo Cuckoo	R/LM	2000m in lower Himalayas & 1500m in peninsular hills.	Indian peninsular hill ranges.	India; Nepal; Bangladesh.	Open forests, plantations, orchards and sometimes evergreen jungles.
97. <i>Eudynamys scolopacea</i> (Linnaeus)	Indian Koel	R/LM	upto 1000m in peninsular hills, 1800m in Himalaya.	Nilgiri, Mudumalai Sanctuary Masinagudi, Moyar, Bandipur N.P.	Throughout India; Sri Lanka; Nepal; Bhutan.	Lightly-wooded countryside, orchards, groves etc.
98. <i>Rhopodytes viridirostris</i> (Jerdon)	Small Greenbilled Malkoha	R (common locally)	upto 1000m	Peninsular India	Sri Lanka.	Deciduous and semi-evergreen scrub and bushy-terrain.
99. <i>Taccocua leschenaultii</i> Lesson	Southern Sirkeer Cuckoo	R	upto 1000m	Peninsular India,	Sri Lanka.	Dry deciduous secondary forests and scrub and bushy jungles.
100. <i>Centropus sinensis</i> (Stephens)	Southern Crow-Pheasant or Coucal	R	upto 2220m in peninsular hills.	Nilgiris Mudumalai, Kargudi, Kakkannalla.	Indian Peninsula; Sri Lanka.	Scrub and bushy jungles, grass lands and near human habitations.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
101. <i>Centropus toulou bengalensis</i> (Gmelin)	Lesser Coucal	R	upto 1500m in Himalaya	NBR areas	Widely distributed in India; Nepal.	Confined to specialized habitats : stretches of tall grassland, bordering dense scrub jungle, reed beds, edges of swamps & jheels & flood plains.
Order	STRIGIFORMES					
Family	STRIGIDAE					
Subfamily	TYTONINAE					
102. <i>Tyto alba</i> (Scopoli)	Indian Barn Owl	R	upto 1000m in peninsular hills.	Peninsular hills.	Throughout India; Bangladesh; Sri Lanka; Pakistan.	Varied habitats.
103. <i>Tyto capensis</i> (A.Smith)	Grass Owl	R	upto 1800m in S.Indian hills.	Nilgiris	Submontane tracts of Himalayas from Dehra Dun to N.E. hill states. Gangetic Plain, W.B., M.P.; Nepal; Bangladesh	Open grassland, tall grass jungle, depressions among low rolling hill tops.
Sub family	STRIGINAE					
104. <i>Otus scops rufipennis</i> (Sharpe)	Peninsular Scops Owl	R	—	Western Ghats and associated hills.	Peninsular India	Deciduous and evergreen forests and groves around settlements.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
105. <i>Otus bakkamoena</i> Pennant	Ceylon Collared Scops Owl.	R	upto 1200m in hills.	Western Ghats and associated hills.	Peninsular India; Sri Lanka.	Plains and hills of deciduous, semi- evergreen forests and well-wooded countrysides.
106. <i>Bubo bubo bengalensis</i> (Franklin)	Great Horned or Eagle-Owl	R	from 1500m in W. Himalaya.	Indian peninsula	Throughout Indian subcontinent; Nepal	Bush-covered rocky hills, wooded country side etc. Avoids pure desert tracts and moist evergreen forests.
107. <i>Bubo nepalensis</i>	Forest Eagle-Owl Hodgson	R	900-1200m (upto 2100m in lower Himalaya)	W. Ghats	Submontane tracts of Lower Hima- laya, Sikkim, N.E. hill States, Karnataka, Kerala; Nepal.	Dense evergreen and moist- deciduous forests valleys and sholas.
108. <i>Bubo coromandus</i> <i>coromandus</i> (Latham)	Dusky Horned Owl	R	—	Nilgiris.	Indian subconti- nent; Nepal; Bangladesh.	Old mango groves, roadsides, densely foliated trees, near water and cultiva- tions in plains and well-wooded, well-watered tracts.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
109. <i>Bubo zeylonensis leschenaulti</i> (Temminck)	Brown Fish Owl	R	upto 1500m in Himalaya, upto 1400m in Nilgiris.	Sholas in Nilgiris.	India; Nepal; Pakistan; Bangladesh.	Well-wooded, well-watered country, road sides, densely foliated trees, along streams and tanks, near human habitations, overgrown eroded ravines and steep river banks.
110. <i>Glaucidium radiatum radiatum</i> (Tickell)	Barred Jungle Owlet	R	2000m in Himalaya and in Nilgiris.	Nilgiri hills.	India; Bhutan; Sri Lanka.	Mixed-moist deciduous forests and secondary jungles.
111. <i>Ninox scutulata hirsuta</i> (Temminck)	South Indian Brown Hawk-Owl	R	upto 1300m in hills.	Nilgiris	Peninsular India.	Forest and well-wooded country and around habitations in Kerala.
112. <i>Athene brama brama</i> (Temminck)	Southern Spotted Owlet	R	—	Nilgiris	South of 20°N latitude.	Ruins, mango-tops and groves of ancient trees, in and around towns, villages and cultivation.
113. <i>Strix ocellata</i> (Lesson)	Southern Mottled Wood Owl	R	—	South India	India: M.P., Gujarat & Orissa.	Lightly-wooded country, and densely foliated trees on outskirts of villages.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
114. <i>Strix leptogrammica indraee</i> Sykes	Brown Wood Owl	R	1800m in Nilgiris, Palni Hills.	Nilgiris and associated hill ranges.	Peninsular India.	In evergreen and moist deciduous forests.
115. <i>Asio flammeus flammeus</i> (Pontoppidan)	Shorteared Owl	WV (Sept/Oct. to Mar/Apr)	1400m in hilly areas.	Entire Indian Union	India; Pakistan; Nepal; Bhutan and Bangladesh.	Grassy country with bushes, tall grassland on the margins of jheels and in semi-desert.
Order CAPRIMULGIFORMES						
Family PODARGIDAE						
116. <i>Batrachostomus moniliger</i> Blyth	Ceylon Frogmouth	R (very rare)	upto 1200m	Western Ghats (heavy rainfall tracts)	W. Ghats South of 15°N lat; Sri Lanka	Dense evergreen forests and secondary jungles with cane brakes.
Family CAPRIMULGIDAE						
117. <i>Caprimulgus indicus</i> Latham	Indian Jungle Nightjar	R/LM	upto 2300m in peninsular hills.	Peninsular hills.	India; Sri Lanka.	Mostly open scrub jungles.
118. <i>Caprimulgus macrurus atripennis</i> Jerdon	Jerdon's or Southern Longtailed Nightjar	R	upto 2000m	Peninsular India.	South of 18°N lat.	Evergreen and moist-deciduous biotopes.
119. <i>Caprimulgus asiaticus</i> Latham	Indian Little Nightjar	R/SM	upto 1500m in Himalayas and peninsular hill ranges.	Peninsular hill ranges.	India; Pakistan; Nepal; Bangladesh.	Scrub jungles and fallow lands.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Order	APODIFORMES					
Family	APODIDAE					
Subfamily	APODINAE					
120. <i>Chaetura gigantea indica</i> Hume	Browthroated Spinetail Swift	R/LM	—	Nilgiri and associated hills.	Peninsular and N. E. Indian states, Andaman Islands; Bangladesh; Sri Lanka.	Evergreen and moist-deciduous biotopes.
121. <i>Chaetura sylvatica</i> (Tickell)	Whiterumped Spinetail Swift	R (patchy & local distribution)	upto 1700m in Himalayas & Somewhat lower in peninsular ranges.	Indian peninsular hills.	India : Lower Himalaya, Garhwal, east to Sikkim, Assam; Bangladesh	Evergreen and moist-deciduous biotopes.
122. <i>Apus melba nubifuga</i> Koelz	Indian Alpine Swift	R/SM/LM (during monsoon) breeding in W. Ghats & peninsular hills	2200m in Himalaya.	Throughout Indian peninsular hills.	India; Bangladesh.	Hilly tracts.
123. <i>Apus pacificus leuconyx</i> (Blyth)	Blyth's or Himalayan White rumped Swift	Uncertain	600m to 3600m in Himalayas (Particularly in breeding season)	Peninsular SW India.	India; Nepal; Bangladesh.	— " —
124. <i>Apus affinis affinis</i> (J. E. Gray)	Indian House Swift	R (common)	upto 2000m in Himalayas & in peninsular hills.	Entire peninsula, peninsular hills.	Throughout India.	Neighbourhood of Urban habitations.
125. <i>Cypsiurus parvus batasiensis</i> (J.E.Gray)	Indian Palm Swift	R	upto 1000m	Throughout peninsula.	India, south of Himalaya; Sri Lanka.	Open country and cultivation fields.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Subfamily HEMIPROCINAE						
126. <i>Hemiprocne longipennis coronata</i> (Tickell)	Crested Tree Swift	R/LM	upto 1000m in Himalayas.	Mudumalai Sanctuary, Nilgiris.	Throughout India from Himalaya to Kerala; Nepal; Bangladesh; Sri Lanka.	Well-wooded areas of deciduous forests.
Order TROGONIFORMES						
Family TROGONIDAE						
127. <i>Harpactes fasciatus malabaricus</i> (Gould)	Malabar Trogon	R (Uncommon)	upto 1500m	W. Ghats	South of 20°N lat.	Evergreen and moist-deciduous forests.
Order CORACIIFORMES						
Family ALCEDINIDAE						
128. <i>Ceryle rudis leucomelanura</i> Reichenbach	Indian Pied Kingfisher	R (common)	upto 1800m in Himalayas & Peninsular hills.	Peninsular hills including Nilgiris and Mudumalai.	Throughout India; Nepal; Bhutan; Pakistan; Sri Lanka; Bangladesh.	Rivers, streams and canals in open country. Occasionally tidal creeks of the sea shore.
129. <i>Alcedo atthis</i> (Linnaeus)	Common, or Small Blue Kingfisher	R (common)	Peninsular hills upto 1800m	Nilgiris, Mudumalai Sanctuary, Sigur falls (Moyar river)	South of the 20°N lat. to Kerala; Sri Lanka.	Streams, irrigation channels and ponds in open country.
130. <i>Alcedo meninting collarti</i> Baker	Blue-eared Kingfisher	R	upto 1000m or 1500m occasionally	W.Ghats complex Nilgiri hills.	India: East India and Western India from Goa to Kerala; Nepal; Bangladesh.	Prefers densely shaded spots. Small hill-streams in evergreen or thick bamboo forests.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
131. <i>Ceyx erithacus</i> (Linnaeus)	Indian Threetoed Forest Kingfisher	R	upto 1000m.	W.Ghats complex Nilgiri hills.	As above.	Moist-deciduous and evergreen biotopes.
132. <i>Pelargopsis capensis</i> (Linnaeus)	Brownheaded Stork-billed Kingfisher	R (common)	upto 1200m	Nilgiris, Mudu- malai Sanctuary Bidarhalla reser- voir (3 sightings)	All India from Lower Himalayas to Kerala, NE Hill states; Nepal; Sri Lanka; Bangladesh.	Forest streams and irrigation channels in well-wooded country and coas- tal backwaters.
133. <i>Halcyon smyrnensis</i> <i>fusca</i> (Boddaert)	Indian Whitebreasted Kingfisher	R/LM (common)	upto 1800m in Himalayas & in peninsular hills.	Nilgiris, Mudu- malai Sanctuary, Thorapalli, Masinagudi, Bandipur N.P.	Widely distributed throughout India, south of Sub-Him- alayan tracts to Kerala.	Wet paddy fields, flooded areas, canals, streams, sandy seashore and gardens in towns.
Family MEROPIDAE						
134. <i>Merops leschenaulti</i> Vieillot	Chestnutheaded Bee-eater	R	upto 1500m	Western Ghats complex including Nilgiris, Mudu- malai Sanctuary.	India: Submontane tracts of Hima- layas, NE hill states, Sri Lanka.	Neighbourhood of streams in mixed deciduous forests.
135. <i>Merops philippinus</i> Linnaeus	Bluetailed Bee- eater	R/LM	—	Peninsular India south to Mysore Dist.	Throughout India including Anda- man & Nicobar Islands; Nepal; Bangladesh.	Wooded country, near jheels, streams and coastal back waters.
136. <i>Merops orientalis</i> Latham	Indian Small Green Bee-eater	R/LM/SM	1500m in Himalayas & to 2000m in Nilgiris.	Nilgiris, Mudu- malai Sanctuary, Masinagudi, Bandipur N.P.	Throughout India; Nepal.	Open country and coastal sandy zones.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
137. <i>Nyctyornis athertoni</i> (Jardine & Selby)	Bluebeared Bee-eater	R/LM	1700m in Nilgiris.	Nilgiris.	Lower Himalaya to NE hill states; Bangladesh and Nepal.	Evergreen and moist-deciduous forests.
Family CORACIIDAE						
138. <i>Coracias benghalensis indica</i> Linnaeus	Southern Roller	R/LM (common)	upto 1000m.	Nilgiris, (Mudumalai Sanctuary, Masinagudi, Bandipur N.P.	Indian peninsula South of 20°N latitude; Sri Lanka; Maldiv Islands.	Groves and deciduous forests.
139. <i>*Eurystomus orientalis laetior</i> Sharpe	Kerala Broadbilled Roller	R	upto 500m.	Nilgiri	Kerala north to Wynaad (Malabar dist.), W. Karnataka (Coorg distt.) & W. Tamil Nadu.	Evergreen and semi-evergreen forests.
Family UPUPIDAE						
140. <i>Upupa epops</i> Linnaeus	Ceylon Hoopoe	R	upto 1700m.	Nilgiris (Mudumalai, Bandipur)	Throughout India; Nepal; and Sri Lanka.	Open country, deciduous forests, cultivated areas, plains and hills.
Family BUCEROTIDAE						
141. <i>Tockus birostris</i> (Scopoli)	Grey Hornbill	R/LM	upto 1000m	Nilgiris (except heavy rainfall areas of Kerala).	Himalaya, to W. Bengal, southward upto Kerala; Nepal	Open and well-wooded country, roadside avenues, groves, gardens and neighbourhood of cultivations.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
142. <i>Tockus griseus</i> (Latham)	Malabar Grey Hornbill	R	upto 1600m	Nilgiris	Mumbai, Goa, Karnataka, Tamil Nadu and Kerala.	Evergreen and moist-deciduous forests.
143. <i>Anthracoceros coronatus</i> (Boddaert)	Malabar Pied Hornbill	R/LM	upto 300m.	Nilgiri.	Indian peninsula; Sri Lanka.	Evergreen and moist deciduous forests, plains and foothills.
144. <i>Buceros bicornis</i> Linnaeus	Great Pied Hornbill	R/LM (governed by fruiting season)	upto 1500m in W.Ghats & upto 2000m in Himalayas.	Nilgiris (Mudu- malai Sanctuary, Masinagudi)	Disjunct popula- tions from Hima- layas eastward to NE hill states and W. Ghats complex.	Inhabits ever- green and moist- deciduous forest, plains and hills.
Order PICIFORMES						
Family CAPITONIDAE						
145. <i>Megalaima zeylanica</i> (Gmelin)	Green Barbet	R	upto 1200m.	Karnataka : Coorg distt.	From Goa to Tamil Nadu	Inhabits well- wooded moist- and dry deci- duous country, roadside avenues gardens.
146. <i>Megalaima viridis</i> (Boddaert)	Small Green Barbet	R (common)	upto 1800m in Nilgiris	Nilgiris (Mudu- malai Sanctuary, Moyar, Avara- halla)	W.Ghats complex	Restricted to ever- green biotope.
147. <i>Megalaima rubricapilla malabarica</i> (Blyth)	Malabar Crimson throated Barbet	R (locally common)	upto 1200m.	Nilgiris (—"") south of 16°N lat.	W.Ghats complex south of 16° N lat.	Restricted to ever- green biotope.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Family	PICIDAE					
Subfamily	PICUMNINAE					
148. <i>Picumnus innominatus malayorum</i> Hartert	Southern Speckled Piculet	R	upto 2000m.	Nilgiris and associated hills. to M.P. (Bastar distt.) and N.E. hill states.	W.Ghats complex South of 16°N, lat.	Inhabits moist deciduous and semi evergreen secondary jungles and mixed bamboo forest foothills.
Subfamily	PICINAE					
149. <i>Micropternus brachyurus jerdonii</i> (Malherbe)	Southern Rufous Woodpecker	R	upto 1000m.	Western Tamil Nadu and Karnataka	Gujarat thro' W. Maharashtra, to Kerala and Sri Lanka.	Plains and foothills, moist deciduous biotopes.
150. <i>Picus chlorolophus chlorigaster</i> Jerdon	South Indian Small Yellownaped Woodpecker	R	upto 1800m.	Nilgiris, Mudumalai and associated hills.	From Narbada River (Surat, Dangs) South to Kerala, Northward to E. ghats A.P. and Orissa.	Semi-evergreen & moist-deciduous forests.
151. <i>Dinopium benghalense</i> (Linnaeus)	Southern Golden-backed Woodpecker	R	upto 1200m.	Nilgiris.	South of Maharashtra, Tamil Nadu, Karnataka and W. Rajasthan.	Moist-deciduous forests, plains, hills, roadside avenues and villages.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
152. <i>Dinopium javanense malabaricus</i> Whistler & Kinnear	Malabar Golden-backed Threetoed Woodpecker	R	upto 1700m.	Nilgiris, Mudumalai	Goa, Kerala, W. Tamil Nadu & W. Karnataka.	Moist-deciduous and evergreen forests especially in the foothills.
153. <i>Dryocopus javensis hodgsonii</i> (Jerdon)	Indian Great Black Woodpecker	R	upto 1200m.	Nilgiris	Kerala northward to Tapti river thro' Western Tamil Nadu, Karnataka and Maharashtra.	Climax and secondary forests of evergreen and moist deciduous types.
154. <i>Picoides mahrattensis</i> (Latham)	Yellow fronted Pied or Mahratta Woodpecker.	R (very common)	upto 1300m. occasionally to 2000m in Nilgiris & Palnis.	Nilgiris	India; Pakistan and Sri Lanka.	Inhabits varied habitats from arid semi-desert to moist deciduous biotope, plains and associated hill ranges, foothills.
155. <i>Picoides nanus hardwickii</i> (Jerdon) Woodpecker	Kerala Brown-crowned Pygmy	R (common locally)	upto 1200m.	Nilgiris, Mudumalai Sanctuary, Masinagudi, Sugur falls.	From Coorg distt. in Karnataka Southward to Kerala.	Inhabits secondary jungle in deciduous and semi-evergreen biotope.
156. <i>Hemicircus canente</i> (Lesson)	Heartspotted Woodpecker	R (sparse distribution)	upto 1300m.	W. Ghats complex, Nilgiris.	Indian peninsula, Orissa to Assam; Bangladesh.	Inhabits plains and hills of moist deciduous and secondary evergreen forest biotope; bamboo jungle; shade trees; coffee plantations in S. India.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
157. <i>Chrysocolaptes festivus</i> (Boddaert)	Indian Black-backed Woodpecker	R	—	Nilgiris (Bandipur N.P.)	Peninsular India.	Inhabits deciduous forest-low country and foothills with scrub & scattered trees.
158. <i>Chrysocolaptes lucidus</i> (Scopoli)	Southern Larger Goldenbacked Woodpecker	R (common)	upto 1800m.	Nilgiris (Mudumalai Sanctuary and Avarahalla)	W.Ghats complex from Gujarat to Kerala.	Evergreen and moist-deciduous biotope, partial to scrub and mixed secondary jungle in the intermediate zone.
Order	PASSERIFORMES					
Family	PITTIDAE					
159. <i>Pitta brachyura</i> (Linneaus)	Indian Pitta	R/SM/WV	upto 1700m.	Nilgiris (Bandipur N.P.)	Indian subcontinent.	Scrub-jungles, deciduous and evergreen forests.
Family	ALAUDIDAE					
160. <i>Mirafra javanica cantillans</i> Blyth	Singing Bush Lark	R	upto 350m.	Nilgiris	Mostly throughout India.	Bush covered undulating plains and foothills, grassland and sandy semi desert.
161. <i>Mirafra assamica affinis</i> Blyth	Madras Bush Lark	R	—	Nilgiris	S.Orissa, M.P., throughout South India and Sri Lanka.	Scrub jungle and fallow land in open plains and plateaus.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
162. <i>Mirafra erythroptera</i> Blyth	Redwinged Bush Lark	R	—	Nilgiris.	Mostly throughout India.	Same habitat as above.
163. <i>Eremopterix grisea</i> (Scopoli)	Ashycrowned Finch-Lark	R/LM/SM	upto 1000m.	Nilgiris (Mudumalai, Bandipur)	India; Nepal and Sri Lanka.	Waste land, grazing grounds, ploughed fields, and dry tidal mudflats near sea coast.
164. <i>Ammomanes phoenicu- rus testaceous</i> Koelz Finch-Lark	Southern Rufostailed	R/SM	—	Nilgiris (Bandipur N.P.)	Peninsular India south of 15°N lat.	Scrub-and bush- country, fallow land, and near cultivated land.
165. <i>Calandrella cinerea dukhunensis</i> (Sykes)	Rufous Short- Toed Lark	WV	—	Nilgiris	From base of the Himalayas, South thro' Gangetic plains, to Kerala.	Open and grass- covered country, cultivated tracts, ploughed fields and dry tidal mudflats in coastal areas.
166. <i>Galerida malabarica</i> (Scopoli)	Malabar Crested Lark	R/SM	upto 2000m.	Nilgiris (Bandipur)	W. peninsular India from 23°N in Gujarat southward to Kerala.	Open scrub jungle, forest clearings, culti- vated land, hill slopes, dry and moist-deciduous biotopes and mudflats in coastal areas.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
167. <i>Galerida deva</i> (Sykes)	Deccan or Sykes's Crested Lark	R/SM	upto 1000m.	Nilgiris.	E. Rajasthan, N. Gujarat, east to Gangetic plains and South to Karnataka.	Scrub jungles and country side.
168. <i>Alauda gulgula australis</i> Brooks	Nilgiri Small Skylark.	R	upto 1600m.	Nilgiri	Sri Lanka.	Damp grassy tank margins, and grassy hilltops in Nilgiris, dry paddy stubbles in coastal & back-water areas of Kerala.
Family HIRUDINIDAE						
169. <i>Hirundo concolor</i> Martin Sykes	Dusky Crag	R/LM	upto 1800m.	Nilgiris (Mudumalai, Bandipur)	Peninsular India and from Gujarat to W.B.	Rocky hills with crags and old buildings.
170. <i>Hirundo rustica</i> Linnaeus	Western Swallow	WV	upto 3000m	Nilgiris (Mudumalai)	Throughout the subcontinent.	Open country, neighbourhood of rivers, jheels.
171. <i>Hirundo tahitica domicola</i> Jerdon	Nilgiri House Swallow	R	700m-2400m.	Nilgiris (Bandipur)	Hills of SW India and Sri Lanka.	Grassy hill slopes near tea & coffee plantations.
172. <i>Hirundo smithii filifera</i> Stephens	Indian Wiretailed Swallow	R/LM	1500m-2700m	Nilgiris	Peninsular India, Assam; and Bangladesh.	Open country and near jheels, rivers and reservoirs.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
173. <i>Hirundo daurica erythrogygia</i> Sykes	Striated or Redrumped Swallow	R/SM	upto 1600m.	Nilgiris. (Bandipur)	Throughout the subcontinent.	Cultivated country and clearings in deciduous forests and rocky hills.
174. <i>Delichon urbica</i> (Linnaeus)	European House Martin	Not Known.	3000m-4000m	Nilgiris.	Ladakh, Kashmir and peninsular India upto Kerala.	Open valleys and grassy hill sides.
Family LANIIDAE						
175. <i>Lanius vittatus</i> Valenciennes	Indian Baybacked Shrike	R/SM (in northern parts)	upto 2000m in Himalaya.	Nilgiris (Mudumalai Sanctuary) Bandipur N.P.	Throughout India.	Open scrub country
176. <i>Lanius schach caniceps</i> Blyth	South Indian Greybacked Shrike	R/SM (Local)	1200m.	Nilgiris	Peninsular India from extreme South to Kutch in Gujarat, M.P. & A.P.	Deciduous forests, cultivated lands etc.
177. <i>Lanius cristatus</i> Linnaeus	Brown Shrike	WV (Aug. to Apr.)	upto 2100m.	Nilgiris (Mudumalai Sanctuary)	Throughout India	Forest edges and clearings, secondary scrub jungle, grass-covered hill sides and semi-evergreen biotopes.
Family ORIOLIDAE						
178. <i>Oriolus oriolus kundoo</i> Sykes	Indian Golden Oriole	SV (to Himalaya) & WV (to peninsular India)	1500m (in peninsular hills, upto 3500m in Himalaya.	Nilgiris N.P.	Throughout the peninsula. Summer visitor to Kashmir Himalaya to Nepal	Well-wooded deciduous and semi-evergreen biotope, urban gardens, orchards, etc.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
179. <i>Oriolus chinensis diffusus</i> Sharpe	Eastern Blacknaped Oriole	WV (occasional)	—	Karnataka, Tamil Nadu & Kerala	Southern India and Assam; Bangladesh	Mixed deciduous and evergreen secondary jungle, rubber plantations, well-wooded gardens in urban areas.
180. <i>Oriolus xanthornus maderaspatanus</i> Franklin	South Indian Black-headed Oriole	R/LM	upto 1700m.	Nilgiris (Mudumalai Sanctuary, Moyar), Kakkanhalla, Bandipur N.P.	Peninsular India	Deciduous and semi-evergreen forest; orchards, gardens in towns & cities.
Family DICRURIDAE						
181. <i>Dicrurus adsimilis macrocerus</i> Vieillot.	South Indian Black Drongo	R/SM (Locally common.)	upto 2100m.	Nilgiris (Mudumalai Sanctuary Masinagudi, Bandipur N.P.).	Throughout the peninsular India.	Open deciduous forest and cultivated countryside.
182. <i>Dicrurus leucophaeus</i> Vieillot.	Indian Grey Drongo	WV to Peninsula.	upto 3300m in Himalaya	Tamil Nadu, Kerala	Breeds in Himalayas & winters in northern plains and peninsula upto Kerala; Sri Lanka.	Mixed-bamboo jungle, forest clearings, shady village groves and coffee & cardamom plantations.
183. <i>Dicrurus caerulescens</i> (Linnaeus)	Whitebellied Drongo	R/SM	upto 2000m.	Nilgiris (Mudumalai Sanctuary, Bandipur N.P.).	Whole of India.	Dry and moist-deciduous and bamboo forests, edges of clearings in thin tree jungle.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
184. <i>Dicrurus aeneus</i> Vieillot	Bronzed Drongo	R/moves locally in winter.	upto 2000m in Himalaya & peninsular hills.	Nilgiris (Mudumalai Sanctuary)	Widely distributed in India; Nepal; Bangladesh.	Broken foothills country in moist- deciduous and evergreen forest biotope, edges of forest clearings, mixed bamboo jungle, tea, coffee rubber plantations.
185. <i>Dicrurus hottentottus</i> (Linnaeus)	Haircrested or Spangled Drongo	R/SM	1400-2000m	Nilgiris.	Himalayan foothills to N.E. hill states, E.Ghats and W.Ghats complex	Inhabits moist- deciduous and evergreen forest biotope.
186. <i>Dicrurus paradiseus</i> (Linnaeus)	Southern Large Racket-tailed Drongo	R	upto 1500m.	Nilgiris (Mudu- malai Sanctuary) Kargudi, Thepp- akudi, Bandipur N.P.).	Peninsular India.	Broken foothill country in deciduous and evergreen forest biotope. Mixed teak and bamboo forest.
Family	ARTAMIDAE					
187. <i>Artamus fuscus</i> Vieillot	Ashy Swallow- Shrike	R/SM (locally in hills and heavy rainfall areas)	1700m to 2100m.	Nilgiris.	Himalayan foot- hills, peninsular India, NE hill states; Sri Lanka; Bangladesh; Nepal.	Openly wooded dry- and moist- deciduous country especially with palms, coconut & date trees.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Family STURNIDAE						
188. <i>Sturnus malabaricus blythii</i> (Jerdon)	Whiteheaded Myna	R/SM (local)	upto 1200m.	Nilgiris (Mudumalai Sanctuary) Masinagudi, Bandipur N.P.	Breeds in SW peninsular India in Kerala (Wynaad), W.Karnataka.	Thinly wooded country near human habitations, open secondary jungle, forest plantations.
189. <i>Sturnus pagodarum</i> (Gmelin)	Blackheaded or Brahminy Myna	R/SM (during monsoon).	upto 2400m.	Nilgiris, Bandipur N.P., Masinagudi.	Whole of India.	Open deciduous forest, scrub jungle, human habitations, wooded urban gardens.
190. <i>Sturnus roseus</i> (Linnaeus)	Rosy Starling or Rosy Pastor	WV	—	Nilgiris (Mudumalai Sanctuary, Bandipur N.P.)	Winter visitor to Pakistan & India, Sri Lanka.	Open countryside, grassland; avoids forests.
191. <i>Acridotheres tristis</i> (Linnaeus)	Indian Myna	R (very common)	upto 3000m in Himalaya.	Nilgiris (Mudumalai Sanctuary), Masinagudi Bandipur N.P.	Throughout Indian Subcontinent; Nepal; Bhutan; Sri Lanka.	Open countryside and near human habitations.
192. <i>Acridotheres fuscus mahrattensis</i> (Sykes)	Southern Jungle Myna	R/LM (seasonal)	upto 2400m.	Nilgiris (Mudumalai Sanctuary, Masinagudi, Bandipur N.P.).	Chiefly on the Western side of peninsula.	Deciduous forests, coffee & tea plantations. Avoids evergreen forests.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
193. <i>Gracula religiosa</i>	Southern Hill <i>indica</i> (Curvier)	R/LM Myna.	300-1700m. (seasonal)	Nilgiris (-"-)	Peninsular India in the Western Ghats complex; Sri Lanka.	In evergreen for- ests found upto 1700m, common in foothills, edges of coffee.
Family CORVIDAE						
194. <i>Dendrocitta vagabunda</i> (Latham)	Indian Tree Pie	R	upto 2000m.	Nilgiris (Mudu- malai sanctuary), Masinagudi, Bandipur N.P.	South of Godavari River, Tamil Nadu, Karnataka.	Dry-and moist- deciduous wooded country, open forests habitations and urban gardens.
195. <i>Dendrocitta leucogastra</i> Gould	Whitebellied Tree Pie	R	upto 1500m	Nilgiri Hills	Western Ghats complex.	Wet evergreen biotope upto 1500m, dense forest, cardamom sholas, ravines, secon- dary jungles, rubber plantations.
196. <i>Corvus splendens</i> Vieillot	Indian House Crow	R/SM (common)	upto 2100m.	Nilgiri Hills. Bandipur N.P. Introduced into Andaman Is.	Whole of India but not in Kerala.	Mostly near human habitations.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
197. <i>Corvus macrorhynchos culminatus</i> Sykes	Indian Jungle Crow	R	upto 2300m. in S.India.	Nilgiris (Mudumalai Sanctuary, Masinagudi, Gudalur), Bandipur Breeding in Nilgiris.	Peninsular India.	Absent in desert, semi-desert areas, inhabits wooded countryside outskirts villages, hamlets cities & towns.
Family CAMPEPHAGIDAE						
198. <i>Hemipus picatus</i> (Sykes)	Blackbacked Pied Flycatcher-Shrike	R	upto 1500m.	Nilgiris	Peninsular India	Moist-deciduous, forests, scrub jungle and gardens and zones between evergreen and deciduous forests.
199. <i>Tephrodornis gularis sylvicola</i> Jerdon.	Malabar Wood Shrike	R (Common)	upto 1800m in Nilgiris.	Nilgiri hills. river to Kerala.	From Narbada	Tall trees in evergreen and moist deciduous forests, shady trees in cardamom plantations.
200. <i>Tephrodornis pondicerianus</i> (Gmelin)	Indian Wood Shrike	R(common)	upto 2000m in Kerala, but usually below 200m.	Nilgiris (Mudumalai, Bandipur)	Deccan upto Kerala, Assam; Bangladesh; Nepal.	Scrub and secondary jungle, light wooded country, roadside, jungles and gardens around towns and villages.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
201. <i>Coracina novaehollandiae macei</i> (Lesson)	Indian Large Cuckoo- Shrike	R/LM	upto 1000m.	Nilgiris	Entire peninsula.	Wooded country, gardens, rubber plantations, deciduous and mixed forests.
202. <i>Coracina melanoptera sykesi</i> (Strickland)	Peninsular Blackheaded Cuckoo-Shrike	R/SM/WV in Nilgiris.	1500m to 2100m in Nilgiris.	Nilgiris (Mudumalai)	Entire Indian peninsula, Assam and NE hill states; Nepal	Secondary jungle, deciduous or mixed forests, fruit gardens and mangroves.
203. <i>Pericrocotus flammeus</i> (Forster)	Peninsular Indian Scarlet Minivet	R	upto 1800m in Nilgiri.	Nilgiris (Mudumalai, Bandipur)	SW Peninsular India from Tapti river in Gujarat Southward to Kerala; and Sri Lanka.	Deciduous, mixed evergreen forests.
204. <i>Pericrocotus cinnamomeus</i> (Linnaeus)	Southern Malabar Small Minivet.	R	upto 1500m in peninsular hills.	Nilgiris Gujarat to Tamil Nadu; Sri Lanka.	From Saurashtra in	Deciduous, mixed and evergreen forests.
205. <i>Pericrocotus erythropygus</i> (Jerdon)	Whitebellied Minivet	R (Rare)	—	Foot of Nilgiris.	Peninsular India. and semi-desert areas.	Open countryside
Family IRENIDAE						
206. <i>Aegithina tiphia deignani</i> Hall	Peninsular Indian Iora	R (common)	upto 1000m.	Nilgiris (Mudumalai Sanctuary, Masinagudi, Moyar river, Bandipur N.P.)	Indian peninsula south of lat. 20°N. excluding S. Kerala.	Deciduous forests and cultivation lands.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
207. <i>Chloropsis aurifrons frontalis</i> (Pelzeln)	Southern Gold fronted Chloropsis or Leaf Bird	R(common)	upto 1200m-1800m in Nilgiris.	Nilgiris (Bandipur N.P. and Mudumalai Sanctuary).	From Tapti River to Western Tamil Nadu and Karnataka.	Evergreen, deciduous and secondary forests and plantations. Prefers thickly wooded country.
208. <i>Chloropsis cochinchinensis jerdoni</i> (Blyth)	Jerdon's Chloropsis or Leaf Bird	R(common)	upto 1000m.	Nilgiris ("--)	Throughout peninsula and Sri Lanka.	Scrub jungle, groves and countryside.
209. <i>Irena puella</i> (Latham)	Fairy Bluebird	R/SM	upto 1800m	Nilgiris ("--)	SW India.	Moist-deciduous and evergreen forests sholas and coffee plantations.
Family PYCNONOTIDAE						
210. <i>Pycnonotus priocephalus</i> (Jerdon)	Greyheaded Bulbul	R (Locally common)	upto 1800m.	Nilgiris.	Heavy railfall areas along SW India from Belgaum to Kerala.	Inhabits dense evergreen cane-brakes in jungles.
211. <i>Pycnonotus melanicterus gularis</i> (Gould)	Rubythroated Yellow Bulbul	R	upto 1000-1200m.	Nilgiris.	Goa, W.Karnataka from Belgaum to Kerala and adjacent parts of Tamil Nadu.	Edges of evergreen forests, thickets along rivers, mixed bamboo, forests clearings and secondary jungles.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
212. <i>Pycnonotus jocosus fuscicaudatus</i> (Gould)	Southern Red-Whiskered Bulbul	R (Common)	upto 1800m.	Nilgiris (Bandipur N.P. Mudumalai Sanctuary, Thorapalli)	From Tapti River south to Cape Comorin	Scrub jungle and urban gardens.
213. <i>Pycnonotus cafer</i> (Linnaeus)	Redvented Bulbul	R (common)	upto 1500m.	Nilgiris ("– & Masinagudi, Moyar River etc.).	S. India.	Gardens, secondary jungles and deciduous forests.
214. <i>Pycnonotus luteolus</i> (Lesson)	Whitebrowed Bulbul	R (common)	upto 1200m	Nilgiris ("–)	Peninsular India South of 23°N latitude.	Dry, open, scrub country.
215. <i>Hypsipetes indicus</i> (Jerdon)	Yellowbrowed Bulbul	R (common)	900-1500m.	Nilgiris ("–)	Western Ghats south of Belgaum; and Sri Lanka.	Sholas, and edges of thick jungles.
216. <i>Hypsipetes madagascariensis ganeesa</i> Sykes	South Indian Black Bulbul	R/LM (in nonbreeding season)	upto 1000m or above.	Nilgiris and associated hills.	Westren Ghats Complex.	Evergreen forests, especially sholas
Family MUSCICAPIDAE						
Subfamily TIMALIINAE						
217. <i>Pellorneum ruficeps olivaceum</i> Jerdon	Peninsular or Kerala Spotted Babbler	R	upto 1350m.	Nilgiris	W. & E. Ghats, tracts of Bihar and Orissa.	Sholas, thickets in ravines and along water courses.
218. <i>Pomatorhinus schsticeps travancorensis</i> Harrington	Kerala Scimitar Babbler	R(common)	upto 2400m in Nilgiris.	Nilgiris	W. Ghats.	Evergreen and deciduous forest.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
219. <i>Dumetia hyperythra albogularis</i> (Blyth)	Whitethroated Babbler	R (common)	upto 1200m	Nilgiris.	S.India.	Grasslands, scrub jungles and deciduous forest.
220. <i>Rhopocichla atriceps bourdilloni</i> (Hume)	Kerala Blackheaded Babbler	R (common)	600-1800m	Nilgiris.	Western Ghats from Belgaum to Palghat gap.	Evergreen biotope.
221. <i>Chrysomma sinense</i> (Gmelin)	Yellow-eyed Babbler	R	upto 1000m in hills.	Nilgiris.	Peninsula and northeastern India; Bangladesh; Nepal; Bhutan.	Inhabits scrub jungles, grassy sugarcane fields etc.
222. <i>Turdoides caudatus</i> (Dumont)	Common Babbler	R (common)	400m in peninsula, 2100m in Himalaya.	Nilgiris, Bandipur N.P., Mudumalai Sanctuary	All India; Pakistan.	Inhabits xerophytic thorny scrub jungles sandy flood plains bushes etc.
223. <i>Turdoides malcolmi</i> (Sykes)	Large Grey Babbler	R (common)	upto 1200m in hills of peninsula.	Nilgiris.	Peninsular India; Punjab, Rajasthan, Uttar Pradesh.	Dry scrub country city gardens, village environs etc.
224. <i>Turdoides subrufus</i> (Jerdon)	Rufous Babbler	R (common in south)	upto 1500m.	Nilgiri hills.	From Mahabaleshwar in W.Ghats to Karnataka.	Dense scrub undergrowth, intermingled with tall grass and bamboo brakes, edges of forests.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
225. <i>Turdoides striatus orientalis</i> (Jerdon)	Peninsular Jungle Babbler	R (commonest bird in peninsula).	upto 1500m.	Nilgiris, Bandipur N.P.	Peninsular India.	Deciduous forests bamboo plants and cultivated lands. (Boundries of the range of sub spp- Malabar Jungle Babbler are close to the Nilgiris).
226. <i>Turdoides affinis</i> (Jerdon)	Whitheaded Babbler	R (locally common)	300m to 1000m.	Nilgiri hills (Mudumalai Sanctuary, Masinagudi, Theppakadu, Moyar)	South India.	Dense and secondary jungle, village surroundings, orchards and urban gardens.
227. <i>Garrulax delesserti delesserti</i> (Jerdon)	Wynaad Laughing Thrush	R (locally common)	1000m and above.	Nilgiris.	Hills of SW India.	Humid rain forests with dense undergrowth of <i>Strobilanthes</i> sp. and canebrakes.
228. * <i>Garrulax cachinnans</i> (Jerdon)	Nilgiri Laughing Thrush	R	1200m & above.	Confined to Nilgiri Hills	Confined to Nilgiri hills only.	Dense undergrowth in forests, sholas bushes and scrub.
229. <i>Garrulax jerdoni</i> Blyth	Kerala or White Breasted Laughing Thrush	R	upto 1200m.	Nilgiris (?)	The hills of Kerala and Western Tamil Nadu.	Evergreen biotopes, tea and cardamom plantations, scrub and secondary jungles.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
230. * <i>Alcippe poiocephala</i> (Jerdon)	Nilgiri Quaker Babbler	R (common)	upto 2100m.	Nilgiris (Bandipur N.P. Mudumalai Sanctuary).	From W.Karna- taka to Kerala along the Ghats.	Evergreen and moist-deciduous forests, sholas, ravines, bamboo jungle and cane-brakes.
Subfamily MUSCICAPINAE						
231. <i>Muscicapa latirostris</i> Raffles	Brown Flycatcher	WV	upto 1300m	Nilgiris (Mudu- malai sanctuary, Masinagudi, Sigur falls)	Most of the penin- sula, Andaman- Nicobar Is.; and Sri Lanka.	Deciduous forests, teak & coffee plantations, margins of jungles & sholas.
232. <i>Muscicapa muttui</i> (Layard)	Brownbreasted Flycatcher	—	300m to 1000m.	Nilgiris	SW India and Sri Lanka.	Evergreen forests and scrub jungles.
233. <i>Muscicapa ruficauda</i> Swainson	Rufoustailed Flycatcher	—	upto 1000m.	Nilgiris.	SW India.	Evergreen forests.
234. <i>Muscicapa parva</i> <i>albicilla</i> Pallas	Eastern Red- breasted Flycatcher	WV & pass- age migrant.	upto 2100m.	Nilgiris.	Most of India; Bangladesh.	Groves, orchards, bushes and scrub jungles.
235. * <i>Muscicapa nigrorufa</i> (Jerdon)	Black-and- Orange Flycatcher	R (common)	700m to 1500m	Nilgiris	Southern section of W.Ghats and associated hills.	Evergreen sholas, edges of carda- mom & coffee plantations.
236. <i>Muscicapa pallipes</i> Jerdon	Whitebellied Blue Flycatcher	R (common)	upto 1800m	Nilgiris	Hills of SW India.	Mostly evergreen forests and sholas.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
237. <i>Muscicapa rubeculoides</i> (Vigors)	Bluethroated Flycatcher	Found in winter (Oct-March)	upto 1000m.	Nilgiri hills.	Widely distributed in India at different seasons.	Well-wooded country and bamboo jungles in winter season.
238. <i>Muscicapa tickelliae</i> (Blyth)	Tickell's Red- breasted Blue Flycatcher	R/LM (breeding in S. Indian hills.)	upto 1500m.	Nilgiri hills (Mudumalai Sanctuary, Bandipur N.P.).	Indian peninsula from U.P. to Kerala, Kutch to N.E. hill states; Bangladesh.	Thick bushes near forests and streams, deci- duous scrubs, bamboo jungles, village groves, wooded gardens and orchards.
239. <i>Muscicapa thalassina</i> Swainson	Verditer Flycatcher	Wintering (Oct.-Mar.) (breeds in Himalaya as SV)	upto 750m in S.India & upto 3000m in Himalaya.	Nilgiris (Mudumalai Sanctuary).	Winters at Himala- yan foothills, south thro' Indian penin- sula from Sambhar lake to S.Kerala. Also Assam; Bangladesh.	Edges of forest garden groves and on Telephonic wives.
240. * <i>Muscicapa albicaudata</i> Jerdon	Nilgiri Verditer Flycatcher	R (common)	600m to 1200m or above.	Nilgiris (Mudumalai Sanctuary)	The Southern section of W.Ghats from hills of Karnataka thro' Nilgiris, Palnis and associated ranges in Kerala to Ashambu Hills.	Around streams, cardamom, coffee plantations, edges of forests, sholas, trees and gardens.
241. <i>Culicicapa ceylonensis</i> (Swainson)	Southern Greyheaded Flycatcher	R (common) breeds in W.Ghats.	900m or above.	Nilgiri hills.	Hills of SW India from S.Karnataka to Ashambu Hills including Palnis; Sri Lanka.	Evergreen forests, sholas, bamboo forests, wooded ravines, coffee plantations

(1)	(2)	(3)	(4)	(5)	(6)	(7)
242. <i>Rhipidura aureola compressirostris</i> Blyth	Southern Whitebrowed Fantail Flycatcher	R/LM (common)	upto 1000m.	Nilgiris (Mudumalai Sanctuary)	Southern India; Sri Lanka.	and gardens. Deciduous forests, groves, wooded compounds, gardens, orchards and secondary scrub jungle.
243. <i>Rhipidura albicollis albogularis</i> Lesson	Whitespotted Flycatcher.	R/LM Fantail (common)	upto 2000m in Nilgiris.	Nilgiri Hills.	Indian Peninsula	Well-wooded areas secondary jungle, groves, gardens, even in cities prefers broken country & more humid areas.
Subfamily MONARCHINAE						
244. <i>Terpsiphone paradisi</i> Linnaeus	Peninsular Indian Paradise Flycatcher	R/LM (common)	2000m in Nilgiris.	Nilgiri hills (Mudumalai Sanctuary, Masinagudi, Moyar river)	Indian peninsula from Gir Forest to the hills of Kerala, east thro' W.B.; Bangladesh. Rare in the Deccan.	Well-watered and shady forest, bamboo clad nallahs, plantations, village groves, gardens and scrub jungle.
245. <i>Monarcha azurea styani</i> (Hartaub)	Indian Blacknaped Monarch Flycatcher	R/LM/winter movements.	upto 1500m in Kerala.	Nilgiris.	Most parts of peninsular and North Eastern India; Nepal; Bangladesh.	Well-wooded country, evergreen and mixed deciduous forests, secondary jungles and coffee, cardamom and

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Subfamily SYLVIINAE						
246. <i>Cisticola exilis erythrocephala</i> Blyth	Redheaded Fantail Warbler	R (common)	above 900m.	Nilgiris.	S.Indian hills from high ranges of Kerala to Palni and north upto Brahmagiri	Tall grass, low <i>Strobilanthes</i> and broken scrub on open hill slopes with sholas.
247. <i>Cisticola juncidis cursitans</i> (Franklin)	Streaked Fantail Warbler	R/LM	upto 2100m in hills of Kerala.	Nilgiris	Widely distributed in India.	Paddy fields, open grasslands, tall grass along margins of tanks, lagoons etc.
248. <i>Prinia hodgsoni</i> Blyth	Southern Ashy-grey Wren-Warbler	R/LM (seasonal & common)	under 1000m	Nilgiris (Mudumalai Sanctuary, Masinagudi) Bandipur N.P.	Indian Peninsula.	Mostly deciduous jungle with tall grass and coffee plantations.
249. * <i>Prinia subflava</i> (Gmelin)	Nilgiri Plain Wren-Warbler	R (common)	upto 1800m.	Nilgiris Bandipur N.P., Mudumalai Sanctuary	SW India from Karnataka through Kerala.	Grasslands, paddy fields, slopes, patches of <i>Berberis</i> , <i>Rubus</i> on high grassy plateaux.
250. <i>Prinia socialis</i> Sykes	Southern Ashy Wren-Warbler	R (locally common)	Hills upto highest summit	Peninsular India including Nilgiris	Entire Indian peninsula.	Grassland and scrub jungles, deciduous forests, gardens, reed-beds, grassy hillsides, mangroves etc.

teak plantations.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
251. <i>Prinia sylvatica</i> Jerdon	Peninsular Jungle Wren-Warbler	R (common)	hills upto 1500m.	Nilgiris	Indian peninsula.	Scrubby country- sides, streams, hills and thorny bushes.
252. <i>Orthotomus sutorius</i> (Pennant)	Indian Tailor Bird	R (common)	upto 1400m.	Nilgiris (Mudu- malai Sanctuary, Masinagudi), Bandipur N.P.	India from Himala- yan foothills to Kanyakumari.	Herbaceous gar- dens, scrub country, deci- duous jungles and wooded- compounds.
253. <i>Locustella naevia</i> <i>straminea</i> Seebohm	Eastern Grasshopper Warbler	WV	upto 1800m	NBR parts of Tamil Nadu.	Indian subconti- nent; Bangladesh,	Swampy depressions jungles, ricefields and fringes of sholas.
254. <i>Schoenicola platyura</i> (Jerdon)	Broadtailed Grass Warbler	R(common)	900m to 2000m.	Nilgiris, & asso- ciated hills.	Hills of Southern W.Ghats.	Steep grassy hill sides, reeds & grass in marshy places along hill tops and open slopes of Nilgiris.
255. <i>Acrocephalus stentoreus</i> <i>brunnescens</i> (Jerdon)	Indian Great Reed Warbler	WV/passage migrant	upto 1600m	NBR parts of Tamil Nadu.	India; Pakistan.	Reed-beds, tall bushes around water bodies, mangrove swamps, reeds along backwaters etc.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
256. <i>Acrocephalus dumetorum</i> Blyth	Blyth's Reed Warbler	WV (common)	upto 3300m in Himalaya, 2100m in Southern hills.	Nilgiris (Mudumalai Sanctuary, Sigur falls)	India; Nepal; Sri Lanka.	Bushes, orchards, gardens, bamboo clumps, grain fields near & away from water-mostly in deciduous biotopes.
257. <i>Acrocephalus agricola</i> (Jerdon)	Indian Paddyfield Warbler	WV	—	Nilgiris	India; Pakistan; Bangladesh.	In winter inhabits paddy fields reed-beds, sugarcane, bushes and elephant grass.
258. <i>Hippolais caligata</i> (Lichtenstein)	Booted Tree Warbler	WV (common)	—	Nilgiris	Indian peninsula from M.P. south to Kanyakumari; Sri Lanka; Bangladesh.	Deciduous, scrub jungles, isolated shrubs in cultivated land, clumps of grass and reeds.
259. <i>Sylvia hortensis</i> (Gmelin)	Eastern Orphean Warbler	WV in South.	—	Nilgiris	Sind, Punjab, U.P., South thro' Deccan to Karnataka & Tamil Nadu.	Semi-deserts, stony countryside, ravines with vegetation and babool trees.
260. <i>Sylvia curruca</i> (Linnaeus)	Siberian Lesser White throat	WV (common)	upto 900m	Nilgiris.	India from W.Himalayan foothills, U.P., thro' peninsula to Tamil Nadu	Scrub jungles and undergrowths, semi-desert country side.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
261. <i>Phylloscopus tyleri</i> Brookes	Tyler's Leaf Warbler	WV	—	Nilgiris (Two records, January & March)	Winter from W. Maharashtra from Khandala to Nilgiris.	Winter habitats uncertain.
262. <i>Phylloscopus affinis</i> (Tickell)	Tickell's Leaf Warbler	WV (SV in Himalayas)	upto 2100m & upto 4500m	Nilgiris.	Winters from Himalayan foot- hills thro' penin- sula to SW hills of Karnataka & Kerala, Assam; Bangladesh.	Scrub and sec- ondary jungles and well-wooded countryside.
263. <i>Phylloscopus magnirostris</i> Blyth	Largebilled Leaf Warbler	WV (SV to Himalayas)	—	Nilgiris	Karnataka, Kerala, Andaman Is. & Sri Lanka.	In winter found in evergreen forests in sholas.
264. <i>Phylloscopus trochiloides</i> (Sundevall)	Western Greenish Leaf Warbler	WV (SV to Himalaya)	600m to 900m.	Nilgiris (Mudu- malai Sanctuary, N.B.R. localities)	Himalayan foothills S.Kerala; Sri Lanka.	Gardens, orchards, wooded compounds, <i>Acacia</i> groves, open deciduous jungle, etc.
265. <i>Phylloscopus occipitalis</i> (Blyth)	Large Crowned Leaf Warbler	WV (SV to Himalaya)	hills upto 2100m.	Nilgiris-common on western side of peninsula.	Winters in Indian peninsula; Bangladesh.	Mostly moist- deciduous and evergreen biotopes in winter.
Subfamily TURDINAE						
266. * <i>Brachypteryx major</i> (Jerdon)	Rufousbellied Shortwing	R (common)	1300 to 2100m (mostly above 1600m)	Nilgiris.	The hills of S.Kar- nataka including Brahmagiri & Nilgiris.	Well-wooded sholas.

Nilgiris.						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
267. <i>Erythacus brunneus</i> (Hodgson)	Bluechat	WV	—	Nilgiris	Hills of SW India; Assam.	Ever green forest, shady streams & plantations.
268. <i>Copsychus saularis</i> <i>ceylonensis</i> Sclater	Ceylon Magpie Robin	R (common)	1200m.	N.B.R. localities	Southern India, South of Cauvery River to Kerala; Sri Lanka.	Near human habitations, orchards, plan- tations and scrub jungles.
269. <i>Copsychus malabaricus</i> (Scopoli)	Malabar Shama	R (local distribution)	upto 700m.	Nilgiri hills.	W. Indian Peninsula	Dense secondary undergrowths, bamboo forests etc.
270. <i>Phoenicurus ochruros</i> <i>rufiventris</i> (Vieillot)	Eastern Black Redstart	WV (SV to N.Himalaya)	3300-5200m in Himalayas during breeding.	Nilgiris.	In winter from foothills of Himalaya to Karnataka and Tamil Nadu.	In winter frequents stony scrubbed broken country, dry water-courses near villages & cultivated areas.
271. * <i>Saxicola caprata</i> <i>nilgirensis</i> Whistler	Nilgiri Pied Bush Chat	R (common)	From 900m upto 1500m.	Nilgiris	Hills of S.India from Nilgiris southwards.	Grassy hill sides with wild palms and <i>Emblica</i> plants.
272. <i>Saxicoloides fulicata</i> (Linnaeus)	Blackbacked Indian Robin	R (common)	900m to 1800m	Nilgiris (Mudu- malai Sanctuary, Masinagudi, Moyar; Bandipur N.P.).	Southern India south of Krishna River upto Kerala.	Thin scrub jungles, dry deci- duous forests, bushes, fallow paddy fields

(1)	(2)	(3)	(4)	(5)	(6)	(7)
273. <i>Monticola cinclorhynchus</i> (Vigors)	Blueheaded Rock Thrush	WV (SV to Himalaya)	upto hills of highest summit in winters.	Nilgiris (Mudumalai Sanctuary)	Winters mostly in W.Ghats.	and gardens. Moist-deciduous, secondary evergreen jungle, coffee & cardamom plantations in hills and mango groves.
274. <i>Monticola solitarius</i> (Linnaeus)	Indian Blue Rock Thrush	WV (SV to Himalaya)	2100m in Southern hills.	Nilgiris.	In winter from Himalayan foothills, through peninsular India; Sri Lanka; Bangladesh.	Inhabits broken, rocky country, cliffs and rocks along seashores, old forts, ruined buildings etc.
275. <i>Myiophonus horsfieldii</i> (Vigors)	Malabar Whistling Thrush	R (common)	upto 2200m in Southern hills.	Nilgiris (N.B.R. localities)	Peninsular India	Swift-running rocky hill streams in shady evergreen jungle, cardamom ravines.
276. <i>Zoothera citrina cyanotus</i> (Jardine & Selby)	Whitethroated Ground Thrush	R/LM (common)	In the hills 1200m-1500m.	Nilgiris.	Indian peninsula	Forests, shady ravines, cardamom sholas, coffee plantations and bamboo jungles.
277. * <i>Zoothera dauma neilgherriensis</i> (Blyth)	Nilgiri Thrush	R (common)	600m to 2000m.	Nilgiris.	W.Ghats complex Palni and associated hills.	Dense evergreen sholas and forests.
278. * <i>Turdus merula simillimus</i> (Jerdon)	Nilgiri Blackbird	R (common)	1200m or above	Nilgiris.	Hills of SW India from Brahmagiris	Evergreen sholas & coffee

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Family	PARIDAE					
Sub family	PARINAE					
279. <i>Parus major stupae</i> Koelz	Indian Grey Tit	R/LM (common) -Breeds in the hills.	—	Nilgiris (Mudu- malai Sanctuary, Masinagudi, Moyar, Bandi- pur N.P.).	Peninsular India to Palnis.	Light-deciduous forests, village groves, orchards etc.
280. <i>Parus xanthogenys</i> <i>travancorensis</i> (Whistler & Kinnear)	Southern Yellow cheeked Tit	R (common)	180m to 1500m	Nilgiris.	W.Ghats	Evergreen biotopes, open forests; mixed bamboo jungle, cardamom sholas and coffee plantations.
Family	SITTIDAE					
Subfamily	SITTINAE					
281. <i>Sitta castanea castanea</i> Lesson	Peninsular Chestnut bellied Nuthatch	R (common)	—	Nilgiris (Mudu- malai Sanctuary)	Practically whole of India.	Forests, mango groves, roadside trees in deci- duous & foothills countryside Avoids coastal areas.
282. <i>Sitta frontalis</i> Swainson	Velvetfronted Nuthatch	R (locally common)	Plains upto 1500m.	Nilgiris (Mudumalai Sanctuary)	From Himalayan foothills to Kerala; Sri Lanka.	Open broad- leaved forests, mixed bamboo jungle, evergreen sholas, coffee & cardamom plantations.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Family MOTACILLIDAE						
283. <i>Anthus hodgsoni</i> Richmond	Indian Tree Pipit	WV (SV to Himalaya)	Plains to summit of hills.	Nilgiris in winter.	In winter from Himalayan foothills to Bangladesh.	Cooffee and cardamom plantations.
284. <i>Anthus trivialis trivialis</i> (Linnaeus)	European Tree Pipit	WV (common)	—	Nilgiris (in winter)	From Himalayan foothills to Nilgiri hills.	Cultivated lands, shady country roads, prefers more open ground.
285. <i>Anthus novaeseelandiae</i> Gmelin	Indian Paddyfield Pipit	R/LM (common)	upto 1000m.	Nilgiris	Most of NE, Eastern & Southern India (except Kerala); Nepal; Bangladesh.	Open country sides.
286. <i>Anthus similis similis</i> Jerdon	Rufous Rock Pipit	R (common)	1000m or above	Nilgiri hills.	W.Ghats and Palni hills.	Grassy hill sides with boulder, rocks, and open field.
287. * <i>Anthus nilghiriensis</i> Sharpe	Nilgiri Pipit	R (common)	Breeds above 1500m in Nilgiris & associated hills.	Nilgiris	—	Hills covered with short grass, coffee plantation.
288. <i>Motacilla indica</i> Gmelin.	Forest Wagtail	WV	upto 2100m.	Nilgiris.	SW India, N.E.hill states; and Sri Lanka.	Evergreen and deciduous forests, coffee & cardamom plantations, forest clearings and mixed bamboo jungles.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
289. <i>Motacilla flava</i> Linnaeus	Yellow Wagtail	WV (common)	—	Nilgiris.	India; Sri Lanka; Maldives and Bangladesh.	Moist grassy grounds, riversides and jheel margins.
290. <i>Motacilla caspica</i> <i>caspica</i> (Gmelin)	Grey Wagtail	WV	upto 1500m.	Nilgiris (Mudu- malai Sanctuary, Masinagudi, Moyar, Bandipur N.P., Theppakadu, Sigur falls etc.)	Thro'out Indian peninsula, Andaman & Nicobar Is.; Sri Lanka and Bangladesh.	Rocky streams in plains & foothills.
291. <i>Motacilla alba</i> <i>dukhunensis</i> Sykes	Indian Pied or White Wagtail	WV	upto 1500m.	Nilgiris	N.E. Hill states, north & peninsular India; Bangladesh and Sri Lanka.	Open country near rivers, tanks, paddy & wheat fields in suburban areas.
292. <i>Motacilla maderaspa-</i> <i>tensis</i> Gmelin	Large Pied Wagtail	R (common)	upto 2200m	Nilgiris Mudu- malai Sanctuary, Moyar River, Bandipur N.P.)	Indian Subconti- nent; Bangladesh and Sri Lanka.	Water courses, smooth running rocky streams, tanks, pools, wells, rice fields & lawns.
Family DICAEDAE						
293. <i>Dicaeum agile</i> (Tickell)	Indian Thickbilled Flower pecker	R (common)	800-3000m.	Nilgiris	Indian peninsula and NE-hill states.	Large flowering or fruiting trees & shrubs in dry- to moist-deci- duous and semi- evergreen forests, cultivation gardens and orchards.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
294. <i>Dicaeum erythrorhynchos</i> (Latham)	Tickell's Flowerpecker	R (common)	upto 1400m	Nilgiris (Mudumalai Sanctuary, Masinagudi, Sigur falls).	Himalayan foothills to Kanyakumari and Bangladesh.	Deciduous forests, plantations and open country.
295. <i>Dicaeum concolor</i> Jerdon	Nilgiri Flowerpecker	R (common)	upto 1000m.	Nilgiris ("--")	SW India.	Deciduous & evergreen forests, tea & coffee plantations and groves.
Family NECTARINIIDAE						
296. <i>Nectarinia zeylonica sola</i> (Viellot)	Indian Sunbird	R (common) Purplerumped	upto 750m	Nilgiris ("--")	Peninsular India, Bengal; Sri Lanka; Bangladesh.	Scrub and secondary jungle, cultivated country and near villages.
297. <i>Nectarinia minima</i> (Sykes)	Small Sunbird	R (common)	300m-2100m in South Indian hills.	Nilgiris.	Western Ghats, Palnis.	Evergreen biotope; foothill country, forests, sholas, gardens & coffee plantations.
298. <i>Nectarinia lotenia hindustanica</i> (Linnaeus)	Indian Maroon-breasted Sunbird	R (common)	upto 1600m.	Nilgiris	Indian peninsula.	Moist-deciduous biotopes with plenty of flowering trees, gardens etc.
299. <i>Nectarinia asiatica asiatica</i> (Latham)	Indian Purple Sunbird	R/LM (common)	2400m in Nilgiris.	Nilgiris (Mudumalai Sanctuary Bandipur N.P.).	Whole of India and Sri Lanka.	Light deciduous forests gardens etc.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
300. <i>Aethopyga siparaja vigorsii</i> (Sykes)	Vigors's Yellow-backed Sunbird	R (common)	upto 900m	Nilgiris	W.Ghats.	Wooded foothills, evergreen and moist-deciduous biotopes.
301. <i>Arachnothera longirostris longirostris</i> (Latham)	Little Spiderhunter	R (common)	upto 2100m.	Nilgiris & associated hills.	W.Ghats complex	Moist-deciduous, evergreen biotopes, secondary jungles along rivers, cardamom sholas & cultivated banana patches.
Family ZOSTEROPIDAE						
302. * <i>Zosterops palpebrosa nilgiriensis</i> Ticehurst	Nilgiri White-eye	R/SM (common)	350m and above	Nilgiris (Mudumalai Sanctuary, Masinagudi Bandipur N.P.).	Hills of SW Karnataka, Kerala, Western Tamil Nadu.	Evergreen sholas, cardamom plantations, scrub jungles, gardens & orchards.
Family PLOCEIDAE						
Subfamily PASSERINAE						
303. <i>Passer domesticus indicus</i> Jardine & Selby	Indian House	R(abundant)	In Nilgiris at all elevations.	Nilgiris (all N.B.R. localities), Bandipur N.P.	The whole of India; Pakistan; Bangladesh; Sri Lanka.	Commensal of man. Inhabits villages to cities, cultivated areas scrub jungle.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
304. <i>Petronia xanthocollis xanthocollis</i> (Burton)	Indian Yellow Sparrow	R/LM (locally common-movements governed by rain)	upto 1200m in Nilgiris.	Nilgiris (Mudumalai Sanctuary)	The whole Indian peninsula, foothills to Kanyakumari.	Open dry-deciduous forests, thorn jungles, groves, hedges, cultivation near villages.
Subfamily PLOCEINAE						
305. <i>Ploceus philippinus philippinus</i> (Linnaeus)	Indian Baya	R/SM (common)	upto 1200m	Nilgiris.	The whole of India; Pakistan.	Open cultivation near paddy fields, grasslands, secondary scrub with babool, date and palm trees.
306. <i>Ploceus manyar flaviceps</i> Lesson	Indian Streaked Weaver Bird	R (common locally)	—	Nilgiris	Bengal & South throughout Indian peninsula; Sri Lanka.	Flat, swampy and rain-flooded land and river beds, reeds standing in water & flooded gardens.
Subfamily ESTRILDINAE						
307. <i>Lonchura malabarica</i> (Linnaeus)	Whitethroated Munia	R (common)	600m to 1200m	Nilgiris, Mudumalai Sanctuary, Bandipur N.P.	Throughout Indian Union.	Grassland, Babool jungle, scrubbed country, light secondary jungle; prefers drier country.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
308. <i>Lonchura striata striata</i> (Linnaeus)	Southern White backed Munia	R/LM	upto 1800m in S.India.	Nilgiris.	Indian peninsula; Sri Lanka.	Scrub and lightly- wooded country- side, deciduous jungles and gardens.
309. * <i>Lonchura kelaarti</i> <i>jerdoni</i> (Hume)	Jerdon's Rufous- bellied Munia	R/LM(SV to Nilgiris)	upto 2100m.	A summer visitor at higher levels in Nilgiris & Western Ghats complex.	SW India from Coorg & S. Karnataka to S.Kerala & Western Tamil Nadu.	Scrub jungle, grassland, fallow fields forest clearings and human settlements.
310. <i>Lonchura punctulata</i> <i>punctulata</i> (Linnaeus)	Indian Spotted Munia	R (common)	upto 2100m. in Nilgiris, 1800m in Himalaya.	Nilgiris (Mudu- malai Sanctuary, Bandipur N.P.).	The whole of India; Sri Lanka.	Open country, scrub, bush clad hill sides, secondary jungle, grasslands and gardens.
311. <i>Lonchura malacca</i> <i>malacca</i> (Linnaeus)	Southern Black- headed Munia	R/LM	upto 2100m in hills of S. India.	Nilgiris	Indian peninsula; Sri Lanka.	Marsh land, reed- beds, grass fields, flooded paddy cultivation in forest clearings.
Family FRINGILLIDAE						
Subfamily CARDUELINAE						
312. <i>Carpodacus erythrinus</i> <i>roseatus</i> (Blyth)	Indian/Common Rosefinch	WV	From 1500m to highest summit in S.India.	Southern peninsula	Winters in most of the Indian peninsula.	Openly wooded country, bushes etc.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Family : EMBERIZIDAE						
313. <i>Emberiza bruniceps</i> Brandt	Redheaded Bunting	WV	—	Southern peninsula	Winters in most of the Indian peninsula.	Cultivated land especially grain fields.

R – Resident, LM – Local Movements, SM – Seasonal Movements, WV – Winter Visitor, SV – Summer Visitor

(* – Birds confined to Nilgiris and associated hills only (of W. Ghats Complex)

Table - 2

List of endangered birds of Nilgiri Biosphere Reserve

Sl. No.	Species Name	Common Name	Status
Order FALCONIFORMES			
1.	<i>Pandion haliaetus</i> (Linnaeus)	Osprey	Endangered
2.	<i>Falco peregrinus</i> <i>pernigrator</i> Sundevall	Shaheen Falcon	Endangered
Order GALLIFORMES			
3.	<i>Pavo cristatus</i> Linnaeus	Indian Peafowl	Endangered in some parts.
Order CAPRIMULGIFORMES			
4.	<i>Batrachostomus</i> <i>moniligær</i> Blyth	Ceylon Frogmouth	Very Rare
Order CORACIIFORMES			
5.	<i>Anthracoceros</i> <i>coronatus</i> (Boddaert)	Malabar Pied Hornbill	Rare
6.	<i>Buceros bicornis</i> Linnaeus	Great Pied Hornbill	Rare

MAMMALIA

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INTRODUCTION

The studies of Blanford (1888, 1891), Ellerman and Morrison-Scott (1951), Prater (1980) and Honacki *et. al.* (1982) have revealed possible occurrence of nearly 100 mammalian species in NBR. An attempt has been made to update information on mammalian species from NBR.

OBSERVATIONS

Ninety seven species have been inventorised in the present work (Appendix - I). A detailed systematic account of every species covering information on its status, distribution within NBR area, external distribution, habitat etc. has been given in Appendix-II. Out of 97 species, 67 have been directly or indirectly sighted and/or collected (small mammals only) during the study period. Table I gives an account on the number of species collected, sighted and recorded.

Table-1 : No. of Mammalian species sighted, collected and/or recorded from NBR.

Total number of species collected.	: 8 (small mammals)
Number of species sighted on the basis of direct and indirect evidences during study period.	: 29
Number of species sighted/recorded in recent years.	: 30
Number of species reported in the past.	: 30
Total number of Mammalian species from NBR	: 97

The NBR mammalian composition comprises nine orders predominated by Carnivora. Chiroptera, Rodentia and Artiodactyla (Fig. 1). The Nilgiri langur in sholas and Nilgiri tahr occur on steep slopes covered with grass. Lion tailed macaque, slender loris and giant squirrel prefer the canopy of dense forests. Common otter lives near large water bodies whereas clawless otter and yellow throated marten keep to higher altitudes (3000 ft. and above). Out of four the mongoose species, Indian brown mongoose prefers higher altitudes (3000-6000 ft.). Spotted deer and sambar occur in open glades, while small groups of barking deer and solitary mouse deer are found in dense forests.

The current status of various mammalian orders is given in Fig. 2. There are a number of species whose status is not yet known. Status studies of lesser known species which form an integral part of the food-web is also required. There are twenty nine species which have been listed as endangered/threatened/rare/vulnerable while the remaining sixty eight consists of common species and those whose status in the NBR is unknown. (Fig. 3)

NBR possessing varied microhabitats presents a picture of substantial endemism in mammalian species (1/5th of the total) (Fig. 4). The twenty endemic mammalian species from NBR are listed in Table 2.

CONCLUDING REMARKS

Considering the endemism of five mammalian orders, it is imperative to adopt urgent measures for the conservation of the endemic species. This can perhaps be achieved by initiating status, ecological, behavioural and related studies.

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SYSTEMATIC LIST

Order INSECTIVORA

1. *Crocidura horsfieldi* (Tomes)
2. *Suncus m. murinus* (Lin.)
3. *Suncus murinus malabaricus* (Lindsay)
4. *Suncus murinus niger* (Horsefield)
5. *Suncus etruscus perrotteti* (Duvernoy)
6. *Suncus dayi* Dobson.

Order CHIROPTERA

7. *Rousettus leschenaulti* Desmarest

8. *Pteropus giganteus* (Brunnich)
9. *Cynopterus sphinx* (Vahl.)
10. *Cynopterus brachiotis* (Muller)
11. *Taphozous malanopogon* Temminck
12. *Megaderma spasma* Lin.
13. *Megaderma lyra* Geoffroy
14. *Rhinolophus rouxi* Temminck
15. *Rhinolophus lepidus* Blyth
16. *Rhinolophus luctus* Temminck
17. *Hipposideros bicolor* (Temminck)
18. *Hipposideros lankadiva* Kelaart

Table-2 : Endemic Mammalian Fauna from NBR

Sl. No.	Common Name	Scientific Name
(1)	Shrew	<i>Suncus murinus niger</i> (Horsefield)
(2)	Shrew	<i>Suncus dayi</i> Dobson
(3)	Pigmy shrew	<i>Suncus etruscus perrotteti</i> (Duvernoy)
(4)	Slender Loris	<i>Loris tardigradus malabaricus</i> (Wroughton)
(5)	Lion-tailed macaque	<i>Macaca silenus</i> (Lin)
(6)	Nilgiri Langur	<i>Presbytis johni</i> (Fischer)
(7)	South Indian yellow throated marten.	<i>Martes gwatkinsi</i> (Horsefield)
(8)	Clawless otter	<i>Aonyx cinera</i> (Illinger)
(9)	Large spotted Civet	<i>Viverra megaspilla civettina</i> (Blyth)
(10)	Brown Palm Civet	<i>Paradoxurus jerdoni</i> (Blanford)
(11)	Indian Brown Mongoose	<i>Herpestes fuscus</i> (Waterhouse)
(12)	Nilgiri Tahr	<i>Hemitragus hylocrius</i> (Ogilby)
(13)	Indian Giant Squirrel	<i>Ratufa indica superans</i> (Ryley)
(14)	Indian Giant Squirrel	<i>Ratufa indica maxima</i> (Schreber)
(15)	Jungle Striped Squirrel	<i>Funambulus tristriatus wroughtoni</i> (Ryley)
(16)	Malbar Spiny Dormouse	<i>Platacanthomys lasiurus</i> (Blyth)
(17)	Indian Gerbil Rat	<i>Tatera indica cuvieri</i> (Waterhouse)
(18)	Longtailed treemouse	<i>Vandeleuria oleracea nilagirica</i> (Jerdon)
(19)	Fawn coloured mouse	<i>Mus cervicolor palnica</i> (Thomas)
(20)		<i>Mus famulus famulus</i> Bonhote

19. *Hipposideros speoris* (Schneider)
20. *Hipposideros fulvus* Gray
21. *Hipposideros pomona* Anderson
22. *Tadarida aegyptica* (Geoffroy)
23. *Chaerephon plicata* (Buchanan)
24. *Myotis peshwa* (Thomas)
25. *Harpiocephalus harpia* (Temminck)
26. *Pipistrellus ceylonicus* Kelaart
27. *Pipistrellus coromandra* Gray
28. *Pipistrellus mimus* Wroughton
29. *Pipistrellus mordax* Peters
30. *Pipistrellus dormari* (Dobson)
31. *Tylonyctaris pachypus* Temminck
32. *Scotophilus heathi* (Horsefield)
33. *Miniopterus schreibersi* (Kuhl)
34. *Kerivoula picta* (Pallus)
35. *Kerivoula hardwickei* Horesfield

Order PRIMATES

36. *Loris tardigradus malabaricus* (Wroughton)
37. *Macaca r. radiata* (Geoffroy)
38. *Macaca silenus* (Lin.)
39. *Presbytis entellus* (Dufresne)
40. *Presbytis johni* (Fischer)

Order PHOLIDATA

41. *Manis crassicaudata* Gray

Order CARNIVORA

42. *Canis aureus naria* Wroughton
43. *Vulpes bengalensis* Shaw
44. *Cuon alpinus* Pallas
45. *Melursus ursinus* Shaw
46. *Martes qwatkinsi* Horsefield
47. *Lutra perspicillata* (I. Geoffroy)

48. *Lutra l. nair* F. Cuvier
49. *Aonyx cinera* Illinger
50. *Viverra megaspilla civettina* Blyth
51. *Viverricula indica* Desmart
52. *Paradoxurus hermaphroditus* Pallas
53. *Paradoxurus jerdoni* Blanford
54. *Herpestes fuscus* Waterhouse
55. *Herpestes smithi* Gray
56. *Herpestes edwardsi* Geoffroy
57. *Herpestes vitticollis* Bennett
58. *Hyaena hyaena* (Lin.)
59. *Felis chaus* Guldenstaedt
60. *Felis bengalensis* Kerr
61. *Felis rubiginosa* Geoffroy
62. *Panthera pardus* Lin.
63. *Panthera tigris* Lin.

Order PROBOSCIDEA

64. *Elephas maximus* Lin.

Order ARTIODACTYLA

65. *Sus scrofa* Lin.
66. *Tragulus memminna* Erxleben
67. *Muntiacus muntjack* Zimm.
68. *Axis axis* Erxleben
69. *Cervus unicolor* Kerr
70. *Tetracerus quadricornis* Blainville
71. *Bos gaurus* H. Smith
72. *Hemitragus hylocrius* Ogilby

Order LAGOMORPHA

73. *Lepus nigricollis* Cuvier

Order RODENTIA

74. *Petaurista petaurista* Pallas

75. *Funambulus layardi* Blyth
 76. *Funambulus sublineatus* Waterhouse
 77. *Funambulus tristriatus wroughtoni* Ryley
 78. *Funambulus p. palmarum* Lin.
 79. *Ratufa macroura* Pennant
 80. *Ratufa indica superans* Ryley
 81. *Ratufa indica bengalensis* Blanford
 82. *Ratufa indica maxima* Schreber
 83. *Hystrix indica* Kerr
 84. *Platacanthomys lasiurus* Blyth
 85. *Tatera indica cuvieri* Waterhouse
 86. *Vandeleuria oleracea nilgirica* Jerdon
 87. *Rattus r. wroughtoni* Hinton
 88. *Rattus blanfordi* Thomas
 89. *Millardia meltada* Gray
 90. *Mus f. famulus* Bonhote
 91. *Mus musculus castaneus* Waterhouse
 92. *Mus booduga* Gray
 93. *Mus cervicolor palnica* Thomas
 94. *Mus platythrix* Bennett
 95. *Golunda ellioti* Gray
 96. *Bandicota bengalensis kok* Gray
 97. *Bandicota i. indica* Bech.

SYSTEMATIC ACCOUNT

*Species collected and/or sighted during the project period

Class	MAMMALIA
Order	INSECTIVORA
Family	SORICIDAE

1. *Crocidura horsefieldi* (Tomes) (Horsefield's Shrew)

Locality : NBR part of Karnataka.

Habitat & Status : Not known.

External Distribution : India : Mysore; Sri Lanka.

Source : Ellerman and Morrison - Scott (1951) and Honacki *et. al.* (1982).

2. *Suncus murinus murinus* (Lin.)* (House Shrew)

Locality : NBR part of Coorg. Dist.

Habitat : Around human settlements in forested areas.

Status : Locally common.

External Distribution : South India.

Source : Lindsay (1929), Ellerman & Morrison - Scott (1951) and P.D. Jenkins from British Museum. (Comm.).

Remarks : One male specimen collected.

3. *Suncus murinus malabaricus* Lindsay

Locality : NBR part of South Coorg.

Habitat : Deciduous forests.

Status : Locally common.

External Distribution : Virajpet and Cochin in South India.

Source : Lindsay (1929) and Ellerman & Morrison - Scott (1951).

4. *Suncus murinus niger* (Horsefield)*

Locality : Bank of Moyar river, near Masinagudi.

Habitat : Deciduous forests.

Status : Endemic to South India.

External Distribution : India : Malabar and Palani Hills.

Source : Lindsay (1929), Ellerman & Morrison Scott (1951) and P.D. Jenkins from British Museum (Comm.)

Remarks : One female specimen collected.

5. *Suncus etruscus perrotteti* (Duvernoy)

Locality : Savi's Pigmy Shrew NBR part of Coorg Dist; Nilgiri Hills.

Habitat : Moist soil of river banks.

Status : Endemic to South India.

External Distribution : Bellary in South India.

Source : Lindsay (1929) and Ellerman & Morrison - Scott (1951).

6. *Suncus dayi* Dobson

Locality : Upper Bhavani.

Habitat : Forests.

Status : Uncommon.

External Distribution : Palani Hills in South India. Endemic to South India.

Source : Lindsay (1929), Ellerman & Morrison - Scott (1951) and Honacki *et. al.* (1982).

Order CHIROPTERA

Sub-order MEGACHIROPTERA

Family PTEROPIDAE

Sub-family PTEROPINAE

7. *Rousettus leschenaulti* Desmarest*

Locality : Fulvus Fruitbat. Karnataka : Titimati; Kerala : Silent Valley.

Habitat : The species has diurnal biotope. During day time, it lives in caves while it attacks fruit bearing trees during nights.

Status : Locally common.

External Distribution : Peninsular India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

Remarks : Two specimens were caught in the mist net, but escaped. The net was set near banana fruit garden.

8. *Pteropus giganteus* (Brunnich)* (Indian flying Fox)

Locality : Nagarhole.

Habitat : Diurnal biotope, daytime on large trees but at night, flies longer distances in search of fruits.

Status : Locally common.

External Distribution : Peninsular India (widely distributed).

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

Remarks : A large roost was sighted on a tree in core zone of Nagarhole National Park.

9. *Cynopterus sphinx* (Vahl.)* (Short nosed fruit bat)

Locality : Nagarhole.

Habitat : Near fruit bearing trees.

Status : Common.

External Distribution : Peninsular India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

Remarks : Six specimens collected. (4M & 2F).

10. *Cynopterus brachiotis* (Muller)* (Lesser/Short nosed fruit bat)

Locality : Silent Valley, Nagarhole.

Habitat : Similar to that of *C. sphinx* (Vahl.) The two species seen roosting together on a tree.

Status : Uncommon.

External Distribution : Peninsular India, Sri Lanka.

Source : Das (1986).

Remarks : Two specimens were netted from Nagarhole.

Suborder MICROCHIROPTERA.

Family EMBELLONURIDAE.

11. *Taphozous melanopogon* Temminck (Black bearded Tomb bat)

Locality : NBR parts of Karnataka in Western Ghats.

Habitat : Occupies cliffs, ruins, dark rooms with high ceilings and haunts hilly and forested countrysides.

Status : Not known.

External Distribution : Peninsular India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

Family MEGADERMATIDAE

12. *Megaderma spasma* Lin.
(Malay false vampire)

Locality : Northern parts of NBR in Western Ghats.

Habitat : Inhabit humid and forested countrysides.

Status : Rare and localized (Brosset, 1962).

External Distribution : Forested areas of India.

Source : Brosset 1962 and Ellerman & Morrison - Scott (1951).

13. *Megaderma lyra* Geoffroy*
(India false vampire)

Locality : Nagarhole.

Habitat : Adapted to anthropic biotopes, generally lives in drier areas and in old and deserted buildings.

Status : Locally common.

External Distribution : Forested areas of India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

Remarks : One specimen collected from the Titimati range of Nagarhole National Park.

Family RHINOLOPHIDAE

Subfamily RHINOLOPHINAE

14. *Rhinolophus rouxi* Temminck

Locality : Nilgiri Hills, Silent Valley.

Habitat : Forest sp., however, during day time prefers anthropic biotope.

Status : Not known.

External Distribution : Peninsular India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

15. *Rhinolophus lepidus* Blyth

Locality : Silent Valley.

Habitat : Similar to the diurnal biotope of the other species of *Rhinolophus*, especially *rouxi*.

Status : Widely distributed (Brosset, 1962)

External Distribution : India : Tamil Nadu : Salem.

Source : Das (1986), Brosset (1962) and Ellerman & Morrison - Scott (1951).

16. *Rhinolophus luctus* Temminck
(Great Eastern Horse-shoe bat)

Locality : Wynad, Coorg.

Habitat : Prefers anthropic biotope in the diurnal haunt.

Status : Brosset (1962) reported this species as rare.

External Distribution : Peninsular India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

17. *Hipposideros bicolor* (Temminck)
(Bicoloured leafnosed bat)

Locality : NBR part of Tamil Nadu.

Habitat : Dry plains, forests, high altitudes in Ghats, small islands. No special ecological requirements.

Status : Common (Brosset, 1962).

External Distribution : Throughout India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

18. *Hipposideros fulvus* Gray

Locality : Likely to occur in NBR part of Karnataka.

Habitat : Forest dwelling species, inhabit caves live in mixed roost.

Status : Not known.

External Distribution : Peninsular India.

Source : Ellerman & Morrison - Scott (1951) and Honacki *et. al.* (1982).

19. *Hipposideros lankadiva* Kelaart

Locality : NBR part of Karnataka.

Habitat : Lives in large colonies in deserted and old temples.

Status : Not known.

External Distribution : Mysore and Canara in South India and Sri Lanka.

Source : Ellerman and Morrison - Scott (1951) and Brosset (1962).

20. *Hipposideros speoris* (Schneider)
(Schneider's Leafnosed bat)

Locality : NBR part of Coorg Dist.

Habitat : Occupies caves and old buildings surrounded by forested hills. Electic species.

Status : Common.

External Distribution : The species appears to inhabit only the southern and central parts of India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

21. *Hipposideros pomona* Anderson

Locality : NBR part of Coorg Dist.

Habitat : Not known.

External Distribution : South India.

Status : Not known.

Source : Ellerman and Morrison Scott (1951).

Family MOLOSSIDAE

Genus TADARIDA

Subgenus TADARIDA

22. *Tadarida aegyptiaca* (Geoffroy)

Locality : NBR part of Karnataka.

Habitat : Occupies stones of cliffs, large buildings etc. which are inaccessible to man.

Status : Not common. (Brosset, 1962)

External Distribution : Southern and Western India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

23. *Chaerephon plicata* (Buchanan)
(Wrinkle-lipped bat)

Locality : NBR part of Tamil Nadu.

Habitat : Not known.

External Distribution : Southern India and Sri Lanka.

Status : Not known.

Source : Ellerman & Morrison - Scott (1951).

Family VESPERTILIONIDAE

24. *Harpiocephalus harpia* (Temminck)
(Hairy winged bat)

Locality : Silent Valley, Valiaparathodu.

Habitat and Status : Not known.

External Distribution : Palni and Anaimalai Hills in South India.

Source : Ellerman and Morrison - Scott (1951) and Honacki *et. al.* (1982).

25. *Myotis peshwa* (Thomas)

Locality : Silent Valley, Valiaparathodu in Kerala.

Habitat : Near jungle stream, flying at lower level.

External Distribution : Western, Central and Southern India.

Status : Rare species (Das 1986).

Source : Brosset (1962) and Das (1986).

26. *Pipistrellus ceylonicus* Kelaart
(Kelaart's Pipistrelle)

Locality : NBR parts of Karnataka and Tamil Nadu.

Habitat : Electic species in selection of habitat, found in tree-holes, cracks, holes in wood, stones or any other material.

Status : Common.

External Distribution : Southern Peninsular India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

27. *Pipistrellus coromandra* (Gray)
(Indian Pipistrelle)

Locality : NBR parts of Karnataka and Kerala.

Habitat : Colonial species living under bark of large trees or in old houses.

Status : Common (Brosset, 1962).

External Distribution : Widely distributed in India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

28. *Pipistrellus mimus* Wroughton
(Indian Pigmy Pipistrelle)

Locality : NBR parts of Western Ghats.

Habitat : The species probably frequents all sort of places with narrow cracks and crevices, prefers woody country.

Status : Common (Brosset, 1962).

External Distribution : Widely distributed in India.

Source : Ellerman & Morrison - Scott (1951) and Brosset (1962).

29. *Pipistrellus mordax* (Peters)

Locality : NBR part of Tamil Nadu.

Habitat : Not known.

Status : Not known.

External Distribution : Calcutta, Darjeeling; Sri Lanka; Java.

Source : Ellerman & Morrison - Scott (1951).

30. *Pipistrellus dormeri* Dobson
(Dorner's bat)

Locality : NBR parts of Karnataka.

Habitat and Status : Not known.

External Distribution : Central, Western and parts of Southern India.

Source : Ellerman & Morrison - Scott (1951) and Brosset (1962).

31. *Tylonycteris pachypus* Temminck
(Club-footed bat)

Locality : NBR part of Coorg Dist.

Habitat : Not known.

Status : Not known.

External Distribution : Dharwar in Karnataka.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

32. *Scotophilus heathi* (Horsefield)
(Greater yellow bat)

Locality : NBR parts of Karnataka.

Habitat : The species inhabits roofs of timber work, narrow crevices, cracks, holes in ceiling etc.

Status : Uncommon in forested area. (Brosset, 1962).

External Distribution : Western and Southern parts of India.

Source : Ellerman & Morrison - Scott (1951) and Brosset (1962).

33. *Miniopterus schreibersi* (Kuhl)
(Schreiber's bat/long winged bat)

Locality : NBR parts of Karnataka.

Habitat : Prefers to live in large natural cave with a subterranean river inside colonial.

Status : The colonies are rarely sighted. (Brosset, 1962).

External Distribution : Peninsular India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951)

Sub-family MURININAE

34. *Kerivoula picta* (Pallas)
(Painted bat)

Locality : NBR parts of Karnataka.

Habitat : Found singly or in pairs hanging on the dry leaves of plaintain or other large leaved tree.

Status : Not known.

External Distribution : Peninsular India.

Source : Brosset (1962) and Ellerman & Morrison - Scott (1951).

35. *Kerivoula hardwickei* Horsfield
(Hardwicke's bat)

Locality : NBR parts of Karnataka.

Habitat : Not known.

Status : Not known.

External Distribution : Southern India.

Source : Ellerman & Morrison - Scott (1951).

Order PRIMATES

Suborder PROSIMII

Family LORISIDAE

36. *Loris tardigradus malabaricus* (Wroughton)
(Slender Loris)

Locality : Nagarhole, Bandipur, Kutta, Sathyamangalam, Mudumalai and Moyar forests.

Altitude : 940 m.

Habitat : It is confined to dense forests and open jungles. It does not keep exclusively to the trees, but comes down into bushes to feed. It is nocturnal in habit.

Status : Locally vulnerable (Tikader, 1983). Endemic to South India.

External Distribution : Malabar, Wynaad Travancore in South India.

Source : Prater (1980), Tikader (1983) and Karanth (1987).

Remarks : It is said to be killed for medicinal use and also serves as an experimental animal in research.

Suborder ANTHROPOIDEA

Family CERCOPITHIDAE

Subfamily CERCOPITHICINAE

37. *Macaca r. radiata* (Geoffroy)*
(Bonnet Macaque)

Locality : Coorg, Bandipur, Nilgiri Hills, Mudumalai, Theppakkadu and Rampur-Varanchi.

Habitat : It is common in villages and Jungles and leads arboreal life.

Status : Not very common.

External Distribution : Peninsular India.

Source : Prater (1980) and Karanth (1987).

Remarks : Sighted at a number of places in N.B.R. (Karnataka).

38. *Macaca silenus* (Linn.)
(Lion-tailed macaque)

Locality : Bramhagiris and Kutta near Nagarhole, Silent Valley, Nilambur and Upper Bhavani.

Habitat : Wet evergreen or shola forests.

Status : Endangered. Endemic to South India.

External Distribution : Southern Western Ghats.

Source : Prater (1980), Tikader (1983) and Karanth (1987).

Remarks : Population around 1,600 only.

Sub-family COLOBINAE

39. *Presbytis entellus* (Dufresne)*
(Langur)

Locality : Nagarhole, Bandipur, Coorg, Mudumalai etc.

Habitat : It is more arboreal in habit than

macaques, prefers deciduous forests along stream banks.

Status : Locally common.

External Distribution : Practically whole of India.

Source : Prater (1980) and Karanth (1987)

Remarks : Sighted at number of places in N.B.R. (Karnataka).

**40. *Presbytis johni* (Fischer)
(John's Langur/Nilgiri Langur)**

Locality : Bramhagiris, Coorg, Mudumalai, Nilgiris, Wynaad, upper Bhavani and Silent Valley.

Altitude : 900 to 1,200 m.

Habitat : Lives in sholas or stretches of dense evergreen forests. They may invade gardens and belts of cultivated woodlands.

Status : Vulnerable (Tikader, 1983), Endemic to South India.

External Distribution : Southern India.

Source : Prater (1980), Tikader (1983) and Karanth (1987).

Remarks : The animal is slaughtered for its fur and alleged aphrodisiac property of its flesh. The status of the Nilgiri Langur seems to be precarious (Karanth, 1987).

Order PHOLIDATA

Family MANIDAE

**41. *Manis crassicaudata* Gray
(Indian Pangolin/Scaly anteater)**

Locality : NBR parts of Coorg Dist.

Habitat : Lives in burrows or shelters among rocks and boulders, nocturnal animal.

Status : Indeterminate (Tikader, 1983).

External Distribution : Peninsular India.

Source : Prater (1980) and Tikader (1983).

Order CARNIVORA

Family CANIDAE

**42. *Canis aureus naria* Wroughton
(Asiatic Jackal)**

Locality : South Coorg, Mudumalai Masinagudi.

Habitat : Scrub to degraded forests marginal to human habitations, nocturnal animal.

Status : Once a very common animal, now the population has gone down due to number of reasons. (Tikader, 1983). However, in Karnataka, it is common (Karanth, 1987).

External Distribution : Southern Peninsular India.

Source : Prater (1980), Tikader (1983) & Karanth (1987).

**43. *Vulpes bengalensis* (Shaw)*
(Indian Fox)**

Locality : Titimati forest range.

Habitat : Lives in scrubs in flat and rocky areas avoiding forests, common near cultivations.

Status : Vulnerable (Tikader, 1983).

External Distribution : Peninsular India.

Source : Prater (1980) and Tikader (1983)

Remarks : Sighted adjacent to a forest patch in Titimati range.

**44. *Cuon alpinus* Pallas*
(Indian wild dog/Dhole)**

Locality : Nagarhole National Park and Bandipur Tiger Reserve, Mudumalai Sanctuary, Wynaad Sanctuary.

Habitat : Lives in open forests and hunts in packs.

Status : Vulnerable (Tikader, 1983)

External Distribution : Peninsular India, South of Ganges.

Source : Prater (1980), Tikader (1983) and Karanth (1987).

Remarks : Sighted at Nagarhole, Sankadkatte and Kalkeri areas of N.B.R. (Karnataka)

Family URSIDAE

45. *Melursus ursinus* (Shaw)*
(Sloth Bear)

Locality : Nagarhole, Bandipur, Mudumalai, Sanctuary.

Habitat : Inhabits forested hills close to water, nocturnal animal, eats fruits, flowers, honey etc. It has a strong liking for flowers of "Mahua" (*Madhuka latifolia*).

Status : Vulnerable (Tikader, 1983).

External Distribution : Peninsular India.

Source : Prater (1980), Tikader (1983) and Karanth (1987).

Remarks : Sighted in the tourism zone of Nagarhole National Park.

Family MUSTELIDAE

Subfamily MUSTELINAE

46. *Martes gwatkinsi* Horsefield
(South Indian Yellow throated Marten)

Locality : Bramhagiri and Coorg (NBR part).

Habitat : Prefers to live in forests at higher altitude (3,000 ft. and above), restless creature and hunts animals and birds in trees and also on ground, most agile animal.

Status : Indeterminate (Karanth, 1987) and Endemic to South India.

External Distribution : Travancore and South India.

Source : Ellerman & Morrison - Scott (1951), Prater (1980) and Karanth (1987).

Sub-family LUTRINAE

47. *Lutra perspicillata* (I. Geoffroy)
(Smooth Indian Otter)

Locality : NBR part of Karnataka.

Habitat : Essentially otter of plains, lives by

the margin of lakes, streams and canals. It hunts in flooded fields, creeks and estuaries.

Status : Indeterminate (Karanth, 1987)

External Distribution : Central and Western India.

Source : Ellerman & Morrison - Scott (1951) and Prater (1980).

48. *Lutra lutra nair* F. Cuvier*
(Common Otter)

Locality : Kabini Reservoir, Sankadkatte and Nagarhole.

Habitat : Prefers to live near water bodies rich in aquatic life, especially fishes. Makes lair in hollows beneath roots of trees and among rocks.

Status : Indeterminate (Karanth, 1987). Endemic to South India.

External Distribution : Southern India and Sri Lanka.

Source : Ellerman & Morrison - Scott (1951), Prater (1980) and Karanth (1987).

Remarks : Sighting of specimens at otter breeding centre at Sankadkatte and sighting of web footed tracks near Peacock water-body in the tourism zone of Nagarhole National Park.

49. *Aonyx ciner* (Illinger)
(Clawless Otter)

Locality : Bramhagiri and southern Coorg.

Habitat : It hunts the same hill streams and lakes as the common otter, keeping to higher altitudes (3,000 ft.). Unlike common form, the clawless otter feeds less on fish, but more on snails, crabs, mussels and other aquatic animals.

Status : Indeterminate (Karanth, 1987). Endemic to South India.

External Distribution : Southern India.

Source : Ellerman & Morrison - Scott (1951), Prater (1980) and Karanth (1987).

Family VIVERRIDAE
Subfamily VIVERRINAE

50. *Viverra megaspilla civettina* (Blyth)
(Large spotted civet)

Locality : NBR parts of Kerala and Karnataka.

Habitat : Lives in wooded plains and adjoining hill slopes.

Status : Endangered (Tikader, 1983). Endemic to South India.

External Distribution : Malabar, Kudremukh, Southern India.

Source : Prater (1980) and Karanth (1987).

51. *Viverricula indica* Desmart*
(Small Indian Civet)

Locality : Nagarhole National Park.

Habitat : It keeps to dense forests, shelters in holes, under rocks or may live near village, prefers to hunt by night, preys on rats, squirrels, small birds and lizards.

Status : Locally common (Karanth, 1987).

External Distribution : Southern India.

Source : Ellerman & Morrison - Scott (1951), Prater (1980) and Karanth (1987).

Remarks : One dead specimen was sighted near Nagarhole village during one of the surveys.

Sub-family PARADOXURINAE

52. *Paradoxurus hermaphroditus* (Pallas)*
(Toddy Cat)

Locality : Titimati range of Nagarhole National Park.

Habitat : Lives much on trees, lying curled up by day among the branches or in holes in the trunk, lives near towns and villages, prefers mango or palm trees for shelter. However, it can adapt to change in habitat. Feeds on birds, small mammals and also on fruits.

Status : Locally common (Karanth, 1987).

External Distribution : Southern India as far North as Narmada river.

Source : Ellerman & Morrison - Scott (1951), Prater (1980) and Karanth (1987).

Remarks : Sighted in Titimati range during one of the surveys.

53. *Paradoxurus jerdoni* Blanford
(Jerdon's Palm or Brown Palm Civet)

Locality : NBR part of Coorg Dist.

Habitat : A shy forest animal and rarely coming close to human habitations.

Status : At present absent in Karnataka, (Karanth, 1987). Endemic to South India.

External Distribution : Southern India.

Source : Ellerman & Morrison - Scott (1951).

Sub-family HERPESTINAE

54. *Herpestes fuscus* Waterhouse
(Indian Brown Mongoose)

Locality : Coorg, Nilgiri Hills, Nagarhole.

Habitat : Prefers to live at high altitude (3,000 - 6,000 ft.) (Prater, 1980) but found in forests of places like Nagarhole and Coorg etc. It is a large and heavily built blackish brown mongoose. Fairly common around coffee plantations.

Status : Endemic to South India.

External Distribution : South Indian Hill Ranges.

Source : Ellerman & Morrison - Scott (1951), Prater (1980) and Karanth (1987).

55. *Herpestes smithi* Gray
(Ruddy Mongoose)

Locality : Bandipur

Habitat : Forested areas.

Status : Not known.

External Distribution : Peninsular India.

Source : Prater (1980) and Karanth (1987).

56. *Herpestes edwardsi* (Geoffroy)*
(Common or Gray Mongoose)

Locality : Bandipur and Nagarhole.

Habitat : Creature of open lands of scrub, jungle and cultivations, lives in hedge and thickets and among bushes.

Status : Common.

External Distribution : Peninsular India

Source : Prater (1980) and Karanth (1987)

Remarks : Sighting of animals in scrubby jungle near Bandipur and coffee plantations near Nagarhole.

57. *Herpestes vitticollis* Bennet*
(Stripe-necked Mongoose)

Locality : Bandipur and Nagarhole.

Habitat : Though a forest living creature, sometimes comes to cultivations near human habitations.

Status : Locally common.

External Distribution : South India.

Source : Prater (1980) and Karanth (1987)

Remarks : Sighted animals at both the localities.

Family HYAENIDAE

58. *Hyaena Hyaena* (Lin.)
(Striped Hyaena)

Locality : Nilgiri Hills, Coorg, Masinagudi, Mudumalai.

Habitat : A scavenger, seeks its food by scent, nocturnal, abundant in scrub forests.

Status : Vulnerable (Tikader, 1983).

External Distribution : Throughout India and Pakistan.

Source : Ellerman & Morrison - Scott (1951) Prater (1980) and Tikader (1983).

Family FELIDAE

59. *Felis chaus* Guldenstaedt*
(Jungle Cat)

Locality : Bandipur.

Habitat : Nocturnal, prefers to stay in bushy jungles, scrubs and forests, preys on small mammals, birds and poultry birds.

Status : Vulnerable (Tikader, 1983).

External Distribution : Forested areas in India.

Source : Tikader (1983) and Karanth (1987).

Remarks : Sighted near Moyar river in Bandipur.

60. *Felis bengalensis* Kerr
(Leopard Cat)

Locality : Nagarhole.

Habitat : Lives in hollows of trees in deep forests. Nocturnal, preying on small mammals and birds.

Status : Vulnerable (Tikader, 1983).

External Distribution : Forested areas in Peninsular India.

Source : Ellerman & Morrison Scott (1951), Tikader (1983) and Karanth (1987).

61. *Felis rubiginosa* Geoffroy
(Rusty Spotted Cat)

Locality : Bandipur and Nagarhole.

Habitat : Less arboreal inhabiting grass and scrubby jungles.

Status : Rare (Tikader, 1983).

External Distribution : Sporadically reported from all parts in India.

Source : Ellerman & Morrison Scott (1951) Tikader (1983) and Karanth (1987).

62. *Panthera pardus* (Lin)*
(Leopard or Panther)

Locality : Bandipur and Nagarhole, Mudumalai, Wynaad, Coimbatore forests.

Habitat : It inhabits a variety of habitats like hills, plains, thick forest, scrubby jungle etc. away from and near human habitations.

Status : Vulnerable (Tikader, 1983).

External Distribution : Forested areas in India.

Source : Prater (1980), Tikader (1983) and Karanth (1987).

Remarks : Sighted at Nagarhole and sighting of fresh pugmarks in Bandipur.

63. *Panthera tigris* (Lin)*
(Tiger)

Locality : Bandipur and Nagarhole, Mudumalai, Wynaad.

Habitat : Like leopard, tiger's habitat is varied, ranging from dry open jungles to mangrove swamps. Nocturnal, hunts between sunset and dawn.

Status : Vulnerable (Tikader, 1983).

External Distribution : Fairly distributed in India.

Source : Prater (1980), Tikader (1983) and Karanth (1987).

Remarks : Sightings of fresh droppings, pugmarks and hairs in Bandipur, Sankadkatte, Titimati and Nagarhole ranges.

Order PROBOSCIDEA
Family ELEPHANTIDAE

64. *Elephas maximus* Lin.*
(Indian Elephant)

Locality : Bandipur and Nagarhole, Mudumalai, Wynaad.

Habitat : Lives in thick and tall forests, particularly where bamboos grow in profusion, extremely adaptable and can live in humid jungle or in cool elevated forests, known for seasonal migrations from wetter parts of the reserve during monsoon to drier parts of Mysore plateau and in reverse direction in summer.

Status : Locally common. Karanth (1987) has reported a population of 1,000 (approx.) elephants in Nagarhole, Bandipur and Billigirirangan sanctuaries.

External Distribution : India: U.P., Bihar and Assam.

Source : Prater (1980), Tikader (1983) and Karanth (1987).

Remarks : Sighting of elephant herds at a number of places.

Order ARTIODACTYLA
Suborder SUIFORMES
Family SUIDAE

65. *Sus scrofa* (Lin.)*
(Wild Boar)

Locality : Bandipur and Nagarhole, Mudumalai, Wynaad etc.

Habitat : Lives near cultivations, grasses, scanty bush - jungle and sometimes in forests. Omnivorous.

Status : Common (Karanth, 1987).

External Distribution : Widely distributed in India.

Source : Prater (1980) and Karanth (1987).

Remarks : Sighting at a number of places.

Suborder RUMINANTIA
Family TRAGULIDAE

66. *Tragulus meminna* (Erleben)
(Indian Chevrotain, Mouse Deer)

Locality : Nagarhole, Bandipur, Mudumalai, Wynaad.

Habitat : Solitary creature hiding in thickets and forests and also in overgrown plantations.

Status : Vulnerable (Tikader, 1983).

External Distribution : Southern India.

Source : Ellerman & Morrison - Scott (1951), Tikader (1983) and Karanth (1987).

Family CERVIDAE
Sub-family MUNTIACINAE

**67. *Muntiacus muntjack* (Zimm.)*
(Indian muntjack or Barking Deer)**

Locality : Bandipur, Nagarhole (Sankadkatte),
Mudumalai, Wynaad.

Habitat : Lives singly or in pairs or in small
groups in thick jungle and comes out to graze in
open; diurnal in habit.

Status : Locally common (Karanth, 1987).

External Distribution : India.

Source : Prater (1980) and Karanth (1987).

Remarks : Sighting at Nagarhole and
Sankadkatte.

Subfamily CERVINAE

**68. *Axis axis* (Erxleben)*
(Chital/Spotted Deer)**

Locality : Bandipur, Nagarhole, Mudumalai and
Wynaad.

Habitat : Lives in herds ranging from 10 to
30, prefers to stay in grassy forest glades and
close to shaded streams, also invades cultivations
near villages.

Status : Locally common (Karanth, 1987)

External Distribution : Widely distributed in
forested parts of Peninsular India.

Source : Prater (1980) and Karanth (1987).

Remarks : Sighting at number of places.

**69. *Cervus unicolor* Kerr*
(Sambar)**

Locality : Bandipur, Nagarhole, Mudumalai,
Wynaad etc.

Habitat : Lives in small herds near forested
hill side, cultivation etc., feeds mainly at night and
retires into heavy cover at daybreak, good
swimmer.

Status : Locally common (Karanth, 1987).

External Distribution : Peninsular India.

Source : Prater (1980) and Karanth (1987).

Remarks : Sighting at a number of places.

Family BOVIDAE
Subfamily BOSELAPHINE

**70. *Tetracerus quadricornis* (Blainville)*
(Four horned Antelope or Chowshinga)**

Locality : Bandipur and Nagarhole.

Habitat : Lives singly or in pairs in wooded
and hilly country or savanna near water. Nocturnal
and shy, avoids dense forests.

Status : Vulnerable (Tikader, 1983).

External Distribution : Peninsular India.

Source : Ellerman & Morrison - Scott (1951),
Tikader (1983) and Karanth (1987).

Remarks : Sighting has been reported from
near Nagarhole village.

Subfamily BOVINAE

**71. *Bos gaurus* H. Smith*
(Gaur or Indian Bison)**

Locality : Bandipur, Nagarhole, Mudumalai,
Wynaad etc.

Habitat : Gaur is essentially hill animal and
lives in herds of 6-12 or even more individuals.
Prefers to stay in dense tropical forests.

Status : Locally common (Karanth, 1987).

External Distribution : Forested areas of
India.

Source : Prater (1980), Tikader (1983) and
Karanth (1987).

Remarks : Sighting of a number of herds at
many places.

**72. *Hemitragus hylocrius* Ogilby
(Nilgiri Tahr)**

Locality : Nilgiri Hills.

Habitat : The preferred habitat is the scarps
and crags which rise above forest level.

Status : Endangered (Tikader, 1983). Endemic to South India.

External Distribution : Anaimalai ranges in South.

Source : Prater (1980) and Tikader (1983).

Order LAGOMORPHA

Family LEPORIDAE

**73. *Lepus nigricollis* Cuvier*
(Indian Hare or Black Naped Hare)**

Locality : Bandipur, Nagarhole, Mudumalai, Wynaad etc.

Habitat : Prefers to stay in large tracts of bush and jungle alternating with cultivated plains.

Status : Common (Karanth, 1987)

External Distribution : Peninsular India.

Source : Ellerman & Morrison-Scott (1951), Prater (1980) and Karanth (1987).

Remarks : Sighting near Bandipur and Nagarhole villages.

Order RODENTIA.

Family SCIURIDAE.

**74. *Petaurista petaurista* (Pallas)*
(Common giant flying squirrel)**

Locality : Coorg and Sankadkatte, Bandipur, Nilgiri.

Habitat : Forest dwelling nocturnal animal living usually in the holes of tall trees. Prefers to stay in tropical and temperate forests.

Status : Not known.

External Distribution : Forested areas of India.

Source : Ellerman (1961), Agarwal and Chakraborty (1979) and Karanth (1987).

Remarks : One pelt of flying squirrel collected at Sankadkatte is with the Manager, Kabini River Lodge, Sankadkatte.

**75. *Funambulus layardi* (Blyth)
(Layard's striped squirrel)**

Locality : NBR parts of Karnataka and Kerala.

Habitat : Not Known.

Status : Rare in India.

External Distribution : Sri Lanka.

Source : Ellerman (1961).

**76. *Funambulus sublineatus* (Waterhouse)*
(Dusty striped Squirrel)**

Locality : Kutta, Coorg and Titimati in Nagarhole.

Habitat : Lives in forests of South India and Sri Lanka. A shy animal keeping to damp gullies in dense forests with tangling creepers and heavy undergrowths.

Status : Not known.

External Distribution : South India and Sri Lanka.

Source : Ellerman (1961), Agrawal and Chakraborty (1979) and Prater (1980).

Remarks : One specimen was sighted at noon in a dense forest in Titimati range.

**77. *Funambulus tristriatus wroughtoni* Ryley*
(Jungle striped Squirrel)**

Locality : Core zone of Bandipur, Coorg.

Habitat : Prefers to stay in jungles.

Status : Not known. Endemic to Western Ghats.

External Distribution : Western Ghats in India.

Source : Ellerman (1961) and Agrawal and Chakraborty (1979).

Remarks : One specimen of jungle striped squirrel was sighted near Karnataka-Kerala boundary in the core zone of Bandipur Tiger Reserve.

**78. *Funambulus p. palmarum* (Lin.)*
(Indian Palm Squirrel)**

Locality : Bandipur, Nilgiri.

Habitat : Thin forest cover.

Status : Not known.

External Distribution : Tamil Nadu in South India and Bihar.

Source : Ellerman (1961) and Agrawal and Chakraborty (1979).

Remarks : One specimen was collected from Bandipur Tiger Reserve area.

79. *Ratufa macroura* (Pennant)
(Grizzled Giant Squirrel)

Locality : NBR parts of Karnataka and Tamil Nadu.

Habitat : Forest dwelling animal living in high trees of dry deciduous type. Diurnal in habit and rarely comes on the ground.

Status : Present in Mysore Plateau (Karanth, 1987) and Vulnerable (Tikader, 1983).

External Distribution : Tamil Nadu and Sri Lanka.

Source : Ellerman (1961), Tikader (1983), Karanth (1987).

80. *Ratufa indica superans* Ryley

Locality : Bramhagiri Hills and South Coorg.

Habitat : Tropical semi-evergreen forests.

Status : Endemic to Western Ghats.

External Distribution : Southern Western Ghats in India.

Source : Ellerman (1961) and Prater (1980).

81. *Ratufa indica bengalensis* (Blanford)*
(Indian Giant Squirrel)

Locality : Nagarhole, Kutta, Nilgiri, Masinagudi, Berampaddy forest, Wynaad.

Habitat : Tropical semi-evergreen forests, lives on the tree tops and rarely comes the ground.

Status : Fairly common.

External Distribution : Southern Western Ghats.

Source : Ellerman (1961), Agrawal and Chakraborty (1979) and Karanth (1987).

Remarks : A pair of Indian Giant Squirrel was sighted in the tourism zone of Nagarhole National Park.

82. *Ratufa indica maxima* (Schreber)

Locality : Ootacmund.

Habitat : Tropical Wet evergreen forests.

Status : Not known.

External Distribution : Malabar, Cochin and Palni Hills. Endemic to India.

Source : Ellerman (1961) and Agrawal and Chakraborty (1979).

Family HYSTRICIDAE

83. *Hystrix indica* Kerr*
(Indian Porcupine)

Locality : Bandipur, Nagarhole, Mudumalai, Wynaad etc.

Habitat : It prefers to live in rocky hill sides, however, it can also adapt to any type of country, moist or arid and inhabit both open land and forests.

Status : Common.

External Distribution : India.

Source : Ellerman (1961), Prater (1980) and Karanth (1987).

Remarks : One specimen was sighted in the tourism zone of Nagarhole National Park. Porcupine is also considered an agricultural pest (Jain and Tripathi, 1988).

Family MUSCARDINIDAE

Subfamily PLATACANTHOMYINAE

84. *Platacanthomys lasiurus* Blyth
(Malabar Spiny Dormouse)

Locality : NBR part of Coorg Dist., Upper Bhavani.

Habitat : Not known.

Status : Endemic to South India.

External Distribution : Travancore and Malabar.

Source : Ellerman & Morrison - Scott (1951) and Ellerman (1961).

Family MURIDAE

Subfamily GERBILLINAE

**85. *Tatera indica cuvieri* (Waterhouse)*
(Indian Gerbil or Antelope Rat)**

Locality : Coorg, Masinagudi, Bandipur and Sankadkatte.

Habitat : Lives in crop fields, fallow and waste land. Nocturnal and fossorial animal.

Status : Endemic to South India.

External Distribution : Southern India.

Source : Ellerman (1961) and Jain and Tripathi (1988).

Remarks : Agricultural Pest (Jain and Tripathi, 1988). Actual sighting in Sankadkatte area.

Subfamily MURINAE

**86. *Vandeleuria oleracea nilagirica* (Jerdon)
(Long tailed Tree Mouse)**

Locality : Coorg and Kutta.

Habitat : Lives in trees and shrubs and nimble in bushes for fruits, buds and tender shoots.

Status : Endemic to South India.

External Distribution : Southern parts of Western Ghats.

Source : Ellerman (1961) and Prater (1980).

**87. *Rattus rattus wroughtoni* Hinton*
(White-belly Rat)**

Locality : Bandipur and Nagarhole.

Habitat : A common white bellied South-West Indian race living close to human habitations.

Status : Appears to be locally common.

External Distribution : South-West India.

Source : Ellerman & Morrison Scott (1951) and Ellerman (1961).

Remarks : Collected 2 M and 3 F specimens from residential complexes in Bandipur and Nagarhole areas. A common pest of the localities.

**88. *Rattus blanfordi* (Thomas)
(White tailed Wood Rat)**

Locality : Sivasamudram, NBR part of Karnataka and further south.

Habitat : Leads arboreal life in forests.

Status : Not known.

External Distribution : Peninsular India and Bengal.

Source : Ellerman (1961) and Prater (1980).

**89. *Millardia meltada* (Gray)
(Metad or soft-furred Rat)**

Locality : Coorg, Kutta, Nilgiris etc.

Habitat : Nocturnal, generally lives in cracks and crevices in fields or occupies deserted burrows of other rodents.

Status : Not known.

External Distribution : Peninsular India.

Source : Ellerman (1961), Mishra and Dhanda (1975) and Jain and Tripathi (1988).

Remarks : Agricultural pest.

90. *Mus famulus famulus* Borhote

Locality : Nilgiri Hills, Coonoor.

Habitat & Status : Endemic to South India.

External Distribution : South India, Alt. 5,000 ft.

Source : Ellerman (1961) and Marshall (1977).

**91. *Mus musculus castaneus* (Waterhouse)
(House Mouse)**

Locality : NBR part of Coorg Dist.

Habitat : As the name indicates, prefers to live in human habitations.

Status : Not known.

External Distribution : Throughout India.

Source : Ellerman (1961), Marshall (1977) and Jain and Tripathi (1988).

Remarks : One of the major pests.

92. *Mus booduga* (Gray)

Locality : Coorg, Kutta.

Habitat : Burrowing in the fields.

Status : Not known.

External Distribution : Whole of India.

Source : Ellerman (1961) and Marshall (1977).

Remarks : Agricultural pest.

**93. *Mus cervicolor palnica* (Thomas)
(Fawn coloured Mouse)**

Locality : Coorg, Kutta, Nilgiris, Coonoor.

Habitat : Forest dwelling mouse.

Status : Endemic to South India.

External Distribution : Palni Hills (Madura) and Mysore dist.

Source : Ellerman (1961) and Marshall (1977).

**94. *Mus platythrix* Bennett
(Spinny Field Mouse)**

Locality : NBR part of Coorg Dist.

Habitat : Burrowing rodent inhabiting grass beneath the deciduous forests.

Status : Not known.

External Distribution : Peninsular India.

Source : Ellerman (1961) and Marshall (1977).

Remarks : One of the major pests (Jain and Tripathi, 1988).

**95. *Golunda ellioti* Gray
(Indian Bush Rat)**

Locality : NBR part of Coorg, Dist., Kardibetta forest.

Habitat : Essentially rodent of forests, prefers bush and scrub jungle.

Status : Not known.

External Distribution : Whole of India.

Source : Ellerman (1961) and Prater (1980).

**96. *Bandicota bengalensis kok* Gray
(Lesser Bandicoot Rat or Indian Mole Rat)**

Locality : Coorg, Srimangala.

Habitat : Essentially rodent of fields and an extensive burrower and hoarder.

Status : Common.

External Distribution : Peninsular, India.

Source : Ellerman (1961), Prater (1980) and Jain and Tripathi (1988).

Remarks : A major pest.

**97. *Bandicota i. indica* (Bech.)
(Bandicoot Rat)**

Locality : Coorg, Masinagudi.

Habitat : A creature of field and forest making extensive burrows. A strong excavator.

Status : Common.

External Distribution : Peninsular, India.

Source : Ellerman (1961), Prater (1980) and Jain and Tripathi (1988).

Remarks : A major pest.

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Total no of mammalian species-100

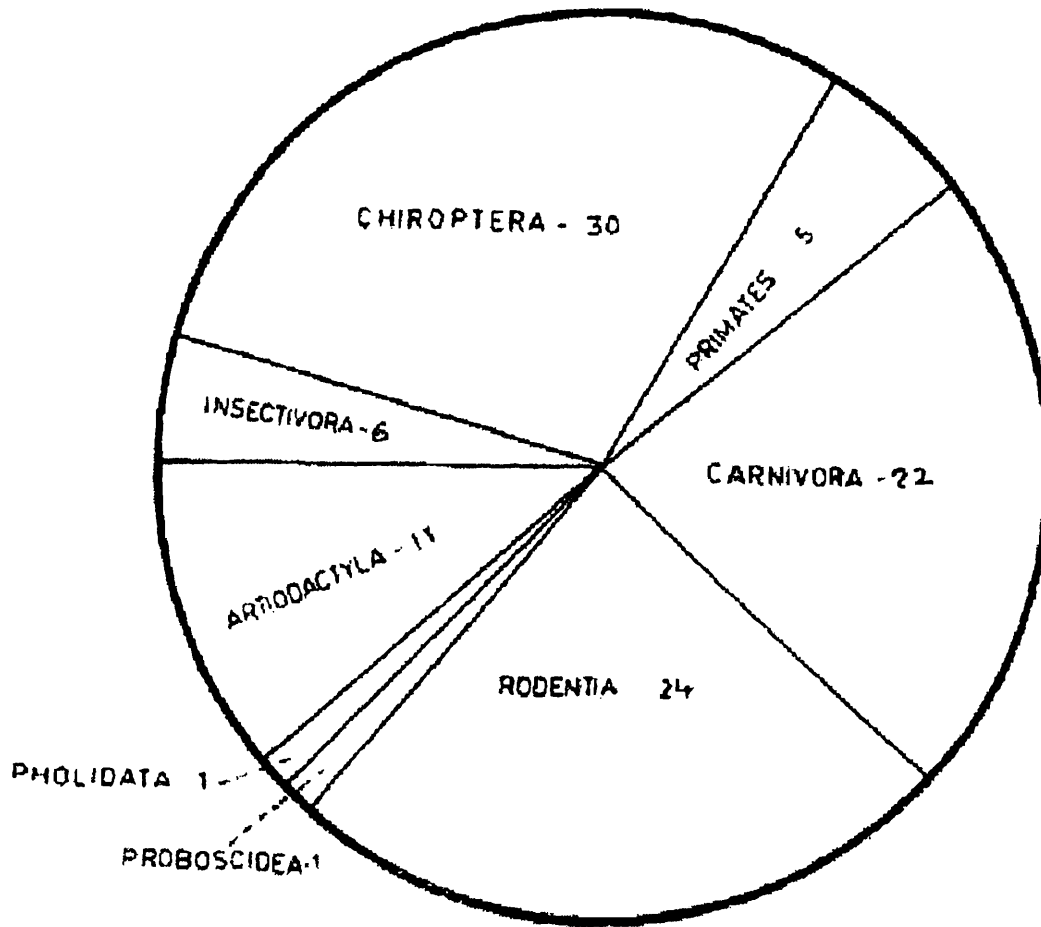


Fig. 1. Order wise representation of mammalian from NBR

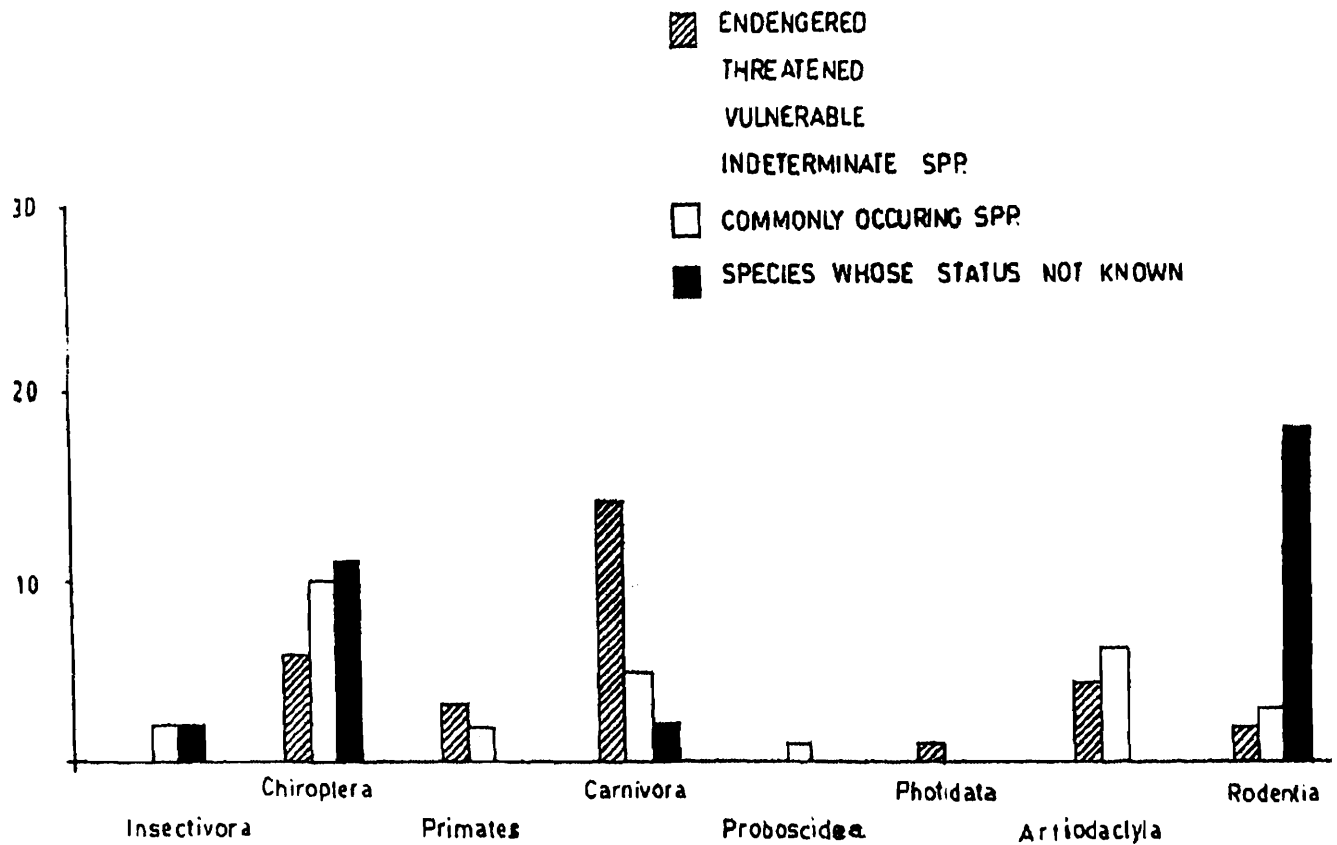


Fig. 2. Current status order-wise

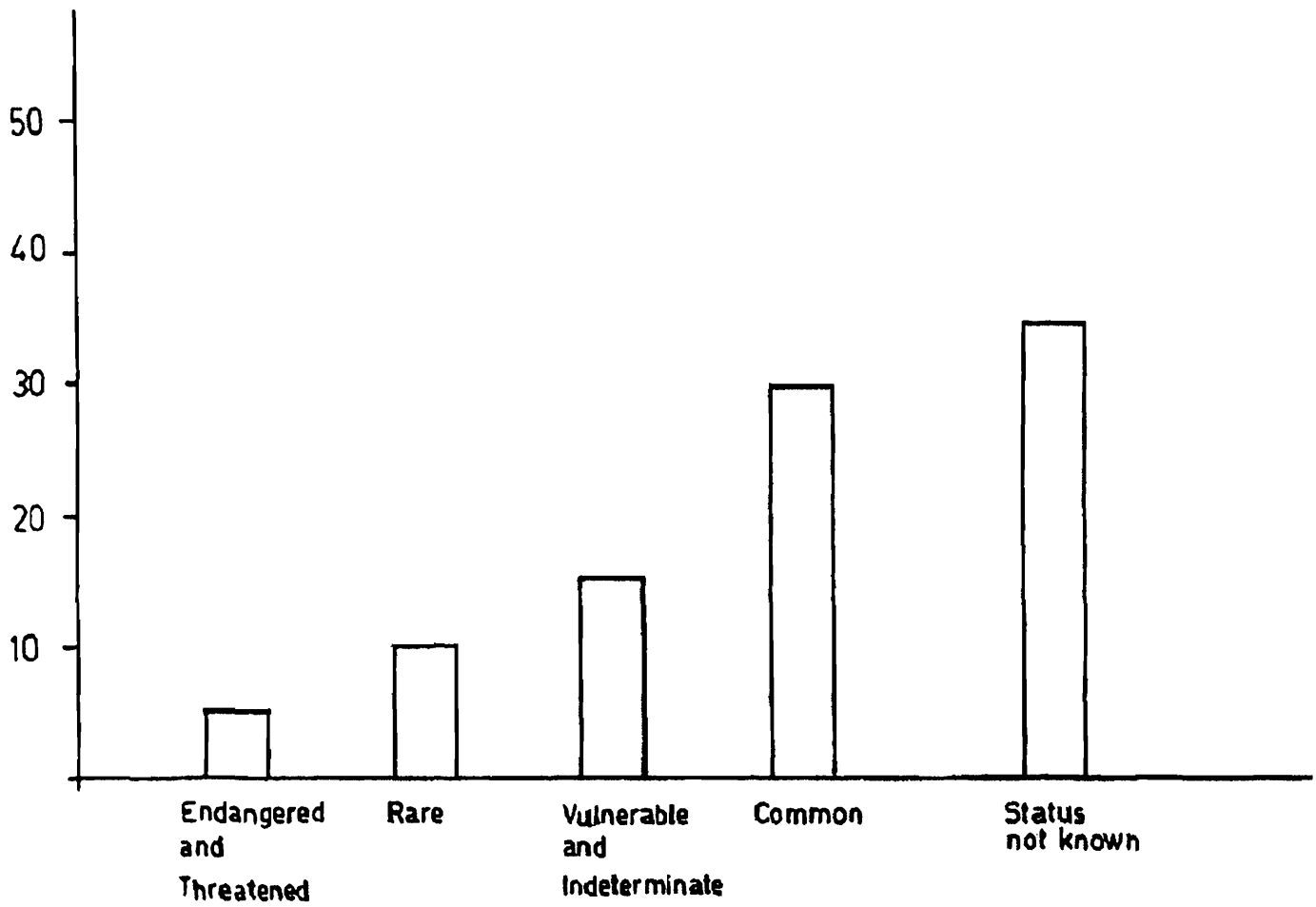


Fig. 3. Current status (IUCN) of mammalian species from NBR

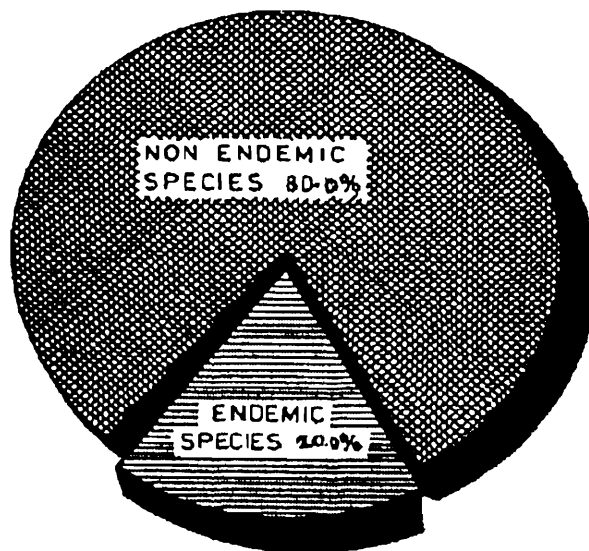


Fig. 4. Endemism in mammalian species from NBR

PLATE 1



A view of forest at Bandipur, Nilgiri Biosphere Reserve (Photo courtesy Dr. R.M. Sharma)



Collecting insects at Bandipur, Nilgiri Biosphere Reserve (Photo courtesy Dr. R.M. Sharma)

PLATE 2



Neurothemis fulvia (Drury) Male



Neurothemis fulvia (Drury) Female

PLATE 3

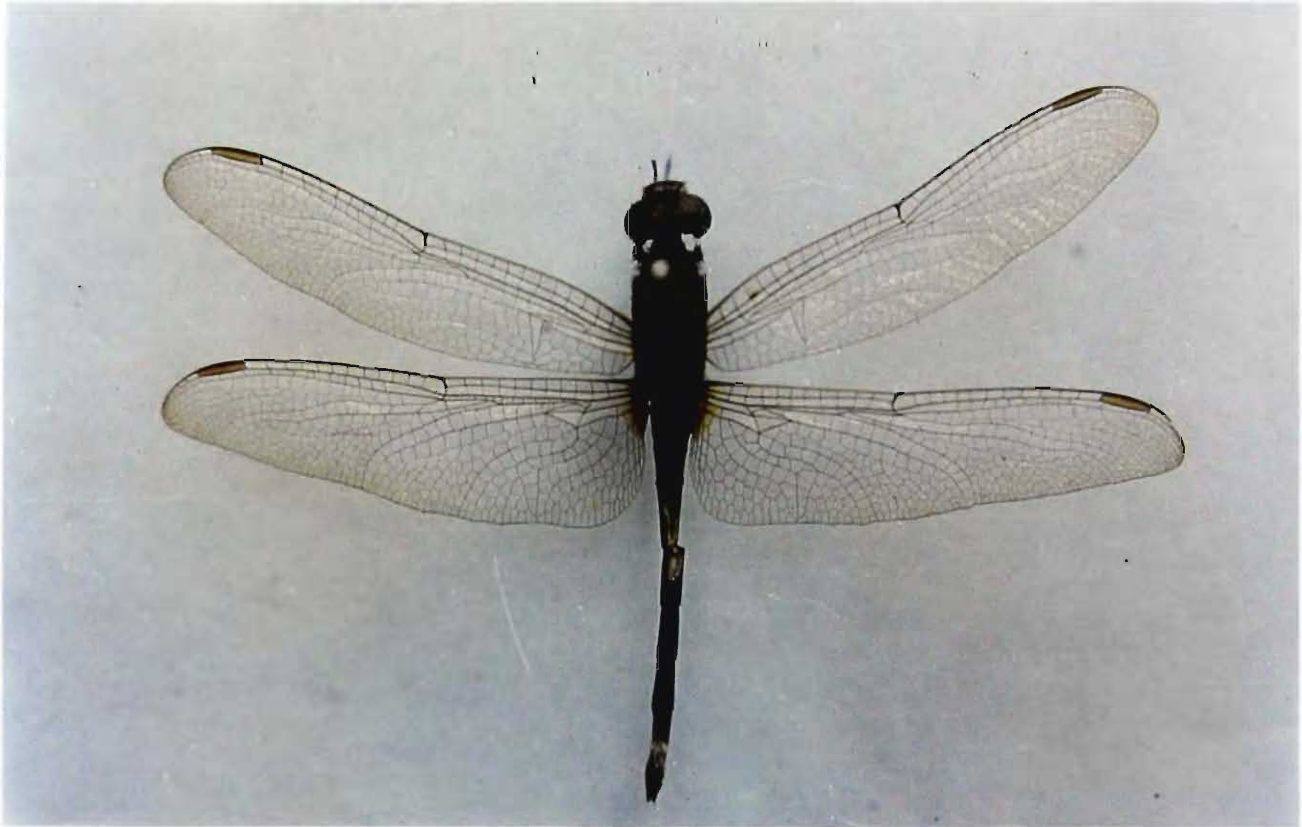


Rhinocypha (Heliocypha) bisignata (Selys)

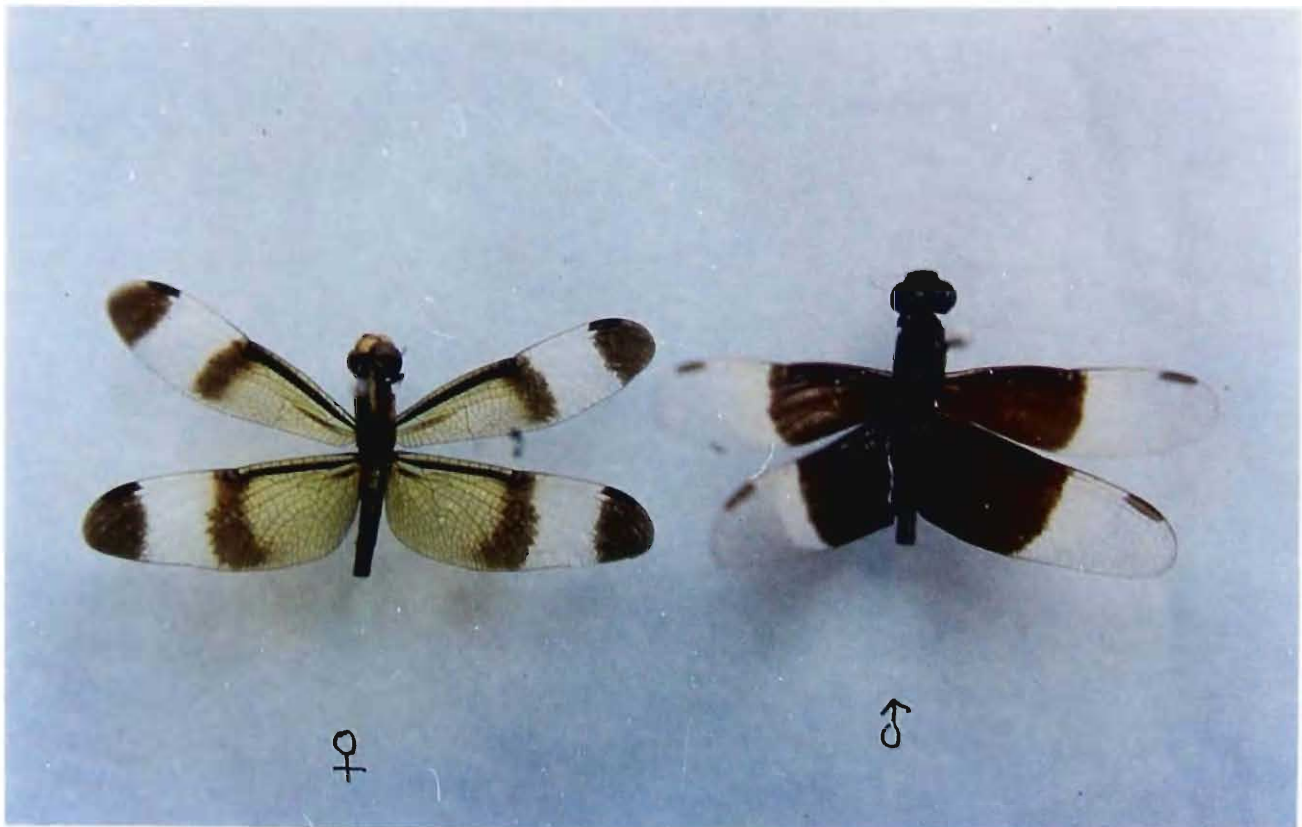


Anax immaculifrons Rambur

PLATE 4

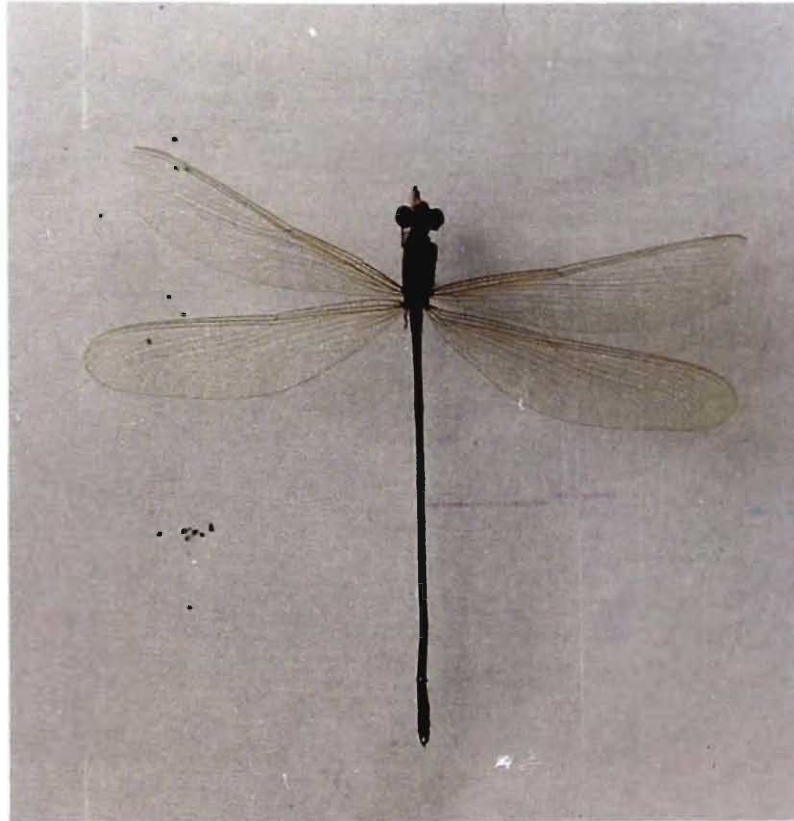


Orthetrum glaucum (Brauer)



Neurothemistullia tullia (Drury) Male and Female

PLATE 5



Vastalis gracilis gracilis (Rambur)



Termite mound at NBR (Photo courtesy Saikh Iqbal)

PLATE 6



Giant Squirrel (Photo courtesy Dr. R.M. Sharma)



Monitor Lizard (Photo courtesy Saikh Iqbal)

PLATE 7



Barking Deer (Photo courtesy Saikh Iqbal)



A herd of Spotted Deer (Photo courtesy Saikh Iqbal)

PLATE 8



Bison herd (Photo courtesy Saikh Iqbal)



Elephant herd (Photo courtesy Saikh Iqbal)