

THE MACRO HYMENOPTERAN FAUNA OF PARAMBIKULAM WILDLIFE SANCTUARY

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Abstract

The macro hymenopteran fauna of Parambikulam Wildlife Sanctuary, Kerala was studied during 1995-97. Of the 105 species collected, 84 species belonging to 47 genera and 16 families were identified. The dominant families includes Formicidae, Apidae, Pompilidae and Sphecidae.

Introduction

The tropical forests, which has an area of only 7% of the total land surface are known to harbour about two third of the world's biological diversity. Along with plants and higher animals, insects form an important component of biodiversity in the tropical forests. Of all the insect orders, Hymenoptera (wasps, bees and ants) are perhaps the commonest, best known and perhaps the most important insects for mankind. Hymenopterans are the most evolved and probably most diverse of all the terrestrial organisms (La Salle & Gauld, 1993). They play a major role in the ecosystem as pollinators of angiosperms and agents of seed dispersal and thereby regulate the floral composition and diversity of an area. The parasitic and predatory species regulate the population size of insect pests, and are considered to be good tools in pest management.

Not much detailed information is available on the Hymenopteran fauna of our forests. Pioneering work on the Hymenoptera of Indian region was made by Bingham (1897, 1903) which contained reference to species found in Kerala. Subsequent to this, some studies have been made specifically on species found in different regions of Kerala (Narendran, 1989, 1994; Mathew, *et al.*, 1998). Apart from these works, the Kerala part of the Western Ghats remains unexplored as far as the order Hymenoptera is concerned. The present paper forms part of a study carried out on the insect fauna in the Parambikulam Wildlife Sanctuary.

Study Area

Parambikulam Wildlife Sanctuary in the Kerala part of Western Ghats is situated in the Palakkad district of Kerala state, between 76°35' and 76°50' east and between 10°20' and 10°26' North. It has an area of 285 sq. km. The average altitude is 600 m. and the highest peak, Karimalagapuram, has an altitude of 1438 m. The yearly temperature ranges between 20°C-30°C and the average precipitation is 1720mm. The Sanctuary exhibits characteristic undulating hilly terrain and is interspersed with marshy areas (Vayals) in the valleys. The vegetation is a combination of natural and manmade forests. Natural forest comprises of tropical wet evergreen forest, tropical semievergreen forest, Southern Indian moist deciduous forest and Southern Indian dry deciduous forest. Teak (*Tectona grandis*) plantation with an extent of 8900 ha is the major manmade habitat.

Materials and Methods

The study was carried out between 1995-1997. Sampling of

insects was done at monthly intervals in different habitats in the Sanctuary and the insects collected were preserved and subsequently identified by reference to collections at Kerala Forest Research Institute, Peechi and at national institutions like Indian Agricultural Research Institute, New Delhi, and Zoological Survey of India, Calcutta as well as by referring to experts. Some of the specimens could not be identified despite such efforts.

Results and Discussion

Altogether 105 species of hymenopterans were collected, of which 84 species were identified (Table 1) with their distribution in various habitats within the Sanctuary. They belong to 47 genera and 16 families. Maximum number of species recorded belonged to the families Formicidae, Sphecidae, Pompilidae and Apidae.

With regard to the habitats studied, the tropical evergreen forests were found to be rich in species as most of the species collected (85 sp.) in this study were from this habitat. Moist deciduous (77 sp.) and dry deciduous forests (39 sp.) showed some remarkable difference in the species composition. Teak plantation (62 sp.) showed close affinity to the moist deciduous forests probably due to recolonisation by different plant species in these areas.

The dominance of the families Apidae, Anthophoridae, Megachilidae, and Xylocopidae was noted in all the habitats. While *Apis dorsata* Fb., *A. indica* Fb., *A. florea* Fb., *Xylocopa verticalis* Lepel., *X. dissimilis* Lepel., were found in abundance in all the habitats, *Mutilla semiaurata* Smith, *Mutilla* sp., *Sphex praedator leutipennis* Moscardi, *Camponotus* sp., *Crematogaster* sp., and *Dorylus* sp. were recorded exclusively from the evergreen areas. *Scolia carbonaria* Saus., *Megascolia* sp., *Dorylus* sp., *Pseudagenia blanda* Guer., *Sphex argentatus* Fb., *Hylaeus feai* (Vachal), and *Platythyrea* sp. were observed only in the moist deciduous and evergreen areas. Some species like *Eumenes conica* Fb., *Trypoxylon errans* Saus. were not very common in the evergreen forests.

The study indicated a rich and diverse hymenopteran fauna in the Parambikulam Wildlife Sanctuary. As this study covered only macroforms and the microforms remain unrecorded further faunistic surveys are recommended for the area to unearth its rich Hymenopteran diversity.

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Table 1. List of Hymenopterans recorded from Parambikulam Wildlife Sanctuary, Kerala.

	EVG	MDF	DDF	PLN		EVG	MDF	DDF	PLN
Family Apidae					<i>Camponotus</i> sp. E				
<i>Apis dorsata</i> Fb.	+	+	+	+	<i>Crematogaster</i> sp.	+	-	-	-
<i>A. indica</i> Fb.	+	+	+	+	<i>Dorylus</i> sp.	+	-	-	-
<i>A. florea</i> Fb.	+	+	+	+	<i>Harpegnathos saltator</i> Jerd.	+	+	-	-
<i>Coelioxys cuneatus</i> Smith	+	+	-	+	<i>Leptogenys</i> sp. A	+	+	-	-
<i>Thyreus</i> sp.	+	+	-	-	<i>Leptogenys</i> sp. B	+	+	-	-
<i>Thyreus ramosa</i> Lepel	+	+	-	-	<i>Leptogenys</i> sp. C	+	+	+	+
<i>Thyreus</i> sp.	+	+	+	+	<i>Myrmecaria</i> sp.	+	+	+	+
<i>Nomia ellioti</i> Smith	+	+	-	+	<i>Oecophylla smaragdina</i> Fb.	+	+	+	+
<i>N. thoracica</i> Smith	+	+	+	+	<i>Pheidologeton diversus</i> Jerd.	+	+	-	+
<i>Psithyrus</i> sp.	+	+	-	-	<i>Pheidologeton</i> sp.	+	+	-	+
Family Xylocopidae					<i>Plagiolipsis longipes</i> Jer.				
<i>Xylocopa dissimilis</i> Lepel.	+	+	+	+	<i>P. rothneyi</i> Forel	+	+	-	-
<i>Xylocopa verticalis</i> Lepel.	+	+	+	+	<i>Platythyrea</i> sp.	+	+	-	-
Family Eumenidae					<i>Polyrhachis</i> sp.				
<i>Eumenes conica</i> Fb.	+	+	+	+	<i>Polyrhachis illaudata</i> Wlk.	+	+	-	+
<i>E. flavopicta</i> Blanch	+	+	+	+	<i>Tetraponera</i> sp.	+	+	+	+
<i>Odynerus fragilis</i> Smith	+	+	-	+	Family Braconidae				
<i>Rhynchium brunneum</i> (Fb.)	+	+	+	+	<i>Cardiochile</i> sp.	+	+	+	+
Family Scoliidae					Family Evaniidae				
<i>Magascolia</i> sp.	+	+	-	-	<i>Evania</i> sp.	+	+	-	+
<i>Scolia carbonaria</i> Saus.	+	+	-	-	Family Ichneumonidae				
<i>S. aureipennis</i> Lepel	+	+	-	+	<i>Enicospilus</i> sp.	+	+	-	+
Family Sphecidae					Family Mutillidae				
<i>Ammophila laevigata</i> Smith	+	+	+	+	<i>Mutilla semiaurata</i> Smith	+	-	-	-
<i>A. atripes</i> Smith	+	+	-	+	<i>Mutilla</i> sp.	+	-	-	-
<i>Chalybion bengalense</i> (Dahl.)	+	+	+	+	Family Colletidae				
<i>Chlorion lobatum</i> Fb.	+	+	-	+	<i>Hylaeus feai</i> (Vachal)	+	+	-	-
<i>Cerceris</i> sp.	+	+	+	+	Family Anthophoridae				
<i>Sceliphron javanum</i> Lepel.	+	+	-	-	<i>Anthophora niveocincta</i> Smith	+	+	+	+
<i>S. coromandelicum</i> Lepel.	+	+	-	+	<i>A. zonata</i> (Lin.)	+	+	-	+
<i>S. madraspatanam madraspatam</i> Fb.	+	+	-	+	<i>A. confusa</i> Smith	+	+	+	+
<i>Sphex argentatus</i> Fb.	+	+	-	-	Family Megachilidae				
<i>S. praedator leutipennis</i> Moscardi	+	-	-	-	<i>Megachile lanata</i> Fb.	+	+	+	+
<i>Sphex</i> sp. nr. <i>nigripes</i>	+	+	+	+	<i>M. carbonaria</i> Smith	+	+	+	+
<i>S. sericeus</i> Fb.	+	+	+	+	<i>M. quartinae</i> Gribodo	+	+	-	+
<i>Tirrhogma caerulea</i> Westwood	+	+	-	-	Family Pompilidae				
<i>Trypoxylon errans</i> Saus.	+	+	+	+	<i>Ceropales</i> sp. A	+	+	-	+
Family Chrysididae					<i>Ceropales</i> sp. B	+	+	+	+
<i>Stilbum cyanarum</i> (Forster)	+	+	+	+	<i>Ceropales</i> sp. C	+	+	+	+
<i>Trichrysis lusca</i>	+	+	+	+	<i>Pompilus</i> sp. A	+	+	+	+
Family Vespidae					<i>Pompilus</i> sp. B	+	+	+	+
<i>Vespa</i> sp. nr. <i>cincta</i> Fb.	+	+	+	+	<i>Pseudagenia blanda</i> Guer.	+	+	-	-
<i>Rhopalidia</i> sp.	+	+	-	+	<i>Salix fulvipennis</i> Fb.	+	+	-	-
<i>Polistes</i> sp.	+	+	-	+	<i>S. perplexus</i> Smith	+	+	+	+
Family Formicidae					<i>S. praestabilis</i> Binham	+	+	+	+
<i>Camponotus</i> sp. A	+	+	+	+	<i>S. caeruleopennis</i> Saus.	+	+	-	+
<i>Camponotus</i> sp. B	+	+	+	+	<i>Salix</i> sp. A	+	+	+	+
<i>Camponotus</i> sp. C	+	-	-	-	<i>Salix</i> sp. B	+	+	-	+
<i>Camponotus</i> sp. D	+	+	+	+	<i>Salix</i> sp. C	+	+	-	+

+ = species present; - = species absent; EVG = evergreen; MDF = moist deciduous; DDF = dry deciduous; PLN = teak plantation.