



E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2017; 5(1): 440-441
© 2017 JEZS
Received: 02-11-2016
Accepted: 03-12-2016

Rabeesh TP
Department of Zoology, S. H.
College Thevara, Cochin, Kerala,
India

Sumesh S
Department of Zoology, S. H.
College Thevara, Cochin, Kerala,
India

Karmaly KA
Department of Zoology, St.
Xavier's College for womens,
Aluva, Kerala, India

Shanas S
Rice Research Station,
Moncompu, Alappuzha, Kerala,
India

Correspondence
Rabeesh TP
Department of Zoology, S. H.
College Thevara, Cochin, Kerala,
India

Diversity of Ants in Kuttanad region of Kerala, India

Rabeesh TP, Sumesh S, Karmaly KA and Shanas S

Abstract

The present study deals with the diversity of ants in Kuttanad region of Kerala, India. Ants were collected from six different sites of Kuttanad region with the help of pitfall trap, brush method, sweep net and aspirator method. 25 species were collected from this region. Among the subfamilies reported from study area Myrmicinae was dominant with 13 species followed by Formicinae with 7 species, Ponerinae with 3 and Dolichoderinae and Pseudomyrmecinae with 1 species each. Ant diversity is very poor in Kuttanad region because of high use of insecticides in the paddy fields.

Keywords: Ants, diversity, Kuttanad, Kerala, India

1. Introduction

Ants play an important role within the terrestrial ecosystems because they have numerous interactions with different plant species, including seed dispersers, leaf- and seed- predators, and in some cases, as pollinators [1, 2]. Ants are found everywhere, except in Iceland, Greenland and Antarctica [3], but the number of species declines with increasing latitude, altitude and aridity [4-7]

Currently, there are 15,983 extant ant species or subspecies as per the recent classification. They are grouped into 20 subfamilies, with 464 genera [8]. All of these belong to a single family called Formicidae included in the super family Vespoidea of the order Hymenoptera, which is placed in the largest class insecta in the animal kingdom. A total of 828 valid species and subspecies names belonging to 100 genera are listed from India [9]. The current study aims to provide diversity of ants in Kuttanad region of Kerala, India

2. Materials and Methods

The ant samples were collected from various localities and around of Kuttanad (Moncompu, Thakazhi, Edathua, Ramankari, Kainakari, Chambakulam). Three ecological habitats, agriculture, grassland forest and human habitat were chosen for sampling. We employed all out search method for the collection of ants in November 2013. Kuttanadu is a region covering the Alappuzha, Pathanamthitta and Kottayam Districts well known for its vast paddy fields and geographical peculiarities. The region has the lowest altitude in India around 1.2 to 3.0 metres (4 to 10 ft) below sea level the climate is tropical. Ants were collected using a brush, aspirator, and sweep net during day time and preserved in 70 % isopropyl alcohol in separate plastic vials at the Department of Zoology, St. Xavier's college for women, Aluva. Species identification was carried out under Leica MZ6 Stereozoom microscope and with the help of the keys of C.T Bingham and Boltons catalogue of the ants of the world [10-12]. Identified specimens will be kept in the air tight insect wooden box.

3. Results

Twenty five species of Ants were reported during the Study period. Those are listed in Table.1. The Survey was conducted at Kuttanad region of Kerala in November 2013. A total of 5 subfamilies distributed among 17 genera and 25 species were recorded. The richest in the species were Myrmicinae, Formicinae and Ponerinae, while Pseudomyrmecinae and Dorylinae were the rarest in species. The most dominant genus was *Camponotus* Mayr.

Table 1: List of identified specimens from Kuttanad regions of Kerala.

	Sub family	Genus	Species
1.	Formicinae	<i>Oecophylla</i>	<i>smaragdina</i> (Fabricius)
2.	Formicinae	<i>Anoplolepis</i>	<i>gracilipes</i> (Smith)
3.	Formicinae	<i>Paratrechina</i>	<i>longicornis</i> (Latreille)
4.	Formicinae	<i>Camponotus</i>	<i>angusticollis</i> (Jerdon)
5.	Formicinae	<i>Camponotus</i>	<i>compressus</i> (Fabricius)
6.	Formicinae	<i>Camponotus</i>	<i>mitis</i> (Smith)
7.	Formicinae	<i>Camponotus</i>	<i>parius</i> Emery
8.	Ponerinae	<i>Diacamma</i>	<i>rugosum</i> (Le Guillou)
9.	Ponerinae	<i>Leptogenys</i>	<i>assamensis</i> Forel
10.	Ponerinae	<i>Odontomachus</i>	<i>haematodus</i> (Linnaeus)
11.	Myrmicinae	<i>Myrmecaria</i>	<i>brunnea</i> Saunders
12.	Myrmicinae	<i>Monomorium</i>	<i>indicum</i> Forel
13.	Myrmicinae	<i>Monomorium</i>	<i>destructor</i> (Jerdon)
14.	Myrmicinae	<i>Monomorium</i>	<i>dichroum</i> Forel
15.	Myrmicinae	<i>Tetramorium</i>	<i>indicum</i> Forel
16.	Myrmicinae	<i>Tetramorium</i>	<i>bicarinatum</i> (Nylander)
17.	Myrmicinae	<i>Meranoplus</i>	<i>bicolor</i> (Guerin-Meneville)
18.	Myrmicinae	<i>Crematogaster</i>	<i>rogenhoferi</i> Mayr
19.	Myrmicinae	<i>Crematogaster</i>	<i>subnuda</i> Mayr
20.	Myrmicinae	<i>Solenopsis</i>	<i>geminata</i> (Fabricius)
21.	Myrmicinae	<i>Pheidole</i>	<i>megacephala</i> (Fabricius)
22.	Myrmicinae	<i>Pheidole</i>	<i>wroughtoni</i> Forel
23.	Myrmicinae	<i>Pheidologiton</i>	<i>affinis</i> (Jerdon)
24.	Dolichoderinae	<i>Tapinoma</i>	<i>melanocephalum</i> (Fabricius)
25.	Pseudomyrmecinae	<i>Tetraponera</i>	<i>rufonigra</i> (Jerdon)

4. Discussion

This is the first attempt of a study on ant diversity in kuttanad region of Kerala. The region has the lowest altitude in India around 1.2 to 3.0 metres below sea level. Species richness is very low in the study area compared to other medium altitude regions of Kerala. Ant abundance and species richness peaked at mid-elevations influenced by the presence of favourable physical conditions and abundance of prey resources^[13]. Kuttanad is a highly pesticide using area for paddy cultivation. In the present study only 25 species of Ants were documented from the study area. This study clearly shows that ants can't tolerate environmental factors and anthropogenic activities like pesticide use and irrigation of the study area. Ant biodiversity is incredibly high and these organisms are highly responsive to human impact, which obviously reduces its richness^[14]. Meanwhile Species like *Monomorium* Mayr, *Tetramorium* Mayr and *Pheidole* Westwood plays a good role in seed dispersal of paddy fields in the Kuttanad region.

5. Conclusion

The present study shows that the diversity of ants in kuttanad region of Kerala. The Kuttanad region suffers from several threats such as habitat alteration, human disturbance such as the high usage of pesticides in the paddy fields, and sudden irrigations which may change the existing species diversity. So the study highlights the importance of conservation of ants in the kuttanad region

6. Acknowledgment

We wish to extend our gratitude to UGC for providing financial assistance. Also thankful to Principal, St. Xavier's College for Women, Aluva and Principal and HOD of Zoology, S. H College, Thevara for providing necessary facilities to carry out our work.

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