

# DIVERSITY OF ENTOMOFAUNA IN NORTHERN CHHATTISGARH INDIA

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**Abstract**—We studied distribution of insect species diversity in northern Chhattisgarh. This is the first widespread account on insect species diversity brought out by the authors in this area. Since, the complete list of insects as far as this known from northern Chhattisgarh have not yet given in the present publication, only the list of orders and their respective species were provided. Overall, 292 species of 16 orders of insect are reported from the study area. It is noteworthy that a widespread report of insect diversity of Surguja has been provided first time, which is mainly based on the collection and surveys. The insect diversity of the study area is estimated about 11% of all the known species from India. Governance of hemipteran and coleopteran insects suggested that northern Chhattisgarh is not yet polluted than that of their counterpart.

**Keywords**— insect species, northern Chhattisgarh

## I. Introduction

Insecta is the largest class of phylum Arthropoda among animal kingdom. The species of the class Insecta are arranged in 29 orders (Arillo and Engel 2006). Out of these orders – the Coleoptera, Diptera, Hymenoptera, and Lepidoptera – report for 81% of total described living insects. It is commonly believed that 75-80 % of the total animal species on this planet are insects (Ehrlich and Wilson, 1991). Hammond (1992) estimated about 9, 50,000 described species of insects, although lower figures of around 7, 50,000 (May, 1998) are generally quoted. Recently zoological survey of India estimated 61,181 insect fauna, which is 7.06% insect species of the world. Prior to that Lefroy and Howlett (1909) were reported 25,700 Indian insect species. Later on Roonwal (1989) estimated that insects constitute two-thirds of the total fauna in India and comprise around 1, 00,000 species, out of that half remain yet to be investigate. Varshney (1997) has reported 589 families and 51450 species of insects from India. In a recent estimate, Alfred *et al.* (1998) estimated 59353 species of insects from

India belonging to 619 families. Entomologists are sustainably debating regarding the number of insect 'species' that exist and the levels of past and likely future extinctions. Documenting and cataloging of entomofauna is a principal aspect of Earth's life is a natural quest of human inquiry. In fact, 'ecological services' such as recycling of materials, pollination, and the economically important activities of

predators and parasitoids are significantly promoting the conservation of entomofauna.

## II. Materials and Methods

Sanawal is situated in Balrmpu-Ramanujan district of Chattisgarh and it has been explored for the listing of insect species diversity. These explorations have been conducted in various seasons of the years from November 2012 to March 2014. Sanawal is a significant biodiversified territory of Chattisgarh located in the northernmost part of Chattisagr, positioned at 17 degrees north latitude. Temperature varies from 10° C to 45°C. People of this region have divergent way of life and civilization, enriched as it is with dense forests and a very diverse population comprising to a number of tribes. They prefer animal husbandry and small industries as additional income-generating activities and are keen to take these up. The individual of sanawal be desperate to commence apiculture, sericulture and lac culture. The Kanhar River is the principal river near the sanawal. Life here is governed by tribal customs, culture and traditions. In the rural areas of the region, people are dependent largely on agriculture and minor forest produce. Due to the available natural resources, the level of migration from this region is comparatively limited. There are no urban centre's except and Ambikapur in northern chattisgarh *i.e.*, Surguja (*JanRapat, cg govt.2005*).

Study area was broadly divided into two main types depending upon the vegetation and human intervention like dense forests, and human settlements. Different insect species were sampled at regular intervals from all the areas. The unrevealed insect species are not yet mentioned in the paper due to under identification assortment.

## Methodology

Northern Chhattisgarh with its variety of ecosystems ranging from mountains supporting thick forests, coastal plains, vegetations is known for its rich diversity. Documentation of insect species of an area is never complete, due to its enormous diversity; even then a good deal of information has been generated on them by planned and systematic surveys. Following methods were used for collection of insect species:

- Most of insects remain a little stationary in early morning due to cold night; therefore these were pulled out by using forceps from grasses and stones (Jonathan, 1990).

- To avoid damage of their body parts intensive care has been taken care.
- Sweeping method (Arora, 1990) were used for free flying and free living insects
- Free flying lepidopterans, dipterans and hymenopterans were collected by aerial nets.
- Soft-bodied insects species such as butterflies were gently picked up from the bottom of the bag, after they got rapt in the bag by a rapid twist of handle.
- To collect small active insects like leafhoppers, white flies, other Hemiptera and Coleoptera etc. was used aspirator method, direct from the plant surface.
- Further insect species were transferred to the killing bottle for preservation. Optimum insects' species like moths, beetles etc. were collected by using synthetic light on white cloth sheet. These insects were picked up by hand or forceps and killed by using killing bottle.

### III. Results

A total of 292 insect species have been documented from study sites. Many of these entomofauna are common among 29 orders of class insecta. Total number of species in different orders along with their common names are represented in Table 1.

Table 1: Insect species diversity in Sanawal

SN	Orders	Common Name	No of Species
1	Mantodea	Mantids	9
2	Isoptera	Termites	11
3	Phthiraptera	Chewing - Lice	3
4	Hemiptera	True -Bugs	7
5	Thysanoptera	Thrips	5
6	Neuroptera	Lace-wings	4
		Antlions	
7	Coleoptera	Beetles	34
8	Siphonaptera	Fleas	2
9	Diptera	True flies	21
10	Lepidoptera	Butterflies	89
		Moths	
11	Trichoptera	Caddis-flies	9
12	Hymenoptera	Wasps & Bees	24
13	Orthoptera	Grasshoppers	28
14	Phasmida	Leaf and Stick insects	3
15	Blattaria	Cockroaches	11
16	Odonata	Dragons	13
		Damsels	
		Total	292

1/ Mantodea : This order belongs to carnivorous insects commonly known as "praying mantis". We reported nine species in sanawal region out of 162 species found in India.

2/ Isoptera : Termites are very common in the world, out of 310 species of India we have reported only eleven species in the study area.

3/ Phthiraptera : We have reported only three bird lice in the study area.

4/ Hemiptera: The 'true bugs' included in this order, we have sited seven phytophagous and blood suckers in the study area.

5/ Thysanoptera: Moderately small insects, usuallu called as 'thrips' are either phytophagous/ mycophagous or predaceous (Sen et al. 1988). We worked on thrips biodiversity and observe only five species in the sanawal region.

6/ Neuroptera : Neuropteran are commonly acknowledged as 'Lace wings, nerve-winged insects and ant lions. The have well defined antennae and transparent wings, who feeds on various pests. We have reported only four species in study area.

7/ Coleoptera : They are commonly known as beetles characterized by the forewings much thickened, veinless and meeting in a mid-dorsal straight line. We have got 34 species in the study area.

8/ Siphonaptera : Smaller, ectoparasitic, wingless insects are the characteristics of order siphonaptera which exhibit piercing and sucking type of mouthparts. Two species (fleas) known from Sanawal.

9/ Diptera: We have reported around 21 species (mosquitoes, midges and flies) in the study area. The species of this order consist generally two-winged, with two halteres fauna, but there are some that have partially or entirely lost their wings, usually leaving their halteres intact behind Datta and Parui (2003) and Parui (2003).

10/ Lepidoptera: This order consist of different size insects commonly recognize as 'butterflies' and 'moths'. Two pairs of well-developed wings with colored scales were found in butter flies and moths (Heppner 1991). We reported 89 species in the study area.

11/ Trichoptera: According to Majumdar (2003) reported around 179 species of caddis-flies in central India. In Surguja region we have been reported 9 species only at this movement.

12/ Hymenoptera: The insects of this order belongs to small to large sized with two pairs of veined or almost vein less wings or may be wingless. In most hymenopterans, a constriction lies between thorax and abdomen. Females of many species furnished with ovipositors having stings or saws (Jaganmohan *et al* 2013). However, we have reported 24 species in the study area.

13/ Orthoptera: The representative of this order are commonly known as grasshoppers, locusts, crickets, mole crickets and grouse locusts. Most of the part of India consist the members of family Acrididae and Grylloidea (Majumdar *et al* 2013). In the study area we have recorded around 28 species of this order.

14/ Phasmida: leaf insects are the representative species of this order in which elongated and cylindrical entomofauna are noticed. At the moment, only three species reported in the study area.

15/ Blattaria: Cockroaches are representative animals of this order, found predominantly in tropical. They are cosmopolitan, omnivorous, cannibal species, around 11 species reported in the study area.

## References

16/ Odonata: The representative Odonatarians are dragonflies and damselflies. Distinguished by large compound eyes with nearly 360-degree vision in both the nymph and adult stage. Brown and green bodies tend to provide camouflage and allow the nymph to blend in with the aquatic habitat of plants and pond bottoms. Around 13 species reported in the study area.

## IV. Discussion

The forests of north-eastern Chhattisgarh have high species diversity and richness and are characterized by a dominance of Insect species. The dominance of Coleoptera, Lepidoptera and orthoptera species appears to be the characteristic feature of study area. A number of factors including available moisture, soil type, exposure and disturbances influence the relative abundance of species in the forested habitat (Archer, 1995; Walker, 1992). According to Hubbell (1979) a more mature and balanced forest community with a long-normal type of dominance-diversity relation is driven back to geometric type through repeated disturbance. Jaganmohan and his colleague (2013) recorded around of 2,185 insects from 10 orders; of these 1,072 insects belonging to eight orders were captured in pitfall traps Bangalore. Overall 578 species belonging to class insecta, reported from Silent Valley Kerala. Among this, 449 species were from the undisturbed and 417 species from the disturbed areas of Kerala (Mathew et al 1998). At the same time we have been reported around 292 species belonging to 16 orders at the specific area within the one year of time period. All 29 recognized orders of insects except Grylloblattodea are known to be represented in Sri Lanka. Based on published information surveyed during this study, the total number of insect species recorded from Sri Lanka is 11144 (Wijesekara and Wijesinghe 2003). A total of 2159 individuals representing 31 species belonging to 23 genera, 15 families and 4 orders were recorded. Maximum of 30 species and 1191 individuals of aquatic insects were recorded in vegetation rich Maharaja Bir Bikram College Lake and minimum of 11 species and 215 individuals were recorded in vegetation poor Laxminarayan Bari Lake (Majumdar et al 2013).

It is noteworthy that a widespread report of insect diversity of Surguja has been provided first time, which is mainly based on the collection and surveys. The insect diversity of the study area is estimated about 11% of all the known species from India. The above study indicates that the study of insects in northern Chhattisgarh is still not very extensive, as many orders are not yet represented, indicating the scope of discovery of a large number of known and unknown species if the organized surveys of unexplored and under explored areas are undertaken with the help of governmental and non-governmental organization.

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