



SPECIES RICHNESS OF ANTS IN KATOL, DIST. NAGPUR (M.S.)

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ABSTRACT

The study was carried out to measure the species richness of ants in Katol town area. All out search and photographic methods were used to observe ants. We found 10 species of ants belonging to 10 genera under 4 subfamilies at different locations. The subfamily Myrmicinae was the most dominant in terms of species richness; with 4 species(40%), while subfamily Formicinae and Myrmicinae recorded with equal number of species(40%) . Least number found with subfamily Dolichoderinae(10%) and Pseudomyrmicinae (10%).

Key words:- Ant Diversity, Formicinae, Oecophylla, Species Richness, Katol.

INTRODUCTION:

Arthropods constitute the vast majority of global animal biodiversity. Among arthropods, ants are considered as ecologically dominant in most terrestrial environments. While ants have been increasingly appreciated as an indicator group in some regions (Bestelmeyer and Wiens 2001, Andersen *et al.*, 2004), Insects constitute 85% of the world's animal biodiversity (Groombridge, 1992). Inclusion of ground-dwelling arthropods in environmental assessment surveys and biodiversity inventories has increased in the recent past (Oliver and Beattie, 1996).

Among the Arthropods, the ants are considered one of the most diverse, abundant and ecologically significant organisms on the earth. Ants, prominent invertebrate group used in assessing ecological responses are one of nine proposed indicators (Underwood and Fisher, 2006). Ants are abundant insects and are considered important in ecosystem functioning. They have diverse ecological roles, including nutrient cycling, seed dispersal and population regulation of other insects (Holldobler and Wilson 1990; Folgarait, 1998).

Ants are known to be an important part of ecosystems not only as they constitute a great role of the animal biomass but also because they act as ecosystem engineers. It performs major ecological functions. They are important seed dispersers, invertebrate predators, scavengers, and competitors, ground-dwelling ants exert a strong impact on the arthropods (Holldobler and Wilson, 1990). In addition, they play important part in the transfer of organic materials, movement of soil and gives better aeration (Agosti et al., 2000). The most diverse and ubiquitous groups of the social insects (Bolton, 2011), ants are eusocial (Gadakgar et al., 1993). Ant species helps in monitoring environmental impacts, eco-social projects and tools in ecological studies (Andersen, 1990).

This study is the first preliminary report from the area with a focus to investigate the species richness of ants.

MATERIALS AND METHODS:

Study Area: The study area is a Katol town, a Tahsil place situated in Nagpur district in the state of Maharashtra, India. The average elevation is 1669ft asl. It receives rainfall both from the South-West during June to September and North-East during November to December. The vegetation of Katol tahsil area is of the dry deciduous type.

The present study was carried out in an attempt to understand and measure the status of ant diversity in selected areas (1) Residential area; it includes two accommodation campus, schools and colleges.(2) Cultivated land (Cotton field, Orange farms, Jowar, Soya bean farms, etc). These sites are located nearby the city and have good tree cover. Over all city is situated at the base of hilly area of Satpuda ranges and covered with greenery. All the sites selected for survey are surrounded with well plantation. The data were collected for a period of six months, from June 2020 to November 2020.

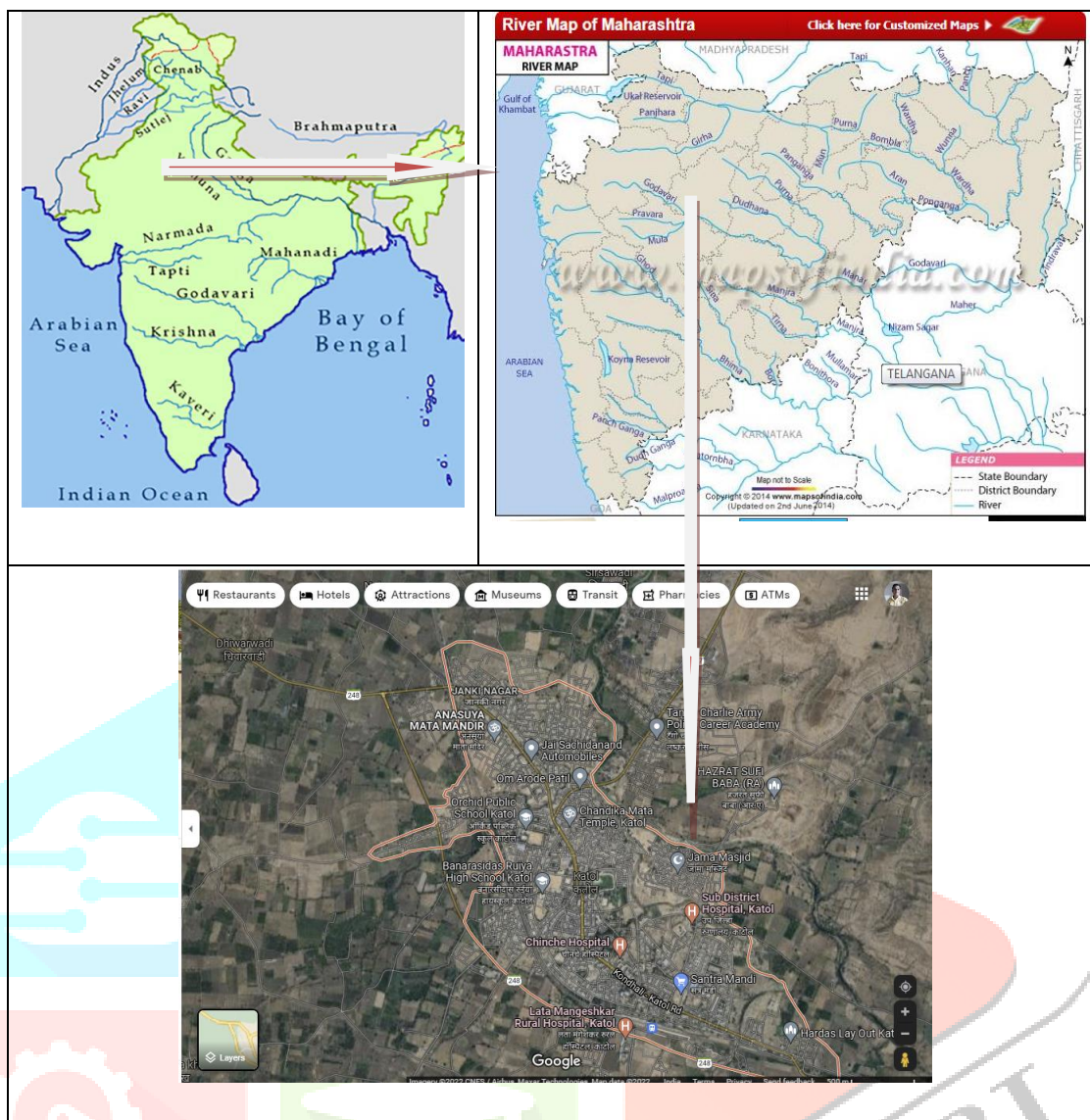


Fig. Geographical location of the study area (Source: Google maps and Maps of India)

Sampling :Sampling was performed using following methods:

All-Out Search Method: The most commonly used method is all-out search method. The ants were just picked up by hand using brushes or forceps. Care was taken to collect all castes from a colony in the case of polymorphic species, because the phenomenon of polymorphism can lead to major confusions, during sorting and identification.

Photographic Method: Photographs were taken using Canon digital camera. More time spent for good quality photographs. This method helps to conserve the biodiversity instead of pit fall, traps and other insect killing methods. Well captured photos selected for identification.

Identification:Sampled ant species that were photographed and identified using stranded identification manuals given by Ali (1992), Bingham (1903), Bolton (1994), Rastogi (1997), Tiwari (1999), Varghese *et. al.*, (2002 and 2003). In the laboratory, the samples were separated and identified to genus level and species level.

RESULTS AND DISCUSSION:

Total 10 species belonging to 10 genera, that spread over 4 subfamilies (Table No.1) were recorded. Of the 4 subfamilies, the Myrmicinae (40%) was the most dominant subfamily in terms of species richness with 4 Species, while subfamily Formicinae and Myrmicinae recorded with equal number of species (40% each). Least number found with subfamily Dolichoderinae(10%) and Pseudomyrmicinae (10%). During the present investigation comparatively lower species diversity 3(30%) was observed in residential area and high diversity of species 7(70%) was noticed under non residential area.

Sr.No.	Subfamily	Genus	Species
1.	Formicinae	<i>Camponotus</i>	<i>compressus</i>
2.		<i>Paratrechina</i>	<i>longicornis</i>
3.		<i>Oecophylla</i>	<i>smaragdina</i>
4.		<i>Lepisiota</i>	<i>fraunfeldi</i>
5.	Myrmicinea	<i>Monomorium</i>	<i>indicum pharaonis</i>
6.		<i>Crematogaster</i>	<i>ransonneti</i>
7.		<i>Solenopsis</i>	<i>geminata</i>
8.		<i>Pheidol</i>	<i>indica</i>
9.	Dolichoderinea	<i>Tapinoma</i>	<i>melanocephalum</i>
10.	Pseudomyrmicinea	<i>Tetraoponera</i>	<i>rufonigra</i>
TOTAL	04	10	10

Table No.1. Subfamily wise distribution of Ant's species in Katol area.



(A) Paratrechina longicornis



(B) Oecophylla smaragdina

(C) *Tetraponera rufonigra*(D) Nest of *Oecophylla smaragdina*(E) *Lepisiota fraunfeldti***Fig.A,B,C,D and E:Photographs of some the ant species observed in the study area.**

As most important components of ecosystems not only because they constitute a great part of the animal biomass but also because they act as ecosystem engineers. All the known species of ants are eusocial (Gadagkar *et al.*, 1993). Environmental changes have an impact on Macroarthropod abundance (Pearson and Derr, 1986; Adis and Latif, 1996). Many ant species are highly sensitive to the microclimate fluctuations and to habitat structure, and thus respond strongly to environmental change (Anderson, 1990; Alonso *et al.*, 2000). Therefore as locations get affected by human activity the distributions of ant also get varied. During this study, non residential, forest, grasslands, urban gardens area etc. represented higher number and diversity of ant. Similarity measurement depicts that forest habitat maximum ant species diversity. It also depicts that highest number of ant species (70%) are present forest habitat and also indicate a favourable microclimatic condition. Low diversity, in human residential areas (30%) i.e. index value indicates non –favourable condition for the ants species. Sunil Kumar *et al.* reported that the ant diversity is directly proportional to the diversity of vegetation. Then as the disturbance gets increased the pattern of ants also gets changed with its diversity (Ghait and Kale, 2015).

Lily Leahy *et.al.* (2020) ,studied diversity and distribution of the dominant ant genus *Anonychomyrma* (Hymenoptera: Formicidae) in the Australian Wet Tropics distribution modelling of the nine commonest species identified maximum temperature of the warmest month, rainfall seasonality, and rainfall of the wettest month as correlates of distributional patterns across subregions. This study supported the notion that *Anonychomyrma* radiated from a southern temperate origin into the tropical zone, with a preference for areas of montane rainforest that were stably cool and wet over the late quaternary.

We investigated that *Oecophyla smaragdina* found mainly on Mango trees as well as noticed on Almond trees having large leaves. It recorded with its nest build with the help of sticking leaves together. Secondly, a well-known ant for building its nest where sandy and rocky soil present was the *Solenopsis geminata*. As Katol is surrounded by hills and forest area, and rocky soil found, *S.geminata* species is abundantly found in compared to other species.

CONCLUSION:

Ants are sensible towards suitable environmental conditions and are attracted towards a particular location avoiding disturbed area. Furthermore, ants are the bio-indicators of nature, habitat and environment. More work is necessary to conclude more information from this area.

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