



Ant Diversity In Psgvpm Campus, Shahada Dist. Nandurbar, Maharashtra

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Abstract: Ants are known to be ecologically significant invertebrates in most of the ecosystems. Ants are classified in a single family, the Formicidae, within the order Hymenoptera, and are social insects that have evolved successfully since the Cretaceous. The known living ants involve 16 subfamilies, 296 genera, and 15,000 species, around 10,000 of which are described. Ants have colonized almost every landmass on Earth. Ants can be found in any habitat from the Arctic Circle to the Equator, although they are absent from Iceland. The present investigation was developed for the study of the functional diversity of ants and their community assembly in the PSGVP campus, Shahada. We have selected four different sites from the PSGVP campus, Shahada with diverse vegetation and divided them into four transects as per the Shanon Wiveer index method to find out the relation between species composition with different transects. Species for the collection of ants used glass bottles having 70% alcohol. Some specimens were collected from soil core samples and hand-picking method. For specific identification different keys of identification were used including the Bolton identification guide to the ant genera of the world and the Bharti List of the Indian ants. For pictorial presentation photographs of ants were taken using a stereo zoom microscope and dissecting microscope by a Sony digital camera. In the present investigation, 11 species were collected and identified. Out of this subfamily, Formicinae showed dominance in the study area with six species followed by the Myrmicinae subfamily representing three species and a single species from Dolichoderinae and Pseudomyrmecinae.

Index Terms - Ant diversity, Formicidae, Social insect, Hymenoptera.

I. INTRODUCTION

Ants are known to be ecologically significant invertebrates in most of the ecosystems (Hölldobler and Wilson 1990). Ants are classified in a single family, the Formicidae, within the order Hymenoptera, and are social insects that have been evolving successfully since the Cretaceous. The known living ants involve 16 subfamilies, 296 genera, and 15,000 species, around 10,000 of which are described (Bolton, 1994). The geographical regions with the greatest number of genera decrease in the following order: Indo-Australian, Neotropical, Oriental, Australian, African, Palearctic, Nearctic, and Malaysian, among which the Neotropical and African areas have the greatest number of endemic genera, and the Nearctic and Oriental the least (Bolton, 1994).

Ants have colonized almost every landmass on Earth. Ants can be found in any type of habitat from the Arctic Circle to the Equator (Brian, 1978), although they are absent from Iceland, Greenland, and Antarctica (HoE Doubler and Wilson, 1990) and some islands lack native ants (Wilson and Taylor, 1967). The number of species declines with increasing latitudes, altitudes, and aridity (Kusnezov, 1957; Fowler and Claver, 1991; Farji Brener and Ruggiero, 1994; Samson et al., 1997). Even though tropical areas and continental forests are amongst the poorest known, these areas have the greatest recorded species diversity (HoE doubler and Wilson, 1990).

II. RESEARCH METHODOLOGY

The present investigation was developed for the study of the Functional diversity of ants and their community assembly in PSGVPM campus, Shahada. The campus has an area of more than 200 acres with diverse vegetation along with different constructions of old and new departments which is one of the preferred sites for the habitat of ants.

Sampling sites: We have selected four different sites from the PSGVPM campus, Shahada with diverse vegetation and divided them into four transects as per the Shanon Wiveer index method to find out the relation between species composition with different transects. These sites are shown in following table No. 1 and in figure No.1 with specific transect boundaries.

Table No. 1 Four different collection sites from the PSGVPM campus.

Sr. No.	Sampling sites
1	Botanical garden
2	Old Buildings
3	New Buildings
4	Parking and playground

Collection of Ants: The ants were collected from the site area of the PSGVPM campus as shown in table No. 1 and figure No.1. The collection was performed in the morning time 8.00 a.m. to 12.00 p.m. and in the evening time 4.00 p.m to 7.00 p.m. when the activity of ants was highest. The ants are found on the tree as well as on the ground surface, some species were collected from their nests. Species for the collection of ants used glass bottles having 70% alcohol. Some specimens were collected from soil core samples and hand-picking method.

Identification of ants: For specific identification different keys of identification were used including Bolton's (1994) identification guide to the ant genera of the world, And Bharti (2011) List of the Indian ants (Hymenoptera, Formicidae) using stereo zoom microscope. For pictorial presentation photographs of ants were taken using stereo zoom microscope and dissecting microscope by Sony digital camera.



Figure No. 1 Four different study sites collection of Ants from the PSGVPM campus with their transect boundaries.

III. RESULTS AND DISCUSSION

In the present investigation, 11 species were collected and identified as shown in table no. 2 with their systemic position in Family Formicidae. Out of this subfamily, Formicinae showed dominance in the study area with six species followed by Myrmicinae sub family representing three species and a single species from Dolichoderinae and Pseudomyrmecinae.

In the present study, efforts have been made to know about the diversity of ants and identification of ant species on the PSGVPM campus. Ants have colonized almost every landmass on Earth. Ants can be found in any habitat from the Arctic Circle to the Equator (Brian 1978), although they are absent from Iceland, Greenland, and Antarctica (HoE Ildobler and Wilson, 1990). Among insects ants are considered important indicators in biodiversity evaluation and monitoring because of their numerical dominance (Folgarait 1998; Underwood & Fisher 2006). Also, ants are sensitive to changes in the environment (Kaspari & Majer 2000). Ants thrive in most ecosystems and may form 15–25% of the terrestrial animal biomass. Their success in so many environments has been attributed to their social organization and their ability to modify habitats, tap resources, and defend themselves. In many ecosystems their species composition indicates ecosystem health and functioning; their abundance and varied ecological roles make them influential in agricultural ecosystems around the world. They positively affect physical and chemical soil properties, plant and animal distribution, and forest health. Some ill effect is only occasionally noticed. The ants were found to occur from mid-June to mid-late July, when berries began to ripen, ants and ant larvae were the main food items observed to be eaten by bears during this season.

Table No. 2 Species collected and identified with their systemic position in Family Formicidae.

Sr No.	Sub families	Common Name	Scientific name
1	Formicinae	Weaver ant	<i>Oecophylla smaragdina</i>
2	Formicinae	Black carpenter ant	<i>Camponotus pennsylvanicus</i>
3	Formicinae	Silky ant	<i>Formica Fusca</i>
4	Formicinae	Black crazy ant	<i>Paratrechina longicornis</i>
5	Formicinae	Common Black ant	<i>Camponotatus compressus</i>
6	Formicinae	Big-headed ant	<i>Pheidole megacephaly</i>
7	Myrmicinae	Pharaoh ant.	<i>Monomorium pharaonis</i>
8	Myrmicinae	Valentine ant	<i>Crematogaster laevinscula</i>
9	Myrmicinae	Common broad acrobat ant	<i>Crematogaster subnuda</i>
10	Dolichoderinae	Ghost ant	<i>Tapinoma megalcephala</i>
11	Pseudomyrmecinae	Bicolored arboreal ant	<i>Tetraponera rufonigra</i>

% Occurance of Species in Subfamily

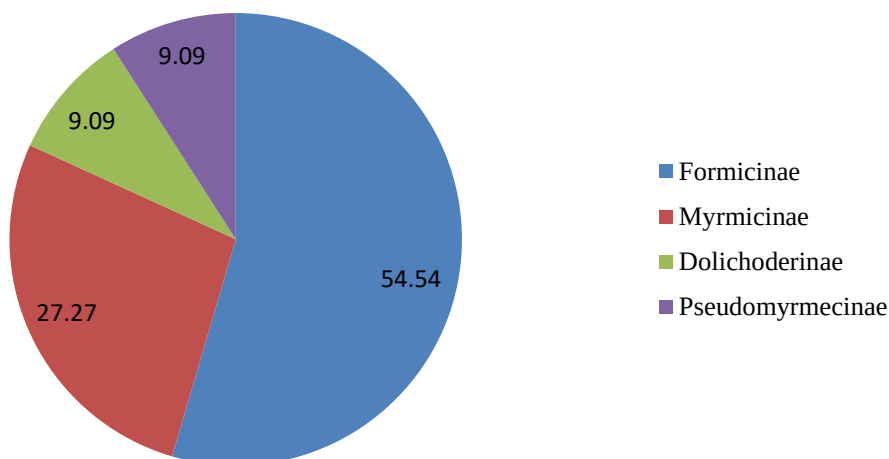
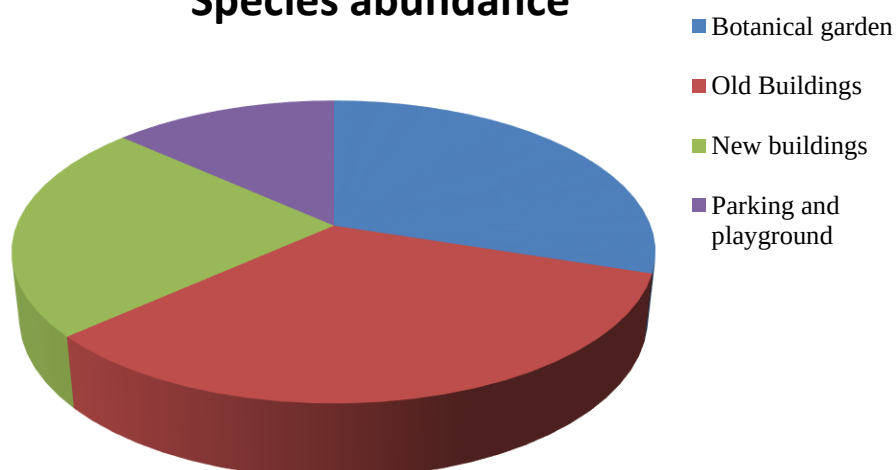


Table No. 3 Species abundance in four different sampling sites

Sr. No	Name of species	Sampling site			
		A	B	C	D
1	<i>Oecophylla smaragdina</i>	Present	Present	Absent	Absent
2	<i>Camponotus pennsylvanicus</i>	Present	Present	Present	Present
3	<i>Formica fusca</i>	Present	Present	Absent	Absent
4	<i>Paratrechina longicornis</i>	Present	Absent	Absent	Absent
5	<i>Camponotatus compressus</i>	Present	Present	Present	Present
6	<i>Pheidole megaphala</i>	Present	Present	Absent	Present
7	<i>Monomorium pharaonis</i>	Present	Present	Present	Absent
8	<i>Crematogaster laeviuscula</i>	Absent	Present	Present	Absent
9	<i>Crematogaster subnuda</i>	Present	Present	Present	Absent
10	<i>Tapinoma melanocephalum</i>	Absent	Present	Present	Absent
11	<i>Tetraponera rufonigra</i>	Present	Present	Present	Present

(A-Botanical garden, B-Old Buildings, C-New buildings, D- Parking and playground)

Species abundance



All species show some degree of social organization many species live in the nest system tunnel or galleries in the soil often under a dorm or hill of excavated earth sand or derbies mount building ants many constructs. Ants are also economic importance, as some species are beneficial and some are harmful for crops as well as human beings; beside this Ants are the free Degradars of waste materials.

The present investigation showed the presence of 11 species; collected and identified from four different transects. Out of these sub- family Formicinae showed dominance in the study area with six species followed by Myrmicinae sub family representing three species and a single species from Dolichoderinae and Pseudomyrmecinae.

Species abundance in four different sampling sites showed the highest preference to Sampling Site B- old Buildings with ten species; followed by Site A-Botanical garden and Site C-New buildings with seven species while Site D- parking and playground showed the presence of only four species.

It can be concluded that the ants are the highest dwellers in the rich vegetation area as in site B than no or low vegetation area as in D site which was a parking and play ground. Hence for the betterment of diversity conservation of vegetation is needed.

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