INTERNATIONAL JOURNAL OF RESEARCHES IN BIOSCIENCES, AGRICULTURE AND TECHNOLOGY
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www.ijrbat.in

DIVERSITY OF ANTS (HYMENOPTERA: FORMICIDAE) IN A COLLEGE CAMPUS OF KARJAT CITY, DISTRICT AHMEDNAGAR, MAHARASHTRA, INDIA

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ABSTRACT:
The ants are the social insects, inhabiting most of the habitat of the globe. They are doing very important services for the ecosystem. The study of the ants' diversity of a particular habitat is an important tool to do the ecological assessment. In this study ant diversity is studied in college campus specifically outdoor ants. Nine species were recorded belonging to subfamily Myrmicinae, Formicinae and **Dolichoderinae**.

Keywords : *Diversity, Ants, Formicidae, Campus.*

INTRODUCTION:

The Phylum Arthropoda is the biggest phylum in animal kingdom which includes the biggest Class Insecta. The Class Insecta has Order Hymenoptera and Family Formicidae which includes Ants along with the related wasps and bees. Ants are evolved from wasp-like ancestors in about 99 million years ago in the Cretaceous period, and get diversified after the rise of flowering plants. Ants are eusocial insect (Gadagkar R et al, 1993). As per the recent classification, all ants are grouped into 26 subfamilies with 428 valid genera and 14,711 valid species (Bolton. B, 2011). Ants are found on all continents except Antarctica, and only a few large islands, such as Greenland, Iceland, parts of Polynesia and the Hawaiian Islands lack native ant species (Jones, Alice S, 2008 and Thomas, Philip, 2007). Currently list of 828 valid species belonging to 10 subfamilies under 100 genera is released by Bharti H, 2016. In India subfamily, Myrmicinae have maximum species diversity of 42.7% followed by the subfamily Formicinae with 29.1% of species, Ponerinae contributes about 13.4% of species, Dorylinae 6.6% and Dolichoderinae 3.6 % (Bharti H, 2016). The most speciose ant genus is *Camponotus* with 83 named species (one tenth of the total known Indian species), followed by *Polyrhachis* (71 species, 8.5%), *Pheidole* (58 species, 7.0%). Other diverse genera include *Tetramorium* and *Crematogaster* (42 and 41 species, each 5.0%), *Leptogenys* (34 species, 4.1%), *Myrmica* (33 species, 4.0%), *Aenictus* (32 species, 3.8%), *Strumigenys* and *Carebara* (24 species each, 2.9%) (Himender Bharti et al 2016).Ant fauna from some parts of Bangalore city is reported by Kumar *et al.,* 1997. Gunawardene *et al.,* 2007 published work on ants of Western Ghats-SriLanka hotspot. Ants in India, occupy a variety of habitats such as leaf litter, trees, soil and dead logs, while some inhabit in human houses. They are also bioindicators and efficient invaders of new habitats (Holway *et al.* 2002). Due to this, ants are increasingly used for biodiversity assessments and comparison of habitats and ecosystems (Andersen and Majer, 2004). They have diverse ecological roles, including nutrient cycling, seed dispersal and population regulation of other insects (Holldobler and Wilson 1990; Folgarait 1998). Ants range in size from 0.75 to 52

millimeters (0.030–2.0 in) (Hölldobler & Wilson 1990, Shattuck SO 1999). Ant societies have division of labour, communication between individuals, and an ability to solve complex problems (Dicke E, at el, 2004). Ants communicate with each other using pheromones, sounds, and touch *(Jackson DE, Ratnieks FL (August 2006).* Many human cultures make use of ants in cuisine, medication, and rituals. Some species are valued in their role as biological pest control agents (Hölldobler & Wilson, 1990).

MATERIALS AND METHODS

Study Site: The college Dada Patil Mahavidyalaya is located in Karjat taluka is a town place located about 75 km from District Ahmednagar in Maharashtra coordinates: 18.55°N 75.00°E. Karjat is a drought prone semi dry region, famous for Blackbuck Rehekuri Sanctuary. The college is spread over 3.19 hectors area.

Experiment: Ants were collected and preserved in 70% ethyl alcohol from January 2017 to February 2017 during morning and evening on every Sunday of each month. The ants were collected by hand using forceps and honey bait trap. The ants photograph is taken by Canon 700 D camera with 100 mm macrolense.

Ants Identification: Ants are observed and identified by using stereoscopic microscope and identification key (Bolton B (1994 & 1995), Hölldobler *et al.* 1990; Mathew and Tiwari 2000).

RESULT:

Nine species of ants were recorded in the study area. All the collected ants were identified are belong to three subfamilies. Out of identified nine species six belong to subfamily Myrmicinae, two species of subfamily Formicinae and one of subfamily Dolichoderinae.

DISCUSSION:

An investigation was carried out to know the diversity and status of ant fauna in a college campus located in drought prone rural area. During the study, 9 ant species belonging to nine genera and three subfamilies were recorded. The subfamily Myrmicinae, represented by six species was the most dominant followed by Formicinae two species and Dolichoderinae one species. Among the ant species richness in the college campus, *Solenopsis geminata,* ***Camponotus compressus*** **and** *Paratrechina longicornis* species were the most dominant species in terms of number of individuals. The findings presented here indicate that in the framework of College Campus, the ants perform extremely favorably as environmental indicators. We believe that the results of this preliminary study justify the launching of more detailed investigations on the role of ants in various climatically different fields like household, tropical forests, grasslands and agricultural field in and around Karjat city.

REFERENCES

Andersen, A.N. and Majer, J.D. (2004): Ants show the way down under: Invertebrates as bioindicators in land management. *Frontiers in Ecology and the Environment*, 2: 291-298.

Bolton B. (1994): Identification Guide to the Ant Genera of the World. Cambridge, Massachusetts: Harvard University Press.

Bolton B. (1995): A New General Catalogue of the Ants of the World. Cambridge, Massachusetts: Harvard University Press.

Bolton B. (2003): Synopsis and classification of Formicidae. Memoirs of the American, Entomological Institute, 71:1-370, 7:251-409.

Bolton B. (2011): Bolton's Catalogue and Synopsis, in http://gap.entclub.org/ Version: 1.

Dicke E, Byde A, Cliff D, Layzell P (2004): A. J. Ispeert, M. Murata, N. Wakamiya, eds. "An ant-inspired technique for storage area network design". Proceedings of Biologically Inspired Approaches to Advanced Information Technology: First International Workshop, BioADIT 2004 LNCS 3141: 364–379.

Folgarait, P. J. (1998): Ant biodiversity and its relationship to ecosystem functioning: a review. Biodiversity and Conservation 7:1221–1244.

Gadagkar R, Nair P, Bhat DM (1993): Ant species richness and diversity in some selected localities in Western Ghats, India. Hexapoda.; 5(2):79-94.

Gunawardene NR, Daniels AE, Dulip G, Gunatilleke CV, Karunakaran PV, Nayak KG et al (2007): A brief overview of the Western Ghats-Sri Lanka biodiversity hotspot. Current Sci; 93(11):1567-1572.

Himender Bharti, Benoit Guénard, Meenakshi Bharti, Evan P. Economo (2016): An updated checklist of the ants of India with their specific distributions in Indian states (Hymenoptera, Formicidae), ZooKeys 551: 1–83

Hölldobler & Wilson (1990): pp. 619–629

Hölldobler & Wilson (1990): p. 589

Hölldobler & Wilson (1990): pp. 143–179

Hölldobler, B. and Wilson, E.O. (1990): The Ants. Springer Verlag, Berlin, 732 pp.

Hölldobler, B. and E. O. Wilson, (1990): The ants Cambridge, Mass.: Harvard University Press, xii + 732 pp.

Holway, D., Lach, L., Suarez, A.V., Tsutsui, N.D. and Case, T.J. (2002): The ecological causes and consequences of ant invasions. Annual Review of Ecology, Evolution and Systematics, 33: 181–233.

Jackson DE, Ratnieks FL (2006): "Communication in ants". Curr. Biol. 16 (15): R570–R574. PMID 16890508.doi:10.1016/j.cub.2006.07.015.

Jones, Alice S. (2008): "Fantastic ants – Did you know?". National Geographic Magazine.

Kumar Sunil M KT, Nair P, Varghese T, Gadagkar R.(1997): Ant species richness at selected localities of Bangalore Insect Environment; 3:3-5.

Mathew, R. and R.N. Tiwari. (2000): Insects: Hymenoptera: Formicidae State fauna Series 4: Fauna of Meghalaya, India. 7: 251-409.

Shattuck SO (1999): Australian ants: their biology and identification. Collingwood, Vic: CSIRO. p. 149. ISBN 0-643-06659-4.

Thomas, Philip (2007): "Pest Ants in Hawaii". Hawaiian Ecosystems at Risk project (HEAR).

Photo 1: Karjat Map- Source Google Map **Photo 2: College Campus-Source Google Satellite**

Table 1: Showing the distribution of ants species in three subfamily.

SUBFAMILY	GENUS AND SPECIES
Myrmicinae (6)	*Crematogaster rothneyi* (Mayr, 1879) *Solenopsis geminata* (Fabricius,1804) *Aphaenogaster schurri* (Forel, 1902) *Monomorium pharaonis* (Linnaeus, 1758) *Tetramorium mayri* (Forel, 1912) *Aphaenogaster beccarii* (Emery,1887)
Formicinae (2)	*Paratrechina longicornis* (Latreille, 1802) *Camponotus compressus* (Fabricius 1787)
Dolichoderinae (1)	*Tapinoma melanocephalum* (Fabricius 1793)

Graph 1: Showing the distribution of ants species in three subfamily.

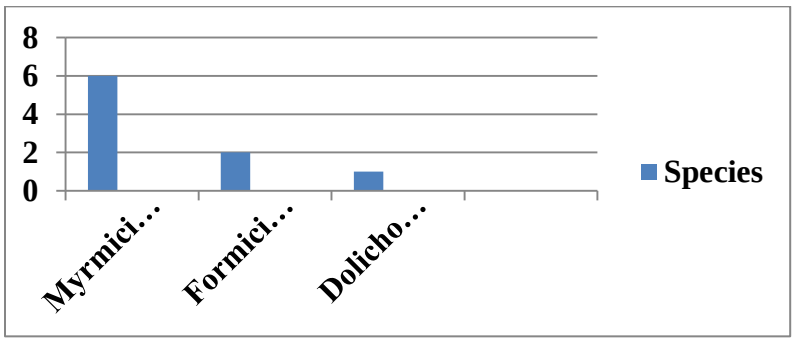

Photo 3: Showing the photo of all nine ants' species recorded.

Crematogaster rothneyi

Solenopsis geminata

Aphaenogaster schurri

Monomorium pharaonis

Tetramorium mayri

Aphaenogaster beccarii

Paratrechina longicornis

Camponotus compressus

Tapinoma melanocephalum