

## Partial checklist of Ants (Hymenoptera: Formicidae) in selected localities in and around Achalpur, District Amravati, Maharashtra, India

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**Abstract**—Ants are highly intelligent, social and ecologically important insects. They are known for their valuable contributions in ecosystems and found in all possible habitats. The present study deals with the checklist of ant species in and around Achalpur, Amravati district, Maharashtra, India. This work was carried out from June 2021 to December 2021 for total six months. Ants were sampled randomly by using different collection methods like all-out search method, hand collection method and species were identified with the help of standard taxonomic literature. During this study a total 09 species of ants were recorded under 07 genera belonging to 03 subfamilies. Myrmicinae (five species) was found to be a most abundant subfamily in terms of species followed by Formicinae (three species) and Dolichoderinae (one species).

**Keywords**— Ants, Myrmicinae, Species, Achalpur, Subfamily.

### I. INTRODUCTION

Ants are members of the family Formicidae belongs to order Hymenoptera which is the third largest insect order of Phylum Arthropoda. Ants have highly organized social life among all the other insects. They are found in almost all types of habitats like grassland, forest and wetland, bark of trees, leaf litter, soil, rocks, human habitats and dead organic matter. They are highly intelligent insects living together in well organized and integrated colonies. There are 17 valid subfamilies, 337 genera, and over 13,837 species of ants have been described from all over the world (Bolton, 2020) [1]. India represented is by 828 species and 100 genera under 10 subfamilies (Bahrti *et al.* 2016) [2]. A vast number of ant species remains to be discovered.

Ant ranges in size from 0.75 to 52 mm (Shattuck, 1999) [3]. Their morphology is varied as per their habitat. Ants shows variable colour; most of them are black, brown or red in colour, but few tropical species have a metallic lustre. Most of them show high degree of polymorphism. Ants have been considered as good bio-indicators for various disturbances such as pesticides, fire, mining, logging and very sensitive to habitat transformation (Andrew *et al.*, 2000 [4]; Maeto and Sato, 2004 [5]; Kwon *et al.*, 2005 [6]).

Generally all the described species of ants are eusocial (Gadagkar *et al.*, 1993) [7]. Ants are known to be a key part of ecosystems because they constitute a great role of the animal biomass and also play a critical ecological role in nutrient cycling, soil turnover, beneficial as pollinators and act as ecosystem engineers. Many other species are considered to be key predators (Thurman *et al.*, 2019 [8];

Ohyama *et al.*, 2020 [9]) in the terrestrial habitats because they feeding on other insects and small invertebrates, so that can be used as biological control of insect pests (Suryanto, 1993) [10].

### II. RELATED WORK

Distribution and diversity of ant fauna from India are well on record. Forel (1885) [11], Rothney (1889) [12] and Wroughton (1892) [13] are some of the earlier workers who works on ants of the Indian sub-continent. Most important and valuable work on Indian Formicidae was contributed by Bingham (1903) [14], who gave the detail account on the distribution of ant species in his published work “Ant fauna of British India including Ceylon and Burma” which is the main source of knowledge on ants. Later checklist of the ants of Asia was published by Chapman and Capco (1951) [15]. Pajni and Suri (1978) [16] worked on the ants fauna of Chandigarh. Ant fauna of Karnataka state reported by Ali (1991, 1992) [17], [18].

Zoological Survey of India published faunal documents including ants from Rajasthan (Chhotani and Ray, 1976) [19], Andaman Islands (Chhotani and Maiti, 1977) [20], Delhi (Tiwari, 1997) [21], Tripura (Mathew, 2000) [22], Meghalaya (Mathew and Tiwari, 2000) [23], West Bengal (Tiwari, *et al.*, 1998) [24], Orissa (Tiwari, *et al.*, 2002) [25], Sikkim (Tiwari, *et al.*, 2003) [26] and Gujarat (Tak and Rathore, 2004) [27]. Tak and Kazmi (2011) [28] has worked on ants of Uttarakhand.

With reference to Maharashtra, Wroughton (1892) [14] provided a good account on ant fauna of the state. Forel

(1902, 1903) [29], [30] also reported 45 species from Maharashtra. Sheela and Chattopadhyhy (2012) [31] reports the list of total 100 species and 10 subspecies of ants under 33 genera from Maharashtra in state fauna series published by Zoological Survey of India. Recently 181 species of ants belonging to 46 genera from the state of Maharashtra listed by Bharti *et al.*, (2016) [2].

Beside the above publications, there are some other important contributions in relation to diversity and distribution of ant fauna in Maharashtra are Bhoje *et al.* (2014) [32] reports 36 ant species belonging to 08 genera from Kolhapur district. Kadu (2016) [33] from Nagpur city recorded 35 species belonging to 22 genera under 06 subfamilies. Chate and Chavan (2017) [34] reported 23 species under 17 genera and six subfamilies from Aurangabad. Momin *et al.* (2018) [35] identified 13 species from Indira Gandhi Garden in Bhiwandi. Khan (2019) [36] reported 11 species belonging to 04 subfamilies from Karjat city, Ahmednagar district. The notable study on the diversity and distribution of ant fauna from Amravati city and allied region, Maharashtra, was done by Chavhan and Pawar (2011) [37], who recorded 34 species under 20 genera belonging to 05 subfamilies.

Perusal of literature shows limited account published on ants is known from this region. Hence an attempt has been made to prepare a checklist of ant species in and around Achalpur, Amravati district, Maharashtra, India. The present study reports 09 species of ants under 07 genera belonging to 03 subfamilies.

### III. METHODOLOGY

#### STUDY AREA

Achalpur is a municipal council located in Amravati district, Maharashtra state of India, situated at 21° 15' 26" N, 77° 30' 31" E and has an average elevation of 369 meters. City is surrounded by Sapan and Bicchhan rivers. It has pleasant climate with annual temperature ranges from 24 to 33°C, daytime humidity 48% with average rainfall of 700-800 mm. This area is rich in biodiversity.

#### COLLECTION OF SAMPLES

Present study was carried out for total six months from June 2021 to December 2021. The ant samples were collected randomly by visiting various localities in and around the study area. Different ecological habitats such as cultivated fields, rural areas and residential area etc. were chosen for sampling. Hand collection method and all-out search method were used for the collection of samples. During sampling ants were picked up by hand using brush and forceps. The collected species were preserved in wide mouthed jars with 70% alcohol for further investigation.

#### IDENTIFICATION OF ANT SPECIES

The identification of collected ant species made with the help of Stemi DV4 stereo microscope on the basis of taxonomic keys provided by Holldobler and Wilson (1990)

[38], Ali (1992) [18], Bolton (1994) [39], and Mathew and Tiwari (2000) [23].

### IV. RESULTS AND DISCUSSION

In present study, total 09 species of ants belonging to 07 genera were recorded from the study area. All the collected ants were identified into three subfamilies namely Myrmicinae, Formicinae and Dolichoderinae. During this study it is noted that out of three subfamilies, Myrmicinae is found to be a most abundant subfamily having 05 species under 04 genera followed by subfamily Formicinae having 03 species under 02 genera and Dolichoderinae with only 01 species (Table. 1).

Table 1. List of ant species collected from the study area.

Sr. No.	Sub-families	Name of Species
1	Myrmicinae	<i>Monomorium minimum</i> (Buckley, 1866) <i>Monomorium pharaonis</i> (Linnaeus, 1758) <i>Solenopsis geminata</i> (Fabricius, 1804) <i>Crematogaster rothneyi</i> (Mayr, 1879) <i>Aphaenogaster schurri</i> (Forel, 1902)
2	Formicinae	<i>Camponotus compressus</i> (Fabricius, 1787) <i>Camponotus parius</i> (Emery, 1889) <i>Paratrechina longicornis</i> (Latreille, 1802)
3	Dolichoderinae	<i>Tapinoma sessile</i> (Say, 1836)

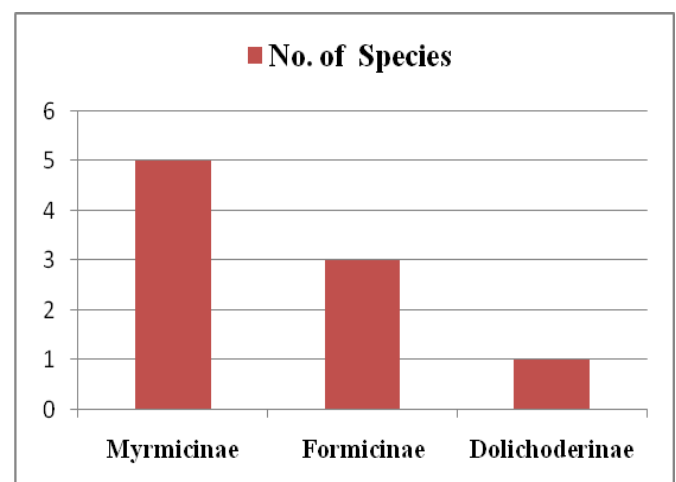


Fig.1. Graph shows number of ant species in different sub-families.

With reference to percentage wise distribution of sub-families, Myrmicinae represents the highest percentage of species (56%) followed by Formicinae (33%) and Dolichoderinae (11%) with least percentage. Bharti *et al.* (2016) [2] reported 181 species under 46 genera 06 subfamilies from Maharashtra state. Out of total 181 species, Myrmicinae 83 species (46 %), Formicinae 43 species (24 %) and Ponerinae 26 species (14 %) have been the dominant subfamilies while 15 species of Dorylinae (08%), 09 of Dolichoderinae (05 %) and 05 species of Pseudomyrmecinae (03 %) were included. This result correlates with the present study, as we also collected the higher number of ant species from subfamilies Myrmicinae and Formicinae. A total 05 species of ants belonging to subfamily Myrmicinae (56 %), 03 species of Formicinae (33%) while only 01 species of Dolichoderinae (11 %) were reported from different localities. Four subfamilies namely Myrmicinae, Formicinae, Dolichoderinae and Ponerinae represent about 87% of all described ant species (Guenard, 2013) [40].

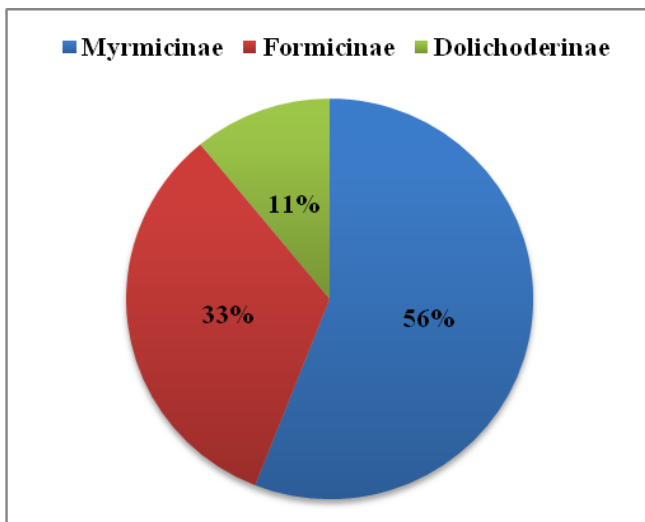


Fig. 2. Percentage wise distribution of sub-families.

Two species of genus *Monomerium* recorded from the study area namely *Monomerium minimum* and *Monomerium pharaonis*. A total 20 species of genus *Monomerium* found in India, out of these 07 species reported from Maharashtra (Bharti *et al.* 2016) [2]. *Monomerium pharaonis* are omnivores feeding on wide varieties of food. They are nesting in the soil at the base of trees, beneath leaf litter and in rotten wood. It is also reported from Karjat city, Ahmednagar district, Maharashtra (Khan, 2019) [36]. *Monomerium minimum* was recorded from residential area. *Camponotus compressus* and *Camponotus parius* are commonly found in all the habitats.

*Solenopsis geminata* was reported from rural houses and cultivated fields. This species generally occur in urban and undisturbed environment (Narendra and Kumar, 2006) [41]. Genus *Aphaenogaster* and *Crematogaster* of Myrmicinae and *Camponotus* of Formicinae were commonly found in all the habitats during study. *Paratrechina longicornis* collected from residential houses from the study area. The

same species was also reported by Ghait and Kale (2015) [42] from Shegaon, Maharashtra. *Tapinoma sessile* is common species in the rural area in all season. It nests in the ground, under and within objects etc.

## V. CONCLUSION AND FUTURE SCOPE

From this study it is concluded that Achalpur region is rich in ant fauna. Total 09 species of ants were recorded from the study area belonging to 07 genera and 03 subfamilies. During this study it is noted that ant species richness was higher in cultivated fields and rural areas and comparatively lower in urban and residential area because of high levels of disturbances and little or absence of vegetation. Modern agricultural practices, urbanization and other human activities may influence the vegetation of that particular habitat which is directly or indirectly affects the ant population. The results of present work generated a base line data on the ant fauna of this region, which may helpful in further researches.

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