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Seasonal Abundance and Commonly Occurring Household Ants Species in Sangli District Maharashtra

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As compared to other groups of arthropods there is more advantage to study the diversity of ant's species. They occur all over the world easily available and taxonomically well-known and constitute an important fraction of the animal biomass in the terrestrial ecosystem (Fittkau and Klinge 1973, Holldobler and Wilson 1990). They provide valuable ecosystem services such as nutrient turnover, energy flow, and seed dispersal (Handel *et al.* 1981). Ant performs an important ecological function (Holldobler and Wilson 1990). They play an important role in the movement of soil and transfer of organic materials, better aeration (Agosti *et al*. 2000). Ants are considered useful for bio-monitoring studies as they can respond rapidly to environmental changes (Underwood and Fisher 2006). Ants include about 1% of all described species of insects, with 2,136 subspecies and 12,116 extant species in 298 genera coming under 21 subfamilies all over the world (Sivadasan *et al*. 2013). In India, ant's fauna is belonging to 87 genera from 660 species (Bharti 2012). Because of their importance in community dynamics and their ecosystem significance, a better understanding of the patterns of ant diversity would greatly enhance our knowledge of the biogeography and dynamics of tropical communities as well as how their biodiversity would best be conserved (Wilkie *et al*. 2010). No scientific studies of ant fauna and seasonal diversity have been conducted in a rural and urban habitat of this region therefore present work is undertaken.

The southwest part of Maharashtra especially Sangli, Satara, and Kolhapur district are an economical and agriculturally well-developed region of Maharashtra. Krishna River and its tributaries are the main source of water for irrigation and domestic use. Water is permanently available in Krishna River except for some tributaries only in the rainy and winter season. The main crops are sugarcane, soybean, grapes, etc. The endemic and endangered flora and fauna are well documented in this area (160 45' to 170 33' N latitude and 730 42' to 750 40' E longitude). The Well agricultural ground and permanent water source are may cause the diversity of arthropods especially ants in this region. The ant's samples were collected from various localities on and around Sangli district (17.17° N and 74.68° E). Hand picking method was employed for collection of ants specimens because it is less labour intensive, does not involve time consuming placement of pitfall traps and can be safely used in too wet or with heavy disturbance activities (Ellison *et al*. 2007). Sampling was done in pre monsoon, monsoon and post monsoon period from December 2018 to January 2019 of morning as well as evening period. 10 samples of each ant were collected usin gloves and were transferred to vials with 70% ethyl alcohol and glycerol for preservation. Forceps and brush were used for collection. These specimens were mounted using standard procedure for identification using stereomicroscope in laboratory. The collected specimens are identified by consulting taxonomic features of the species and literature cited under reference.

The observed 10 species of ant's fauna in a rural and urban habitat of Sangli district, Maharashtra belong to 09 genus and single subfamily formicine, family Formicidae (Table 1). The Formicidae includes a relatively large number of introduced or invasive species (Mc Glynn 1999). High richness and abundance of Formicidae in most terrestrial habitats were reported by Varghese (2009), Ramesh *et al*. (2010). Sivadasan *et al*. (2013) reported the dominance of family Formicidae in Periyar tiger reserve in South Western Ghats, Kerala. The numbers of S. geminate individuals are large in summer. *Solenopsis geminate* is dominated in the summer and winter season. The same

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result was reported by David *et al.* (2013) on the campus of Bangalore University, Bengaluru, India. The increased abundance of *S. geminate* during summer could be attributed to its heat-tolerant nature and capacity to adapt to a wide range of temperatures. They often become dominant in infested areas outside of their native range due to their aggressive foraging behavior, high reproductive capability, and lack of predators and competitors (Allen *et al*. 2004). *Oecophylla smaragdina* is found in through year and it is common in forest and less number in the human habitat. Chavhan *et al*. (2011) have given the same result in and around Amravati city of Maharashtra. Similarly, Boje *et al.*, (2013) reported in Kolhapur district, Maharashtra. Out of two species of genus *Tapinoma,* the *melanocephalum* species is common in the rural area and all season. It has one of the widest distributions known for any ant species.

Table 1 List of ants species recorded during December 2018 to January 2019 in and around Sangli district, Maharashtra

Common name of ant	Order	Family	Genus	Species
Red Ants	Hymenoptera	Formicidae	*Solenopsisi*	*geminate* (Fabricius 1804)
Weaver ant	Hymenoptera	Formicidae	*Oecophylla*	*smaragdina* (Fabricius 1775)
Odorous House Ants or Ghost Ant	Hymenoptera	Formicidae	*Tapinoma*	*melanocephalum* (Fabricius 1793)
Black Carpenter Ants	Hymenoptera	Formicidae	*Camponotus*	*compressor* (Fabricius 1787)
House Ants	Hymenoptera	Formicidae	*Monomorium*	*pharoonis* (Linnaeus 1758)
	Hymenoptera	Formicidae	*Monomorium*	*destructor* (Jerdon 1851)
	Hymenoptera	Formicidae	*Monomorium*	*indicum* (Forel 1902)
	Hymenoptera	Formicidae	*Monomorium*	*nigrum* (Forel 1902)
	Hymenoptera	Formicidae	*Pheidole*	*spathifera* (Forel 1902)
Black crazy ant	Hymenoptera	Formicidae	*Paratrechina*	*longicornis* (Latreille 1802)
Yellow crazy ant	Hymenoptera	Formicinae	*Anoplolepis*	*gracilipes* (Smith 1857)
	Hymenoptera	Formicinae	*Crematogaster*	*Rothneyi* (Mayr 1878)

The most specious ant genus is *Camponotus* with 83 named species in India. In Maharashtra 19 species have been reported (Bharti *et al*. 2016). The *Camponotus* was a frequently occurring species everywhere. It had the greatest individual number. These ants are called as carpenter ants because of their nesting behavior (Chavhan *et al*. 2011). The carpenter ants are important insect pests causing damages in building (Lee and Tan 2004). The *C. compressor* is common and present in all seasons. It is a general predator (Khot *et al*. 2013). The *C. compressor* is found in semi-evergreen, deciduous, grassland, and riparian habitat in Periyar Tiger Forest (Sivadasan *et al*. (2013). Chandran *et al*. (2018) had reported that the role of carpenter ants as a bio-indicator for heavy metals and modify soil chemistry. The house ants are worldwide distribution, belong to genus *Monomerium.* The 20 species of genus *Monomerium* found in India, out of that 7 species reported in Maharashtra (Bharti *et al*. 2016). Four species of genus *Monomerium* are found such as *M. pharoonis, M. destuctor* and *M. indicum* in the study area. The *M. phroonis* is present dominantly in monsoon season and it is commonly called Pharaoh ants. It is omnivores feeding on a wide variety of food (Khot *et al*. 2013, Chavhan *et al.* 2011). It is also reported by Ratnaparkhi and Kale (2018) in Akola, Maharashtra. It is common at Contai Municipality, West Bengal (Hazra 2018). The species *M. indicum* and *M. destructor* are found in Monsoon but in all habitats that are forest, grassland, and human (Bharti *et al*. 2009, Chavhan *et al*. 2011). The 58 species of genus *Pheidole* are found in India out of that 25 species are reported in Maharashtra (Bharti *et al*. 2016). The species *P. spathifera* is observed in the study area in the summer season. The same result is given by Ratnaparkhi and Kale (2018) in Akola, Maharashtra. The species *P. longicornis* is common in all season. The genus *Crematogaster* belong ants are sometime called as acrobat ants (Department of entomology, Lowa State University) and members of this genus are also known as cocktail ant because of their habitat of raising their abdomens when alarmed.

SUMMARY

Ants are a very significant group of animals on earth. They are ecologically important and sensitive to any changes in the environment. The present study aims to identify the species of ants across the rural and urban habitat in a different season of Sangli district, Maharashtra. 12 species of ants belonging to 09 genera were observed from the rural and urban areas from 2018 to 2019. This study shows that the dominancy by family Formicidae within the ant communities, due to their ability to adapt to different niches. From the present study it can be concluded that ant diversity, abundance is a different season in a different habitat. The study of ants helps us to an effective indicator of the surrounding environment. An ant is more disturbance indicators as compared to other groups of invertebrates. The number of species is considerably increased due to the availability of plenty of food and feeding ground in a different habitat.

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