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Distribution of (Hymenoptera: Formicidae) Ants Diversity in Pohara Forest Area of Amravati Region, Maharashtra State, India

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Abstract: ***The distribution of ants diversity in Pohara forest area of Amravati region has been studied. This Pohara region is located near the Wadali garden of Amravati region. In this region we identified different types of formicidae ants. This study was tried to explore the distribution of ants in Pohara forest area. In this area, three species of ants with three genera were identified. Three species namely Red imported fire ant, Solenopsis invicta; Carpenter ant, Camponotus and Pharaoh ant, Monomorium pharaonis were observed. Out of these Red imported fire ant, Solenopsis invicta; was most dominant in this studied area.***

Keywords: Ants, Pohara forest area of Amravati region.

1. Introduction

Ants are 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). The family Formicidae belongs to the order Hymenoptera, which also includes sawflies, bees, and wasps. Ants evolved from a lineage within the Aculeate wasps and a 2013 study suggests that they are a sister group of the Apoidea. (Johnson *et al*., 2013). 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 and Alice S. 2008; Thomas and Philip 2007). Ants occupy a wide range of ecological niches, and are able to exploit a wide range of food resources either as direct or indirect herbivores, predators, and scavengers. Most species are omnivorous generalists, but a few are specialist feeders. Their ecological dominance may be measured by their biomass and estimates in different environments suggest that they contribute 15–20% (on average and nearly 25% in the tropics) of the total terrestrial animal biomass, which exceeds that of the vertebrates (Schultz T.R 2000).

Indian Ant Fauna, represent diversity, includes 12 known subfamilies like; Aenictinae, Amblyoponinae Cerapachyinae, Dolichoderinae, Dorylinae, Ectatomminae Formicinae, Leptanillinae, Myrmicinae, Ponerinae, Proceratiinae and Pseudomyrmecinae. All over the world there are 22 known subfamilies of ants. Ants in India, occupy a variety of habitats such as leaf litter, trees, soil and dead logs, while tramp species prefer human-modified habitats.

2. Materials and Methods

2.1 Collection of Ant

The ant samples were collected from Pohara forest area of Amravati city. Samples were collected randomly from the selected habitats. In the present study sharp forceps between 10 and 30 cm was used for collection. 500 to 1000 ml wide mouthed jars with killing agent (70% alcohol) were used as collecting jars. Before collection, 70 % alcohol (5 to 10 ml) was added as a preservative.

2.2 Identification of Ant

The collected ants were identified by using Stemi DV4 stereo microscope based on identification key (Mathew R. N. and Tiwari, 2000; Bolton B,1994; Bingham C. T.,1903; Holldobler B. *and* Wilson E.D,1990 and Krebs C.J.,1999).

3. Results and Discussion

3.1 Red imported fire ants

The red imported fire ant (*Solenopsis invicta*), or simply RIFA, is one of over 280 species in the widespread genus *Solenopsis*. Although the red imported fire ant is native to South America.The red imported fire ant (RIFA) *Solenopsis invicta* is a globally invasive species, in part because it lives in high densities and may dominate potential food sources (Vinson 1994; Holway *et al*., 2002). The species is omnivorous, opportunistic, and exploits recently disturbed habitats by searching for food sources through a pheromonal pathway (Tschinkel *et al*., 1995; Taber 2000). The species utilizes a foraging distance of around 40 m from the mound (Martin *et al*., 1998). Evolution has modified the ants' sting in various ways to produce chemical substances to inject in, smear upon, or expel predators and potential competitors (Hölldobler and Wilson 1990). Unlike many other ants, *S. invicta* only uses its jaws to grip, and instead uses its abdominal petiole to inject 0.01 to 0.11 µl of poison (Tschinkel 2006). Furthermore, these ants use their poison for prey capture in territorial disputes and for colony defense (Haight and Tschinkel 2003). RIFAs are known to give a painful, persistently irritating sting that often leaves a pustule on the skin.(Buren 1972).The red imported fire ant, a eusocial species, are far more aggressive than most ant species.

3.1.1 Identification

We identified Red imported fire ants from Pohara forest. They have both a pedicel and postpediole. In other words, they belong to a group of ants that have two humps between the thorax and abdomen. The workers have 10 antennal segments terminating in a two-segmented club. These ants vary in size from 3-7mm and are a reddish or dark colored, stinging ant. **Color:** Red colored, Red imported fire ant, black colored, black imported fire ant. **Workers:** Many sizes. **Nesting:** Usually build mounds outdoors in sunny areas and are very aggressive. Colonies can grow to hundreds of thousands. **Location:** Acacia tree and bamboo tree. **Food facts:** Eats almost any plant or animal matter. Prefers high-protein foods.

3.1.2 Classification

- Kingdom: Animalia,
- Phylum: Arthropoda,
- Class: Insecta,
- Order: Hymenoptera ,
- Family: Formicidae ,
- Subfamily: Myrmicinae ,
- Ttribe: Solenopsidini ,
- Genus: *Solenopsis,*
- Species: *S.invicta*

3.2 Pharaoh Ants

Pharaoh ants, *Monomorium pharaonis*, was found on shaded leaves present on the floor of the region of Pohara forest. There were large amount of dry shaded leaves where present in that forest region on which these ants were distributed in colonies or group.They are omnivorous and have the obnoxious habit of getting into virtually everything, pharaoh ants can also pose a serious health threat in hospitals and veterinary clinics where they are attracted to intravenous units, medical preparations, and open wounds.

The **pharaoh ant** (*Monomorium pharaonis*) is a small (2 mm) yellow or light brown, almost transparent and notorious for being a major indoor nuisance pest, especially in hospitals. (David *et al*., 1994).This ant can be found almost anywhere in the world. Pharaoh ant eyesight is poor and they possess on average 32 ommatidia (Cranbrook 2013) .
Identification-

All workers are approximately the same size (monomorphic) and are approximately 1/16 inch long. They are yellow or light brown to reddish, although the tip of the abdomen may be somewhat darker. The petiole or waist has two nodes (segments), and the thorax is without spines.The antennae have 12 segments; the last three segments end in a distinctive club.

Color: Yellow with a reddish abdomen. **Workers:** One size. **Nesting:** Typically builds nests in wood, wall voids, baseboards, etc. Colonies are quite large, with many queens. They prefer warm humid areas near food and water. **Location:**Present on dry shaded leaves of forest. **Food facts:** Likes fats and oils.

3.2.1 Classification

- Kingdom : Animalia,
- Phylum: Arthropoda,
- Class : Insecta,
- Order: Hymenoptera,
- Family: Formicidae,
- Subfamily: myrmicinae ,
- Tribe: Solenopsidini,
- Genus: *Monomorium,*
- Species*: M.pharaonis*

3.3 Camponotus

Carpenter ants *(Camponotus species)* are the largest ants that abundant in forested areas. They may be either black or black with a reddish brown thorax. They are most similar to the field ants but can be distinguished by examining them in side view, with the thorax of the carpenter ants being uniformly rounded without indentation. Carpenter ants nest in wood, almost always establishing colonies in wood that has been softened by decay. Carpenter ants mostly feed on a mixture of dead insects and honeydew.

a) Identification

Carpenter ants, genus *Camponotus,* belong to the subfamily Formicinae, which is characterized by a circular anal orifice (opening) surrounded by a fringe of hairs (hand lens of 20X required, Carpenter ants are large, having queens 16–18 mm long and workers varying from 6–13 mm long. When workers vary in size, they exhibit polymorphism (many sizes). The workers of some ants are monomorphic (one size).
Color: black. **Workers:** Many sizes. **Nesting:** Carpenters hollow out dead, moist wood in trees, firewood and fence posts to build nests, but they don't eat wood. **Location:** This ant was found on firewood tree of forest region. **Food facts:** Feeds on insects, insect secretions during the summer. Often invade structures in spring and fall looking for other food sources. Likes sweets.

b) Classification

- Kingdom:Animalia,
- Phylum: Arthropoda,

- Class: Insecta,
- Order: Hymenoptera,
- Family: Formicidae,
- Subfamily: Formicinae,
- Tribe: camponotini,
- Genus: *camponotus*

4. Future Scope

The future scope of this study is to identify the Ants and list their diversity in this region. It will be also further studied their hierarchy, richness, indices and dominancy including similarity indices in the selected habitats of this region. This study will also generate some valuable informative data about distribution and richness of ant's species. These non targeted animal is very useful to human being like order hymenoptera, till these are unknown to researchers. Therefore, we have initiated to study the diversity of Ants in this region and extend this study in future.

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