



An interconnection of ant species with agricultural plants in Elayirampennai of Tamil Nadu

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Abstract

The present study aims at the preliminary survey of interactive ant species at different plantation areas in Elayirampennai, Tamil Nadu. A total of 11 ant species were observed from the entire study site. Our study of this interrelationship of ants and plants emphasizes the impact of local factors such as the availability of suitable ant partners and domatia occupancy and the protection mutualism between ants and plants.

Keywords: interconnection, formicidae, agricultural plantation, Tamil Nadu

1. Introduction

Ants, order Hymenoptera, family Formicidae, play among insects a demonstrated role in transporting and pooling nutrients (Mueller *et al.*, 2005) ^[1]. They are highly mobile, skilful tillers of soil, dispensers of seeds and microbial propagules, transmitters of N₂-fixing bacteria, predators, ecosystem engineers, fungi growers, waste managers, biotechnologists, pest controllers, soldiers, and reproducers (Balasubramani and Kannaiyan, 1991; Jouquet *et al.*, 2006; Philpott *et al.*, 2006; Benckiser, 2007; Hölldobler and Wilson, 2009) ^[2-5].

Interactions of species vary spatially and seasonally and should be analyzed using a landscape approach (Bronstein 1995; Ortiz-Pulido) ^[6]. Ant-plant interactions vary in their probability of occurrence along environmental gradients and under different disturbance regimes (Koptur 1992; Rico-Gray *et al.*, 1998) ^[8, 9]. The pattern of interactions in different ecological conditions (Cushman and Addicott, 1991) and between habitats, also exhibit the significant temporal variation (Alonso, 1998) ^[10]. The structure of ant communities and of ant-plant interactions has been studied in a variety of habitats, assessing that neither the spatial nor the temporal dimensions can be ignored (Herbers, 1989) ^[11]. In comparison with the studies on the ant-plant interaction in worldwide, in India, only limited studies were carried out.

2. Materials and Methods

The study carried out at the agriculture lands in Elayirampennai, (9.2750° N, 77.8424° E), situated at Virudhunagar district of Tamil Nadu, India. Specimens

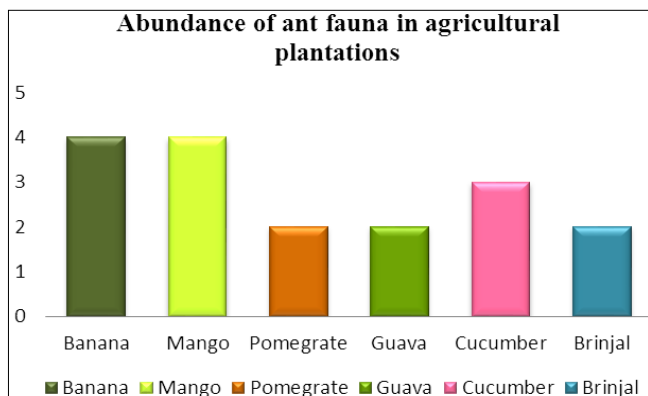
randomly collected by Brush Method and All out Search Method. The studied area is grown with different varieties of plants in each part and the plant species were noted from the field itself. The ant specimens were collected both from the plant and from the soil surface of each plantation. The collected specimens were kept in 70% ethanol for preservation. The mounted specimens were identified with the help of a binocular microscope and with the identification keys of Bingham (1903) ^[12] and Bolton (1994) ^[13]. Mounted specimens were kept in the laboratory, Department of Zoology, Ayya Nadar Janaki Ammal College, Sivakasi, Tamil Nadu.

3. Observations and Results

A total of 11 species were observed from the study sites. Most of the ant species were *Camponotus compressus*, *Camponotus crispulus*, *Camponotus sericeus* and *Crematogaster sp.* *Tetramorium sp.*, *Camponotus sericeus* and *Camponotus crispulus* were commonly found in the mango tree and the species of ants mostly preferred the flowers for their food. *Solenopsis geminata* found as one of the invasive group on Brinjal of Eggplant (*Solanum sp.*). In Pomegranate tree, *C. crispulus* and *C. compressus* were common in the soil of study site. *Camponotus compressus* and *Tetraponera rufonigra* preferred floral parts in the Guava. *Monomorium minimum* and *Solenopsis* was a common species in Cucumber and Brinjal. An ant visits the cucumber plant for the nectars in flowers and fleshy portions of fruits. The detailed list of ant fauna and the plantation area are given in the Table.

Table 1: Ants species observed in the different plantations

Area of plantation	Ant species observed	Parts of plant preferred by ants	Remarks
Banana Plant (Musa sp.)	<i>Solenopsis Invicta</i> , <i>Tapinoma sp.</i> , <i>Crematogaster sp1</i> , <i>Camponotus compressus</i>	Trunk	<i>Tapinoma sp</i> and <i>Crematogaster sp1</i> observed on the plant. The remaining species, <i>Solenopsis invicta</i> and <i>Camponotus compressus</i> observed from the soil.
Mango tree (<i>Mangifera sp.</i>)	<i>Tetramorium sp.</i> , <i>Solenopsis geminata</i> , <i>Camponotus sericeus</i> <i>Camponotus crispulus</i>	Flowers	Three species were found in the soil except <i>Tetramorium</i> which observed on the tree.
Pomegranate (<i>Punica sp.</i>)	<i>Camponotus crispulus</i> <i>Camponotus compressus</i>	Flowers	The species were found in the soil.
Guava (<i>Psidium sp.</i>)	<i>Camponotus compressus</i> <i>Tetraponera rufonigra</i>	Flowers	The species observed on the soil, beside the plant
Cucumber (<i>Cucumis sp.</i>)	<i>Monomorium minimum</i> , <i>Solenopsis Invicta</i> , <i>Pheidole sp.</i>	Flowers and Fruits	The species observed on the soil, beside the plant
Brinjal	<i>Monomorium minimum</i> <i>Solenopsis geminata</i>	Flowers	<i>Monomorium minimum</i> were found under the plant and <i>Solenopsis geminate</i> were observed in the soil.

**Fig 1:** Abundance of ant fauna in different agricultural plantations

4. Conclusion

Ants are important in terms of biodiversity as they are the most diverse, abundant and ecologically significant organisms on earth. Ants perform many ecological roles which are beneficial to humans being, including the suppression of pest populations and an erosion of the soil. The present study has shown that the extent of ant protection from herbivore received by a myrmecophyte is positively related to the local richness of ants, and extent of ant occupancy of domatia. The study concluded that the ants act like pollinators in agriculture fields.

5. Acknowledgement

We thank Management and Principal, Ayya Nadar Janaki Ammal College (Autonomous), Sivakasi for providing facilities to carry out this research work.

6. References

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