

Species composition in ants: its role in bio-monitoring the ecosystem of Gorumara National Park area

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Abstract: Ant, family Formicidae, class Insecta, is one of the dominant soil fauna and plays a key role in regulating the soil quality. Thus ants play a pivotal role maintaining the forest as well as agro-ecosystem. The present work aims to assess the ants on its population diversity, dominance, seasonality and its role as an indicator in monitoring the forest ecosystem, in Gorumara National Park, West-Bengal and in adjoining human habitation.

27 species of ants were recorded from four sampling sites in Gorumara National Park area. Soil samples collected from the study areas were analysed for various edaphic factors and results were co-related with the abundance of the ants. Significant results were obtained from such analysis.

With the seasons, population of Ants species shows notable quantitative and qualitative variation. The calculated 't' value for any two of the other sampling sites show significant variation in the prevalence of the ants species and in ecological environment affecting the prevalence. Thus, the ants play important role as bio-indicators. At present, world is leading towards the exhaustion of natural resources scientists are in search of alternative resources. Ants play an important role for sustainable resources in our survival as well, in spite of their natural intricacies.

Index Terms: Ants, Biodiversity, Bio-indicator, Gorumara National Park

I. INTRODUCTION: Among the most populous life forms on the planet insect stands as the forerunner. Insect demonstrates amazing evolutionary adaptations and habitat diversity. To foster biodiversity, protection of forest and human dominated land use, proper understanding of its every unit (inhabitant) is necessary in order to conserve our ecosystem and its good health.

Ants are one of the important indicator insects in assessing environmental qualities, ecosystem and community structure and evaluating bio-diversity [18, 37]. [1, 3] proved Ants, extensively, as bio-indicators. Role of Ants in maintaining the forest as well as agro-ecosystem was studied by [5, 7]. The two important eco-regions, the Himalayas and the Western Ghats are listed as biodiversity hot spots and both the ecosystems are under major threat. More than 3,000 kilometers long, the Himalayan system, harbors about 202 species of ants, with 45% being endemic to the region, [5]. Temperature and altitudinal gradients in Himalayan ecology have a remarkable effect on ant species composition and abundance, [7]. As key players in many ecosystems their species composition gives an indication of ecosystem health and functioning. Some attempts have been made earlier to estimate the dominance and species richness of ants in different areas of Indian subcontinents [4, 31, 6, 30, 33, 34, 7] as well as in other continents [24]. Ants have been used as indicators of several environmental impacts, such as fire, deforestation and logging, agricultural intensification, mining, and urbanization [24, 16, 10]. Structure of ground-foraging ant assemblages in relation to land-use change in the northwestern Mediterranean region was reported [20]. Ants as biological indicators of human impact in mangroves of Brazil showed [14]. Ants as bio-indicators of land restoration in a brazilian atlantic forest fragment was reported [11]. The impact of Ants as indicator of ecosystem health was reviewed by [8]. The impact of abundant *Pheidole* ant species on soil nutrients in relation to the food biology of the species was studied [36].