



DIVERSITY OF COLEOPTERA IN TWO VEGETATIONAL COVERS IN PAKHAL WILD LIFE SANCTUARY, WARANGAL, TELANGANA

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ABSTRACT

A survey of diversity of Coleoptera in two vegetational covers in Pakhal wildlife sanctuary, Warangal. The Coleopterans were collected by using standard trapping methods from two areas selected on the basis of their specific habitat differences and estimated that the Coleopterans were in higher abundances during the rainy season in both areas and decreased during the dried seasons and less in number during summer season. They are relatively more in number during rainy season in the natural forest area compared to the teak plantation area. The higher number of total coleopterans was recorded in June in the natural forest. The seasonal variation in the population densities of Coleoptera may be attributed to the variation in the abiotic factors. The abiotic factors would influence 65% variation in their seasonal abundance in natural forest and 30% variation in their seasonal abundance in teak plantation area. The rainfall was also favorable for increasing the population density of total Coleoptera.

KEYWORDS: Coleoptera, wildlife sanctuary, Natural forest area, Teak plantation area.

INTRODUCTION

The Coleoptera is an order of insects commonly called beetles. The word Coleoptera is taken from the Greek, Keleos = Sheath, pteron = wing sheathed wing. Most beetles have two pairs of wings coleoptera includes more species than any other order. They are found in all major habitats except marine and the Polar Regions. 75% of beetle species are phytophagous in both the larval and adult stages. The beetles can be considered as pests (Gillott, 1995). Beetles are not only act as pests but can also be beneficial, usually by controlling the population of pests. The diversity of the coleoptera in the natural systems is in dynamic equilibrium (Aquino, 2001, 2005) and in agricultural production system. Coleopterans play an important role in nutrient cycling (Hemski and Cambefort, 1991, Nichols et al., 2008). The physical quality of the soil changed with the increase of total soil porosity (Pempeo et al., 2016). The abundance of beetles is affected by land use and management and their occurrence is associated with the amount and quality of plant residues in agricultural production systems including forest production (Price and Young, 2006). Present studies have been attempted made on diversity of Coleoptera in two vegetational covers in Pakhal wild life sanctuary Warangal.

MATERIALS AND METHODS

Study area; Two habitats with different types of vegetation covers such as the natural forest and teak plantation areas were selected in Pakhal Wildlife Sanctuary, Warangal. This sanctuary located between (Altitude 17 42.5° and 18 10 North and between Longitude 79 55° and 80 10 East) forest ecosystem in Telangana State, India. In the Natural forest area trees *Terninalia tomentosa*, *Anogeissus latifolia*, *Pteracarpus marsupium*, *Lagerstroemia parviflora*, *Cleistanthus collinus*, *Adina cordifolia*, *Diospyros melanoxylon* and *Emblca officinalis* sp were predominant. Herbs; *Aegle marmelos* (L) Correa, *Costus speciosus* (Koen. ex Retz) Smith, *Curcuma pseudomontana*, (Graham), *Drosira indica* (L), *Glonosa superba* (L), *Merremia turpenthum* (L), *Pueraria tuberosa* (Wild) DC, *Rauvolfia serpentine* (L) and *Trichosanthes cucumarina* (L) were found. Shrubs; *Buchnanan lanzan* (Spreng), *Colycopteris floribunda* (Roxb), were dominant. In teak plantation area only one tree species *Tectona grandis* L and Shrubs ; *Butea superba* Roxb, *Casia auriculata* and *Shrum* sp were found. The vegetation in Natural forest area and Teak plantation area were dried up to the heat of summer. The litter was thick layer due to the accumulation of the leaves.

Pit –fall trap method: The soil inhabiting Coleopteran fauna of both forest area and Teak plantation areas were

sampled by pit- fall trap method. In pit- fall trap method wide mouth bottles of 24 cm length and 5 cm mouth diameter with 100ml of 5% formalin solution were placed as pit fall traps by digging into the ground randomly at ten places, the distance between two traps being 20 feet in each habitat. A flat stone kept over each traps allowing a minimum distance of 2 cm, between the mouth of the trap and the under surface of the stone to protect the trap from rain and dust. These bottles were collected monthly during the study period. Besides, the traps were inspected more frequently to avoid complete evaporation of formalin from the bottle due to the sun heat. The traps after collection from the fields, were tightly capped and brought to the laboratory for calculation and analysed the data of Arachnids.

RESULTS AND DISCUSSION

The percentage of identified coleopteran species were recorded in the natural forest area and teak plantation area of the sanctuary presented in Table-1. In natural forest area which total Coleoptera have been recorded 61.93 per cent in which *Megalodecne sp* recorded 16.95%, *Scarites bengalensis* 15.63%, *Amblystomus magnus* 14.65%, *Coleolissus sp* 9.22% and *Pochycera sp* 5.46% respectively. In teak plantation area in which total Coleoptera was recorded 38.06 per cent in which *Amblystomus magnus* recorded 19.47%, *Scarites bengalensis* 6.96%, *Pochycera sp* 5.80%, *Coleolissus sp* 3.41% and *Megalodecne sp* 2.39% were recorded. These results showed that the total Coleoptera including Carabidae, *Scarites bengalensis* species, *Amblystomus magus* Bates, *Pachycera sp.*, *Coleolissus sp.* Some of

them being predators were recorded in natural forest area when compared to the teak plantation area. Seasonal abundance of Coleoptera was showed in Table-2 &3. The total Coleopterans represented *Scarites bengalensis*, *Amblystomus magnus*, *Pochycera sp*, *Coleolissus sp* and *Megalodecne sp* were in higher abundance during the rainy season in both the areas and decreased during dry seasons- winter and in low abundance in summer. However, Dutta and Gupta (1981) recorded higher number of Coleoptera, Carabidae being dominant in August followed by October. Carabidae being dominant in natural forest, whereas in the teak plantation forest, Carabidae was dominant in May. (Moeed and Meeds, 1985) recorded 188 species of Coleopterans in three forest habitats. Mac Coll (1975) collected 6 Carabid species in forest of the Orongorongo valley. The Coleopterans are nocturnal and predatory in natural hiding under logs, stones and litter cover. The presence of more number of Coleopterans in natural forest area may be due to the presence of preferable niches compared to the Teak plantation area. The density and ground vegetation have great influence as the activity of Coleopterans particularly the Carabidae than the presence of more prey (Greenslade, 1964, Thiele, 1977, Lone and Sunderland, 1996). In Natural forest area organic matter is available more in the form of litter produced every year being added continuously to the soil litter system being favorable for more render ground vegetation served as their food also the litter and the vegetation served as favorable regions for the soil surface inhabiting invertebrates leading to their higher abundance (Reddy and Venkaiah, 1990).

Table 1: Total number of Coleoptera percentages during the study period in Natural forest and Teak plantation area during the study period.

Arthropod taxa	Natural forest area	%	Teak plantation area	%
Coleoptera	1450	61.93	891	38.06
Carabidae				
<i>Scarites bengalensis</i>	366	15.63	163	6.96
<i>Amblystomus magnus</i> Bates	343	14.65	456	19.47
<i>Pochycera sp</i>	128	5.46	136	5.80
<i>Coleolissus sp</i>	216	9.22	80	3.41
Eritilidae				
<i>Megalodecne sp</i>	397	16.95	56	2.39

Table 2: Relative population abundance of Coleoptera in Natural Forest Area during the study period.

Season	Month	Population abundance
Rainy season	June	15.50 ± 2.24
	July	14.6 ± 1.95
	August	6.50 ± 1.22
	September	5.80 ± 0.86
Winter	October	15.3 ± 1.58
	November	3.9 ± 0.61
	December	4.2 0.93
	January	3.8 ± 0.28
Summer	February	5.3 ± 1.06
	March	2.2 ± 0.72

	April	6.3 ± 0.30
	May	3.6 ± 1.49

Table 3: Relative population abundance of Coleoptera in teak plantation area during the study period.

Season	Month	Population abundance
Rainy season	June	15.1 ± 1.65
	July	7.2 ± 0.37
	August	5.4 ± 0.78
	September	3.2 ± 0.18
Winter	October	3.1 ± 0.61
	November	1.3 ± 0.15
	December	3.5 ± 0.22
	January	3.3 ± 0.99
Summer	February	3.1±0.86
	March	2.0±0.11
	April	2.5 ± 0.19
	May	1.8 ± 0.09

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