



## DIVERSITY OF ARACHNIDA IN DIFFERENT HABITATS OF PAKHAL WILDLIFE SANCTUARY, WARANGAL, TELANGANA, INDIA

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### ABSTRACT

Soil surface arachnida collected by pit-fall trapping for a period one year in two habitats were reported. The habitats have different types of vegetations, Natural Forest area and Teak Plantation area of Pakhal wildlife sanctuary, Warangal. 11 species were identified from 5 families in both areas. Out of 3619 Arachnida fauna, 64.02% in natural forest and 35.97% in teak plantation area were recorded. Among the total population solpugida was absent in teak plantation area. The species composition and qualitative and quantitative study was analysed with statistical data.

**KEYWORDS:** soil surface arachnida, different habitats, Pakhal wildlife sanctuary,

### INTRODUCTION

Arachnids are a diverse group of terrestrial predators, although generalizations about habitat use by spiders, scorpions are complicated by their wide diversity in foraging strategies (Sorensen, L.L. (2004). Spiders are used as successful biological indicators to assess the ecosystem health as they can be easily identified and are differently responsive to natural and anthropogenic disturbances (Kapoor V (2008)). As spiders are general predators, they are of immense economic importance to man because of their ability to suppress pest abundance in agro-ecosystems. The population densities and species abundance of spider communities in agricultural fields can be as high as that in natural ecosystems (Coddington, 1996). Despite their size, the ecological importance of spiders is undeniable as they are abundant predators of other forest arthropods (Uetz, G.W. (1979).

In India, 1686 species belonging to 438 genera of 60 families of spiders are reported (Keshari, 2012). Western Ghats, being one of the global hotspots of biodiversity, supports an enormous vegetal wealth and the entire Western Ghats biogeographic region is a major genetic estate with an enormous biodiversity of ancient lineage. Anthropogenic factors are posing serious threats to the biodiversity of Western Ghats. Land use changes in the Western Ghats over the last century caused by agricultural expansion; conversion to plantations and infrastructural projects have resulted in loss of forests and grasslands. Fifty one oribatid mites were identified in different habitats in natural forests of Georgia (Murvanidze, M., 2014) Soil mites are plays a role in litter decomposition in forest floor.

### 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*, (Grahm), *Drosira indica*(L), *Glonosa superba*(L), *Merremia turpenthum*(L), *Pueraria tuberosa*(Wild)DC,*Rauvolfia serpentine* (L) and *Trichosanthes cucumarina* (L) were found. Shrubs; *Buchnanania lanzan*(Spreng), *Colycopteris floribunda* (Roxb), were dominant. In teak plantation area only one tree species *Tectona grandis* L and Shrubs ; *Butea superb* 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 surface Arachnida 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 Arachnida (Table-1) were recorded both qualitatively and quantitatively maximum in natural forest area followed by teak plantation area. This may be due to the accumulation of leaf litter and other plant parts in the soil system. 11 species were recorded in both habitats. However, Solpugida was absent in teak plantation area. In natural forest area Arenea were recorded maximum number 45.54% followed by Acarina 12.11%, Pseudoscorpionida 3.22%, Scorpionida 2.23% and Solpugida 0.98% were recorded in minimum

number. In teak plantation area Arenea 26.64% followed by Acarina 8.27%, Scorpionida 0.69% and Pseudoscorpionida 0.35% were recorded in minimum number. Spiders have also an important role in the ecosystem balance and are considered as the prospective biological control agents (Riechert and Bishop 1990). The status of spider diversity is an important constraint to evaluate the community level of biological organization. Higher species diversity is an indication of a healthier and complex community because a greater variety of species allows more interactions, hence greater system stability which in turn indicates good environmental conditions. It is concluded that Arachnid diversity depends on the vegetation covers i.e. natural forest was favourable than teak plantation forests it leads to greater abundance of arachnids in natural forest (Fathima P Shabnam et al. 2021). A diversity index (Table-2) shows that total Arachnida was slightly higher in teak plantation area. However, spider population was higher in natural forest area compared to teak plantation area.

**Table 1: Diversity of Arachnida in different habitats of Pakhal Wildlife Sanctuary, Warangal.**

Taxa	Number of individuals in forest area	%	Number of individuals In teak plantation area	%
Arachnida	2319	64.02	1300	35.97
Areneae	1646	45.54	963	26.6
Thanatus sp	173	4.8	51	1.4
Storena sp	196	5.4	188	5.2
Gnaphosidae	310	8.5	279	7.7
Lycosidae	603	16.6	241	6.6
Acarina	438	12.11	299	8.2
Oribatid	133	3.6	145	4.0
Trambidium sp	84	2.3	35	0.9
Stigmaeus sp	163	4.5	68	1.8
Eremulus avenifer	58	1.6	51	1.4
Solpugida	36	0.9	-	-
Scorpionida	82	2.2	25	0.6
Pseudoscorpionoda	117	3.2	13	0.3

**Table 2: Diversity indices in natural forest and teak plantation areas in Pakhal wildlife sanctuary, Warangal.**

Diversity index	Taxa	Natural forest area	Teak plantation area
Simpsons Index	Arenae	0.68	0.75
	Acarina	0.72	0.68
	Total Arachnida	0.46	0.40

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