



## STUDY OF SPIDER DIVERSITY AT CENTRAL ORDNANCE DEPOT (C.O.D.) ESTATE, JABALPUR, MADHYA PRADESH

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### ABSTRACT

This study aims to analyse the diversity of spiders (Arachnida: Araneae) at Central Ordnance Depot. The C.O.D. is a defence establishment in the Jabalpur district of Madhya Pradesh. The institute is well known for its lush green surroundings which provide adobe to many species of flora as well as fauna. The area is totally free from access for common people due to high-security reasons, which is a plus point for the spider diversity found here. The current study was performed here by taking field surveys in the accessible regions of the estate. There were 36 species reported belonging to 11 families.

**KEYWORDS:** Araneae, Biodiversity, Jabalpur, Madhya Pradesh

Spiders are usually assessed as generalist hunters and have a great influence on the structure of the community, particularly the food cycle as well as the web. They play a vital role because as a chief insect predator, they keep a check on the insect population (Borror *et al.*, 1996; Kostanjšek *et al.*, 2015). Since spiders can feed on a number of insect species, they are responsible for the diversity control of many insect pests. Thus, it shows that the spider is very important within any food-chain. Similarly, they conjointly play a vital role in agriculture and plantation by safeguarding it from tormentor insects (Brunet, 2000). Moreover, spiders can even be the bioindicator for any alteration in the ecosystem (Kapoor, 2006).

The tropical forest includes a vast diversity of spider species (Suana, 2004). Spider likes to create their net in the places where it can be guarded against direct sunlight. Also, they prefer the spot where they can attach their nets safely from the predators and can get an ample supply of food material, thus decreasing their foraging efforts as well as time (Morse, 1984; Pollard *et al.*, 1995). The spider diversity in any area is affected by many aspects (Larrivee and Buddle, 2010). Any alterations within the current set up can lead to a decrease in their numbers. Similarly, the reduction of floral diversity within the region can lead to a decrease in spider diversity (Samu *et al.*, 1996; Reichert and Lockley, 1984). While on the other hand, there are certain factors within an ecosystem that can increase its complexness, which in turn helps in improving the spider populations in the region (Reichert and Lockley, 1984; Chew, 1961).

In order to halt in-progress diversity loss, conservation efforts are typically focussed on cross-country conservation and diversity action plans, that are dependent upon existing threats to diversity and precise information on the distribution of species within the region (Ceballos and Brown, 1995; Garcia, 2006; Newbold *et al.*, 2009; Arponen, 2012). Deepa *et al.*, (2020). In terms of arthropod conservation, because of the absence of analysis, conservation plans do not generally embrace these species up to the required extent, thus denying their contribution to the general species diversity. This successively results in conservation efforts, that don't effectively cover areas vital for invertebrate diversity (Hernandez-Manrique *et al.*, 2012) and thus most likely end in a dramatically magnified diversity loss among this taxonomic group, and therefore overall species diversity. So as to really check the current trend of diversity loss, it is, therefore, necessary to review patterns of invertebrate diversity a lot intensively and use the obtained insights in updated conservation plans and diversity action plans (Cardoso *et al.*, 2008; Diniz-Filho *et al.*, 2010; Beck *et al.*, 2012; Hernandez-Manrique *et al.*, 2012).

In India, various studies have been conducted on spider diversity. Biologists like Tikader (1970, 1977, 1980, 1982), Patel (1975), Tikader and Biswas (1981), Pocock (1900), and Gajbe and Rane (1992) have contributed a lot in this regard. In the context of Jabalpur, various new species of spiders are described by Gajbe and Gajbe (1999 and 2000) and Bhandari and Gajbe (2001). A similar study was also done by Dubey

and Pant (2020) in which they have described 48 species of spiders from RDVV Campus, Jabalpur.

**MATERIALS AND METHODS**

- Sites were selected where there was a higher probability of finding the subjects.
- Three plots of fifty x fifty square centimetres were established in various localities in the study sites.
- The distance among the plots was five hundred meters.
- Then four transects were created in every plot.
- The length of each transaction was kept at fifty meters
- The distance between each transect was kept at fifteen meters.
- The sample is obtained employing a pitfall trap as well as a sweeping net.
- The pitfall trap was to gather spiders that go on the land surface while the sweep net was used to collect the spiders that inhabit the vegetation (Vincent and Hadrien, 2013).
- The spiders that go past the trap is predicted to be cornered and died within.
- There were five traps in one transect with a spacing of fifty meters. The traps ought to be positioned for forty-eight hours (Suana, 2004).
- The sample of spiders was then kept in a tube containing ninety-five percentage of alcohol.
- The collection of spiders from the sweep net is obtained by swinging the net a hundred times in every transect.
- The time of data collection was kept fixed from 09.00 am to 15:00 pm throughout the study period.
- The sampling was conducted for four months.
- The sample taken from the pitfall trap and sweep net was then processed one by one.
- The process of identification is predicated on the external morphology provided within the literature available. Chiefly the literature concerned was Borror et al. (1996), ‘Spider and their kin’ (Levi and St. Matthew the Apostle, 1990), and therefore the ‘Riceland spider of South and Southeast Asia’ written by Barrion and Litsinger (1995).

**RESULTS**

The results of the surveys of the Central Ordnance Depot (COD), also known as Jabalpur Ordnance Depot, identified altogether 36 species of spider. These species were collected from various localities of the COD Estate. These species belonged to 11 species. The tabular depiction of these species is given in Table 1 which is as follows:

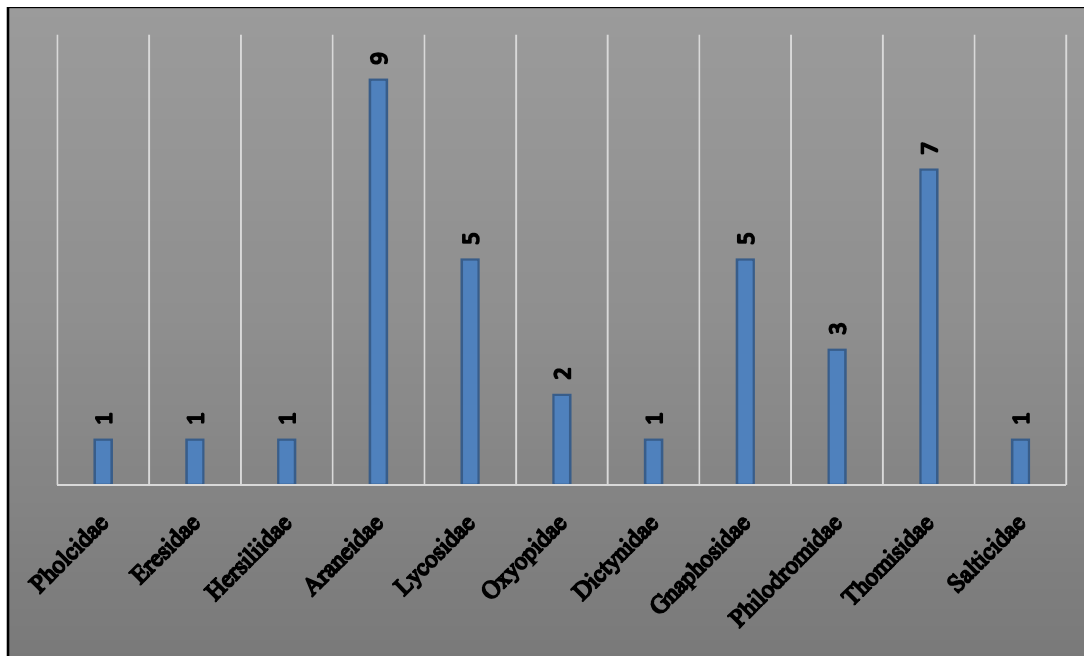
**Table 1: Families and Species of spiders identified at COD Estate.**

S. No.	Family	Species
1	Pholcidae	<i>Artema atlanta</i>
2	Eresidae	<i>Stegodyphus sarasinorum</i>
3	Hersiliidae	<i>Hersilia savignyi</i>
4	Araneidae	<i>Leucauge decorata</i>
5		<i>Nephila maculata</i>
6		<i>Argiope aemula</i>
7		<i>Chorizopes tikaderi</i>
8		<i>Cyrtophora cicatrosa</i>
9		<i>Cyrtophora citricola</i>
10		<i>Cyclosa spirifera</i>
11		<i>Larinia bhadatae</i>
12		<i>Neoscona rumpfi</i>
13		Lycosidae
14	<i>Hippasafabreae</i>	
15	<i>Arctosa indicus</i>	
16	<i>Lycosa shaktae</i>	
17		<i>Hippasa partita</i>
18	Oxyopidae	<i>Oxyopes ketani</i>
19		<i>Peucetia ashae</i>
20	Dictynidae	<i>Dictyna shiprae</i>
21	Gnaphosidae	<i>Gnaphosa poonaensis</i>
22		<i>Callilepis lambai</i>
23		<i>Scopodes maitraiae</i>
24		<i>Scotophaeus poonaensis</i>
25		<i>Poeilloehroa barmani</i>
26	Philodromidae	<i>Philodromus durvei</i>
27		<i>Philodromus ashae</i>
28		<i>Thanatus ketani</i>
29	Thomisidae	<i>Thomisus sundari</i>
30		<i>Thomisus rajani</i>
31		<i>Runeinia yogeshi</i>
32		<i>Oxyptila amkhasensis</i>
33		<i>Xystieus bengalensis</i>
34		<i>Xystieus bhadatae</i>
35		<i>Synaema deeorata</i>
36	Salticidae	<i>Marpissa dhakuriensis</i>

The family wise distribution of all the species of spiders is compiled as table 2 the graphical representation of the same is depicted as Figure 1.

**Table 2: Number of species from each family recorded from COD Estate.**

Family	Number of Species
Pholcidae	1
Eresidae	1
Hersiliidae	1
Araneidae	9
Lycosidae	5
Oxyopidae	2
Dictynidae	1
Gnaphosidae	5
Philodromidae	3
Thomisidae	7
Salticidae	1
Total	36

**Figure 1: Number of species from each family recorded from COD Estate**

## DISCUSSION

A total of 36 species of spiders belonging to 11 families were recorded. The majority of species were from the Araneidae family (9 species) followed by Thomisidae (7 species) and Lycosidae and Gnaphosidae (5 species each). While on the other hand, Pholcidae, Eresidae, Hersiliidae, Dictynidae, and Salticidae were the least represented families with one species each. The COD estate is very vast and distributed over 1200 square hectares. A major area is covered with lush green forest and grasslands with can support a diversity of flora as

well as fauna. the recorded data of spider diversity shows that area has a very high potential to sustain biodiversity.

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