



ASSEMBLAGES OF SPIDERS FROM TAVANDI GHAT, (NIPANI RANGE), KARNATAKA

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ABSTRACT:

Spiders are very much fascinating organism among all invertebrates. It plays crucial role in ecological balance. Spiders are cosmopolitan in occurrence; it is found everywhere and inhabiting all possible environments. It utilizes very cleverly its available microhabitat. It is very much interesting to study their behavior. Study of spiders in India is neglected topic among researchers but spiders are diversely distributed among India. For this instance we have carried preliminary survey at Tavandi ghat for diversity and occurrence of spider. Present paper concerned with preliminary checklist of spider from Tawandi ghat.

Key words: - *Arachnology, ecological indicator, Tavandi Ghat, Taxonomy & ecology.*

INTRODUCTION:

Spiders are among largest group of invertebrates, nearing 49084 known species so far (WSC, 21.5). Spiders are found worldwide and can live in all types of habitats and occupy almost all niches (Turnbull, 1973; Nyfeller and Benz, 1987). They play a significant role in the controlling insect and other invertebrate populations in most ecosystems (Wise, 1993). Spiders form one of the vastly distributed groups of predatory organisms in the animal kingdom (Riechert and Lockley, 1984). Despite the similarity in their biology, details of the lifestyles of spiders vary greatly. Spiders belong to large taxon with the vast array of adaptations ranging from generalist to those narrowly adapted to particular ecological circumstances (Jocqué & Dippenaar-Schoeman, 2006).

Spiders are excellent models for sexual selection. Their exposed male copulatory organs range in complexity from a simple intermittent 'thorn' to a long whip-like stature

accompanied by amazingly complex supporting appendages. The variety, complexity of these organs and the accompanying variety in secondary sexual characters and courting behavior makes them a 'mating model' (Jacqué & Szüts, 2001). Spiders voraciously feed on insects (Nentwig, 1987). Small web-building spiders (Linyphiidae), which live near the ground, numerically dominate in field crops of northern-temperate Europe (Nyffeler, 2003).

In contrast to other mega diverse terrestrial groups with large numbers of species such as the Acari, Nematodes and Collembola, spiders are relatively large animals. Because of their external copulatory organs are species specific, is fairly simple to identify them. No time consuming dissections are required for their identification and sorting spiders by morphospecies is thus fairly straightforward. Surveys of spiders are therefore the most simple to conduct and spiders appear to be the ideal animals to use for rapid biodiversity

assessments. Simple identification, ease of collection and fine-tuned distributions makes these animals study objects par excellence for decision makes that require information about the intrinsic biological value of any particular habitat. Spiders provide such information about the value of any particular habitat better than higher plants or vertebrates (Mittermeier et al., 1999), and thus offer small scale data for the selection of biodiversity 'hot spot' that is required for triage purposes.

Spider size depend upon the quality of the habitat, thus by simply monitoring the size we can consider an 'early warning system', revealing changes in habitat quality (Jacqué, 1981; Volarth, 1988). The density of occurrence of spiders can be reliably estimated by night collecting using the light from headlamp that reflects off the tapetum in the back of their eyes (Jacqué et al., 2005).

It would seem logical that the spider community would be a key component of integrated pest management strategies. Spider surveys may provide an effective means for measuring the impact of habitat degradation or land use change on biodiversity. Present study give account of total 18 families, 53 genus and 76 species were recorded and this is first attempt in exploring Tavandi Ghat region in exploring spider diversity.

MATERIAL & METHODS:

Well established sampling protocols or spider collection will be adopted in different selected sampling plots. Spider collection was done by active search and line transects method. Spiders were collected by areal hand collection from knee level to arm length level, which gives accesses to web-building and free-living spiders on the foliage and stems of living or dead shrubs, high herbs, tree trunks etc.

Some collected specimens were transferred to 70% alcohol. All adult specimens were identified to family, genus and species level. Species was distinguished by examination of

external genitalia. Sexes were matched by color pattern and somatic features. Identification was done on the basis of morphometric characters of various body parts. A detailed taxonomic study was carried out based on the various keys and catalogues and other relevant literatures. Identification and photographs were taken with help of Almicro stereo-zoom Trinocular microscope with attached camera and process by using Biowizard software. Genital was excised with help of sharp pointed entomological needles and cleared in 10% KOH.

The study was carries out during May 2019 - March 2020 in all three seasons of the year. As many spiders are nocturnal as well as diurnal so sampling was conducted both day time from 5:00 A. M. to 10:00 A. M. and night survey from 6:00 P. M. to 1:00 A. M. under suitable weather conditions.

Study area

Tavandi Ghat is famous for Jain temple. It is situated on NH4 highway. It falls under following Latitude and longitude: 16°21'43.9"N 74°24'17.8"E- 16°20'51.9"N 74°23'41.3"E. It is about 4 kms belt, comes under Chikodi forest division and Tavandi range. This range has been fragmented by six lane highway no. 4 (NH4) Pune-Bengalore. Mix type of vegetation is found in upper side with grass lands and steep area with large trees.



Figure 1: Image showing Google map of Tavandi Ghat.

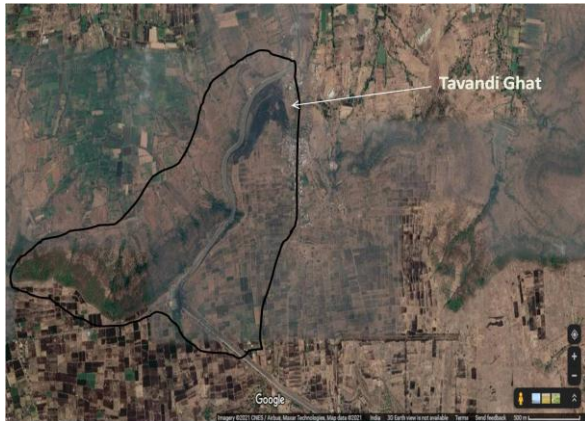


Figure 2: Image showing marked Tavandi Ghat region on Google map.

RESULT AND DISCUSSION:

Preliminary survey was carried out in Tavandi ghat region. The study was conducted to explore this area for spider diversity as spider diversity in this area is unknown. Tavandi range is lateral branch of Western Ghat ranges so it is having great potential of biodiversity.

Following results showing data of one year extensive survey (Table 1)

Table 2 enlisted Number of families and respective genus and species which were found in this study. A total 18 Families were reported so far.

Table 3 shows numerical data showing number of genus and species were found from respective 18 families. Above data shows Araneidae family is more divers than rest of the families which counts 9 Genus and 15 species. After Araneidae family, family Salticidae found diverse in the field area which counts about 6 Genus and 9 species followed by Theriidae which counts 6 Genus and 7 species.

CONCLUSION

Present study is based on preliminary study of spiders from Tavandi Ghat which was carried out for a period of one year May 2019 to March 2020 for study diversity and ecology of spiders from this area. A total 18 families were reported so far, 52 Genus and 75 species were reported first time from this area. Occurrence

of spider we are concluding that there is no occurrence of larger species of spiders such as *Nephila pelipies*, tarantula which indicated degrading habitat and lots of disturbances in this area. More attempts must make towards conservation of this habitat so that biodiversity of this habitat will flourish.

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Table 1: Taxonomical account of spider from Tavandi Ghat during year 2019-20

Sr. No	Name of Family	Species
1	Araneidae Clerck, 1757	1. <i>Araneus mitificus</i> 2. <i>Araneus sp</i> 3. <i>Argiope anasuja</i> 4. <i>Cyrtophora citricola</i> 5. <i>Cyrtophora sp</i> 6. <i>Cyclosa sp1</i> 7. <i>Cyclosa sp2</i> 8. <i>Cyclosa sp3</i> 9. <i>Cyclosa sp4</i> 10. <i>Eriovixia excelsa</i> 11. <i>Larinia</i> 12. <i>Neoscona mukharji</i> 13. <i>Neoscona sp</i> 14. <i>Neoscona sp</i> 15. <i>Poltyis ilipidis</i>
4	Cheiracanthiidae Wagner 1887	16. <i>Cheiracanthium sp.</i>

2	Clubionidae Wagner, 1887	17.	<i>Clubiona sp.</i>
3	Eresidae C. L. Koch, 1845	18.	<i>Stegodyphus sarasinorum</i>
5	Filistatidae Simon, 1864	19.	<i>Pritha nana</i>
6	Gnaphosidae Pocock, 1898	20.	<i>Gnaphosa sp.</i>
		21.	<i>Drassodes sp.</i>
7	Hahaniidae Pocock, 1901	22.	<i>Hahnia sp.</i>
8	Linyphiidae Blackwall, 1859	23.	<i>Linyphia sp.</i>
9	Lycosidae Sundevall, 1833	24.	<i>Evippa sp</i>
		25.	<i>Geolycosa sp.</i>
		26.	<i>Hippasa sp1</i>
		27.	<i>Hippasa sp1</i>
		28.	<i>Lycosa sp1</i>
		29.	<i>Lycosa sp2</i>
		30.	<i>Lycosa sp3</i>
19	Oxyopidae	31.	<i>Oxyopus sp.</i>
		32.	<i>Hamataliva sp.</i>
10	Pholcidae C. L. Koch, 1850	33.	<i>Artema atalanta</i>
		34.	<i>Crossopriza lyoni</i>
		35.	<i>Leptopholcus sp.</i>
		36.	<i>Micropholcus faurati</i>
		37.	<i>Pholcus</i>
11	Salticidae Blackwall, 1841	38.	<i>Harmochirus brachiatus</i>
		39.	<i>Hasarius adansonii</i>
		40.	<i>Myrmarachne sp1</i>
		41.	<i>Myrmarachne sp2</i>
		42.	<i>Phintella sp1</i>
		43.	<i>Phintella sp2</i>
		44.	<i>Plexippus pykulli</i>
		45.	<i>Stenaelurillus sp1</i>
		46.	<i>Stenaelurillus sp2</i>
12	Sparassidae Bertkau, 1872	47.	<i>Heteropoda sp1</i>
		48.	<i>Heteropoda sp2</i>
		49.	<i>Olios sp.</i>
		50.	<i>Olios tener</i>
13	Tertragnathidae Thorell, 1869	51.	<i>Guizygella shivui</i>
		52.	<i>Leucauge decorata</i>
		53.	<i>Tetragnatha mandibulata</i>
		54.	<i>Tetragnatha sp1</i>
14	Theridiidae Sundevall, 1833	55.	<i>Achaeearanea sp.</i>

		56. <i>Chryso</i> sp.
		57. <i>Euryopsis cyclosisa</i>
		58. <i>Nesticodes rufipes</i>
		59. <i>Phycosoma martinae</i>
		60. <i>Steatoda</i> sp1
		61. <i>Steatoda</i> sp2
		62. <i>Steatoda</i> sp3
		63. <i>Theridion</i> <i>melanostictum</i>
		64. <i>Theridion</i> sp
15	Thomisidae sundevall, 1883	65. <i>Amyciaea forticeps</i>
		66. <i>Runcinia</i> sp.
		67. <i>Tmarus</i> sp.
		68. <i>Thomisus</i> sp1
		69. <i>Thomisus</i> sp2
		70. <i>Xysticus</i> sp.
16	Tiatanoecidae Lehtinen, 1967	71. <i>Pandava laminata</i>
17	Uloboridae Thorell, 1869	72. <i>Miagrammopes</i> sp.
		73. <i>Uloborus</i> sp.
		74. <i>Zosis</i> sp.
18	Zodariidae Thorell, 1881	75. <i>Euryidon</i> sp.

Table 2 enlisted Number of families and respective genus and species which were found in this study. A total 18 Families were reported so far.

Table 2: Total number of families, genus and species occurrences

Total number of Families	Genus	Species
18	52	75

Above table summarise number of Families, Genus and Species reported from Tavandi Ghat region. A total 75 species were reported from 52 Genus which were belongs to 18 Families

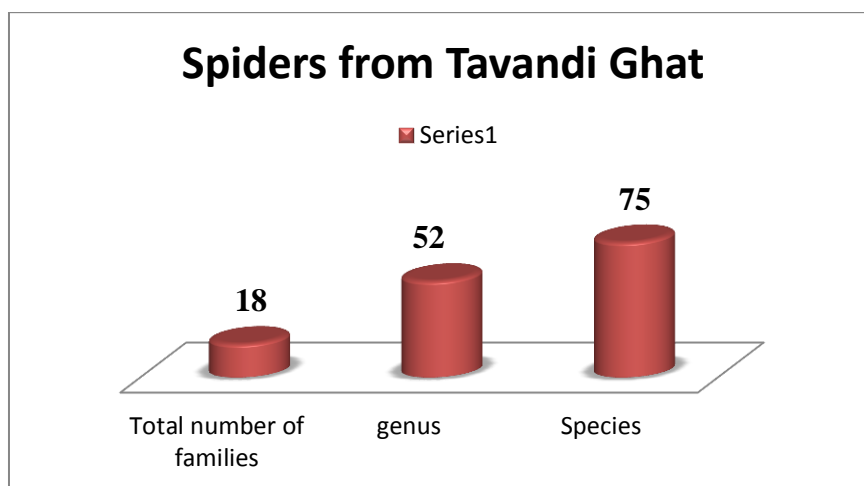


Figure 3: Graph showing no of spider families, genus and species encountered

Above figure illustrate bar diagram showing number of families, genus and species found in this area.

Table 3: Numerical data showing family wise genus and species number

Sr. No.	Name of Family	No. Genus	No. Species
1	Araneidae Clerck, 1757	9	15
2	Clubionidae Wagner, 1887	1	1
3	Eresidae C. L. Koch, 1845	1	1
4	Cheiracanthiidae Wagner 1887	1	1
5	Filistatidae Simon, 1864	1	1
6	Gnaphosidae Pocock, 1898	2	2
7	Hahaniidae Pocock, 1901	1	1
8	Linyphiidae Blackwall, 1859	1	1
9	Lycosidae Sundevall, 1833	4	6
10	Pholcidae C. L. Koch, 1850	5	5
11	Salticidae Blackwall, 1841	6	9
12	Sparassidae Bertkau, 1872	2	4
13	Tertragnathidae Thorell, 1869	3	4
14	Theridiidae Sundevall, 1833	6	7
15	Thomisidae sundevall, 1883	5	6
16	Tiatanoecidae Lehtinen, 1967	1	1
17	Uloboridae Thorell, 1869	3	3
18	Zodariidae Thorell, 1881	1	1
	Total	52	75

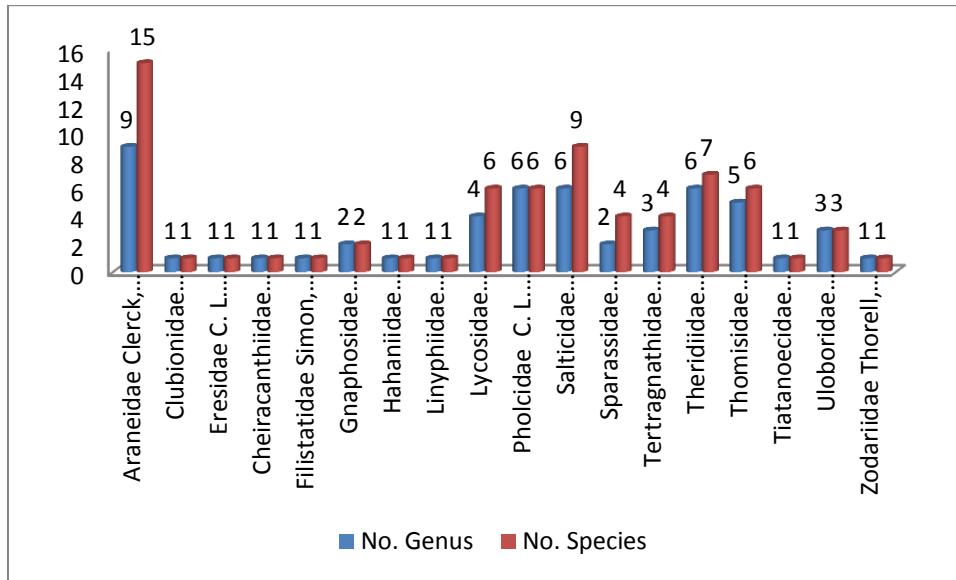


Figure 4: Graphs showing number of species found



Figure 5: Sampling of spiders



Figure 6: Web builder spiders from field



Figure 7: Orb Weaver spider *Neoscona* from field

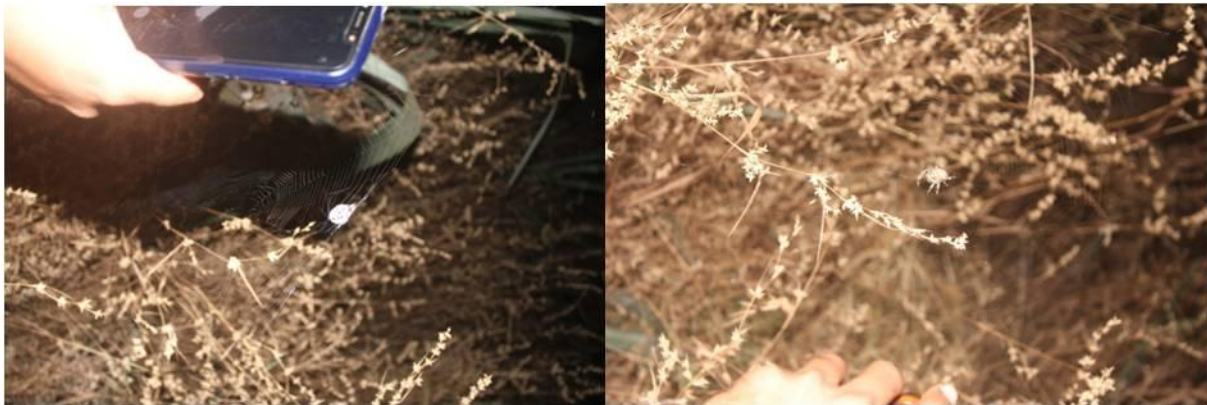


Figure 8: Field images of some minute spiders