



Exploring the Spider fauna of Gomarda Wildlife Sanctuary, Chhattisgarh, India

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Abstract

The aim of the current survey was to explore the spider fauna of Gomarda Wildlife Sanctuary, with geographical location 21°25'36.41" N 83° 9'46.92" E, spreads over an area of 277. 82 sq. km. located about 12 km. away from Sarangarh, Raigarh district of Chhattisgarh, India. This survey was the first approach to prepare checklist of GWS. 120 species representing 49 genera under 16 families, 16 specimens were identified till genera. Families indicating excessive member of species are Thomisidae (24 species under 9 genus) followed by Araneidae (22 species under 8 genus), while family Gnaphosidae indicates highest number of genera (10 genera). The least diversity of species was recorded in Agelenidae, Clubionidae, Eresidae, Filistatidae, Hersiliidae, Nephilidae, Uloboridae.

Keyword: Spider, Gomarda Wildlife Sanctuary, Raigarh, Araneae, Chhattisgarh.

Introduction

Uniqueness attracts attention; spiders are eye-catching because of their fascinating biology. Spider represents class Arachnida under Phylum Arthropoda. The member of class Arachnida were commonly characterized by two body sections, the cephalothorax having 8 segmented legs and the abdomen, absence of chewing mouthparts, antennae and wings. Spiders are also inimitable as they possess spinneret which produces silk but several of them can't whirl the web, they may use the silk to construct sac, nest and mostly to envelop the prey. They participate in the food chain by regulating the population of insects. Furthermore, Spiders are a vital food source for some animals such as amphibians, birds, small reptiles etc. Globally 44906 described species of spiders were catalogued¹. Sebastian and Peter documented 1520 species of spiders representing 377 genera under 60 families². Keshwani *et. al.* catalogued 1685 species of spiders represent 438 genera under 60 families from India³.

Gajbe studied spiders from protected areas of central India and illustrated 13 species from Indravati Tiger Reserve, Chhattisgarh⁴. Ramakrishna *et. al.* reported 16 species from Kanha National Park, 27 species from Pench National Park and 29 species from Rani Durgawati Wildlife Sanctuary⁵. Gajbe depicted 32 species of spiders from Panchmarhi Biosphere reserve⁶. Shailendra *et. al.* illustrated 44 species of spiders belongs to 12 families from Rajghat, Barwani (Madhya Pradesh)⁷. Chandra *et. al.* documented 154 species of spiders from Narmada River Basin, Madhya Pradesh⁸. Patil has listed 214 species of spiders belongs to 68 genera and 22 families from state Madhya Pradesh and Chhattisgarh⁹. Sachin *et. al.* documented 23 species belongs 12 genera under 7 families from

Rani Veerangana Durgawati wildlife Sanctuary, Damoh¹⁰. Ekka and Kujur documented 118 species of spiders from Ram Jharna, Raigarh district, Chhattisgarh¹¹.

The present study was carried out in Gomarda Wildlife Sanctuary, Chhattisgarh, India. State Government established the Gomarda Wildlife Sanctuary in the year 1972. It is approximately 12 km. away from town Sarangarh, Raigarh district of Chhattisgarh. The GWS covers an area of 277. 82 sq. km. The forest vegetation, in the sampling area is tropical dry deciduous, dominated by *Terminalia tomentosa*, *Shorea robusta*, *Madhuca indica*, *Buchnanian lanzan* etc. The temperature ranges between 29.5 - 49°C in summer and 8 - 25 °C in winter. The state is covered mostly by moist and deciduous forests. The varied climatic, edaphic and geographical conditions of central India have covered the way for establishing its floral wealth¹². Forest vegetation may be an imperative factor for existence of spider fauna.

Materials and Methods

Study Area: The current study was performed from April 2013 to March 2014 at Gomarda Wildlife Sanctuary with Geographical location 21°25'36.41"N 83° 9'46.92"E, spreads over an area of 277. 82 sq. km. The temperature ranges between 29.5 - 49 °C in summer and 8 - 25 °C in winter. The forest vegetation, in the sampling area is tropical dry deciduous, dominated by *Terminalia tomentosa*, *Shorea robusta*, *Madhuca indica*, *Buchnanian lanzan* etc. Forest vegetation may be an imperative factor for existence of spider fauna.

Sample Collection: Sampling protocols for spiders were followed by Sorensen *et. al.* Six methods like Pitfall Trapping,

Sweep Netting, Ground Hand Collection, Aerial hand Collection, Vegetation Beating Litter Sampling were employed as spiders make use of wide variety of niches¹. Unidentified specimens were collected are then transferred to 70% alcohol

for later identification. Identification of collected specimen of spiders were done on basis of the taxonomic keys for Indian spiders explained by Tikader^{14,15}, Sebastian and Peter² and published literature.

Table-1
Identification of collected specimen of spiders

Family	Genus	Species
Agelenidae (Koch,1837)	<i>Tegenaria</i> (Latreille, 1804)	<i>Tegenaria sp.</i>
Araneidae (Simon,1895)	a. <i>Araneus</i> (Clerck,1757)	<i>Araneus mitificus</i> (Simon, 1886)
		<i>Araneus nympa</i> (Simon, 1889)
	b. <i>Argiope</i> (Audouin, 1826)	<i>Argiope aemula</i> (Walckenaer,1842)
		<i>Argiope pulchella</i> (Thorell,1881)
		<i>Argiope sp.</i>
	c. <i>Chorizopes</i> (Cambridge, 1870)	<i>Chorizopes tikaderi</i> (Sharma and Kaur,1974)
	d. <i>Cyclosa</i> (Menge, 1866)	<i>Cyclosa confraga</i> (Thorell,1892)
		<i>Cyclosa insulana</i> (Costa, 1834)
		<i>Cyclosa moonduensis</i> (Tikader,1983)
	e. <i>Cyrtophora</i> (Simon, 1864)	<i>Cyrtophora bidenta</i> (Tikader,1970)
		<i>Cyrtophora jabalpurensis</i> (Gajbe and Gajbe, 1999)
		<i>Cyrtophora sp.</i>
	f. <i>Eriovixia</i> (Archer, 1951)	<i>Eriovixia sp.</i>
	g. <i>Larinia</i> (Simon, 1874)	<i>Larinia bhataratae</i> (Bhandari and Gajbe 2001)
		<i>Larinia emertoni</i> (Gajbe and Gajbe, 2004)
	h. <i>Neoscana</i> (Simon, 1864)	<i>Neoscana bengalensis</i> (Tikader and Bal 1981)
		<i>Neoscana biswasi</i> (Bhandari and Gajbe, 2001)
		<i>Neoscana mukerjei</i> (Tikader, 1980)
		<i>Neoscana nautica</i> (L. Koch, 1875)
		<i>Neoscana pavida</i> (Simon, 1906)
<i>Neoscana sanghi</i> (Gajbe, 2004)		
<i>Neoscana sp.</i>		
Clubionidae (Wagner, 1887)	<i>Clubiona</i> (Latreille, 1804)	<i>Clubiona drassodes</i> (O.P Cambribe, 1874)
Eresidae (Koch, 1851)	<i>Stegodyphus</i> (Simon, 1873)	<i>Stegodyphus sarsinorum</i> (Karsch, 1891)
		<i>Stegodyphus sp.</i>
Filistatidae (Ausserer, 1867)	<i>Pritha</i> (Lehtinen, 1967)	<i>Pritha poonaensis</i> (Tikader, 1963)

Family	Genus	Species
Gnaphosidae (Pocock, 1898)	a. <i>Callilepis</i> (Westring, 1874)	<i>Callilepis lambai</i> (Tikader and Gajbe, 1977)
		<i>Callilepis rukminiae</i> (Tikader and Gajbe, 1977)
	b. <i>Drassodes</i> (Westring, 1851)	<i>Drassodes meghalayaensis</i> (Tikader and Gajbe, 1977)
		<i>Drassodes tikaderi</i> (Gajbe, 1987)
	c. <i>Drassyllus</i> (Chamberlin, 1922)	<i>Drassyllus jabalpurensis</i> (Gajbe, 2005)
	d. <i>Gnaphosa</i> (Latreille, 1804)	<i>Gnaphosa jodhpurensis</i> (Tikader and Gajbe, 1977)
		<i>Gnaphosa poonaensis</i> (Tikader, 1973)
	e. <i>Nodocion</i> (Chamberline, 1922)	<i>Nodocion sp.</i>
	f. <i>Poecilochroa</i> (Westring, 1874)	<i>Poecilochroa barmani</i> (Tikader, 1982)
		<i>Poecilochroa tikaderi</i> (Patel, 1989)
	g. <i>Scopoides</i> (Platnick, 1989)	<i>Scopoides maitraiae</i> (Tikader and Gajbe, 1977)
		<i>Scopoides tikaderi</i> (Gajbe, 1987)
	h. <i>Sergiolus</i> (Simon, 1891)	<i>Sergiolus meghalayensis</i> (Tikader and Gajbe, 1976)
		<i>Sergiolus poonaensis</i> (Tikader and Gajbe, 1976)
		<i>Sergiolus singhi</i> (Tikader and Gajbe, 1976)
	i. <i>Sosticus</i> (Chamberline, 1922)	<i>Sosticus jabalpurensis</i> (Bhandari and Gajbe, 2001)
<i>Sosticus sp.</i>		
j. <i>Zelotes</i> (Gistel, 1848)	<i>Zelotes bharaatae</i> (Gajbe, 2005)	
	<i>Zelotes jabalpurensis</i> (Tikader and Gajbe, 1976)	
	<i>Zelotes poonaensis</i> (Tikader and Gajbe, 1976)	
	<i>Zelotes sp.</i>	
Hersilidae (Thorell, 1870)	a. <i>Hersilia</i> Audouin, 1826	<i>Hersilia savignyi</i> (Lucas, 1836)
Lycosidae (Sundevall, 1833)	a. <i>Arctosa</i> (C.L. Koch, 1847)	<i>Arctosa himalayensis</i> (Tikader and Malhotra, 1980)
		<i>Arctosa indica</i> (Tikader and Malhotra, 1980)
	b. <i>Hippasa</i> (Simon, 1885)	<i>Hippasa agelenoides</i> (Simon 1884)
		<i>Hippasa greenalliae</i> (Blackwall, 1867)
	c. <i>Lycosa</i> (Latreille, 1804)	<i>Lycosa bistrata</i> (Gravely, 1924)
		<i>Lycosa jagdalpurensis</i> (Gajbe, 2004)
		<i>Lycosa poonaensis</i> (Tikader and Malhotra, 1980)
		<i>Lycosa shaktae</i> (Bhandari and Gajbe, 2001)
	d. <i>Pardosa</i> (C.L. Koch, 1847)	<i>Pardosa amkhasensis</i> (Tikader and Malhotra, 1976)
		<i>Pardosa birmanica</i> (Simon, 1884)
		<i>Pardosa jabalpurensis</i> (Gajbe and Gajbe, 1999)
		<i>Pardosa mukundi</i> (Tikader and Malhotra, 1980)
		<i>Pardosa timidula</i> (Roewer, 1951)

Family	Genus	Species	
Nephilidae (Simon, 1984)	a. <i>Nephila</i> (Leach, 1815)	<i>Nephila clavata</i> (L.Koch, 1878)	
		<i>Nephila pilipes</i> (Fabricius, 1793)	
Oxyopidae (Thorell, 1870)	a. <i>Oxyopes</i> (Latreille, 1804)	<i>Oxyopes ashae</i> (Gajbe, 1999)	
		<i>Oxyopes bharatae</i> (Gajbe, 1999)	
		<i>Oxyopes jabalpurensis</i> (Gajbe and Gajbe, 1999)	
		<i>Oxyopes naliniae</i> (Gajbe, 1999)	
		<i>Oxyopes pankaji</i> (Gajbe and Gajbe, 2001)	
		<i>Oxyopes rukminiae</i> (Gajbe, 1999)	
		<i>Oxyopes sp.</i>	
	b. <i>Peucetia</i> (Thorell, 1869)	<i>Peucetia jabalpurensis</i> (Gajbe and Gajbe, 1999)	
		<i>Peucetia pawani</i> (Gajbe, 1999)	
		<i>Peucetia yogeshi</i> (Gajbe, 1999)	
	Philodromidae (Thorell, 1870)	a. <i>Philodromus</i> (Walckenaer, 1826)	<i>Philodromus ashae</i> (Gajbe and Gajbe, 1999)
			<i>Philodromus barmani</i> (Tikader, 1980)
<i>Philodromus bhagirathai</i> (Tikader, 1966)			
<i>Philodromus domesticus</i> (Tikader 1962)			
<i>Philodromus jabalpurensis</i> (Gajbe and Gajbe 1999)			
<i>Philodromus pali</i> (Gajbe and Gajbe , 2001)			
b. <i>Thanatus</i> (C.L. Koch, 1837)		<i>Thanatus jabalpurensis</i> (Gajbe and Gajbe, 1999)	
		<i>Thanatus ketani</i> (Bhandari and Gajbe)	
c. <i>Tibellus</i> (Simon, 1875)		<i>Tibellus jabalpurensis</i> (Gajbe and Gajbe, 1999)	
		<i>Tibellus poonaensis</i> (Tikader, 1962)	
Salticidae (Blackwall, 1841)		a. <i>Phidippus</i> (C.L.Koch, , 1846)	<i>Phidippus bhimrakshiti</i> (Gajbe, 2004)
		b. <i>Plexippus</i> (C.L.Koch, , 1846)	<i>Plexippus paykulli</i> (Audoun, 1826)
	c. <i>Rhene</i> (Thorell, 1859)	<i>Rhene haldanei</i> (Gajbe, 2004)	
		<i>Rhene sp.</i>	
Scytodidae (Blackwall, 1864)	a. <i>Scytodes</i> (Latreille, 1804)	<i>Scytodes alfredi</i> (Gajbe, 2004)	
		<i>Scytodes sp.</i>	
Tetragnathidae (Menge, 1866)	a. <i>Tetragnatha</i> (Latreille, 1804)	<i>Tetragnatha chamberlini</i> (Gajbe, 2004)	
		<i>Tetragnatha geniculata</i> (Krasch, 1891)	
		<i>Tetragnatha vermiformis</i> (Emerton, 1884)	
	b. <i>Leucauge</i> White, 1841	<i>Leucauge decorate</i> (Blackwall, 1864)	
		<i>Leucauge celebesiana</i> (Walckenaer, 1841)	

Family	Genus	Species
Thomisidae (Sundevall, 1833)	a. <i>Misumenoides</i> (Cambridge, 1900)	<i>Misumenoides sp</i>
	b. <i>Monoeses</i> (Thorell, 1869)	<i>Monoeses sp.</i>
	c. <i>Oxytate</i> (Koch, 1878)	<i>Oxytate elongata</i> (Tikader, 1980)
	d. <i>Ozyptila</i> (Simon, 1864)	<i>Ozyptila amkhasensis</i> (Tikader, 1980)
		<i>Ozyptila jabalpurensis</i> (Bhandari and Gajbe, 2001)
	e. <i>Runcinia</i> (Simon, 1875)	<i>Runcinia affinis</i> (Simon, 1897)
		<i>Runcinia khandari</i> (Gajbe, 2004)
		<i>Runcinia yogeshi</i> (Gajbe and Gajbe, 2001)
	f. <i>Synema</i> (Simon, 1864)	<i>Synema decoratum</i> (Tikader, 1960)
		<i>Synema mysorese</i> (Tikader, 1980)
	g. <i>Thomisus</i> (Walckenaer, 1805)	<i>Thomisus bargi</i> (Gajbe, 2004)
		<i>Thomisus danleli</i> (Gajbe 2004)
		<i>Thomisus lobosus</i> (Tikader, 1965)
		<i>Thomisus projectus</i> (Tikader, 1960)
		<i>Thomisus rajani</i> (Bhandari and Gajbe, 2001)
		<i>Thomisus simoni</i> (Gajbe, 2004)
		<i>Thomisus sundari</i> (Gajbe and Gajbe, 2001)
		<i>Thomisus sp. 1</i>
		<i>Thomisus sp. 2</i>
	h. <i>Tmarus</i> (Simon, 1875)	<i>Tmarus jabalpurensis</i> (Gajbe and Gajbe, 1999)
	i. <i>Xysticus</i> (Koch, 1835)	<i>Xysticus jabalpurensis</i> (Gajbe and Gajbe, 1999)
		<i>Xysticus joyantius</i> (Tikader, 1966)
<i>Xysticus kali</i> (Tikader and Biswas, 1974)		
<i>Xysticus sp.</i>		
Uloboridae (Thorell, 1869)	a. <i>Uloborus</i> (Latreille, 1806)	<i>Uloborus donoliui</i> (Tikader, 1969)

Results and Discussion

On illustrating the samples, it is somewhat attention-grabbing to document various types of spiders found flourishing in this small protected area. Vegetation of forest may be an essential factor for existence of spider. Result reveals the presence of 120 species representing 49 genera belonging 16 families, 16 specimens were identified till genera as shown in table no. 1. Families indicating an excessive member of species are Thomisidae (24 species under 9 genus) followed by Araneidae (22 species under 8 genus), while family Gnaphosidae indicates the highest number of genera (10 genera). The least diversity of species was recorded in Agelenidae, Clubionidae, Eresidae, Filistatidae, Hersiliidae, Nephilidae, Uloboridae.

Some members of family Araneidae, Gnaphosidae, Lycosidae, Salticidae and Thomisidae were observed throughout the year.

Ground dwelling spiders were captured in pitfall traps throughout the year, found highest during late April to mid-June. At the same time as the rainy season starts *Neoscana sp.*, *Thomisus sp.* etc. starts appearing.

After the onset of rainy season, diverse seasonal plants start blooming and fascinate a large number of insects; this helps them to find their prey. Throughout this period (Rainy season) highest families of spiders were observed mainly with abundance *Argiope sp.*, *Leucage decorata*, *Hippasa agelenoides*, etc. this examination coincides with observation of Deshmukh and Raut¹⁶. Large orb web weaver *Nephila pilipes* were recorded abundantly during winter. Sheet web builders and some members of family Salticidae were observed throughout the year.

Conclusion

The presence of 120 species of spiders indicates that vegetation may be an essential factor for existence of spider. Investigating the spider fauna from Gomarda Wildlife Sanctuary, Chhattisgarh, India has highlighted the lack of information on the ecology and diversity of most of the arachnid groups, Present data will help in forming the checklist of Araneae fauna of state Chhattisgarh.

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