CHAPTER-III

3. TAXONOMY AND DIVERSITY OF SPIDERS

3.1 Spider Systematic

3.1.1 Classification of spiders

Systematics along with taxonomy helps in classification of diverse groups of organisms and also provides information on relationships among the organisms. There have been about 20 different spider classifications proposed since 1900 but the most accepted classification of spiders from that era was provided by (Pocock, 1900) which includes two suborders (Mesothelae and Opisthothelae) and two infraorders of Opisthothelae (Mygalomorphae and Araneomorphae) based on paraphylatic arrangements. However, recent research on systematics of spiders supports monophyly and cladistic relations for araneae. It is based on modifications in abdominal appendages like spinnerets, silk glands and associated spigots, cheliceral venom glands, tarsi of male pedipalp modified as sperm transfer organ and loss of abdominal segments (Coddington & Herbert, 1991). Three major monophyletic groups of order Araneae were recognized namely, Mesothelae, Mygalomorphae and Araneomorpha (Coddington, 2005). The latter two were placed as infraorder under suborder Opisthothelae based on terminally positioned spinnerets and reduction of external abdominal segmentation.

The suborder Mesothelae comprised of a single family Liphistiidae, with 8 genera and 91 species distributed in China, Japan, Southeast Asia, and Sumatra (Catalog, 2015). These spiders are tube-dwelling that construct rudimentary trap doors and are characterized by having tergite plates on the abdomen and four pairs of spinnerets situated just behind the epigastric furrow (Jocqué & Dippenaar-Schoeman, 2006). The infraorders Mygalomorphae comprise of tarantulas (Theraphosidae), Trap-door spiders (Actinopodidae, Barychelidae, Ctenizidae, Idiopidae, Migidae and Nemesiidae), Purse-web spiders (Atypidae), Funnel web tarantulas (Dipluridae), Funnel web spiders

(Hexathelidae) etc. These spiders are characterized by having chelicerae which moves nearly parallel to each other in vertical position and have two pairs of book lungs.

On the contrary the infraorder Araneomorphae consists of spiders which possess vertical chelicerae which moves opposing each other in horizontal plane and in these spiders the book-lungs are either absent or they have one pair of book-lungs. They are also sometimes referred as "true" spiders and about 90% of the total described species comprise of infraorder Araneomorphae (Foelix, 2011). The araneomorphs are further divided into two groups i.e., cribellate and ecribellate on the bases of presence and absence of cribellum which is formed by reduction and fusion of anterior median spinnerets (Lehtinen, 1967).

3.2 Comprehensive account of spiders from JWLS

The present study revealed the occurrence of 148 species belonging to 90 genera and 29 families of spiders (Table 31). All the scientific names are in accordance with (Catalog, 2015) and wherever the authority name i.e. author and year of publication after scientific name are provided within the brackets e.g. *Araneus mitificus* (Simon, 1886). This indicates that the species was first described in 1886 by Simon under a different generic name (*Epeira*) which has been changed to *Araneus* (Koh & Ming, 2013). General description of each family, genera and species are provided below and these follow the descriptions provided by (Baehr & Baehr, 1993; Jocqué & Dippenaar-Schoeman, 2006; Kraus & Kraus, 1989; Koh & Ming, 2013; Majumder & Tikader, 1991; Tikader, 1982) including field observations.

Family: Araneidae Clerck, 1757 (Orb-Web Spiders)

Araneids are a diverse group of sticky orb-web spiders which occupies wide range of habitats. The size of spiders belonging to this family varies from small to large (3-30 mm). They are characterized by three tarsal claws, ecribellate, eyes arranged in two rows with lateral eyes widely separated from median eyes. Abdomen globose, over hanging the carapace, legs usually with numerous spines. This family is represented by 14 genus and 26 species from the study area (Table 2).

Table 2. Taxonomic characters of the Genus & Species (Family: Araneidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Araneus* Clerck, 1757** Carapace with no horny outgrowths, females with transverse thoracic groove whereas males with longitudinal thoracic groove, median eyes unequal in size forming trapezium, eyes arranged in two rows of eyes both the rows recurved.	***Araneus mitificus* (Simon, 1886)** Carapace slightly convex, lateral eyes situated on tubercles, Abdomen globular, off-white in color, wider than longer, dorsum with kidney shaped black patch, four small oval black patches near spinnerets, greenish ventrally.	Figure 24
2.	***Argiope* Audouin, 1826** Carapace flat, longer than wide, Ocular quad forms trapezium, eyes with two rows, posterior row of eyes strongly procurved, Abdomen usually flat with variable shapes.	***Argiope aemula* (Walckenaer, 1841)** Carapace flat, longer than wide, lateral eyes situated on tubercles, Abdomen oval, longer than wide, dorsum grayish-white with network of black stripes, ventrally blackish-brown with pair of longitudinal stripes reaching till spinnerets.	Figure 25
		***Argiope anasuja* Thorell, 1887** Carapace slightly longer than wide, uniformly clothed with grey hairs, posterior median eyes with black ring, Abdomen pentagonal, slightly longer than wide, Dorsum chalk-white in color, with transverse brown bands and three pairs of sigilla, ventrally dark brown in color with a pair of longitudinal chalk-white patch.	Figure 26
3.	***Chorizopes* O. Pickard-Cambridge, 1870** Carapace broadest anteriorly, cephalic region roundish, thoracic	***Chorizopes sp.*** Carapace reddish-brown in color, eyes in two rows, off-white in color, abdomen brown	Figure 27

Sr. No.	Genus Characters	Species Characters	Figure No.
	region slanting, median eyes forms trapezium at ocular quad, abdomen with few paired or unpaired conical or blunt tubercles	with white patches, dorsum with two paired and one unpaired tubercle towards spinnerets	
4.	***Cyclosa* Menge, 1866** Posterior median eyes very close, nearly touching, carapace provided with U-shaped junction between cephalic and thoracic region	***Cyclosa confraga* (Thorell, 1892)** Carapace light brownish yellow, longer than wide, narrowing in front, legs yellowish, abdomen grayish with chalk white and black patches, elongated with distinct pointed caudal hump and two lateral humps posteriroly	Figure 28
		***Cyclosa hexatuberculata* Tikader, 1982** Carapace yellowish with some blackish patches, longer than wide, legs yellowish with blackish-brown bands, abdomen yellowish-brown with silvery and blackish patches	Figure 29
		***Cyclosa moonduensis* Tikader, 1963** Carapace longer than wide, narrowing in front, thoracic fovea pit like, carapace and legs blackish-brown, abdeomen dark brown, elongated with on biforked caudal hump and two pairs of lateral humps	Figure 30
		***Cyclosa spirifera* Simon, 1889** Carapace brownish yellow with dark brown patches, longer than wide, narrowing in front, legs yellowish with brownish patches and bands, abdomen brownish yellow with silvery and blackish	Figure 31

Sr. No.	Genus Characters	Species Characters	Figure No.
		patches, provided with two median humps	
5.	***Cyrtophora* Simon, 1864** Carapace flat with distinct thoracic groove, abdomen anteriorly very high and provided with atleast on pair of shoulder humps	***Cyrtophora cicatrosa* (Stoliczka, 1869)** Carapace and legs pale yellowish with black patches and stripes, carapace longer than wide, narrow in front, very broad and round posteriorly, abdomen high up anteriorly with two pairs of tubercles	Figure 32
		***Cyrtophora citricola* (Forsskål, 1775)** Carapace and legs brownish with yellowish patches, abdomen grayish with yellow and brown patches, carapace slightly longer than wide, narrowing anteriorly, abdomen with one pair of shoulder humps	Figure 33
6.	***Eriovixia* Archer, 1951** Clothed with pubescence hairs	***Eriovixia excelsa* (Simon, 1889)** Carapace slightly longer than wide, narrowing in front, legs brown, abdomen blackish-brown, slightly wider than long, globular	Figure 34
		***Eriovixia laglaizei* (Simon, 1877)** Carapace longer than wide, yellowish, narrowing in front, legs yellowish, abdomen posteriorly cone shaped, yellowish grey with chalk white patches	Figure 35
		***Eriovixia poonaensis* (Tikader & Bal, 1981)** Carapce slightly longer than	Figure 36

Sr. No.	Genus Characters	Species Characters	Figure No.
		wide, yellowish, narrowing in front, legs yellowish, abdomen nearly pentangular in shape, yellowish-grey with chalk white patches and dark brown lines	
7.	***Gasteracantha* Sundevall, 1833** Spinnerets situated on an elevated circular space surrounded by thick flange in the form of ring, abdomen hard flattened dorsally and provided with conical hunps and spines	***Gasteracantha kuhli* C. L. Koch, 1837** Carapace and legs yellowish-brown, abdomen blackish-brown, Carapace slightly longer than wide, abdomen roughly octagonal, wider than long with black, yellow and chalk white pattern, horney tubercles in front of spinnerets	Figure 37
8.	***Gea* C. L. Koch, 1843** Eyes of anterior row evenly spaced or medians closer to laterals than to each other, tibia I of male curved and bearing strong spines	***Gea subarmata* Thorell, 1890** Carapace longer than wide, narrow in front, light brown, legs yellowish-brown, abdomen pentagonal, grayish with chalk white spots, having one pair of small humps anteriorly on dorsum	Figure 38
9.	***Larinia* Simon, 1874** Abdomen a little pointed mid-longitudinally over the carapace and no caudal projection, ventral side of abdomen with a white median longitudinal band framed by black color	***Larinia chloris* (Audouin, 1826)** Carapace brownish-yellow, nearly one and half times longer than wide, legs yellowish, abdeomen grayish brown, nearly twice as long as wide	Figure 39
10.	***Lipocrea* Thorell, 1878** Carapace long, ocular quad froming trapexium, abdomen a little pointed mid-longitudinally over the carapace and no caudal projection	***Lipocrea fusiformis* (Thorell, 1877)** Carapace brownish-orange, nearly one and half times longer than wide, legs yellowish-brown, abdeomen grayish brown, nearly twice as long as wide	Figure 40

Sr. No.	Genus Characters	Species Characters	Figure No.
11.	***Neoscona* Simon, 1864** Thoracic groove longitudinal, epigyne with unwrinkled scape and provided with one or two lateral lobes	***Neoscona mukerjei* Tikader, 1980** Carapace longer than wide, yellowish, legs yellowish in color,abdomen sub-triangular, slightly longer than wide, dorsum with club shaped grayish white patch	Figure 41
		***Neoscona nautica* (L. Koch, 1875)** Carapace longer than wide, blackish-brown in color, legs brown with black bands, abdomen nearly triangular, posterior narrow, clothed with pubescence hairs	Figure 42
		***Neoscona theisi* (Walckenaer, 1841)** Carapace longer than wide, yellowish-brown, legs yellowish-brown, abdomen sub-oval, longer than wide, dorsum with chalk white mid-longitudinal band with lateral projections	Figure 43
		***Neoscona vigilans* (Blackwall, 1865)** Carapace longer than wide, reddish-brown in color, legs long, slender, reddish brown in color, abdomen sub-triangular with three pairs of sigilla, reddish brown tapering towards spinnerets	Figure 44
12.	***Poltys* C. L. Koch, 1843** Ocular quad situated on a distinct projection from the cephalic	***Poltys bhabanii* (Tikader, 1970)** Carapace slightly longer than	Figure 45

Sr. No.	Genus Characters	Species Characters	Figure No.
	region, lateral eyes widely separated from each other	wide, deep brown, cephalic region prominent with elevated conical and anteriorly projecting ocular region, legs dark brown, abdomen large spherical, blackish with irregular tubercles	
		***Poltys columnaris* Thorell, 1890** Carapace longer than wide, yellow in color, eyes situated on tubercles, thoracic groove brown and sharp, abdomen dark brown in color, tall, dorsum with row of shiny maculae present just anterior to spinnerets, ventrum dark grey in color	Figure 46
		***Poltys nagpurensis* Tikader, 1982** Carapace slightly longer than wide, dark brown, cephalic region prominent with elevated conical and anteriorly projecting ocular region, legs and abdomen yellowish, abdomen large, high up anteriorly with small and large irregular tubercles	Figure 47
13.	***Singa* C. L. Koch, 1836** Carapace darker,abdeomen oval with prominent dorsal and lateral white spots, legs short and slender	***Singa sp.*** Carapace longer than wide, cephalic region darker, abdomen oval chalk white with balck markings legs short, reddish-brown in color	Figure 48
14.	***Thelacantha* Hasselt, 1882** abdomen hard flattened dorsally and provided with conical humps and lateral spines, spinnerets situated on an elevated circular space surrounded by thick flange	***Thelacantha brevispina* (Doleschall, 1857)** Carapace slightly longer than wide, reddish brown, legs reddish-brown, abdomen roughly octagonal with	Figure 49

Sr. No.	Genus Characters	Species Characters	Figure No.
	in the form of ring,	yellowish-white patches and prominent tubercles and spines	

Family: Clubionidae Wagner, 1887 (Sac Spiders)

Clubionids are free-living, nocturnal hunting spiders. They are commonly found in sac-like retreats on foliage during day time. These spiders are of small to medium size, characterized by having two tarsal claws with dense claw tufts, ecribellate. Clubionid have eight eyes which are arranged in two rows stretching to the lateral edge of the carapace. There is a presence of distinct thoracic groove on the carapace in all clubionid spiders. This family is represented by one genus and 4 species from the JWLS (Table 3).

Table 3. Taxonomic characters of the Genus & Species (Family: Clubionidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Clubiona* Latreille, 1804** Carapace usually long, narrow in front and broader posteriorly, Cephalic groove short, Eyes in two rows, anterior medians closer to each other, posterior row procurved or straight with medians not too closer to each other, Abdomen elongate or ovoid, uniformly clothed with white or pale yellow pubescence	***Clubiona drassodes* O. Pickard-Cambridge, 1874** Carapace yellowish-brown, longer than wide with prominent cephalic groove, Ocular area darker, eyes similar in size arranged in two rows, legs yellowish brown in color, abdomen elongated, dorsum light brown with pattern of yellowish-brownish inverted V markings in posterior half of abdomen	Figure 50
		***Clubiona filicata* O. Pickard-Cambridge, 1874** Carapace yellowish-white in color, longer than wide, fovea situated in the median half of carapace, eyes in two rows,	Figure 51

Sr. No.	Genus Characters	Species Characters	Figure No.
		almost of same size, white in color except anterior medians, anterior row slightly recurved, posterior row slightly procurved, abdomen yellowish-white in color, longer than wide, pointed behind, dorsum with brown dots	
		***Clubiona foliata* Keswani & Vankhede, 2014** Carapace oval, convex with longitudinal fovea, reddish brown in color towards cephalic region, eight eyes in two rows, anterior row of eyes slightly recurved whereas posterior row of eyes procurved, abdomen yellowish white, oval in shape, tapering towards spinnerets, dorsum with brown colored patches	Figure 52
		***Clubiona pashabhaii* Patel & Patel, 1973** Carapace yellow to yellowish-brown in color, longer than wide with a prominent cephalic groove, eyes in two rows, anterior row straight whereas posterior row slightly procurved, abdomen longer than wide, dorsum with brown patches, posterior pair of spinnerets longer than other pairs	Figure 53

Family: Corinnidae Karsch, 1880 (Armoured Sac Spiders)

Spiders belonging to family Corinnidae are mostly small to medium sized and are frequently encountered in leaf-litter in forest areas. These are ecribellate spiders with two tarsal claws. The cephalothorax is typically hardened (sclerotized) and the abdomen may

be covered partially by scuta. Some species of this family are found to mimic ants or mutillid wasps. Only one genus and one species of this family were found in the study area (Table 4).

Table 4. Taxonomic characters of the Genus & Species (Family: Corinnidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Castianeira* Keyserling, 1879** Carapace elongated, ovoid with median cephalic groove, eight eyes arrangedin two rows, anterior eyes slightly recurved, posterior row distinctly procurved, abdomen elongated, ovoid, slender with transverse bands	***Castianeira zetes* Simon, 1897** Carapace brown, longer than wide, convex and broader anteriorly, eyes pearly white, similar in size, abdomen brown in color with grey transverse bands, longer than wide, three pairs of sigilla, scutum just above the median half of dorsum	Figure 54

Family: Ctenidae Keyserling, 1877 (Wandering Spiders)

Ctenids are nocturnal, wandering spiders, which prefer to hunt their prey on foliage or on the soil surface, rarely higher up. Members of this family look superficially looks like wolf spiders. But can be separated from wolf spiders by their eye arrangement. The eyes are arranged in three rows: two small eyes in front, a pair of tiny anterior lateral eyes and a large pair of posterior median eyes in the middle and a pair of large posterior lateral eyes behind. Unlike wolf spiders, these spiders have only two claws at the tip of each leg. Only one genus and one species are represented from the study area (Table 5).

Table 5. Taxonomic characters of the Genus & Species (Family: Ctenidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Ctenus* Walckenaer, 1805** Carapace oblong to oval, eyes in three rows, all rows recurved,	***Ctenus narashinhai* Patel & Reddy, 1988** Carapace longer than wide,	Figure 55

Sr. No.	Genus Characters	Species Characters	Figure No.
	retromargin of chelicerae with four or sometimes five teeths, tarsi with two claws, trochanter of leg notched ventrally	reddish brown in color with prominent cephalic groove, ocular areae darker, abdomen brown in color, longer than wide, legs yellowish-brown in color	

Family: Eresidae C. L. Koch, 1845 (Velvet Spiders)

Spiders belonging to this family lives in variety of habitats. They construct retreat webs and are found on grounds in burrows or on plants. Three species of *Stegodyphus* are social. These are cribellate spiders, characterized by presence of three tarsal claws, eight eyes, body usually clothed with dense layer of short plumose setae, median eyes situated closed together, with lateral eyes widely separated. In JWLS, this family is represented by only one genus and two species (Table 6).

Table 6. Taxonomic characters of the Genus & Species (Family: Eresidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Stegodyphus* Simon, 1873** Carapace wider in front, round, high, light brown to reddish brown in color, uniformly covered with grey hairs, eight eyes arranged in three rows, posterior lateral eyes far apart from rest of the eyes, abdomen oval with pair of longitudinal white bands lined with brown borders, cribellum well developed	***Stegodyphus pacificus* Pocock, 1900** Carapace reddish-brown, clothed with grey hairs, anterior row slightly procurved, posterior median eyes slightly larger than anterior median eyes, abdomen yellowish-brown with 3 pair of sigilla, legs short, stout and dark brown in color	Figure 56
		***Stegodyphus sarasinorum* Karsch, 1892** Carapace light brown in color, round, high, wider in front, ocular quad forming trapezium,	Figure 57

Sr. No.	Genus Characters	Species Characters	Figure No.
		legs strong, stout, spiny, abdomen oval, cribellum thick teansverselly divided, abdomen yellowish-brown with three pairs of sigilla	

Family: Eutichuridae Lehtinen, 1967 (Long-Legged Sac Spiders)

These are commonly known as long-legged sac spiders, these can be differentiated form clubionids by presence of cephalic groove, commonly found in folded leaf retreat and they have presence of two tarsal claws, ecribellate spiders with eight eyes, posterior spinnerets two segmented, distal segment longer or short, spigot present only on posterior median spinnerets. This family is represented by only one genus and five species from JWLS (Table 7).

Table 7. Taxonomic characters of the Genus & Species (Family: Eutichuridae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Cheiracanthium* C. L. Koch, 1839** Carapace yellowish to brownish in color without cephalic groove, anterior part narrow, posterior half broadest, eyes almost similar in size, arranged in two rows, abdomen smooth, longer than wide, with or without markings, posterior pair of spinnerets much longer than other pairs of spinnerets	***Cheiracanthium inornatum* O. Pickard-Cambridge, 1874** Carapace longer than wide, yellowish-brown, cephalic region slightly convex prominent fovea, eyes pearly white, anterior row slightly recurved, posterior row procurved, abdomen oval in shape, longer than wide, pale yellow in color	Figure 58
		***Cheiracanthium melanostomum* (Thorell, 1895)** Carapace yellowish,anterior part narrow, broadest posterior half, eyes pearly white, anterior row	Figure 59

Sr. No.	Genus Characters	Species Characters	Figure No.
		of eyes recurved, posterior row slightly procurved, abdomen yellowish, longer than wide, ventrum pale yellow without any markings, posterior pair of spinnerets comparatively longer	
		***Cheiracanthium triviale* (Thorell, 1895)** Carapace longer than wide, light yellowish-brown in color, cephalic region slightly elevated, eyes black, anterior row slightly recurved, legs long, slender, abdomen longer than wide, tapering in both ends, dorsum without any markings	Figure 60
		***Cheiracanthium sp.* 1** Carapace longer than wide, yellowish-white in color with small cephalic groove, Abdomen longer than wide, tapering at both the ends, yellowish white in color, spinnerets prominent	Figure 61
		***Cheiracanthium sp.* 2** Carapace longer than wide, brownish-yellow, cephalic region with fovea, eyes black, anterior row slightly recurved, posterior row procurved, abdomen oval in shape, longer than wide, pale yellow in color	Figure 62

Family: Gnaphosidae Pocock, 1898 (Flat-bellied Ground Spiders)

Gnaphosids are free-living spiders, mostly found on soil surface but some are foliage dwellers, living in rolled life retreats. These ecribellate spiders are characterized by

presence of two tarsal claws. Their anterior spinnerets are well separated and characteristically tubular, not conical as in other spider families. The posterior median eyes of Gnaphosids are typically oval and not round. This family is represented by six genus and seven species from the study area (Table 8).

Table 8. Taxonomic characters of the Genus & Species (Family: Gnaphosidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Drassodes* Westring, 1851** Mediaum to large spiders with tawny light grayish colored abdomen, trochanter notched ventrally, males lack dorsal scutum	***Drassodes sp.*** Carapace light brown in color, longer than wide, abdomen grey in color, longer than wide, legs yellowish brown	Figure 63
2.	***Haplodrassus* Chamberlin, 1922** Mediaum to large sized spiders, light brownish in color, possess smooth trochanters, males lack dorsal scutum	***Haplodrassus sp.*** Carapace longer than wide, preiphery darker in color, abdomen light brown with pattern	Figure 64
3.	***Megamyrmaekion* Reuss, 1834** Abdomen plain grayish brown in color, males with short narrow tapering scutum dorsally	***Megamyrmaekion ashae* Tikader & Gajbe, 1977** Carapace reddish-brown, longer than wide with prominent cephalic groove, abdomen plain grey in color, longer than wide, legs light brown in color	Figure 65
4.	***Scopoides* Platnick, 1989** Abdomen generally plain-colored, grey or tawny or brownish occasionally with darker chevrons posteriorly, males possess a dorsal scutum	***Scopoides kuljitae* (Tikader, 1982)** Carapace yellowish-brown in color, longer than wide, narrow at the ocular area, eyes arranged in two rows, anterior row strongly recurved and posterior row procurved, abdomen plain grey in color	Figure 66
		Scopoides sp. Carapace narrower in front	Figure 67

Sr. No.	Genus Characters	Species Characters	Figure No.
		broadest in middle, yellow in color, abdomen grey in color, longer than wide	
5.	***Trachyzelotes* Lohmander, 1944** Small to medium sized spiders, uniform grey or brownish in color, metatarsai of leg III & IV with preening comb distally	***Trachyzelotes jaxartensis* (Kroneberg, 1875)** Carapace longer than wide, narrower ocular area, eyes arranged in two rows, abdomen longer than wide, grey in color, legs reddish-brown in color	Figure 68
6.	***Zelotes* Gistel, 1848** Small to medium-sized spiders which posses preening combs distally on metatarsai III & IV	***Zelotes mandae* Tikader & Gajbe, 1979** Carapace longer than wide, widest in the middle, prominent cephalic groove, legs light brown in color, abdomen longer than wide, light grey in color	Figure 69

Family: Hersiliidae Thorell, 1870 (Two-Tailed Spiders)

Hersiliidae have diverse lifestyles, ranging from wandering tree-trunk-dwellers to ground-dwelling web builders. Spiders belonging to this family are ecribellate and have three tarsal claws. These spiders have two of the posterior lateral spinnerets disproportionately long and pointed and hence are named as "Two-Tailed Spiders". The head region is elevated above the rest of the cephalothorax and eyes are placed on large tubercle. The body is compressed and legs are exceedingly long. This family is represented by two genus and three species in the study area (Table 9).

Table 9. Taxonomic characters of the Genus & Species (Family: Hersiliidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Hersilia* Audouin, 1826**	***Hersilia aadi* Pravalikha, Srinivasulu & Srinivasulu,**	Figure 70

Sr. No.	Genus Characters	Species Characters	Figure No.
	Carapace almost circular, eyes on strongly raised area, anterior median eyes much larger than other pair of eyes, andomen longer than wide, oval, widest in middle, legs elonagate, first pair of legs comaparatively longer, posterior lateral spinnerets very long, much longer than the abdomen	**2014** Carapace dark brown, dark laterally with longitudinal fovea, eyes small with lateral eyes situated on tubercle, legs pale yellow with dark brown bands, abdomen pale yellow with dark mid-longitudinal band, ventrum mottled white	
		***Hersilia savignyi* Lucas, 1836** Carapace dark yellowish-brown, lateral broders indistinctly darker, eye area darker, anterior median eyes with dark spot, abdomen light yellowish-brown, elongated and ventrum lighter mottled white in color	Figure 71
3.	***Murricia* Simon, 1882** Carapace wider than long sometimes almost round, lateral eyes placed on distinct eye tubercles, three pairs of dorsal muscular pits where third pair is transverse, abdomen shape varies form subtriangular to subquadrate, ventrum with or without white patches	***Murricia hyderabadensis* Javed & Tampal, 2010** Carapace rounded, wider than long, eyes small, lateral eyes situated on tubercle, abdomen wider than long, widest posteriorly, dorsum with five pairs of dorsal median pits, all dissimilar in size, ventral side with uniform white patches	Figure 72

Family: Liocranidae Simon, 1897 (Liocranid Spiders)

Liocranids are exclusively ground-dwelling spiders inhabiting forest litter; some genera are associated with ants and termites. Spiders belonging to this family are ecribellate with the presence of two tarsal claws, eight eyes which are sometimes reduced, females with posterior median spinnerets flattered, male palp with media apophysis. Only one genus and one species are represented from JWLS (Table 10).

Table 10. Taxonomic characters of the Genus & Species (Family: Liocranidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Oedignatha* Thorell, 1881** Carapace oblong, broader in front with short cephalic groove, eight eyes arranged in two rows, almost equal in size, anterior row slightly recurved, posterior row slightly procurved, abdomen oblong, dorsum with sclerotized dorsal shield or sometimes with dorsal scutum	***Oedignatha sp.*** Carapace longer than wide, brown in color, prominent cephalic groove, eight eyes covering almost two third of front area, abdomen with dorsal scletorized scutum covering epigastic furrow ventrally	Figure 73

Family: Lycosidae Sundevall, 1833 (Wolf Spiders)

Most of the species of spiders belonging to family Lycosidae ground dwelling hunters but some do prefer to live in burrows or make sheet webs provided with a funnel. Females are immediately recognized in the field as they roam around with a spherical egg sac attached to their spinnerets. The newly hatched spiderlings are carried by mother on its back for about a week. These are ecribellate spiders characterized by presence of three tarsal claws. The eyes are in three rows, comprising a front row of four small eyes forming a horizontal line whereas second row of eyes with a pair of median eyes and posterior row of two large eyes each. This family is represented by four genus and seven species from study area (Table 11).

Table 11. Taxonomic characters of the Genus & Species (Family: Lycosidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Evippa* Simon, 1882** Anterior portion of carapace abruptly elevated, anterior row of eyes procurved, tibia I provided with six pairs of ventral spines,	***Evippa sp.* 1** Carapace longer than wide, light brown with black longitudinal lines, ocular area black, legs thick, slender, abdomen oval,	Figure 74

Sr. No.	Genus Characters	Species Characters	Figure No.
	clypeus vertical, labium wider than long	light brown in color	
		***Evippa sp.* 2** Carapace longer than wide, dark brown in color with black markings, legs thick, brown in color with spines, abdomen oval light brown in color	Figure 75
2.	***Hippasa* Simon, 1885** Spiders belonging to this genus differ from Lycosa by having posterior spinnerets comparatively longer than the anterior spinnerets, anterior row of eyes little wider than the second row of eyes	***Hippasa lycosina* Pocock, 1900** Carapace longer than wide, narrow anteriorly, prominent cephalic groove off-white in color, abdomen elongated, grey in color, tapering towards spinnerets, pattern of off-white color on dorsum	Figure 76
3.	***Lycosa* Latreille, 1804** Carapace long, eyes arranged in two rows, four posterior eyes large and arranged in a quadrangle, clypeus not vertical, labium longer than wide	***Lycosa poonaensis* Tikader & Malhotra, 1980** Carapace longer than wide, prominent cephalic groove, abdomen oval in shape, light brown in color, legs clothed with grayish-brown hairs	Figure 77
		Lycosa sp. Carapace elongated, black laterally, presence of median broad band of yellow color continuing till spinnerets, second and third pair of leg tips brown in color rest black in color	Figure 78
4.	***Pardosa* C. L. Koch, 1847** Cephalic region elevated, clypeus vertical, chelicerae much smaller, eyes in two rows, tibia I provided with three pairs of vetral spines,	***Pardosa birmanica* Simon, 1884** Carapace oval, longer than wide, blackish-brown in color, legs brown in color with bands of black color, abdomen oval,	Figure 79

Sr. No.	Genus Characters	Species Characters	Figure No.
	legs relatively long and thin	brown in color	
		***Pardosa sumatrana* (Thorell, 1890)** Carapace longer than wide with two prominent longitudinal balck bands, abdomen oval as long as wide, legs long and slender, brown in color	Figure 80

Family: Oecobiidae Blackwall, 1862 (Dwarf Round-Headed Spiders)

These are tiny spiders with cribellum and calamistrum and make small star-shaped mesh webs over crevices on rocks and walls. They are fast runners and feeds mostly on ants. They are characterized by having three tarsal claws, carapace sub-circular with eyes grouped around a central cluster. The anus has a large tubercle with a fringe of long curved hairs which is the unique feature only found in this family. Only one genus and one species are represented from study site (Table 12).

Table 12. Taxonomic characters of the Genus & Species (Family: Oecobiidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Oecobius* Lucas, 1846** Elevated ocular area, eyes clustered at one place, pointed towards spinnerets, anal tubercle high with a fringe of long curved hairs	***Oecobius putus* O. Pickard-Cambridge, 1876** Carapace sub-circular with front slightly pointed, abdomen pale, oval in shape, legs lighter with dark patches	Figure 81

Family: Oonopidae Simon, 1890 (Dwarf Hunting Spiders)

Oonopids are tiny, nocturnal, ground dwelling spiders, found in variety of habitats ranging from forest floors to deserts. These are ecribellate spiders with two tarsal claws.

They have either six, four or no eyes. Only two genus and two species are represented from JWLS (Table 13).

Table 13. Taxonomic characters of the Genus & Species (Family: Oonopidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Brignolia* Dumitrescu & Georgescu, 1983** Small ground dwelling spiders, Carapace longer than wide, narrow anteriorly covered with eyes, carapace surface may or may not be pitted, abdomen sclerotised dorsally, longer than wide, legs short and robust	***Brignolia sp.*** Carapace reddish-brown, anterior portion narrow, dorsal surface pitted, six eyes with darker medians and pale laterals, abdomen reddish brown, longer than broad, dorsum sclerotised	Figure 82
2.	-	***Unidentified Species* 1** Carapace yellowish-brown, anterior portion narrow, dorsal surface plain, six eyes with darker medians and pale laterals, abdomen yellow with minute black hairs posteriorly, longer than broad, dorsum sclerotised	Figure 83

Family: Oxyopidae Thorell, 1870 (Lynx Spiders)

Lynx spiders are easily recognized by their long legs with nearly erect spines. The eye arrangement is also characteristic: six of the eight eyes form a hexagon. They are usually found running on low shrubs. Spiders belonging to this family are ecribellate with three tarsal claws, clypeus wide, trochanter notched. This family is represented by three genus and 12 species from study site (Table 14).

Table 14. Taxonomic characters of the Genus & Species (Family: Oxyopidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Hamadruas* Deeleman-Reinhold, 2009** Relatively larger spiders as compared to oxyopids, long abdomen, saddle-shaped carapace, mostly found in shades of brown or iridescent green	***Hamadruas sikkimensis* (Tikader, 1970)** Carapace slanting, saddle-shape, brown in color with yellow dots, longer than wide, abdomen longer than wide tapering towards posterior, dark brown in color with scattered yellow dots	Figure 84
2.	***Oxyopes* Latreille, 1804** Inner margin of chelicerae provided with single tooth on each side, eyes in two rows, posterior row of eyes strongly procurved. Color varies from yellow, orange, brown but not green	***Oxyopes ashae* Gajbe, 1999** Carapace longer than wide, reddish-brown in color, cephalic region slightly high with prominent fovea, legs long, strong and clothed with spines, abdomen longer than wide, narrowing behind, dorsum with longitudinal band of reddish-brown color	Figure 85
		***Oxyopes bharatae* Gajbe, 1999** Carapace longer than wide, yellowish-brown in color, cephalic region slightly high with prominent fovea, legs long and clothed with spines, abdomen longer than wide, narrowing behind, reddish-orange in color, dorsum with peculiar pattern	Figure 86
		***Oxyopes birmanicus* Thorell, 1887** Carapace longer than wide, brownish in color, cephalic region slightly high with prominent fovea, legs long and strong clothed with spines, abdomen longer than wide,	Figure 87

Sr. No.	Genus Characters	Species Characters	Figure No.
		narrowing behind, dorsum with peculiar pattern of chalk white lines	
		***Oxyopes pankaji* Gajbe & Gajbe, 2000** Carapace longer than wide, blackish-brown in color, cephalic region slightly high with prominent fovea, legs long and clothed with spines, abdomen longer than wide, narrowing behind, dorsum with peculiar pattern of chalk white and yellow lines	Figure 88
		***Oxyopes sp.* 1** Carapace longer than wide, brown in color, cephalic region slightly high with prominent fovea, legs long, clothed with spines, abdomen longer than wide, narrowing behind, dorsum with pattern of chalk white lines laterally	Figure 89
		***Oxyopes sp.* 2** Carapace longer than wide, yellowish-orange in color, cephalic region slightly high with prominent fovea, legs long, slender, clothed with spines, abdomen longer than wide, narrowing behind, dorsum with peculiar pattern of yellowish-white lines	Figure 90
		***Oxyopes sp.* 3** Carapace longer than wide, brownish-gray in color, cephalic region slightly high with prominent fovea, legs long and	Figure 91

Sr. No.	Genus Characters	Species Characters	Figure No.
		clothed with spines, abdomen longer than wide, narrowing behind, dorsum with peculiar pattern of chalk white and light yellow lines	
3.	***Peucetia* Thorell, 1869** Inner margin of chelicerae without tooth, anterior lateral eye row wider than posterior median eye row, eyes in two rows, posterior row of eyes slightly procurved. Live specimens usually bright green in color	***Peucetia akwadaensis* Patel, 1978** Carapace light green in color with prominent fovea, longer than wide, abdomen longer than wide, tapering towards spinnerets, metallelic green in color, legs reddish-brown with spines	Figure 92
		***Peucetia viridana* (Stoliczka, 1869)** Carapace longer than wide, light green in color with black dots, eyes with two black lines from anterior medians down clypeus towards mandibles, abdomen green with white median stripes, legs long, slender, light green with black dots, ventrally with pink shade, leg joints yellow in color	Figure 93
		***Peucetia yogeshi* Gajbe, 1999** Carapace longer than wide, yellowish-brown in color, ocular area darker, legs yellowish-brown with black dots and spines, abdomen longer than wide, tapering posteriorly, green in color with chalk white pattern	Figure 94
		Peucetia sp. Carapace longer than wide, light green in color with black dots, abdomen green with pair of	Figure 95

Sr. No.	Genus Characters	Species Characters	Figure No.
		chalk white median stripes, legs long, slender, light green with black dots and spines, leg joints yellow in color	

Family: Palpimanidae Thorell, 1870 (Palp-Footed Spiders)

Palpimanids are free-living ground dwelling spiders known to feed on other tiny spiders in their habitat. These are small to medium sized spiders with two or three tarsal claws and have presence of six to eight eyes. They are ecribellate spiders characterized by enlarged and strong first pair of legs as compared to other pairs of legs with prolateral scopula on distal segments also the numbers of spinnerets is reduced. Only one genus and one species of this family are recorded from the study site (Table 15).

Table 15. Taxonomic characters of the Genus & Species (Family: Palpimanidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	-	***Unidentified Species* 2** Carapace light-red in color, oval in shape. Eyes eight, arranged in two rows, first row strongly procurved and the second slightly recurved. Abdomen oval, light brown, with a ventral scutum covering the epigastric area	Figure 96

Family: Philodromidae Thorell, 1870 (Elongated Crab Spiders)

Philodromids are small to medium sized crab-like spiders. Their body is dorsoventrally flattered, covered with soft hairs pressed to the surface. Spiders belonging to this family are ecribellate, with eight eyes, two tarsal claws and legs laterigrade with second pair of

legs typically longer than other legs, chelicerae lack teeth and secondary eyes lack a tapetum. This family is represented by only one genus and one species from the study site (Table 16).

Table 16. Taxonomic characters of the Genus & Species (Family: Philodromidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Tibellus* Simon, 1875** Carapace flat, broad and longer than wide, anterior row of eyes together with posterior medians forms hexagonal shape, abdomen slightly blunt, long, cylindrical or cigar shaped, tapering towards spinnerets	***Tibellus elongatus* Tikader, 1960** Carapace yellowish with dark mid-dorsal band, two rows of eyes, both the rows recurved, abdomen yellowish with two black spots on posterior half and a median dorsal band	Figure 97

Family: Pholcidae C. L. Koch, 1850 (Daddy-Long-Leg Spiders)

Pholcids constructs sheet or space webs and are found in a wide variety of habitats but frequently in dark and damp places such as caves, under stones and fallen logs. These ecribellate spiders are very small to medium in size with three tarsal claws. They have presence of six to eight eyes, where eight eyes are present; the anterior median pair is small, while the rest are set in two groups of three or "triads". The chelicerae are fused at the base. Eggs are held together by a few strands of silk and carried by the mother between its chelicerae. It is represented by two genus and three species from the study site (Table 17).

Table 17. Taxonomic characters of the Genus & Species (Family: Pholcidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Crossopriza* Simon, 1893** Carapace circular, yellow with brown median stripe, cephalic	***Crossopriza lyoni* (Blackwall, 1867)** Carapace wider than long,	Figure 98

Sr. No.	Genus Characters	Species Characters	Figure No.
	egion slightly raised, six pairs of eyes, abdomen short, ovate, yellowish-brown with dark patches	grayish-white in color, three pairs of eyes located at the tip of carapace, abdomen grayish-off-white in color, a small projection at the upper posterior end of abdomen	
2.	***Pholcus* Walckenaer, 1805** Carapace slightly longer than wide and circular, three pairs of eyes arranged in two triads, abdomen cyclindrical or sausage-shaped, legs extremely long and thin	***Pholcus fragillimus* Strand, 1907** Carapace pale yellow with brown median band, no thoracic groove, ocular area elevated, abdomen pale grey and ventrally with brown genital area, very indistinct	Figure 99
		***Pholcus phalangioides* (Fuesslin, 1775)** Carapace yellowish-brown to grey in color, males with chelicerae having teeths on the anterior margin, legs long and slender, abdomen oval to cyclindrical, two to three times longer than wide	Figure 100

Family: Pisauridae Simon, 1890 (Nursery Web Spiders)

Nursery web spiders are medium to large sized hunting spiders often associated with moist or aquatic habitat, on plants or on ground. They can stay afloat on water surface with the help of densely spaced fine hairs on their legs. They are ecribellate spiders having three tarsal claws. The eyes are arranged in three rows: four eyes in the front are unequal in size but form a straight line; the two posterior median eyes are closer to each other (forms second row of eyes) as compare to the distance between the posterior lateral eyes (in third row). The females carry their spherical egg sac under the chelicerae, sometimes further secured with a thread from the spinnerets. The egg sac is eventually enclosed in a three- dimensional web called the Nursery web, in which the spiderlings

will hatch. Some species do make permanent tangled webs. This family is represented by four genus and four species in the study area (Table 18).

Table 18. Taxonomic characters of the Genus & Species (Family: Pisauridae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Hygropoda* Thorell, 1894** Carapace grey to brown in color, three pairs of spinnerets, posterior lateral and median spinnerets with cylindrical gland spigots, legs I, II and III with long flexible tarsi	***Hygropoda mahendriensis* Vankhede, Keswani & Rajoria, 2013** Carapace longer than wide, brown in color with white vertically radiating bands, eyes in two rows, anterior row of eyes slightly recurved, posterior row highly recurved, legs brownish, slender, tarsi flexible, abdomen longer than wide, brown in color, tapering towards spinnerets	Figure 101
2.	***Nilus* O. Pickard-Cambridge, 1876** Carapace greenish-brown or dark brown, eyes in three rows, anterior row of eyes stringly recurved, anterior medians larger than posterior medians, abdomen tapering towards spinnerets	***Nilus phipsoni* (F. O. Pickard-Cambridge, 1898)** Carapace slightly longer than wide, greenish-brown in color with two longitudinal lateral white bands which continues till spinnerets, abdomen longer than wide tapering posteriorly, dorsum with five pairs of white dots, legs greenish to brown, long and slender	Figure 102
3.	***Perenethis* L. Koch, 1878** Carapace and abdomen with distinct continuous longitudinal bands, eyes in two rows, anterior row of eyes distinctly procurved, posterior row strongly recurved, tibia of legs with short vebtral spines at diatal ends	***Perenethis venusta* L. Koch, 1878** Carapace longer than broad, anterior end narrower, broadest posteriorly, presence of longitudinal deep fovea, eyes in two rows, anterior row of eyes procurved, posterior row slightly recurved, abdomen elongated, longer than broad, slightly	Figure 103

Sr. No.	Genus Characters	Species Characters	Figure No.
		narrowing towards spinnerets	
4.	***Pisaura* Simon, 1885** Carapace yellowish or brown, chelicerae with three or four retromarginal teeths, eyes arranged in two row, anterior row of eyes slightly recurved, posterior median eyes usually larger than anterior median eyes, carapace and abdomen with longitudinal narrow white stripes	***Pisaura podilensis* Patel & Reddy, 1990** Carapace longer than wide, narrow in front, yellowish to deep brown in color, cephalic region slightly high, eyes in two rows, anterior row slightly procurved, posterior row slightly recurved, legs brownish-green, abdomen yellowish to deep brown, longer than wide, ventrum pale in color	Figure 104

Family: Prodidomidae Simon, 1884 (Long-spinneret Ground Spiders)

Prodidomids are nocturnal, ground- dwelling spiders. These are very small to medium-sized araneomorph spiders, with two tarsal claws, ecribellate, eight eyes, the anterior spinnerets are farther forward than in typical Gnaphosids. Only one genus and one species of this family were found in the study area (Table 19).

Table 19. Taxonomic characters of the Genus & Species (Family: Prodidomidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Prodidomus* Hentz, 1847** Carapace longer than wide, reddish or brown in color, eyes arranged in two rows, sometimes eyes in circular arrangement, posterior row strongly recurved, anterior median eyes black, legs pinkish or reddish brown in color, abdomen elobgated, oval, broad blakish brown in color	***Prodidomus sp.*** Carapace oval, flat, reddish brown in color with thin black longitudinal strations, eyes arranged in circular pattern, posterior row of eyes strongly recurved, abdomen oval, dark brown in color, legs thick pinkish-brown in color	Figure 105

Family: Salticidae Blackwall, 1841 (Jumping Spiders)

Salticids are diurnal, cursorial hunting spiders and occur in a wide variety of habitats. They are ecribellate spiders with two tarsal claws. Their carapace is square in front with eyes arranged in three rows: two pairs in front with anterior median eyes being larger in size as compared to other pairs of eyes forming first row of eyes, a pair of usually tiny ones in the middle, another pair further back. This eye arrangement allows them to see almost 360 fields of vision. This family is represented by 14 genus and 18 species from the study site (Table 20).

Table 20. Taxonomic characters of the Genus & Species (Family: Salticidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Epocilla* Thorell, 1887** Slender body with brownish-orange color, longitudinal brown bands may be present on abdomen	***Epocilla sp.*** Carapace longer than wide, cephalic region elevated, body with brownish-orange color, longitudinal brown bands, abdomen slender	Figure 106
2.	***Harmochirus* Simon, 1885** Carapace laterally pooled outwards, cephalic part high, abdomen small, circular or oval, scutum sclerotized and shiny, fringe of hairs present on patella and tibia of leg	***Harmochirus brachiatus* (Thorell, 1877)** Carapace broadest and elevated at the cephalic region, slanting posteriorly, abdomen shiny brown, oval in shape	Figure 107
3.	***Hasarius* Simon, 1871** Dull brown colored salticids, carapace thick, flat, sloping to the margins, abdomen broad, oval, rounded in front and tapering towards spinnerets	***Hasarius adansoni* (Audouin, 1826)** Carapace longer than wide, blackish-brown in color with lateral white bands, abdomen broad at base, blunt towards tip, dorsum with two pairs of white dots and anterior with white band	Figure 108
4.	***Hyllus* C. L. Koch, 1846** Carapace swollen spherical,	***Hyllus semicupreus* (Simon, 1885)**	Figure 109

Sr. No.	Genus Characters	Species Characters	Figure No.
	abdomen broad at base, blunt towards tip, body and legs with thick covering of hairs	Carapace longer than wide, brownish-yellow in color, abdomen broad at base, blunt towards tip, body and legs with thick covering of hairs	
5.	***Marpissa* C. L. Koch, 1846**	***Marpissa tigrina* Tikader, 1965** Carapace longer than wide, reddish in color, cephalic region slighty elevated, abdomen oval, tapering towards spinnerets, dorsum with pattern of red color	Figure 110
		Marpissa sp. Carapace longer than wide, balck in color, cephalic region slighty elevated, abdomen oval, tapering towards spinnerets, dorsum with two dots and pattern of cream, black and brown color	Figure 111
6.	***Menemerus* Simon, 1868** Mediaum size salticids with flat carapace, legs short, moderately thick, abdomen broad tapering towards spinnerets	***Menemerus bivittatus* (Dufour, 1831)** Carapace longer than broad, dull brown with black markings, abdomen broad at base tapering towards spinnerets, dull brown in color with black dots and patches	Figure 112
7.	***Myrmarachne* MacLeay, 1839** These are ant-mimic spiders, carapace elongated, roughly rectangular, abdomen elongated oval or spherical, legs slender with long segements	***Myrmarachne tristis* (Simon, 1882)** Carapace longer than wide, widest at the cephalic region, abdomen oval, bilobed, anterior lobe smaller, yellowish-brown in color with prominent spinnerets	Figure 113

Sr. No.	Genus Characters	Species Characters	Figure No.
		***Myrmarachne sp.* 1** Carapace longer than wide, widest at the cephalic region, abdomen oval, yellowish-brown in color with prominent spinnerets	Figure 114
		***Myrmarachne sp.* 2** Carapace longer than wide, widest at the cephalic region, abdomen oval, anterior half orange in color whereas posterior half black in color	Figure 115
8.	***Phintella* Strand, in Bösenberg & Strand, 1906** Small spiders usually with iridescent color pattern, comparatively longer first leg, chelicerae slender with long fangs curved at tip	***Phintella vittata* (C. L. Koch, 1846)** Carapace longer than wide, cephalic region darker, abdomen oval with iridescent color pattern, legs slender	Figure 116
9.	***Plexippus* C. L. Koch, 1846** Carapace longer than wide, ocular quad wider than long, anterior row of eyes recurved, abdomen oval and broadest at the middle	***Plexippus paykulli* (Audouin, 1826)** Carapace longer than wide, broadest in the middle, mid-lateral with long black band pattern, abdomen oval, tapering towards spinnerets	Figure 117
		***Plexippus petersi* (Karsch, 1878)** Carapace longer than wide, mid-lateral with long black band pattern, abdomen oval, tapering towards spinnerets, have pattern of black bands	Figure 118
10.	***Portia* Karsch, 1878** Carapace compact with sharp slope, posterior median eyes minute,	***Portia sp.*** Carapace longer than wide, palp with white prominent	Figure 119

Sr. No.	Genus Characters	Species Characters	Figure No.
	abdomen broad in the middle, legs slender	hairs, metatarsus of leg with prominent brush of hairs, legs slender with spines	
11.	***Rhene* Thorell, 1869** Small broad body covered with pubescence, resembles beetles with their attractive colors, head broader than long, abdomen small, with broader base and blunt tip	***Rhene albigera* (C. L. Koch, 1846)** Carapace broader with black median patch and white laterally, abdomen elongated with black markings, legs black, first pair of legs robust	Figure 120
12.	***Stenaelurillus* Simon, 1886** Carapace longer than wide, with two lateral white stripes, abdomen oval tapering posteriorly, dorsum with a pair of white dots, legs slender and stout	***Stenaelurillus sp.*** Carapace longer than wide, blackish-brown with two lateral white stripes, abdomen oval tapering posteriorly, dorsum blackish-brown with a pair of white dots	Figure 121
13.	***Telamonia* Thorell, 1887** Carapace large, swollen, slender, and elongated, abdomen pointed, legs long, stout and hairy with spines	***Telamonia dimidiata* (Simon, 1899)** Males with orange stripes on body alternating with white stripes, females lighter in color	Figure 122
14.	***Thyene* Simon, 1885** Carapace and abdomen uniformly clothed with hairs, carapace broader at cephalic region, abdomen circular anteriorly and pointed towards spinnerets	***Thyene imperialis* (Rossi, 1846)** Carapace longer than wide, broadest anteriorly, silvey white with orange markings near eyes, abdomen longer than wide, dorum pattern of black, grey and orange color	Figure 123

Family: Scytodidae Blackwall, 1864 (Spitting Spiders)

Spiders belonging to family Scytodidae are commonly known as spitting spiders as they immobilize their prey by spraying jets of sticky glue-venom mixture through their fangs.

This glue is produced by large prosomal glands inside the cephalothorax, which has a characteristic plum shape. Hunting takes place outside the nest. After squirting glue, the spider moves forward to the prey, eats away the glue lines that affix it. Wraps the prey with silk and carries it back to the nest to consume the meal. Some foliage-dwelling spitting spiders build a nest around the leaf with strongly adhesive silk. Eggs are carried around by the mother under the palps, spiderlings are sometimes fed by the mother with capture food. These are slow moving, medium sized, nocturnal, ecribellate spiders with six eyes. Only one genus and four species of this family are found in JWLS (Table 21).

Table 21. Taxonomic characters of the Genus & Species (Family: Scytodidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Scytodes* Latreille, 1804** Carapace high, subglobose behind and sloping forward, six eyes, anterior row strongly recurved, abdomen globose with or without pattern	***Scytodes fusca* Walckenaer, 1837** Carapace balck, abruptly slanting towards posterior margins, abdomen blackish, ovoid to subglobular, uniformly clothed with small hairs	Figure 124
		***Scytodes pallida* Doleschall, 1859** Carapace reddish-yellow with brown longitudinal lines, abdomen yellowish, ovoid to subglobular, with brown transverse patches, uniformly clothed with small hairs	Figure 125
		***Scytodes thoracica* (Latreille, 1802)** Carapace reddish-brown with dark patches, abdomen creamish-white, ovoid to subglobular, with brown patches, uniformly clothed with small hairs	Figure 126
		Scytodes sp.	Figure 127

Sr. No.	Genus Characters	Species Characters	Figure No.
		Carapace light cream color with dark patches, abdomen creamish-yellow, ovoid to subglobular, with brown patches, uniformly clothed with small hairs	

Family: Sicariidae Keyserling, 1880 (Violin Spiders)

Family Sicariidae comprise of ground dwelling and wandering spiders. They are mainly medium to large in size with two tarsal claws, ecribellate and have presence of six eyes in three diads. Only one genus and one species of this family were found in the study area (Table 22).

Table 22. Taxonomic characters of the Genus & Species (Family: Sicariidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Loxosceles* Heineken & Lowe, 1832** Carapace flat, longer than wide, sometimes with violin shaped pattern, six eyes are present, anterior median eyes are missing, abdomen oval, legs long and slender	***Loxosceles rufescens* (Dufour, 1820)** Carapace flat, reddish-brown with cephalic area darker and elevated, abdomen oval, yellowish-brown in color, legs long, slender and yellowish in color	Figure 128

Family: Sparassidae Bertkau, 1872 (Huntsman Spiders)

These are nocturnal, wandering spiders found on plants, soil surface or in caves. They have "laterigrade" legs i.e., the legs are spread outward from the body. The entire length of the legs is twisted or rotated so that the prolateral side is turned upwards taking a dorsal position. These allow the spiders to move sideways like crab. Eyes are arranged in two rows. Many species in this family are large and can reach upto 40 mm in length.

They are ecribellate, with two tarsal claws. This family is represented by two genus and seven species from the study area (Table 23).

Table 23. Taxonomic characters of the Genus & Species (Family: Sparassidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Heteropoda* Latreille, 1804** Carapace nearly as long as wide, upper surface flat, cephalic part slightly depressed, posterior row of eyes recurved, abdomen dorsoventrally flatten, elongated and oval	***Heteropoda bhaikakai* Patel & Patel, 1973** Carapace as long as wide, narrowing anteriorly, brown in color, abdomen elliptical, dark brown patches, two pair of sigilla on dorsum, legs long, slender, brown with black dots	Figure 129
		***Heteropoda venatoria* (Linnaeus, 1767)** Carapace as long as wide, narrowing anteriorly, brown in color, abdomen elongated with two pair of sigilla on dorsum, legs long, slender, brown with black patches	Figure 130
2.	***Olios* Walckenaer, 1837** Carapace distinctly high and convex, prominent cephalic groove, anterior row of eyes straight, posterior row slightly procurved, abdomen elongated oval with or without pattern	***Olios bhavnagarensis* Sethi & Tikader, 1988** Carapace as long as wide, broadest in middle, abdomen provided with mid longitudinal brown streak like marking on dorsum, chelicerae with three teeth on inner margin	Figure 131
		***Olios gravelyi* Sethi & Tikader, 1988** Carapace as long as wide, elevated cephalic region, yellowish-brown in color, labium without any lateral notch, abdomen elongated oval, yellowish-brown in color	Figure 132

Sr. No.	Genus Characters	Species Characters	Figure No.
		***Olios milleti* (Pocock, 1901)** Carapace as long as wide, light green in color, abdomen oval in shape, greenish-white in color, chelicerae with six teeth on inner margin	Figure 133
		***Olios wroughtoni* (Simon, 1897)** Carapace as long as wide, broadest in middle, eyes in two rows, abdomen oval, yellowish-brown in color, legs pale brown in color	Figure 134
		Olios sp. Carapace as long as wide, broadest in middle, light brown in color, abdomen oval, reddish-brown with black markings, metatarsus and tarsus of legs dark black in color	Figure 135

Family: Stenochilidae Thorell, 1873 (Diamond Carapace Spiders)

Stenochilids can be recognized instantly by their diamond shaped carapace and are extremely rare spiders. The surface of the carapace is typically granulated. On the underside, the labium is fused with the sternum. Leg I and II are robust and are armed ventrally with dense scopulae of stiff hairs. These spiders are free roaming and build no prey trapping webs. This family is represented by one genus and one species in the study area (Table 24).

Table 24. Taxonomic characters of the Genus & Species (Family: Stenochilidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Stenochilus* O. Pickard-Cambridge, 1870** Carapace longer than wide, diamond shaped having laterally undulating margins, dorsal surface of coxae rough but without distinct tubercles, abdomen longer than wide, oval in shape	***Stenochilus hobsoni* O. Pickard-Cambridge, 1870** Carapace reddish brown in color, broadest in the middle with prominent cephalic groove, eyes arranged in two rows, anterior row of eyes strongly recurved, posterior medians larger and oval in shape, abdomen reddish-brown in color	Figure 136

Family: Tetragnathidae Menge, 1866 (Big-Jawed Spiders)

These are very small to very large araneomorph spiders with three tarsal claws, ecribellate, and eight eyes arranged in two rows. Spiders belonging to this family build delicate Orb- Webs with open hubs. The webs are suspended horizontally or at an inclined plane. This family includes stick like spiders of genus Tetragnatha that are often found near water. The femora of leg IV of Tetragnathids show some fine and long sensory hairs, known as Trichobothria. This family is represented by four genus and eight species from JWLS (Table 25).

Table 25. Taxonomic characters of the Genus & Species (Family: Tetragnathidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Guizygiella* Zhu, Kim & Song, 1997** Cepahlic region of carapace brownish black than light colored thoracic region, eyes in two rows, anterior row of eyes recurved, dorsum of abdomen with distinct	***Guizygiella indica* (Tikader & Bal, 1980)** Carapace reddish-brown with cephalic region darker, longer than wide, abdomen oval with prominent folium, first pair of legs longer than other pairs	Figure 137

Sr. No.	Genus Characters	Species Characters	Figure No.
	folium	***Guizygiella melanocrania* (Thorell, 1887)** Carapace , longer than wide, reddish-brown with cephalic region darker, abdomen oval with lighter folium, first & second pair of legs longer than other pairs	Figure 138
		***Guizygiella shivui* (Patel & Reddy, 1990)** Carapace reddish-brown with cephalic region darker, longer than wide, abdomen oval with prominent dark brown folium, first pair of legs longer than other pairs	Figure 139
2.	***Leucauge* White, 1841** Carapace truncated anteriorly, prominent thoracic groove, leg femora IV with double fringe of hairs on prolateral surface, abdomen with silvery pigmentation	***Leucauge decorata* (Blackwall, 1864)** Carapace longer than wide, light green in color, abdomen nearly twice as long as wide, dirty green with chalk white to silvery strips, narrow towards spinnerets	Figure 140
3.	***Tetragnatha* Latreille, 1804** Carapace twice as long as wide, chelicerae exceptionally long with many teeth, abdomen twig like, elongated, legs long, slender and streatched along longitudinal length while resting	***Tetragnatha extensa* (Linnaeus, 1758)** Carapace reddish-brown, twice as long as wide, chelicerae prominently long with dentation, abdomen long twig like, reddish-brown in color, legs long, slender, brown in color	Figure 141
		***Tetragnatha mandibulata* Walckenaer, 1841** Carapace reddish-brown, twice as long as wide, chelicerae prominently long with dentation,	Figure 142

Sr. No.	Genus Characters	Species Characters	Figure No.
		abdomen long twig like, yellowish-brown in color, legs long, slender, brown in color	
		***Tetragnatha maxillosa* Thorell, 1895** Carapace reddish-brown, twice as long as wide, chelicerae prominently long with dentation, abdomen long twig like, greenish-brown in color, legs long, slender, blackish-brown in color	Figure 143
4.	***Tylorida* Simon, 1894** Carapace with ocular area elevated, eyes in two rows, abdomen stout, bluntly pointed at the posterior end	***Tylorida ventralis* (Thorell, 1877)** Carapace longer than wide, light brown in color, abdomen brownish with some silvery or light colored speckles, legs long, slender light brown in color, streatched along longitudinal length while resting	Figure 144

Family: Theridiidae Sundevall, 1833 (Comb-Footed Spiders)

This family comprises of small to medium- sized spiders, they are known to construct irregular space webs, also known as Cob- Webs or Gum- Foot- Webs with threads radiating in different directions and with a suspended leaf retreat. Other do not build any web at all, or just make single- lined or simple H- Shaped snares. Most of the members of this family have a “comb” of serrated bristles on tarsi IV. This comb helps to draw sticky threads of silk from the spinnerets to wrap any prey caught in the web. This family is represented by 10 genus and 11 species from the study area (Table 26).

Table 26. Taxonomic characters of the Genus & Species (Family: Theridiidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Argyrodes* Simon, 1864** Carapace of males with eyes and clypeus usually swollen,projecting forward, chelicerae with one or several teeths on anterior margin, abdomen higher than long, large colulus usually with only two seate	***Argyrodes argentatus* O. Pickard-Cambridge, 1880** Carapace longer than wide, black, abdomen higher than long with silver patches alternating with black patches, legs slender blackish-brown in color	Figure 145
2.	***Cephalobares* O. Pickard-Cambridge, 1870** Anterior part of carapace enormously swollen, chelicerae small, abdomen longer than wide extends beyond spinnerets with two posterior tubercles, no colulus present	***Cephalobares globiceps* O. Pickard-Cambridge, 1870** Carapace with cephalic region abruptly elevated, reddish-brown in color, abdomen longer than wide with two posterior tubercles, legs slender yellowish-brown with brown bands	Figure 146
3.	***Coleosoma* O. Pickard-Cambridge, 1882** Males oval with prohecting clypeus, chelicerae small, leg I longest, male abdomen with sclerotized ring, no colulus present	***Coleosoma blandum* O. Pickard-Cambridge, 1882** Carapace oval, longer than wide, eyes in two rows, abdomen longer than wide, blackish brown in color, with sclerotized ring near pedicle	Figure 147
4.	***Euryopis* Menge, 1868** Carapace variable in shapes, posterior median eyes more apart, chelicerae small, abdomen usually triangular, pointed behind, colulus absent or replace by small setae	***Euryopis sp.*** Carapace black with cephalic region elevated, abdomen triangular, pointed behind, dorsum silver with black patches	Figure 148
5.	**Latrodectus Walckenaer, 1805** Carapace longer than wide, chelicerae toothless; fourth tarsi bear tarsal combs, abdomen tapering towards spinnerets	***Latrodectus hasseltii* Thorell, 1870** Carapace longer than wide, black in color, abdomen globular, black with red median patch starting mid-dorsum till	Figure 149

Sr. No.	Genus Characters	Species Characters	Figure No.
		spinnerets, legs slender black in color	
6.	***Meotipa* Simon, 1894** Carapace longer than wide, abdomen as high as long, triangular in shape, legs with leaf like setae on metatarsus segment	***Meotipa picturata* Simon, 1895** Carapace longer than wide, yellowish in color, abdomen as high as long, triangular in shape, yellowish with chalk white dots	Figure 150
7.	***Parasteatoda* Archer, 1946** Carapace longer than wide with cephalic area elevated, abdomen globose with or without pattern, legs slender, spinnerets and chelicerae small	***Parasteatoda mundula* (L. Koch, 1872)** Carapace longer than wide with cephalic area elevated, brown in color, abdomen globose, reddish-brown in color with black and chalk white pattern	Figure 151
8.	***Rhomphaea* L. Koch, 1872** Carapace flat, longer than wide, palp with flattened tips, abdomen as high as long forming triangular shape, legs slender	***Rhomphaea projiciens* O. Pickard-Cambridge, 1896** Carapace flat, longer than wide, blackish-brown in color, abdomen as high as long forming triangular shape, tip of triangle with on setae, legs slender and brown in color	Figure 152
9.	***Steatoda* Sundevall, 1833** Carapace longer than wide with prominent cephalic groove, ocular area darker, abdomen globose, legs slender, with first pair longest	***Steatoda sp.* 1** Carapace longer than wide with prominent cephalic groove, reddish-brown in color, ocular area darker, abdomen globose, blackish brown in color with stripes of chalk white color	Figure 153
		***Steatoda sp.* 2** Carapace longer than wide with prominent cephalic groove, black in color, eyes silvery white, abdomen globose, black in color with single stripe of chalk white color on anterior	Figure 154

Sr. No.	Genus Characters	Species Characters	Figure No.
		dorsum	
10.	***Yaginumena* Yoshida, 2002** Small spider with darker body, uniformly covered with hairs, Carapace as long as wide with cephalic area elevated abruptly, abdomen globose, entire body sclerotized, legs slender	***Yaginumena maculosa* (Yoshida & Ono, 2000)** Carapace as long as wide with cephalic area elevated abruptly, abdomen globose, dark blackish-brown in color, entire body sclerotized, legs pale yellow and slender	Figure 155

Family: Thomisidae Sundevall, 1833 (Crab Spiders)

The spiders belonging to this family are ecribellate, with two tarsal claws, eight eyes, legs are laterigrade with I and II usually longer than III and IV, lateral eyes usually on tubercles. These are wandering spiders found mainly on foliage. This family is represented by five genus and seven species from the study area (Table 27).

Table 27. Taxonomic characters of the Genus & Species (Family: Thomisidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Amyciaea* Simon, 1885** Ant-like spiders, clypeus area elevated, abdomen as long as broad	***Amyciaea forticeps* (O. Pickard-Cambridge, 1873)** Carapace longer than wide, reddish-brown in color, abdomen rectangular in shape, longer than wide, reddish-brown in color, with two black dots at posterior cornes of abdomen	Figure 156
2.	***Camaricus* Thorell, 1887** Body not clothed with setae, cephalic region as wide as thoracic region	***Camaricus sp.*** Carapace darker as long as broad, cephalic region slightly elevated, abdomen with uniformly covered with spines, and have chalk white colored	Figure 157

Sr. No.	Genus Characters	Species Characters	Figure No.
		pattern on dorsum	
3.	***Indoxysticus* Benjamin & Jaleel, 2010** Body covered with conspicuous spines, anterior median eyes closer to lateral eyes than to each other	***Indoxysticus minutus* (Tikader, 1960)** Carapace as broad as long, darker laterally, abdomen with unform spines and black patches, legs yellowish-white stout	Figure 158
4.	***Runcinia* Simon, 1875** Lateral eyes on strong conical protuberance, abdomen long, lateral side with longitudinal mucular striations	***Runcinia sp.*** Carapace longer than wide, reddish-brown in color, abdomen long, pointed near spinnerets, legs with prominent spines	Figure 159
5.	***Thomisus* Walckenaer, 1805** Lateral eyes on strong conical protuberance, abdomen widened and truncated behind	***Thomisus sp.* 1** Carapace longer than wide, with brown longitudinal lateral markings, abdomen with pair of mid-lateral tubercals with black dots, legs stout with brown bands on metatarsus	Figure 160
		***Thomisus sp.* 2** Carapace longer than wide, with dark brown longitudinal lateral markings, abdomen with pair of mid-lateral tubercals with horizontal brown line, legs stout with darker tips	Figure 161
		***Thomisus sp.* 3** Carapace longer than wide, greenish-white in color, abdomen with pair of mid-lateral tubercals with black dots, legs stout with uneven black dots	Figure 162

Family: Titanoecidae Lehtinen, 1967 (Titanoecid Spiders)

Spiders belonging to this family are small to medium in size with three tarsal claws, cribellate, eight eyes, calamistrum long, uniseriate. These are ground dwelling spiders, which makes flimsy webs under stones or cribellate space-webs. Only one genus and one species are represented from JWLS (Table 28).

Table 28. Taxonomic characters of the Genus & Species (Family: Titanoecidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Pandava* Lehtinen, 1967** Carapace with cephalic area high and thoracic groove reduced, eyes round, abdomen oval, Cribellum divided, as broad as spinneret area, distally curved setae present on femur, tibia and metatarsus of leg in some males	***Pandava laminata* (Thorell, 1878)** Carapace longer than wide, brown in color with cephalic region dark brown, eyes arranged in two rows with posterior lateral eyes being largest, abdomen longer than wide, yellowish brown in color	Figure 163

Family: Uloboridae Thorell, 1869 (Uloborid Spiders)

Uloborid spiders have a cigar-shaped plate known as the “Cribellum” on the underside of the abdomen in front of the spinnerets. The upper margin of the metatarsus of the fourth leg is armed with a row of strongly curved setae known as “Calamistrum”. With the combined action of cribellum and calamistrum the bluish silk of the Uloborids is produced. The front legs of the Uloborids are extra ordinarily long, often longer than the entire length of the body. Unlike other spiders, Uloborids do not possess venom glands. This family is represented by three genus and six species from the study area (Table 29).

Table 29. Taxonomic characters of the Genus & Species (Family: Uloboridae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Miagrammopes* O. Pickard-Cambridge, 1870** Carapace flat, thin, longer than wide, four eyes in a transverse row, anterior row of eyes absent, abdomen very long and thin, almost tubular, five times as long as wide, entire body appears like a dry twig	***Miagrammopes sp.*** Carapace longer than broad, light brown in color, dorsum flat, smooth with prominent fovea, posterior eyes black, placed equidistant, abdomen brown with grey patches, longer than wide, posterior end truncated, upper part projecting backwards	Figure 164
2.	***Uloborus* Latreille, 1806**	***Uloborus danolius* Tikader, 1969** Carapace longer than wide, uniformly covered with grayish hairs, eyes in two rows, posterior eyes black, first leg longer than rest of the legs, abdomen yellowish-brown, longer than wide, anterior one-third portion bears tuft of hairs forming tubercles	Figure 165
		***Uloborus krishnae* Tikader, 1970** Carapace yellowish-white in color, median and lateral portion whitish, ocular quad longer than wide, legs off-white in color, first pair of legs longer than other pairs, abdomen longer than wide, off-white in color, ventrum with brownish patch, cribellum present	Figure 166
		***Uloborus sp.* 1** Carapace longer than wide, Legs with tuft of hairs at the joints, abdomen with one pair of larger	Figure 167

Sr. No.	Genus Characters	Species Characters	Figure No.
		tubercles covered with hairs and other three pairs of tubercles towards spinnerets	
		***Uloborus sp.* 2** Carapace longer than wide, off-white in color, metatarsus of first pair of legs with yellow colored tuft of hairs, abdomen white with brown patches, midof the abdomen has one pair of tuft of white hairs forming tubercles	Figure 168
3.	***Zosis* Walckenaer, 1841** Commonly known as feathered-legged spiders characterized by having eight eyes arragnged in two rows, posterior row of eyes slightly recurved, cribellum and calamistrum present, sternum undivided	***Zosis geniculata* (Olivier, 1789)** Carapace flat, brown in color clothed with white hairs, legs dark brown with white annulations, this banding pattern on legs is unique charater to this species, abdomen brownish with single much flattened hump which is very light in color	Figure 169

Family: Zodariidae Thorell, 1881 (Ground Ant-Eaters)

Spiders belonging to this family have variations in their abdominal shapes; have three tarsal claws with teeth on paired tarsal claws. These are ant- like, ecribellate, swift-running spiders and lives mainly under stones and among leaf- litter. The anterior lateral spinnerets are more prominent than the remaining spinnerets. Some species feed only on ants and termites. This family is represented by one genus and two species from the study site (Table 30).

Table 30. Taxonomic characters of the Genus & Species (Family: Zodariidae)

Sr. No.	Genus Characters	Species Characters	Figure No.
1.	***Storena* Walckenaer, 1805** Carapace oval, elongate, red or reddish-brown or sometimes black in color, eyes pearly white arranged in three rows, abdomen pale to dark grey with or without three or five pale spots on dorsum, unpaired ones in front of spinnerets	***Storena gujaratensis* Tikader & Patel, 1975** Carapace longer than wide, reddish-brown in color, anterior margin narrow; round and smooth, all three rows of eyes procurved, abdomen longer than wide, darker dorsally, lighter in color ventrally	Figure 170
		Storena sp. Carapace longer than wide, reddish in color, posterior row of eyes strongly procurved, abdomen longer than wide, with paired white patches dorsally	Figure 171

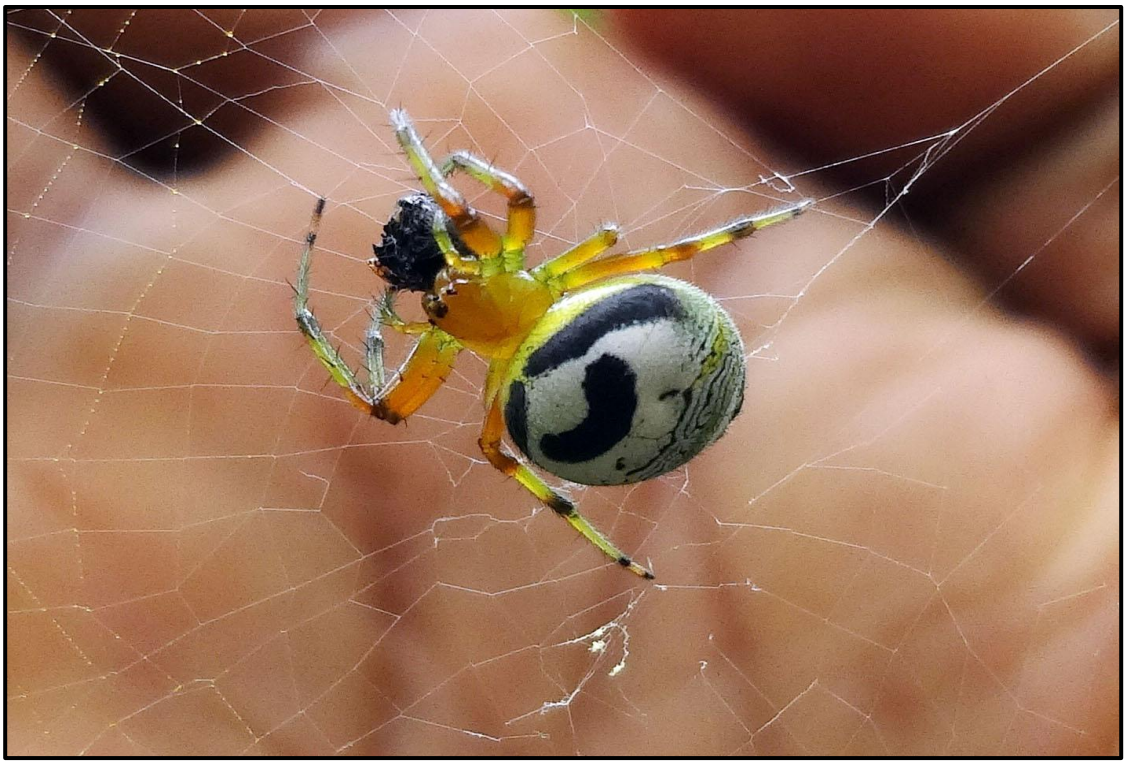


Figure 24. ***Araneus mitificus*** **feeding on Dipteran**

Figure 25. ***Argiope aemula***

Figure 26. ***Argiope anasuja***

Figure 27. ***Chorizopes sp.***

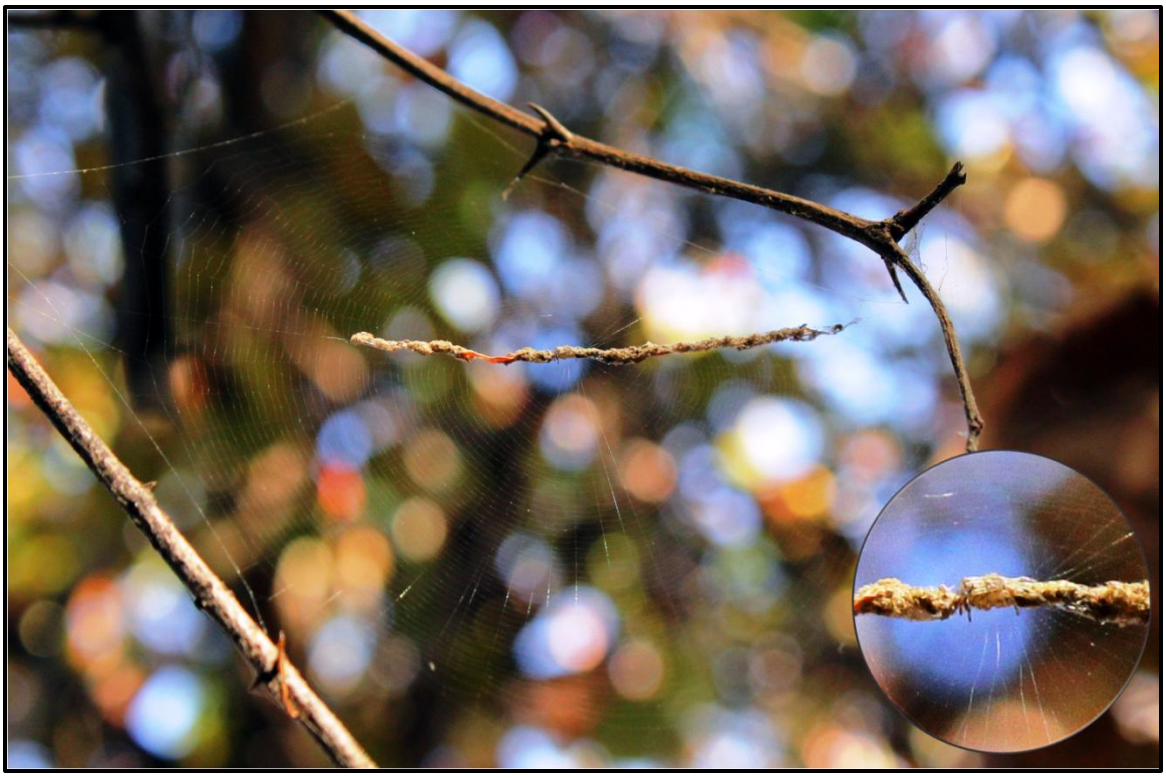


Figure 28. ***Cyclosa confraga*** **on its orb-web**

Figure 29. ***Cyclosa hexatuberculata*** **resting in hub**

Figure 30. ***Cyclosa moonduensis***

Figure 31. ***Cyclosa spirifera***

Figure 32. ***Cyrtophora cicatrosa***

Figure 33. ***Cyrtophora citricola***

Figure 34. ***Eriovixia excelsa***

Figure 35. ***Eriovixia laglaizei***

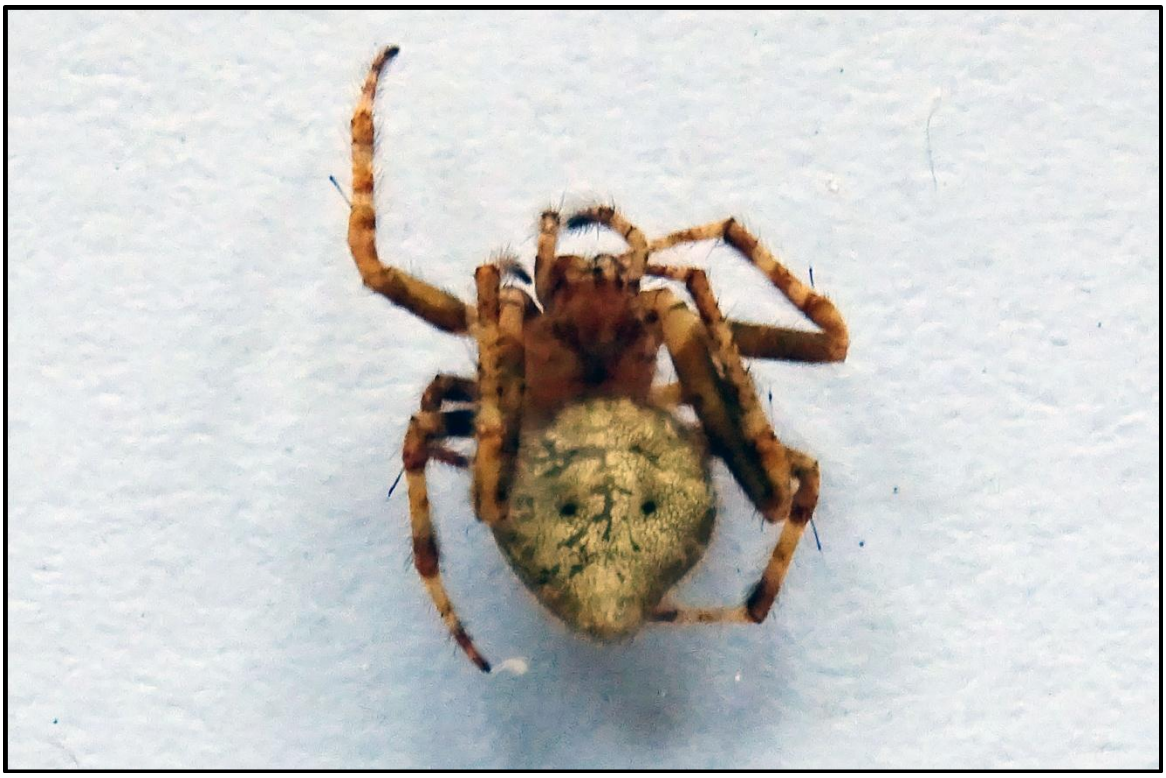


Figure 36. ***Eriovixia poonaensis***

Figure 37. ***Gasteracantha kuhli***

Figure 38. ***Gea subarmata***

Figure 39. ***Larinia chloris***

Figure 40. ***Lipocrea fusiformis***

Figure 41. ***Neoscona mukerjei***

Figure 42. ***Neoscona nautica***

Figure 43. ***Neoscona theisi***

Figure 44. ***Neoscona vigilans***

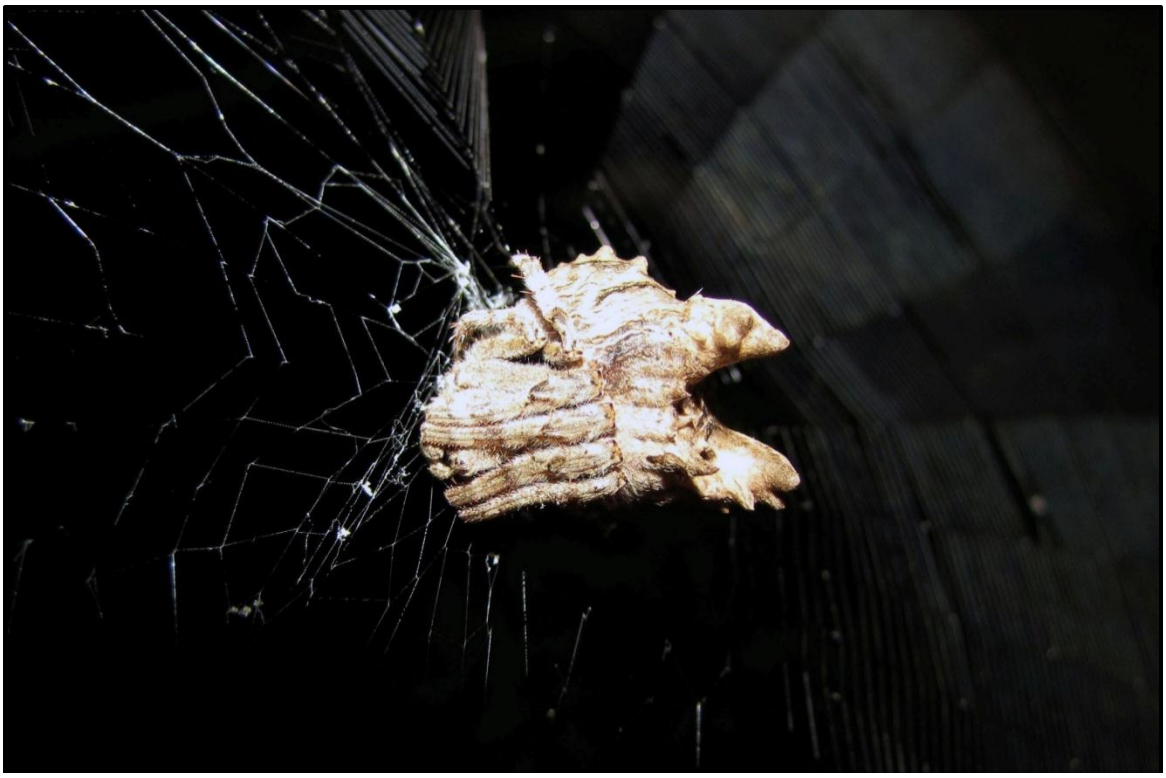


Figure 45. ***Poltys bhabanii***

Figure 46. ***Poltys columnaris***

Figure 47. ***Poltys nagpurensis*** **feeding on Orthoptera**

Figure 48. ***Singa sp.***

Figure 49. ***Thelacantha brevispina***

Figure 50. ***Clubiona drassodes***

Figure 51. ***Clubiona filicata***

Figure 52. ***Clubiona foliata***

Figure 53. ***Clubiona pashabhaii***

Figure 54. ***Castianeira zetes***

Figure 55. ***Ctenus narashinhai***

Figure 56. ***Stegodyphus pacificus***

Figure 57. ***Stegodyphus sarasinorum***

Figure 58. ***Cheiracanthium inornatum***

Figure 59. ***Cheiracanthium melanostomum*** **on is retreat**

Figure 60. ***Cheiracanthium triviale***

Figure 61. ***Cheiracanthium sp. 1***

Figure 62. ***Cheiracanthium sp. 2***

Figure 63. ***Drassodes sp.***

Figure 64. ***Haplodrassus sp.***

Figure 65. ***Megamyrmaekion ashae***

Figure 66. ***Scopoides kuljitae***

Figure 67. ***Scopoides sp.***

Figure 68. ***Trachyzelotes jaxartensis***

Figure 69. ***Zelotes mandae***

Figure 70. ***Hersilia aadi*** **feeding on Orthoptera**

Figure 71. ***Hersilia savignyi***

Figure 72. ***Murricia hyderabadensis***

Figure 73. ***Oedignatha sp.***

Figure 74. ***Evippa sp. 1***

Figure 75. ***Evippa sp. 2***

Figure 76. ***Hippasa lycosina***

Figure 77. ***Lycosa poonaensis*** **with spiderlings on back**

Figure 78. ***Lycosa sp.*** **with its eggsac**

Figure 79. ***Pardosa birmanica***

Figure 80. ***Pardosa sumatrana***

Figure 81. ***Oecobius putus***

Figure 82. ***Brignolia sp.***

Figure 83. ***Unidentified Species 1***

Figure 84. ***Hamadruas sikkimensis*** **guarding the cocoon**

Figure 85. ***Oxyopes ashae***

Figure 86. ***Oxyopes bharatae*** **feeding on Diptera**

Figure 87. ***Oxyopes birmanicus*** **feeding on Diptera**

Figure 88. ***Oxyopes pankaji***

Figure 89. ***Oxyopes sp. 1*** **feeding on spider**

Figure 90. ***Oxyopes sp. 2***

Figure 91. ***Oxyopes sp. 3*** **feeding on Diptera**

Figure 92. ***Peucetia akwadaensis***

Figure 93. ***Peucetia viridana***

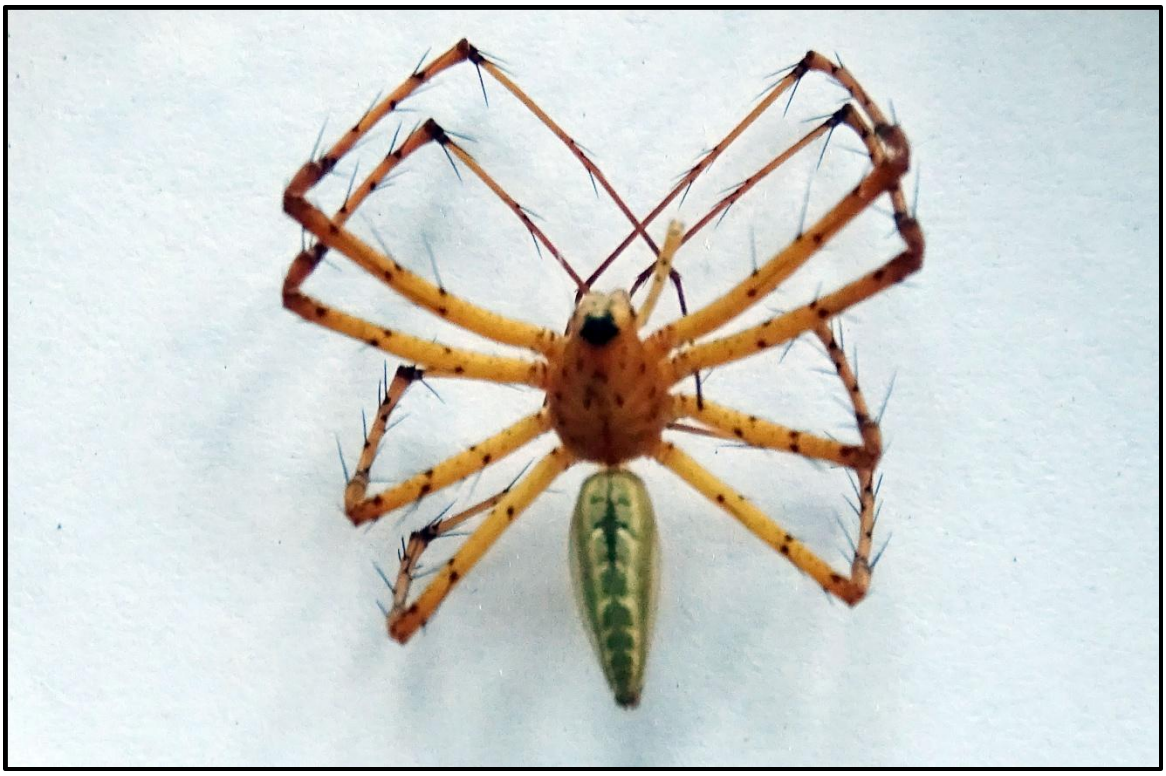


Figure 94. ***Peucetia yogeshi***

Figure 95. ***Peucetia sp.*** **feeding on** ***Leucauge decorata***

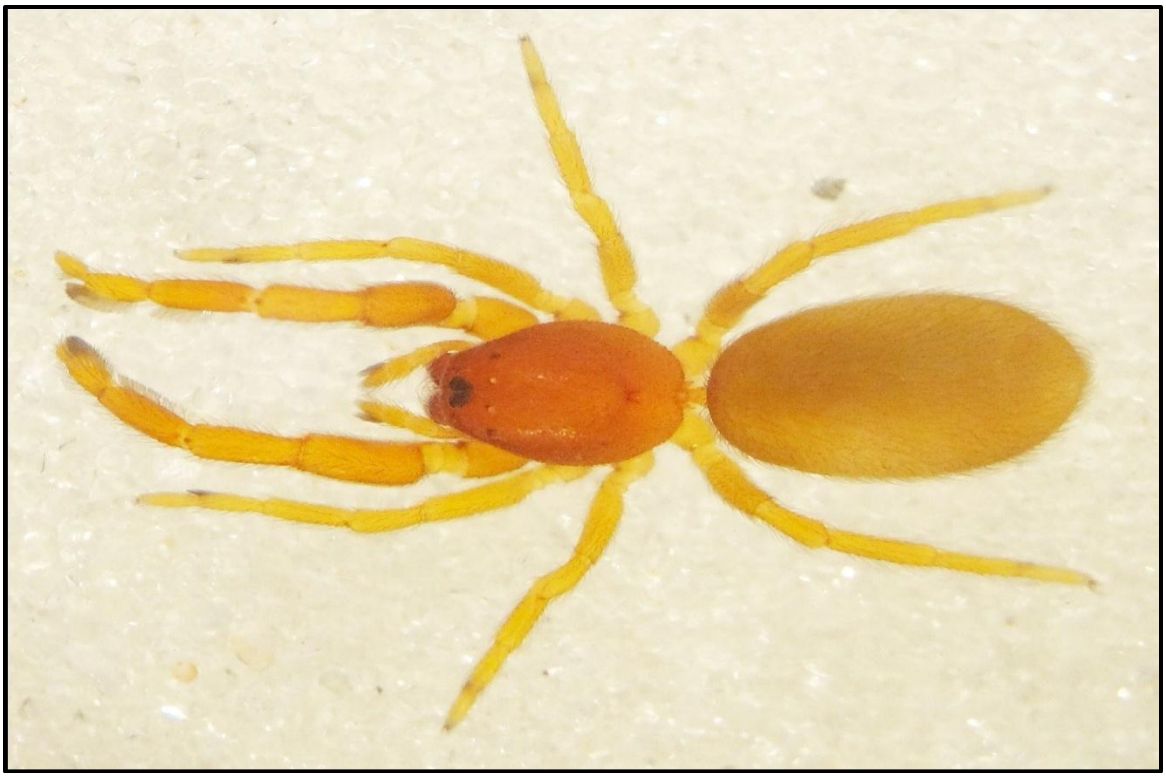


Figure 96. ***Unidentified Species 2***

Figure 97. ***Tibellus elongatus*** **guarding its eggsac**

Figure 98. ***Crossopriza lyoni*** **with eggsca in chelicerae**

Figure 99. ***Pholcus fragillimus***

Figure 100. ***Pholcus phalangioides*** **with eggsac in chelicerae**

Figure 101. ***Hygropoda mahendriensis***

Figure 102. ***Nilus phipsoni***

Figure 103. ***Perenethis venusta***

Figure 104. ***Pisaura podilensis*** **guarding its eggsac**

Figure 105. ***Prodidomus sp.***

Figure 106. ***Epocilla sp.***

Figure 107. ***Harmochirus brachiatus***

Figure 108. ***Hasarius adansoni***

Figure 109. ***Hyllus semicupreus***

Figure 110. ***Marpissa tigrina***

Figure 111. ***Marpissa sp.***

Figure 112. ***Menemerus bivittatus***

Figure 113. ***Myrmarachne tristis***

Figure 114. ***Myrmarachne sp. 1***

Figure 115. ***Myrmarachne sp. 2***

Figure 116. ***Phintella vittata***

Figure 117. ***Plexippus paykulli***

Figure 118. ***Plexippus petersi*** **feeding on Neuropteran**

Figure 119. ***Portia sp.***

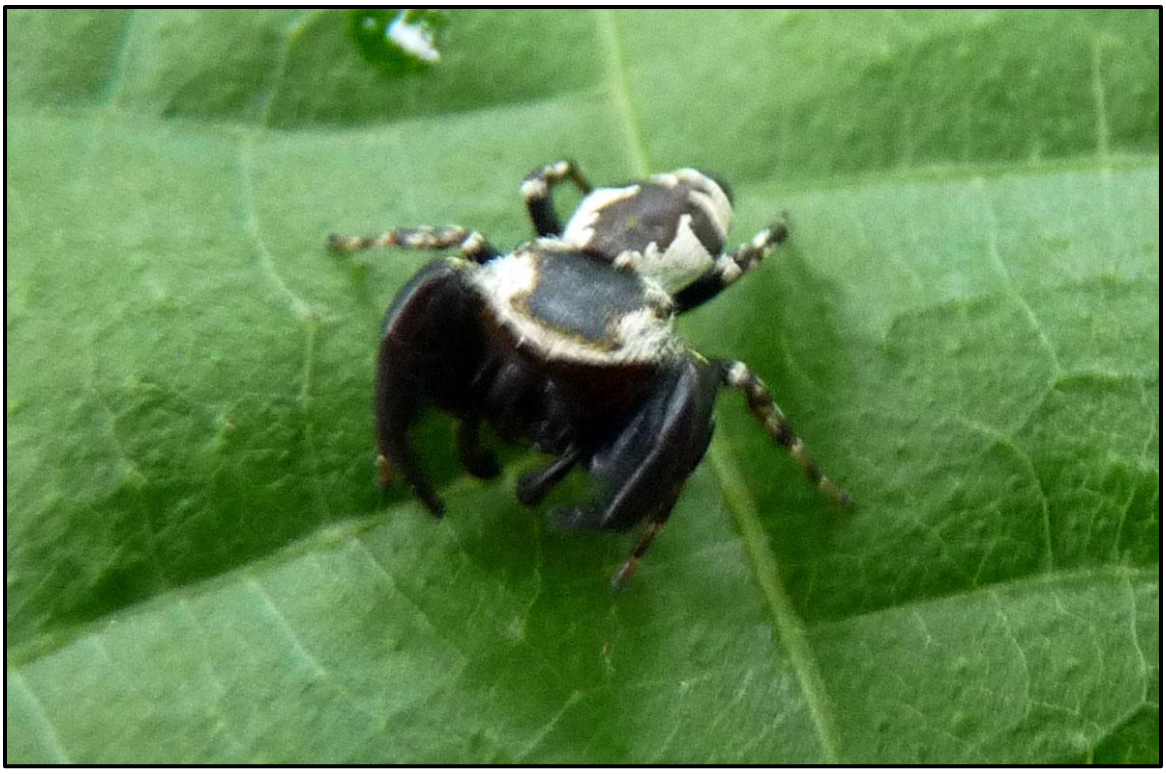


Figure 120. ***Rhene albigera***

Figure 121. ***Stenaelurillus sp.***

Figure 122. ***Telamonia dimidiata***

Figure 123. ***Thyene imperialis***

Figure 124. ***Scytodes fusca***

Figure 125. ***Scytodes pallida***

Figure 126. ***Scytodes thoracica*** **guarding its eggsac**

Figure 127. ***Scytodes sp.***

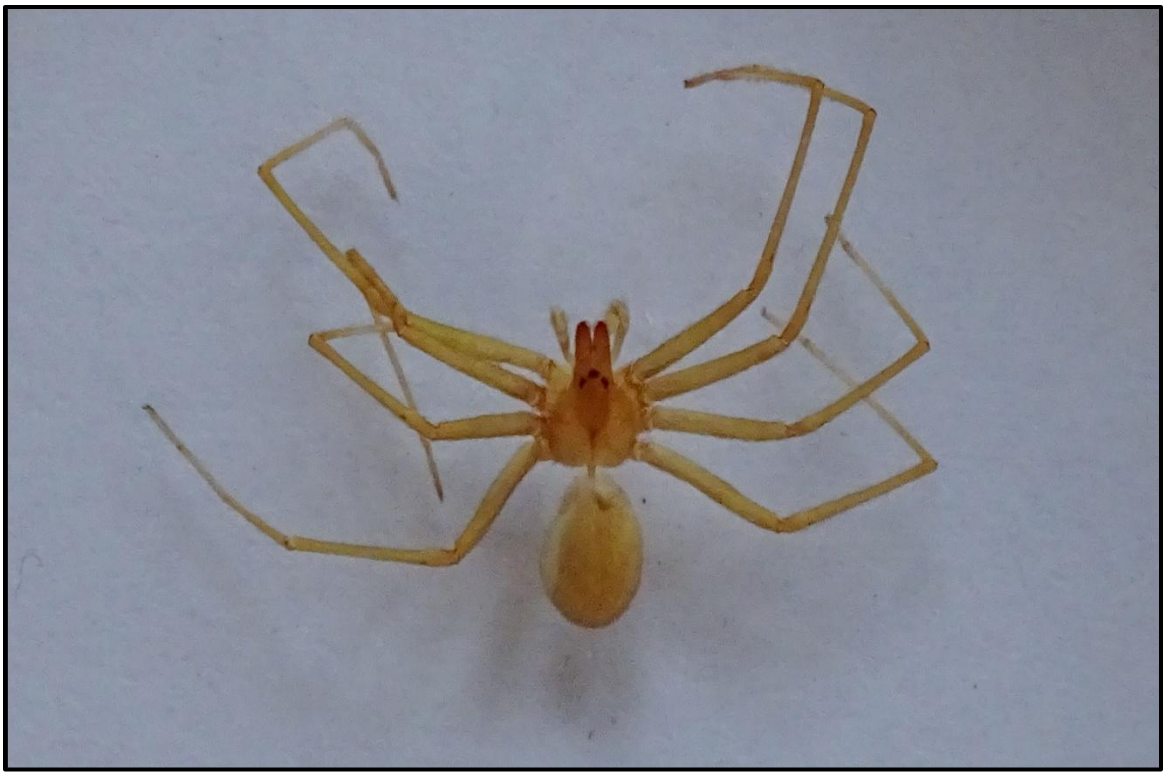


Figure 128. ***Loxosceles rufescens***

Figure 129. ***Heteropoda bhaikakai***

Figure 130. ***Heteropoda venatoria***

Figure 131. ***Olios bhavnagarensis*** **in its retreat**

Figure 132. ***Olios gravelyi***

Figure 133. ***Olios milleti***

Figure 134. ***Olios wroughtoni***

Figure 135. ***Olios sp.***

Figure 136. ***Stenochilus hobsoni***

Figure 137. ***Guizygiella indica***

Figure 138. ***Guizygiella melanocrania***

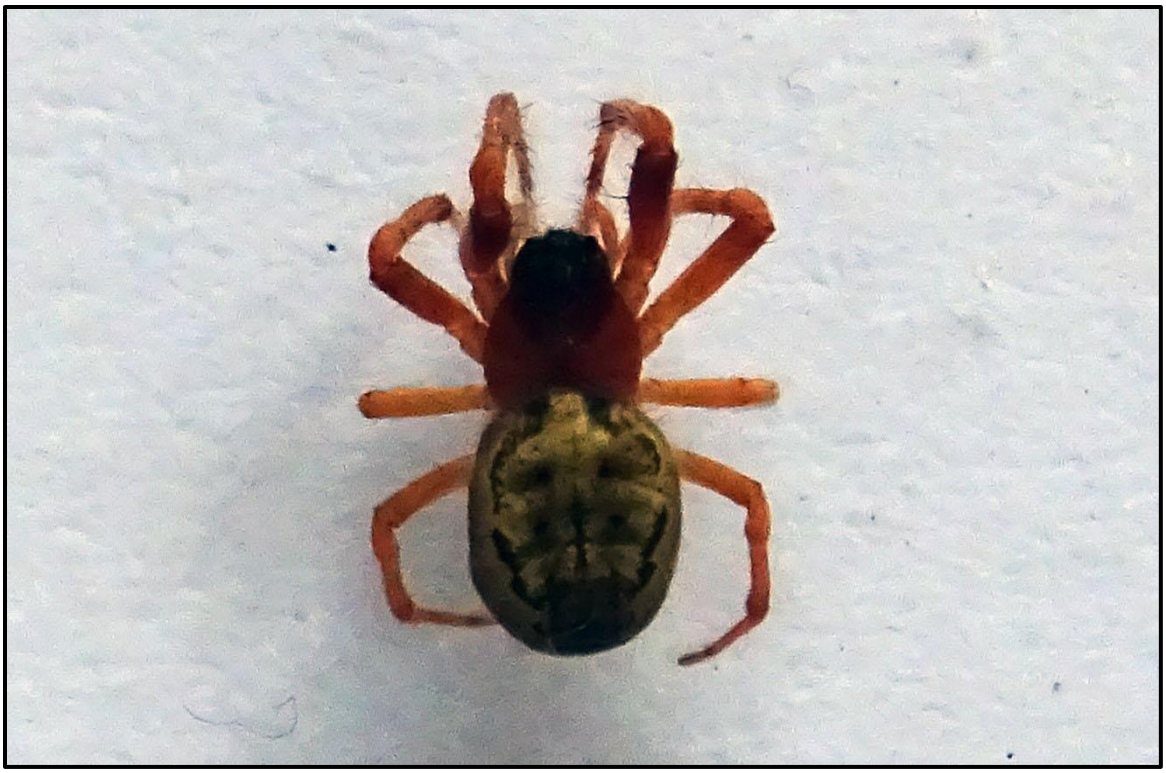


Figure 139. ***Guizygiella shivui***

Figure 140. ***Leucauge decorata***

Figure 141. ***Tetragnatha extensa***

Figure 142. ***Tetragnatha mandibulata***

Figure 143. ***Tetragnatha maxillosa***

Figure 144. ***Tylorida ventralis***

Figure 145. ***Argyrodes argentatus***

Figure 146. ***Cephalobares globiceps***

Figure 147. ***Coleosoma blandum***

Figure 148. ***Euryopis sp.***

Figure 149. ***Latrodectus hasseltii***

Figure 150. ***Meotipa picturata***

Figure 151. ***Parasteatoda mundula*** **guarding its eggsac**

Figure 152. ***Rhomphaea projiciens***

Figure 153. ***Steatoda sp. 1***

Figure 154. ***Steatoda sp. 2***

Figure 155. ***Yaginumena maculosa***

Figure 156. ***Amyciaea forticeps*** **feeding on weaver ant**

Figure 157. ***Camaricus sp.***

Figure 158. ***Indoxysticus minutus***

Figure 159. ***Runcinia sp.***

Figure 160. ***Thomisus sp. 1***

Figure 161. ***Thomisus sp. 2*** **guarding its cocoon**

Figure 162. ***Thomisus sp. 3*** **feeding on Diptera**

Figure 163. ***Pandava laminata***

Figure 164. ***Miagrammopes sp.***

Figure 165. ***Uloborus danolius***

Figure 166. ***Uloborus krishnae***

Figure 167. ***Uloborus sp. 1***

Figure 168. ***Uloborus sp. 2*** **with spiderlings in retreat**

Figure 169. ***Zosis geniculata*** **in its web**

Figure 170. ***Storena gujaratensis***

Figure 171. ***Storena sp.***

Table 31. List of spider species from Jambughoda Wildlife Sanctuary, Gujarat along with Natural History Notes

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
1.	Araneidae	*Araneus mitificus* (Simon, 1886)	M, F	Found resting in the retreat of folded leaf which was attached to the one end of its orb web
2.		*Argiope aemula* (Walckenaer, 1841)	M, F	Observed resting in upside down position at the center (Hub) of its orb web
3.		*Argiope anasuja* Thorell, 1887	M, F	Observed feeding on moths, grasshoppers entangled in its web
4.		*Chorizopes sp.*	F	Collected from underside of leave resting in its mesh web
5.		*Cyclosa confraga* (Thorell, 1892)	F	Collected from its web, decorated with a longitudinal line of debris passing through the hub were the spider camouflages it self
6.		*Cyclosa hexatuberculata* Tikader, 1982	F	Collected from its web, decorated with a longitudinal line of debris passing through the hub were the spider camouflages it self
7.		*Cyclosa moonduensis* Tikader, 1963	M, F	Observed hanging by a single strand of silk over the lower

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
				vegetation
8.		*Cyclosa spirifera* Simon, 1889	F	Collected from its web, decorated with a longitudinal line of debris passing through the hub were the spider camouflages it self
9.		*Cyrtophora cicatrosa* (Stoliczka, 1869)	F	Observed resting in upside down position at the center of the tent shape web
10.		*Cyrtophora citricola* (Forsskål, 1775)	M, F	Observed resting in upside down position at the center of the tent shape web
11.		*Eriovixia excelsa* (Simon, 1889)	M, F	Nocturnal spider, during day time hides in their retreat (rolled leaf) attached to their web
12.		*Eriovixia laglaizei* (Simon, 1877)	F	Nocturnal spider, collected from its orb web
13.		*Eriovixia poonaensis* (Tikader & Bal, 1981)	F	Nocturnal spider, found resting during day time in its retreat (rolled leaf)
14.		*Gasteracantha kuhli* C. L. Koch, 1837	F	Collected from its orb web
15.		*Gea subarmata* Thorell, 1890	F	Small orb web with uniformly circular radii constructed between blades of grass. Spider was found resting in the

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
				centre of the web
16.		*Larinia chloris* (Audouin, 1826)	F	Observed resting in upside down position at the center (Hub) of the orb web
17.		*Lipocrea fusiformis* (Thorell, 1877)	F	Observed resting in upside down position at the center (Hub) of the orb web
18.		*Neoscona mukerjei* Tikader, 1980	M, F	Observed resting in upside down position at the center (Hub) of its orb web
19.		*Neoscona nautica* (L. Koch, 1875)	F	Observed resting in upside down position at the center (Hub) of its orb web
20.		*Neoscona theisi* (Walckenaer, 1841)	M, F	Observed resting in upside down position at the center (Hub) of its orb web
21.		*Neoscona vigilans* (Blackwall, 1865)	F	Observed resting in upside down position at the center (Hub) of its orb web
22.		*Poltys bhabanii* (Tikader, 1970)	F	Nocturnal spider, observed resting in upside down position at the center (Hub) of its orb web
23.		*Poltys columnaris* Thorell, 1890	F	Nocturnal spiders, looks like dry broken twig of plant. At night they were found resting in the centre of their large orb web

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
24.		*Poltys nagpurensis* Tikader, 1982	M, F	Nocturnal spider, collected from its orb web constructed between two lower branches of *Tectona grandis*
25.		*Singa sp.*	M, F	Observed hanging with a single strand of silk attached from one side to a leave and other side to a shrub branch
26.		*Thelacantha brevispina* (Doleschall, 1857)	F	Observed resting in upside down position at the center (Hub) of its orb web
27.	Clubionidae	*Clubiona drassodes* O. Pickard-Cambridge, 1874	F	Found resting on the underside of leaf
28.		*Clubiona filicata* O. Pickard-Cambridge, 1874	F	Found resting on the underside of leaf
29.		*Clubiona foliata* Keswani & Vankhede, 2014	F	Observed wandering on the foliage
30.		*Clubiona pashabhaii* Patel & Patel, 1973	F	Found resting on the underside of leaf
31.	Corinnidae	*Castianeira zetes* Simon, 1897	F	Found running in the leaf litter
32.	Ctenidae	*Ctenus narashinhai* Patel & Reddy, 1988	F	Found running in the leaf litter
33.	Eresidae	*Stegodyphus pacificus* Pocock, 1900	F	Colonial spider, collected from its web which was having many entrances
34.		*Stegodyphus sarasinorum* Karsch, 1892	M, F	Colonial spider, collected from its web

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
				which was having many entrances
35.	Eutichuridae	*Cheiracanthium inornatum* O. Pickard-Cambridge, 1874	M, F	Collected resting on the grass blade
36.		*Cheiracanthium melanostomum* (Thorell, 1895)	F	Collected while it was resting on the underside of leaf
37.		*Cheiracanthium triviale* (Thorell, 1895)	F	Collected while it was resting on the underside of leaf
38.		*Cheiracanthium sp.* 1	F	Collected while it was resting on the underside of leaf
39.		*Cheiracanthium sp.* 2	F	Collected while it was resting on the underside of leaf
40.	Gnaphosidae	*Drassodes sp.*	J	Found under the bark of palm tree
41.		*Haplodrassus sp.*	J	Collected by pitfall method
42.		*Megamyrmaekion ashae* Tikader & Gajbe, 1977	F	Collected by pitfall method
43.		*Scopoides kuljitae* (Tikader, 1982)	F	Collected by applying litter sampling
44.		*Scopoides sp.*	J	Collected by applying litter sampling
45.		*Trachyzelotes jaxartensis* (Kroneberg, 1875)	F	Collected by pitfall method
46.		*Zelotes mandae* Tikader & Gajbe, 1979	F	Collected by pitfall method
47.	Hersiliidae	*Hersilia aadi* Pravalikha,	F	Found camouflaged

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
		Srinivasulu & Srinivasulu, 2014		on the bark of trees
48.		*Hersilia savignyi* Lucas, 1836	M, F	Found camouflaged on the bark of trees Observed feeding on *Camponotus compressus*
49.		*Murricia hyderabadensis* Javed & Tampal, 2010	F	Found camouflaged on the bark of trees
50.	Liocranidae	*Oedignatha sp.*	M	Collected by applying litter sampling
51.	Lycosidae	*Evippa sp.* 1	F	Collected by pitfall method
52.		*Evippa sp.* 2	F	Collected by pitfall method
53.		*Hippasa lycosina* Pocock, 1900	F	Collected by pitfall method
54.		*Lycosa poonaensis* Tikader & Malhotra, 1980	F	Collected by pitfall method
55.		*Lycosa sp.*	F	Collected by pitfall method
56.		*Pardosa birmanica* Simon, 1884	F	Collected by pitfall method
57.		*Pardosa sumatrana* (Thorell, 1890)	M, F	Collected by pitfall method
58.	Oecobiidae	*Oecobius putus* O. Pickard-Cambridge, 1876	M, F	Collected from its web constructed at the corner of huts in the village
59.	Oonopidae	*Brignolia sp.*	F	Collected by pitfall method
60.		*Unidentified Species* 1	F	Collected by pitfall

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
				method
61.	Oxyopidae	*Hamadruas sikkimensis* (Tikader, 1970)	F	Collected from the underside of leaf
62.		*Oxyopes ashae* Gajbe, 1999	F	Found resting on grass blades
63.		*Oxyopes bharatae* Gajbe, 1999	F	Collected from the underside of leaf
64.		*Oxyopes birmanicus* Thorell, 1887	F	Found resting on grass blades
65.		*Oxyopes pankaji* Gajbe & Gajbe, 2000	F	Collected from the underside of leaf
66.		*Oxyopes sp.* 1	F	Collected from the underside of leaf
67.		*Oxyopes sp.* 2	M, F	Collected from the underside of leaf
68.		*Oxyopes sp.* 3	M, F	Collected from the underside of leaf
69.		*Peucetia akwadaensis* Patel, 1978	M	Collected from the underside of leaf
70.		*Peucetia viridana* (Stoliczka, 1869)	F	Collected from the underside of leaf
71.		*Peucetia yogeshi* Gajbe, 1999	M, F	Collected from the underside of leaf
72.		*Peucetia sp.*	F	Collected from the underside of leaf
73.	Palpimanidae	*Unidentified Species* 2	F	Collected by pitfall method
74.	Philodromidae	*Tibellus elongatus* Tikader, 1960	M, F	Collected from the branch of tree where it was fully

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
				camouflaged
75.	Pholcidae	*Crossopriza lyoni* (Blackwall, 1867)	M, F	Collected from its tangled web constructed between the lower vegetation in the forest
76.		*Pholcus fragillimus* Strand, 1907	M, F	Collected from its tangled untidy web constructed between the lower vegetation in the forest
77.		*Pholcus phalangioides* (Fuesslin, 1775)	F	Collected from its tangled web constructed between the lower vegetation in the forest
78.	Pisauridae	*Hygropoda mahendriensis* Vankhede, Keswani & Rajoria, 2013	M, F	Found near the streams of water, resting at periphery of stream and waiting for its prey (Hunting position)
79.		*Nilus phipsoni* (F. O. Pickard-Cambridge, 1898)	M, F	Found near the streams of water, resting on stones at the periphery of streams
80.		*Perenethis venusta* L. Koch, 1878	M	Found on the vegetation near the stream of water
81.		*Pisaura podilensis* Patel & Reddy, 1990	M, F	Collected from the upper side of leaf near its nursery web
82.	Prodidomidae	*Prodidomus sp.*	M	Accidentally found moving in the leaf litter and collected by

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
				handpick method
83.	Salticidae	*Epocilla sp.*	M	Found in the underside of leaf
84.		*Harmochirus brachiatus* (Thorell, 1877)	M	Found under the bark of Palm tree
85.		*Hasarius adansoni* (Audouin, 1826)	M, F	Found underside of leaf
86.		*Hyllus semicupreus* (Simon, 1885)	M, F	Found underside of leaf
87.		*Marpissa tigrina* Tikader, 1965	F	Found underside of leaf
88.		*Marpissa sp.*	F	Collected from the lower vegetation by handpick method
89.		*Menemerus bivittatus* (Dufour, 1831)	M, F	Found underside of leaf
90.		*Myrmarachne tristis* (Simon, 1882)	M, F	Found underside of leaf
91.		*Myrmarachne sp.* 1	F	Collected form its retreat constructed in a rolled leaf
92.		*Myrmarachne sp.* 2	F	Collected from its retreat constructed in a rolled leaf
93.		*Phintella vittata* (C. L. Koch, 1846)	M, F	Found underside of leaf
94.		*Plexippus paykulli* (Audouin, 1826)	M, F	Found wandering on the walls of huts in the village
95.		*Plexippus petersi* (Karsch, 1878)	M, F	Found wandering on the walls of huts in

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
				the village
96.		*Portia sp.*	M	Observed wandering on the ground within the leaf litter
97.		*Rhene albigera* (C. L. Koch, 1846)	M	Found underside of leaf
98.		*Stenaelurillus sp.*	M, F	Collected wandering on the ground and in the dry leaf litter
99.		*Telamonia dimidiata* (Simon, 1899)	M, F	Found underside of leaf
100.		*Thyene imperialis* (Rossi, 1846)	M, F	Found underside of leaf
101.	Scytodidae	*Scytodes fusca* Walckenaer, 1837	F	Found underside of leaf
102.		*Scytodes pallida* Doleschall, 1859	M, F	Found inside the folded leaf probably resting during day time
103.		*Scytodes thoracica* (Latreille, 1802)	F	Found inside the folded leaf probably resting during day time
104.		*Scytodes sp.*	F	Found underside of leaf
105.	Sicariidae	*Loxosceles rufescens* (Dufour, 1820)	M, F	Collected from the leaf litter and also from its web constructed in the crevices of mines walls
106.	Sparassidae	*Heteropoda bhaikakai* Patel & Patel, 1973	F	Collected from the inner & outer walls of huts in the village,

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
				also seen in the leaf litter of *Tectona grandis*
107.		*Heteropoda venatoria* (Linnaeus, 1767)	F	Collected from the outer walls of huts in the village, also seen in the leaf litter of *Tectona grandis*
108.		*Olios bhavnagarensis* Sethi & Tikader, 1988	F	Collected from the underside of leaf
109.		*Olios gravelyi* Sethi & Tikader, 1988	F	Collected from the underside of leaf
110.		*Olios milleti* (Pocock, 1901)	F	Collected from the folded leaf
111.		*Olios wroughtoni* (Simon, 1897)	M	Collected from the underside of leaf
112.		*Olios sp.*	F	Collected from the underside of leaf
113.	Stenochilidae	*Stenochilus hobsoni* O. Pickard-Cambridge, 1870	M	Collected by pitfall method. Probably inhabits in leaf litter
114.	Tetragnathidae	*Guizygiella indica* (Tikader & Bal, 1980)	M, F	Collected from its orb web constructed between lower branches of tree
115.		*Guizygiella melanocrania* (Thorell, 1887)	M, F	Collected from its orb web constructed between lower branches of tree
116.		*Guizygiella shivui* (Patel & Reddy, 1990)	M, F	Collected from its orb web constructed between lower branches of tree

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
117.		*Leucauge decorata* (Blackwall, 1864)	M, F	Collected from its web near the water stream
118.		*Tetragnatha extensa* (Linnaeus, 1758)	M, F	Found resting on the leaves of lower branches of *Pongamia pinnata* tree near water stream
119.		*Tetragnatha mandibulata* Walckenaer, 1841	M, F	Found resting on the leaves of lower branches of *Pongamia pinnata* tree near water stream
120.		*Tetragnatha maxillosa* Thorell, 1895	M, F	Found resting on the leaves of lower branches of *Pongamia pinnata* tree near water stream
121.		*Tylorida ventralis* (Thorell, 1877)	M, F	Found resting at the periphery of streams on twigs of plants with their legs stretched longitudinally
122.	Theridiidae	*Argyrodes argentatus* O. Pickard-Cambridge, 1880	M, F	Observed hanging on a single strand of silk attached to nearby vegetation or twigs
123.		*Cephalobares globiceps* O. Pickard-Cambridge, 1870	M, F	Collected from the underside of leaves
124.		*Coleosoma blandum* O. Pickard-Cambridge, 1882	M	Collected from the base of dried bark of palm tree leaf by handpick method
125.		*Euryopis sp.*	F	Observed hanging by a single strand of silk

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
				attached to the leaves/branch of tree from both the sides
126.		*Latrodectus hasseltii* Thorell, 1870	F	Collected from the underside of rock by uplifting it. Female was observed guarding the eggsac
127.		*Meotipa picturata* Simon, 1895	F	Observed hanging on a single strand of silk attached to the leaves/branch of tree from both the sides
128.		*Parasteatoda mundula* (L. Koch, 1872)	F	Collected from mesh web. In which it was resting in the conical shaped folded dry leaf
129.		*Rhomphaea projiciens* O. Pickard-Cambridge, 1896	M, F	Mostly seen hanging on a single strand of silk attached from both the sides on either leaf/branch of tree/shrub
130.		*Steatoda sp.* 1	F	Found in the crevices and holes of the trees
131.		*Steatoda sp.* 2	F	Found in the crevices and holes of the trees
132.		*Yaginumena maculosa* (Yoshida & Ono, 2000)	M	Collected from small undity mesh web constructed underside of large leaves
133.	Thomisidae	*Amyciaea forticeps* (O. Pickard-Cambridge, 1873)	M, F	Collected from the trail of red weaver ants on tree branches. Few of them were also observed feeding

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
				on these ants
134.		*Camaricus sp.*	F	Collescted from the lower foliage by handpick method
135.		*Indoxysticus minutus* (Tikader, 1960)	F	Found on lower branches of tree, fully camouflaged with the background
136.		*Runcinia sp.*	F	Collected from the underside of leaf
137.		*Thomisus sp.* 1	F	Found on and underside of lower foliage/shrubs
138.		*Thomisus sp.* 2	F	Found on and underside of lower foliage/shrubs
139.		*Thomisus sp.* 3	F	Found on and underside of lower foliage/shrubs
140.	Titanoecidae	*Pandava laminata* (Thorell, 1878)	M, F	Collected from the underside of loose barks of tree and can be located by the outline of silk at the periphery of loose bark
141.	Uloboridae	*Miagrammopes sp.*	J	Collected from leaf litter by handpick method
142.		*Uloborus danolius* Tikader, 1969	F	Collected from its web constructed in between dry twigs
143.		*Uloborus krishnae* Tikader, 1970	F	Observed resting underside of the leaf

Sr. No.	Family	Scientific Name	Sex	Natural History Notes
				in its web
144.		*Uloborus sp.* 1	F	Found underside of leaf hanging on a single strand of silk
145.		*Uloborus sp.* 2	F	Found underside of leaf hanging on a single strand of silk
146.		*Zosis geniculata* (Olivier, 1789)	F	Collected from its web constructed attached to the walls of mines
147.	Zodariidae	*Storena gujaratensis* Tikader & Patel, 1975	M	Leaf litter dwelling spider; collected by pitfall method
148.		*Storena sp.*	F	Leaf litter dwelling spider; collected by pitfall method

Table 32. List of spiders collected from five major agro-ecosystems of Jambughoda Village

Sr. No.	Family	Scientific Name	Castor	Corn	Cotton	Paddy	Pigeon-pea
1.	Araneidae	*Araneus mitificus* (Simon, 1886)	√	√	√	-	√
2.		*Argiope aemula* (Walckenaer, 1841)	√	√	-	-	√
3.		*Argiope anasuja* Thorell, 1887	√	√	√	√	√
4.		*Cyclosa confraga* (Thorell, 1892)	√	√	√	√	√
5.		*Cyclosa moonduensis* Tikader, 1963	√	√	-	-	√
6.		*Cyrtophora cicatrosa* (Stoliczka, 1869)	√	√	√	√	-
7.		*Cyrtophora citricola* (Forsskål, 1775)	-	√	√	√	√

Sr. No.	Family	Scientific Name	Castor	Corn	Cotton	Paddy	Pigeon-pea
8.		*Eriovixia excelsa* (Simon, 1889)	√	√	-	√	√
9.		*Eriovixia laglaizei* (Simon, 1877)	√	√	√	-	√
10.		*Gasteracantha kuhli* C. L. Koch, 1837	-	√	√	-	√
11.		*Larinia chloris* (Audouin, 1826)	√	√	√	√	-
12.		*Neoscona mukerjei* Tikader, 1980	√	√	√	√	√
13.		*Neoscona nautica* (L. Koch, 1875)	-	√	-	-	√
14.		*Neoscona theisi* (Walckenaer, 1841)	√	√	√	√	√
15.		*Neoscona vigilans* (Blackwall, 1865)	√	√	√	-	√

Sr. No.	Family	Scientific Name	Castor	Corn	Cotton	Paddy	Pigeon-pea
16.		*Thelacantha brevispina* (Doleschall, 1857)	√	√	-	-	√
17.	Clubionidae	*Clubiona drassodes* O. Pickard-Cambridge, 1874	-	√	-	√	√
18.		*Clubiona filicata* O. Pickard-Cambridge, 1874	√	√	√	-	√
19.	Corinnidae	*Castianeira zetes* Simon, 1897	√	√	√	-	√
20.	Eresidae	*Stegodyphus sarasinorum* Karsch, 1892	√	√	√	-	√
21.	Eutichuridae	*Cheiracanthium inornatum* O. Pickard-Cambridge, 1874	√	√	-	√	√
22.		*Cheiracanthium melanostomum*	-	√	√	√	-

Sr. No.	Family	Scientific Name	Castor	Corn	Cotton	Paddy	Pigeon-pea
		(Thorell, 1895)					
23.	Gnaphosidae	*Drassodes sp.*	√	√	-	√	√
24.		*Haplodrassus sp.*	√	√	-	-	√
25.		*Scopoides sp.*	√	√	√	√	-
26.	Lycosidae	*Evippa sp.* 1	√	√	-	√	√
27.		*Evippa sp.* 2	-	√	-	√	√
28.		*Hippasa lycosina* Pocock, 1900	√	√	√	√	√
29.		*Lycosa sp.*	√	-	√	√	√
30.		*Pardosa birmanica* Simon, 1884	√	√	√	√	√
31.	Oxyopidae	*Oxyopes birmanicus* Thorell, 1887	√	√	√	√	√
32.		*Oxyopes pankaji* Gajbe & Gajbe, 2000	√	√	√	√	-

Sr. No.	Family	Scientific Name	Castor	Corn	Cotton	Paddy	Pigeon-pea
33.		*Oxyopes sp.* 1	-	√	-	√	√
34.		*Oxyopes sp.* 2	√	√	√	√	-
35.		*Oxyopes sp.* 3	-	√	√	√	
36.		*Peucetia akwadaensis* Patel, 1978	-	√	√	√	√
37.		*Peucetia viridana* (Stoliczka, 1869)	√	√	-	√	√
38.	Pholcidae	*Crossopriza lyoni* (Blackwall, 1867)	√	√	-	√	√
39.		*Pholcus fragillimus* Strand, 1907	√	√	√	√	-
40.		*Pholcus phalangioides* (Fuesslin, 1775)	-	√	√	√	√
41.	Pisauridae	*Pisaura podilensis* Patel	-	-	-	√	-

Sr. No.	Family	Scientific Name	Castor	Corn	Cotton	Paddy	Pigeon-pea
		& Reddy, 1990					
42.	Salticidae	*Hasarius adansoni* (Audouin, 1826)	√	√	√	√	√
43.		*Hyllus semicupreus* (Simon, 1885)	√	√	√	√	√
44.		*Menemerus bivittatus* (Dufour, 1831)	√	√	√	√	√
45.		*Myrmarachne tristis* (Simon, 1882)	-	√	√	-	√
46.		*Phintella vittata* (C. L. Koch, 1846)	-	√	√	-	√
47.		*Plexippus paykulli* (Audouin, 1826)	√	√	√	√	√
48.		*Rhene albigera* (C. L. Koch, 1846)	√	√	-	-	√

Sr. No.	Family	Scientific Name	Castor	Corn	Cotton	Paddy	Pigeon-pea
49.		*Stenaelurillus sp.*	√	√	√	√	√
50.		*Telamonia dimidiata* (Simon, 1899)	√	√	√	√	√
51.		*Thyene imperialis* (Rossi, 1846)	√	-	√	√	√
52.	Scytodidae	*Scytodes fusca* Walckenaer, 1837	-	√	√	-	√
53.		*Scytodes thoracica* (Latreille, 1802)	√	-	√	-	√
54.	Sparassidae	*Heteropoda venatoria* (Linnaeus, 1767)	√	√	√	√	√
55.		*Olios milleti* (Pocock, 1901)	√	√	√	√	√
56.		*Olios sp.*	-	√	√	-	-
57.	Tetragnathidae	*Guizygiella indica* (Tikader	√	√	√	√	-

Sr. No.	Family	Scientific Name	Castor	Corn	Cotton	Paddy	Pigeon-pea
		& Bal, 1980)					
58.		*Guizygiella melanocrania* (Thorell, 1887)	√	-	√	√	√
59.		*Leucauge decorata* (Blackwall, 1864)	√	√	√	√	√
60.	Theridiidae	*Argyrodes argentatus* O. Pickard-Cambridge, 1880	√	√	√	-	√
61.		*Parasteatoda mundula* (L. Koch, 1872)	√	√	√	√	√
62.		*Rhomphaea projiciens* O. Pickard-Cambridge, 1896	-	√	√	√	√
63.	Thomisidae	*Indoxysticus minutus* (Tikader, 1960)	√	√	√	√	-
64.		*Thomisus sp.* 1	-	√	√	-	√

Sr. No.	Family	Scientific Name	Castor	Corn	Cotton	Paddy	Pigeon-pea
65.		*Thomisus sp.* 2	√	√	-	√	√
66.	Uloboridae	*Uloborus danolius* Tikader, 1969	√	√	√	√	-
67.		*Uloborus krishnae* Tikader, 1970	√	√	√	-	√
68.		*Uloborus sp.* 1	-	-	√	√	√
		Total	**50**	**62**	**51**	**47**	**55**

Table 33. List of spider species found from three sub-sites of Jambughoda Wildlife Sanctuary, Gujarat, India

Sr. No.	Family	Scientific Name	Natural Forest	Riparian Habitat	Forest Plantation
1.	Araneidae	*Araneus mitificus* (Simon, 1886)	√	-	-
2.		*Argiope aemula* (Walckenaer, 1841)	√	√	√
3.		*Argiope anasuja* Thorell, 1887	√	√	√
4.		*Chorizopes sp.*	√	-	-
5.		*Cyclosa confraga* (Thorell, 1892)	√	-	√
6.		*Cyclosa hexatuberculata* Tikader, 1982	√	√	-
7.		*Cyclosa moonduensis* Tikader, 1963	√	√	√
8.		*Cyclosa spirifera* Simon, 1889	√	-	-
9.		*Cyrtophora cicatrosa* (Stoliczka, 1869)	√	√	√
10.		*Cyrtophora citricola* (Forsskål, 1775)	√	√	√
11.		*Eriovixia excelsa* (Simon, 1889)	√	√	√
12.		*Eriovixia laglaizei* (Simon, 1877)	√	√	√
13.		*Eriovixia poonaensis* (Tikader & Bal, 1981)	√	-	-
14.		*Gasteracantha kuhli* C. L. Koch, 1837	√	√	√

Sr. No.	Family	Scientific Name	Natural Forest	Riparian Habitat	Forest Plantation
15.		*Gea subarmata* Thorell, 1890	√	-	-
16.		*Larinia chloris* (Audouin, 1826)	√	-	-
17.		*Lipocrea fusiformis* (Thorell, 1877)	√	-	-
18.		*Neoscona mukerjei* Tikader, 1980	√	√	√
19.		*Neoscona nautica* (L. Koch, 1875)	√	√	√
20.		*Neoscona theisi* (Walckenaer, 1841)	√	√	√
21.		*Neoscona vigilans* (Blackwall, 1865)	√	√	-
22.		*Poltys bhabanii* (Tikader, 1970)	√	√	-
23.		*Poltys columnaris* Thorell, 1890	√	-	-
24.		*Poltys nagpurensis* Tikader, 1982	√	-	-
25.		*Singa sp.*	√	-	-
26.		*Thelacantha brevispina* (Doleschall, 1857)	√	√	√
27.	Clubionidae	*Clubiona drassodes* O. Pickard-Cambridge, 1874	√	√	√
28.		*Clubiona filicata* O. Pickard-Cambridge, 1874	√	√	√
29.		*Clubiona foliata* Keswani & Vankhede, 2014	√	-	-

Sr. No.	Family	Scientific Name	Natural Forest	Riparian Habitat	Forest Plantation
30.		*Clubiona pashabhaii* Patel & Patel, 1973	√	-	-
31.	Corinnidae	*Castianeira zetes* Simon, 1897	√	-	√
32.	Ctenidae	*Ctenus narashinhai* Patel & Reddy, 1988	√	-	-
33.	Eresidae	*Stegodyphus pacificus* Pocock, 1900	√	√	-
34.		*Stegodyphus sarasinorum* Karsch, 1892	√	√	√
35.	Eutichuridae	*Cheiracanthium inornatum* O. Pickard-Cambridge, 1874	√	√	-
36.		*Cheiracanthium melanostomum* (Thorell, 1895)	√	√	-
37.		*Cheiracanthium triviale* (Thorell, 1895)	-	√	-
38.		*Cheiracanthium sp.* 1	√	√	-
39.		*Cheiracanthium sp.* 2	-	√	-
40.	Gnaphosidae	*Drassodes sp.*	√	-	√
41.		*Haplodrassus sp.*	√	-	√
42.		*Megamyrmaekion ashae* Tikader & Gajbe, 1977	√	-	-
43.		*Scopoides kuljitae* (Tikader, 1982)	√	-	-
44.		*Scopoides sp.*	√	-	√
45.		*Trachyzelotes jaxartensis* (Kroneberg, 1875)	√	-	-

Sr. No.	Family	Scientific Name	Natural Forest	Riparian Habitat	Forest Plantation
46.		*Zelotes mandae* Tikader & Gajbe, 1979	√	-	√
47.	Hersiliidae	*Hersilia aadi* Pravalikha, Srinivasulu & Srinivasulu, 2014	√	-	-
48.		*Hersilia savignyi* Lucas, 1836	√	√	√
49.		*Murricia hyderabadensis* Javed & Tampal, 2010	√	-	-
50.	Liocranidae	*Oedignatha sp.*	√	-	√
51.	Lycosidae	*Evippa sp.* 1	√	√	√
52.		*Evippa sp.* 2	√	√	√
53.		*Hippasa lycosina* Pocock, 1900	√	√	√
54.		*Lycosa poonaensis* Tikader & Malhotra, 1980	-	√	-
55.		*Lycosa sp.*	√	√	√
56.		*Pardosa birmanica* Simon, 1884	√	√	√
57.		*Pardosa sumatrana* (Thorell, 1890)	√	√	-
58.	Oecobiidae	*Oecobius putus* O. Pickard-Cambridge, 1876	√	-	-
59.	Oonopidae	*Brignolia sp.*	√	-	-
60.		*Unidentified Species* 1	√	-	-
61.	Oxyopidae	*Hamadruas sikkimensis* (Tikader, 1970)	√	-	-

Sr. No.	Family	Scientific Name	Natural Forest	Riparian Habitat	Forest Plantation
62.		*Oxyopes ashae* Gajbe, 1999	√	-	-
63.		*Oxyopes bharatae* Gajbe, 1999	√	-	-
64.		*Oxyopes birmanicus* Thorell, 1887	√	√	√
65.		*Oxyopes pankaji* Gajbe & Gajbe, 2000	√	-	-
66.		*Oxyopes sp.* 1	√	√	-
67.		*Oxyopes sp.* 2	√	-	-
68.		*Oxyopes sp.* 3	√	-	-
69.		*Peucetia akwadaensis* Patel, 1978	√	-	-
70.		*Peucetia viridana* (Stoliczka, 1869)	√	√	√
71.		*Peucetia yogeshi* Gajbe, 1999	√	-	-
72.		*Peucetia sp.*	√	√	-
73.	Palpimanidae	*Unidentified Species* 2	√	-	-
74.	Philodromidae	*Tibellus elongatus* Tikader, 1960	√	√	-
75.	Pholcidae	*Crossopriza lyoni* (Blackwall, 1867)	√	√	√
76.		*Pholcus fragillimus* Strand, 1907	√	√	√
77.		*Pholcus phalangioides* (Fuesslin, 1775)	√	√	-
78.	Pisauridae	*Hygropoda mahendriensis* Vankhede,	-	√	-

Sr. No.	Family	Scientific Name	Natural Forest	Riparian Habitat	Forest Plantation
		Keswani & Rajoria, 2013			
79.		*Nilus phipsoni* (F. O. Pickard-Cambridge, 1898)	-	√	-
80.		*Perenethis venusta* L. Koch, 1878	-	√	-
81.		*Pisaura podilensis* Patel & Reddy, 1990	-	√	-
82.	Prodidomidae	*Prodidomus sp.*	√	-	-
83.	Salticidae	*Epocilla sp.*	√	-	-
84.		*Harmochirus brachiatus* (Thorell, 1877)	√	-	-
85.		*Hasarius adansoni* (Audouin, 1826)	√	√	√
86.		*Hyllus semicupreus* (Simon, 1885)	√	√	√
87.		*Marpissa tigrina* Tikader, 1965	√	-	-
88.		*Marpissa sp.*	√	√	-
89.		*Menemerus bivittatus* (Dufour, 1831)	√	√	√
90.		*Myrmarachne tristis* (Simon, 1882)	√	-	-
91.		*Myrmarachne sp.* 1	√	-	-
92.		*Myrmarachne sp.* 2	√	-	-
93.		*Phintella vittata* (C. L. Koch, 1846)	√	√	-
94.		*Plexippus paykulli* (Audouin, 1826)	√	√	-

Sr. No.	Family	Scientific Name	Natural Forest	Riparian Habitat	Forest Plantation
95.		*Plexippus petersi* (Karsch, 1878)	√	-	-
96.		*Portia sp.*	√	-	-
97.		*Rhene albigera* (C. L. Koch, 1846)	√	√	-
98.		*Stenaelurillus sp.*	√	√	√
99.		*Telamonia dimidiata* (Simon, 1899)	√	√	√
100.		*Thyene imperialis* (Rossi, 1846)	√	√	√
101.	Scytodidae	*Scytodes fusca* Walckenaer, 1837	√	√	-
102.		*Scytodes pallida* Doleschall, 1859	-	√	-
103.		*Scytodes thoracica* (Latreille, 1802)	√	√	-
104.		*Scytodes sp.*	√	-	-
105.	Sicariidae	*Loxosceles rufescens* (Dufour, 1820)	√	-	-
106.	Sparassidae	*Heteropoda bhaikakai* Patel & Patel, 1973	√	√	-
107.		*Heteropoda venatoria* (Linnaeus, 1767)	√	√	√
108.		*Olios bhavnagarensis* Sethi & Tikader, 1988	√	√	-
109.		*Olios gravelyi* Sethi & Tikader, 1988	√	-	-
110.		*Olios milleti* (Pocock, 1901)	√	√	√

Sr. No.	Family	Scientific Name	Natural Forest	Riparian Habitat	Forest Plantation
111.		*Olios wroughtoni* (Simon, 1897)	√	-	-
112.		*Olios sp.*	√	√	-
113.	Stenochilidae	*Stenochilus hobsoni* O. Pickard-Cambridge, 1870	√	-	-
114.	Tetragnathidae	*Guizygiella indica* (Tikader & Bal, 1980)	√	-	-
115.		*Guizygiella melanocrania* (Thorell, 1887)	√	-	-
116.		*Guizygiella shivui* (Patel & Reddy, 1990)	√	-	-
117.		*Leucauge decorata* (Blackwall, 1864)	√	√	-
118.		*Tetragnatha extensa* (Linnaeus, 1758)	-	√	-
119.		*Tetragnatha mandibulata* Walckenaer, 1841	-	√	-
120.		*Tetragnatha maxillosa* Thorell, 1895	-	√	-
121.		*Tylorida ventralis* (Thorell, 1877)	-	√	-
122.	Theridiidae	*Argyrodes argentatus* O. Pickard-Cambridge, 1880	√	√	√
123.		*Cephalobares globiceps* O. Pickard-Cambridge, 1870	√	-	-
124.		*Coleosoma blandum* O. Pickard-Cambridge, 1882	√	-	-
125.		*Euryopis sp.*	√	-	-

Sr. No.	Family	Scientific Name	Natural Forest	Riparian Habitat	Forest Plantation
126.		*Latrodectus hasseltii* Thorell, 1870	√	-	-
127.		*Meotipa picturata* Simon, 1895	√	-	-
128.		*Parasteatoda mundula* (L. Koch, 1872)	√	√	√
129.		*Rhomphaea projiciens* O. Pickard-Cambridge, 1896	√	√	√
130.		*Steatoda sp.* 1	√	-	-
131.		*Steatoda sp.* 2	√	-	-
132.		*Yaginumena maculosa* (Yoshida & Ono, 2000)	√	-	-
133.	Thomisidae	*Amyciaea forticeps* (O. Pickard-Cambridge, 1873)	√	√	-
134.		*Camaricus sp.*	√	√	-
135.		*Indoxysticus minutus* (Tikader, 1960)	√	√	-
136.		*Runcinia sp.*	√	√	-
137.		*Thomisus sp.* 1	√	√	-
138.		*Thomisus sp.* 2	√	√	-
139.		*Thomisus sp.* 3	√	√	-
140.	Titanoecidae	*Pandava laminata* (Thorell, 1878)	√	-	-
141.	Uloboridae	*Miagrammopes sp.*	√	-	-
142.		*Uloborus danolius* Tikader, 1969	√	√	√

Sr. No.	Family	Scientific Name	Natural Forest	Riparian Habitat	Forest Plantation
143.		*Uloborus krishnae* Tikader, 1970	√	√	√
144.		*Uloborus sp.* 1	√	-	-
145.		*Uloborus sp.* 2	√	-	-
146.		*Zosis geniculata* (Olivier, 1789)	√	-	-
147.	Zodariidae	*Storena gujaratensis* Tikader & Patel, 1975	√	-	-
148.		*Storena sp.*	√	-	√
		Total	**136**	**79**	**46**

3.3 Interesting records of genus and species from JWLS

During the study period, in total 24 interesting species of spider are recorded from Jambughoda Wildlife Sanctuary. Out of which two species are recorded for the first time from India, 16 species are new to Gujarat (Table 38) and six species of spiders are new to science (Table 41). Details of all these newly recorded species are as given below:

3.3.1 First record of Genera/species from India

Two spider species namely, *Cephalobares globiceps* O. Pickard-Cambridge, 1870 and *Pandava laminata* (Thorell, 1878) are recorded for the first time from India during the field work carried out at Jambughoda Wildlife Sanctuary. *C. globiceps* which belongs to family Theridiidae was previously reported only from China and Sri Lanka whereas *P. laminata* of family Titanoecidae was earlier reported from Asia (China, Japan, Myanmar, Indonesia, Thailand, Philippines), Africa (Tanzania, Kenya, Madagascar), Pacific (Marquesas Is., New Guinea) and Europe (Germany) (Almeida-Silva et al., 2010; Catalog, 2015). The detailed taxonomic description of both the species are as follows:

Taxonomy

1. *Cephalobares globiceps* O. Pickard-Cambridge, 1870

Cephalobares globiceps O. Pickard-Cambridge, 1870: 735, pl. 44, f. 4

Cephalobares globiceps Simon, 1894: 551, f. 560

Cephalobares globiceps Levi & Levi, 1962: 50, f. 178-183

Material examined: 1 male, 3 females, 11.viii.2014, Narukot, Jambughoda Wildlife Sanctuary, Gujarat, India (22˚23'53.4"N & 73˚37'57"E; 97.1m), coll. Reshma Solanki.

Description of Female (Image 1: A-E; Image 2: A-C ; Table 34) - Total length: 3.00 Carapace 1.08 long; 0.74 wide; 0.78 high; Abdomen 1.92 long; 1.54 wide; 1.48 high. Eye diameters and inter - distances: AME 0.12; ALE 0.1; PME 0.1; PLE 0.08; AME–AME 0.2; AME–ALE 0.14; PME–PME 0.3; PME–PLE 0.18; AME–PME 0.22; ALE–PLE 0.02. Chelicerae 0.39 long. Sternum 0.52 long; 0.44 wide; Endite 0.26 long; 0.16 wide, Labium 0.12 long; 0.20 wide. Leg formula 1423.

Carapace yellowish-brown with lighter thoracic area, cephalic area elevated, round and projecting anteriorly over the chelicerae, covered with pale colored hairs. Eyes are arranged on the elevated area of cephalic region, anterior row of eyes strongly recurved forming semicircle at the anterior cephalic region, posterior row of eyes strongly procurved. Chelicerae yellowish-brown in color, small, straight, covered with pale hairs. Sternum triangular in shape, posteriorly v shaped, having small extensions in between coxae of all legs, uniformly yellowish-brown covered with small pale hairs. Endites longer than wide, almost parallel, pale yellowish-brown at the base, darker at the tip with bunch of hairs covering the tip of endites. Labium shorter than wide, sub-circular to rectangular in shape, dark yellowish-brown in color.

Abdomen slightly longer than wide, uniformly covered with short and long pale hairs. Indistinct pattern dorsally with two elongated mid-lateral blotch of brown color bordered by chalky white dots, posteriorly one blotch of dark brown color extending till posterior most dorsal tubercles. Entire abdomen has dots of chalky white color alternating with brown color dots. Posteriorly four tubercles pinkish-red in color forming a distinct

square. Ventrally three pair of spinnerets, located at the three-forth part of abdomen surrounded by pinkish-red color and a boundary of chalky white dots. Anterior and posterior pair of spinnerets is similar in size whereas median pair of spinnerets is smaller in size and pale yellow in color. Legs entirely pale yellowish in color having bands of yellowish brown color at the joints of femur-patella, patella-tibia and tibia-metatarsus. Legs moderately covered with short pale hairs, tarsi with three claws. Epigynum, externally sclerotized epigastric plate with two orbicular spots. Internally epigynum is simple with two globular seminal receptacles. Connecting tubes simple and weakly sclerotized. Copulatory duct shorter than fertilization duct, both are situated at the posterior prolateral ends of each spermathecae.

Table 34. Morphometry of legs and Palp of female *Cephalobares globiceps* from Jambughoda Wildlife Sanctuary, Gujarat

	Femur	**Patella**	**Tibia**	**Metatarsus**	**Tarsus**	**Total**
LEG I	1.00	0.32	0.66	0.91	0.68	3.57
LEG II	0.86	0.28	0.5	0.66	0.43	2.73
LEG III	0.66	0.21	0.36	0.46	0.32	2.01
LEG IV	1.04	0.36	0.64	0.82	0.44	3.30
PALP	0.26	0.13	0.16	–	0.32	0.87

Description of Male (Image 1: F; Image 2: D-F; Table 35) - Total length: 2.06. Carapace 1.02 long; 0.78 wide; 0.90 high; Abdomen 1.04 long; 0.68 wide; 0.76 high. Eye diameters and inter - distances: AME 0.12; ALE 0.09; PME 0.09; PLE 0.09; AME–AME 0.17; AME–ALE 0.09; PME–PME 0.19; PME–PLE 0.15; AME–PME 0.15; ALE–PLE 0.02. Chelicerae 0.35 long. Sternum 0.41 long; 0.44 wide; Endite 0.22 long; 0.22 wide, Labium 0.12 long; 0.19 wide. Leg formula 1423. Carapace, eye arrangement, chelicerae, sternum, endites and labium similar as in female. Abdomen slightly shorter than female. Legs, palp and chelicerae slightly longer than female. Chelicerae with three retromarginal and three promarginal teeth with larger space in-between. Fangs longer in males as compared to females with fine serration on the margin. Abdomen longer than wide, with

no distinct pattern but entire abdomen has chalky white color dots alternating with patches of brown color. Posterior part of abdomen has four small tubercles with dark brown color, ventrally three pairs of spinnerets located more posterior as compared to female. Legs entirely pale yellowish in color with bands of light yellowish-brown color at the joints of femur-patella, patella-tibia and tibia-metatarsus. Padipalp with cymbium long up to the tip of conductor, embolus big and thick, conductor membranous lying behind theridiidae tegular apophysis and without sclerotized ridge, suprategulum broad, subtegulum cup shaped, theridiidae tegular apophysis with wide base, apex thin and obtuse.

Table 35. Morphometry of legs and Palp of male *Cephalobares globiceps* from Jambughoda Wildlife Sanctuary, Gujarat

	Femur	**Patella**	**Tibia**	**Metatarsus**	**Tarsus**	**Total**
LEG I	1.16	0.34	0.88	1.12	0.52	4.02
LEG II	0.92	0.32	0.66	0.82	0.42	3.14
LEG III	0.76	0.28	0.44	0.56	0.34	2.38
LEG IV	1.02	0.34	0.72	0.84	0.46	3.38
PALP	0.29	0.09	0.13	–	0.38	0.89

Remarks: We considered the present species as *C. globiceps* based on epigynum and palp structures as provided in (Pickard-Cambridge, 1870; Levi & Levi, 1962). We noticed that the male & female specimens of *C. globiceps* closely resembled that of *C. yangdingi* (Gao & Li, 2010). But can be distinguished by the presence of weakly sclerotized copulatory ducts in females and conductor without sclerotized ridge in male palp.

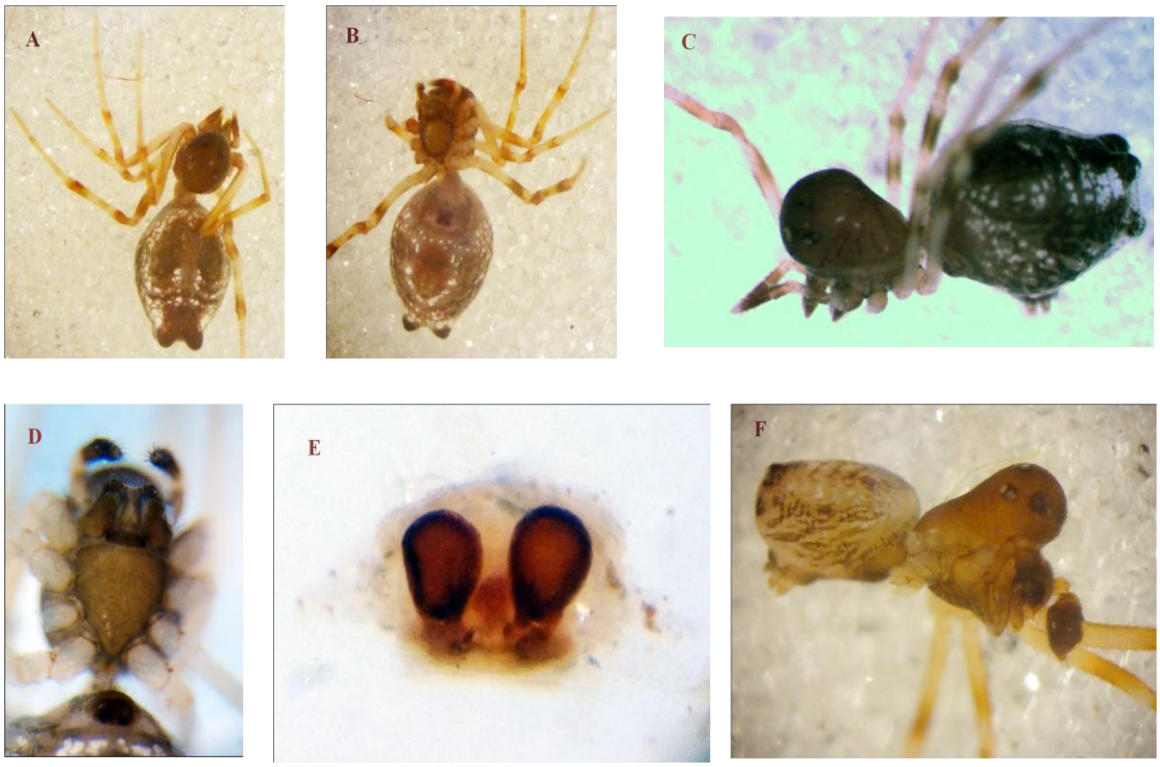


Image 1. *Cephalobares globiceps*, Habit
A-E female, F-male
A - dorsal view; B - ventral view; C - lateral view; D - Sternum; E – epigynum, internal view; F - lateral view

Natural History: The specimens were collected from under side of *Tectona grandis* leaf by hand pick method in the month of August from the Narukot village of the Jambughoda Wildlife Sanctuary which is a the dry deciduous forests. They are also observed to be kleptoparasitic as they were feeding on the insect prey left over by *G. shivui* in their web. In order to stay away from host, these little spiders tend to remain at the periphery of the web when the host spider was resting in the hub. Exuvia of coleopteran, lepidopteran specially moths and dipternas were found entangled in the web of the host spider which was later on feed by these kleptoparasitic spiders.

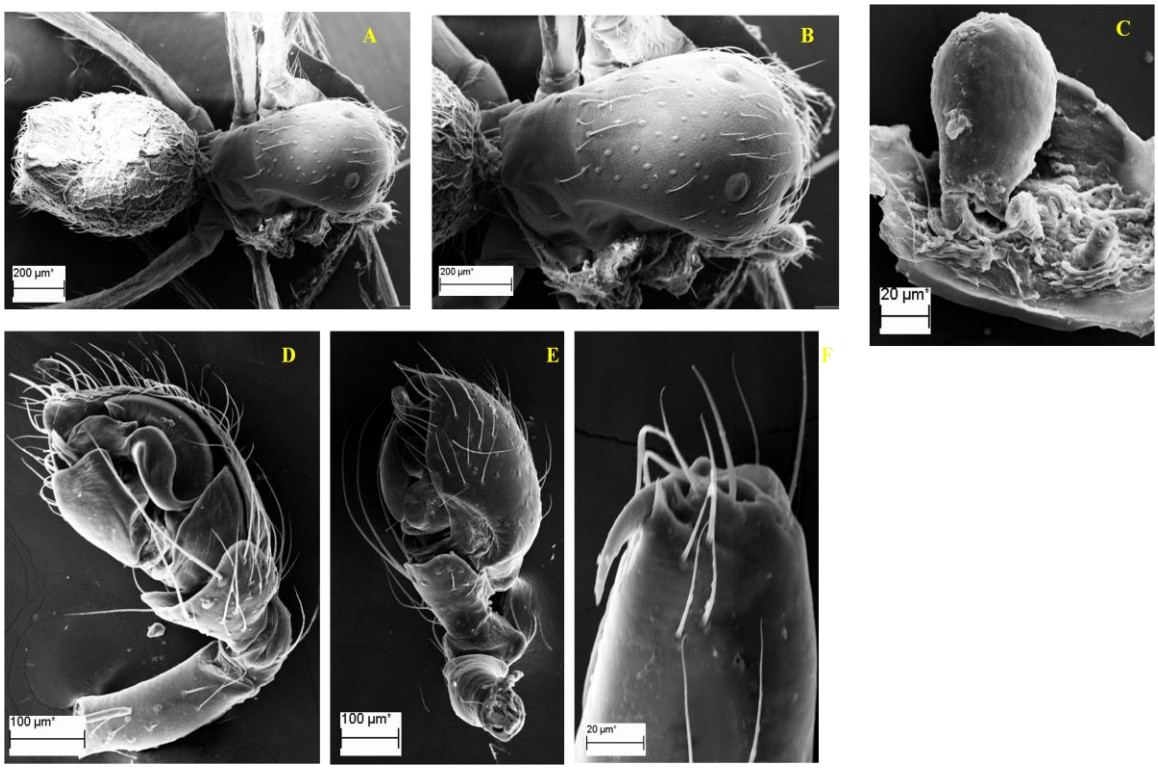


Image 2. ***Cephalobares globiceps*****, SEM Images**
A-C female, D-F male
A - dorsal view; B - cephalothorax; C- epigynum internal view (Right side spermathecae); D -

2. ***Pandava laminata*** **(Thorell, 1878)**

Amaurobius laminatus Thorell, 1878: 168

Amaurobius castaneiceps Simon, 1893: 69, f. 1

Titanoeca birmanica Thorell, 1895: 62; 1897: 261

Amaurobiu taprobanicola Strand, 1907: 110, f. 49, 50b

Amaurobius chinesicus Strand, 1907: 113, f. 50a

Titanoeca fulmeki Reimoser, 1927: 1, f. 1

Syrorisa mumfordi Berland, 1933: 69, f. 60-62

Material examined: WILD-14-ARA-1267, 1 male, WILD-14-ARA-1268, WILD-14-ARA-1269, 2 females, 16.x.2014, Katkoi, Jambughoda Wildlife Sanctuary, Gujarat, India (22˚23’51.4”N & 73˚37’16.1”E; 175m), coll. Reshma Solanki.

Description of Female (WILD-14-ARA-1268) (Image 3; Image 4: A-B; Image 5; Table 36) - Total length: 6.95. Carapace 3.00 long, 1.74 wide; Abdomen 3.95 long, 2.68 wide. Eye diameters and inter distances: AME 0.13; ALE 0.16; PME 0.18; PLE 0.16; AME–AME 0.105; AME–ALE 0.16; PME–PME 0.18; PME–PLE 0.24; AME–PME 0.07; ALE–PLE 0.05. Chelicerae 0.76 long. Sternum 1.47 long, 1.05 wide; Endite 0.89 long, 0.37 wide; Labium 0.48 long, 0.46 wide. Leg formula–1423. Leg spines: I fe p1, ti p2 r1 v5, mt p2 r1 v4; II ti p1 v2, mt p2 r1 v5; III fe p1, ti p1 r1 v1, mt p3 r3 v3-3; IV ti p1 r1 v1, mt p1 r1 v3-3. Carapace reddish-brown with lighter thoracic area, uniformly covered with black bristles and hairs intermixed. Anterior row of eyes straight, posterior row of eyes slightly procurved. Chelicerae long reddish-brown covered with hairs. Sternum oval, posteriorly acute, projecting between coxae IV, yellowish-brown in color, uniformly covered with black long hairs. Endites longer than wide, almost parallel, pale-brown. Labium sub-circular to rectangular. Abdomen beige, oval, longer than broad, uniformly covered with short and long black hairs, dorsally as well as ventrally. Cribellum divided, as broad as spinneret area width. Calamistrum uniseriate and extending in the middle of the metatarsus IV, leaving one-fourth length on both sides. Three pairs of spinnerets, anterior spinneret two segmented with tip dome-shaped, posterior median pair of spinnerets smallest, posterior pair cylindrical with very short second segment. Legs yellowish-green. Distally curved setae absent on legs. Tarsi with three claws and have presence of falsified claw tufts obscuring claws. Externally, epigynum with posterior border round, epigynal rim separated by less than their length; median field ending slightly before posterior margin and partly sclerotized. Internally, spermathecae with parallel vertical bunches; primary pore clearly visible near giant pore.

Morphometry of another female (WILD-14-ARA-1269) - Total length: 6.95. Carapace 4.05 long, 2.25 wide; Abdomen 5.85 long, 3.25 wide. Chelicerae 0.82 long. Sternum 1.85 long, 1.15 wide; Endite 0.95 long, 0.36 wide, Labium 0.50 long, 0.47 wide.

Table 36. Morphometry of legs and Palp of female *Pandava laminata* from Jambughoda Wildlife Sanctuary, Gujarat, WILD-14-ARA-1268 (WILD-14-ARA-1269)

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
LEG I	2.37 (2.25)	1.05 (1.00)	2.00 (2.05)	1.79 (1.95)	1.00 (0.95)	8.21 (8.20)
LEG II	2.21 (2.45)	0.95 (0.92)	1.74 (2.00)	1.68 (1.75)	0.79 (0.75)	7.37 (7.87)
LEG III	2.00 (2.00)	0.95 (0.92)	1.42 (1.43)	1.47 (1.53)	0.84 (0.85)	6.68 (6.73)
LEG IV	2.42 (2.32)	1.00 (1.00)	2.00 (2.05)	1.74 (1.55)	1.00 (1.00)	8.16 (7.92)
PALP	0.84 (0.85)	0.31 (0.30)	0.53 (0.52)	–	0.84 (0.85)	2.52 (2.52)

Description of Male (WILD-14-ARA-1267) (Image 4: C-F; Table 37) - Total length 6.32. Carapace 2.95 long, 2.05 wide; Abdomen 3.37 long, 2.21 wide. Eye diameters and inter-distances: AME 0.105; ALE 0.18; PME 0.13; PLE 0.16; AME–AME 0.105; AME–ALE 0.16; PME–PME 0.18; PME–PLE 0.24; AME–PME 0.105; ALE–PLE 0.05. Chelicerae: 1.37 long; Sternum 1.53 long, 1.56 wide; Endite 0.95 long, 0.37 wide; Labium 0.47 long, 0.45 wide. Leg formula–1243. Leg spines: I fe p1, ti p2 r4 v8, mt p3 r3 v4; II fe p1, ti p2 r2 v4, mt p3 r2 v5; III fe p1, ti d1 p1 r1 v1, mt p3 r3 v5; IV ti p1 r2, mt p3 r2 v6. Carapace, eye arrangement, chelicerae, sternum, endites, labium and abdomen similar as in female. Cribellum divided, as broad as spinneret area. Calamistrum uniseriate and extending in the middle of the metatarsus IV, leaving one-fourth lenngth on both sides. Legs yellowish-green. Distally curved setae on prolateral face of leg I and II on femur, patella, tibia and metatarsus. Padipalp with median apophysis conical, prolateral lobe of tibial apophysis with two lobes, PLT short not extending beyond tip of RLT.

Remarks: The male specimen of *P. laminata* from Gujarat resembles *P. saraswati* by presence of median apophysis and PLT with two lobes but differed from it by having blunt median apophysis; PLT short; not extending beyond the tip of RLT; presence of distally curved setae on prolateral face of leg I and II on femur, patella, tibia and metatarsus. Whereas, female specimen of *P. laminata* resembles *P. sarasvati* and *P.*

ganesha by the general shape of epigynum; median field of epigynum partly sclerotized but differed from both the later species by posterior border of epigynum rounded; ER forming an acute angle and separated by less than their length as provided in (Almeida-Silva et al., 2010).

Table 37. Morphometry of legs and Palp of male *Pandava laminata* (WILD-14-ARA-1267) from Jambughoda Wildlife Sanctuary, Gujarat

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
LEG I	3.05	1.21	2.84	2.74	1.21	11.05
LEG II	2.79	1.16	2.42	2.37	1.00	9.74
LEG III	2.37	1.00	1.84	2.00	0.95	8.16
LEG IV	2.74	1.00	2.37	2.31	1.05	9.47
PALP	1.89	0.68	0.89	–	2.05	5.51

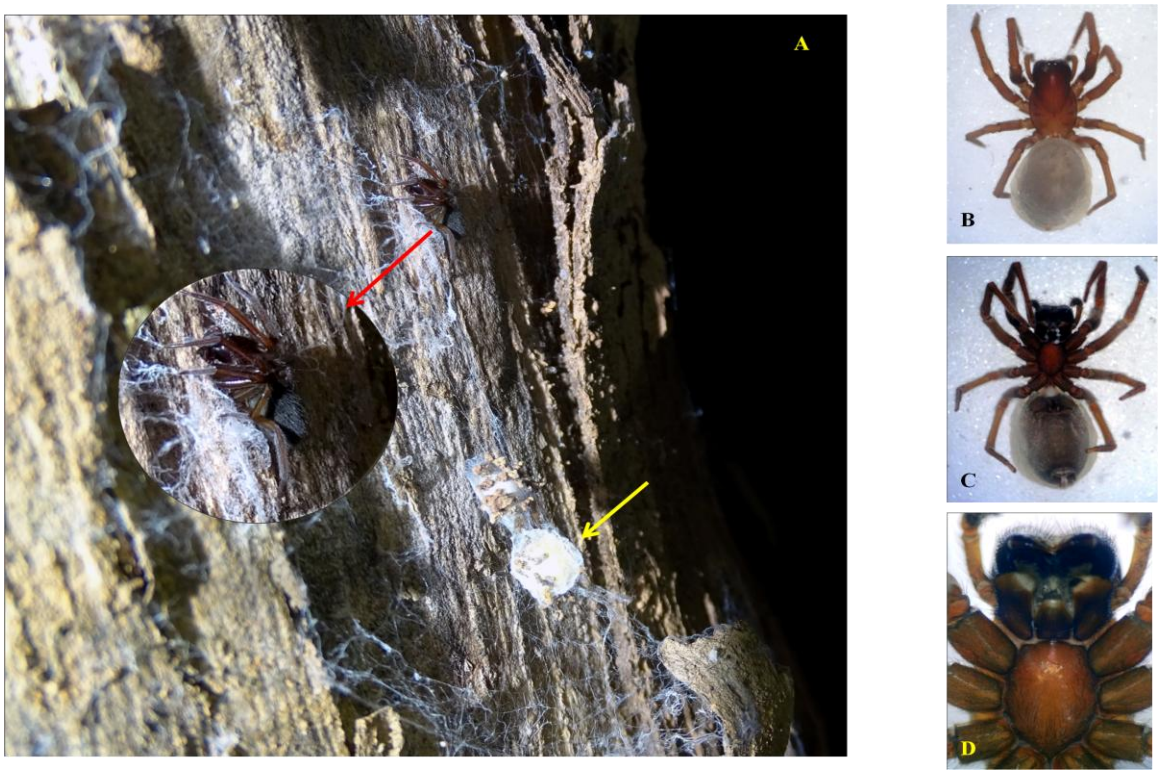


Image 3. *Pandava laminata,* Female, Habit
A - cribellate web of P. laminata under the bark of tree and an inset picture of spider habit (red arrow), egg sac (yellow arrow); B - dorsal view; C - ventral view; D - sternum, maxillae, labium

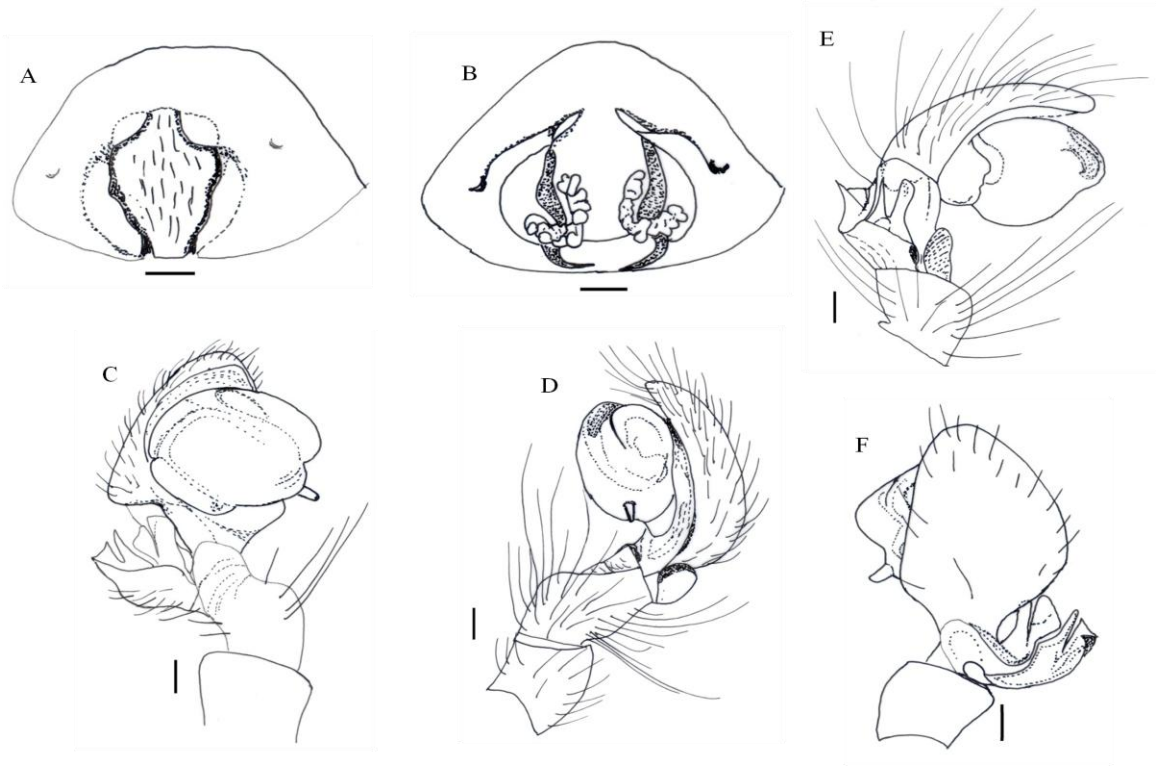


Image 4. *Pandava laminata*, A-B female epigyne, C-F male palp
A - external view; B - internal view; C - ventral view; D - retrolateral view; E - prolateral view; F - dorsal view. Scale=0.1mm.

Natural History: The spiders were collected in the month of October from southern tropical dry deciduous forest of the Jambughoda Wildlife Sanctuary, Gujarat. They were found under the bark on a tree trunk and preferred, darker barks to camouflage with the surrounding. These spiders could be easily spotted by the presence of cribellate, short, sticky, irregular web extending from their nest under the bark on the tree trunk. The web extensions patches on the tree trunk were about 50–80 mm in length. Under the bark in the middle of the web there was a hollow space surround by plain sheet of web in which the spider rested. The insects that entered under these bark in search of hiding place or wander near web were caught by these spiders. Exuvia of coleopteran and lepidopteran were found entangled in their web.

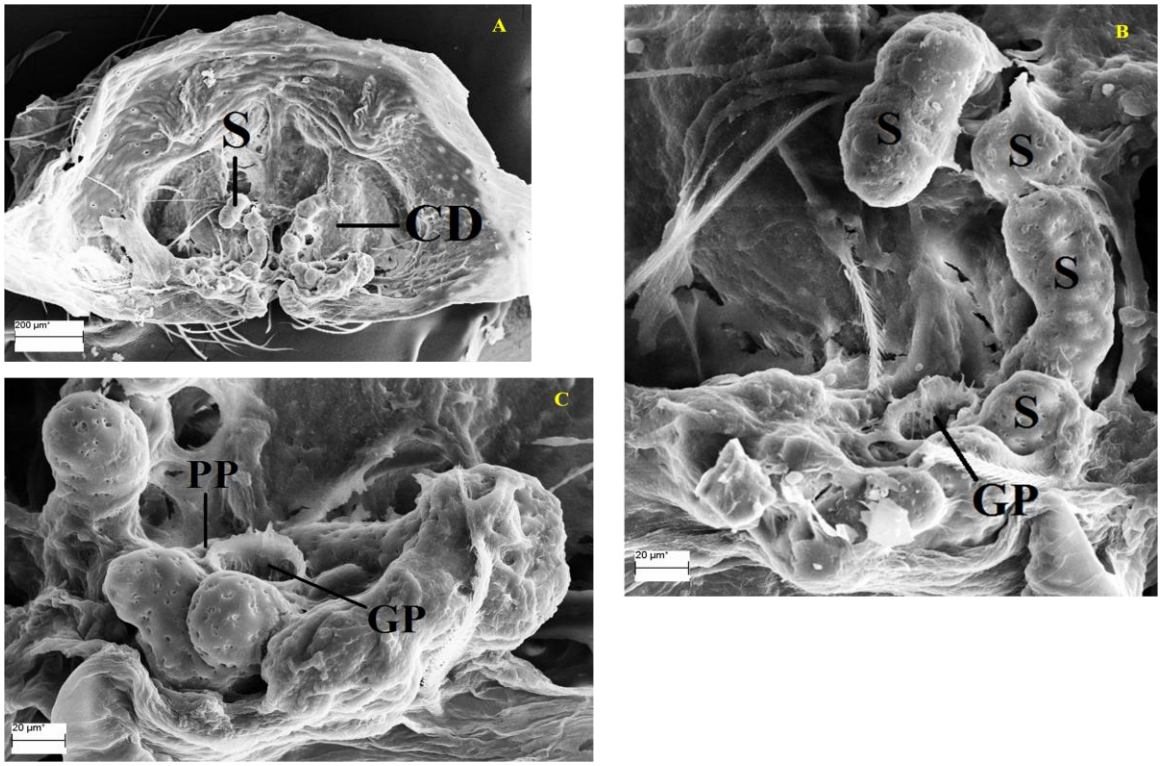


Image 5. Epigyne of *Pandava laminata*, SEM Images
A - internal view; B - vulva-right spermathecae; C - vulva-left spermathecae showing primary pore and giant pore

3.3.2 First record of Genera/species from Gujarat

16 species of spiders are recorded for the first time from Gujarat. Below given is the list of all the new recorded spider species from Gujarat (Table 38):

Table 38. New records from Gujarat

Sr. No.	Family	Scientific Name	Previous Records*
1.	Araneidae	*Gea subarmata* Thorell, 1890	India, Bangladesh to Philippines, New Guinea
2.		*Lipocrea fusiformis* (Thorell, 1877)	India to Japan, Philippines, Sulawesi

Sr. No.	Family	Scientific Name	Previous Records*
3.		*Poltys columnaris* Thorell, 1890	India, Sri Lanka, Sumatra, Japan
4.		*Poltys nagpurensis* Tikader, 1982	India
5.	Clubionidae	*Clubiona foliata* Keswani & Vankhede, 2014	Maharashtra, India
6.	Ctenidae	*Ctenus narashinhai* Patel & Reddy, 1988	India
7.	Eutichuridae	*Cheiracanthium inornatum* O. Pickard-Cambridge, 1874	India
8.	Hersiliidae	*Murricia hyderabadensis* Javed & Tampal, 2010	Andhra Pradesh, India
9.	Pisauridae	*Hygropoda mahendriensis* Vankhede, Keswani & Rajoria, 2013	Maharashtra, India
10.		*Nilus phipsoni* (F. O. Pickard-Cambridge, 1898)	India to China, Indonesia
11.		*Pisaura podilensis* Patel & Reddy, 1990	India
12.	Salticidae	*Myrmarachne tristis* (Simon, 1882)	Libya to India
13.	Stenochilidae	*Stenochilus hobsoni* O. Pickard-Cambridge, 1870	India
14.	Tetragnathidae	*Tylorida ventralis* (Thorell, 1877)	India to Taiwan, Japan, New Guinea
15.	Theridiidae	*Yaginumena maculosa* (Yoshida & Ono, 2000)	zerbaijan, Abkhazia, India, China, Japan
16.	Uloboridae	*Zosis geniculata* (Olivier, 1789)	Pantropical in distribution

*Information based on World Spider Catalog (Catalog, 2015)

Out of these 16 spider species, *Hygropoda mahendriensis* Vankhede Keswani & Rajoria, 2013, which was described from Mahendri Forest, Maharashtra was placed under nomen nudem due to lack of designation of type specimens and diagnosis in the original description (Vankhede et al., 2013 ; Catalog, 2015). For which we assign type specimens from Gujarat along with diagnosis and revised description for the species which will validate the species.

Taxonomy

Hygropoda mahendriensis Vankhede, Keswani & Rajoria, 2013

Hygropoda mahendriensis Vankhede, Keswani & Rajoria, 2013: 53, f. 1A-J, 2A-G. Assigned as nomen nudum (Catalog, 2015).

Type material

Holotype: WILD-14-ARA-1277, female, 7.ix.2014, Katkoi, Jambughoda Wildlife Sanctuary, Gujarat, India (22˚23'51.4"N & 73˚37'16.1"E; 175m), coll. Reshma Solanki and Kartik Upadhyay.

Allotype: WILD-14-ARA-1276, male, same data as in holotype.

Paratypes: WILD-14-ARA-1278, WILD-14-ARA-1279, 2 females, WILD-14-ARA-1293, 1 male, same data as in holotype.

Diagnosis: The male and female specimens of *H. mahendriensis* from Gujarat are similar to *Hygropoda higenaga* (Kishida 1936) in body shape and coloration, but males differs from the latter species by having median apophysis with two hooked finger like projections at the tip, embolus elongated and broader at the base, tegelum spear shaped and conductor twisted terminally. Whereas female epigynum of *H. mahendriensis* resembles *H. higenaga* by the general external shape and median field of epigynum but differed from the latter species by having narrow distal part which forms U shape with deep concavity, two sclerotised spermathecae bulged outwards and both head and base of spermathecae are round in shape.

Description of Holotype female (WILD-14-ARA-1277, 1278, 1279) (Image 6: A; Image 7: A-C) - Total length: 10.34. Carapace 4.27 long, 3.87 wide; Abdomen 6.07 long, 2.93 wide. Eye diameters and inter distances: AME 0.33; ALE 0.27; PME 0.33; PLE 0.40; AME–AME 0.20; AME–ALE 0.13; PME–PME 0.40; PME–PLE 0.33; AME–PME 0.14; ALE–PLE 0.47. Chelicerae 1.87 long. Sternum 1.87 long, 2.00 wide; Endite 1.60 long, 1.07 wide; Labium 0.93 long, 0.73 wide. Leg formula–1423. Leg spines: I fe d2 p4 r6, pa p2 r1, ti d1 p6 r6, mt p5 r5; II fe d5 p5 r5, pa r2, ti d2 p5 r6 v5, mt p5 r5 v2; III fe d2 p4 r3, pa p1, ti d2 p6 r7, mt d2 p5 r6; IV fe d3 p5 r4, pa d2 p1 r2, d1 p6 r7, mt p7 r7. Carapace longer than wide, slightly narrowed anteriorly, brown in color with two pairs of white longitudinally radiating bands. Carapace margins light brown in color with hairs at the margins. Cephalic groove covered with one median dark brown band which gets bifurcated at the anterior part of abdomen, making an elongated triangular shape covering half of abdomen. Eyes black in color, anterior row of eyes slightly recurved whereas posterior row of eyes strongly recurved. Chelicerae longer then wide covered with long and short hairs. Chelicerae with three retromarginal and three promarginal teeth. Sternum almost heart shape with anterior margin almost straight, light-brown in color, uniformly covered with fine hairs. Endites brown in color, longer than wide, broader apically, narrow at the base. Labium longer than wide, apically semicircular in shaped, light-brown in color, and marginal tip of labium covered with unequal hairs. Abdomen elongated, longer than wide, broader anteriorly, tapering near spinnerets. Three pairs of spinnerets, anterior pair of spinnerets shorter than median and posterior spinnerets. Legs uniformly light-brown in color, presence of spines on femur, patella, tibia and metatarsus. Tarsi of leg I and II flexible and longer than the usual size. Tarsi with three claws. Externally, epigynum covered with fine hairs, Epigynal rim longer than wide, median field of epigynum broad V shaped at the anterior margin, narrowing distally to form U shape deep concavity. Internally two sclerotised spermathecae bulged outwards; both head and base of spermathecae are round in shape. Copulatory duct short and solid. Fertilization duct short and slender.

Table 39. Morphometry of legs and Palp of female *Hygropoda mahendriensis* (WILD-14-ARA-1277) from Jambughoda Wildlife Sanctuary, Gujarat.

	Femur	**Patella**	**Tibia**	**Metatarsus**	**Tarsus**	**Total**
LEG I	9.50	2.62	8.90	9.75	8.00	38.77
LEG II	7.37	2.25	6.12	6.37	4.90	27.01
LEG III	4.25	1.62	3.00	3.62	1.75	14.24
LEG IV	8.00	2.00	6.25	7.00	4.37	27.62
PALP	2.40	1.07	1.00	–	1.80	6.27

Description of allotype male (WILD-14-ARA-1276, 1293) (Image 6: B; Image 7: D-H; Table 40) - Total length 9.35. Carapace 4.29 long, 3.59 wide; Abdomen 5.06 long, 2.12 wide. Eye diameters and inter-distances: AME 0.29; ALE 0.23; PME 0.35; PLE 0.41; AME–AME 0.18; AME–ALE 0.12; PME–PME 0.35; PME–PLE 0.23; AME–PME 0.16; ALE–PLE 0.41. Chelicerae: 3.00 long; Sternum 2.18 long, 1.70 wide; Endite 2.00 long, 0.88 wide; Labium 1.65 long, 0.82 wide. Leg formula–1423. Leg spines: I fe d2 p3 r5, pa p2 r1, ti p6 r5, mt p1r5; II fe d1 p4 r4, pa p2 r1, ti d2 p5 r5 v1, mt p4 r5; III fe d1 p3 r3, ti d2 p5 r6, mt d3 p3 r6; IV fe d3 p5 r2, pa r1, ti d1 p7 r5, mt d1 p6 r6. Carapace, eye arrangement, chelicerae, sternum, endites, labium and abdomen similar as in female. Abdomen slightly shorter than female. Legs, palp and chelicerae slightly longer than female. Chelicerae with three retromarginal and three promarginal teeth with larger space in-between. Fangs longer in males as compared to females with fine serration on the margin. Padipalp with cymbium elongated and tapering apically with cavity in the middle, entire cymbium covered with hairs from outer side. Tibia short as compared to patella with single pointed tibial apophysis broader at the base. Median apophysis hooked at the tip with two fingers like projections. Embolus elongated, broader at the base, tegelum round white spear shaped. Conductor and distal apophysis membranous with former twiddled terminally.

Table 40. Morphometry of legs and Palp of male *Hygropoda mahendriensis* (WILD-14-ARA-1276) from Jambughoda Wildlife Sanctuary, Gujarat.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
LEG I	12.00	2.87	13.25	15.75	10.87	54.74
LEG II	8.45	2.64	7.73	8.20	4.20	31.22
LEG III	4.82	1.20	3.64	4.20	1.73	15.59
LEG IV	8.73	2.27	7.36	8.64	4.90	31.90
PALP	4.6	2.23	1.23	–	2.12	10.18

Image 6. *Hygropoda mahendriensis*, Habit
A - Female resting on leaf; B - Male in hunting position near the bank of stream

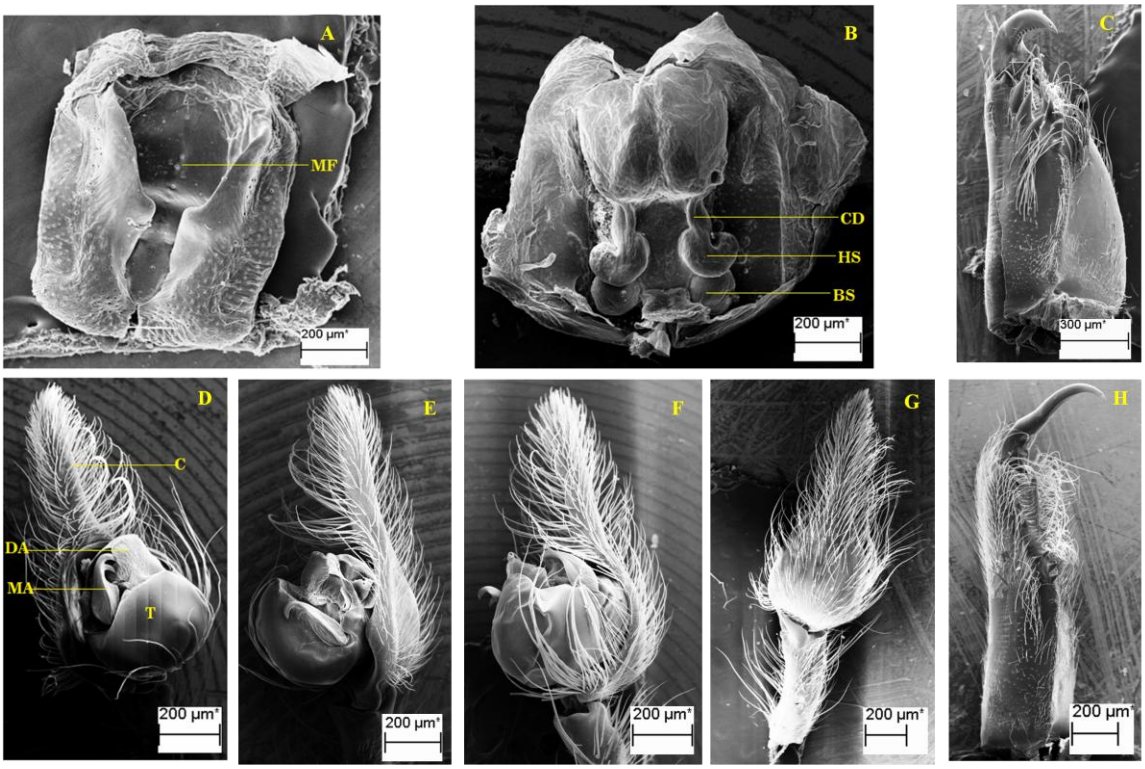


Image 7. *Hygropoda mahendriensis*, SEM Images
A-C female epigyne & chelicerae, D-H male palp & chelicerae
A - external view; B - internal view; C - left chelicera of female, retrolateral view ; D - ventral view; E - retrolateral view; F - prolateral view; G - dorsal view; H - left chelicera of male, retrolateral view

Natural History: Adult males and females of *H. mahendrinesis* were collected in the month of July–November 2014 from the southern tropical dry deciduous forest of Jambughoda Wildlife Sanctuary, Gujarat. They were found abundant near the stream flowing through the Sanctuary which remains dry except in rainy season. These spiders were spotted hunting for insects which fall accidently or aquatic insects at the edge of stream. When spiders were disturbed, they immediately climbs up the nearby shrubs and try to camouflage with background by stretching their legs along the stem. Their body color allows them to camouflage with the branches of trees and smalls shrubs around the stream and remained unnoticed till disturbed. They were seen active during dawn and dusk and observed to be feeding on insects which includes Ephemeropteran (mayflies), Odonates larvae, Orthopterans (nymph of Katidids), Coleopternas (aquatic beetles), Dipterans (adult & larvae), lepidopteran (moths) and Hymenopteran (Camponotus compressus) which were found in the stream or accidently fallen into the stream.

3.3.3 New species reported from JWLS

Amongst the 142 species of spiders recorded from Jambughoda Wildlife Sanctuary, six are probably new species, for which the list is given below (Table 41):

Table 41. New species from JWLS

Sr. No.	Family	Spider species
1.	Araneidae	*Singa sp. nov.*
2.	Oonopidae	*Brinolia sp. nov.*
3.	Prodidomidae	*Prodidomus sp. nov.*
4.	Salticidae	*Epocilla sp. nov.*
5.	Theridiidae	*Euryopis sp. nov.*
6.	Zodariidae	*Storena sp. nov.*

3.4 Diversity of spider from JWLS

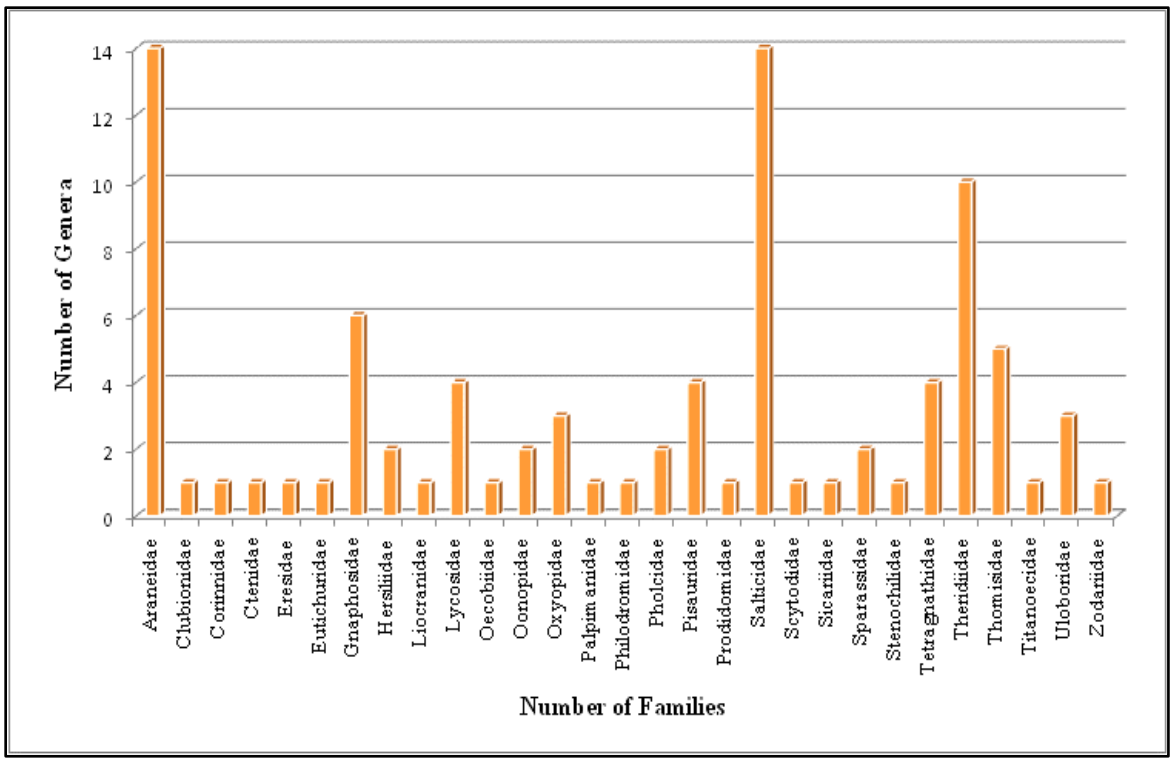
3.4.1 Diversity and Composition of Spiders

Jambughoda Wildlife Sanctuary harbours 148 species of spiders belonging to 90 genera and 29 different families (Graph 1 & 2). Amongst these 29 families, the most dominant family was Araneidae (14 genera & 26 species) followed by family Salticidae (11 genera & 12 species), Oxyopidae (3 genera & 9 species), Theridiidae (4 genera & 7 species) and Tetragnathidae (3 genera & 6 species) (Graph 1 & 2). Occurrence of Araneids could be due to mixed vegetation of the forest, which provides enough space to build webs of different sizes and protection from their predators. On the basis of guilt structure the dominant guild was recorded for ground runners followed by foliage runner, ambushers, orb-weavers, stalkers, sheet-web builders and space web builders (Graph 3).

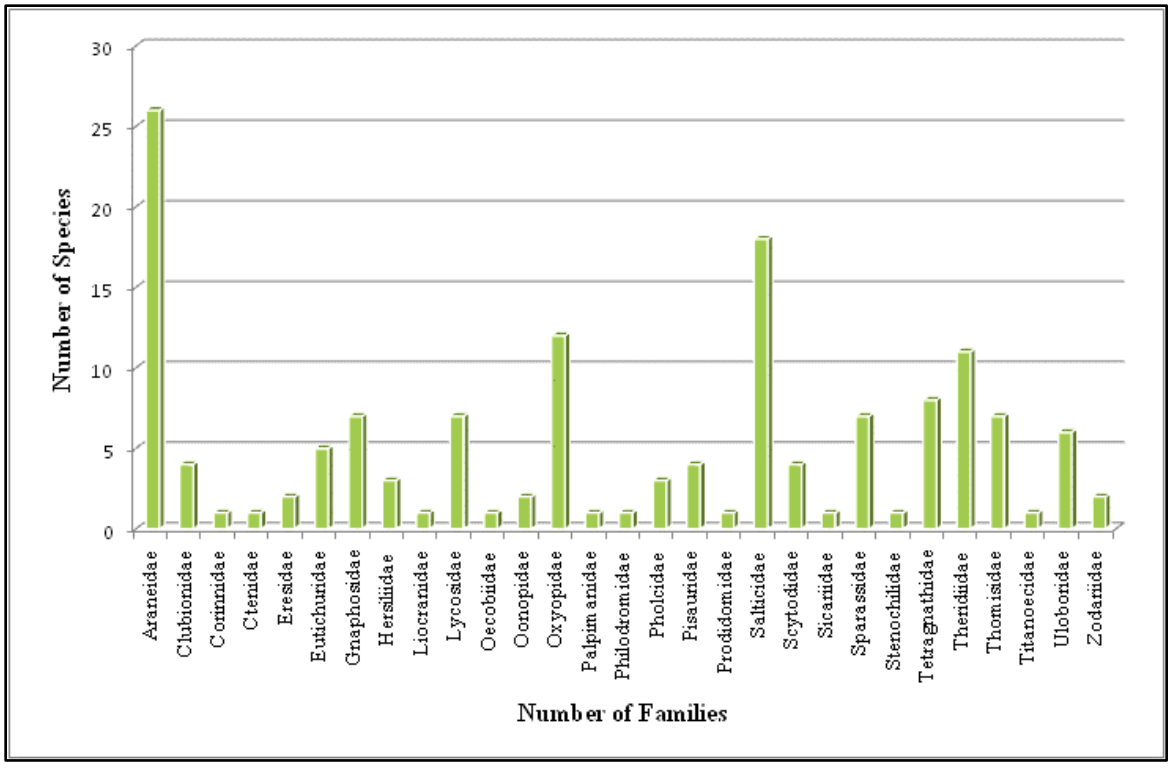
In case of four sub-sites the maximum diversity of spiders was recorded in Natural Forest (28 families, 84 genera & 136 species) followed by Riparian Habitat (17 families, 50

genera & 79 species), Agricultural fields (16 families, 43 genera & 62 species) and Forest Plantation (15 families, 37 genera & 46 species) (Graph 5). Family Pisauridae was documented only from riparian habitat as these spiders needs humid atmosphere for their survival.

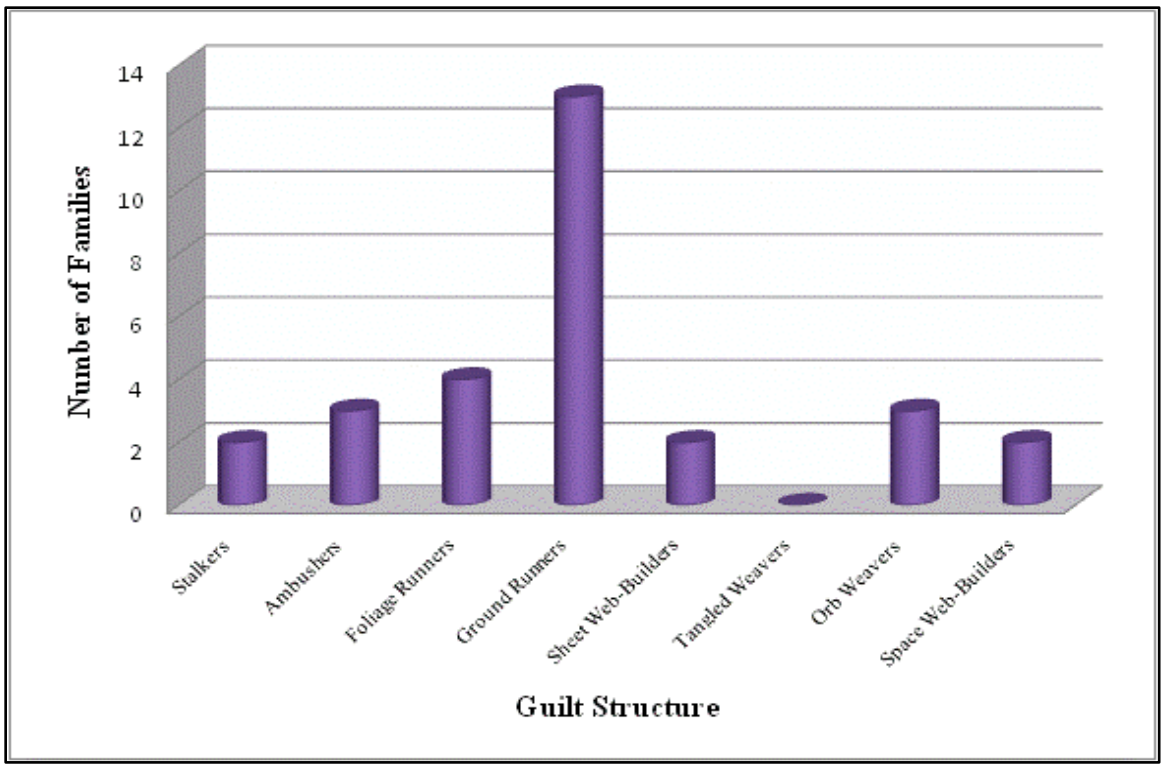
Out of 16 families from agricultural fields the maximum family diversity of spiders was observed in castor, corn, cotton and pigeonpea (16 families each) and minimum family diversity was observed in paddy fields. The maximum generic diversity of spiders was recorded from corn fields (43 genera) followed by pigeonpea (42 genera), castor (41 genera), cotton (39 genera) and paddy (35 genera). Also the maximum species diversity of spiders was recorded from corn fields (62 species) followed by pigeonpea (55 species), cotton (51 species), castor (50 species) and paddy (47 species) (Graph 4). The higher diversity of spiders in corn fields is due to habitat diversification; also corn provides provisioning of alternative food (pollen) and enhanced habitat resources (Peterson et al., 2010). In case of pegionpea, the plant structure affects the spider's efficiency to locate the insect pests (Shanower & Romeis, 1999). Results also showed that density and diversity of the spider communities has been closely tied to the structural complexity of the local environment. For instance, soil dwelling spiders increase dramatically when the litter layers is enhanced because there are more retreats and hiding places and because temperature and humidity extremes are moderated. Species richness and diversity was high during the month of July to November.



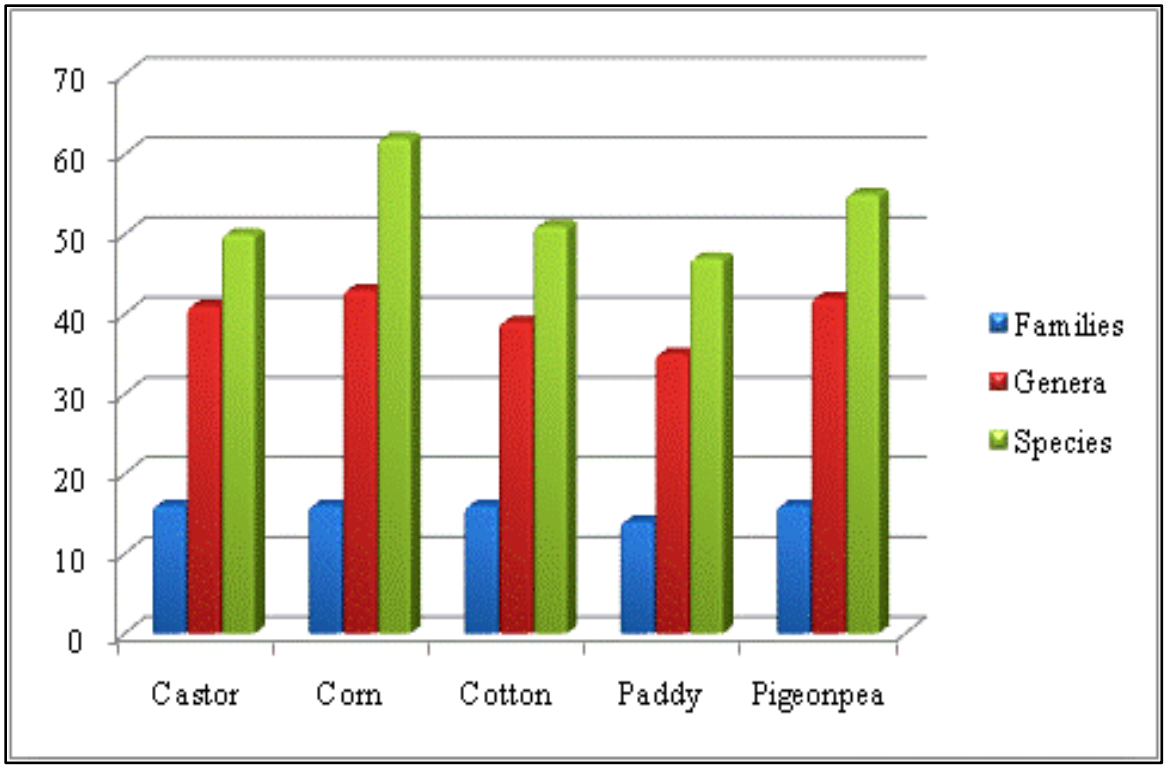
Graph 1. Generic Diversity of Spiders from JWLS



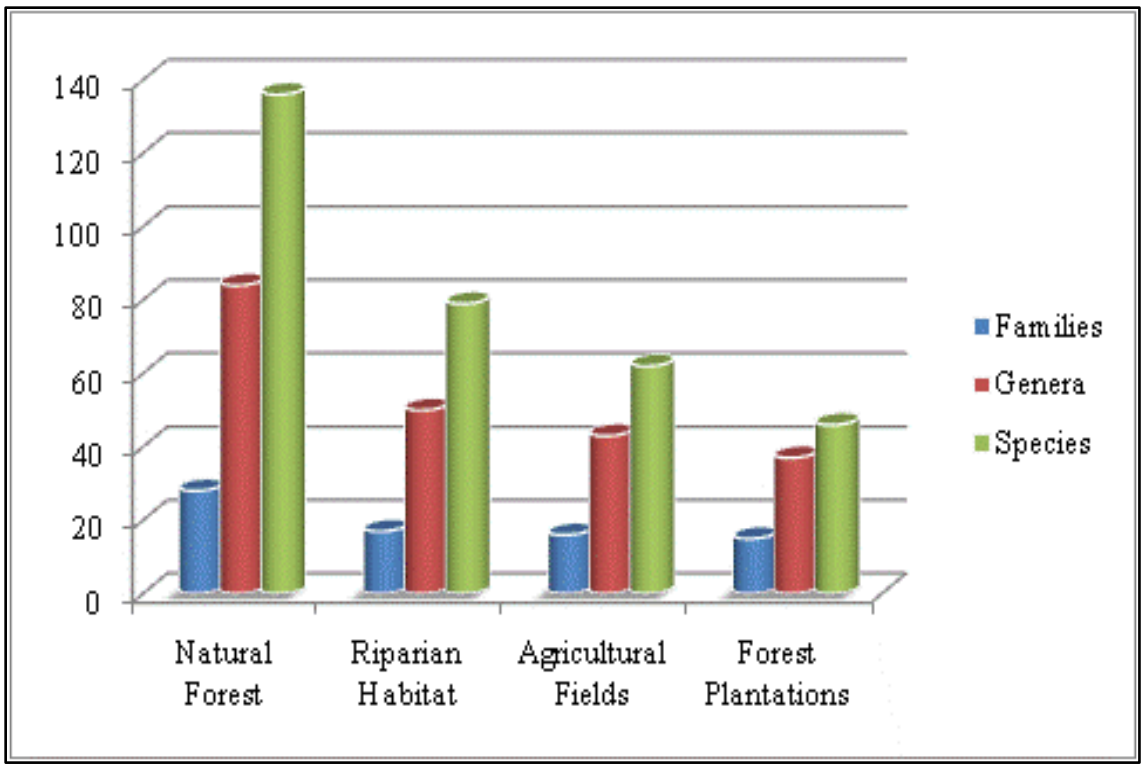
Graph 2. Species Diversity of Spider from JWLS



Graph 3. Guilt Structure of Spiders from JWLS



Graph 4. Diversity of spiders from five major agricultural fileds of JWLS



Graph 5. Diversity of spiders from four sub-sites in JWLS