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## Spider Faunal Diversity of Barasat and Basirhat, 24 Parganas, West Bengal, India

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### ABSTRACT

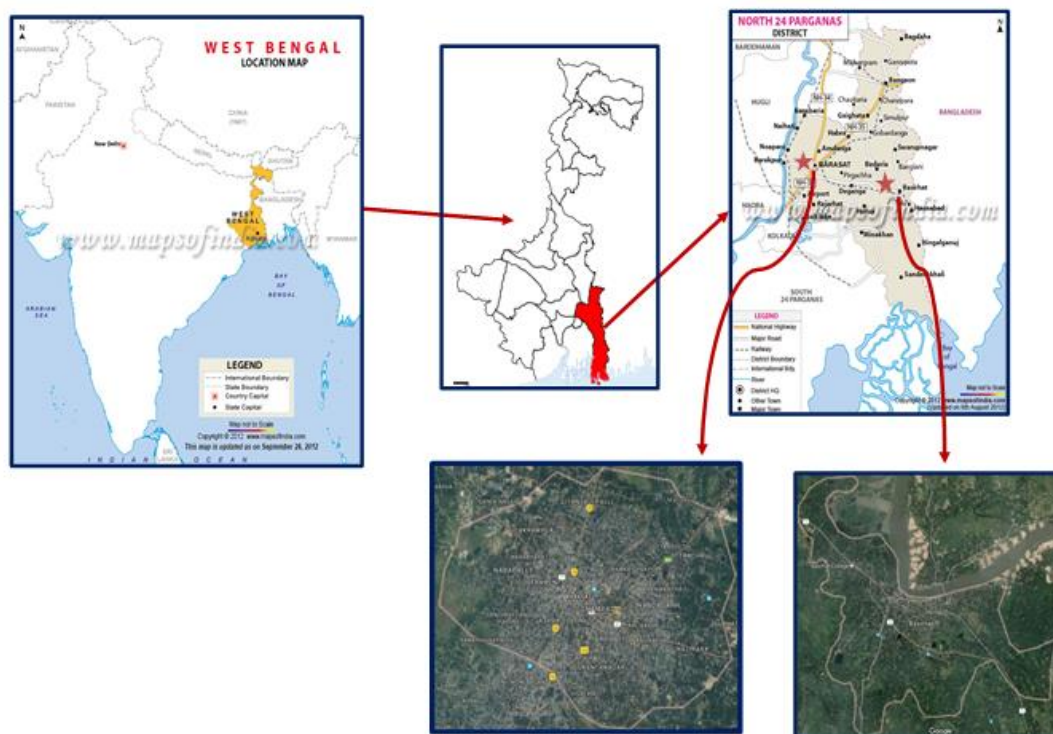
The present study is on the spider fauna of Barasat and Basirhat of North 24 Parganas, West Bengal, India. A total of 23 species belonging to 20 genera and 11 families are sampled during the period August 2016 to July 2017. These include the newly recorded species, *Anepsion maritatum* (O.P. Cambridge) from the state. The dominant guild is constituted by the Orb web weavers (30.43%). Analysis of their zoogeographical distribution reveals that the fauna apart from being Oriental also includes some Australian (23%), Palaearctic (21.73%) and Ethiopian, Nearctic and Neotropical (each 17.39%) elements. Spiders are mostly prevalent during Postmonsoon (82.60%), followed by Premonsoon (60.86%) and Monsoon (47.82%) which is in conformity with the incidence of the insect species. Two species namely *Eriovixia excelsa* (Simon) and *Leucauge decorata* (Blackwall) are recorded throughout the period of survey. All the diversity indices are higher in case of Basirhat as compared to Barasat. An overall negative impact of urbanization on spider diversity, distribution and abundance is evidenced from the present study. Ranking sequence of the most abundant species (six) in descending order are: *Leucauge decorata* (25.68%) > *Eriovixia excelsa* (19.13%) > *Pholcus phalangioides* (11.48%) > *Plexippus paykullii* (8.74%) > *Anepsion maritatum* (7.10%) > *Cyrtophora cicatrosa* (6.56%). Sex ratio (♀ : ♂) is about 12 : 1. Availability of food/season and/or cannibalism may be the factors for female dominated society.

**Keywords:** Spiders, New record, Distribution, Diversity Indices, Barasat, Basirhat, North 24 Parganas, West Bengal, India

## 1. INTRODUCTION

Spiders are one of the diverse and functionally important predators regulating the terrestrial arthropod populations. They have immense potential in the natural ecosystem like : they are omnipotent or ubiquitous; numerous and dominant; generalist predators in both agricultural and natural ecosystem; exert considerable top down control; potential to both lower and stabilize herbivorous insect pest population and acting as excellent biological pest management candidate; have special features of predatory behaviour : ability to kill prey even in their absence by the web only, mortality of non-consumed prey in the web and wasteful killing or partial consumption of prey by hunting and have specific adaptations for matching with the background such as- leaves, flowers, twigs, grass, bark, etc. As a potential bioresource agent spider silk could replace Kevlar and be used in bullet-proof clothing, weather-resistant light weight clothing, ropes, nets, seat belts, parachutes, rust-free panels on motor vehicles or boats, biodegradable bottles, bandages and surgical threads, artificial tendons or ligaments, supports for weak blood vessels. Spider venom (neurotoxins) now a days are used in developing pesticides, potential life saving drugs for cardiac diseases (proteins involved: GSMtx 2 & 4) and neural diseases (protein involved: HF7) limit brain damage of stroke victim. Again spiders as such are used in homeopathic medicines (tincture prepared by putting the living spider into absolute alcohol). Despite their fundamental roles in the natural ecosystem and in the field of biotechnology, they have largely been ignored in conservational studies. The present study is therefore carried out to explore the spider faunal diversity of the North 24 Parganas, West Bengal.

### Study Area



**Plate 1. Study Area**

Barasat (22°72' N and 88°48' E) and Basirhat (22°65' N and 88°86' E) (Plate: 1) are located at an average elevation of 4 meters. Global Positioning System (GPS; GPSMAP 76Cx, Garmin, Olathe, Kansas, USA) was used to record the geographic coordinates. The climate of the areas is tropical. These tropical areas are with monsoon as the hallmark (from early June to mid September) receiving an average rainfall of 1579-2000 mm. The weather remains dry during winter and humid during summer (March to early June) (avg. temp. 40 °C). A cool and dry winter ranges from mid November to mid February (avg. temp. 10 °C).

## **2. MATERIALS AND METHODS**



**Using inverted umbrella**



**Visual search**



**Sweeping by net**



**Hand picking**

**Plate 2.** Collection From Different Sites

Survey was conducted during August 2016 to July 2017 in two sites of North 24 Parganas (Basirhat & Barasat). Sampling was done by hand picking, bush beating, sweeping and using inverted umbrella (Plate 2). Samples were killed and preserved in 70% alcohol as per recommendation of Tikader (1987) and Barrion & Litsinger (1995). The materials were studied using Stereo Zoom Binocular Microscope, model Olympus SZX-16.

The measurements are in millimeters, made with an eye piece graticule. Materials are in the deposition of Post Graduate Department of Zoology, Barasat Government College, Barasat, Kolkata.

### Diversity Indices:

Structural association (% abundance) were also analyzed from pooled data and finally enumerating spider faunal diversity by applying biodiversity indices (Brower et al., 1998).

## 3. RESULTS AND DISCUSSIONS

The present work unfolds the taxonomy of spiders of Barasat and Basirhat, North 24 Parganas, West Bengal, India. A total of 23 species under 20 genera distributed over 11 families could be recorded so far from the study area (Table 1, Fig. 1). These include the newly recorded species, *Anepsion maritatum* (O.P. Cambridge) from the state. Families of the sampled spiders are determined basing on the eye pattern (Fig. 2).

**Table 1.** Distribution of the recorded spider taxa.

Taxa	Distribution				
	Localities		India	Zoogeographical	Seasonal
	Basirhat	Barasat			
<b>1. Family: Araneidae</b>					
◆ <i>Anepsion maritatum</i> (O.P. Cambridge)	+	+	Kerala, West Bengal	OR	PrM, M, PM
<i>Araneus ellipticus</i> (Tikader & Bal)	+	-	Madhya Pradesh, Tamil Nadu, West Bengal	OR	PrM

<i>Cryptophora cicatrosa</i> (Stoliczka)	+	+	Andaman and Nicobar Island, Kerala, Madhya Pradesh, Maharashtra, Punjab, Tamil Nadu, Uttar Pradesh, West Bengal	OR	PrM, PM
<i>Eriovixia excelsa</i> (Simon)	+	+	Andhra Pradesh, Kerala, Tamil Nadu, West Bengal	AS, OR	PrM, M, PM
<i>Neoscona bengalensis</i> Tikader & Bal	+	-	Andhra Pradesh, Kerala, Manipur, West Bengal	OR	PrM, PM
<b>2. Family: Hersiliidae</b>					
<i>Hersilia savignyi</i> Lucas	+	-	Karnataka, Kerala, Gujarat, Maharashtra, West Bengal	OR	PrM, PM
<b>3. Family: Linyphiidae</b>					
<i>Lepthyphantes</i> sp.	+	-	West Bengal	OR	PrM
<b>4. Family: Lycosidae</b>					
<i>Draposa</i> sp. (A)	+	-	West Bengal	OR	PM
<i>Draposa</i> sp. (B)	+	-	West Bengal	OR	PM
<i>Lycosa phipsoni</i> Pocock	-	+	Assam, Maharashtra, West Bengal	OR	M, PM



<b>5. Family: Oxyopidae</b>					
<i>Hamadruas sikkimensis</i> (Tikader)	+	–	Meghalaya, Sikkim, Tripura, West Bengal	OR	PM
<i>Oxyopus shweta</i> Tikader	+	+	Arunachal Pradesh, Kerala, Manipur, Meghalaya, Sikkim, Tripura, West Bengal	OR	PrM, PM
<b>6. Family: Pholcidae</b>					
<i>Pholcus phalangioides</i> (Fuesslin)	+	+	Andhra Pradesh, Kerala, Maharashtra, Madhya Pradesh, West Bengal	AS, ET, NE, NT, OR, PL	M, PM
<i>Pholcus</i> sp.	–	+	West Bengal	AS, ET, NE, NT, OR, PL	M, PM
<b>7. Family: Salticidae</b>					
<i>Menemerus</i> sp.	+	–	West Bengal	OR	PrM
<i>Myrmarachne</i> sp.	+	–	West Bengal	OR	PM
<i>Plexippus paykullii</i> (Audouin)	+	+	Andhra Pradesh, Arunachal Pradesh, Assam, Kerala, Manipur, Orissa, West Bengal	AS, ET, NE, NT, OR, PL	PrM, M, PM
<b>8. Family: Scytodidae</b>					
<i>Scytodes pallida</i> (Doleschall)	–	+	Kerala, West Bengal	AS, OR	M, PM
<b>9. Family: Sparassidae</b>					
<i>Heteropoda venatoria</i> (Linnaeus)	–	+	Cosmopolitan	AS, ET, NE, NT, OR, PL	PrM, M, PM

<i>Pseudopoda straminiosa</i> Kundu, Biswas, Raychaudhuri	–	+	West Bengal	OR	M
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<b>10. Family: Tetragnathidae</b>					
<i>Leucauge tessellata</i> (Thorell)	+	–	Arunachal Pradesh, Assam, Gujrat, Karnataka, Kerala, Maharastra, Manipur, Sikkim, West Bengal	OR	PrM, PM
<i>Leucauge decorata</i> (Blackwall)	+	+	Assam,Bihar, Gujrat,Karnataka, Kerala, Maharastra, Meghalaya, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal	OR, PL	PrM, M, PM
<b>11. Family: Thomisidae</b>					
<i>Camaricus formosus</i> (Thorell)	+	+	Andaman Island, Arunachal Pradesh, Karnataka, Kerala, Maharashtra, West Bengal	OR	PrM, M, PM

♦New Record

AS : Australian, ET : Ethiopian; NE : Nearctic, NT : Neotropical; OR : Oriental; PL : Palaearctic; PrM : Premonsoon; M : Monsoon; PM : Postmonsoon

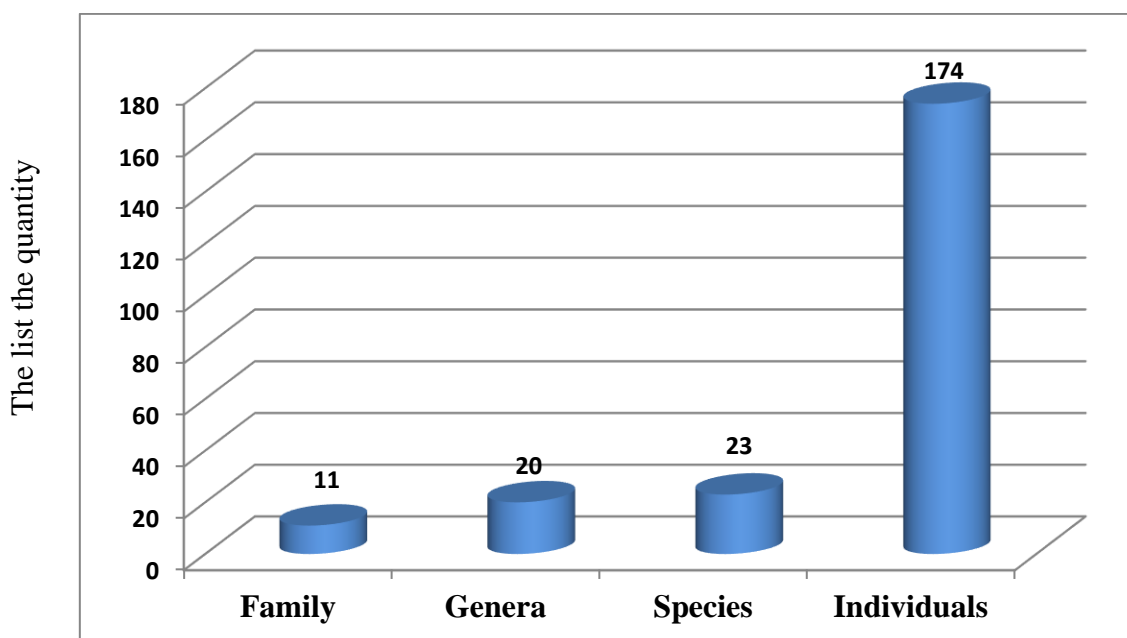
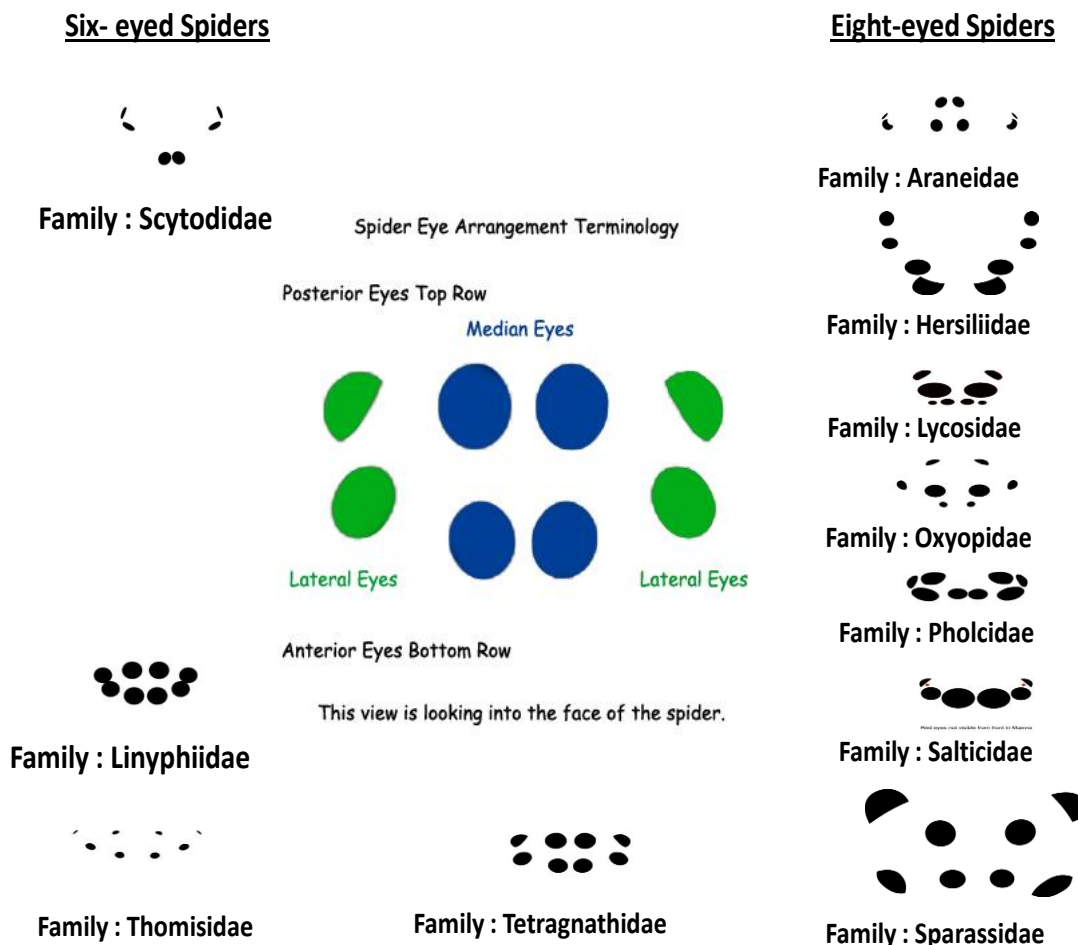


Fig. 1. Spider taxa recorded from study area



**Fig. 2.** Families of the sampled spiders are determined basing on the eye pattern

## TAXONOMY

### Order: Araneae

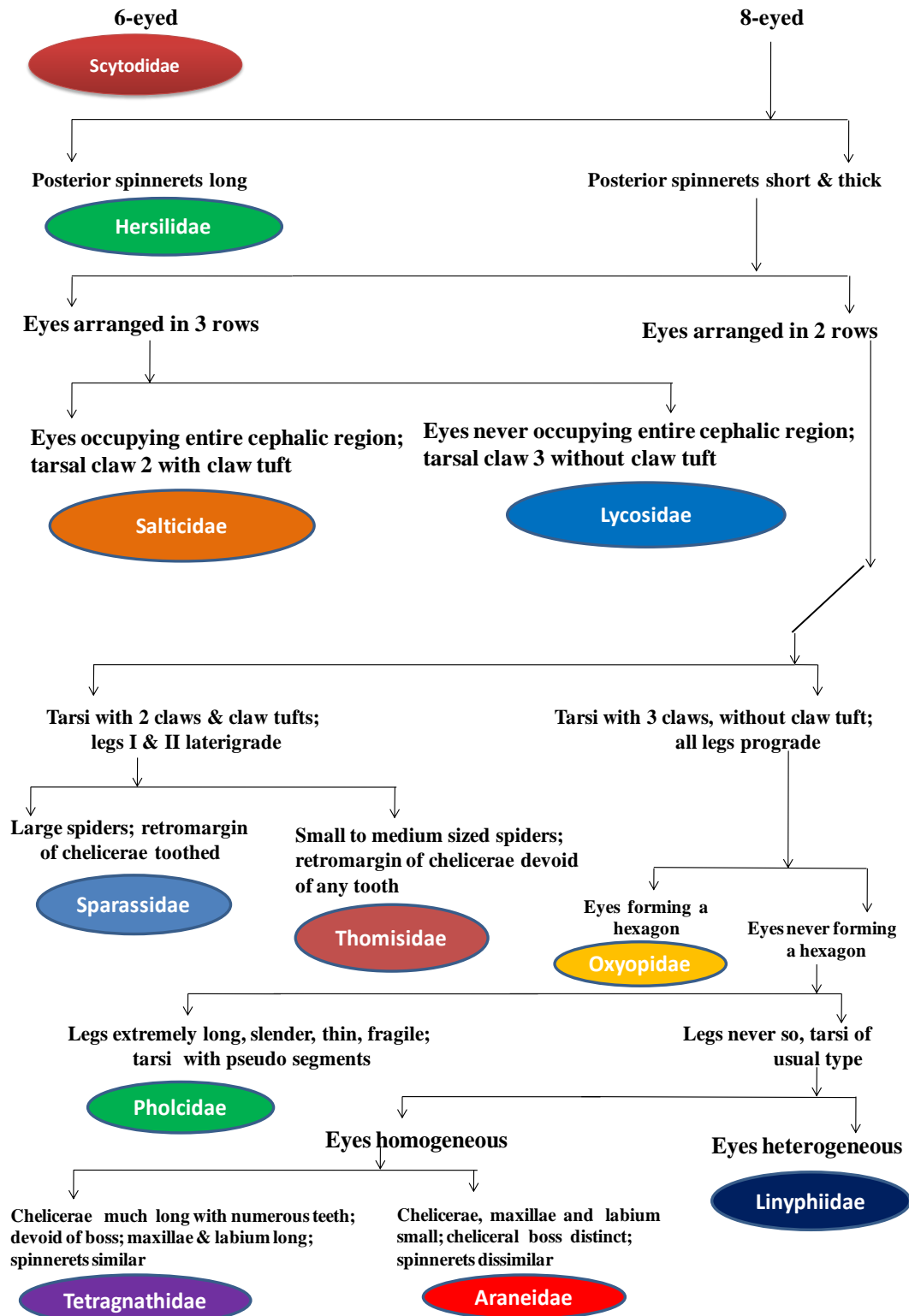
**Diagnosis:** Body divisible into cephalothorax and abdomen, joined by narrow, stalk like pedicel. Eyes 6-8, simple. Legs 4 pairs, jointed. Book lungs 1-2 pairs. Spinnerets 2-3 pairs.

### Suborder: Araneomorphae

**Diagnosis:** Cheliceral fangs diaxial i.e. opposing each other. Book lungs 1 pair. Spinnerets 3 pairs. Cribellum (modified median spinnerets) and colulus (transformed Cribellum) usually present. Sternum without any sigillae.

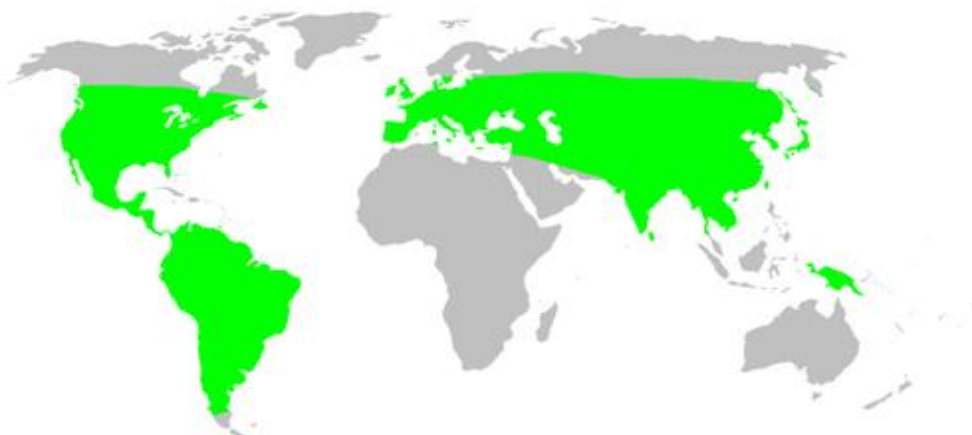


**Key to families:**



**Family: Scytodidae**  
**[Spitting Spiders]**

- **Diagnosis:** Eyes 6, cephalothorax dome shaped
- **Biological Notes:** The scytodids are cursorial, with a specialized way of catching prey. These are the only spiders known to possess prosomal gland that produces gluey silk. The prey is glued to the substrate and paralyzed by the venom.
- **World Distribution Map:**



**Recorded Species**

▪ ***Scytodes pallida* Doleschall**

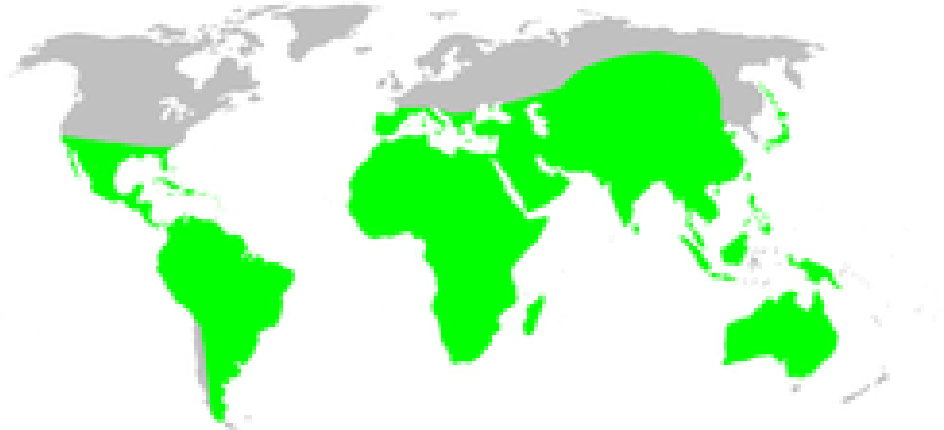
*Scytodes pallida* Doleschall, 1859, Acta Soc. Sci. Ind. Neerl., 5: 48.



- **Size:** 5 mm
- **Habitat:** Dusty and sheltered corner of wood
- **Distribution in India:** Kerala, West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distribution in world:** India, China, Philippines, New Guinea (WSC, 2017)
- **Material examined:** 1♀, Barasat, 15.11.2016, coll. I. Das.

**Family: Hersiliidae**  
**[Two Tailed Spiders]**

- **Diagnosis:** Posterior spinnerets enormously long, longer than or as long as abdomen.
- **Biological Notes:** The members of this family are usually found on tree trunk. Hersiliids are very fast running, active hunting spiders. They usually do not make web, but sometimes make a scanty web with irregular thread. Their brown body often help camouflage with the tree trunk.
- **World Distribution Map:**



**Recorded Species**

▪ *Hersilia savignyi* (Lucas)

*Hersilia savignyi* Lucas, 1836, *Mag. Zool. Guérin*, 6(8): 1-11.



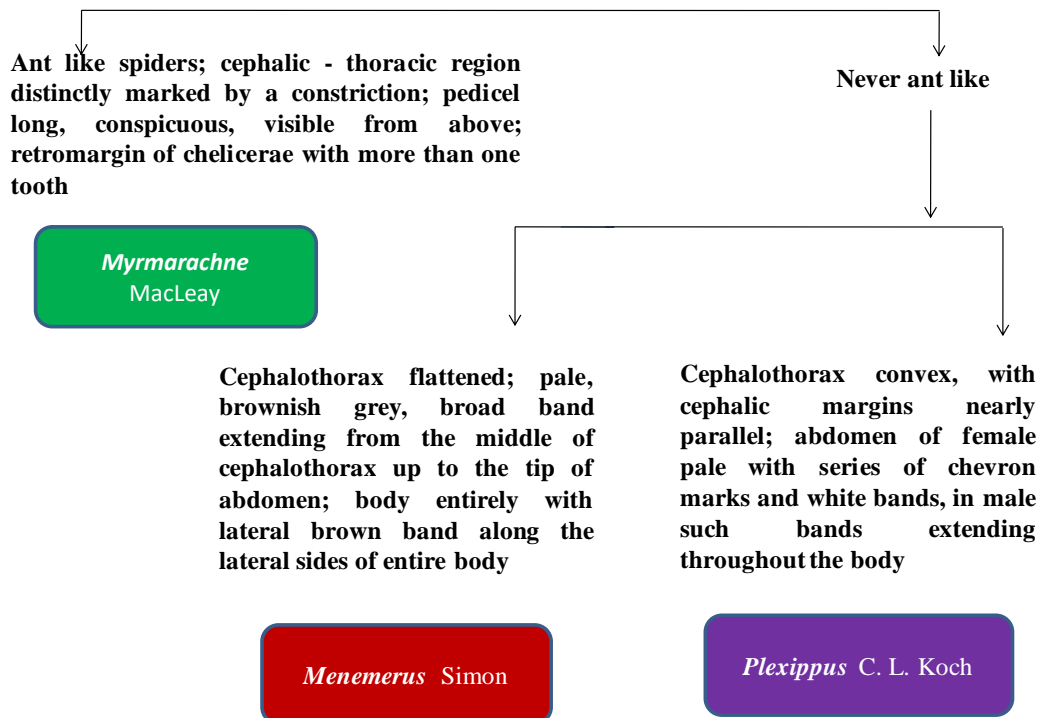
- **Size:** 10 mm
- **Habitat:** Tree trunks
- **Distribution in India:** Gujarat, Karnataka, Kerala, Maharastra, West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distribution in World:** India, Myanmar, Philippines, Sri Lanka (WSC, 2017)
- **Material examined:** 1♀/1♀, Basirhat, 28.10.2016/25.2.2017, coll. I. Das.

**Family: Salticidae**  
**[Jumping Spiders]**

- **Diagnosis:** Eyes 8, arranged in 3 rows, 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> rows 4, 2 and 2 respectively, occupying entire cephalic area, their diameter : Anteromedians > Anterolaterals ≥ Posterolaterals > Posteromedians; tarsal claw 2, with claw tuft.
- **Biological Notes:** The jumping spider have the keenest vision and pursue their prey by stalking, chasing and leaping over it. They can jump a long distance. They make no webs except in which they hide in winter or at the time of molting or laying eggs.
- **World Distribution Map:**



**Key to Genera**



**Recorded species**

**1. *Myrmarachne* sp.**



- **Size:** 7.1 mm
- **Habitat:** Dusty and sheltered corners of wood
- **Distribution in India:** West Bengal
- **Distribution in world:** India
- **Material examined:** 1♂(imm), Basirhat, 25.12.2016, coll. I. Das.

**2. *Menemerus* sp.**



- **Size:** 7.2 mm
- **Habitat:** Dry leaf
- **Distribution in India:** West Bengal
- **Distribution in world:** India

- **Material examined:** 1♂ (imm), Basirhat, 25.4.2017, coll. I. Das.

### 3. *Plexippus paykulli* (Audouin)

*Attus paykullii* Audouin, 1826, Description de l'Egypte, 22: 172.

*Plexippus paykulli* (Audouin), Koch, 1850, Ueb. Ar. Syst., 5: 51.



- **Size:** 6-8 mm
- **Habitat:** Tree trunks, walls of building
- **Distribution in India:** Andhra Pradesh, Arunachal Pradesh, Assam, Kerala, Manipur, Orissa, West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distribution in World:** Afghanistan, Africa, Algeria, America, Australia, Bermuda, Brazil, Canary Island, Celebes, China, Costarica, Crete, Cuba, Egypt, Europe, Fiji, France, Galapagos Island, Gambia, Greece, Hawaii, Hispaniola Island, Indochina, Iran, Italy, Japan, Java, Kenya, Krakatau, Lao, Libya, Malaysia, Malta, Marquesas Island, Myanmar, Nepal, New Hebrides, Palmyra Atoll, Panama, Papua New Guinea, Paraguay, Philippines, Samoa, Saudi Arabia, Senegal, Singapore, Society Island, South Korea, Sri Lanka, Sudan, Suriname, Taiwan, Tonga, Trinidad, Tuamotu Island, Tunisia, United Arab Emirates, USA, Venezuela, Vietnam, Yemen (Metzner, 2017; WSC, 2017).
- **Material examined:** 1♀/1♀, 2♀(imm)/3♀/3♀/1♀/1♀, Barasat, 12.8.2016/25.9.2016/15.10.2016/15.11.2016/15.3.2017/18.5.2017; 1♀/1♀/1♀/1♀, Basirhat, 15.8.2016/20.10.2016/25.12.2016/10.6.2017, coll. I. Das.

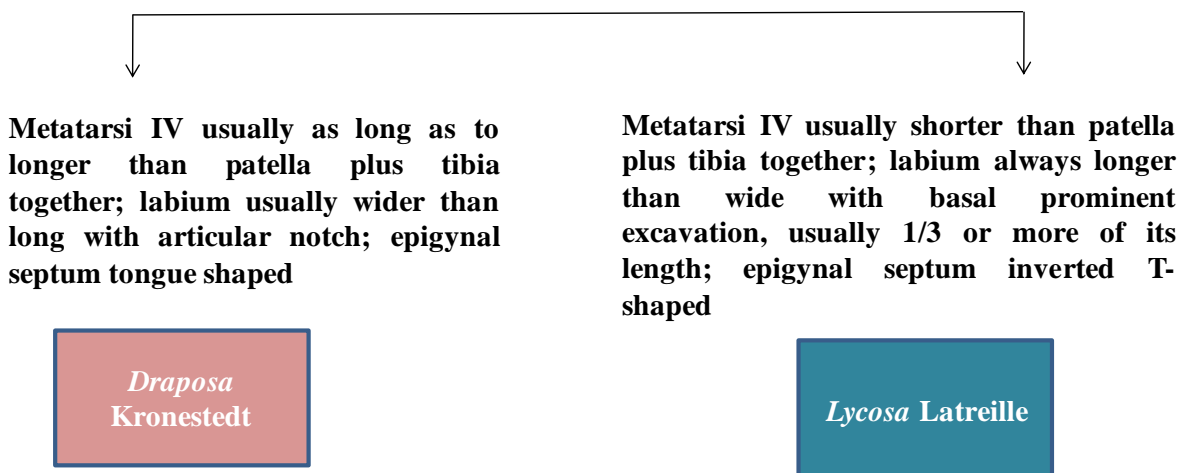


**Family: Lycosidae**  
**[Wolf Spiders]**

- **Diagnosis:** Eyes 8, arranged in 2 rows, anterior row with 4 small eyes, lying in straight or slightly curved line, posterior row with 4 large eyes, strongly recurved, thus forming 3 rows; tarsal claw 3; colulus absent.
- **Biological Notes:** Most of these are nocturnal. Large lycosids make burrows in the ground and others make silken retreats in the grass. They have good vision and their sense of touch is highly developed. Females attach the egg sac to their spinnerets and carry them under their abdomen.
- **World Distribution Map:**



**Key to Genera**



### **Recorded Species**

#### **1. *Draposa* sp. (A)**



- **Size:** 7 mm
- **Habitat:** Grassland
- **Distribution in India:** West Bengal
- **Distribution in World:** India
- **Material examined:** 1♂ (imm), Basirhat, 20.10.2016, coll. I. Das.

#### **2. *Draposa* sp. (B)**



- **Size:** 5 mm
- **Habitat:** Grassland

- **Distribution in India:** West Bengal
- **Distribution in World:** India
- **Material examined:** 1♀ (imm), Basirhat, 20.10.2016, coll. I. Das.

### **3. *Lycosa phipsoni* Pocock**

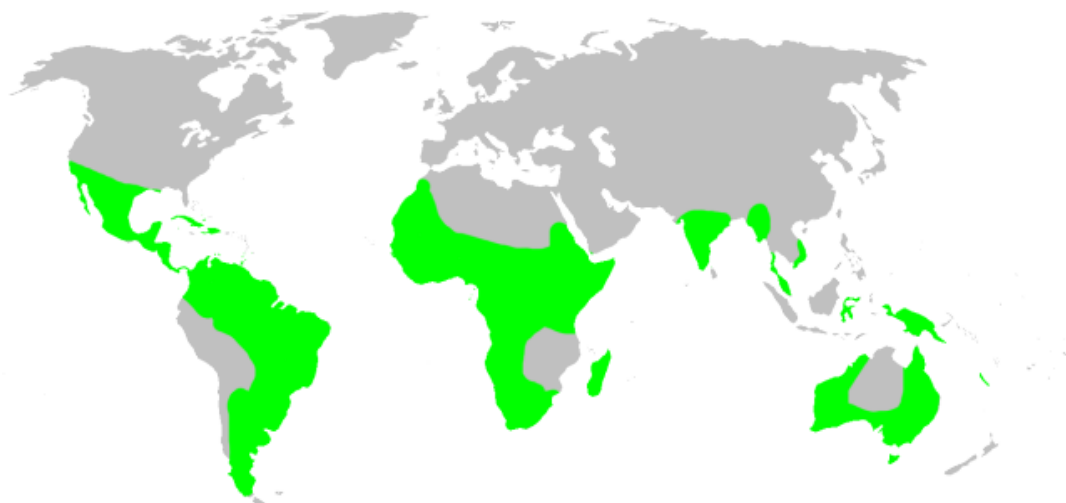
*Lycosa phipsoni* Pocock, 1899, J. Bombay nat. Hist. Soc., 12 : 751.



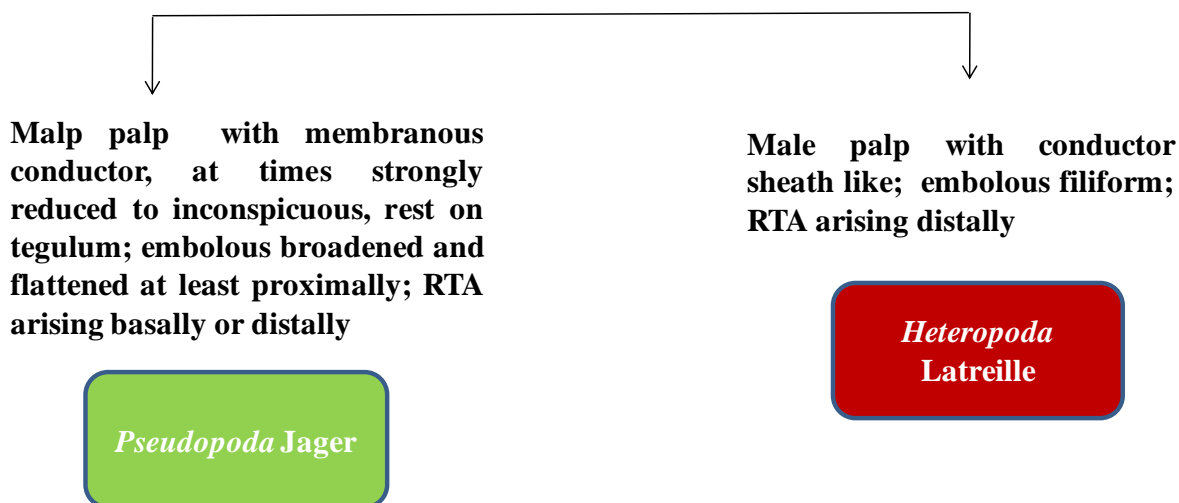
- **Size:** 9 mm
- **Habitat:** Grassland
- **Distribution in India:** Assam, Maharashtra, West Bengal
- **Distribution in World:** China, Myanmar, Taiwan (Tikader & Malhotra, 1980, WSC, 2017)
- **Material examined:** 1♀ /1♀, Barasat, 25.9.2016/15.11.2016, coll. I. Das.

### **Family: Sparassidae [Giant Crab Spiders]**

- **Diagnosis:** Large spiders; metatarsal apex with soft trilobed membrane; retromargin of chelicerae toothed; epigynal lateral lobes distinct, at least legs 1 and 2 laterigrade.
- **Biological Notes:** These spiders do not spin webs, only build silk retreats. Females carry egg sac underneath the body by clasping it with their pedipalp. Colour of body and legs provide useful camouflage when they rest on barks.
- **World Distribution Map:**



### Key to Genera



### Recorded Species

1. *Pseudopoda straminiosa* (Kundu, Biswas & Raychaudhuri)  
*Heteropoda straminea* Kundu, Biswas & Raychaudhuri, 1999,  
J. Bombay Nat. Hist. Soc., 96: 98.  
*Pseudopoda straminiosa* (Kundu, Biswas & Raychaudhuri) Jäger, 2014,  
Arthropoda Selecta 23(2): 186.



- **Size:** 2.6 cm
- **Habitat:** Human habitation
- **Distribution in India:** West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distribution in World:** India (WSC, 2017)
- **Material examined:** 1♀/1♀ (imm), Barasat, 25.9.2016/15.11.2016, coll. I. Das.

## **2. *Heteropoda venatoria* (Linnaeus)**

*Araneae venatoria* Linnaeus, 1766, Syst. Nat., 12: 1035.

*Heteropoda venatoria* (Linnaeus), Latreille, 1804, Nouv. Dic. Hist. Nat., 24: 135.

**Male**



**Female**

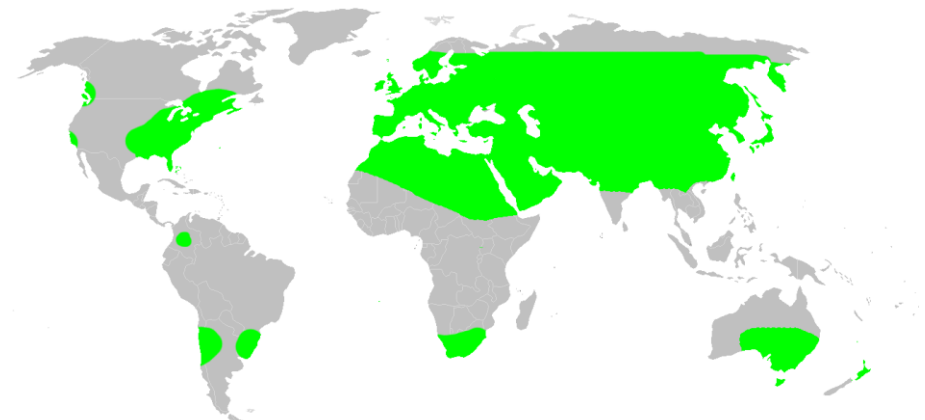




- **Size:** 2.2 to 2.8 cm
- **Habitat:** Human habitation
- **Distribution in India:** Throughout (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015 )
- **Distribution in World:** Cosmopolitan (WSC, 2017)
- **Material examined:** 1♀ (imm), 1♂(imm)/, 1♀, Barasat, 15.11.2017/18.5.2017, coll. I. Das.

**Family: Thomisidae**  
**[Crab Spiders]**

- **Diagnosis:** Small to medium size spiders; metatarsal apex devoid of trilobite membrane; retromargin of chelicerae usually devoid of any tooth; colulus present; tarsi I and II never scopulate.
- **Biological Notes:** The usual habitats of thomisids are leaves, flower or bark. They are mainly active during day time and spin no web.
- **World Distribution Map:**



**Recorded species**

**1. *Camaricus formosus* (Thorell)**

*Camaricus formosus* Thorell, 1887, *Ann. Mus. Civ. Stor. Nat. Genova*, 25: 262.





- **Size:** 4-6 mm
- **Habitat:** Foliage
- **Distribution in India:** Andaman Island, Arunachal Pradesh, Karnataka, Kerala, Maharashtra, West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distribution in World:** Bangladesh, China, India, Indonesia, Myanmar, Philippines (WSC, 2017)
- **Material examined:** 2♀/1♀, Barasat, 15.11.2016/18.5.2017; 2♀, Basirhat, 20.10.2016, coll. I. Das.

**Family: Oxyopidae**

**[Lynx Spiders]**

- **Diagnosis:** Eyes forming a hexagon, by strongly recurved anterior row and procurved posterior row.
- **Biological Notes:** The lynx spiders are so called because of the way in which they hunt prey. Diurnal or nocturnal, chase their prey with great rapidity over herbage and foliage of shrubs and herbs. They make no web for capturing their prey and are good predators.
- **World Distribution Map:**



**Key to Genera**

Anteromedian eyes more than their diameter apart; clypeus and femora usually lined with black band; male palp without tegular lobe and retrolateral margin of cymbium without basal apophysis

*Oxyopes* Latreille

Anteromedian eyes less than their diameter apart or equal; clypeus and femora not so; male palp with tegular lobe; epigyne with a chitinised U shaped rim

*Hamadruas*  
Deeleman-Reinhold

## Recorded Species

### 1. *Oxyopes shweta* (Tikader)

*Oxyopes shweta* Tikader, 1970, *Rec. Zool. Surv. India*, 64: 78.

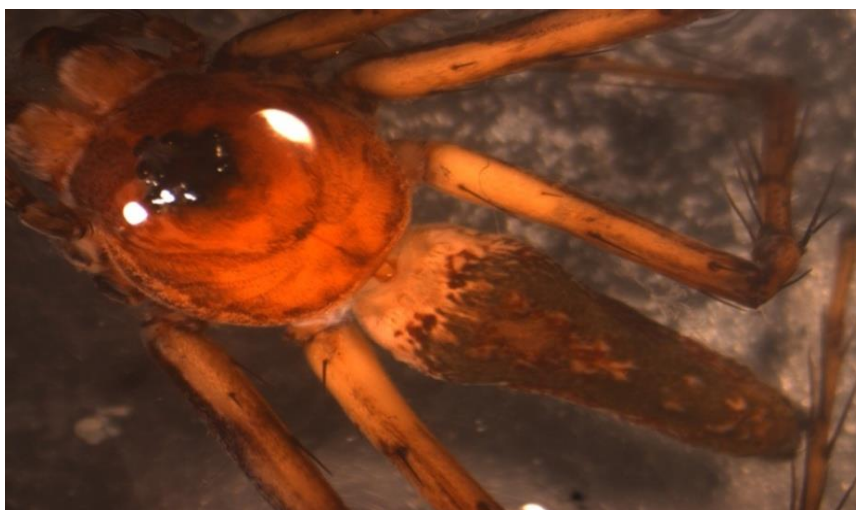


- **Size:** 7 mm
- **Habitat:** Shrub in garden
- **Distribution in India:** Arunachal Pradesh, Kerala, Manipur, Meghalaya, Sikkim, Tripura, West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distribution in World:** China, India (WSC, 2017)
- **Material examined:** 1♀, Barasat, 18.5.2017; 1♂, Basirhat, 25.12.2016, coll. I. Das.

### 2. *Hamadruas sikkimensis* (Tikader)

*Oxyopes sikkimensis* Tikader, 1970, *Rec. Zool. Surv. India*, 64: 76.

*Hamadruas sikkimensis* (Tikader) Deeleman-Reinhold, 2009, *Zool. Med. Leiden*, 83: 693.



- **Size:** 8.5 mm
- **Habitat:** Shrub in garden
- **Distribution in India:** Meghalaya, Sikkim, Tripura, West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distribution in World:** China, India (WSC, 2017)
- **Material examined:** 1♀, Basirhat, 25.12.2016, coll. I. Das.

**Family: Pholcidae**  
**[Daddy Long Leg Spiders]**

- **Diagnosis:** Leg extremely long, slender, thin and fragile, tarsi with pseudo segments.
- **Biological Notes:** Pholcids are sedentary in habit and construct loose tangled webs of different configurations. They build irregular webs in dark places of house, garden, forests etc. in which they hang with back downward. Females carry their cocoon in their mandibles.
- **World Distribution Map:**



**Recorded Species**

**1. *Pholcus phalangioides* (Fuesslin)**

*Aranea phalangoides* Fuesslin, 1775, Verz. schweizerischen Ins., : 61

*Pholcus phalangioides* (Fuesslin) Walckenaer, 1805, Tableau des araneides : 80.



- **Size:** 7-9 mm
- **Habitat:** Within house
- **Distribution in India:** Andhra Pradesh, Kerala, Maharastra, Madhya Pradesh, West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distrbution in World:** Cosmopolitan (WSC, 2017)
- **Material examined:** 1♀, 4♀ (imm)/4♀, 3♀ (imm), 3♂, Barasat, 25.9.2016/15.11.2016; 2♀(imm) /3♀, 1♀ (imm) Basirhat, 23.10.2017/28.10. 2016, I. Das.

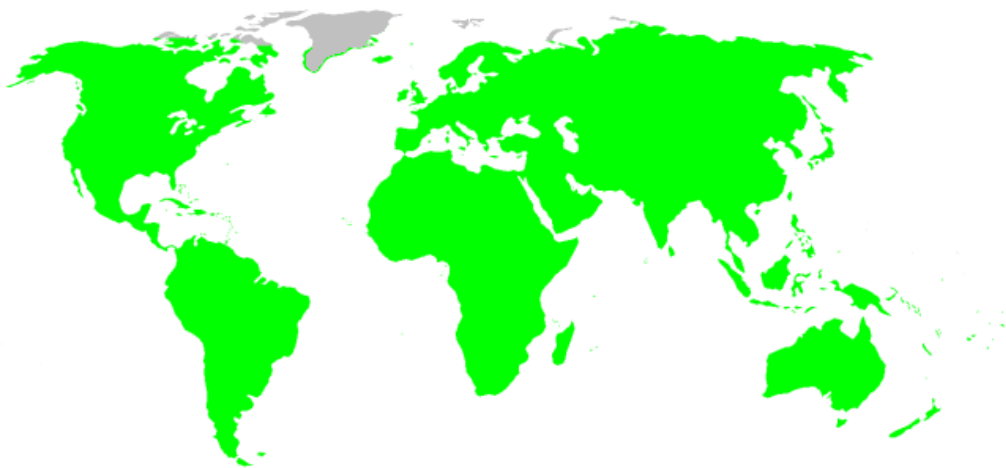
## **2. *Pholcus* sp.**



- **Size:** 9 mm
- **Habitat:** Within house
- **Distribution in India:** West Bengal
- **Distribution in World:** India
- **Material examined:** 1♀ (imm), Barasat, 15.11.2016, coll. I. Das.

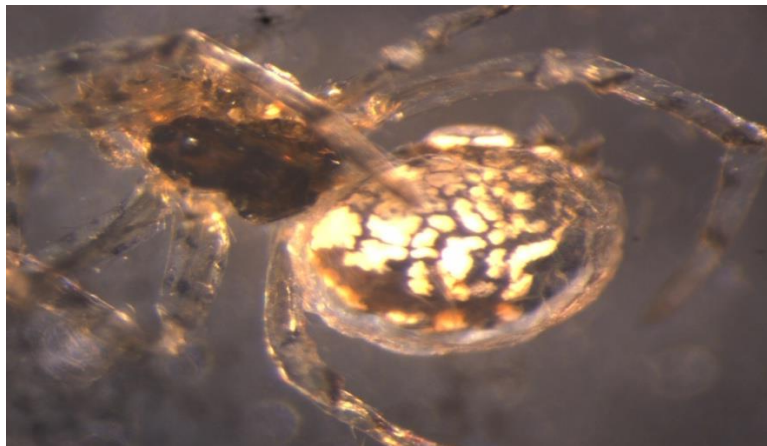
**Family: Linyphiidae**  
**[Sheet Web builders]**

- **Diagnosis:** Small spiders. Cephalothorax variable in shape. Eyes 8, heterogenous, arranged in 2 rows, AME slightly darker. Legs usually slender, tibia and metatarsus with setae, tarsal claw 3. Abdomen usually longer than wide, overlapping cephalothorax, sometimes with characteristics pattern. Epigynum complex, variable, often simple with flat surface modified by groove, pit or notch. Male palp usually lack tibial apophysis.
- **Biological Notes:** Linyphiids spin webs which are flat, dome, or hammock-shaped with isolated threads above the sheet forming scaffolding. The spider hangs upside down under the sheet. Prey is bitten from below through the sheet and is then pulled through the sheet before being consumed.
- **World Distribution Map:**



**Recorded Species**

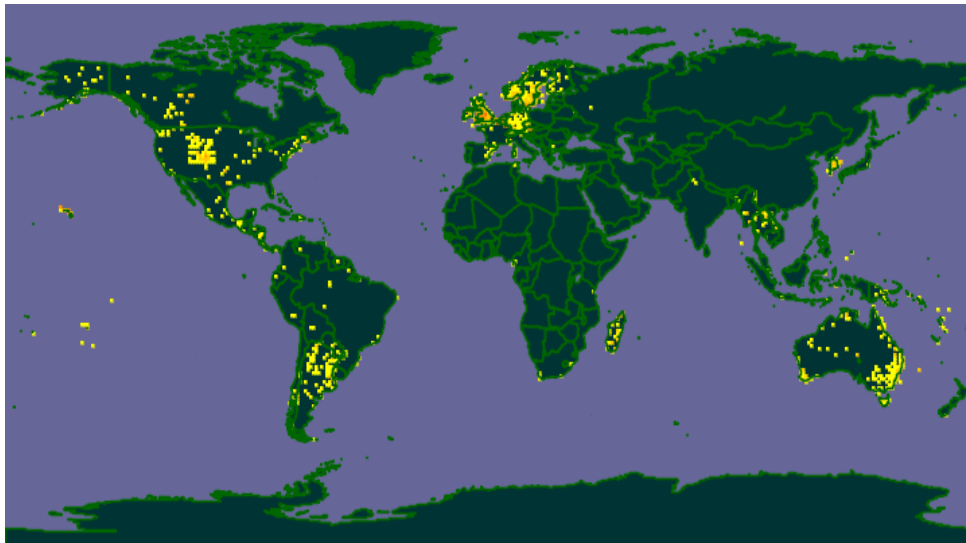
1. *Lepthyphantes* sp.



- **Size:** 4.0 mm
- **Habitat:** Web is attached to fence post
- **Distribution in India:** West Bengal
- **Distribution in World:** India
- **Material examined:** 1♀ (imm), Basirhat, 25.4.2017, coll. I. Das.

**Family: Tetragnathidae**  
**[Long-jawed Orb Weavers]**

- **Diagnosis:** Chelicerae usually long, with numerous teeth, devoid of boss; maxillae and labium long; spinnerets similar; epigynum usually indistinct.
- **Biological Notes:** The webs of these spiders are either inclined or horizontal and of moderate or large size. They are common on plants and other objects in the vicinity of water and some of them occur on grasses in drier places. When at rest on a branch, the 1<sup>st</sup> and 2<sup>nd</sup> pair of legs are stretched directly forward, 4<sup>th</sup> pair backward and the shorter 3<sup>rd</sup> pair embrace the branch. They are one of the good predators of pest insects in the field.
- **World Distribution Map:**



**Recorded Species**

**1. *Leucauge tessellata* (Thorell)**

*Callinethis tessellata* Thorell, 1887, Ann. Mus. civ. stor. nat. Genova, 25: 135.

*Leucauge tessellata* (Thorell), Gravelly, 1921, Rec. Ind. Mus., Calcutta, 22(4): 455.





- **Size:** 12 mm
- **Habitat:** Agricultural field
- **Distribution in India:** Arunachal Pradesh, Assam, Gujarat, Karnataka, Kerala, Maharashtra, Manipur, Sikkim, West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distribution in World:** Bhutan, China, India, Laos, Moluccas, Myanmar, Taiwan (WSC, 2017)
- **Material examined:** 1♀, Barasat, 18.5.2017; 1♀, Basirhat, 23.10.2016, coll. I. Das.

## **2. *Leucauge decorata* (Blackwall)**

*Tetragnatha decorata* Blackwall, 1864, Ann. Mag. Nat. Hist., (3) 14: 44.  
*Leucauge decorata* (Blackwall) Simon, 1906, Ann. Soc. Ent. Fr., 75: 282.



- **Size:** 12-15 mm
- **Habitat:** Agricultural fields

- **Distribution in India:** Assam, Bihar, Karnataka, Kerala, Maharashtra, Meghalaya, Orissa, Sikkim. Tamil Nadu, Uttar Pradesh, West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distribution in World:** Palearctica (WSC, 2017)
- **Material examined:** 1♀/2♀/2♀/5♀/2♀/4♀/1♀/2♀/4♀/1♀, Barasat, 12.8.2016/ 15.10.2016/15.11.2016/10.12.2016/24.1.2017/5.2.2017/18.4.2017/8.5.2017/6.6.2017/ 8.7.2017; 1♀/5♀/3♀/1♀/2♀/3♀/1♀, 1♂/4♀/1♀/1♀ Basirhat, 15.8.2016/ 25.9.2016/ 12.11.2016/25.12.2016/18.1.2017/5.2.2017/8.3.2017/5.5.2017/10.6.2017/11.7.2017, coll. I. Das.

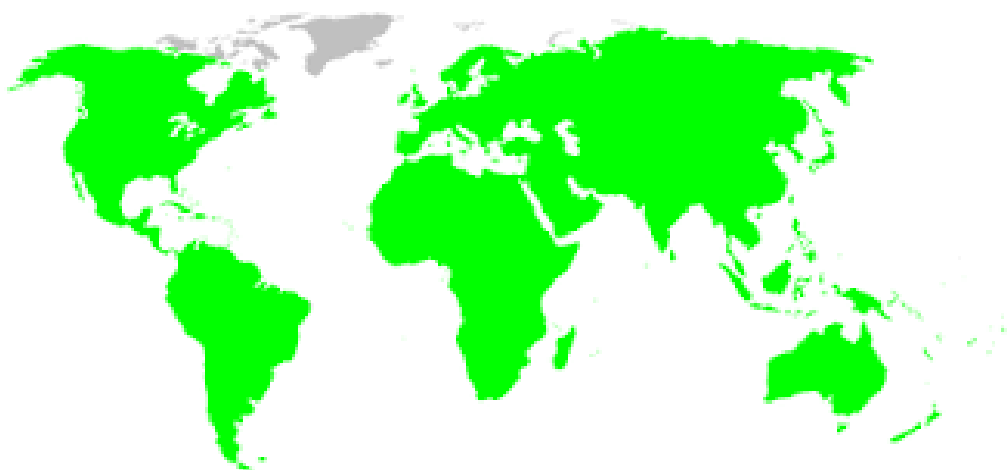
**Family: Araneidae**

**[True Orb Weavers]**

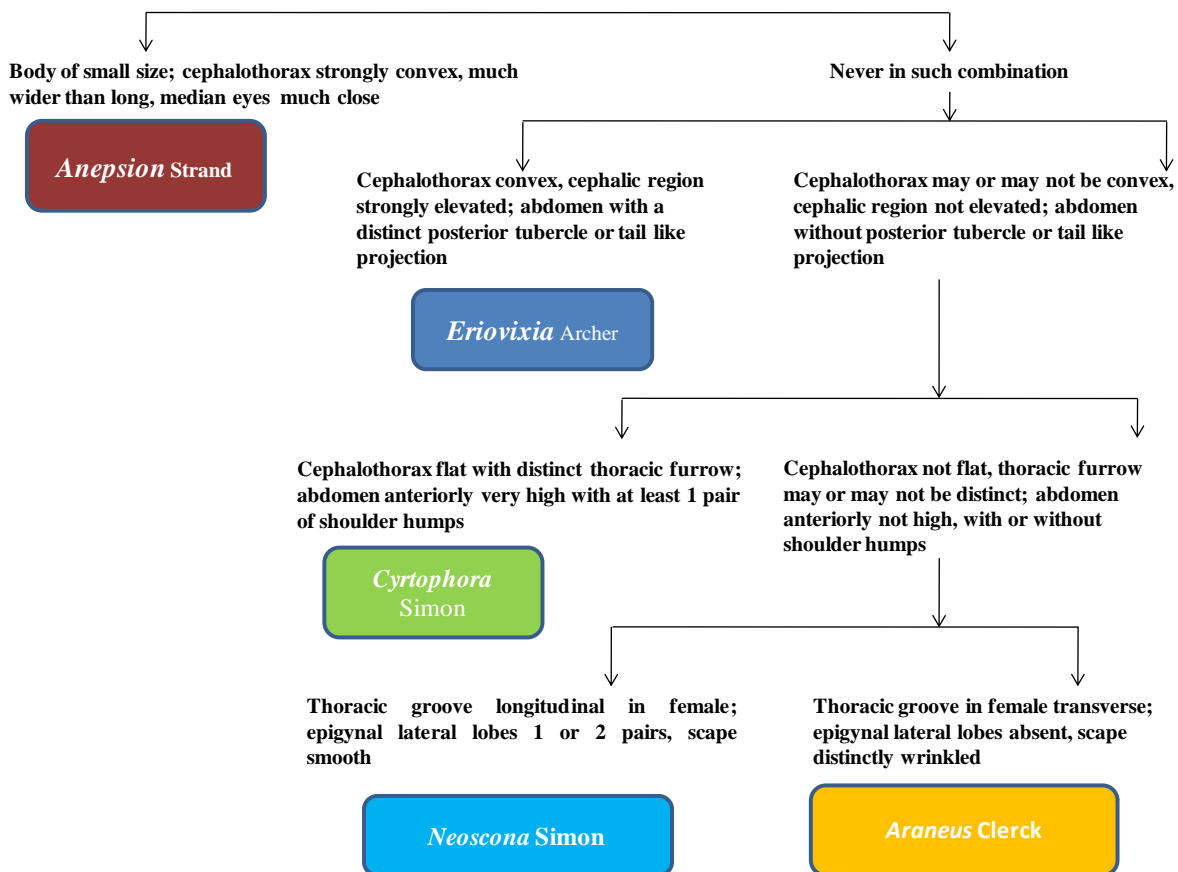
**Diagnosis:** Tarsus and metatarsus together never longer than patella and tibia together; epigynum never heavily sclerotised, scape long; male paracymbium usually hook like.

**Biological Notes:** Almost all the species construct orb web that remain suspended by one or more pairs of threads from objects, such as grass, leaves, branches, stones etc. Some orb weavers wait away from the web in a retreat. When any insect gets trapped in the web, the spider rushes to get the prey. Others remain at the centre of the web in upside down position and wait quietly for their prey.

**World distribution map:**



## Key to Genera:



## Recorded Species

### 1. *Anepsion maritatum* (O.P. Cambridge)

*Paraplectana maritata* O. P. Cambridge, 1877. Ann. Mag. Nat Hist. (4) 19 : 32.  
*Anepsion maritatum* (O. P. Cambridge) Chrysanthus, 1961. Senck. Biol. 42 : 465.



- **Size:** 4-6 mm
- **Habitat:** Agricultural field near water bodies
- **Distribution in India:** Kerala ( Malamel *et al*, 2015) , West Bengal (**New Record**)
- **Distribution in World:** China to Sulawesi, India, Sri Lanka (WSC, 2017)
- **Material examined:** 1♀/1♀, Barasat, 5.2.2017/8.7.2017; 1♀/2♀/3♀/3♀/1♀/1♀, Basirhat, 15.8.2016/12.11.2016/25.12.2016 /18.1.2017/25.3.2017/11.7.2017, coll. I. Das.

## 2. *Eriovixia excelsa* (Simon)

*Glyptogona excelsa* Simon, 1889, J. Asiat. Soc. Bengal, 58: 337.

*Eriovixia excelsa* (Simon) Grasshoff, 1986, Zool. Wetensch., 250: 118.



- **Size:** 5-9 mm
- **Habitat:** Urban localities
- **Distribution in India:** Andhra Pradesh, Kerala, Tamil Nadu, West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distribution in World:** China to Philippines, New Guinea (WSC, 2017)
- **Material examined:** 1♀/2♀/2♂/1♀/3♀, 2♂ (imm)/1♀/1♀/1♀, Barasat, 12.8.2016/15.10.2016/15.11.2016/24.1.2017/5.2.2017/15.3.2017/6.6.2017/8.7.2017; 1♀/2♀/1♀/8♀/5♀/2♀(imm)/1♀/1♀, Basirhat, 15.8.2016/20.9.2016/23.10.2016/25.2.2017/25.3.2017/25.4.2017/16.5.1017/ 11.7.2017, coll. I. Das.

## 3. *Cyrtophora cicatrosa* (Stoliczka)

*Epeira cicatrosa* Stoliczka, 1869, J. Asiat. Soc. Bengal, 38: 242.

*Cyrtophora cicatrosa* (Stoliczka) Chrysanthus, 1960, Nova Guinea (N.S.), 10: 28.

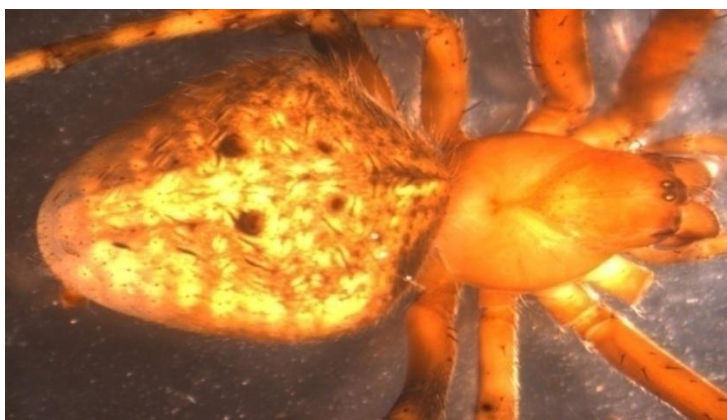
- **Size:** 5-6 mm
- **Habitat:** Agricultural fields
- **Distribution in India:** Andaman & Nicobar Island, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Punjab, Tamil Nadu, Uttar Pradesh, West Bengal
- **Distribution in World:** Pakistan, Bangladesh to Northern Territory

- **Material examined:** 1♀, 5.2.2017, Barasat; 3♀/1♀/1♀, 2♀(imm)/2♀/1♀/1♀, Basirhat, 20.10.2016/ 28.10.2016/5.2.2017/25.2.2017/ 25.3.2017/25.4.2017, coll. I. Das.



#### **4. *Neoscona bengalensis* Tikader & Bal**

*Neoscona bengalensis* Tikader & Bal, 1981, *Rec. Zool. Surv. India, Occ. Pap.*, 24: 15.



- **Size:** 8-8.5 mm
- **Habitat:** Paddy leaves
- **Distribution in India:** Andhra Pradesh, Kerala, Manipur, West Bengal (Sen *et al.*, 2010; Raychaudhuri *et al.*, 2012; Raychaudhuri & Saha, 2014; Raychaudhuri *et al.*, 2015)
- **Distribution in World:** India (WSC, 2017)
- **Material examined:** 1♀/1♀, Basirhat, 25.12.2016/25.4.2017, coll. I. Das.

#### **5. *Araneus ellipticus* (Tikader & Bal)**

*Neoscona elliptica* Tikader & Bal, 1981. *Rec. Zool. Surv. India, Occ. Pap.* 24 : 24.

*Araneus ellipticus* (Tikader & Bal) Grasshoff, 1986. *Zool. Wetensch.*, 250:118.





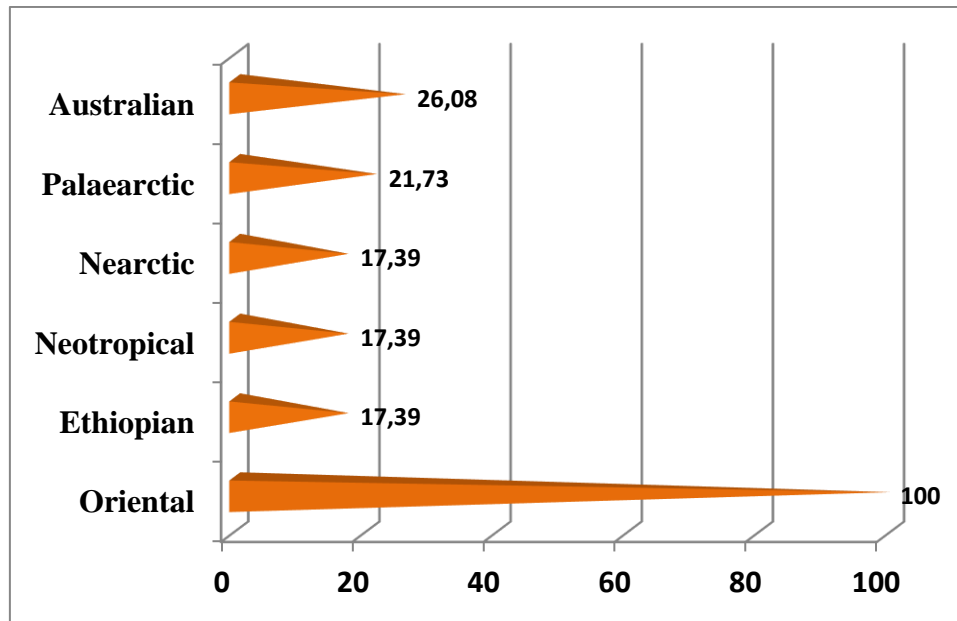
- **Size:** 5.6-5.8 mm
- **Habitat:** Leaves of upper canopy
- **Distribution in India:** Madhya Pradesh, Tamil Nadu, West Bengal (Tikader & Bal, 1981)
- **Distribution in World:** Bangladesh, China, India, Laos, Malaysia, Myanmar, Sri Lanka (WSC, 2017)
- **Material examined:** 1♀(imm)/1♀, Basirhat, 5.2.2017/25.3.2017, coll. I. Das.

Analysis of their zoogeographical distribution reveals that the fauna apart from being Oriental also includes some Australian (23%), Palaearctic (21.73%) and Ethiopian, Nearctic and Neotropical (each 17.39%) elements (Fig. 3). The dominant guild is constituted by the Orb web weavers (30.43%) followed by Foliage hunters (17.39%), Ground runners (13.04%), Stalkers (21.73%), Space web builders (8.69%), Sheet web builders and Ambushers (4.34% each) (Table 2, Fig. 4, Plate 3).

Spiders are mostly prevalent during Postmonsoon (82.60%), followed by Premonsoon (60.86%) and Monsoon (47.82%) (Fig. 5) which is in conformity with the incidence of the insect species. Two species namely *Eriovixia excelsa* (Simon) and *Leucauge decorata* (Blackwall) are recorded throughout the period of study. All the diversity indices are higher in case of Basirhat as compared to Barasat (Table 3).

An overall negative impact of urbanization on spider diversity, distribution and abundance is evidenced from the present study. Ranking sequence of the most abundant species (six) in descending order are: *Leucauge decorata* (25.68%) > *Eriovixia excelsa* (19.13%) > *Pholcus phalangioides* (11.48%) > *Plexippus paykullii* (8.74%) > *Anepsion maritatum* (7.10%) > *Cyrtophora cicatrosa* (6.56%). Sex ratio (♀ : ♂) is around 12 : 1. Availability of food/season and/or cannibalism may be the factors for female dominated society.

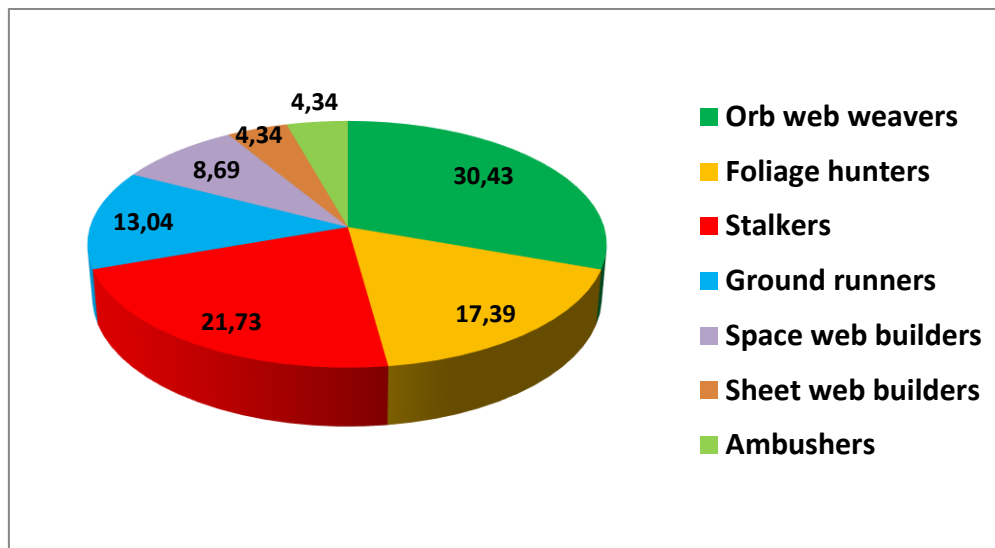




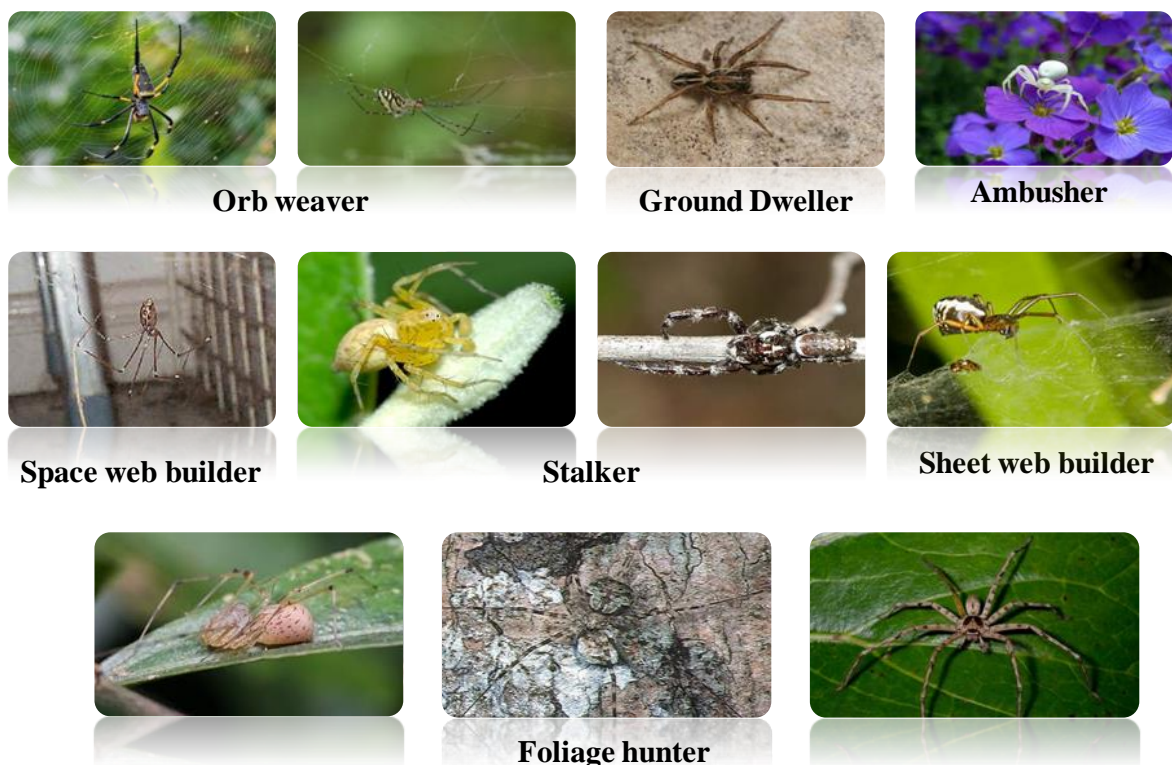
**Fig. 3.** Zoogeographical distribution (%) of spider taxa trapped from the study area

**Table 2.** Different functional guilds of spider taxa recorded from study areas

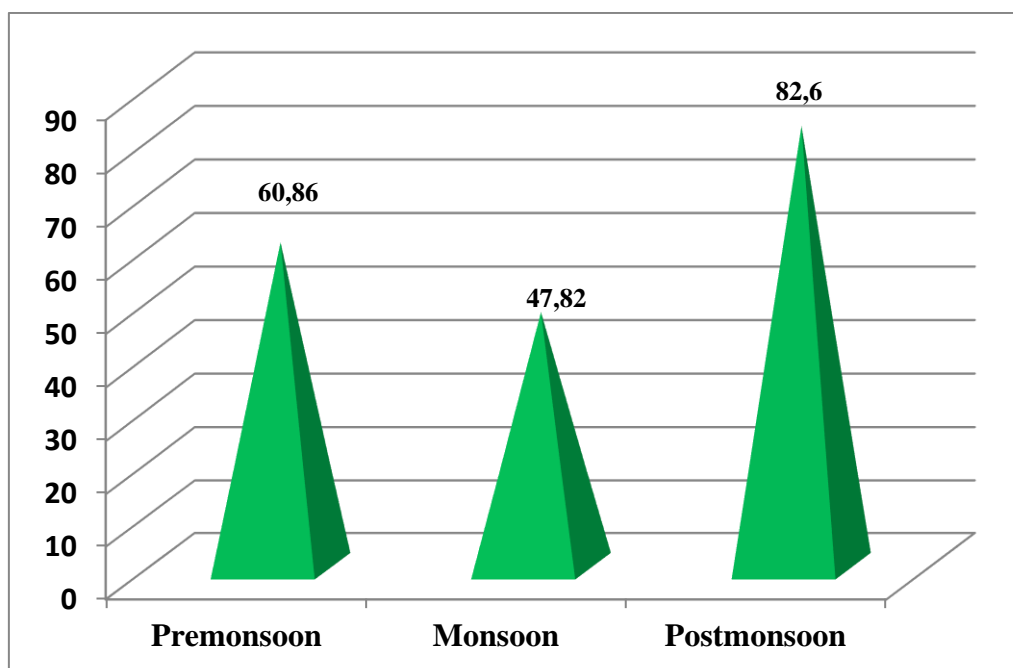
Families	Guilds
Araneidae, Tetragnathidae	Orb web Weavers
Hersiliidae, Scytodidae, Sparassidae	Foliage hunters
Oxyopidae, Salticidae	Stalkers
Lycosidae	Ground runners
Pholcidae	Space web builders
Linyphiidae	Sheet web builders
Thomisidae	Ambushers



**Fig. 4.** Guild structure of spider taxa trapped from the study area



**Plate 3.** Different Spider Guilds



**Fig. 5.** Seasonal distribution (%) of spider taxa trapped from the study site

**Table 3.** Site specific biodiversity indices of recorded spider fauna

Diversity Indices	Barasat	Basirhat
Shannon-Wiener's Index	2.0325	2.2289
Simpson's Dominance Index	0.8353	0.8572
Pielou's Evenness Index	0.7701	0.7711
Margalef's Index	2.9500	3.7596
Sørensen's Similarity Index	39.13%	

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