

# Studies on Taxonomy and Diversity of Spiders from Darjeeling Hills

S.C. MAJUMDER and S. TALUKDAR



ZOOLOGICAL SURVEY OF INDIA



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**STUDIES ON TAXONOMY AND DIVERSITY OF  
SPIDERS FROM DARJEELING HILLS WITH  
SPECIAL REFERENCE TO FAMILY  
CLUBIONEIDAE IN LIGHT OF  
CONSERVATION**

**S.C. MAJUMDER AND S. TALUKDAR**

*Zoological Survey of India  
M-Block, New Alipore, Kolkata-700 053*

*Edited by  
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**Zoological Survey of India  
Kolkata**

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## INTRODUCTION

Darjeeling hill area is unique from environmental Eco-perception. The relief varies from 100 mts. above sea level to the mighty Kanchenjunga. There are different climatic zones with distinctive attributes and there are endangered animals like red panda etc along with memory orchids and medicinal plants are available in this hilly region. The Darjeeling hill area is formed of comparatively recent rock structure that has a direct bearing on landslides. The causes of the landslides vary from one locality to another. Heavy monsoon precipitation is however a very common cause of these disasters. More over soils of Darjeeling hill areas are extremely varied, depending on elevation, degree of slope, negative cover and obviously geolithology. The natural system of erosion in the hill gets more complicated when man interferes. As the mountains serve as the source of resources for the population residing in the hills as well as in the plains, the form of environmental degradation is quite extensive other particularly is applied to the extraction of timber and other forest produces, mining and agriculture are taken into account. As human population expands in the hills, forests are being depleted for the extension of agricultural lands, introduction of new settlements, roadways etc. The growing changes coming in the wake of industrialization and urban development leave deep impression on the hill ecosystem; disrupting normal functioning. Due to unprecedented growth of population during the last few decades in the Darjeeling hill areas, nature has started reacting sharply to the accumulated human guilt. Landslide hazards, especially during rainy season have become a common factor to the people of the hill.

The hill areas of Darjeeling district are located within the lesser and Sub-Himalayan belts of the eastern Himalayas. The area is bounded by the Sikkim Himalaya in the north, the Bhutan Himalaya in the east and Nepal Himalaya in the west, the southern foothills. Keeping all these in mind exploration and documentation of data on biological resources from this diverse land form became essential towards the conservation aspect. In this context the authors tried to fulfill the part of Arachnid (spiders) faunal resources to be documented for monitoring through future studies.

Spider fauna of Darjeeling has not yet been studied in a comprehensive manner. Although there are several published papers on the spiders on Darjeeling (Pocock, 1900 & 1901; Simon 1906; Gravely 1931; Sinha 1951; Tikader 1970; Tikader 1980 & 1982; Sethi & Tikader 1988; Majumder & Tikader 1991; Biswas & Biswas 1992) but so far as the spider fauna of Darjeeling is concerned, the published information indeed lacking compilation and comparative descriptions altogether to visualize the abundance and diversity of this fauna in the diverse mountain habitats of Darjeeling hills. Since the spiders are important bio-control agents especially

of insect pests of agricultural crop fields and as this group is not adequately explored from Darjeeling, survey of this group in different crop fields and tea-garden as well as hilly bushes were assigned for the years 2006-2008 (four seasons). Accordingly the present work was undertaken to study an up-to-date information regarding taxonomy and diversity of spider fauna of Darjeeling hills. Unfortunately due to some unavoidable administrative guideline the actual frame of study is to reduce by one year (two seasons) instead the assigned two years (4 seasons namely pre and post monsoon and pre and post winter) had to renege for a publishable manuscript with the collected data.

Thus the taxonomy and diversity of spider fauna of Darjeeling hills is prepared with the collected specimen of our study along with the recorded data of National Zoological Collection of Zoological Survey of India and other published information. Spiders from different families like-Amaurobiidae, Araneidae, Atypidae, Clubionidae, Corinnidae, Ctenidae, Gnaphosidae, Hersilidae, Heteropodidae, Homalonichidae, Linyphidae, Lycosidae, Mithurgidae, Oecobidae, Oxyopidae, Pisauridae, Philodromidae, Salticidae, Scytodiidae, Tetragnathidae, Theraphosidae, Thomisidae and Trocanteriidae from Darjeeling hills in the light of modern taxonomic concept have been explored. It is very much expected that this comprehensive account will prove quite useful to the future worker in the field of Arachnology and also would be useful to the forest managers in the process of planning for conservation strategies. A total 119 spider species were dealt with here for the study of taxonomy and biodiversity and finally approached for conservation aspects. At present the named specimens are deposited at the national collection of the Zoological Survey of India, Kolkata.

#### **MATERIALS AND METHOD**

*Study Area* : Darjeeling district is the northernmost district of west Bengal. It is located on the lap of the Himalayas. The district comprises of four subdivisions namely-Darjeeling sadar, Kalimpong, Kurseong and Siliguri. Darjeeling Himalaya forms a part of eastern Himalayan ranges and is bounded by Sikkim, Nepal and Bhutan on the north, west and east respectively. It consists of the first three subdivisions of the district while Siliguri is mainly characterized by the tarai and foothills of the district (Figure-1). Therefore, the paper does not include Siliguri in the study. The area covered by Darjeeling Himalaya is about 1721 Sq. kms. while the total area of the district is 3202 Sq. kms. Darjeeling Himalaya consists of a portion of the outlying hills of lower Himalayas and a stretch of territory lying along the base of the hills known as the Terai. The Terai is only 91 meters high above the sea level but there are parts of the districts, which are as high as 3660 m. at Sandakpu. The exquisite scenic grandeur and invigorating climate in the area have earned the title of "Queen of the Hill Stations" river Teesta is the master stream in the area while the Rammam and Rangit are the two important tributaries of the Teesta. Besides, numerous rain fed rivulets in the hills become the most

dominating factors of environmental control during rainy season. Tourism is a climate-based industry while tea plantations that earned fame for Darjeeling Himalaya is largely a contribution of the climate. The climate of Darjeeling is especially noteworthy. Springs and autumns are the seasons most favoured by visitors. The monsoon is a period of continuous rainfall while the winter after December is too cold and unpleasant. The local climate in fact depends largely on the elevation and aspect. The first access of the man in the Darjeeling Hills and when who fell down the first tree to establish a living has not clearly been brought to book. But when British came here, it was inhabited merely by a few hundred souls in the pure natural environment, between the undiscovered flora and fauna.

#### **GPS DATA OF SPIDER-LOCATIONS IN THE AREAS OF DARJEELING HILLS**

The collection areas Figure-1 have been located through GPS co-ordinates under four main camp areas namely Darjeeling, Kalimpong, Kurseong and Mirik. Altitudes and Geographical positions have been plotted for individual collection spots for future convenience and for finding proper locations. GPS data for the geographical co-ordinates and altitudes of the study areas were taken through Germin GPS 12 and incorporated in the context in tabular form in Table-1.

**Table-1**

Sl. No.	Name of the place	Co-ordinate N/E <sup>o</sup> /''	Altitude
<b><i>Places covered from Darjeeling camp</i></b>			
1.	Darjeeling	27° ,02' ,22.08'' 88° ,25' ,06.48''	6525
2.	Batasia Loop	27° ,00' ,58.45'' 88° ,14' ,53.34''	7225
3.	Ghoom	27° ,00' ,27.04'' 88° ,15' ,16.43''	7172
4.	Zoological Garden	27° ,03' ,22.08'' 88° ,15' ,16.48''	6525
5.	Bhitia Basti	27° ,02' ,40.91'' 88° ,01' ,61.88''	6095
6.	Pasupati Lake	26° ,57' ,30.79'' 88° ,16' ,14.01''	6250
<b><i>Places covered from Kalimpong camp</i></b>			
1.	Kalimpong	27° ,03' ,33.25'' 88° ,28' ,06.79''	3912

Sl. No.	Name of the place	Co-ordinate N/E°/'/'	Altitude
2.	Lava	27°05',22.46'' 88°37',30.87''	5470
3.	Rishop Valley	27°06',37.84'' 88°38',33.62''	6592
4.	Langsong Valley	27°06',52.79'' 88°38',15.49''	5054
5.	Pedong	27°07',06.34'' 88°35',39.31''	5392
6.	Flower Garden	27°64',02.65'' 88°27',09.40''	3500
<b>Places covered from Kurseong camp</b>			
1.	Kurseong	26°53',03.76'' 88°16',46.57''	5165
2.	Dowhill School	26°53',53.96'' 88°16',58.80''	5089
3.	Tindharia	26°49',20.77'' 88°14',36.46''	1427
4.	Latpancher	26°55',03.92'' 88°24',04.64''	3608
5.	Sonada	26°56',52.52'' 88°17',30.64''	6432
6.	Ninth Mile	26°54',21.61'' 88°09',34.60''	5293
<b>Places covered from Mirik camp</b>			
1.	Mirik	26°54',00.37'' 88°09',59.19''	5075
2.	Mirik Lake	26°56',03.26'' 88°17',47.81''	6315
3.	Sukiapokhri	26°59',50.33'' 88°09',59.66''	6986
4.	Bagora Hills	26°58',02.89'' 88°09',50.83''	6081
5.	Jorapokhri	27°02',04.02'' 88°11',01.81''	6979

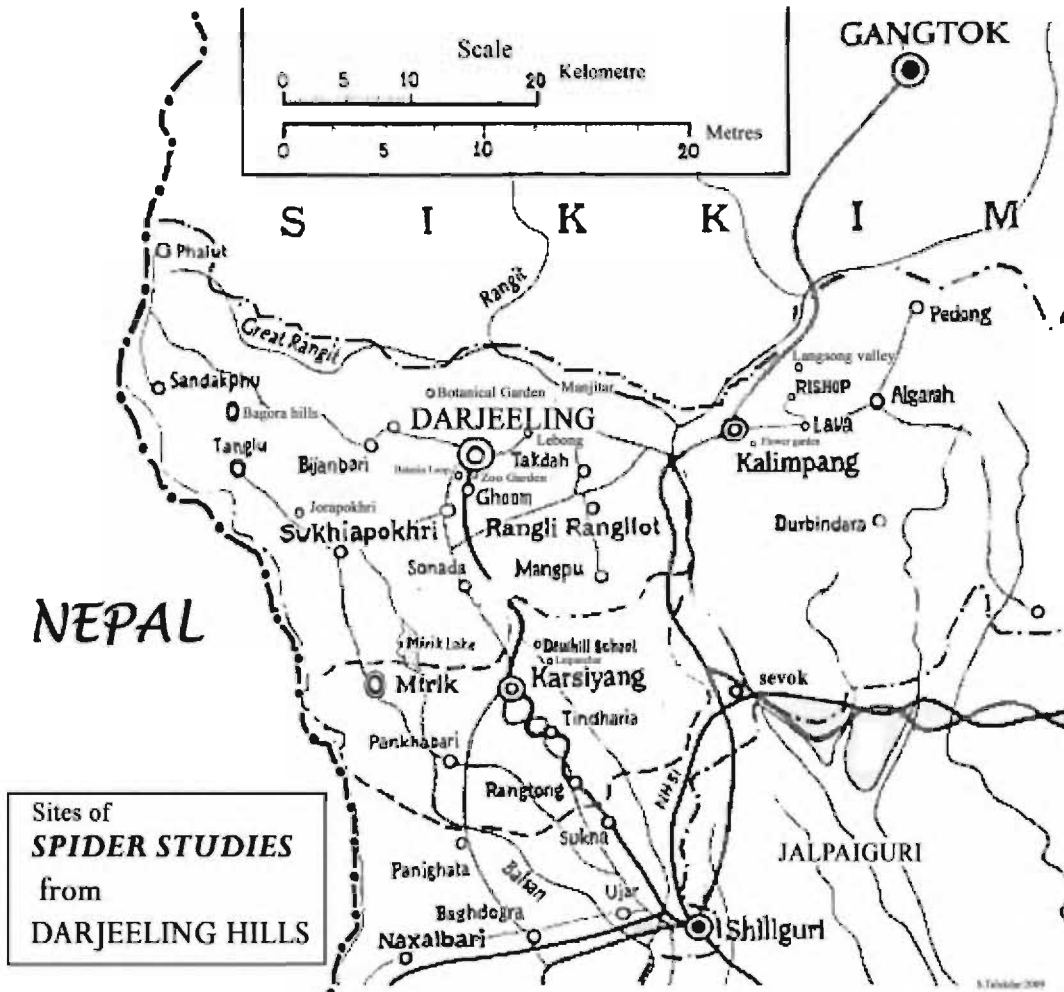


Figure - 1 overall Map of the study area

**Climate**

Monsoon prevails for about four months from early of June to mid October with high humidity. Annual range of humidity is between 90-95%. July-August are the heavy rainfall months with precipitations as high as 500 mm. Annual rainfall is about 320 cms. Occasional rains are often encountered throughout the rainy season. Pre-monsoon is dry and warm with versatile climatic conditions within a single day. Clouds from mild to most dense accumulation and precipitation thereon following sunny sky warmth are very common. Post-monsoon is apparently cold with negligible rainfall. Maximum temperature reaches up to 14.89 degree celsius in May while the mean maximum temperature is 8.59 degree celsius observed in June. On the other hand the minimum temperature drops up to 1.2 degree celsius in January and the mean minimum temperature is about 3 degree celsius observed during early December every year. The amount of rainfall plays a very important role in causing instability of slopes. A very high intensity of rainfall within a short span of time is not uncommon in Darjeeling hill areas. It is found in the old records that this natural phenomenon has occurred about 42 times during the period from 1891 to 1975 (Chatterjee 1982).

**Forests in Darjeeling Hill Areas**

Forests of Darjeeling Hills are in a dire need of similar aerial survey as highlighted above. Forests in Darjeeling Hills have been degrading and depleting with time. There is a huge gap between the area under forest and actual forest coverage in the region. This gap is rapidly increasing with time. Further, even within a particular area covered with forest the density of trees has been falling on a massive scale in the last 15-20 years. Today it is believed Darjeeling Hills has less than 30 per cent of its land under forest cover in strict sense of the term. However, as per the records of Forest Department, over 40 per cent of its land is under forest cover. Mention should be made here that according to the forest guidelines of India, 60 per cent of the geographical area of hills and mountains should be covered with forest.

**Instruments**

Collections were performed by an inverted umbrella, forceps with soft-tension, small brush and with a standard hand sweeping net (129 cm in diameter). Sunca electronic emergency lamp was used during collection. Taxonomic studies have been made by a Olympus dissecting type binocular microscope with ocular micrometer while behavioral observations were done by a Samsung's field binocular (B-10x25N), an electronic stop watch. Black velvet paper and tabulated data sheets were used. Field photographs (Movie and still digital) were taken with Sony, DCRH42E mini DV camcorder.

### Collection methods

Spiders were collected from the study areas directly from the webs by hand picking method, by the sweeping net by beating the nearby bushes into an inverted umbrella for the arial and arboreal spider specimens.

Pitfall collections have been made for terrestrial and ground dwelling spiders. In Pitfall, traps (flat plastic bowl) were filled with preservative liquid (69% water, 30% ethyl acetate and 1% detergent). In first evening of each collection camp we fixed the traps on ground in the nearby shaded areas so that ground dwellers and other wondering spiders could be trapped. In every morning specimens were removed from traps and preserve after suitable wash, which allowed us to maintain spider specimens in good conditions before taking them for laboratory processing.

### Preservation

Collected spider other than pitfall collection were anaesthetized, killed in a killing jar and finally preserved in Oudman's preservative (90 parts 70% ethanol, 5 parts glycerol and 5 parts glacial acetic acid) in glass vials.

### Identification

Well-preserved spider specimens were transferred in ethyl alcohol and studied under binocular microscope in a Petridish. The specimens were identified up to species level following Tikader (1982) and Keaston (3<sup>rd</sup> edition, 1978). All adult and sub adult (if possible) spiders were identified at the species level based on the specialized keys of Tikader (1980, 1982), Gajbe (2003), Biswas and Biswas (2004) and with taxonomic revisions according to the check-list of Silwal, Molur (2006).

### A CHECK LIST OF SPIDER SPECIES RECORDED FROM DARJEELING HILLS

#### Family I. AMAUROBIIDAE Thorell, 1870

##### Genus 1. *Tamgrinia* Lehtinen, 1967

1. *T. alveolifera* (Schenkel, 1936)

#### Family II. ARANEIDAE Simon, 1805

##### Genus 2. *Araneus* Clerck, 1757

2. *A. himalayensis* Tikader, 1975

##### Genus 3. *Argiope* Adouin, 1826

3. *A. aemula* (Walckenaer, 1841)
4. *A. anasuja* Thorell, 1887
5. *A. caesarea* Thorell, 1897

6. *A. minuta* Karsch, 1879  
 7. *A. pulchella* Thorell, 1881  
     Genus 4. ***Chorizopes*** Cambridge, 1870  
 8. *C. bengalensis* Tikader, 1975  
     Genus 5. ***Cyclosa*** Menge, 1866  
 9. *C. insulana* (Costa, 1834)  
     Genus 6. ***Cyrtarachne*** Thorell, 1868  
 10. *C. gravelyi* Tikader, 1960  
 11. *C. inaequalis* Thorell, 1895  
     Genus 7. ***Cyrtophora*** Simon, 1864  
 12. *C. bidenta* Tikader, 1970  
 13. *C. cicatrosa* (Stoliczka, 1869)  
 14. *C. moluccensis* (Doleshchall, 1857)  
     Genus 8. ***Eriovixia*** Archer, 1951  
 15. *E. excelsa* (Simon, 1889)  
     Genus 9. ***Gasteracantha*** Sundeval, 1833  
 16. *G. brivispina* (Doleschall, 1857)  
 17. *G. diadesmia* Thorell, 1887  
 18. *G. hasselti* Koch, 1838  
 19. *G. kuhli* Koch, 1837  
 20. *G. cancriformis* (Linn., 1758)  
 21. *G. unguifera* Simon, 1889  
     Genus 10. ***Gibbaranea*** Archer, 1951  
 22. *G. bituberculata* (Walckenaer, 1802)  
     Genus 11. ***Neoscona*** Simon, 1864  
 23. *N. mukerjei* Tikader, 1980  
 24. *N. nautica* Koch, 1875  
 25. *N. pavida* (Simon, 1906)  
     Family III. **ATYPIDAE** Bertkau, 1878  
     Genus 12. ***Atypus*** Latreille, 1804  
 26. *A. sutherlandi* Chennapaiya, 1935

## Family IV. CLUBIONIDAE Wagner, 1887

Genus 13. **Clubiona** Latreille, 1804

27. *C. drassodes* Cambridge, 1874
28. *C. filicata* Cambridge, 1874
29. *C. pogonias* Simon, 1906
30. *C. shillongensis* Majumder & Tikader, 1991

## Family V. CORINNIDAE Karsch, 1880

Genus 14. **Castianeira** Keyserling, 1879

31. *C. albopicta* (Gravely, 1931)
32. *C. himalayensis* (Gravely, 1931)
33. *C. indica* Tikader, 1981
34. *C. zetes* Simon, 1897

Genus 15. **Oedignatha** Thorell, 1881

35. *O. carli* Reimoser, 1934
36. *O. scrobiculata* Thorell, 1881

## Family VI. CTENIDAE Keyserling, 1877

Genus 16. **Ctenus** Walckenaer, 1805

37. *C. himalayaensis* Gravely, 1921
38. *C. sikkimensis* Gravely, 1931

## Family VII. GNAPHOSIDAE Pocock, 1898

Genus 17. **Gnaphosa** Latreille, 1804

39. *G. poonaensis* Tikader, 1973

Genus 18. **Geodrassus** Westring, 1857

40. *G. himalayensis* Tikader & Gajbe, 1975

Genus 19. **Scotophaeus** Simon, 1893

41. *S. madalasa* Tikade & Gajbe, 1975

## Family VIII. HERSILIDAE Thorell, 1869

Genus 20. **Hersilia** Audouin, 1826

42. *H. savignyi* Lucas, 1836
43. *H. sumatrana* Thorell, 1890

## Family IX. HOMALONYCHIDAE Simon, 1893

Genus 21. *Homanichus* Marx, 1891

- 44.
- H. jayantius*
- Tikader, 1970

## Family X. LINYPHIIDAE Blackwall, 1859

Genus 22. *Leptyphantus* Menge, 1866

- 45.
- L. bhudbari*
- Tikader, 1970

- 46.
- L. lingsoka*
- Tikader, 1970

## Family XI. LYCOSIDAE Sundeval, 1833

Genus 23. *Hippasa* Simon, 1885

- 47.
- H. agelenoides*
- (Blackwall, 1884)

- 48.
- H. greenalliae*
- (Blackwall, 1867)

- 49.
- H. himalayensis*
- Gravely, 1924

- 50.
- H. holmerae*
- Thorell, 1895

- 51.
- H. pantherina*
- Pocock, 1899

- 52.
- H. partita*
- (Cambridge, 1876)

Genus 24. *Hogna* Simon, 1885

- 53.
- H. himalayensis*
- Gravely, 1924

Genus 25. *Lycosa* Latreille, 1804

- 54.
- L. bistrigata*
- Gravely, 1924

- 55.
- L. carmichaeli*
- Gravely, 1924

- 56.
- L. kempfi*
- Gravely, 1924

- 57.
- L. nigrotibialis*
- Simon, 1884

Genus 26. *Pardosa* Koch, 1847

- 58.
- P. birmanica*
- Simon, 1884

- 59.
- P. pseudoannulata*
- (Bosenbarg & Strand, 1906)

- 60.
- P. pusiola*
- (Thorell, 1891)

- 61.
- P. shyamae*
- (Tikader, 1970)

- 62.
- P. sumatrana*
- Thorell, 1890

- 63.
- P. sutherlandi*
- (Gravely, 1924)

Genus 27. *Venonia* Thorell, 1894

- 64.
- V. himalayensis*
- Gravely, 1924

## Family XII. MITURGIDAE Simon, 1885

Genus 28. **Cheiracanthium** Koch, 1839

65. *C. himalyense* Gravely, 1931
66. *C. indicum* Cambridge, 1874
67. *C. insigne* Cambridge, 1874
68. *C. melanostoma* Thorell, 1895
69. *C. mysorensis* Majumder & Tikader, 1991
70. *C. pauriense* Majumder & Tikader, 1991
71. *C. triviale* Thorell, 1895

## Family XIII. OECOBIIDAE Blackwall, 1862

Genus 29. **Oecobius** Lucus, 1846

72. *O. putus* Cambridge, 1876

## Family XIV. OXYOPIDAE Thorell, 1870

Genus 30. **Oxyopes** Latreille, 1804

73. *O. pandae* Tikader, 1969
74. *O. ratnae* Tikader, 1970
75. *O. sakuntalae* Tikader, 1970
76. *O. shweta* Tikader, 1970
77. *O. sikkimensis* Tikader, 1970

## Family XV. PISAURIDAE Simon, 1870

Genus 31. **Pisaura** Simon, 1885

78. *P. gitae* Tikader, 1970

## Family XVI. PHILODROMIDAE Cambridge, 1871

Genus 32. **Phylodromus** Walckenaer, 1825

79. *P. malinae* Tikader, 1966

## Family XVII. SALTICIDAE Blackwall, 1841

Genus 33. **Marpisa** Koch, 1846

80. *M. decorata* Tikader, 1974

Genus 34. **Myrmerachne** Mac Leay, 1839

81. *M. orientalis* Tikader, 1973

Genus 35. **Plegra** Simon, 1876

82. *P. dhakuriensis* Tikader, 1974

Genus 36. **Plexippus** Koch, 1846

- 83.
- P. calcuttaensis*
- Tikader, 1974

Genus 37. **Telamania** Thorell, 1887

- 84.
- T. dimidiata*
- (Simon, 1899)

Genus 38. **Zygoballus** Peckham & Peckham, 1885

- 85.
- Z. narmadaensis*
- Tikader, 1975

## Family XVIII. SCYTODIDAE Blackwall, 1852

Genus 39. **Scytodes** Latreille, 1804

- 86.
- S. Propinqua*
- Stoliczka, 1869

- 87.
- S. thoracica*
- (Latreille, 1804)

## Family XIX. SPARASSIDAE Bertkau, 1872

Genus 40. **Butaniella** Gravely, 1931

- 88.
- B. sikkimensis*
- Gravely, 1931

Genus 41. **Heteropoda** Latreille, 1804

- 89.
- H. kandiana*
- Pocock, 1899

- 90.
- H. leprosa*
- Simon, 1884

- 91.
- H. venatoria*
- (Linnaeus, 1758)

Genus 42. **Olios** Walckenaer, 1837

- 92.
- O. milleti*
- (Pocock, 1901)

- 93.
- O. punctipes*
- Simon, 1884

Genus 43. **Pseudopoda** Jager, 2000

- 94.
- P. promta*
- O.P. Cambridge, 1885

## Family XX. TETRAGNATHIDAE Menge, 1866

Genus 44. **Guizygiella** Thorell, 1870

- 95.
- G. melanocrania*
- (Thorell, 1887)

Genus 45. **Herennia** Thorell, 1877

- 96.
- H. ornatissima*
- (Doleschall, 1859)

Genus 46. **Larinia** Simon, 1874

- 97.
- L. joysankari*
- Biswas, 1984

- 98.
- L. phthisica*
- (L. Koch, 1877)

Genus 47. **Leucauge** White, 1841

- 99.
- L. celebesiana*
- (Walckenaer, 1841)

100. *L. culta* (O.P. Cambridge, 1869)

101. *L. decorata* (Blackwall, 1864)

102. *L. tessellata* (Thorell, 1887)

Genus 48. ***Nephila*** Leach, 1815

103. *N. clavata* Koch, 1878

104. *N. kuhllii* (Doleschal, 1859)

105. *N. pilipes* (Fabricius, 1793)

Genus 49. ***Tetragntha*** Latreille, 1804

106. *T. javana* Thorell, 1890

107. *T. mandibulata* Walckenaer, 1841

108. *T. maxillosa* Thorell, 1895

109. *T. sutherlandi* Gravely, 1921

Family XXI. THERAPHOSIDAE Thorell, 1869

Genus 50. ***Haploclastus*** Simon, 1892

110. *H. himalayensis* Tikader, 1976

Family XXII. THOMISIDAE Sundevall, 1833

Genus 51. ***Camaricus*** Thorell, 1887

111. *C. formosus* Thorell, 1887

Genus 52. ***Lysiteles*** Simon, 1895

112. *L. brunettii* Tikader, 1962

Genus 53. ***Pistiis*** Simon, 1875

113. *P. kalimpu* Tikader, 1970

Genus 54. ***Thomisus*** Walckenaer, 1805

114. *T. bulani* Tikader, 1960

115. *T. pugilis* Stoliczka, 1869

Genus 55. ***Xysticus*** Koch, 1835

116. *X. bengalensis* Tikader & Biswas, 1974

117. *X. himalayensis* Tikader & Biswas, 1974

118. *X. kali* Tikader & Biswas, 1974

Family XXIII. TROCHANTERIIDAE Karsch, 1879

Genus 56. ***Plator*** Simon, 1880

119. *P. indicus* Simon, 1897

**Table-2** : Common and Taxonomic names of the Spider Families of Darjeeling hills

Sl. No.	Family	Common name of the families
1.	AMAUROBIIDAE	Mothering spiders
2.	ARANEIDAE	Orb-webing weavers
3.	ATYPIDAE	Purse Web spiders
4.	CLUBIONIDAE	Forest spiders
5.	CORINNIDAE	Sac spiders
6.	CTENIDAE	Wandering spiders
7.	GNAPHOSIDAE	Mouse spiders
8.	HERSILIDAE	Double tailed spiders
9.	HOMALONICHIDAE	Dusty desert spiders
10.	LINYPHIDAE	Money spiders
11.	LYCOSIDAE	Wolf spiders
12.	MITHURGIDAE	Prowling spiders
13.	OEOBIDAE	Wall spiders
14.	OXYOPIDAE	Lynx spiders
15.	PHILODROMIDAE	Hunting spiders
16.	PISAURIDAE	Striped wolf spiders
17.	SALTICIDAE	Jumping spiders
18.	SCYTODIIDAE	Spitting spiders
19.	SPARASSIDAE	Huntsman spiders
20.	TETRAGNATHIDAE	Long-jawed spiders
21.	THERAPHOSIDAE	Tarantulas
22.	THOMISIDAE	Crab spiders
23.	TROCHANTERIIDAE *	Flattened Crab spiders
* = Added at verge of finalization of the paper		

To provide an easy approach towards the popularization of spider Arachnology for the common people regarding conservation of the biodiversity and sustainable use of them for ethno-biological utilities of these faunal resources common names of the spider families have been included herewith in this text (Table-2).

**KEY TO THE SPIDER FAMILIES FROM DARJEELING**

1. Cephalothorax oval with longitudinal fovea. Eyes not very different in size. Abdomen oval, a transverse slit near the spinnerets usually very difficult to see; the posterior spinneret is very long ..... AMAUROBIIDAE
- Cephalothorax not oval with or without longitudinal fovea. Eyes less different in size. Abdomen not oval, transverse slit not present near the spinnerets; the posterior spinneret is very long ..... 2
2. Epigastric furrow nearly straight. Boss present on chelicerae though rudimentary in some cases; chelicerae not very large ..... ARANEIDAE
- Epigastric furrow nearly straight. Boss present on chelicerae though rudimentary in some cases; chelicerae not very large ..... 3
3. Maxilla strongly developed and labium fused with sternum. 6 spinnerets situated in the lower end of the abdomen..... ATYPIDAE
- Maxilla moderately developed and Labium not fused with sternum. Six spinnerets may or may not situate in the lower end of the abdomen ..... 4
4. Anterior spinnerets conical, contiguous. Maxillae without a transverse or oblique depression. Eyes homogeneous or almost nearly so (few exceptions) . CLUBIONIDAE
- Anterior spinnerets not conical, contiguous. Maxillae with a transverse oblique depression. Eyes not homogeneous ..... 5
5. The median furrow of the thorax is distinct, the apex of the endites is rounded, not angulate at outside and not depressed at the middle. The tarsi of the anterior legs are not usually long and the sternum is distinctly margined..... CORINNIDAE
- The median furrow of the thorax may or may not distinct, the apex of the endites not rounded, angulate at outside and depressed at the middle. The tarsi of the anterior legs are usually long and the sternum is not distinctly margined ..... 6
6. First row with two eyes, second row with four and third row with two; anterior laterals much closer to the posterior laterals than to the anterior medians. Retromargin of cheliceral fang furrow with at least three teeth ..... CTENIDAE
- First row without two eyes, second row without four and third row without two; anterior laterals not much closer to the posterior laterals than to the anterior medians. Retromargin of cheliceral fang furrow with or without at least three teeth ..... 7
7. Anterior spinnerets cylindrical and separated by a distance about equal to the diameter of one. Maxillae with an oblique depression. Eyes distinctly heterogenous, the anterior medians dark; the posterior medians often oblique, oval or triangular ..... GNAPHOSIDAE

- Anterior spinnerets not cylindrical and not separated by a distance about equal to the diameter of one. Maxillae without an oblique depression. Eyes may or may not distinctly heterogenous, the anterior medians dark; the posterior medians may often oblique, oval or triangular ..... 8
- 8. Posterior spinnerets very long, usually longer than the abdomen .....HERSILIDAE
- Posterior spinnerets enormously long, usually not longer than the abdomen..... 9
- 9. Tarsal claw without teeth ..... HOMONICHIDAE
- Tarsal claw with teeth ..... 10
- 10. Tibia of the male palp without apophysis (though the tibia may be dilated distally). Pedipalp of female in most species with a claw at the end of tarsus. Tibia IV in most species with two dorsal spines, or if only one spine is present then there is one short spine on metatarsi I and II ..... LINYPHIDAE
- Tibia of the male palp with apophysis. Pedipalp of female in most species with or without a claw at the end of tarsus. Tibia IV in most species with three or four dorsal spines ..... 11
- 11. Posterior row of eyes so strongly recurved that it may be considered to form two rows. Median claw smooth or with single tooth. Anterior piece of lorum rounded behind and fitting into a notch of posterior piece. Egg-sac carried attached to spinnerets and young carried on mother's back .....LYCOSIDAE
- Posterior row of eyes not strongly recurved. Median claw without single tooth. Anterior piece of labium not rounded behind and not fitting into a notch of posterior piece. Egg-sac not carried and not attached to spinnerets and young carried mother's back ..... 12
- 12. Cephalothorax with or without fovea, if present very inconspicuous. Retrolateral apophysis of the male palp with single hooked structure and the cymbium with long spur at its base ..... MITURGIDAE
- Cephalothorax without fovea, if present very inconspicuous. Retrolateral apophysis of the male palp without single hooked structure and the cymbium without long spur at its base ..... 13
- 13. Anal tubercle large and prominent, two segmented with a fringe of long hairs. Posterior median eyes triangular or irregular in shape. Small spider 2.00 mm. to 2.50 mm. long with carapace sub circular ..... OECOBIDAE
- Anal tubercle absent. Posterior median eyes not triangular or irregular in shape. Medium sized spider with carapace longer ..... 14

14. Eyes hexagonal, the posterior row procured and anterior row recurved with clypeus high. Abdomen pointed behind. The legs provided with conspicuous spine. .... OXYOPIDAE
- Eyes not hexagonal, the posterior row recurved and anterior row recurved with clypeus high. Abdomen pointed behind, the legs provided with conspicuous spines ..... 15
15. Posterior row of eyes not forming two distinct rows but only slightly recurved with a layer of light-reflecting cells, the grate shaped tapetum and two very prominent eyes. Median claw with two or three teeth. Anterior piece of lorum with a notch into which the posterior piece fits. Egg-sac held under cephalothorax. Young not carried by mother ..... PISAURIDAE
- The posterior eyes have no tapetum or any prominence among the 4 eyes ..... 16
16. Tarsi of the first and second pair of legs furnished with scapulae. Legs approximately equal in length. The upper margin of the chelicerae armed with one or two teeth ..... PHYLODROMIDAE
- Tarsal scapulae are not prominent but sometimes present; legs normally rather short and unequal in length with two tarsal claws; larger tooth on the inner margin of the chelicerae ..... 17
17. Front row of eyes more or less situated vertically; median eyes enormously large, second row of two eyes usually very small, often minute, third row of two eyes of medium size ..... SALTICIDAE
- Front row of eyes more or less situated transversely; median eyes not enormously large, second row of two eyes not very small, third row of eyes usually absent ..... 18
18. Cephalothorax as long as wide or slightly longer than wide. Posterior row of eyes straight or slightly procurve, anterior row usually straight and sub equal, lateral not longer than medians. Apex of the metatarsus with a soft trilobite membrane ..... SPARASSIDAE
- Cephalothorax high and subglobose behind the slopes forward, unlike other spiders eye six nocturnal arranged in three groups of two each. Anterior row of eyes strongly recurved ..... 19
19. Carapace round and high behind. Sternum rounded behind ..... SCYTODIDAE
- Carapace not round and not high behind. Sternum not rounded behind ..... 20
20. Chelicerae without castellan. Apical segment of the posterior spinnerets cylindrical and at least as long as the second segment ..... THERAPHOSIDAE
- Chelicerae with castellan. Apical segment of the posterior spinnerets not cylindrical and not as long as the second segment ..... 21

21. Epigastric furrow between lung slits procured. No boss on chelicerae. In most cases the chelicerae large and powerful ..... TETRAGNATHIDAE  
 — Epigastric furrow not between lungs slits and not procured. Boss on chelicerae. In most cases the chelicerae not large and powerful ..... 22
22. The first and second pair of legs much longer and stouter than rest of the legs. Apex of metatarsus not provided with soft trilobite membrane Lower margin of fang furrow of chelicerae distinct and armed with teeth. Colulus absent ..... THOMISIDAE  
 — First legs shorter than the rest, 2<sup>nd</sup> legs longest, no scapulae or ungula tufts. Anterior legs armed with erect spiniform bristles, tarsal claws true and toothed ..... 23
23. Sternum and carapace much wider than long; the posterior coxae widely Separated; mandibles weakly armed; labium longer than wide ..... TROCHANTERIIDAE

#### TAXONOMIC DESCRIPTIONS OF THE SPIDERS OF DARJEELING HILLS

##### Family I. AMAUROBIIDAE Thorell, 1870

##### Genus 1. *Tammagrinia* Lehtinen, 1967

1804. *Tagenaria* Latreille, *Nouv. Dict. Hist. Nat.*, **24** : 134.

1970. *Tagenaria* : Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 56.

2005. *Tammagrinia* Lehtinen, 1967 : As per reference : 2006. Silwal, M. and Molur, S *Zoo's Print Journal*. **22**(2) : 2551-2597.

*Diagnosis* : Cephalothorax rather long. Eyes anterior row procurved; eyes equal or medians smaller than the laterals. Posterior row longer than anterior row, slightly procurved medians slightly closer to each other than to adjacent laterals. Chelicerae strong inner margin without teeth but outer margin provided with one tooth. Legs robust. Abdomen longer than wide, slightly overlapped the posterior region of the cephalothorax. Dorsum provided with a queer design of dark brown patches.

*Type-species* : *Tagenaria domestica* Clerck.

*Distribution* : Europe, Africa, Asia, and America.

##### 1. *Tammagrinia alveoliferae* (Schenkel, 1936)

1970. *Tagenaria* : Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 56.

2005. *Tammagrinia alveoliferae* Schenkel, 1936 : As per reference : 2006. Silwal, M. and Molur, S *Zoo's Print Journal*. **22**(2) : 2551-2597.

*Materials examined* : 1 ♀, Sukiapokhri, Mirik, Dist. Darjeeling. West Bengal, 10.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Diagnosis* : Cephalothorax longer than wide relatively broad in front. Eyes pearly white, anterior row slightly procurved; eyes equal or medians smaller than the laterals. Posterior

row a little longer, slightly procurved. Chelicerae slightly convex, the lower margin armed with four to six teeth.

*Distribution* : India : West Bengal (Mirik, Dist. Darjeeling), Sikkim.

Family II. ARANEIDAE Simon, 1805

**Key to the genera of the family ARANIDAE**

1. Thoracic groove transverse; epigyne with distinct scape, often wrinkled, not provided with lateral lobes ..... ***Araneus***
- Thoracic groove not transverse; epigyne without distinct scape and with lateral lobes ..... 2
2. Eyes of the anterior row not evenly spaced or median closer to each other than to laterals..... ***Argiope***
- Eyes of the anterior row evenly spaced or median not close to each other than laterals ..... 3
3. Carapace strongly convex, anteriorly roundish; cephalic region strongly elevated than the thoracic region; abdomen provided with a few tubercles ..... ***Chorizopes***
- Carapace may or may not convex on anteriorly; cephalic region not elevated than the thoracic region; abdomen may or may not with tubercles ..... 4
4. Posterior median eyes very close, nearly touching; carapace provided with a U-shaped junction between cephalic and thoracic region ..... ***Cyclosa***
- Posterior median eyes not very close, carapace without any U-shaped junction between cephalic and thoracic region ..... 5
5. Integument of abdomen leathery; dorsum of the abdomen strongly convex, epigyne provided with short blunt scape ..... ***Cyrtarachne***
- Integument of abdomen not leathery; dorsum of the abdomen not strongly convex, epigyne with no scape ..... 6
6. Carapace flat with distinct thoracic furrow; abdomen anteriorly not high shoulder hump may or may not present ..... ***Cyrtophora***
- Carapace not flat thoracic furrow may or may not distinct; abdomen anteriorly very high provided with at least one pair of shoulder hump..... 7
7. Four pair of sigilla on the dorsum of abdomen, caudal humps with a large black spot ..... ***Eriovixia***
- Four pieces of sigilla absent on the dorsum of abdomen, caudal hump without a large black spot ..... 8

8. Spinnerets situated on an elevated circular space surrounded by a thick flange in the form of a ring ..... **Gasteracantha**  
 — Spinnerets not situated on an elevated circular space surrounded by a thick flange in the form of a ring ..... 9
9. Carapace not flat; abdomen may or may not flat laterally, epigyne with short unwrinkled scape ..... **Gibbarania**  
 — Carapace flat; abdomen may or may not flat laterally, epigyne without short Unwrinkled scape ..... 10
10. Abdomen a little pointed mid-longitudinally over the carapace without caudal projection, ventral side of the abdomen with a white median-longitudinal band formed by black ...  
 ..... **Larinia**  
 — Abdomen may or may not little pointed mid-longitudinally over the carapace with caudal projection, ventral side of the abdomen not provided with median longitudinal band which formed by black ..... 11
11. Thoracic groove longitudinal, epigyne with unwrinkled scape and provided with one or two pairs of lateral lobes ..... **Neoscona**

Genus 2. **Araneus** Clerck, 1757

1757. *Araneus* Clerck, *Arign. Succ.*, 15.

1882. *Araneus* : Tikader, *Fauna of India*, Spiders : Araneae 2(1) : 219.

*Type-species* : **Araneus angulatus** Clerck.

*Distribution* : Cosmopolitan.

2. **Araneus himalayensis** Tikader, 1975

1975. *Araneus himalayensis* Tikader, *Proc. Indian Acad. Sci.*, 81(4) : 14.

1982. *Araneus himalayensis* : Tikader, *Fauna of India*, Spider : Araneae, 2(1) : 229.

1992. *Araneus himalayensis* : Biswas & Biswas, *Fauna of West Bengal Part III*, Araneae : Spiders, *State Fauna Series*, No. 3 : 452.

*Materials examined* : 1 ♀, Namthing pokhri, Mirik, Dist .Darjeeling, West Bengal. 9. Xii.2006, Coll. S.C.Majumder & S.Talukdar.

*Distribution* : India : West Bengal (Kurseong, Mirik, Dist. Darjeeling, Jalpaiguri, And Nadia); Maharashtra; Karnataka.

*Elsewhere* : Pakistan, Myanmar.

Genus 3. **Argiope** Audouin, 1826

1826. *Argiope* Audouin, in *Savigny, descriptions de l' Egypte*, 1(4) : 121.

1982. *Argiope* : Tikader, *Fauna of India*, Spider : Araneae, 2(1) : 229. 2(1) : 111.

*Type species* : *Argiope lobata* (Thorell).

*Distribution* : Tropical and temperate countries of the world.

### Key to the species of the genus *Argiope* Aud

1. Abdomen broadly oval and conspicuously truncated anteriorly, dorsum provided with black transverse strips and forming a network on the posterior half ..... *aemula*  
— Abdomen not oval and not truncated anteriorly; dorsum not provided with black transverse strips and network on the posterior half ..... 2
2. Anterior edge of the epigyne provided with a broad and conspicuous lip median epigynal septum abruptly wide posteriorly ..... *anasuja*  
— Anterior edge of the epigyne provided with very thin wall and inconspicuous lip; median epigynal septum gradually wider posterior ..... 3
3. Abdomen broadest at the middle; median epigynal septum very wide ..... *cacsarea*  
— Abdomen broadest more posteriorly than middle, median epigynal more broad ..... 4
4. Cephalothorax and legs light brownish in color abdomen not anteriorly blunt, dorsum without yellowish aches ..... *minuta*  
— Cephalothorax and legs light brownish in colour abdomen not anteriorly blunt, dorsum without yellowish aches ..... 5
5. Labium as long as wide; maxillae roundish in shape dark brown of the proximal part...  
..... *pulchella*

### 3. *Argiope aemula* (Walckenaer, 1841)

1841. *Epeira aemula* Walckenaer, *Hist. Nat. Ins. Apt.* : 11.

1982. *Argiope aemula* : Tikader, *Fauna of India*, Spider: Araneae, 2(1) : 119.

2004. *Argiope aemula* : Majumder, *Rec. zool. Surv. India*, 20(2) : 6.

*Distribution* : India : West Bengal (Kalimpong, Darjeeling), Sundarban areas (Hingalgunj, Kulpi, Gosaba, Mandirbazar, Dist. North and South 24 Parganas); Gujarat; Tamil Nadu; Maharashtra : Andaman & Nicobar Island.

*Elsewhere* : Myanmar.

### 4. *Argiope anasuja* Thorell, 1887

1887. *Argiope anasuja*, Thorell, *Annali Mus. Civ. Genova*, 5.

1982. *Argiope anasuja* : Tikader, *Fauna of India*, Spider: Araneae, 2(1) : 127.

1992. *Argiope anasuja* : Biswas & Biswas, *Fauna of West Bengal Part III*, Araneae : Spiders, *State Fauna Series*, No. 3 : 454.

2004. *Argiope anasuja*, Majumder, *Rec. zool. Surv. India*, 20(2) : 6.

*Material examined* : 1 ♀, Gopaldhara, Dist. Darjeeling, West Bengal, 30.xii. 2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Kalimpong, Mirik), Sunderban areas : Patharpratima, Gosaba, Mandir bazar, Kulpi, Dist. South 24 Parganas; Sandeshkhali, Dist. North 24 Parganas, Kcbbibar; Tamil Nadu; Karnataka; Maharashtra; Orissa.

*Elsewhere* : Sri Lanka and Pakistan.

#### 5. *Argiope cacsarea* Thorell, 1897

1951. *Argiope kalimpongensis* Sinha, *Rec. Indian Mus.* **49** : 77.  
 1982. *Argiope kalimpongensis* : Tikader, *Fauna of India*, Spider : Araneae, **2(1)** : 125.  
 2004. *Argiope Kalimpongensis* : Majumder, *Rec. zool. Surv. India*, **20(2)** : 6.  
 2005. *Argiope cacsarea* Thorell 1897 : As per reference : 2006, Silwal, M. and Molur, S *Zoo's Print Journal*. **22(2)** : 2551-2597.

*Materials examined* : 1 ♀, Darjeeling Zoo-Garden, Dist. Darjeeling, Eastern Himalayas, West Bengal, Coll. 15.ix.1959. Coll. B.K. Tikader.

*Distribution* : India : West Bengal : (Kurseong, Darjeeling), Sundarban areas : Kulpi, Sagar Island. Dist. South 24 Parganas; Bihar; Karnataka; Maharastra; Madhya Pradesh; Tamil Nadu; Rajasthan.

#### 6. *Argiope minuta* Karsch, 1879

1951. *Argiope shillongensis* Sinha, *Rec. Indian Mus.* **49** : 75.  
 1982. *Argiope shillongensis* : Tikader, *Fauna of India*, Spider : Araneae, **2(1)** : 117.  
 2004. *Argiope shillongensis* : Majumder *Rec. zool. Surv. India*, **20(2)** : 7.  
 2005. *Argiope minuta* Karsch 1879 : As per reference : 2006, Silwal, M. and Molur, S *Zoo's Print Journal*. **22(2)** : 2551-2597.

*Materials examined* : 1 ♀, Sukiapokhri, Mirik, Dist. Darjeeling. West Bengal, 10.xii.2006. Coll. S.C. Majumder & S. Talukdar; 1 ♀, Kurseong, Dist. Darjeeling, West Bengal, 2.xii.2006. Coll. S.C. Majumder & S. Talukdar; 1 ♀, Kalimpong, Dist. Darjeeling, West Bengal, 2.xii.2006. Coll. S.C. Majumder & S. Talukdar; 1 ♀, Sonada, Dist. Darjeeling West Bengal, 12.xii.2006, Coll. S.C. Majumder & S. Talukdar; 1 ♀, Tindheria, Dist. Darjeeling, West Bengal, 30.xii.2006, Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Darjeeling Kalimpong, Kurseong Mirik), Sunderban area (Kakdwip, Patharpratima, Sagar Island, Dist. South 24 Parganas, Hingalgunj, and Dist. North 24 Parganas); Meghalaya.

#### 7. *Argiope pulchella* Thorell, 1881

1881. *Argiope pulchella* Thorell, *Annali. Mus. civ. Genova*, **18** : 74.  
 1992. *Argiope pulchella* : Biswas & Biswas, *Fauna of West Bengal Part III*, Araneae : Spiders, *State Fauna Series*, No. **3** : 455.  
 2004. *Argiope pulchella* : Majumder, *Rec. zool. Surv. India*, **20(2)** : 7.

*Materials examined* : 1 ♀, Panchong Bazar, Darjeeling, Dist. Darjeeling, West Bengal, 14.vii.2006. Coll. S.C. Majumder & S.Talukdar. 1 ♀, Tindheria, Dist. Darjeeling, Eastern Himalayas, West Bengal, 30.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Darjeeling Kalimpong, Kurseong, Mirik), Sundarban areas : (Kakdwip. Patharpratima, Gosaba, Dist. South 24 Parganas : Sandeshkhali, Dist. North Parganas), Bankura, Jalpaiguri, Midnapur, Maldah, Mursidabad. Nadia; Madhya Pradesh; Orissa; Assam; Maharashtra; Tamil Nadu.

*Elsewhere* : Myanmar, Malaysia Peninsula.

#### Genus 4. *Chorizopes* Cambridge, 1890

1890. *Chorizopes* Cambridge, *Proc. Zool. Soc. London*, 737.

1982. *Chorizopes* Tikader, *Fauna of India, Spider : Araneae*, 2(1) : 157.

*Type Species* : *Chorizopes frontalis* O.P. Cambridge.

*Distribution* : India, Myanmar, Japan.

#### 8. *Chorizopes bengalensis* Tikader, 1975

1975. *Chorizopes bengalensis* Tikader, *Proc. Indian Acad. Sci.*, 81(4) : 1.

1992. *Chorizopes bengalensis* : Biswas & Biswas *Fauna of West Bengal*, Part III, Araneae : Spider, *State Fauna Series*, 3 : 456.

*Materials examined* : 1 ♀, Raj Villa, Dist. Darjeeling, Eastern Himalayas, West Bengal, Coll. 17.iv.1974 Coll. B.K. Biswas.

*Diagnosis* : Cephalothorax longer than wide, clothed with fine black and grey pubescence, wide and high in front, convex and descending steeply behind the cephalic region. Eyes pearly white. Lateral eyes nearly contiguous, small and far away from the middle eyes. Ocular quadrate slightly wider in front than behind. Legs strong, provided with transverse bands. Abdomen longer than wide, clothed with fine pubescence. Dorsum ornamented with admixture of chalk white and brown spots.

*Distribution* : India : West Bengal (Darjeeling).

#### Genus 5. *Cyclosa* Menge

1866. *Cyclosa* Menge, *Schrift. Nat. Ges. Danzing (N.F.)* 1 : 73.

1982. *Cyclosa* : Tikader, *Fauna of India*, (Araneidae), 2(1) : 183.

*Type Species* : *Cyclosa conica* (Pallas).

*Distribution* : Cosmopolitan.

#### 9. *Cyclosa insulana* (Costa, 1934)

1934. *Epeira insulana* Costa, *Ann Zool.* : 65.

1982. *Cyclosa* : Tikader, *Fauna of India, Spider : Araneae*, 2(1) : 201.

*Diagnosis* : Cephalothorax longer than wide, narrowing in front, cephalic region distinctly separated from thoracic region by cephalic groove, thoracic fovea transverse. Eyes pearly white. Both the rows of eyes recurved. Ocular quadrate as long as wide. Chelicerae moderately strong. Abdomen rhombic shaped. Dorsum of the abdomen provided with 3 pairs of distinct sigilla arranged mid-longitudinally.

*Distribution* : India : West Bengal (Dist. Darjeeling); Meghalaya; Sikkim.

#### Genus 6. *Cyrtarachne* Thorell, 1868

1868. *Cyrtarachne* Thorell, *Eug. Resa. Arach.*, 10.

1992. *Cyrtarachne* : Biswas & Biswas, *Fauna of West Bengal*, Part III, Araneae : Spiders, *State Fauna Series* No. 3 : 358.

*Type species* : *Cyrtarachne qrubei* (Keyserling).

*Distribution* : Asia, Africa and Australia.

#### Key to the species of the genus *Cyrtarachne* Thorell

1. Dorsum of abdomen provided with sigilla, each surrounded by black patches; epigynal scape sent ..... *gravelyi*
- Dorsum of abdomen provided with sigilla but not surrounded by black patches; epigynal scape with thin rim ..... 2
2. Abdomen with large smooth convex indistinct prominences having chocolate colored patches; epigynal scape broad and blunt ..... *inequalis*

#### 10. *Cyrtarachne gravrlyi* Tikader, 1960

1960. *Cyrtarachne gravrlyi* Tikader, *J Bombay nat. Hist. Soc.*, 57(3) : 553.

1992. *Cyrtarachne gravrlyi* : Biswas & Biswas, *Fauna of West Bengal*, Part III, Araneae : Spiders, *State Fauna Series*, No. 3 : 459.

*Distribution* : India : West Bengal (Dist. Darjeeling).

#### 11. *Cyrtarachne inequalis* Thorell, 1895

1895. *Cyrtarachne inequalis* Thorell, *Spider of Burma*, 201.

1992. *Cyrtarachne inequalis* : Biswas & Biswas, *Fauna of West Bengal*, Part III, Araneae : Spiders, *State Fauna Series*, No. 3 : 459.

*Materials examined* : 1 ♀, Kalijhora, Kalimpong, Dist. Darjeeling, West Bengal 12.vii.2006, Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Kalimpong, Dist. Darjeeling).

#### Genus 7. *Cyrtophora* Simon, 1864

1864. *Cyrtophora* Simon, *Hist. Nat. des. Araign.* 1 : 261.

1962. *Cyrtophora* : Tikader, *J. Linn. Soc.*, 44(300) : 561.

1982. *Cyrtophora* : Tikader, *Fauna of India*, Spider : Araneae, 2(1) : 171.

1992. *Cyrtophora* : Biswas & Biswas, *Fauna of West Bengal Part III, Araneae : Spiders, State Fauna Series*, No. 3 : 460.

*Type-species* : *Cyrtophora citricola* (Forskal).

*Distribution* : Tropical and sub-tropical countries of the world.

### Key to the species of the genus *Cyrtophora* Simon

1. Epigyne provided with median septum ..... *bidenta*  
— Epigyne provided without median septum ..... 2
2. Abdomen provided with two pair's humps; epigyne provided with a broad rim .....  
..... *cicatrosa*  
— Abdomen not provided with two pairs humps; epigyne not provided with abroad rim  
..... 3
3. Abdomen oval; dorsum decorated with numerous small white spots and without any  
black patches; carapace uniformly blackish ..... *moluccensis*

#### 12. *Cyrtophora bidenta* Tikader, 1970

1970. *Cyrtophora bidenta* Tikader, *Rec. zool. Surv. India*, **63**(1-4) : 32. 2005. *Cyrtophora bidenta* Majumder, *Mem. zool. Surv. India*, **20**(3) : 15.

*Distribution* : India : West Bengal : (Darjeeling), Sundarban areas : (Patharpratima, Gosaba, Kulpi, Mandirbazar, Dist. South 24 Parganas; Sandeshkhali, Hingalgunj, Haroa, Dist. North Parganas); Sikkim.

#### 13. *Cyrtophora cicatrosa* (Stoliczka, 1869)

1869. *Epeira cicatrosa* Stoliczka, *J. Asiat. Soc. Beng.*, **33** : 242.

1982. *Cyrtophora cicatrosa* : Tikader, *Fauna of India, Spider : Araneae*, **2**(1) : 178.

2005. *Cyrtophora cicatrosa* : Majumder, *Mem. Zoo. Surv. India*, **20**(3) : 14.

*Distribution* : India : West Bengal : (Kalimpong, Kurseong, Mirik, Darjeeling), Sundarban areas : (Hingalgunj, Dist. North 24 Parganas, Gosaba, Kulpi, Patharpratima, Dist. South 24 Parganas), Koch Bihar. Hugli, Jalpaiguri, Midnapur, Maldah, Nadia, Burdwan. Mursidabad; Uttar Pradesh.

#### 14. *Cyrtophora moluccensis* (Doleschall, 1857)

1857. *Cyrtophora moluccensis* Doleschall, *Naturw. Nat Indie*, **13** : 418.

1982. *Cyrtophora moluccensis* : Tikader, *Fauna of India, Spider : Araneae*, **2**(1) : 172.

*Distribution* : India : West Bengal : (Darjeeling, Koch Bihar); Andaman Nicobar Islands; Karnataka; Kerala; Madhya Pradesh.

*Elsewhere* : Austra-Malaysia; Myanmar; Nepal; Sri Lanka.

Genus 8. *Eriovixia* Archer, 1951

1864. *Neoscona* Simon, *Hist. Nat. des. Aragin*, **1** : 261.  
 1951. *Gibbarania*, Archer *Am. Mus. Novit.* **1487** : 1-52 : As per Silwal, M. and Molur, S *Zoo's Print Journal*, 2006, **22(2)** : 2551-2597.  
 1982. *Neoscona* : Tikader, *Fauna of India, Spider : Araneae*, **2(1)** : 23.

*Type-species* : *Neoscona anabesca* (Walckenaer).

*Distribution* : *Neoscona* distributed all over the world.

15. *Eriovixia excelsa* (Simon, 1889)

1889. *Glyptogana excelsus* Simon, *J. Asiat. Soc. Bengal*, **58** : 337.  
 1981. *Neoscona excelsus* : Tikader & Bal, *Rec. zool. Surv. India, Occ. Pap. No.* **24** : 25.  
 2004. *Neoscona excelsus* : Majumder, *Rec. zool. Surv. India*, **20(2)** : 10.  
 2005. *Eriovixia excelsa* (Simon) 1889 : As per Silwal, M. and Molur, S *Zoo's Print Journal*, 2006, **22(2)** : 2551-2597.

*Diagnostic characters* : Cephalothorax brownish, slightly longer than wide, cephalic region distinctly elevated with inconspicuous groove. Both rows of eyes strongly recurved, anterior median eyes slightly smaller than posterior median; posterior median eyes encircled by black rings. Chelicerae moderately strong. provided with moderate boss. Legs moderate," long and thin. Abdomen wider than long. Five pairs of sigilla present on the dorsum. Caudal hump with black spot.

*Distribution* : India : West Bengal (Darjeeling), Sunderban area (Patharpratima, Gosaba, Namkhana, And Dist. South 24 Parganas; Sandeshkhali, Hasnabad. North 24 Parganas); Bihar; Gujarat; Maharastra.

Genus 9. *Gasteracantha* Sundevall, 1833

1833. *Gasteracantha* Sundevall, *Conspictus Arachniden*, 14.  
 1981. *Gasteracantha* : Tikader & Biswas, *Rec. zool. Surv. India, Occ. Pap. No.*, **30(1)** : 33.  
 1982. *Gasteracantha* : Tikader, *Fauna of India, Spider : Araneae*, **2(1)** : 52.

*Type species* : *Gasteracantha cancriformis* (Linnaeus).

*Distribution* : Tropical countries of the world.

**Key to the species of the genus *Gasteracantha* Sundevall**

1. Median spines not minute and simple ..... *brevispina*
- Median spines minute and simple ..... 2
2. Cephalic region provided with a median bulge-like conical elevation ..... *cancriformis*
- Cephalic region not provided with a median bulge-like conical elevation ..... 3
3. Dorsum of the abdomen provided with three conspicuous transverse yellowish bar ..... *diadesmia*

- Dorsum of the abdomen not provided with three conspicuous transverse yellowish bar ..... 4
- 4. Length of median spines slightly lesser than half of the width of abdomen of the base of anterior spines ..... *hasseltii*
- Length of median spines greater than width of abdomen of the base of anterior spines ..... 5
- 5. Posterior spine not abruptly narrowed at the apex ..... *kuhli*
- Posterior spine abruptly narrowed at the apex ..... 6
- 6. Spines provided with conspicuous bulge base and abruptly narrowed at the
- 7. Apex ..... *unguifera*

16. ***Gasteracantha brevispina*** (Doleschall, 1857)

1857. *Plectana brevispina* Doleschall, *Nat. Tij. Netherland Indle* **13** : 423.

1900. *Gasteracantha brevispina* : Pocock, *Fauna Brit. India, Arch* : 235.

1970. *Gasteracantha brevispina* : Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 38.

*Material examined* : 2♀, Kalimpong, Dist. Darjeeling, West Bengal, 17.ix.1959 Coll. B.K. Tikader 10♀, Darjeeling, West Bengal, 9.xii.1959 Coll. B.K. Tikader.

*Distribution* : India : West Bengal (Kalimpong, Kurseong, Dist. Darjeeling), Kolkata; Andaman & Nicobar Islands; Bihar; Maharashtra; Meghalaya; Orissa; Sikkim; Tamil Nadu.

*Elsewhere* : Austro-Malaysia, Bangladesh, Japan, Myanmar, Sri Lanka.

17. ***Gasteracantha cancriformis*** Linn., 1758

1945. *Gasteracantha mammosa* C.L. Koch, *Die. Arachniden*, **11** : 57.

1982. *Gasteracantha mammosa* : Tikader, *Fauna of India, Spider : Araneae*, **2**(1) : 55.

1992. *Gasteracantha mammosa* : Biswas & Biswas *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series*, No. **3** : 470.

2005. *Gasteracantha cancriformis* Linn 1758 : As per Silwal, M. and Molur, *S Zoo's Print Journal*. 2006, **22**(2) : 2551-2597.

*Distribution* : India : West Bengal (Darjeeling, Kalimpong), Dist. South 24 Parganas; Andaman & Nicobar Island; Bihar; Maharashtra; Meghalaya; Orissa; Pakistan, Austro-Malaysia, Sri Lanka, Pakistan.

18. ***Gasteracantha diadesmia*** Thorell, 1887

1887. *Gasteracantha diadesmia* Thorell, *Ann. Mus. Civ. Genova*, **25** : 225.

1992. *Gasteracantha diadesmia* : Biswas & Biswas, *Fauna of West Bengal*, Part-III Araneae : Spiders, *State Fauna Series*, No. **3** : 470.

*Material examined* : 8♀, Kalimpong, Dist. Darjeeling, West Bengal, 17.ix.1959 Coll. B.K. Tikader.

*Distribution* : India : West Bengal (Kalimpong, Darjeeling).

19. *Gasteracantha hasseltii* C.L. Koch, 1838

1838. *Gasteracantha hasseltii* C.L. Koch, *Die. Arachniden*, 4 : 29.  
 1992. *Gasteracantha hasseltii* : Biswas & Biswas, *Fauna of West Bengal Part-III, Araneae : Spiders, State Fauna Series, No. 3* : 470.  
 2004. *Gasteracantha hasseltii* : Majumder, *Rec. zool. Surv. India*, 20(2) : 7.

*Materials examined* : 1 ♀, Mirick, Dist. Darjeeling, West Bengal, 14.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Kalimpong, Mirik and Darjeeling), Sundarban areas (Haroa, Dist. North Parganas); Andaman & Nicobar Islands; Sikkim.

20. *Gasteracantha kuhli* Koch, 1837

1859. *Plectana leucomelaena* Doleschall, *Verh. Nat. Vereen. Netherland Indle*, 5(5) : 42.  
 1900. *Gasteracantha leucomelaena* Pocock, *Fauna Brit. India, Arach* : 235.  
 1970. *Gasteracantha leucomelaena* Tikader, *Rec. zool. Surv. India*, 64(1-4) : 40.  
 2005. *Gasteracantha kuhli* Koch 1837 : As per Silwal, M. and Molur, *S Zoo's Print Journal*. 2006, 22(2) : 2551-2597.

*Distribution* : India : West Bengal (Kalimpong, Kurseong, Darjeeling), Kolkata; Andaman & Nicobar Islands; Assam; Bihar; Bhutan; Sikkim.

*Elsewhere* : Malaysia; Myanmar and Japan.

21. *Gasteracantha unguifera* Simon, 1845

1845. *Gasteracantha unguifera* Simon, *J. Asiat. Soc. Bengal.*, 58 : 336.  
 1970. *Gasteracantha unguifera* Tikader, *Rec. zool. Surv. India*, 64(1-4) : 38.  
 1992. *Gasteracantha unguifera* : Biswas & Biswas *Fauna of West Bengal, Part-III, Araneae : Spiders, State Fauna Series, No. 3* : 471.

*Materials examined* : 1 ♀, Kalimpong, Dist. Darjeeling, West Bengal, 9.xii.1959. Coll. B.K. Tikader.

*Distribution* : India : West Bengal (Darjeeling, Kalimpong ), Koch Bihar, Jalpaiguri, South 24 Parganas; Sikkim.

Genus 10. *Gibbarania* Archar, 1951

1951. *Gibbarania*, Archar 1951 : As per Silwal, M. and Molur, *S Zoo's Print Journal*. 2006, 22(2) : 2551-2597.  
 1951. *Gibbarania*, Archer *Am. Mus. Novit.* 1487 : 1-52.  
 1757. *Araneus*, Clerck, *Arign. Succ.*, 15.

*Type-species* : *Araneus angulatus* Clerck.

*Distribution* : Tropical countries of the world.

22. *Gibbarania bituberculata* (Walckenaer, 1802)

1982. *Araneus mitifica* Tikader, *Fauna of India, Spider : Araneae*, 2(1) : 233.

1802. *Epeira bituberculata* Walckenaer, *Fauna Peris*, **2** : 19.  
 1886. *Epeira mitifica* Simon, *Act. Soc. Linon Bordeaux*, **40** : 150. *Fauna Peris*, **2** : 19.  
 1982. *Araneus bituberculata* : Tikader, *Fauna of India, Spider : Araneae*, **2(1)** : 231.  
 2005. *Gibbarania bituberculata* Walckenaer 1802 : As per Silwal, M. and Molur, S *Zoo's Print Journal*. 2006, **22(2)** : 2551-2597.

*Materials examined* : 1 ♀, Darjeeling Zoo-Garden, Dist. Darjeeling, 15.ix.1959. Coll. : B.K. Tikader; 1 ♀, Kalimpong, Dist. Darjeeling, 7.xii.2006. Coll. : S.C. Majumder & S. Talukdar; 1 ♀ Tindheria, Dist. Darjeeling, 30.xi.2006. Coll. : S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal : (Kalimpong, Kurseong, Mirik, Darjeeling), Sundarban areas : (Hingalgunj, North 24 Parganas), Jalpaiguri, Nadia; Maharashtra; Karnataka.

*Elsewhere* : Pakistan, Myanmar.

#### Genus 11. *Neoscona* Simon, 1864

1864. *Neoscona* : Simon, *Hist. Nat. des. Aragin*, **1** : 261.  
 1992. *Neoscona* : Biswas & Biswas *Fauna of West Bengal*, Part-III, Araneae Spiders, *State Fauna Series*, No. **3** : 465.

*Type-species* : *Neoscona anabesca* (Walckenaer).

*Distribution* : *Neoscona* distributed all over the world but many species this genus have been erroneously placed under the genus *Araneus* Clerck.

#### Key to the specis of the genus *Neoscona* Simon

1. Cephalic region with 'V' shaped conspicuons dark brown patches ..... *mukarjei*  
 — Cephalic region with no V shaped patches ..... 2
2. Abdomen triangular in shape, epigynal scape short, broad and triangular ..... *nautica*  
 — Abdomen nearly oval, epigynal scape long and narrow ..... 3
3. Carapace provided with 'V' shaped brown mark, epigynal scape sent at right angle to the base ..... *pavida*

#### 23. *Neoscona mukerjei* Tikader, 1980

1980. *Neoscona mukerjei* : Tikader, *Proc. Indian Acad. Sci.*, **89(3)** : 247.  
 1982. *Neoscona mukerjei* : Tikader, *Fauna of India*, Spider : Araneae, **2(1)** : 248.  
 1992. *Neoscona mukerjei* : Biswas & Biswas, *Fauna of West Bengal Part-III*, Araneae : Spiders, *State Fauna Series*, No. **3** : 467.  
 2004. *Neoscona mukerjee* : Majumder, *Rec. zool. Surv. India*, **20(2)** : 819.

*Materials examined* : 1 ♀, Kurseong, Dist. Darjeeling, West Bengal, 2.xii.2006 Coll. S.C. Majumder & S. Talukdar; 1 ♀, Sonada, Dist. Darjeeling, Eastern Himalayas, West Bengal, 11.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal : (Kalimpong, Kurseong, Darjeeling), Sundarban areas : (Gosaba, Namkhana, Patharpratima, Dist. South 24 Parganas; Sandeshkhali, Hasnabad, Dist. North 24 Parganas), Burdwan, Midnapur, Nadia, Koochbihar; Maharashtra.

#### 24. *Neoscona nautica* (L. Koch)

1875. *Epeira nautica* : L. Koch, *Aegypt. Abyssin. Arachn. Jickeli* : 17.

1982. *Neoscona nautica* : Tikader, *Fauna of India, Spider : Araneae*, 2(1) : 242.

1992. *Neoscona nautica* : Biswas & Biswas, *Fauna of West Bengal Part-III, Araneae : Spiders, State Fauna Series*, No. 3 : 467.

2004. *Neoscona nautica* : Majumder. *Rec. zool. Surv India*, 20(2) : 11.

*Materials examined* : 1 ♀, Kalijhora, Kalimpong, Dist. Darjeeling, West Bengal, 12.vii.2006 Coll. S.C. Majumder & S. Talukdar; 1 ♀, Panchong, Bazar, Dist. Darjeeling, West Bengal, 13.vii.2006. Coll. : S.C. Majumder & S. Talukdar.

*Distribution* : India : Bengal : (Kalimpong, Darjeeling), Sunderban area : Kakdwip, Mandir Bazar, Dist. South 24 Parganas; Hingalgunj, Hasnabad, Dist. North 24 Parganas), Assam : Gujarat : Maharashtra; Meghalaya.

*Elsewhere* : Myanmar : Pakistan; North America.

#### 25. *Neoscona pavida* (Simon, 1906)

1906. *Araneus pavida* Simon, *Annals, Soc.ent. Fr.*, 75 : 309.

1982. *Neoscona pavida* : Tikader, *Fauna of India, Spider : Araneae*, 2(1) : 276.

1992. *Neoscona pavida* : Biswas & Biswas, *Fauna of West Bengal Part-III, Araneae : Spiders, State Fauna Series*, No. 3 : 468.

2004. *Neoscona pavida* : Majumder, *Rec. Zool. Surv. India*, 20(2) : 9.

*Materials examined* : 1 ♀, Kurseong, Darjeeling, Dist. Darjeeling, West Bengal, 2.xii.2006 Coll. : S.C. Majumder & S.Talukdar.

*Distribution* : India : West Bengal (Kurseong, Mirik, Dist. Darjeeling), Sundarban areas : Hingalgunj, Sandeshkhali Dist. North 24 Parganas.

*Elsewhere* : China, Japan, Austro-Malayasia, South New Guinea.

#### Family III. ATYPIDAE Bertkau, 1878

##### Genus 12 *Atypus* Thorell, 1870

1870. *Atypus* Thorell : As per reference : 2005. Silwal, M. Molur, S. and B.K. Biswas *Zoo's Print Journal*. 20(10) : 1993-2500.

*Diagnosis* : Cephalothorax is very broad in front. Mandible is very large. Legs are weakly spined. Abdomen oval, longer than wide.

*Type Species* : *Atypus stherlandi* Chennapaiya, 1935.

*Distribution* : Oriental region from India, Burma to Java and North America; Palaearctic region from Ireland to Japan.

26. *Atypus sutherlandi* Chennappaiya, 19351955. *Atypus sutherlandi* Roewer, BZW. 1955 *Bruxelles*, 2 : 1-1751.2005. *Atypus sutherlandi* Chennappaiya 1935 : As per reference Silwal, M. and Molur, S 2006. *Zoo's Print Journal*. 22(2) : 2551-2597.

*Material examined* : 1 ♀, Kalimpong, Dist. Darjeeling, West Bengal, 20.ii.1935, Coll. F.H. Gravely.

*Diagnosis* : Cephalothorax is very broad in front with median conical ocular tubercle. Coxa of palp is furnished with large maxillary process. Spinnerets are six in number. Mandible is very large without rastellum. Sternum with anterior sigilla is not forming a groove at the base of the labium. Legs are weakly spined and furnished with three tarsal claws. Abdomen oval, longer than wide.

*Distribution* : India : West Bengal : (Kalimpong, Dist. Darjeeling).

## Family IV. CLUBIONIDAE Wagner, 1887

Genus 13. *Clubiona* Latreille, 19041804. *Clubiona* Latreille, *Nouv. Dict. Hist. Nat.*, 24 : 134.1991. *Clubiona* : Majumder & Tikader, *Rec. zool. Surv. India, Occ. Pap. No.*, 102 : 19.

*Type-species* : *Clubiona pallidula* (Clerck).

*Distribution* : All tropical part of the world.

**Key to the species of the genus *Clubiona* Latreille**

1. Abdomen spindle shaped, the posterior half of abdomen provided with V-shaped brownish ornamentation ..... *drassodes*
- Abdomen not spindle shaped, the posterior half of abdomen without V-shaped brownish ornamentation ..... 2
2. Eyes of the anterior row slightly recurved; anterior median not silvery white in color ..... *filicata*
- Eyes of the anterior row not slightly procurved, anterior medians silvery white in colour ..... 3
3. Tarsi usually long with short claws ..... *pogonias*
- Tarsi usually short with long claws ..... 4
4. Labium broader anterior end, provided with 6 long black spines ..... *shillongensis*

27. *Clubiona drassodes* Cambridge, 18741874. *Clubiona drassodes* Cambridge, *Proc. Zool. Soc. London* : 414.1970. *Clubiona atwali* Sing, *Science & Culture*, 36 : 410.1991. *Clubiona drassode* : Majumder & Tikader, *Rec. zool. Surv. India, Occ. Pap. No.* 2 : 5.

2005. *Clubiona drassodes* Cambridge 1874 : As per reference : Silwal, M. and Molur, S *Zoo's Print Journal*. 2006, **22**(2) : 2551-2597.

*Material examined* : 1 ♀, Karshiong, Dist. Darjeeling, West Bengal, 2.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal : (Kurshiong, Dist. Darjeeling, North 24 Parganas, Burdwan, Hawrah, Birbhum); Uttar Pradesh; Bihar; Tamil Nadu; Maharashtra; Karnataka.

#### 28. *Clubiona filicata* Cambridge, 1974

1874. *Clubiona filicata* Cambridge, *Proc. zool. Soc. London*, 413.

1991. *Clubiona filicata* : Majumder & Tikader, *Rec. zool. Surv. India, Occ. Pap. No.* **102** : 23.

*Material examined* : 1 ♀, Jorapokhri, Mirik, Dist. Darjeeling, West Bengal, 9xii.2006. Coll. S.C. Majumder & S. Talukdar. 1 ♀, Little Rangit River, Dist. Darjeeling, West Bengal 4.vii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal : (Mirik, Darjeeling). North & South 24 Parganas, Bardhaman, Howrah. Kolkata; Maharashtra; Rajasthan; Madhya Pradesh.

#### 29. *Clubiona pogonias* Simon, 1895

1895. *Clubiona pogonias* Simon, *Ann. Soc. Ent. Fr.*, **76** : 312.

2005. *Clubionapogonias* : Majumder, *Mem. Zool. Surv. India*, **20**(3) : 17.

*Distribution* : India : West Bengal : (Dist. Darjeeling).

#### 30. *Clubiona shilongensis* Majumder & Tikader, 1991

1991. *Clubiona shilongensis* Majumder & Tikader, *Rec. zool. Surv. India, Occ. Pap. No.* **102** : 23.

1992. *Clubiona shilongensis* : Biswas & Biswas, *Fauna of West Bengal, Araneae : Spider, State Fauna Series*, **3** : 414.

*Distribution* : India : West Bengal : (Dist. Darjeeling); Meghalaya; Tamil Nadu.

### Family V. CORINNIDAE Karsch, 1880

#### Key to the genera of the family CORINNIDAE Karsch, 1880

1. Cephalothorax with median furrow. The last segment of the hind spinnerets is very short ..... ***Castianeira***
- Cephalothorax with or without median furrow. The last segment of the hind spinnerets is not very short ..... 2
2. The posterior row of eyes is not strongly curved; sternum not distinctly margined; ventral notch present in the IV trochanter ..... ***Oedignatha***

*Remarks* : The genera *Castianeira* Keyserling, 1879 and *Oedignatha* Thorell, 1881 are presently included under the family Corinnidae : As per reference : Silwal, M. and Molur, S 2006. *Zoos's Print Journal*. **22**(2) : 2551-2597.

Genus 14. *Castianeira* Keyserling, 18791879. *Castianeira* Keyserling *Verh. Zool. Bot. Ges. Wien.* **29** : 335.1991. *Castianeira* : Majumder & Tikader, *Rec. zool. surv. India, Occ. Pap. No.*, **102** : 130.*Type-species* : *Castianeira rubicunda* keyserling.*Distribution* : India, Africa, Malaysia, America and Canada.**Key to the species of the genus *Castianeira*, Keyserling**

1. Labium whitish in color not broader than long and not scopulated anteriorly .....  
..... *albopicta*
- Labium not whitish in color broader than long not scopulated anteriorly ..... 2
2. Legs not so strong and without longitudinal markings or whitish band, posterior tibia  
without conspicuous band at the apex ..... *himalayensis*
- Legs strong and with longitudinal markings or whitish band, posterior tibia with  
conspicuous band at the apex ..... 3
3. Chelicerae enormous size, inner margin with 6 teeth ..... *indica*
- Chelicerae not enormous size, inner margin not provided with 6 teeth ..... 4
3. Abdomen cylindrical, dorsum provided with 3 pairs of segilla ..... *zetes*

**31. *Castianeira albopicta* Gravely, 1931**1931. *Castianeira albopicta* Gravely, *Rec. Indian Mus.*, **33**(3) : 275.1992. *Castianeira albopicta* : Biswas & Biswas, *Fauna of West Bengal, Part-III, Araneae : Spiders, State Fauna Series, No. 3* : 425.*Material examined* : 1 ♀, Pashok Dist. Darjeeling, West Bengal, 6.viii.1916. Coll. F.H. Gravely.*Distribution* : India : West Bengal : (Pashok, Darjeeling); Bihar; Gujarat.**32. *Castianeira himalayensis* Gravely, 1931**1931. *Castianeira himalayensis* Gravely, *Rec. India Mus.*, **33**(3) : 275.1992. *Castianeira himalayensis* : Biswas & Biswas, *Fauna of West Bengal, Part-III, Araneae : Spiders, State Fauna Series No. 3* : 424.*Material examined* : 1 ♀, Tindheria, Dist. Darjeeling, West Bengal, 9.x.1915. Coll. Mrs. Drake.*Distribution* : India : West Bengal (Kurshiong, Kalimpong, Dist. Darjeeling, Kolkata).**33. *Castianeira indicum* Tikader, 1981**1981. *Castianeira indicum* : Tikader, *Bull. Zool. Surv. India*, **4**(3) : 260.*Distribution* : India : West Bengal (Darjeeling).

34. *Castianeira zetes* Simon, 18971897. *Castianeira zetes* : Simon, *Bull. Mus. Hist. nat. Paris*, 3(7) : 294.1992. *Castianeira zetes* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series*, No. 3 : 425.*Distribution* : India : West Bengal : (Kalimpong, Kurseong, Darjeeling). Tamil Nadu; Bangalore; Orissa; Assam; Maharashtra; Bhutan.Genus 15. *Oedignatha* Thorell, 18811881. *Oedignatha* Thorell, *Ann. Mus. civ. Stor. Nat. Genova*, 18 : 209.1991. *Oedignatha* : Majumder & Tikader, *Rec. zool. Surv. India*, Occ. Pap. No. 102 : 102.*Type species* : *Oedignatha scrobiculata* Thorell.*Distribution* : India, Sri-Lanka, Java, China.**Key to the species of the genus *Oedignatha* Thorell**

1. Chelicerae brownish red; abdominal shield not provided with 6 whitish patches on either side of the mid-dorsal line ..... *carli*
- Chelicerae blackish; abdominal shield provided with 6 whitish patches on either side of the mid-dorsal line ..... 2
2. Cephalothorax oblonged, a prominent median tubercle situated just below the median frontal eye ..... *scrobiculata*

35. *Oedignatha carly* Reimoser, 19341934. *Oedignatha carly* Reimoser, *Rev. Suisse. Zool.*, 41(32) : 492.1992. *Oedignatha carly* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series*, No. 3 : 422.*Distribution* : India : West Bengal : (Darjeeling); Bihar; Tamil Nadu; Kerala.36. *Oedignatha scrobiculata* Thorell, 18811881. *Oedignatha scrobiculata* Thorell, *Ann. Mus. Civ. Nat. Genova*, 18 : 209.1992. *Oedignatha scrobiculata* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series*, No. 3 : 422.*Distribution* : India : West Bengal (Darjeeling), (Kolkata, Serampore, Birbhum. Tamil Nadu; Maharashtra; Orissa; Bihar.*Remarks* : The genera *Oedignatha* Thorell and *Castianeira* Keyserling have been included in the Family : Corinnidae as per reference : 2005. Silwal, M. Molur, S and B.K. Biswas *Zoo's Print Journal*. 20(10) : As per Silwal, M. and Molur, S *Zoo's Print Journal*. 2006, 22(2) : 2551-2597.

## Family VI. CTENIDAE Keserling, 1877

Genus 16. *Ctenus* Cambridge, 19011901. *Ctenus* Cambridge, *Biol. Centr. Amer Ar.*, 2 : 310.1940. *Ctenus* : Comstock. *The spider Book*, New York : 631.1970. *Homalonichus* : Tikader, *Rec. zool. Surv. India*, 64(1-4) : 60.

*Diagnosis* : The lower margin of the furrow of the chelicerae armed with three teeth. The first row of eyes slightly procurved, the median eyes larger than the lateral eyes and closer to them. The posterior row of eyes recurved, the eyes equal in size, somewhat larger than those of the anterior row. The median ocular quadrate wider behind than in front. Abdomen with or without dorsal pattern.

*Type species* : *Ctenus nigrinus* Cambridge.

*Distribution* : India, Asia and America.

**Key to the species of the genus *Tenus* Cambridge**

1. Femora provided with indistinct black bands ..... *himalayensis*
- Femora provided with distinct black bands ..... 2
2. Lateral side of the abdomen provided with longitudinal whitish band ..... *sikkimensis*

**37. *Ctenus himalayensis* Gravely, 1931**1931. *Ctenus himalayensis* Gravely, *Rec. Indian Mus.*, 33(3) : 230.

*Material examined* : 1 ♀, Belong, Dist. Darjeeling, West Bengal, 24.ix.1914, Coll. F.H. Gravely.

*Distribution* : India : West Bengal (Darjeeling), Sikkim.

**38. *Ctenus sikkimensis* Gravely, 1931**1931. *Ctenus himalayensis* Gravely, *Rec. Indian Mus.*, 33(3) : 232.1970. *Homalonichus* : Tikader, *Rec. zool. Surv. India*, 64(1-4) : 61.

*Material examined* : 1 ♀, Pashok, Dist. Darjeeling, West Bengal, 1.i.1915. Coll. F.H. Gravely.  
4 ♀, Kalimpong, Dist. Darjeeling, West Bengal 1.i.1914. Coll. Sutherlandi.

*Distribution* : India : West Bengal (Darjeeling), Sikkim.

## Family VII. GNAPHOSIDAE Pocock, 1898

**Key to the genera of the family GNAPHOSIDAE**

1. Chelicerae strong, inner and outer margin provided with two teeth, ..... *Geodrassus*
- Chelicerae not strong, inner and outer margin without teeth ..... 2
2. Maxillae rounded; labium narrower anterior and broad posteriorly ..... *Gnaphosa*
- Maxillae rounded; labium not narrower anterior and broad posteriorly ..... 3

4. Eyes of the posterior row nearly equal in size and equidistance from each other  
 ..... **Scotophaeus**

Genus 17. **Geodrassus** Westring, 1857

1857. *Geodrassus* Westring : As per Silwal, M. and Molur, S *Zoo's Print Journal*. 2006, **22**(2) : 2551-2597.  
 1851. *Drassodes* Westring *Getoborgs. K. Vetensk. Vetterh. Samh. Handl.*, **2** : 25-62.  
 1982. *Drassodes* : Tikader, *Fauna of India*, Spider, Spider : Araneae, **2**(2) : 388.

*Type species* : *Drassodes lapidosus* (Walckenaer).

*Distribution* : Oriental, sub-tropical and temperate regions of the world.

39. **Geodrassus himalayensis** Tikader & Gajbe, 1975

1975. *Drassodes himalayensis* Tikader & Gajbe, *Oriental Ins.*, **9**(3) : 274-275.  
 1982. *Drassodes himalayensis* Tikader & Gajbe, *Fauna of India*, Spider : Araneae, **2**(2) : 427.  
 2005. *Geodrassus himalayensis* Tikader & Gajbe As 1975 : As per Silwal, M. and Molur, S. *Zoo's Print Journal*. 2006, **22**(2) : 2551-2597.

*Diagnosis* : Cephalothorax and legs light brown, longer than wide, cephalic region slightly high, provided with conspicuous fovea. Eyes pearly white except anterior medians Anterior row slightly procurved; posterior row longer, procurved, medians oval, slightly larger than laterals. Anterior medians slightly smaller than the laterals. Chelicerae strong, inner and outer margin provided with two small teeth. Legs long and strong. Abdomen longer than wide slightly narrow in front and wider behind.

*Distribution* : India : West Bengal : (Kalimpong, Kurseong, Mirik, Dist. Darjeeling); Uttaranchal; Meghalaya.

Genus 18. **Gnaphosa** Latreille, 1804

1804. *Gnaphosa* Latreille, *Nouv. Dict. Hist. Nat.*, **24** : 134.  
 1982. *Gnaphosa* : Tikader & Gajbe, *Fauna of India*, Spider : Araneae, **2**(2) : 329.

*Type species* : *Gnaphosa lucifuga* Latreille.

*Distribution* : Europe, Asia Africa and America.

40. **Gnaphosa poonaensis** Tikader, 1973

1973. *Gnaphosa poonaensis* Tikader, *Proc. Indian Acad. Sci.*, **77**(5) : 188.  
 1982. *Gnaphosa Poonaensis* : Tikader, *Fauna of India*, (Araneidae), **2**(2) : 332.

*Material examined* : 1 ♀, Sukiapokhri, Mirik, Dist. Darjeeling West Bengal, 10.xii.2006, Coll. S.C. Majumder & S.Talukdar.

*Diagnosis* : Cephalothorax. Longer than wide narrow in front, posterior middle provided with conspicuous fovea. Anterior row of eyes procurved, medians more or less equal size to laterals. Posterior row of eyes slightly recurved and slightly longer than anterior row, posterior medians oval and conspicuously silvery white in color. Chelicerae strong, inner margin provided

with chitinous ridge. Sternum heart shape pointed behind. Abdomen longer than wide, elliptical in shape. Dorsum provided with whitish chevrons.

*Distribution* : India : West Bengal : (Mirik, Darjeeling); Himachal Pradesh; Maharashtra; Rajasthan; Uttaranchal.

Genus 19. **Scotophaeus** Simon, 1893

1893. *Scotophaeus* Simon, *Hist. Nat. Aragn.*, 1(2) : 371.

1982. *Scotophaeus* : Tikader, *Fauna of India*, (Araneidae), 2(2) : 374.

*Type species* : *Scotophaeus quadripunctatus* Latreille.

*Distribution* : Oriental and temperate region of the world.

41. **Scotophaeus madalasa** Tikader & Gajbe, 1977

1977. *Scotophaeus madalasa* : Tikader & Gajbe, *Rec. zool. Surv. India*, 73(1-4) : 18.

*Diagnosis* : Cephalothorax. Longer than wide, convex narrow in front, cephalic region slightly high, centre provided with conspicuous fovea. Anterior row of eyes slightly procurved, medians circular, black and slightly larger than laterals. Posterior row of eyes slightly procurved and slightly longer than anterior row, posterior medians elliptical in shape and silvery white in color. Chelicerae vertical, inner and outer margin provided with three small teeth on each. Legs strong ridge. Sternum oval in shape slightly pointed behind. Abdomen longer than wide, more or less elliptical in shape. Dorsum provided with two white patches.

*Distribution* : India : West Bengal : (Kalimpong, Kurseong, Dist. Darjeeling); Uttaranchal.

Family VIII. HERESIDAE Thorell, 1870

Genus 20. **Hersilia** Audouin, 1826

1826. *Hersilia* Audouin *Derocr. Egypta. Arach.*, : 114.

1977. *Hersilia* : Tikader, *Rec. zool. Surv. India*, 72(1-4) : 84.

*Diagnosis* : Ocular quadrangle parallel sided; head flat, angular laterally; clypeus usually very high, prominent, protarsi of I and II and IV legs are bi-segmented.

*Type-species* : *Hersilia caudata* Audouin.

*Distribution* : Africa, Madagascar, Oriental region.

**Key to the species of the genus *Hersilia* Audouin**

1. Cephalo-thorax rounded; abdomen broad apple shaped, dorsum decorate with different colors ..... *savignyi*
- Cephalo-thorax not rounded; abdomen not broad and apple shaped, dorsum not decorate with different colors ..... 2
5. Eyes blackish similar, anterior row slightly procurved posterior row slightly recurved ..... *sumatrana*

42. *Hersilia savignyi* Lucas, 1836

1836. *Hersilia savignyi* Lucas Mag. Zool., 8 : 10.

1992. *Hersilia savignyi* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series* No. 3 : 382.

2004. *Hersilia savignyi* : Majumder, *Rec. zool. Surv. India*, 20(2) : 37.

*Material examined* : 1 ♀, Jorapokhri, Mirik, Dist. Darjeeling West Bengal, 9.xii.2006, Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal : (Mirik, Dist. Darjeeling) Sundarban areas : (Hasnabad, Dist. North 24 Parganas; Gosaba, Dist. South 24 Parganas), Hoogly, Jalpaiguri, Maldah, Midnapur, Murshidabad, Nadia, West Diaper; Assam; Maharashtra; Tamil Nadu; Uttar Pradesh.

*Elsewhere* : Myanmar, Sri Lanka.

43. *Hersilia sumatrana* Thorell, 1890

1951. *Hersilia Stevens* Sinha *Rec. Indian Mus.* 49 : 85.

2005. *Hersilia sumatrana* Thorell 1890 : As per Silwal, M. and Molur, S. *Zoo's Print Journal*. 2006, 22(2) : 2551-2597.

*Material examined* : 1 ♀, Gopaldhara, Dist. Darjeeling West Bengal, 1.i.1916, Coll. Stevens is.

*Distribution* : India : West Bengal : (Darjeeling).

## Family IX. HOMALONYCHIDAE Simon, 1893

Genus 21. *Homalonychus* Marx, 1891

1891. *Homalonychus* Marx, *Proceed. Ent. Soc. Wash.*, 2(1) : 2.

1970. *Homalonychus* : Tikader, *Rec. zool. Surv. India*, 64(1-4) : 6.

*Diagnosis* : The genus *Homalonychus* formerly belonging to the family Zoodaridae. Now this has been placed in a family of its own Tarsal claw two, similar and smooth, completely lacking denticles. The tarsi provided with a brush of terminal tenent hairs and a pairs of spurious claws. The eight eyes placed in two rows of four each. The first row strongly recurved and much wider than first row.

*Distribution* : America, India.

44. *Homalonychus jayantius* Tikader, 1970

1970. *Homalonychus jayantius* Tikader, *Rec. zool. Surv. India*, 64(1-4) : 6.

*Material examined* : 1 ♀, Mirik, Dist. Darjeeling West Bengal, 14.xii.2006, Coll. S.C. Majumder & S. Talukdar.

*Diagnosis* : Cephalothorax and abdomen black, legs brown in colour. Cephalothorax longer than wide slightly convex narrow in front provided with a broad longitudinal brown patches and this portion clothed with fine grey hair, lateral margins also provided with brown patch.

Centre of the thorax with deep foveal impression. Eyes dark. Posterior row strongly recurved and much wider than anterior row; anterior row short and procurved, and middle eyes slightly larger than laterals. Clypeus high. Chelicerae without tooth on the margin. Sternum broad. Clothed with spiny hairs, and posterior coxae widely separated. Legs strong and robust clothed with thick hairs. Tarsal claw two, similar in size and without denticles. Abdomen longer than wide, provided with longitudinal white line.

*Distribution* : India : West Bengal (Darjeeling).

Family X. LYNYPHIDAE Blackwall, 1859

Genus 22. *Lepthyphantes* Menge, 1866

1866. *Lepthyphantes* Menge, *Preuss. Spinn.*, **1** : 95.

1970. *Lepthyphantes* : Tikader, *zool. Surv. India*, **64**(1-4) : 22.

*Diagnosis* : Cephalothorax narrowed anteriorly. Eyes large with black spot. Anterior median smaller than posterior medians Clypeus slightly concave. Abdomen with or without dorsal pattern.

*Type species* : *Lepthyphantes nebulosa* Sundevall.

*Distribution* : Africa, America, Asia, Australia and Europe.

#### Key to the species of the genus *Lepthyphantes* Menge

1. Abdomen not triangular, anterior portion of abdomen high ..... *bhudbari*
- Abdomen not triangular, anterior portion of abdomen high ..... *lingsoka*

#### 45. *Lepthyphantes bhudbari* Tikader, 1970

1970. *Lepthyphantes bhudbari* Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 23.

*Material examined* : 1 ♀ Bhudbari, Darjeeling, West Bengal, 15. ix.1959. Coll. B.K. Tikader.

*Diagnosis* : Cephalothorax and legs brownish green. Cephalothorax as long as wide, cephalic region slightly rose. Eyes not pearly white. But base of all eyes encircled by black patches; anterior row strongly recurved; posterior row straight; lateral and anterior median eyes are contiguous. Anterior median eyes smaller than others. Legs strong. Abdomen egg shaped. Dorsum ornamented mid-dorsally with a longitudinal black bar extending from base to end of abdomen of abdomen and lateral side provided with irregular chalk white patches.

*Distribution* : India : West Bengal (Darjeeling).

#### 46. *Lepthyphantes lingsoka* Tikader, 1970

1970. *Lepthyphantes lingsoka* Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 24.

*Material examined* : 1 ♀ Lingsoka, Darjeeling, West Bengal, 2. ix.1959. Coll. B.K. Tikader.

*Diagnosis* : Cephalothorax and legs brownish green. Cephalothorax as long as wide, cephalic region slightly rose. Eyes not pearly white but base of all eyes encircled by black patches;

anterior row strongly recurved; posterior row straight; lateral and anterior median eyes are contiguous. Anterior median eyes smaller than others. Legs strong. Abdomen egg shaped. Dorsum ornamented mid-dorsally with a longitudinal black bar extending from base to end of abdomen of abdomen and lateral side provided with irregular chalk white patches.

*Distribution* : India : West Bengal (Darjeeling).

Family XI. LYCOSIDAE Sundevall, 1833

**Key to the genera of the family LYCOSIDAE**

1. Posterior spinnerets distinctly longer than anterior; sternum generally provided with mid-longitudinal dark marking ..... **Hippasa**
- Posterior spinnerets not distinctly longer than anterior; sternum not provided with mid-longitudinal dark markings ..... 2
2. Anterior row of eyes straight, Ocular quadrate wider than long ..... **Hogna**
- Anterior row of eyes not straight, not Ocular quadrate wider than long ..... 3
3. Labium longer than wide and the basal excavation is prominent ..... **Lycosa**
- Labium not longer than wide and the basal excavation is not prominent ..... 4
4. Cephalic region not much elevated from the thoracic region ..... **Pardosa**
- Cephalic region much elevated from the thoracic region ..... 5
5. Ocular quadrate longer than wide ..... **Venonia**

Genus 23. **Hippasa** Simon, 1885

1885. *Hippasa* Simon, *Bull. Soc. Zool. Prs.*, **10** : 31.

1951. *Hippasa* : Sinha, *Rec. Indian Mus.*, **48**(2) : 11.

*Type species* : *Hippasa agelenoides* (Simon).

*Distribution* : Madagascar : Africa, Malaysia and India.

**Key to the species of the genus *Hippasa* Simon**

1. Chitinous plate covering the pit of the valve and bifurcated posteriorly, producing a pair of large elevated triangular plate ..... *agelenoides*
- Chitinous plate not covering the pit of the valve, not producing a pair of elevated triangular plate ..... 2
2. Chitinous plate covering the pit of the valve and bifurcated posteriorly, producing a pair of large elevated triangular plate ..... *greennalliae*
- Chitinous plate not covering the pit of the valve, not producing a pair of elevated triangular plate ..... 3

3. Pit of the vulva triangular in front and dorsal side of abdomen with dark brown spots and white chevrons ..... *himalayensis*
- Pit of the vulva not triangular in front and dorsal side of abdomen without dark brown spots and white chevrons ..... 4
4. Plate of valve produced into a tongue like process very much drawn out posteriorly ..... *holmerae*
- Plate of valve not produced into a tongue like process ..... 5
5. Posterior spinners conspicuously longer than the anterior spinners ..... *pantherina*
- Posterior spinners conspicuously longer than the anterior spinners ..... 6
6. Ventral side of the abdomen provided with three longitudinal dark bands extending from the epigastric fold to the base of the spinnerets ..... *parlita*

**47. *Hippasa agelenoides* (Simon, 1884)**

1884. *Pirata agelenoides* Simon, *Ann. Mus. civ. Stor. Nat. Genova*, **20** : 334.

1900. *Hippasa agelenoides* : Pocock, *Fauna of Brit. India, Arach.* 251.

1980. *Hippasa agelenoides* : Tikader, *Fauna of India, (Lycosidae)*, **1(2)** : 293.

*Material examined* : 1 ♀, Lopchu, Kalimpong, Dist. Darjeeling West Bengal, 12.xii.2006.  
Coll. S.C. Majumder & S.Talukdar.

*Distribution* : India : West Bengal (Kalimpong, Mirik, Dist. Darjeeling); Kerala; Tamil Nadu; Karnataka; Uttaranchal; Madhya Pradesh.

*Elsewhere* : Myanmar.

**48. *Hippasa greenalliae* (Blackwall, 1867)**

1867. *Lycosa greenalliae* Blackwall, *Ann. Mag. Nat. Hist.* **19(3)** : 387.

1980. *Hippasa greenalliae* : Tikader, *Fauna of India, (Lycosidae)*, **1(2)** : 277.

1992. *Hippasa greenalliae* : Biswas & Biswas, *Fauna of West Bengal, Part-III, Araneae : Spiders, State Fauna Series No. 3* : 439.

*Distribution* : India : West Bengal (Darjeeling), Sunderban areas : Patharpratima, Dist. South 24 Parganas.) Karnataka; Kerala; Orissa; Maharashtra; Tamil Nadu; Sikkim.

**49. *Hippasa himalayensis* (Gravely, 1924)**

1924. *Hippasa himalayensis* Gravely, *Rec. Indian Mus.*, **26** : 593.

1980. *Hippasa himalayensis* Tikader, *Fauna of India, (Lycosidae)*, **1(2)** : 281.

*Distribution* : India : West Bengal (Kalimpong, Dist. Darjeeling); Himachal Pradesh; Karnataka.

**50. *Hippasa holmerae* Thorell, 1895**

1895. *Hippasa holmerae* Thorell, *Spiders of Burma* : 218.

1980. *Hippasa holmerae* : Tikader, *Fauna of India*, (Lycosidae), **1**(2) : 295.

1992. *Hippasa holmerae* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series No. 3* : 439.

*Distribution* : India : West Bengal (Mirik, Darjeeling) Sunderban areas (Patharpratima, Dist. North and South 24 Parganas). Uttar Pradesh; Manipur.

*Elsewhere* : Myanmar, Singapur, West China.

#### 51. *Hippasa pantheina* Pocock, 1899

1899. *Hippasa pantherina* Pocock, *J. Bombay nat. Hist. Soc.*, **12** : 152.

1970. *Hippasa pantherina* : Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 62.

*Distribution* : India : West Bengal (Darjeeling); Balasore; Orissa; Maharashtra; Sikkim.

#### 52. *Hippasa partita* (Cambridge, 1876)

1876. *Trochosa partita* Cambridge, *Proc. Zool. Soc.* : 541-630.

1992. *Hippasa partita* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series No. 3* : 439.

2004. *Hippasa partita* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 16.

*Material examined* : 1 ♀, Kurseong, Dist. Darjeeling West Bengal, 10.xii.2006, Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Kurseong, Mirik, Dist. Darjeeling), Sunderban area : Patharpratima, Dist. South 24 Parganas); Gujarat; Rajasthan.

*Elsewhere* : Egypt, Arabia, Pakistan.

#### Genus 24. *Hogna* Gravely, 1924

1804. *Lycosa Latrielle*, *Nouv. Dist. Hist. Nat.* **24** : 135.

1970. *Lycosa* : Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 63.

2005. *Hogna* : Gravely 1924, As per Silwal, M. and Molur, S *Zoo's Print Journal*. 2006, **22**(2) : 2551-2597.

*Type-species* : *Lycosa tarantula* Rossi.

*Distribution* : All over the world.

#### 53. *Hogna himalayensis* Gravely, 1924

1924. *Lycosa himalayensis* Gravely, *Rec. Indian Mus.* **26** : 603.

1980. *Lycosa himalayensis* : Tikader, *Fauna of India*, (Lycosidae), **1**(2) : 382.

2004. *Lycosa himalayensis* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 18.

2005. *Hogna himalayensis* Gravely 1924, As per Silwal, M. and Molur, S. *Zoo's Print Journal*, 2006, **22**(2) : 2551-2597.

*Distribution* : India : West Bengal (Darjeeling), Sundarban areas : (Gosaba, Dist. South 24 Parganas, Bankura). Meghalaya, Assam. Key to the species of the genus *Lycosa* Latreille from Darjeeling.

Genus 25. *Lycosa* Latreille, 19041804. *Lycosa* Latreille, *Nouv. Dist. Hist. Nat.* **24** : 135.1970. *Lycosa* : Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 63.*Type-species* : *Lycosa tarantula* Rossi.*Distribution* : All over the world.**Key to the species of the genus *Lycosa* Latreille**

1. Labium slightly longer than broad and anterior part of the dorsum provided with longitudinal dark brown patches ..... *bistriata*
- Anterior part of the dorsum not provided with longitudinal dark brown patches ..... 2
2. Coxa of all legs pale ventrally and extremities of ventral side of IV tibia without band ..... *charmichaeli*
- Coxa of all legs not pale ventrally and extremities of ventral side of IV tibia with any band ..... 3
3. Carapace provided with median broad, pale band extending from base of 2<sup>nd</sup> row of eyes to the base of cephalothorax ..... *himalayensis*
4. Carapace redish brown in colour, femora of all legs provided with light patches ..... *kempi*
- Carapace not redish brown in femora all legs not provided with any patches ..... 5
5. Carapace with a broad mid-longitudinal plate band; sternum redish brown; coxa of all legs dark brown ..... *nigrotibialis*

54. *Lycosa bistriata* Gravely, 19241924. *Lycosa bistriata* Gravely, *Rec. Indian Mus.*, **26** : 600.1980. *Lycosa charmichaeli* : Sinha, *Rec. Indian Mus.*, **48**(2) : 21.*Distribution* : India : West Bengal (Darjeeling, Birbhum, Kolkata). Tamilnadu (Chennai).55. *Lycosa charmichaeli* Gravely, 19241924. *Lycosa charmichaeli* Gravely, *Rec. Indian Mus.*, **26** : 604.1980. *Lycosa charmichaeli* : Tikader, *Fauna of India*, (Lycosidae), **1**(2) : 407.1992. *Lycosa charmichaeli* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series No. 3* : 441.*Distribution* : India : West Bengal (Darjeeling). Andhra Pradesh; Punjab.56. *Lycosa himalayensis* Gravely, 19241924. *Lycosa himalayensis* Gravely, *Rec. Indian Mus.* **26** : 603.1995. *Lycosa himalayensis* : Biswas & Majumder, *Fauna of Meghalaya*, Part-II and Araneae : Spiders, *State Fauna Series No. 4* : 112.

2003. *Lycosa himalayensis* : Majumder, *Rec. zool. Surv. India*.

*Distribution* : India : West Bengal (Darjeeling), Sundarban areas : (Gosaba, Dist. South 24 Parganas, Bankura). Meghalaya; Assam.

57. *Lycosa kempi* Gravely, 1924

1924. *Lycosa kempi* Gravely, *Rec. Indian Mus.* **26** : 602.

1980. *Lycosa kempi* : Tikader, *Fauna of India*, (Lycosidae), **1(2)** : 3829.

1995. *Lycosa kempi* : Biswas & Majumder, *Fauna of Meghalaya*, Part-II, Araneae : Spiders, *State Fauna Series No. 4* : 112.

2004. *Lycosa Kempii* : Majumder, *Rec. zool. Surv. India*, **20(2)** : 17.

*Material examined* : 1 ♀, 1 ♂, Sambiyong, Dist. Darjeeling, West Bengal, 14i.xi.1959. B.K. Tikader.

*Distribution* : India : West Bengal (Mirik, Darjeeling), Sunderban areas : (Gosaba, Dist. South 24 Parganas; Gosaba). Meghalaya; Assam; Sikkim.

58. *Lycosa nigrotibialis* Simon, 1884

1884. *Lycosa nigrotibialis* Simon, *Ann. Muss. Stor. Nat. Genova.* **20** : 330.

1980. *Lycosa nigrotibialis* : Tikader, *Fauna of India*, (Lycosidae), **1(2)** : 405.

*Distribution* : India : West Bengal (Kalimpong, Mirik, Dist. Darjeeling, Birbhum and Kolkata) Assam; Bihar; Maharashtra; Sikkim.

Genus 26. *Pardosa* Koch, 1848

1848. *Pardosa* Koch. *Die. Arachnide*, **14** : 100.

1980. *Pardosa* : Tikader & Malhotra, *Fauna of India. Spiders : Araneae*, **1(2)** : 315.

*Type Species* : *Pardosa striatipes* Koch.

*Distribution* : Asia, Europe, America.

**Key to the species of the genus *Pardosa* Koch**

1. Anterior row of eyes slightly procurved ..... *birmanica*
- Anterior row of eyes slightly recurved ..... 2
2. Dorsal side of the abdomen decorated with minute light spots ..... *pseudoannulata*
- Dorsal side of the abdomen not decorated with minute light spots ..... 3
3. Dorsal side of abdomen dark brown with minute pale spots and mid-longitudinal area pale ..... *pusiola*
- Dorsal side of abdomen pale with few small dark brown spots ..... 4
4. Abdomen ventrally provided with sub-lateral longitudinal irregular greenish brown patches ..... *shyamae*

- Abdomen ventrally not provided with sub-lateral longitudinal irregular greenish brown patches ..... 5
5. Legs not so strong, provided dorsally with irregular greenish brown patches ..... *sumatrana*
- Legs not so strong, provided dorsally without irregular greenish brown patches ..... 6
6. Tibia and metatarsi of I & II provided with three pieces of ventral spines.....*sutherlandi*

59. ***Pardosa birmanica*** Simon, 1884

1884. *Pardosa birmanica* Simon, *Ann. Mus. Civ. Store nat. Genova*, **20** : 333.
1980. *Pardosa birmanica* : Tikader, *Fauna of India*, (Lycosidae), **1(2)** : 351.
1995. *Pardosa birmanica* : Biswas & Majumder, *Fauna of Meghalaya*, Part-II, Araneae : Spiders, *State Fauna Series*, **4** : 110.
2004. *Pardosa birmanica* : Majumder, *Rec. zool. Surv. India*, **20(2)** : 20.

*Distribution* : India : West Bengal : (Mirik, Darjeeling) Sunderban areas : (Sandeshkhali, Hasnabad, Hingalgunj, Dist North 24 Parganas; Gosaba, Dist. South 24 Paraganas), Burdwan, Birbhum, Gujarat; Rajasthan; Maharashtra; Punjab; Himachal Pradesh; Madhya Pradesh; Meghalaya; Tamil Nadu; Andhra Pradesh; Bihar; Orissa.

*Elsewhere* : Java, Pakistan.

60. ***Pardosa pseudoannulata*** (Bosenbarg & Strand, 1906)

1924. *Lycosa annandalei* Gravely, *Rec. Indian Mus.*, **26** : 606.
1980. *Pardosa annandalei* : Tikader, *Fauna of India*, (Lycosidae), **1(2)** : 351.
2004. *Pardosa annandalei* : Majumder, *Rec. zool. Surv. India*, **20(2)** : 20.
2005. *Pardosa pseudoannulata* Bosenbarg & Strand 1906, As per Silwal, M. and Molur, *S Zoo's Print Journal*, 2006, **22(2)** : 2551-2597.

*Distribution* : India : West Bengal (Mirik, Darjeeling) Sunderban area (Hingalgunj, Minakhan, Dist. North 24 Parganas; Patharpratima, Gosaba), Birbhum. Kerala; Maharashtra; Madhya Pradesh; Bihar; Assam : Gujarat; Andhra Pradesh; Karnataka; TamilNadu.

*Elsewhere* : Myanmar, Pakistan and Bangladesh.

61. ***Pardosa pusiola*** (Thorell, 1891)

1891. *Pardosa pusiola* Thorell, *Vs. A.K. Handl.* **24(2)** : 65.
1923. *Pardosa pusiola*, Gravely, *Rec. Indian Mus.*, **26** : 609.
1980. *Pardosa pusiola* Tikader, *Fauna of India*, (Lycosidae), **1(2)** : 323.

*Distribution* : India : West Bengal (Mirik, Suriel, Dist. Darjeeling).

*Elsewhere* : Bornio; Myanmar; Indronesia & Java.

62. ***Pardosa shyamae*** (Tikader, 1970)

1970. *Lycosa shyamae* Tikader, *Rec. zool. Surv. India*, **64(1-4)** : 67.

1980. *Pardosa shyamae* : Tikader, *Fauna of India*, (Lycosidae), **1**(2) : 343.  
 1992. *Pardosa shyamae* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series No. 3* : 445.  
 2004. *Pardosa shyamae* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 22.

*Material examined* : 5 ♀, Sambiyong, Dist. Dist. Darjeeling, West Bengal, 14i.xi.1959.  
 B.K. Tikader.

*Distribution* : India : West Bengal (Kalimpong, Darjeeling), Sunderban area (Hingalgunj, Minakhan. Sandeshkhali, Dist North 24 Parganas).

### 63. *Pardosa sumatrana* (Thorell, 1890)

1890. *Lycosa sumatrana* Thorell, *Ann. Mus. Stor. Nat. Genova*, **30** : 136.  
 1980. *Pardosa sumatrana* : Tikader, *Fauna of India*, (Lycosidae), **1**(2) : 353.  
 1995. *Pardosa sumatrana* : Biswas & Majumder, *Fauna of Maghalaya*, Part-II, Araneae : Spiders, *State Fauna Series No. 4* : 110.  
 2004. *Pardosa sumatrana* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 22.

*Distribution* : India : West Bengal (Mirik, Darjeeling), Sunderban area : (Kultali, Patharpratima, Gosaba, Dist South 24 Parganas; Hingalgunj, Sandeshkhali, Dist. North 24 Parganas), Birbhum, Burdwan, Hugli. Meghalaya; Karnataka; Tamil Nadu; Andhra Pradesh; Maharashtra; Bihar; Himachal Pradesh; Tripura; Rajasthan; Gujarat; Madhya Pradesh; Arunachal Pradesh; Andaman & Nicobar Island.

*Elsewhere* : Bangladesh, Nepal, Sri Lanka, Sumatra.

### 64. *Pardosa sutherlandi* (Gravely, 1924)

1924. *Lycosa sutherlandi* Gravely, *Rec. Indian Mus.*, **26** : 606.  
 1980. *Pardosa sutherlandi* : Tikader, *Fauna of India*, (Lycosidae), **1**(2) : 347.  
 1995. *Pardosa sutherlandi*, Biswas & Majumder, *Fauna of Meghalaya*, Part-II, Araneae, Spiders, *State Fauna Series No. 4* : 110.  
 2004. *Pardosa sutherlandi* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 23.

*Distribution* : India : West Bengal (Mirik, Darjeeling) Sunderban area (Gosaba, Dist. South 24 Parganas; Hingalgunj, Dist. North 24 Parganas).

### Genus 27. *Venonia* Thorell, 1894

1894. *Venonia* Thorell, *Bull. Soc. nt. Ital.*, **26** : 332.  
 1980. *Venonia* : Tikader, *Fauna of India*, (Lycosidae), **1**(2) : 433.

*Type Species* : *Venonia coruscans* Thorell.

*Distribution* : India, New Holland, Singapore.

### 65. *Venonia himalayensis* Gravely, 1924

1924. *Venonia himalayensis* Gravely, *Rec. Indian Mus.*, **608**.  
 1980. *Venonia himalayensis* : Tikader, *Fauna of India*, (Lycosidae), **1**(2) : 434.

1992. *Venonia himalayensis* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders State Fauna series, No. 3 : 446.

*Diagnosis* : Cephalothorax wider than long, Cephalothorax provided with conspicuous fovea. Anterior view of eyes strongly procurved, anterior medians smaller than the laterals. Ocular quadrate wider than long. Chelicerae moderately strong. Legs long. Abdomen longer than wide, oval in shape, dorsum provided with three longitudinal rows of oblique strips.

*Distribution* : India : West Bengal (Darjeeling).

Family XII. MITURGIDAE Simon, 1885

Genus 28. ***Cheiracanthium*** Koch, 1839

1839. *Cheiracanthium* Koch. C.L. Die. Arach. Sochster Bond, 9.

1991. *Cheiracanthium* : Majumder & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 102* : 53.

*Type species* : *Cheiracanthium punctorium* Villers.

*Distribution* : All tropical parts of the world.

**Key to the species of the genus *Cheiracanthium* Koch**

1. Tarsi comparatively longer and less scopulated, maxillary lobe angulated distinctly at its outer side ..... *himalayensis*
- Tarsi comparatively shorter and more scopulated, maxillary lobenot angulated distinctly at its outer side ..... 2
2. Cymbium with long stout spurs at its base, extending almost at the middle of the tibia ..... *indicum*
- Cymbium with rudimentary spur, not extending almost at the middle of the Tibia ..... 3
3. Apophysis of the palpal organ enormously developed ..... *insigne*
- Apophysis of the palpal organ not enormously developed ..... 4
4. Retrolateral apophysis of the tibia of male palpal organ generally short and not slender, slightly sinuous at its tip ..... *melanostoma*
- Retro lateral apophysis of the tibia of male palpal organ generally long and slender, strongly sinuous at its tip ..... 5
5. Lateral eyes both anterior and posterior slightly separated from each other ..... *mysorensis*
- Lateral eyes both anterior and posterior very close to each other ..... 6
6. Chelicerae more or less parallel, inner and outer margin provided with 4 and 3 teeth... ..... *pauriensis*
- Chelicerae not parallel, inner and outer margin provided with 2 teeth ..... 7

7. Genital bulb or male palpus broad anteriorly, membranes of the palpal organ well developed  
 ..... **trivialis**

**Remarks :** The genus *Cheiracanthium* has been included under the family MITHURGIDAE  
 Simon : As per reference : 2005. Silwal, M. Molur, Sand B.K. Biswas, *Zoo's Print Journal*.  
**20(10) : 1999-2050.**

**66. *Cheiracanthium himalayensis* Gravely, 1931**

1931. *Cheiracanthium himalayensis* Gravely, *Rec. Indian Mus*, **33(3) : 264**

1991. *Cheiracanthium himalayensis* : Majumder & Tikader *Rec. zool. Surv. India, Occ. Pap. No. 102* : 65.

2004. *Cheiracanthium himalayensis* : Majumder, *Rec. zool. Surv. India*, **20(2)**.

**Material examined :** 1 ♀, Kalimpong, Dist. Darjeeling, Eastern Himalayas, West Bengal, 30.x.1917. Coll. Sutherland; 1 ♀, Tindharia, Dist. Darjeeling, Eastern Himalayas, West Bengal, 30.x.1915. Coll. Mrs. R. Drake; 1 ♂, Kalimpong, Dist. Darjeeling West Bengal, 10.xii.1914. Coll. 1914. Sutherland.

**Distribution :** India : West Bengal : (Kalimpong, Kurshiong, Dist. Darjeeling), Sundarban areas : Hingalgunj, Dist. North 24 Parganas; Meghalaya; Gujarat; Maharashtra.

**67. *Cheiracanthium indicum* Cambridge, 1874**

1874. *Cheiracanthium indicum* Cambridge *Proc. Zool. Soc. London*, 411.

1992. *Cheiracanthium : indicum* : Biswas & Biswas, *Fauna of West Bengal*, and Part-III, Araneae Spider, *State Fauna Series*, No. 3 : 420.

**Material examined :** 1 ♂, Kalimpong, Dist. Darjeeling, West Bengal 4.iv.1931; Coll. Sutherland.

**Distribution :** India : West Bengal : (Kalimpong, Dist. Darjeeling); Maharashtra; Gujarat; Sikkim; Meghalaya.

**68. *Cheiracanthium insigne* Cambridge, 1874**

1874. *Cheiracanthium insigne* Cambridge *Proc. Zool. Soc. London*, 408.

1992. *Cheiracanthium insigne* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae Spider, *State Fauna Series* No. 3 : 420.

**Material examined :** 1 ♂, Jorapokhri, Mirik, Dist. Darjeeling West Bengal, 10.xii.2006. Coll. S.C. Majumder & S. Talukdar.

**Distribution :** India : West Bengal : (Mirik, Dist. Darjeeling), Dist. North 24 Parganas; Assam; Bihar; Maharashtra; Tamil Nadu.

**Elsewhere :** Sri Lanka.

**69. *Cheiracanthium melanostoma* Thorell, 1895**

1895. *Cheiracanthium melanostoma* Thorell, *Spider Fauna of Burma* : 44.

1991. *Cheiracanthium melanostoma* : Majumder & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 102* : 62.

*Material examined* : 1♂, Kalimpong, Dist. Darjeeling, West Bengal 4.iv.1918; Coll. Mrs. Dake; 1♀, Namthingpokheri, Mirik, Dist. Darjeeling, Eastern Himalayas, West Bengal, 10.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal : (Kalimpong, Kurseong Mirik, Dist. Darjeeling), Sunderban areas (Gosaba, Dist. South 24 Parganas), Midnapur, Mursidabad. Bihar; Rajasthan; Goa; Maharashtra; Gujarat; Mysore; Karnataka; Andaman & Nicobar Island.

**70. *Cheiracanthium mysorensis* Majumder & Tikader, 1991**

1991. *Cheiracanthium mysorensis* Majumder & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 102* : 79.

1895. *Cheiracanthium murina* Thorell, *Spider Fauna of Burma* : 406.

1991. *Cheiracanthium murina* : Majumder & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 102* : 72.

*Material examined* : 3♀, Kalimpong, Dist., Darjeeling, Eastern Himalayas, West Bengal, 14.iv.1931. Coll. Sutherlandi.

*Distribution* : India : West Bengal : (Kalimpong, Dist. Darjeeling.); Gujarat; Karnataka; Maharashtra.

**71. *Cheiracanthium pauriensis* Majumder & Tikader, 1991**

1991. *Cheiracanthium pauriensis* Majumder & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 102* : 75.

1992. *Cheiracanthium pauriensis* : Biswas & Biswas, *Fauna of West Bengal, Part-III, State Fauna Series, No. 3* : 421.

*Material examined* : 1♀, Richmond Hill, Darjeeling, Eastern Himalayas, West Bengal, 14.iv.1975. Coll. B.K. Biswas.

*Distribution* : India : West Bengal : (Richmond Hills, Darjeeling); Uttaranchal.

**72. *Cheiracanthium trivialis* Thorell, 1895**

1895. *Cheiracanthium trivialis* Thorell, *Spider Fauna of Burma* : 44.

1991. *Cheiracanthium trivialis* : Majumder & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 102* : 56.

2004. *Cheiracanthium trivialis* : Majumder, *Rec. zool. Surv. India, 20(2)* : 56.

*Material examined* : 2♀, Kalimpong, Dist. Darjeeling, 4.iv.1931, Coll. Sutherlandi; 1♂, Kalimpong, Dist. Darjeeling West Bengal, 10.xii.1914. Coll. 1931 Sutherlandi, 1♀, Gopaldhara, Mirik, Dist. Darjeeling, 9.xii.2006, Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal : (Kalimpong, Mirik, Dist. Darjeeling, South 24 Parganas, Nadia); Tamil Nadu; Madhya Pradesh; Maharashtra.

*Elsewhere* : Myanmar.

*Remarks* : The genus *Cheiracanthium* Koch has been included under the family MITURGIDAE : As per Silwal, M. and Molur, S *Zoo's Print Journal*. 2006, **22(2)** : 2551-2597.

## Family XIII. OECOBIDAE Blackwall, 1862

Genus 29. *Oecobius* Lucus, 18451845. *Oecobius* Lucus, *Expl. Aig. Ar.*, 110.1962. *Oecobius* : Tikader, *J. Bombay nat. Hist. Soc.*, 59(2) : 683.

*Diagnosis* : Cephalothorax is convex and moderately elevated. The legs are proportionately long. The metatarsus and tarsus together of each of the legs for exceeding the carapace in length. Median ocular quadrangle longer than broad.

*Type Species* : *Oecobius domesticus* Lucus.

*Distribution* : India, Japan, Middle East, North America.

73. *Oecobius putus* Cambridge, 18761876. *Oecobius putus* Cambridge, *Proc. Zool. Soc. London*, 544.1981. *Oecobius putus* : Tikader & Biswas, *Rec. zool. Surv. India, Occ. Pap. No. 30*(1) : 12.

*Diagnosis* : Cephalothorax wider than long, Eyes unequal in size and dissimilar in form, Both row of eyes procurved.

*Distribution* : India : West Bengal (Darjeeling), Dist. South 24 Parganas, Bardhaman. Maharashtra; Tamil Nadu.

*Elsewhere* : Ethiopia; Egypt.

## Family XIV. OXYOPIDAE Thorell, 1870

Genus 30. *Oxyopes* Latreille, 18041804. *Oxyopes* Latreille, *Hist. Nat. Arach, France*, 14(7) : 144.1995. *Oxyopes* : Biswas & Biswas *Fauna of Meghalaya, Part-II, Araneae : Spiders, State Fauna Series No. 4* : 121.

*Type Species* : *Oxyopes heterophthalmus* Latreille.

*Distribution* : Cosmopolitan.

**Key to the species of the genus *Oxyopes* Latreille**

1. Cephalothorax not blotched with alternate lighten dark olive patches rayed out fovea ..  
..... *pandae*
- Cephalothorax blotched with alternate lighten dark olive patches rayed out fovea ..... 2
46. Upper side of the femora of all legs provided with longitudinal black lines ..... *ratnae*
- Upper side of the femora of all legs not provided with longitudinal black lines ..... 3
3. Abdomen wider at the middle, narrowed both anterior and posterior end; dorsum without  
any patches at the middle ..... *sakuntalae*

- Abdomen not wider at the middle and not narrowed on both the ends; dorsum provided with patches at the middle..... 4
4. Cephalothorax narrowed in front and provided with inconspicuous fovea at the middle ..... *shweta*
- Cephalothorax wider in front and not provided with inconspicuous fovea at the middle ..... 5
5. Eyes enclosed in a black field, situated in an equal distance to each other ..... *sikkimensis*

**74. *Oxyopes panda* Tikader, 1969**

1969. *Oxyopes panda* Tikader, *Oriental Insects*, **3**(1) : 33.

2004. *Oxyopes panda* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 28.

*Material examined* : 1 ♀, Gopaldhara, Mirik, Dist. Darjeeling, 9.xii.2006, Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Mirik, Dist. Darjeeling), Sundarban areas (Gosaba, Dist. South Paraganas).

**75. *Oxyopes ratnae* Tikader, 1970**

1970. *Oxyopes ratnae* Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 70.

1992. *Oxyopes ratnae* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series*, No. **3** : 433.

2004. *Oxyopes ratnae* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 26.

*Material examined* : 1 ♀, Tindharia, Kurshiong, Dist. Darjeeling, West Bengal, 30.xi.2006, Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Kurshiong, Dist. Darjeeling) Sunderban area (Gosaba, Dist. South 24 Parganas), Hugh, Maldah, Midnapur; Sikkim.

**76. *Oxyopes sakuntalae* Tikader, 1870**

1970. *Oxyopes sakuntalae* Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 73.

1992. *Oxyopes sakuntalae* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series*, No. **3** : 435.

2004. *Oxyopes sakuntalae* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 25.

*Materials examined* : 1 ♀, Loyed's Botanical Garden, Dist. Darjeeling, West Bengal, 14.vii.2006 Coll. S.C. Majumder & S. Talukdar; 1 ♀, Karshiong, Dist. Darjeeling, West Bengal, 2.xii.2006. Coll. S.C. Majumder & S. Talukdar; 1 ♀, Lopchu, Dist. Darjeeling West Bengal, 12.xii.200 Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Kalimpong, Kurseong, Darjeeling), Sundarban areas : (Hingalgunj Dist. North 24 Parganas; Kultali, Gosaba, Dist. South 24 Parganas).

**77. *Oxyopes shweta* Tikader, 1970**

1970. *Oxyopes shweta* Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 74.  
 1992. *Oxyopes shweta* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series* No. **3** : 434.  
 2004. *Oxyopes shweta* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 25.

*Material examined* : 1 ♀, 1 ♂, Sonada, Dist. Darjeeling, 14.vii.2006, Coll. S.C. Majumder & S. Talukdar; 1 ♂, Sukiapokhri, Mirik, Dist. Darjeeling West Bengal, 10.vii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal : (Mirik, Darjeeling), Sundarban areas : (Gosaba, Patharpratima, Dist. South 24 Parganas), Jalpaiguri, Hooghly; Sikkim; Meghalaya.

**78. *Oxyopes sikkimensis* Tikader, 1970**

1970. *Oxyopes sikkimensis* Tikader, *Rec. zool. Surv. India*, **64**(1-4) : 76.  
 1995. *Oxyopes sikkimensis* : Biswas & Majumder, *Fauna of Meghalaya*, *State Fauna Series*, No. **4** : 21.  
 2004. *Oxyopes sikkimensis* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 28.

*Material examined* : 1 ♀, Kalimpong, Dist. Darjeeling, West Bengal, 2.xii.2006. Coll. S.C. Majumder & S. Talukdar; 1 ♀, Sukiapokhri, Mirik, Dist. Darjeeling West Bengal, 10.vii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Mirik, Kalimpong, Dist. Darjeeling), Sunderban area (Gosaba, Dist. South 24 Parganas), Jalpaiguri. Sikkim.

Family XV PISAURIDAE Simon, 1890

Genus 31. ***Pisaura*** Simon, 1885

1885. *Pisaura* Simon, *Ann. Soc. ENT. France*, 354.  
 1970. *Pisaura* : Tikader, *zool. Surv. India*, **64**(1-4) : 59.

*Diagnosis* : His median ocular area a little longer than wide. Lower margin of the furrow of chelicerae with three teeth. Abdomen tapering behind.

*Type species* : *Pisaura mirabilis* Clerck.

*Distribution* : Europe, Africa, Asia.

**79. *Pisaura gitae* Tikader, 1970**

1970. *Pisaura gitae* Tikader, *zool. Surv. India*, **64**(1-4) : 59.

*Diagnosis* : Cephalothorax and abdomen light to deep brown, legs green. Cephalothorax longer than wide, cephalic region slightly high, middle and lateral margin provided with longitudinal brown patches. Eyes anterior row slightly short, recurved and almost similar size. Posterior rows more recurved than the anterior row and nearly equal in size; ocular quadrate longer than wide and narrowing in front. The lower margin of the chelicerae armed with three teeth. Sternum heart shaped, pointed behind. Legs long and strong. Abdomen longer

than wide, anterior half of. Dorsum ornamented with two longitudinal white lines and both lateral sides provided with broad longitudinal white lines.

*Distribution* : India : West Bengal (Darjeeling).

Family XVI. PHILODROMIDAE Thorell, 1070

Genus 32. ***Philodromus*** Walckeneur, 1826

1825. *Philodromus* : Walckeneur, *ENT. Fr. Ar.*, 86.

1981. *Philodromus* : Tikader & Biswas, *Rec. zool. Surv. India, Occ. Pap. No. 30(1)* : 86.

*Type-species* : *Philodromus aurcolus* Clerck.

*Distribution* : Cosmopolitan.

80. ***Philodromus malinia*** Tikader, 1966

1966. *Philodromus malinia* Tikader, *Proc. Linn. Soc. London*, **177(1)** : 39-40.

1992. *Philodromus malinia* : Biswas & Biswas, *Fauna of West Bengal, Part-III, Araneae : Spiders, State Fauna Series No. 3* : 412.

*Diagnosis* : Cephalothorax uniform depressed slightly wider than long. Eyes round and black provided with tubercle, both rows of eyes very close and not forming a crescent shaped group. Sternum oval not pointed behind. Legs relatively long, II pairs slightly longer than I. Abdomen longer than wide, dorsally provided with white and light brown patches.

*Material examined* : 1 ♀, Kalimpong, Darjeeling, Eastern Himalayas, West Bengal, 17.iv.1961. Coll. B.K. Tikader.

*Distribution* : India : West Bengal (Kalimpong, Dist. Darjeeling).

Family XVII. SALTICIDAE Blackwall, 1841

**Key to the genera of the family SALTICIDAE**

1. Cephalothorax rectangular in shape not pointed behind ..... ***Marpissa***
- Cephalothorax not rectangular in shape pointed behind ..... 2
2. Chelicerae robust and prominent, nearly as long as cephalothorax ..... ***Myrmarachne***
- Chelicerae not robust and prominent; not longer as cephalothorax ..... 3
3. Ocular region more darker than the rest portion of the cephalothorax ..... ***Plegra***
- Ocular region not darker than the rest portion of the cephalothorax ..... 4
4. Labium little longer than wide; coxa of the 1st leg separated by less than the wide of Labium ..... ***Plexippus***
- Labium not longer than wide; coxa of the 1st leg not separated by legs than the of the Labium ..... 5
5. Eyes are small in proportion to the size of spider ..... ***Telamonia***

- Eyes are not small in proportion to the size of spider ..... 6  
 6. The first legs are heaviest than the rest ..... **Zygoballus**

Genus 33. **Marpissa** Koch, 1845

1845. *Marpissa* : Koch, *Die Arach.* **8** : 123.

1981. *Marpissa* : Tikader & Biswas, *Rec. zool. Surv. India, Occ. Pap. No.* **30(1)** : 93.

*Type species* : *Marpissamuscosa* Clerck.

*Distribution* : Cosmopolitan.

81. ***Marpissa decorata*** Tikader, 1974

1974. *Marpissa decorata* Tikader, *Proc. Indian Acad. Sci.* **79(5)** : 207.

2005. *Marpissa decorata* : Majumder, *Mem. zool. Surv. India*, **20(3)** : 44.

*Material examined* : 1 ♀, Kalijhora, Kalimpong, Dist Darjeeling, Eastern Himalays, West Bengal, 12.vii.2006. Coll. S.C. Majumder & S. Talukdar.

*Diagnosis* : Cephalothorax redish brown, longer than wide cephalic region flat, at the middle of the cephalothorax provided with a small fovea. Anterior row of eyes recurved, anterior lateral eyes slightly larger than the posterior eyes; second pair of eyes very small and situated more near to the anterior laterals. Chelicerae with one moderate tooth on the inner margin and two small teeth on the outer margin. Abdomen longer than wide pointed behind. Dorsum decorated with white and black patches.

*Distribution* : India : West Bengal (Kalimpong, Darjeeling) Dist. North & South 24 Parganas, Kolkata.

Genus 34. **Myrmarachne** Mac Leay, 1839

1839. *Myrmarachne* Mac Leay, *Ann. Mag. Nat. Hist.* **2** : 10.

1992. *Myrmarachne* : Biswas & Biswas, *Fauna of West Bengal. Part-III, Araneae : Spiders, State Fauna Series No.* **3** : 393.

2005. *Myrmarachne* : Majumder, *Mem. zool. Surv. India*, **20(3)** : 47.

*Type Species* : *Myrmarachne melanocephalus* Mac Leay.

*Distribution* : Oriental and sub-tropical regions of the world.

82. ***Myrmarachne orientalis*** Tikader, 1973

1973. *Myrmarachne orientalis* Tikader, *Proc. Indian Acad. Sci.*, **78(2)** : 60.

2005. *Myrmarachne orientalis* : Majumder, *Mem. zool. Surv. India*, **20(3)** : 48.

*Material examined* : 1 ♀, Neora velly, Dist. Darjeeling, Eastern Himalays, West Bengal, 11.xi.2006. Coll. S.C. Majumder & S. Talukdar.

*Diagnostic characters* : Cephalothorax redish in colour, longer than wide, with a nearly complete transverse constriction at the cephalic and thoracic junction. Anterior row of eyes slightly recurved, posterior row of eyes straight. Chelicerae as long as cephalothorax, outer

margin provided with 4-5 slightly larger teeth, inner margin with small teeth. Maxillae and labium longer than wide. Legs thin and long. Abdomen elongated, distinctly constricted, pedicel very long and prominent.

*Distribution* : India : West Bengal (Darjeeling), Sundarban areas : (Basanti, Dist. South 24 Parganas), Darjeeling, Haroa, Maldah, Midnapur, West Diaper.

Genus 35. ***Plegra*** Simon, 1876

1845. *Marpissa* Koch, *Die. Arachn.* **13** : 56.

1845. *Marpissa* Koch, *Die Arach.* **8** : 123.

2005. *Plegra* Simon 1876 : As per Silwal, M. and Molur, *S Zoo's Print Journal.* 2006, **22(2)** : 2551-2597.

*Type species* : *Plegra muscosa* Clerck.

*Distribution* : Cosmopolitan.

83. ***Plegra dhakuriensis*** Tikader, 1974

1974. *Marpissa dhakuriensis* Tikader, *Proc. Indian Acad. Sci.* **79(5)** : 207.

1992. *Marpissa dhakuriensis* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series*, No. **3** : 391.

2004. *Marpissa dhakuriensis* Majumder, *Rec. zool. Surv. India*, **20(2)** : 32.

2005. *Plegra dhakuriensis* Tikader 1974 : As per reference : 2006. Silwal, M. and Molur, *S. Zoo's Print Journal.* **22(2)** : 2551-2597.

*Material examined* : 1 ♀, Tindheria, Kurshiong, Dist. Darjeeling, Eastern Himalays, West Bengal, 30.xi.2006. Coll. S.C. Majumder & S. Talukdar.

*Diagnosis* : Cephalothorax brownish in colour, longer than wide, cephalic region flat, middle of the cephalothorax provided with conspicuous fovea. Anterior row of eyes recurved, middle eyes milky white and the others pearly white. Anterior median eyes nearly three times larger than the lateral eyes. Chelicerae moderately strong, inner margin provided with one large tooth, outer margin with two smaller teeth. Legs I & II short and stout. Abdomen longer than wide, provided with white patches.

*Distribution* : India : West Bengal (Kurshiong, Dist. Darjeeling, Kolkata, Hawrah), Sunderban area : (Patharpratima, Dist. South 24 Parganas).

Genus 36. ***Plexippus*** Koch, 1866

1846. *Plexippus* Koch, *Die Aruchn.* **13** : 07.

1967. *Plexippus* : Tikader, *Proc. Indian Acad. Sic.* **66(4)** : 118.

*Type species* : *Plexippus paykullii* (Aud.).

*Distribution* : Cosmopolitan.

84. ***Plexippus calcuttaensis*** Tikader, 1974

1974. *Marpissa calcuttaensis* Tikader, *Proc. Indian Acad. Sci.*, **79(5)** : 210.

2005. *Marpissa calcuttaensis* : Majumder, *Mem. Zool. Surv. India*, **20**(3) : 44.

2005. *Plexippus calcuttaensis* Tikader, 1974 as per reference : 2006. Silwal, M. and Molur, Suzhou's Print Journal, **22**(2) : 2551-2597.

*Material examined* : 1 ♀, Lopchu, Kalimpong, Dist. Darjeeling, Eastern Himalays, West Bengal, 2.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Diagnostic characters* : Cephalothorax, abdomen and legs light brown, cephalothorax longer than wide, without fovea. Anterior row of eyes slightly recurved; median eyes twice longer than anterior laterals. Middle or second row of eyes very small and situated nearly equidistant from anterior lateral and posterior row. Chelicerae strong, inner and outer margin of chelicerae provided with one moderate tooth. Abdomen longer than wide, dorsum decorated with white patches.

*Distribution* : India : West Bengal (Kalimpong, Dist. Darjeeling) Sunderban areas (Hingalgunj, Haroa; Dist. North 24 Parganas), Kolkata.

#### Genus 37. *Telamonia* Koch, 1846

1846. *Phidippus* Koch, *Die. Arachn*, **73** : 125.

1981. *Phidippus* Tikader & Biswas, *Rec. zool. surv. India. Occ. Pap. No.* **30**(1) : 90.

2005. *Telamonia* Koch : As per reference : 2006. Silwal, M. and Molur, *S. Zoo's Print Journal*. **22**(2) : 2551-2597.

*Type species* : *Phidippus variegatus* (Lucas).

*Distribution* : All tropical and sub-tropical countries of the world.

#### 85. *Telamonia dimidiata* (Simon, 1899)

1974. *Phidippus pateli* Tikader, *Proc. Indian Acad. Sci.* **79**(3) : 124.

2005. *Phidippus pateli* : Majumder, *Mem. Zool. Surv. India*, **20**(3) : 47.

2005. *Telamonia dimidiata* Simon 1899 : As per reference : 2006. Silwal, M. and Molur, *S. Zoo's Print Journal*, **22**(2) : 2551-2597.

*Material examined* : 1 ♀, Kalijhora, Kalimpong, Dist. Darjeeling, Eastern Himalays, West Bengal, 12.vii.2006. Coll. S.C. Majumder & S. Talukdar.

*Diagnosis* : Cephalothorax longer than wide, oval in shape, cephalic region flat, middle of the cephalothorax provided with distinct bifurcated fovea. Eyes comparatively small according to the size of the spider. Anterior row recurved, anterior lateral eyes and posterior lateral eyes nearly same size, second pair very small. Chelicerae strong, outer margin provided with 2 small teeth and the inner margin with one large tooth. Legs I and II more robust than III and IV. Longer than wide, pointed behind. Dorsum provided with V-shaped longitudinal deep brown bands.

*Distribution* : India : West Bengal (Kalimpong, Dist. Darjeeling), Sunderban area : (Gosaba, Dist. South 24 Parganas), Koochbihar, Maldah, Jalpaiguri, Midnapur, Murshidabad, Nadia; Gujarat; Maharashtra.

Genus 38. **Zygoballus** Peckham, 18851885. *Zygoballus* Peckham, *Proc. Nat. Hist. Soc. Wis.*, **1** : 82.*Type species* : *Zygoballus rufipes* Peckham.*Distribution* : India, America.86. **Zygoballus narmadaensis** Tikader, 19751975. *Zygoballus narmadaensis* : Tikader, *Proc. Indian Acad. Sci.*, **81**(4) : 151.1992. *Zygoballus narmadaensis* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series*, No. **3** : 401.*Material examined* : 1 ♀, Rambhi, Kalimpong, Dist. Darjeeling, Eastern Himalays, West Bengal, 1.vii.2006. Coll. S.C. Majumder & S.Talukdar.*Diagnostic characters* : Cephalothorax and legs deep brown, abdomen light brown in colour. Cephalothorax wider than long, anterior and posterior end slightly narrowed than the middle; a lense-shaped fovea present at the posterior part of the cephalic region. Eyes are black, except anterior eyes which are pearly white. Anterior row slightly recurved. Anterior and posterior laterals eyes are nearly same size. Second pair of eyes small and situated more closer to the anterior laterals than to the posterior eyes. First pair of legs conspicuously stout. Abdomen short, longer than wide; dorsum without segilla and provided with a number of redish brown patches which seems to be a panther.*Distribution* : India : West Bengal (Kalimpong, Dist. Darjeeling), North 24 Parganas and Birbhum.

## Family XII. SCYTODIIDAE Blackwall, 1952

Genus 39. **Scytodes** Latreille, 18041804. *Scytodes* Latreille, *Nouv. Dict. Etc.*, **24** : 134.1995. *Scytodes* : Dyal *Bull.zool. Punjab Univ.*, **1** : 153.*Diagnosis* : Cephalothorax high and subglobose behind and slopes forward. Eyes six nocturnal arranged in three groups of two each. Anterior row of eyes strongly recurved.*Type Species* : *Scytodes thoracica* Latreille.*Distribution* : India, Africa, America, Europe.**Key to the species of the genus Scytodes Latreille**

1. Abdomen yellowish white; four narrow transverse black bands on the dorsum ..... *propinqua*
- Abdomen not yellowish white; no transverse black bands on the dorsum ..... 2
2. Cephalothorax provided with a few black lonitudinal streaks ..... *thoracica*

87. *Scytodes propinqua* Stoliczka, 1869

1869. *Scytodes propinqua* Stoliczka, *J. Asiat. Soc. Bengal*, **38** : 232.

1981. *Scytodes propinqua*: Tikader & Biswas, *Rec. zool. Surv. India, Occ. Pap. No. 30* : 16.

*Material examined* : 1 ♀, Tindheria, Kurshiong, Dist. Darjeeling, Eastern Himalays, West Bengal, 30.xi.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Kurseong, Dist. Darjeeling and North & South 24 Parganas), Punjab, America.

88. *Scytodes thoracica* (Latreille, 1804)

1804. *Araneae thoracica* Latreille, *Hist. Nat. Inscie, Paris*, **7** : 249.

1992. *Scytodes thoracica* : Biswas & Biswas. *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series*, No. **3** : 384.

*Material examined* : 1 ♀, Sonada, Dist. Darjeeling West Bengal, 11.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Darjeeling, North 24 Parganas).

*Elsewhere* : Africa, America, Australia and Europe.

## Family XIX. SPARASSIDAE Bertkau, 1872

## Key to the genera of the family SPARASSIDAE

1. Epigynum provided with a horizontal plate, spermatheca not convoluted ..... ***Butaniella***
- Epigynum provided with a horizontal plate, spermatheca not convoluted ..... 2
2. Maxillae not provided with distinct median longitudinal creast ..... ***Heteropoda***
- Maxillae provided with distinct median longitudinal creast ..... 3
3. Thoracic fovea indistinct; posterior row of eyes procurved ..... ***Olios***
- Thoracic fovea distinct; posterior row of eyes not procurved ..... 4
4. Median sclerite of vulva not hammer shaped ..... ***Pseudopoda***

Genus 40. ***Butaniella*** Gravely, 1931

1931. *Heteropoda* : Gravely, *Rec. Indian Mus*, **33**(3) : 255.

1988. *Heteropoda* : Sethi & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 93* : 9.

2004. *Heteropoda sikkimensis* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 40.

2007. *Butaniella* Gravely 1931 : As per reference Silwal, M. and Molur, S 2006. *Zoo's Print Journal*. **22**(2) : 2551-2597.

*Type species* : *Heteropoda venatoria* (Linn.)

*Distribution* : India Sikkim, Meghalaya.

89. ***Butaniella sikkimensis*** Gravely, 1931

1931. *Heteropoda sikkimensis* Gravely, *Rec. Indian Mus*, **33**(3) : 255.

1988. *Heteropoda sikkimensis* : Sethi & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 93* : 27.  
 2004. *Heteropoda sikkimensis* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 40.  
 2005. *Heteropoda sikkimensis* : Majumder, *Mem. zool. Surv. India*, **20**(3) : 24.  
 2005. *Butaniella sikkimensis* : Gravely 1931 : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*. **22**(2) : 2551-2597.

*Distribution* : India : West Bengal (Darjeeling), Sundarban areas : (Patharpratima, Dist. South 24 Parganas; Hasnabad, Dist. North 24 parganas); Sikkim, Meghalaya.

Genus 41. ***Heteropoda*** Latreille, 1804

1804. *Heteropoda* : Latreille, N. *Dic. hist. nat.*, **24** : 135.  
 1988. *Heteropoda* : Sethi & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 93* : 9.  
 2004. *Camaricus formosus* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 40.  
 2005. *Heteropoda sikkimensis* : Majumder, *Mem. Zool. Surv. India*, **20**(3) : 24.

*Type species* : *Heteropoda venatoria* (Linn.).

*Distribution* : India; Australia; China; Japan; U.S.A.; Srilanka.

**Key to the species of the genus *Heteropoda* Latreille from Darjeeling**

1. Abdomen roundish with no marking on the dorsum ..... *kandiana*  
 — Abdomen oval with 3 pairs of sigilla on the dorsum ..... 2
2. Median piece of epigynum form a septum in between the lateral lobes, spermatheca sac like ..... *leprosa*  
 — Median piece of epigynum long not forming any septum in between the lateral lobes, spermathecaotsac like ..... 3
3. Abdomen not black, without yellow border below ..... *venatoria*

90. ***Heteropoda kandiana*** Pocock, 1899

1899. *Heteropoda kandiana* : Pocock, *J. Bombay nat. Hist. Soc.*, **12** : 752.  
 1988. *Heteropoda kandiana* : Sethi & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 93* : 26.  
 2005. *Heteropoda kandiana* : Majumder, *Mem. zool. Surv. India*, **20**(3) : 424.

*Distribution* : India : West Bengal : (Kalimpong, Kurseong, Darjeeling) Sunderban areas : (Hasnabad, Dist. North 24 Parganas); Tamil Nadu; Bihar; Meghalaya; Orissa; Assam.

*Elsewhere* : Sri Lanka.

91. ***Heteropoda leprosa*** Simon, 1884

1884. *Heteropoda leprosa* Simon, *Ann. Mus. Civ. Genova*, **30** : 144.  
 1984. *Heteropoda leprosa* Sethi & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 93* : 20.

*Distribution* : India : West Bengal : (Tindheria, Kurseong, Mirik, Pesshok, Kalimpong, Darjeeling); Tamil Nadu; Uttar Pradesh; Sikkim; Assam; Nicobar Island.

*Elsewhere* : Burma.

92. *Heteropoda venatoria* (Linnaeus, 1766)

1766. *Araneaevenatoria* Linnaeus, *Syst. Nat.*, **12** : 1035.  
 1988. *Heteropoda venatoria* : Sethi & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 93* : 16.  
 2004. *Heteropoda venatoria* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 40.  
 2004. *Heteropoda venatoria* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 24.

*Distribution* : India : West Bengal : (Mirik, Darjeeling), Sunderban areas : (Hasnabad, Dist. North 24 Parganas); Bihar; Tamil Nadu.

Genus 42. *Olios* Walckenaer, 1837

1837. *Olios* : Walckenaer, *Hist. Nat. Ins. Apt.*, **1** : 202.  
 1988. *Olios* : Sethi & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 93* : 30.

*Type species* : *Olios argelasius* (Walckenaer).

*Distribution* : Tropical countries of the world.

**Key to the species of the genus *Olios* Walckenaer**

1. Anterior row of eyes slightly recurved ..... *milleti*  
 — Anterior row of eyes almost straight ..... *punctipes*

93. *Olios milleti* (Pocock, 1901)

1901. *Sparassus milleti* : Pocock, *J. Bombay nat. Hist. Soc.*, **13** : 494.  
 1988. *Olios milleti* : Sethi & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 93* : 35.

*Distribution* : India : West Bengal : (Mirik, Gopaldhara, Darjeeling); Bihar; Gujarat; Maharashtra; Tamil Nadu.

94. *Olios punctipes* Simon, 1884

1884. *Olios punctipes* Simon, *Ann. Mus. Civ. Genova*, **20** : 339.  
 1988. *Olios punctipes* : Sethi & Tikader, *Rec. zool. Surv. India, Occ. Pap. No. 93* : 37.

*Distribution* : India : West Bengal : (Kalimpong, Tindheria, Kurseong, Dist. Darjeeling), Salt Lake, Kolkata, Shreerampur, Botanical Garden, Howrah); Andaman Island; Assam; Bihar; Gujarat; Madhya Pradesh; Maharashtra; Orissa; Uttaranchal; Uttar Pradesh.

*Elsewhere* : Bangladesh, Malaysia, Myanmar, Sumatra.

Family XX TETRAGNATHIDAE Menge, 1866

**\*Key to the family TETRAGNATHA Latreille 1904**

1. Dorsum of the abdomen provided with distinct folium and the thoracic region with few hair ..... *Guizygiella*  
 — Dorsum of the abdomen not provided with distinct folium and the thoracic region without few hair ..... 2  
 2. Carapce flat; abdomen flat dorsally, lobate laterally ..... *Herennia*

- Carapce not flat; abdomen may or may not flat dorsally ..... 3
4. Femoral IV with a double fringe of hair on the trilateral surface of the basal half ..... ***Leucauge***
- Femora IV without a double fringe of hair on the prolateral surface of the basal half.. ..... 5
5. Abdomen long and narrow and bears the spinnerets near its end ..... ***Tetragnatha***
- \*The genera *Guizygiella* and *Herennia* Thorell, *Leucauge* White and *Nephila* Leach, have been included in the family Tetragnath from Araneidae : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*. **22(2)** : 2551-2597.

Genus 43. ***Guizygiella*** Thorell 1878

1902. *Zygeilla*, O.P. Cembridge, *Ann. Meg. Nat. Hist.* **9(7)** : 15.
1982. *Zygeilla* : Tikader, *Fauna of India*, Spider : Araneae, **2(1)** : 214.
2005. *Guizygiella* Thorell 1878 : As per reference : 2006. Silwal, M. and Molur. S. *Zoo's Print Journal*. **22(2)** : 2551-2597.

*Type Species* : *Zygeilla arnica* (Koch).

*Distribution* : Cosmopolitan.

95. ***Guizygiella melanocrania*** Thorell, 1878

1887. *Zygeilla melanocrania* : Thorell, *Annali. Mus. Civ. Genova*. **25** : 209.
1982. *Zygeilla melanocrania* : Tikader, *Fauna of India Spider* : Aranea, **2(1)** : 215.
2004. *Zygeilla melanocrania* Majumder & Tikader, *Rec. zool. Surv. India*, **20(2)** : 113.

*Material examined* : 1 ♀, Kurseong, Dist. Darjeeling, West Bengal, 2.xii.2006. Coll. S.C. Majumder & S. Talukdar. 1 ♀, Little Panchong Bazar, Dist. Darjeeling, West Benga 1 3.vii.2006. Coll. S.C. Majumder & S. Talukdar.

*Diagnostic* : Cephalothorax longer than wide narrowing in front. Ocular quadrate slightly longer than wide both rows of eyes are recurved but posterior row very narrowly recurved. Anterior median eyes larger than the Posterior medians. Chelicerae moderately strong, provided with distinct boss. Legs moderately long and strong. Abdomen oval, longer than wide. Dorsum provided with distinct folium composed of white and black patches.

*Distribution* : India : West Bengal (Kurseong, Mirik, Darjeeling), Sunderban area, (Gosaba, Dist. North and Oath 24 Parganas), Burdwan; Orissa.

Genus 44. ***Herennia*** Thorell, 1877

1877. *Herennia* Thorell, *Annali. Mus.Civ. Geneva*, **10** : 370.
1982. *Herennia* Tikader, *Fauna of India*, Spider : Araneae, **2(1)** : 106.

*Type Species* : *Herennia ornatissima* (Doleschall).

*Distribution* : India, Malaysia and Sri Lanka.

96. *Herannia ornatissima* (Doleschall, 1859)1859. *Herannia ornatissima* Doleschall. Act. Soc. Ind. Neel. 5 : 32.1982. *Herannia ornatissima* Tikader, *Fauna of India*, Spider : Araneae, 2(1) : 106.

*Material examined* : 1 ♀, Karshiong, Dist. Darjeeling, West Bengal, 2.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Diagnosis* : Cephalothorax longer than wide, flat, narrowing in front, cephalic region light brown with a U-shaped yellowish white patches thoracic fovea transverse. Eyes pearly white. Anterior rows of eyes recurved, posterior row nearly aright. Lateral eyes subequal in size. Ocular quadrate as long as wide. Chelicerae strong and stout. Legs long and slender. Abdomen flat, lobate having four pairs of lateral lobes. Dorsum of the abdomen provided with numerous grayish specks with distinct centre and five pairs of distinct sigilla. Lateral eyes subequal in size. Ocular quadrate as long as wide. Chelicerae strong and stout. Legs long and slender. Abdomen flat, lobate having four pairs of lateral lobes. Dorsum of the abdomen provided with numerous grayish specks with distinct centre and five pairs of distinct sigils.

*Distribution* : India : West Bengal (Dist. Darjeeling); Goa; Meghalaya; Tamil Nadu.

*Elsewhere* : Austro-Malaysia, Myanmar.

Genus 45. *Larinia* Simon, 18741874. *Larinia* Simon, *Ar. Fr.* 1 : 155.1982. *Larinia* : Tikader, *Fauna of India*, Spider (Araneidae & Gnaphosidae, 2(1-2) : 242.

*Type Species* : *Larinia lineata* (Lucas).

*Distribution* : Tropical & Sub-Tropical countries of the world.

**Key to the species of the genus *Larinia* Simon**

1. Labium as long as wide, brownish with proximal white boarder ..... *joysankari*
- Labium short, brownish with pale distal boarder ..... 2
2. Dorsum of abdomen light yellowish white, provided with some grayish line and a double of black spots ..... *phtisica*

97. *Larinia joysankari* Biswas, 19841984. *Larinia joysankari* Biswas, *Bull. Zool. Surv. India*, 6(1-3) : 133.1992. *Larinia joysankari* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series* No. 3 : 462.

*Materials examined* : 1 ♀, Darjeeling, 7.ii.2006, Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Darjeeling), North 24 Parganas; Assam; Kerala.

98. *Larinia phtisica* (L. Koch, 1871)1871. *Epeira phtisica* L. Koch, *Die. Arachniden Australians*, 1(1) : 193.

2004. *Larinia phtisica* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 10.

*Materials examined* : 1 ♀, Kurshiong, Dist. Darjeeling, West Bengal, 2.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Darjeeling), Sundarban areas : (Sandeshkhali, Dist. North South 24 Parganas), Burdwan, Nadia; Gujarat.

#### Genus 46. *Leucauge* White, 1841

1841. *Leucauge* White, *Ann. Mag. Nat. Hist.*, **7**(1) : 473.

1982. *Leucauge* : Tikader, *Fauna of India*, Spider (Araneidae & Gnaphosidae) **2**(1-2) : 71.

*Type Species* : *Leucauge hortorum* (Hentz).

*Distribution* : Tropical and sub-tropical countries of the world.

#### Key to the species of the genus *Leucauge* White

1. Abdomen uniformly silver white and decorated with longitudinal black bands  
*celesbesiana*
- Abdomen uniformly silver white and decorated with longitudinal black band ..... 2
2. Three paired and one median black spots at the posterior end of dorsum ..... *culta*
- Three paired and one median black spots not present at the posterior end of dorsum . 3
3. Both paired tubercles and median tubercle highly prominent ..... *decorata*
- Both paired Abdomen with two tubercles and median caudal tubercle are small and less prominent ..... 5
4. Abdomen with two blunt rounded prominences and blunt caudal hump at the posterior end ..... *tessellata*

#### 99. *Leucauge celesbesiana* (Walckenaer, 1884)

184. *Tetragnatha celesbesiana* Walckenaer, *Hist. Nat. Ins. Apt.*, **2** : 222.

1992. *Leucauge celesbesiana* Biswas & Biswas : *Fauna of West Bengal Part-III*, Araneae : Spiders, *State Fauna Series No. 3* : 472.

*Material examined* : 50 ♀, 10 ♂, Chongton, Dist. Darjeeling, West Bengal, 16.iv.1957 Coll. B.K. Tikader.

*Distribution* : India : West Bengal : (Darjeeling), Kolkata, Assam; Maharashtra; Meghalaya; Tamil Nadu.

*Elsewhere* : China; Burma, Sri Lanka.

#### 100. *Leucauge culta* (O.P. Cambridge, 1841)

1841. *Tetragnatha culta* O.P. Cambridge, *J. Linn. Soc.*, **10** : 360.

1992. *Leucauge culta* Biswas & Biswas : *Fauna of West Bengal Part-III*, Araneae : Spiders, *State Fauna Series No. 3* : 472.

*Distribution* : India : West Bengal : (Darjeeling), Kolkata, Assam; Maharashtra; Meghalaya; Tamil Nadu.

*Elsewhere* : China; Burma, Sri Lanka.

101. ***Leucauge decorata*** (Blackwall, 1864)

1864. *Tetragnatha decorata* Blackwall, *Ann. Mag. Nat. Hist.*, **14**(3) : 44.

2004. *Leucauge decorata* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 11.

*Material examined* : 10 ♀, Chongton, Dist. Darjeeling, West Bengal, 16.iv.1957 Coll. B.K. Tikader; 1 ♀, Jorapokri, Mirik, Dist. Darjeeling, Eastern Himalays, West Bengal, 19.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal : (Darjeeling), Sunderban area : (Gosaba, Patharpratima, Dist. South 24 Parganas), Ma1dah, Nadia, Midnapur, Mursidabad, Purulia, West Diaper; Assam; Gujarat; Karnataka; Kerala; Meghalaya; Orissa; Pondicherry; Sikkim.

*Elsewhere* : Myanmar, Pakistan, Sri Lanka.

102. ***Leucauge tessellata*** (Thorell, 1887)

1887. *Callinethis tessellata* Thorell, *Anneli. Mus. Civ. Genova*, **25** : 135. 2004.

2004. *Leucauge tessellata* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 11.

*Material examined* : 125 ♀, Kalimpong, Dist. Darjeeling, Eastern Himalays, West Bengal, 14.ix.1959. Coll. B.K. Tikader.

*Distribution* : India : West Bengal : (Darjeeling), Sunderban area (Gosaba, Patharpratima, Dist. South 24 Pargana). Ma1dah, Nadia, Midnapur, Mursidabad, Purulia, West Dinajpur; Assam; Meghalaya; Gujarat; Karnataka; Kerala; Pondichery; Orissa; Sikkim.

*Elsewhere* : Myanmar, Pakistan.

Genus 47. ***Nephila*** Leach, 1815

1815. *Nephila* : Leach, *Zoological Miscellany*, 133.

1981. *Nephila* : Tikader & Biswas, *Rec. zool. Surv. India, Occ. Pap. No.* **30**(1) : 37.

*Type species* : *Nephila maculata* (Fabricius).

*Distribution* : Tropical and nearly sub-tropical countries of the world.

**Key to the species of the genus *Nephila* Leach from Darjeeling**

1. Carapace provided with V-shaped yellow patch ..... ***clavata***
- Carapace not provided with V-shaped yellow patch ..... 2
2. Abdomen having single mid-longitudinal broad yellow with dark brown side ..... ***kuhlii***
- Abdomen without any single mid-longitudinal broad yellow bar with dark brown side ..... 3

3. Cephalothorax relatively broad in front; a deep groove in the middle with a pair of sharp tubercle in front ..... ***pilipes***

103. ***Nephila clavata*** L. Koch, 1878

1878. *Nephila clavata* L. Koch, *Verh. Zool. Bot. Ges. Wln.*, **27** : 741.

1982. *Nephila clavata* : Tikader, *Fauna of India*, Spider : Araneae, **2(1)** : 102.

1992. *Nephila clavata* : Biswas & Biswas, *Fauna of West Bengal Part-III*, Araneae : Spiders, *State Fauna Series No. 3* : 474.

*Material examined* : 5 ♀, Kalimpong, Dist. Darjeeling, West Bengal, 17.ix.1959, Coll. B.K. Tikader.

*Distribution* : India : West Bengal : (Dist. Darjeeling); Andaman and Nicobar Island, Laccadive Island; Meghalaya; Sikkim; Tamil Nadu.

*Elsewhere* : Bhutan, China, Formosa, Myanmar; Pakistan; Thailand.

104. ***Nephila kuhlii*** Doleschall, 1859

1859. *Nephila kuhlii* Doleschall, *Acta. Soc. Ind. Neeri*, **5(5)** : 27.

1982. *Nephila clavata* : Tikader, *Fauna of India*, Spider : Araneae, **2(1)** : 104.

1992. *Nephila kuhlii* Biswas & Biswas : *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series, No. 3* : 474.

2005. *Nephila kuhlii* Koch 1837 : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*. **22(2)** : 2551-2597.

*Distribution* : India : West Bengal (Darjeeling), North 24 Parganas.

*Elsewhere* : Burma.

105. ***Nephila pilipes*** (Fabricius, 1793)

1793. ***Nephila pilipes*** Fabricius : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*. **22(2)** : 2551-2597.

1793. *Araneae maculata*, Fabricius, *ENT. Cyst.* **2** : 425.

1982. *Nephila maculata* : Tikader, *Fauna of India*, Spider : Araneae, **2(1)** : 97.

1992. *Nephila maculata* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spider, *State Fauna Series No. 3* : 474.

*Material examined* : 1 ♀, Karshiong, Dist. Darjeeling, West Bengal, 2.xii.2006. Coll. S.C. Majumder & S. Talukdar. 1 ♀, Mirik Dist. Darjeeling, West Bengal, 2.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Darjeeling), Sundarban areas : (Dist. North 24 Parganas); Assam; Andaman & Nicobar Island; Gujarat; Maharashtra; Madhya Pradesh; Sikkim; Uttar Pradesh.

*Elsewhere* : Myanmar; China; Japan; Australia; Malaysia; New Guinea; Sri Lanka.

Genus 48. ***Tetragnatha*** Latreille, 18041804. *Tetragnatha* Latreille, *Neuv. Diet. d' Hist. Nat.*, **24** : 135.1804. *Tetragnatha* Latreille, *Neuv. Diet. d' Hist. Nat.*, **24** : 13.1977. *Tetragnatha* : Tikader, *Rec. zool. Surv. India*, **72** : 27.*Type species* : *Tetragnath extensa* Linn.*Distribution* : Tropical countries of the world.**Key to the specis of the genus *Tetragnatha* Laterille**

1. Anterior row of eyes straight, posterior row of eyes strongly recurved; spinnerets present beyond the tail ..... *javanus*
2. Anterior row of eyes recurved, posterior row of eyes not strongly recurved; spinnerets not present beyond the tail ..... *mandibulata*
- Anterior row of eyes may or may not recurved, posterior row of eyes slightly procurved; spinnerets present beyond the tail ..... 3
3. Fang very stout in the basal half, then very slender, first dorsal tooth broad and obliquely transcate ..... *maxillosa*
- Fang may or may not stout in the basal half, then not slender, first dorsal tooth not broad and not obliquely transcate ..... 4
4. Chelicerae stout, first two ventral teeth very large, first two dorsal teeth very small ...  
..... *sutherlandi*

106. ***Tetragnatha javanas*** Thorell, 18951895. *Tetragnatha javanas* Thorell : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*. **22**(2) : 2551-2597.1895. *Eucta javanas* Thorell, *Spider of Burma* : 146.1981. *Eucta javanas* : Tikader & Biswas *Rec. zool. Surv. India, Occ. Pap. No.* **30**(1) : 46.*Distribution* : India : West Bengal (Kolkata, Darjeeling Birbhum) : Orissa; Bihar; Tamil Nadu; Karnataka.107. ***Tetragnatha mandibulata*** Walckenaer, 18371837. *Tetragnatha mandibulata* Walckenaer, *Ins. Apt.*, **2** : 211.1992. *Tetragnatha mandibulata* : Biswas & Biswas, *Fauna of West Bengal, Part-III, And Araneae : Spiders, State Fauna Series No.* **3** : 448.*Distribution* : India : West Bengal (Darjeeling), Sunderban areas (Hingalgunj, Dist. North 24 Parganas; Gosaba, Dist. South 24 Parganas), Midnapur, Mursidabad, Purulia, Birbhum, Burdwan, Kochbihar, Jalpaiguri, Maldah, Bankura; Andaman Island.

108. ***Tetragnatha maxillosa*** Thorell, 1895

1895. *Tetragnatha amaxillosa* Thorell : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*. **22(2)** : 2551-2597.

1921. *Tetragnatha listery* : Gravely, *Rec. Indian Mus*, **22** : 425.

*Material examined* : 1 ♀, 1 ♂, Kalimpong, Darjeeling, Eastern Himalays, West Bengal, 10.xi.1956. Coll. Senior.

*Distribution* : India : West Bengal (Darjeeling).

109. ***Tetragnatha sutherlandi*** Gravely, 1921

1921. *Tetragnatha sutherlandi* Gravely, *Rec. Indian Mus.*, **22** : 425.

*Material examined* : 12 ♀, Kalimpong, Darjeeling, Eastern Himalays, West Bengal, 10.xi.1956. Coll. Senior.

*Distribution* : India : West Bengal (Darjeeling).

## Family XXI. THERAPHOSIDAE Thorell, 1870

Genus 49. ***Haploctustus*** Pocock, 1899

1899. *Haploctustus* Pocock : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*. **22(2)** : 2551-2597.

1899. *Phlogoides* Pocock, *J. Bombay nat. Hist. Soc.*, **12** : 784.

1976. *Phlogoides* Tikader, *J. Bombay nat. Hist. Soc.*, **74** : 306.

*Diagnosis* : Thoracic fovea deep, strongly procurvrd. Eyes of anterior liur slightly procurved. Legs long weakly spined, strongly scopulated, at least in male, claws armed. Sternum with posterior sigilla very large and remote from the margin. First leg without tibial spur in male.

*Type specis* : *Phlogoides validus* Pocock.

*Distribution* : India : West Bengal (Darjeeling); Western India; Eastern Himalays.

110. ***Haploctustus himalayensis*** Tikader, 1976

1976. *Haploctustus* : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*. **22(2)** : 2551-2597.

1976. *Haploctustus himalayensis* Tikader, *J. Bombay nat. Hist. Soc.*, **74** : 306.

1992. *Phlogoides himalayensis* Biswas & Biswas : *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series No. 3* : 377.

*Diagnosis* : Anterior row of eyes slightly procurved. Middle of the cephalothorax provided with deep procurved fovea, Eyes situated in a group on a slightly elevated tubercle. Ocular tubercle situated near the edge of clypeus. Two pairs of spinnerets, anterior pair's small and posterior pair long within three segments, posterior segment is longer than others.

*Material examined* : 1 ♀, Birch Hill, Darjeeling, Eastern Himalays, West Bengal, 22.iv.1974. Coll. B.K. Biswas.

## Family XXII. THOMISIDAE Sundevall, 1833

**Key to the genera of the family THOMISIDAE**

1. Cephalic region as wider as thoracic region ..... ***Camaricus***
- Cephalic region narrower than thoracic region..... 2
2. Tarsal claws of first leg provided with 6-12 teeth ..... ***Lysiteles***
- Tarsal claws of first leg without 6-12 teeth ..... 3
3. Abdomen broadened and truncated behind ..... ***Pistius***
- Abdomen may broadened but not truncated behind ..... 4
4. Abdomen long, lateral sides with longitudinal muscular corrugation ..... ***Thomisus***
- Abdomen not long, lateral sides without longitudinal muscular corrugation ..... 5
5. Anterior median eyes close to the lateral eyes than to each other ..... ***Xysticus***

Genus 50. ***Camaricus*** Thorell, 18871887. *Camaricus* Thorell, *Ann. Mus. Civ. Gen.*, 26.1980. *Camaricus* : Tikader, *Fauna of India, Spiders : Araneae* : **1**(1) : 174.*Type species* : *Camaricus maugei* (Walckenaer).*Distribution* : India, Tropical Africa and Malayasia.111. ***Camaricus formosus*** Thorell, 18871887. *Camaricus formosus* Thorell, *Ann. Mus. Civ. Gen.*, 261.1992. *Camaricus formosus* Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series*, No. **3** : 404.2004. *Camaricus formosus* : Majumder, *Rec. zool. Surv. India*, **20**(2) : 39.

*Diagnosis* : Cephalothorax longer than wide provided with deep brown patches at The centre but in male specimen no such patches are present. Eyes in two rows, both rows are recurved. Posterior row of eyes slightly longer than the anterior row. Middle eyes situated adjacent to the lateral eyes. Legs are robust, clothed with hair and spine, ornamented with black patches, tibia and metatarsi of leg II provided with 3 pairs of ventral spines. Chelicerae moderately strong, sternum heart shaped. Abdomen longer than wide, widest behind the middle, clothed with black hairs.

*Material examined* : 1 ♀, Kalimpong, Darjeeling, Eastern Himalayas, West Bengal, 7.xii.2006. Coll. S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal : (Darjeeling), Sundarban areas : (Gosaba, Patharpratima, Dist. South 24 Parganas), Nadia, Jalpaiguri; Karnataka; Maharashtra; Andaman & Nicobar Island.

Genus 51. **Lysiteles** Simon, 1895

1895. *Synaema* Simon, *Hist. Nat. Araign.* Paris, **1**(4) : 1023.  
 1864. *Synaema* Simon, *Hist. Nat. Ar.* **1** : 70.  
 1980. *Synaema* : Tikader, *Fauna of India*, Spiders : Araneae, **1**(1) : 134.  
 2005. *Lysiteles* Simon 1895 : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*, **22**(2) : 2551-2597.

*Type specis* : *Synaema globosum* (Fabr.).

*Distribution* : Asia, America and Africa.

112. **Lysiteles brunettii** Tikader, 1962

1962. *Synaema brunettii* : Tikader, *J. Linn. Soc. London*, **44**(300) : 578.  
 1980. *Synaema brunettii* : Tikader, *Fauna of India*, Spiders : Araneae, **1**(1) : 134.  
 1992. *Synaema brunettii* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series* No. **3** : 406.  
 2005. *Lysiteles brunet* Tikader 1962 : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*. **22**(2) : 2551-2597.

*Diagnosis* : Cephalothorax as long as wide, cephalic region high. Eyes in two rows, both rows are strongly recurved. Posterior row of eyes slightly longer than the anterior row. Middle eyes situated adjacent to the lateral eyes. Legs not very strong, I and II pairs longer than III and IV. sternum heart shaped. Abdomen oval, four pairs of irregular black patches on the posterior half of abdomen arranged in longitudinal rows.

*Distribution* : India : West Bengal (Darjeeling).

Genus 52. **Pistius** Simon, 1875

1875. *Pistius* Simon, *Ar. Fr.* **2** : 257.  
 1980. *Pistius* : Tikader, *Fauna of India*, Spiders : Araneae, **1**(1) : 65.

*Type- specis* : *Pistius truncatus* (Pallas).

*Distribution* : Central Asia, Europe, Japan and India.

113. **Pistius kalimpus** Tikader, 1970

1970. *Pistius kalimpus* Tikader, *Rec. zool. Surv. India*, **64** : 53.  
 1980. *Pistius kalimpus* : Tikader *Fauna of India*, Spiders : Araneae, **1**(1) : 74.

*Diagnosis* : Cephalothorax nearly as long as wide, convex oval in outline. Eyes black, eyes of the anterior row equidistant, recurved, white. The posterior row less recurved. Sternum oval, Legs not very strong, I and II pairs much longer than III and IV. Abdomen longer than wide, dorsally provided with chalk white patches.

*Distribution* : India : West Bengal (Kalimpong Dist. Darjeeling).

Genus 53. **Thomisus** Walckenaer, 1805

1805. *Thomisus* : Walckenaer, *Tabl. Aron.* P. 28.

1980. *Thomisus* : Tikader, *Fauna of India*, Spiders : Araneae, **1**(1) : 58.

2005. *Runcinia* : Simon 1875 : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*. **22**(2) : 2551-2597.

*Type-species* : *Thomisus lateralis* (Koch).

*Distribution* : Europe, Africa, Asia, Australia and America.

#### Key to the species of the genus *Runcinia* Simon

1. Abdomen with a three pairs of longitudinally arranged reddish brown spots ..... *bulani*
- Abdomen with out three pairs of longitudinally arranged spots..... 2
2. Abdomen with a pair of shoulder tubercle, each with a black spots situated inwardly in the middle ..... *pugilis*

#### 114. *Thomisus bulani* Tikader, 1960

1960. *Thomisus bulani* : Tikader, *J. Bombay nat. Hist. Soc.*, **59**(1) : 198.

1980. *Thomisus bulani* : Tikader, *Fauna of India*, Spiders : Araneae, **1**(1) : 50.

1992. *Thomisus bulani* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders *State Fauna Series* No. **3** : 407.

2005. *Runcinia bulani* Tikader : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*, **22**(2) : 2551-2597.

*Materials examined* : 1 ♀, Kalimpong, Dist. Darjeeling, 7.xii.2006. Coll. : S.C. Majumder & S. Talukdar; 1 ♀, Karshiong, Dist. Darjeeling, 2.xii.2006. Coll. : S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Darjeeling), Kolkata.

#### 115. *Thomisus pugilis* Stoliczka, 1869

1869. *Thomisus (Xysticus) pugilis* Stoliczka. *J. Asiat. Soc. Bengal*, **38** : 225.

1992. *Thomisus pugilis* : Biswas & Biswas, *Fauna of West Bengal*, Part-III, Araneae : Spiders, *State Fauna Series* No. **3** : 409.

2005. *Runcinia pugilis* Stoliczka 1869 : As per reference : 2006. Silwal, M. and Molur, S. *Zoo's Print Journal*. **22**(2) : 2551-2597.

*Materials examined* : 1 ♀, Sukapokhri, Dist. Darjeeling, 10.xii.2006. Coll. : S.C. Majumder & S. Talukdar.

*Distribution* : India : West Bengal (Darjeeling). Kolkata. Punjab; Tamil Nadu.

#### Genus 54. *Xysticus* Koch, 1853

1853. *Xysticus* : Koch, *H. Schaeff. Deutschl. Ins.*, 35.

1981. *Xysticus* : Tikader & Biswas, *Rec. zool. Surv. India, Occ. Pap. No.* **30**(1) : 80.

*Type species* : *Xysticus cristatus* Clerck.

*Distribution* : Cosmopolitan except Australia.

**Key to the species of the genus *Xysticus* Koch**

1. Abdomen broader behind ..... *bengalensis*  
— Abdomen not broader behind ..... 2
2. Cephalothorax wider in front and pale green in colour ..... *himalayaensis*  
— Cephalothorax not wider in front & not pale brown in colour ..... 3
3. Abdomen with more than one transverse lines ..... *kali*

**116. *Xysticus bengalensis* Tikader & Biswas, 1974**

1974. *Xysticus bengalensis* Tikader & Biswas, *Proc. Indian Acad. Sci.*, **80**(6) : 262-263.

1980. *Xysticus bengalensis* : Tikader, *Fauna of India, Spiders : Araneae*, **1**(1) : 127-129.

*Distribution* : India : West Bengal (Darjeeling), Kolkata.

**117. *Xysticus himalayaensis* Tikader & biswas, 1963**

1963. *Xysticus himalayaensis* Tikader & Biswas, *Proc. Indian Acad. Sci.*, **80**(6) : 262.

1992. *Xysticus himalayaensis* : Biswas & Biswas, *Fauna of West Bengal, Part-III, Araneae : Spiders, State Fauna Series No. 3* : 410.

*Distribution* : India : West Bengal (Darjeeling).

**118. *Xysticus kali* Tikader & Biswas, 1960**

1960. *Xysticus kali* Tikader & Biswas, *Proc. Indian Acad. Sci.*, **80**(6) : 265.

1992. *Xysticus kali* : Biswas & Biswas, *Fauna of West Bengal, Part-III, Araneae : Spiders, State Fauna Series No. 3* : 410.

*Distribution* : India : West Bengal (Darjeeling).

**Family XXIII. TROCHANTERIIDAE Kirsch, 1879****Genus 55. *Plator* Simon, 1880**

1973. *Plator* : Tikader & Gajbe, *Corr. Sci.* 42(23) : 829.

2006. *Plator* : Platnick's World Spider Catalog, version 9.5.

2007. *Plator* : Simon, 1980 As per reference Silwal, M. and Molur, S 2006. *Zoo's Print Journal*. **22**(2) : 2551-2597.

**119. *Platorindicus* Simon, 1897**

1897. *Plator indicus* Simon : As per reference Silwal, M. and Molur, S 2006. *Zoo's Print Journal*. **22**(2) : 2551-2597.

1899. *Plator ixodinus* Pocock *J.B.N.H.S* : **12** : 744-753.

1900. *Plator indicus* Pocock : *Fauna of British India, Arachnida* : 1-279.

*Diagnosis* : Body is very flat, legs completely later grade. Head narrow, Cephalothorax is wide and semicircular, cephalic region flat end. Carapace much wider than long. Mandibles weakly armed, labium longer than wide, Maxilla directed obliquely inwards. Sternum much wider than long. First legs shorter than the rest, 2<sup>nd</sup> legs longest, no scapulae or ungula tufts.

Anterior legs armed with erect spiniform bristles, tarsal claws true and toothed. Eyes in three rows, both rows are poorly recurved. Posterior row of eyes slightly longer than the anterior row. Lateral eyes are larger than anterior and posterior eyes.

*Materials examined* : 1 ♀ Singhalina National park, Dist. Darjeeling, 10.xii.2008. Coll. : Sasha (Examined by S. Talukdar, ZSI While received from D.F.O Wild Life of Darjeeling Dist. after seized from the foreign collector in conservation area).

*Distribution* : India : West Bengal : Darjeeling.

**Table-3** : Taxonomic Status and Numerical Biodiversity of Spiders in Darjeeling Hills

Family	Total No. of species	Genus	Darjeeling	Kalimpong	Kurseong	Mirik
AMAUROBIIDAE	01	<i>Ammagrinia</i>	0	0	0	1
		<i>Araneus</i>	0	0	1	1
		<i>Argiope</i>	3	3	3	4
		<i>Chorizopes</i>	1	0	0	0
		<i>Cyclosa</i>	1	0	0	0
		<i>Cyrtarachne</i>	1	1	1	0
ARANEIDAE	25	<i>Cyrtophora</i>	3	1	1	1
		<i>Eriovixia</i>	1	0	0	0
		<i>Gasteracantha</i>	5	6	2	1
		<i>Gibbarania</i>	1	1	1	1
		<i>Neoscona</i>	2	2	2	1
		<i>Zygeilla</i>	1	0	1	1
ATIPIDAE	01	<i>Atypus</i>	0	1	0	0
CLUBIONIDAE	04	<i>Clubiona</i>	3	0	2	0
CORINNIAE	06	<i>Castianeira</i>	3	2	2	0
		<i>Oedignatha</i>	2	0	0	0
CTENIDAE	02	<i>Ctenus</i>	2	0	0	0
GNAPHOSIDAE	03	<i>Gedrarassus</i>	0	1	1	1
		<i>Gnaphosa</i>	1	0	1	0
		<i>Scotophaeus</i>	0	1	1	0
HERSILIDAE	02	<i>Hersilia</i>	1	0	0	1
HOMALONICHIDAE	01	<i>Homanichus</i>	0	0	0	1
LINYPHIDAE	02	<i>Lepthyphante</i>	2	0	0	0

Family	Total No. of species	Genus	Darjeeling	Kalimpong	Kurseong	Mirik
LYCOSIDAE	18	<i>Hippasa</i>	3	2	1	3
		<i>Lycosa</i>	4	1	0	2
		<i>Pardosa</i>	5	1	0	4
		<i>Venonia</i>	1	0	0	0
MITURGIDAE	07	<i>Cheiracanthium</i>	1	5	2	3
OECOBIDAE	01	<i>Oecobius</i>	1	0	0	0
OXYOPIDAE	05	<i>Oxyopes</i>	2	2	2	3
PISAURIDAE	01	<i>Pisaura</i>	1	0	0	0
PHILODROMIDAE	01	<i>Philodromus</i>	0	1	0	0
SALTICIDAE	06	<i>Marpisa</i>	0	1	0	0
		<i>Myrmarachne</i>	1	0	0	0
		<i>Phidippus</i>	0	1	0	0
		<i>Plegra</i>	0	0	1	0
		<i>Plexippus</i>	0	1	0	0
		<i>Zygoballus</i>	0	1	0	0
SCYTODIIDAE		<i>Scytodes</i>	1	0	1	0
SPARASSIDAE	07	<i>Butaniella</i>	1	0	0	0
		<i>Heteropoda</i>	3	2	2	2
		<i>Olios</i>	1	1	1	0
		<i>Pseudopoda</i>	0	1	1	0
TETRAGNATHIDAE	14	<i>Herennia</i>	0	0	1	0
		<i>Larinia</i>	0	2	2	2
		<i>Leucauge</i>	2	4	2	1
		<i>Nephila</i>	1	1	1	1
		<i>Tetragnatha</i>	2	2	0	2
THERAPHOSIDAE	01	<i>Haploclostus</i>	1	0	0	0
THOMISIDAE	08	<i>Camarius</i>	0	1	0	1
		<i>Lysiteles</i>	1	0	0	0
		<i>Pistius</i>	0	1	0	0
		<i>Runcinia</i>	0	1	1	1
		<i>Xysticu</i>	3	0	0	0
TROCHANTERIIDAE	01	<i>Plator</i>	0	0	0	1
TOTAL	119	55	68	51	37	40

### SPIDER DIVERSITY IN DIFFERENT AREAS OF DARJEELING

Studied a very good number of collected life specimens in the field itself to which we have released in their habitat only after possible studies. 119 spider species belonging to 56 genera under 23 families have been identified altogether from different parts of Darjeeling Hills. Taxonomic data regarding availability and diversity of Spiders against different parts of the study area have been recorded. Comparative studies on the numerical diversity of the spiders of this hill area have been incorporated with the text (Table-3) under 4 broad divisions, the main camps of the faunal survey where from the actual studies were initiated.

### SPECIES RICHNESS OF SPIDERS IN DARJEELING HILLS

During our one year study in the versatile environment of different areas of Darjeeling hills a very good number of spider specimens were observed in their diverse habitat. A total of 119 species under 54 genera belonging to 23 families were recorded in this context. Among them, 3 families, 5 genera and 21 species are hitherto record from the state of West Bengal. Species richness in different study areas have been incorporated in tabular form (Table-4) for easy understanding. Family Araneidae is the richest spider family recorded from this hill area having 25 species under 11 genera followed by Lycosidae with 18 species under 4 genera, Tetragnathidae with 14 species under 5 genera, Thomisidae with 8 species under 5 genera. Family Sparassidae and Miturgidae both are having 7 species under 4 and 1 genera respectively, family Salticidae and Corinnidae are having 6 species each under 6 and 2 genera respectively, family Oxyopidae with 5 species under 1 genus, family Clubionidae with 4 species under 1 genus, family Gnaphosidae with 3 species under 3 genera whereas family Ctenidae, Harshilidae and Scytodidae all are having 2 species under 1 genus each and family Amaurobiidae, Atypidae, Homalonichidae, Oecobidae, Pisauridae, Philodromidae, Theraphosidae and Trochanteriidae with single representative species. Among the 4 different study areas, Darjeeling shows the richest spider diversity with 67 species followed by Kalimpong with 51 species, Mirik and Kurseong with 38 and 37 respectively.

**Table-4** : List of spider species from Darjeeling

AREA 1–DARJEELING	AREA 2–KALIMPONG	AREA 3–KURSEONG	AREA 4–MIRIK			
FAMILY	GENUS	SPECIES	SPECIES COLLECTED FROM AREAS			
			1	2	3	4
AMAUROBIIDAE °	<i>Ammagrinia</i> •	<i>chhanguensis</i> ®	-	-	-	+
ARANEIDAE	<i>Araneus</i>	<i>Himalayensis</i>	-	-	+	+
	<i>Argiope</i>	<i>Aemula</i>	+	-	-	-
		<i>anasuja</i> ®	-	+	-	+

Table-4 : Cont'd.

AREA 1–DARJEELING	AREA 2–KALIMPONG	AREA 3–KURSEONG	AREA 4–MIRIK			
FAMILY	GENUS	SPECIES	SPECIES COLLECTED FROM AREAS			
			1	2	3	4
		<i>cacsarea</i> ®	-	-	+	+
		<i>minutus</i> ®	+	+	+	+
		<i>pulchella</i>	+	+	+	+
	<i>Chorizopes</i>	<i>bengalensis</i>	+	-	-	-
	<i>Cyclosa</i>	<i>insulana</i>	+	-	-	-
	<i>Cyrtarachne</i>	<i>gravelyi</i>	+	-	-	-
	<i>Cyrtophora</i>	<i>inequalis</i> ®	-	+	+	-
		<i>bidenta</i>	+	-	-	-
		<i>cicatrosa</i>	+	+	+	+
		<i>moluccensis</i>	+	-	-	-
	<i>Eriovixia</i>	<i>excelsa</i>	+	-	-	-
	<i>Gasteracantha</i>	<i>brivispina</i>	-	+	+	-
		<i>cancreformis</i>	+	+	-	-
		<i>diadesma</i>	+	+	-	-
		<i>hasselti</i>	+	+	-	+
		<i>kuhli</i>	+	+	+	-
		<i>unquifera</i>	+	+	-	-
	<i>Gibbarania</i>	<i>bituberculata</i>	+	+	+	+
	<i>Neoscona</i>	<i>mukerjei</i> ®	+	+	+	-
		<i>nautica</i>	+	+	-	-
		<i>pavida</i>	-	-	+	+
<i>Zygeilla</i>	<i>melanocrania</i>	+	-	+	+	
ATIPIDAE °	<i>Atypus</i>	<i>sutherlandi</i>	-	+	-	-
CLUBIONIDAE	<i>Clubiona</i>	<i>drassodes</i> ®	-	-	+	-
		<i>filicata</i> ®	+	-	+	-
		<i>pogonius</i>	+	-	-	-
		<i>shillongensis</i> ®	+	-	-	-
CORINNIDAE	<i>Castianeira</i>	<i>albopicta</i>	+	-	-	-
	<i>Oedignatha</i>	<i>himalayensis</i>	-	+	+	-
		<i>indica</i>	+	-	-	-
		<i>zetes</i>	+	+	+	-

Table-4 : Cont'd.

AREA 1-DARJEELING	AREA 2-KALIMPONG	AREA 3-KURSEONG	AREA 4-MIRIK				
FAMILY	GENUS	SPECIES	SPECIES COLLECTED FROM AREAS				
			1	2	3	4	
		<i>carly</i>	+	-	-	-	
		<i>scrobiculata</i>	+	-	-	-	
CTENIDAE °	<i>Ctenus</i>	<i>himalayaensis</i>	+	-	-	-	
		<i>sikkimensis</i>	+	-	-	-	
GNAPHOSIDAE	<i>Geodrassus</i>	<i>himalayensis</i>	-	+	+	+	
	<i>Gnaphosa</i> •	<i>poonaensis</i> ®	+	-	+	-	
	<i>Scotophaeus</i> •	<i>madalasa</i> ®	-	+	+	-	
HERSILIDAE	<i>Hersilia</i>	<i>savignyi</i> ®	-	-	-	+	
		<i>sumatrana</i>	+	-	-	-	
HOMALONICHIDAE	<i>Homanichus</i>	<i>jayantiu</i>	-	-	-	+	
LINYPHIDAE	<i>Lepthyphante</i>	<i>bhudbari</i>	+	-	-	-	
		<i>lingsoka</i>	+	-	-	-	
LYCOSIDAE	<i>Hippasa</i>	<i>agelenoides</i>	-	+	-	+	
		<i>greenalliae</i>	+	-	-	-	
		<i>himalayensis</i>	-	+	-	-	
		<i>holmerae</i>	+	-	-	+	
		<i>pantherina</i>	+	-	-	-	
		<i>partita</i> ®	-	-	+	+	
	<i>Lycosa</i>	<i>bistriatai</i>	+	-	-	-	
		<i>carmicaeli</i>	+	-	-	-	
		<i>himalayensis</i>	+	-	-	-	
		<i>kempi</i>	+	-	-	+	
		<i>nigrotibialis</i>	-	+	-	+	
	<i>Pardosa</i>	<i>annandalei</i>	+	-	-	+	
		<i>birmanica</i>	+	-	-	+	
		<i>pusioala</i>	+	-	-	+	
		<i>shyamae</i>	-	+	-	+	
		<i>sumatrana</i>	+	-	-	-	
		<i>sutherlandi</i>	+	-	-	-	
	<i>Venonia</i>	<i>himalayensis</i>	+	-	-	-	
	<i>Hogna</i>	<i>himalayensis</i>	-	-	-	+	
	MITURGIDAE	<i>Cheiracanthium</i>	<i>himalyensis</i>	-	+	+	-

Table-4 : Cont'd.

AREA 1–DARJEELING	AREA 2–KALIMPONG	AREA 3–KURSEONG	AREA 4–MIRIK			
FAMILY	GENUS	SPECIES	SPECIES COLLECTED FROM AREAS			
			1	2	3	4
		<i>indicum</i>	-	+	-	-
		<i>insigne</i>	-	-	-	+
		<i>melanostoma</i>	-	+	+	+
		<i>mysorensis</i>	-	+	-	-
		<i>pauriense</i>	+	-	-	-
		<i>triviale</i>	-	+	-	+
OECOBIDAE	<i>Oecobius</i>	<i>putus</i>	+	-	-	-
OXYOPIDAE	<i>Oxyopes</i>	<i>pandae</i> ®	-	-	-	+
		<i>ratnae</i> ®	-	-	+	-
		<i>sakuntalae</i> ®	+	+	+	-
		<i>shweta</i>	+	-	-	+
		<i>sikkimensis</i>	-	+	-	+
PHILODROMIDAE	<i>Philodromus</i>	<i>malini</i>	-	+	-	-
PISAURIDAE	<i>Pisaura</i>	<i>gitae</i>	+	-	-	-
SALTICIDAE	<i>Marpisa</i> •	<i>decorata</i> ®	-	+	-	-
	<i>Myrmarachn</i> •	<i>orientalis</i> ®	+	-	-	-
	<i>Phidippus</i>	<i>pateli</i>	-	+	-	-
	<i>Plegra</i>	<i>dhakuriensis</i>	-	-	+	-
	<i>Plexippus</i>	<i>calcuttaensis</i>	-	+	-	-
	<i>Zygoballus</i>	<i>narmadaensis</i>	-	+	-	-
SCYTODIIDAE	<i>Scytodes</i>	<i>propinqua</i> ®	-	-	+	-
		<i>thoracica</i> ®	+	-	-	-
SPARASSIDAE	<i>Butaniella</i>	<i>sikkimensis</i>	+	-	-	-
	<i>Heteropoda</i>	<i>kandiana</i>	+	+	+	-
		<i>leprosa</i>	+	+	+	+
		<i>venatoria</i>	+	-	-	+
	<i>Olios</i>	<i>milleti</i>	+	-	-	-
		<i>punctipes</i>	-	+	+	-

Table-4 : Cont'd.

AREA 1-DARJEELING	AREA 2-KALIMPONG	AREA 3-KURSEONG	AREA 4-MIRIK			
FAMILY	GENUS	SPECIES	SPECIES COLLECTED FROM AREAS			
			1	2	3	4
TETRAGNATHIDAE	<i>Pseudopoda</i>	<i>promta</i>	-	+	+	-
	<i>Herennia</i>	<i>ornatissima</i>	-	-	+	-
	<i>Larinia</i>	<i>joysankari</i>	-	+	+	+
		<i>phtisica</i>	-	+	+	+
	<i>Leucauge</i>	<i>celebrasiana</i>	-	+	+	+
		<i>culta</i>	-	+	+	-
		<i>decorata</i> ®	+	+	-	-
		<i>tessellata</i>	+	+	-	-
	<i>Nephila</i>	<i>clavata</i>	-	+	-	+
		<i>kuhli</i>	+	-	-	-
		<i>pilipes</i>	-	-	+	-
	<i>Tetragntha</i>	<i>javanus</i>	+	-	-	+
		<i>mandibulata</i>	+	-	-	+
		<i>maxillosa</i>	-	+	-	-
		<i>sutherlandi</i>		+	-	-
THERAPHOSIDAE	<i>Haploclastus</i>	<i>himalayensis</i>	+	-	-	-
THOMISIDAE	<i>Camaricus</i>	<i>formosus</i>	-	+	-	+
	<i>Lysiteles</i>	<i>bruneti</i>	+	-	-	-
	<i>Pistius</i>	<i>kalimpus</i>	-	+	-	-
	<i>Thomisus</i>	<i>bulani</i>	-	+	+	-
		<i>pugilis</i>	-	-	-	+
	<i>Xysticus</i>	<i>bengalensis</i>	+	-	-	-
		<i>himalayensis</i>	+	-	-	-
<i>kali</i>		+	-	-	-	
TROCHANTERIIDAE <sup>o</sup>	<i>Plator</i> •	<i>indicus</i> ®	-	-	-	+
		<b>TOTAL</b>	68	51	37	40

<sup>o</sup> = Family recorded first time from Darjeeling as well as from West Bengal

• = Genus recorded first time from Darjeeling

® = Species first time recorded from Darjeeling

**COMPARATIVE DISTRIBUTION OF THE SPIDERS OF DARJEELING HILLS**

Spider genera and species available from Darjeeling hills have been carefully compared with Global, National and State scenarios and plotted in a table (Table-5) and analysed the comparative abundance against global status for easy understanding.

**Table-5** : Comparative Distribution

Sl. No.	FAMILY	World		India		West Bengal		Darjeeling Hills	
		Genus	Species	Genus	Species	Genus	Species	Genus	Species
1	AMAUROBIIDAE	00069	00640	00002	00004	00001□	00001□	00001□	00001□
2	ARANEIDAE	00167	02831	00027	00147	00015	00057	00011	00025
3	ATYPIDAE	00003	00033	00001	00001	00000	00000	00001	00001
4	CLUBIONIDAE	00015	00532	00003	00023	00002	00009	00001	00004
5	CORINNIDAE	00076	00924	00009	00035	00002*	00006*	00002*	00006*
6	CTENIDAE	00039	00455	00002	00014	00001□	00001□	00001□	00002□
7	GNAPHOSIDAE	00115	01954	00028	00134	00007	00008	00003	00003
8	HERSILIDAE	00010	00143	00003	00006	00001	00001	00001	00002
9	HOMALONICHIDAE	00001	00003	00001	00001	00001□	00001□	00001□	00001□
10	LINYPHIDAE	00569	04307	00015	00024	00001□	00002□	00001□	00002□
11	LYCOSIDAE	00102	02304	00017	00126	00005	00025	00004	00017
12	MITURGIDAE	00026	00351	00003	00029	00001*	00007*	00001*	00007*
13	OEOBIDAE	00006	00101	00002	00005	00001	00001	00001	00001
14	OXYOPIDAE	00009	00417	00004	00065	00002	00009	00001	00005
15	PHILODROMIDAE	00029	00516	00007	00043	00002	00003	00001	00001
16	PISAUROIDAE	00052	00324	00008	00017	00001	00001	00001	00001
17	SALTICIDAE	00550	05027	00062	00161	00008	00029	00006	00006
18	SCYTODIIDAE	00005	00168	00001	00009	00001	00002	00001	00002
19	SPARASSIDAE	00083	00995	00010	00080	00001	00003	00004	00007
20	TETRAGNATHIDAE	00056	01020	00012	00051	00002	00003	00005	00014
21	THERAPHOSIDAE	00111	00889	00018	00052	00001	00001	00001	00001
22	THOMISIDAE	00169	02022	00037	00154	00010	00032	00006	00009
23	TROCHANTERIIDAE	00018	00146	00001	00005	00001	00001	00001	00001
	<b>Total</b>	<b>02280</b>	<b>26102</b>	<b>00273</b>	<b>01186</b>	<b>00070□</b>	<b>00203□</b>	<b>00056□</b>	<b>00119□</b>
	% (Abundance)	<b>100.00%</b>	<b>100.00%</b>	<b>11.97%</b>	<b>04.54%</b>	<b>03.07%</b>	<b>00.78%</b>	<b>02.46%</b>	<b>00.46%</b>
□ = New distribution in West Bengal * = Previously with other family (Clubionidae)									

### **DIVERSITY OF SPIDER FAMILIES, GENERA AND SPECIES IN DARJEELING HILLS**

From our exploration and studies on the spiders in Darjeeling hills, it is revealed that richest species diversity of spider fauna observed among the Araneus having 25 species covering about 21.5% of the total followed by the spider species of families namely Lycosidae, Tetragnathidae, Thomisidae, Sparassidae, Corinnidae, Miturgidae, Salticidae, Oxyopidae, Clubionidae, Gnaphosidae, Ctinidae, Harsilidae, Linyphidae, Scytodiidae, Amaurobiidae, Atipidae, Homalonichidae, Oecobidae, Philodromidae, Pisauridae, Theraphosidae, and Trochantheriidae. The lowest coverage observed among the last 8 families covering about 0.8% of the total number of species. The ratio of number of species against number of genus is highest in family Lycosidae with 17 species under 4 genera covering about 14.6% of the total number of species. More details are available with Table-5 and Figure-2.

### **TAXONOMY AND DIVERSITY OF CLUBIONID SPIDERS IN DARJEELING HILLS**

Clubionid spiders are generally called the sac-spider because they construct silken tubular sac, whitish in colour, open at both the ends or closed. Due to their general habitat in forest floor they are also known as forest sac spiders. They can be easily seen running over the ground, on grassy land as well as rocky ground under stone and the foliage of leaves or loose bark of trees. Like Gnaphosid they do not spin web but they mostly weave silk cells of flat tubular sac in rolled leaves, folded blades of grass, under loose bark of trees or under objects on the ground. Some of the clubionids live on the ground amongst clumps of grass or under stone, some of the species of the genus like *Oedignatha* Thorell 1881 lives in the higher altitude. April and May are the chief months for reaching their maturity. The females guard their egg sac inside the thick walled white cells from July onwards. When the eggs are going to be laid, the female usually selects a broad leaf of plant and curls it over enclosing herself inside a white cells strong silk lined chambers, in this sun she retreats and deposits a compact mass of yellow eggs (Bristoe, 1958).

Most of the clubionids do not prefer town life. Some of the spider of the genus *Clubiona* Latreille, 1804 are found to live in the drier areas than moist areas (Majumder & Tikader, 1991). Sometimes they are found to make their way into houses and seen promenading the walls at night for searching of insects.

There are some other species of this genus have been found to built tubular retreats just underside of the stone or they make flat tubular nest on the rolled leaves of plants.

The Forest Sac-spiders of the family Clubionidae have a very confusing taxonomic history. Once this family was a large catch-all taxon for a large group of disparate collection of spiders, similar only in that they had eight legs arranged in two rows, conical anterior spinnerets that touched and were wandering predators that built silken retreats, or sacs, usually on plant

terminals, between leaves, under bark or under rocks. These are now recognized to include several families, some of which are more closely related to the three-clawed spiders, like lynx and wolf spiders, than to true "Clubionoids".

Among the spider families of Darjeeling formerly classified as sac-spiders, some of which have common names including the words "sac-spider", include :

- MITURGIDAE (long-legged sac-spider)
- CORINNIDAE (Corinnid sac-spider)

as well as the remnant Clubionidae (now consisting of 4 species in 1 genus of Darjeeling hills, 9 species in 2 genera of West Bengal, 23 species in 3 genera of India and over 532 species in 15 genera worldwide). However "sac-spider" used on its own should imply a member of the family Clubionidae.

In Darjeeling hills, the family as it is recognized now consisting of 4 species in only one genus, *Clubiona* which is nearly worldwide in distribution.

#### **GENERIC CHARACTERS STUDIED IN FAMILY CLUBIONIDAE (PREREVISED) FROM DARJEELING HILLS**

Characters of the 4 genera have been dealt with special care *namely Clubiona* from existing CLUBIONIDAE, *Castianeira*, *Oedignatha* from CORINNIDAE and *Cheiracanthium* from MITURGIDAE which are recently shifted from family CLUBIONIDAE are as follows :

***Clubiona*** : Cephalothorax rather long somewhat narrowed in front and broad posteriorly, highest at the level of the cephalic groove, covered with fine silky hair, sometimes with large hairs at the anterior part; fovea usually short, radiating streak sometimes originates from it. Eyes in two rows, the anterior row slightly recurved, medians closer to each other than the laterals the posterior row markedly the longest and slightly procurved or straight. Medians not to close to each other than the laterals. Chelicerae robust and convex, sometimes cylindrical in males. Usually cylinder pale yellow to redish brown in colour with dense claw tuft and thin scapulae. Maxillae longer than wide concave on lateral margin labium loon. Legs usually longer than wide. Legs formula 4.1.2.2. Tibia of the male palpus without ventral apophysis but with short retrolateral apophysis. Tegulum elongate, convex, embolus arises near the base of the tegular apophysis. Abdomen elongate and ovoid clothed with white or pale yellow pubescence most of them without markings. Presence of semi erect and long erect setae at the anterior end of abdomen. Epigyne with elongate concave or convex plate, often traversed by the grooves and ridge, copulatory opening conspicuous and cavity like, hidden in posterior margin of epigynal plate situated at the lateral margin of the plate. Copulatory tube extending anterior direction forward to the spermatheca bent or coiled. Spermatheca often composed of two parts.

**Castianeira** : Cephalothorax elongated, ovoid, long with prominent cephalic shield usually dark to dark brown in colour provided with median fovea, short sparse and with few longer setae present in front of the carapace. Eyes small and uniform size, arranged in two transverse series-anterior and posterior. The anterior row slightly recurved, medians slightly closer to laterals than to each other. The posterior row distinctly procurved. Chelas moderately long and stout with rarely 3 teeth on retromargin. Maxillae not constricted at the middle more or less convex on its outer side. Legs rather long and cylinder orange to dark brown or black in colour with short dense dark claw tufts. Tibia of male palp as long as wide. Cymbium rounded at the base, long and cylinder distally, embolus usually long and slender spirally twisted. Abdomen elongated, ovoid rather cylinder often with transverse band. Dorsum without long cluster of erect setae at the anterior end. Epigyne as rounded convex hairy flat copulatory opening small and rounded or elliptical, well separated and distinct, spermatheca longer than wide, copulatory tube short.

**Oedignatha** : Cephalothorax oblonged, long narrow in front sufficiently high with a very short central fovea. The cephalic shield coming up to the posterior median eyes. There are 8 eyes arranged in two transverse rows almost equal in size coming close to the extremities and occupy two third of the breadth of the front. The frontal row slightly recurved and the posterior row longer than the anterior row, slightly procurved. Ocular quadrate almost square. Chelicerae twice longer than wide, inner margin provided with 5 to 9 teeth outer margin with 3 teeth. Maxillae longer than wide anterior end broad and rounded slightly constricted at the middle. Concave Labium longer than wide. Sternum oval in shape. Legs are short not very strong. Tibia and metatarsi I & II provided with 5-7 pairs of ventral spines. Legs formula 4 1 2 3. Tibia of the male palp longer than wide with tibial apophysis. Cymbium without spur, embolus narrower. Abdomen oblonged covered with sclerotized dorsal shield ornamented by whitish spots, sometimes dorsum provided by dorsal scutum. Epigyne flat rounded concave plate, with elliptical copulatory opening. Spermatheca terminating in two branches.

**Cheiracanthium** : Cephalothorax ovoid in shape, longer than wide convex anteriorly with no median fovea if present very inconspicuous. Eyes nearly uniform size, arranged in two transverse series-anterior and posterior. The anterior row slightly recurved, posterior row scarcely longer than the anterior row, straight and uniformly spaced, the laterals further remote from the medians, both the laterals anterior and posterior closer to each other. Ocular quadrate relatively narrow anteriorly. Chelicerae longer than wide, moderately strong and stout dark brown in colour, outer margin provided with 2 teeth and the inner margin with 2 or 3 teeth. Maxillae longer than wide constricted at the middle, concave-Labium longer than wide. Legs long and cylinder, moderately stout, the 1<sup>st</sup> leg longer than the 4<sup>th</sup> leg. Trochanter IV with distinct ventral notch. Tibia of the male palpus with retrolateral apophysis sometimes

with dorsal and ventral apophysis; cymbium with strong spur at its base, tegulum with strong apophysis, embolus arises on retrolateral side of the tegulum. Abdomen elongate, oval and pointed posteriorly, dull yellow or pale green without pattern of scutum without cluster long erect setae at the anterior end. Epigyne with flat or concave plate, with copulatory opening situated at the lateral margin of the plate. Spermatheca small, nearly rounded, well separated. Global, national and state Clubionid fauna, the genera and their available species diversity were studied for comparison with the only Clubionid genus of Darjeeling then analyzed them to plot two different charts as Generic diversity and Species diversity (Figure 3) for easy visual understanding and included herewith. Figure-3

The yellow sac-spiders (family Miturgidae) include 7 species in 1 genus in Darjeeling hills as well as in West Bengal, 29 species of 3 genera in India where as 351 species in 26 genera have already been recorded worldwide. The Corinnidae, as now recognized 6 species and 2 genera from Darjeeling hills, 9 species in 2 genera from the state of West Bengal, 35 species in 9 genera in India and over 924 species in 76 genera worldwide, making it the largest of the "Clubionoid" families. Members of the genus *Castianeira* appear to be mimics of ants and velvet ants *Corinna* is the type genus for the family and consists of small running spiders.

The present scenario of the previous 4 genera of family Clubionidae from Darjeeling Hills after proper allocation under two other families namely Miturgidae (1) and family Corinnidae (2) keeping the rest spiders under Family Clubionidae itself have been analysed by comparing them with the greater diversities of global, national and state spider fauna and included herewith (Figure-4) for visual understanding. Figure-4

The genus *Cheiracanthium* Koch 1839 tends to live in drier climate. Other species of this genus constructs in a grass head, bent in a characteristic fashion or inside curled leaves of plants. The species *Cheiracanthium himalayensis* Gravelly, 1931 were found to construct with tubular sac on broad leaves. Some species of the genus like *C. indicum* Cambridge, *C. melanostoma* Thorell 1895, *C. mysorensis* Majumder & Tikader, 1991 and *C. pauriensis* Majumder & Tikader, 1991 have been found in the foliage of small trees, herb, shrub or bushes near the tea garden, in particular season they are frequently predominant in the paddy fields for catching the paddy pest, hence they are called the essential predator of paddy pest. They were also found in the post monsoon months when the tall grasses are grown plenty in mangrove bushes of Sunderban areas, the females were found to construct brooding nest with the help of larger blade of these grasses nicely curved in two tier folding, stuck with the help of sticky web threads. The mother spider firms an egg cocoon inside this nest and stays as guard. Preyed mainly by direct jumping upon the small insects (Majumder 2007). The genus *Castianeira* Keyserling 1879 is smaller in size found on foliage of small bushes as well as on the ground. Sometimes they have been collected under decayed wood and under stone.

They are also distributed in the soil litters of hilly region as well as semi mangrove areas of Sunderban (Majumder 2007). The species of this genus like *C. albopicta* Gravely 1931, *C. himalayensis* Gravely 1931 construct small tubular whitish retreats under logs or decayed wood. The female spiders were found to attach the egg cocoon inside this retreat. They preyed on small insects by direct jumping (Majumder 2007) the species of this genus like *C. indica* Tikader 1981 and *C. zetes* Simon 1897 smaller in size, ground dwellers, rarely found in the foliage of bushes. They run over the ground like mutilated wasp. Sometimes they are found in association with the ants. In some cases they were collected from the forest litters of undershed vegetation, preyed on small insects by direct attack.

The genus *Oedignatha* Thorell are medium to smaller in size, ground dwellers as well as found in the foliage of bushes of hilly areas. They run over the ground like the other group of spiders. Sometimes they are found to construct silk retreats inside rolled leaves, some were found under stone or other object on the ground. The species *O. curly* Reimoser 1934 were also found to live in the drier situation than the humid atmosphere and high altitudinal region than lower altitude (Majumder 2007). The species *O. scrobiculata* Thorell, 1881 construct a tubular sac under decayed log and under other objects in the hilly areas in some cases they were collected from the forest litters preyed on small insects by direct attack.

During initiation of the project, family Clubionidae Wagner, 1887 was supposed to be undivided. Later, during the preparation of manuscript it is understood by the literature Survey (Silwal and Molars, 2006) regarding spider of India that Darjeeling-Hill spider of this family is presently distributed in two other families namely CLUBIONIDAE Karsch, 1880 and Miturgidae Simon, 1885 under 3 genera *Castianeira* Keyserling, 1879, *Oedignatha* Thorell, 1881, *Cheiracanthium* Koch, 1839 along with *Clubiona* Latreille, 1804 under Clubionidae itself. There are 4 species *Calbipicta*, *C. himalayensis*, *C. indica*, and *C. zetes* under genus *Castianeira* and 2 species *O. curly* and *O. scrobiculata* under genus *Oedignatha* have been included under the family Corinnidae while 7 other species *C. himalayensis*, *C. indicum*, *C. insigne*, *C. melanostoma*, *C. mysorensis*, *C. pauiensis* and *C. travialse* in Genus *Cheiracanthium* under the family Miturgidae is recorded. The members of this family (Clubionidae) which we have been recorded from Darjeeling-Hill expressed some interesting habitat specificity as 3 species namely *C. silicate*, *C. Polonius*, *C. shillongensis* are abundant in Darjeeling while *C. drassodes* and *C. filicata* are moderately available in higher hilly areas of Kurseong whereas not a single species has been reported from Kalimpong and Mirik areas.

Areas show that the members of genus *Clubiona* do not like moist areas and the period (pre-monsoon) we collected specimens from the areas of Kalimpong were comparatively high humid and Mirik area is always with higher humidity than other places of Darjeeling hills. This supports the idea of Majumder & Tikader, 1991 that the Clubionidae spiders like

drier areas than moist areas. In our study we observed 3 species of the genus *Castianeira* and 2 species of the Genus *Oedignatha* under the family Corinnidae were available from Darjeeling (Table-3 & 4). Where as 2 species of the genus *Castianeira* were observed in the Kurseong and Kalimpong but not a single specimen from Mirik which again support the previously mentioned phenomena. In the study of the family Miturgidae represented by a single genus *Cheiracanthium*. A single species namely *pauriense* of this genus have only been found in Darjeeling. Species richness of this genus is highest in Kalimpong (5 species) followed by 3 in Mirik and 2 in Kurshiong (Table-3 & 4). The most interesting observation in our study is that in every case in our collection from canopy it is available from those plants which have some aroma of specific type with pungent flavor and in other hand all Clubionid species have specific group of toxin may correlate the bimolecular resource of it by relating its habitat flora. The overall Species diversity of Clubionid related families were studied by comparing them with the Global, Indian and West Bengal spider fauna for better demonstration and clear understanding (Figure-5). Figure-5

#### SPIDER ENDEMICITY IN DARJEELING HILLS

Among the 119 spiders from 23 available spider families about 40 species under 31 genera belonging to 20 families are endemic to India. A list of the endemic species is given with Table-6.

**Table-6** : List of the spiders from Darjeeling hills endemic to India

Sl. No.	Family	Genus	Species
1	ARANEIDAE	<i>Cyrtarachne</i>	<i>inequalis</i>
2		<i>Cyrtophora</i>	<i>bidenta</i>
3		<i>Gasteracantha</i>	<i>cancriformis</i>
4		<i>Neoscona</i>	<i>mukerjei</i>
5	ATYPIDAE	<i>Atypus</i>	<i>sutherlandi</i>
6	CLUBIONIDAE	<i>Clubiona</i>	<i>pogonius</i>
7		<i>Clubiona</i>	<i>shillongensis</i>
8	CORINNIDAE	<i>Castianeira</i>	<i>albopicta</i>
9		<i>Castianeira</i>	<i>himalayensis</i>
10		<i>Castianeira</i>	<i>indica</i>
11		<i>Oedignatha</i>	<i>carly</i>
12	CTENIDAE	<i>Ctenus</i>	<i>himalayensis</i>
13		<i>Ctenus</i>	<i>sikkimensis</i>

Table-6 : Cont'd.

Sl. No.	Family	Genus	Species
14	GNAPHOSIDAE	<i>Gnaphosa</i>	<i>poonaensis</i>
15		<i>Scotophaeus</i>	<i>madalasmae</i>
16	HOMALONICHIDAE	<i>Homanichus</i>	<i>jayantius</i>
17	LINYPHIDAE	<i>Lepthyphantes</i>	<i>bhudbari</i>
18		<i>Lepthyphantes</i>	<i>lingsoka</i>
19	LYCOSIDAE	<i>Hippasa</i>	<i>himalayensis</i>
20		<i>Lycosa</i>	<i>carmicaeli</i>
21	MITURGIDAE	<i>Cheiracanthium</i>	<i>indicum</i>
22		<i>Cheiracanthium</i>	<i>mysorensis</i>
23		<i>Cheiracanthium</i>	<i>pauriensis</i>
24	OXYOPIIDAE	<i>Oxyopes</i>	<i>pandae</i>
25		<i>Oxyopes</i>	<i>ratnae</i>
26		<i>Oxyopes</i>	<i>sakuntalae</i>
27	PISAURIDAE	<i>Pisaura</i>	<i>gitae</i>
28	PHILODROMIDAE	<i>Philodromus</i>	<i>malinae</i>
29	SALTICIDAE	<i>Marpisa</i>	<i>decorata</i>
30		<i>Zygoballus</i>	<i>narmadaensis</i>
31	SPARASSIDAE	<i>Butaniella</i>	<i>sikkimensis</i>
32	SCYTODIIDAE	<i>Scytodes</i>	<i>propinqua</i>
33	TETRAGNATHIDAE	<i>Herennia</i>	<i>ornatissima</i>
34		<i>Larinia</i>	<i>joysankari</i>
35		<i>Tetragnatha</i>	<i>sutherlandi</i>
36	THERAPHOSIDAE	<i>Haploclastus</i>	<i>himalayensis</i>
37	THOMISIDAE	<i>Lysiteles</i>	<i>brunettii</i>
38		<i>Pistius</i>	<i>kalimpus</i>
39		<i>Thomisus</i>	<i>pugilis</i>
40	TROCHANTERIIDAE	<i>Plator</i>	<i>indicus</i>

**COMPARATIVE SPIDER ENDEMICITY**

Spider diversity part of which are endemic to India is then studied by comparing them with the total number of endemic spiders from India their covering percentage over the whole spider fauna of India among the concerning families have been carefully plotted into a table (Table-7) for easy understanding.

**Table -7 : COMPARATIVE SPIDER ENDEMICITY FROM DARJEELING HILLS**

Sl. No.	Family	Total		Endemic		
		In India	In Darjeeling Hills	In India (EI)	In Darjeeling Hills (ED)	% Over (EI)
1	ARANEIDAE	149	025	069	005	007.25
2	ATYPIDAE	001	001	001	001	100.00
3	CLUBIONIDAE	023	004	016	002	012.50
4	CORINNIDAE	035	006	023	006	026.08
5	CTENIDAE	014	002	013	002	015.38
6	GNAPHOSIDAE	134	003	112	002	001.59
7	HOMALONICHIDAE	001	001	001	001	100.00
8	LINYPHIDAE	024	002	019	002	010.53
9	LYCOSIDAE	126	017	081	002	002.47
10	MITURGIDAE	029	007	020	003	015.00
11	OXYOPIDAE	066	005	050	003	006.00
12	PISAURIDAE	017	001	011	001	009.09
13	PHILODROMIDAE	043	001	037	001	002.70
14	SALTICIDAE	182	006	107	002	001.87
15	SPARASSIDAE	080	007	058	001	001.72
16	SCYTODIIDAE	009	002	005	001	020.00
17	TETRAGNATHIDAE	052	014	023	002	008.69
18	THERAPHOSIDAE	051	001	046	001	002.17
19	THOMISIDAE	154	009	124	002	001.61
20	TROCHANTERIIDAE	005	001	004	001	025.00
	Total	1195	115	820	041	005.00

### REARRANGED STATUS OF TAXA OF THE SPIDERS OF DARJEELING HILLS

Very recently spider taxonomy due to its extensive worldwide impetus has got several justified changes in the arrangement of taxa by rearranging the existing one with suitable placement and considerable re-nomenclatures. In this aspect some family name, its taxonomic position and composition is reconstructed or fragmented in to more than one family. Some genera has got new name or shifted to other family. Similarly some species name is changed or synonymies with other species or shifted to other genus of the same or new family. Changes of the spiders of Darjeeling hills are described here.

#### CHANGES IN FAMILIES

1. Spiders (one species *Tegeneria chhanguensis* Tikader, 1970) of family AGELENIDAE Koch, 1837 from Darjeeling is changed and revised by inclusion with Family : AMOUROBIIDAE Thorell, 1870 as *Tamagrinia alveoliferae* (Schenkel, 1936).
2. Some species of family CLUBIONIDAE Wagener, 1827 is Synonymies with other families like CORRINIDAE Karsch, 1880 and MITHURGIDAE Simon, 1885 with the same specific name (*Cheiracanthium himalayensis* Gravely, 1931, *C. indicum* Cambridge, 1874, *C. insigne* Cambridge, 1874, *C. melanostoma* Thorell 1895, *C. mysorensis* Majumder & Tikader, 1991, *C. pauriense* Majumder & Tikader, 1991, *C. triviale* Thorell, 1895 under the Genus 29. *Cheiracanthium* Koch, 1839).
3. Some species of family ARAENIDAE Simon, 1805 is Synonymies with family TETRAGNATHIDAE Menge, 1866 with the same specific name (*L. celebrasiana* (Walckenaer, 1841), *L. culta* (O.P. Cambridge, 1869), *L. decorata* (Blackwall, 1864), *L. tessellata* (Thorell, 1847) under the Genus *Leucauge* White, 1841.
4. Some species of family THOMISIDAE is synonymies with family PHILODROMIDAE.
5. Family PLATORIDAE is renamed as TROCHANTERIIDAE in recent time.

#### CHANGES IN GENERA

1. *Tegeneria chhanguensis* Tikader, 1970 is shifted to Genus *Tamagrinia* Lehtinen, 1967 of family AMOUROBIIDAE Thorell, 1870 as *Tamagrinia chhanguensis* Tikader, 1970.
2. *Drassodes himalayensis* Tikader & Gajbe, 1975 transferred to the Genus *Geodrassus* Westring, 1857 in the same Family as *Geodrassus himalayensis* Tikader & Gajbe, 1975.
3. *Lycosa himalayensis* Gravely, 1924 Transferred to Genus *Hogna* Gravely, 1924 in the same Family as *Hogna himalayensis* Gravely, 1924.
4. *Zygeilla melanocrania* Thorell, 1902 of Genus *Zygeilla* Cambridge, 1902 is shifted to the Genus *Guizygiella* Thorell, 1870 in family TETRAGNATHIDAE Menge, 1866 as *Guizygiella melanocrania* Thorell, 1902.

5. *Heteopoda sikkimensis* Gravely, 1931 of Genus *Heteropoda* Latreille, 1804 is shifted to the Genus *Butaniella* Gravely in family SPARASSIDAE Bertkau, 1872 as *Butaniella sikkimensis* Gravely, 1931.
6. *Heteopoda promta* O.P. Cambridge, 1885 of Genus *Heteropoda* Latreille 1804 is shifted to the Genus *Pseudopoda* Jager, 2000 in family SPARASSIDAE Bertkau, 1872 as *Pseudopoda promta* O.P. Cambridge, 1885.
7. *Marpisa dhakuriensis* Tikader, 1974 of Genus *Marpisa* Koch, 1846 is Shifted to the Genus *Plegra* Simon, 1876 in family SALTICIDAE as *P. dhakuriensis* Tikader, 1974.
8. *Phiddippus pateli* Tikader, 1974 of the Genus *Phiddippus* Koch, 1846 is Shifted to the Genus *Telamonia* Thorell, 1887 as *T. dimidiata* (Simon, 1899).
9. *Marpisa calcuttaensis* Tikader, 1974 of Genus *Marpisa* Koch, 1846 is Shifted to the Genus *Plexippus* Aud., 1846 as *P. calcuttaensis* Tikader, 1974.
8. *Syanema brunettii* Tikader, 1962 of Genus *Syanema* Simon, 1895 shifted to genus *Lysiteles* Simon, 1895 as *L. brunettii* Tikader, 1962.

#### CHANGES IN SPECIES

1. Species *chhanguensis* of genus *Tegeneria* Latreille, 1804 is synonymised with *Tamagrinia alveoliferae* (Schenkel, 1936).
2. Species *kalimpongensis* Sinha, 1952 of genus *Argeope* Audouin, 1826 is synonymised with *Argiope Caesarea* Thorell, 1897.
3. Species *shillongensis* Sinha, 1951 of genus *Argeope* Audouin, 1826 is synonymised with *Argiope minuta* Karsch, 1879.
4. Species *leucomelaena* Thorell, 1887 of genus *Gasteracantha* Sundeval, 1833 is synonymised with *Gasteracantha kuhli* Koch, 1837.
5. Species *mammosa* C.L. Koch, 1844 of genus *Gasteracantha* Sundeval, 1833 is synonymised with *Gasteracantha cancriformis* (Linn., 1758).
6. Species *anandelei* (Gravely, 1924) of genus *Pardosa* Koch, 1848 is Synonymised with *Pardosa psedoannulata* (Bosenbarg & Strand, 1990).

#### DISCUSSION

The inventory of spiders from Darjeeling hills comprises 119 species under 23 families belonging to 55 genera among which 22 species, 7 genera and 4 families have been recorded for the first time from Darjeeling District. It is also worth mentioned that four spider families namely Ammurobiidae, Atipidae, Trochanteriidae and Ctenidae is reported first time in the state of West Bengal with 1 genus from each and single species from first three families

while 2 species from family Ctenidae. Species richness have been observed significantly different in four different areas of the hills (Table-4) in which Darjeeling shows the highest with 68 species under 28 genera whereas Kurseong shows the minimum with 37 number of species under 26 genera. Analysis of species richness is described with a chart (Figure-6).

Generic diversity of the spider families of Darjeeling hills also demonstrate a significant variation in 8 families among the 23 spider families of the total 55 spider genera available altogether in this dynamic mountain ecosystem and described through the pie-chart (Figure-7). The highest generic diversity observed in family Araneidae with 11 genera covering about 19.64% followed by family Salticidae and Thomisidae with 6 genera Tetragnathidae with 5 genera, Lycosidae and Sparassidae with 4 genera, Gnaphosidae with 3, Corinnidae with 2 and all other 15 families with single genus (Table-4). The last 15 families covered 1.78% of the whole generic diversity of the study area. The richest genus of all spider families of Darjeeling is *Cheiracanthium* with 7 species followed by *Gasteracantha*, *Hippasa* and *Pardosa* with 6 species each, *Lycosa*, *Argiope* and *Oxyopes* with 5 species each, *Clubiona*, *Castianeria*, *Leucauge* and *Tetragnatha* with 4 species each *Xysticus*, *Nephila*, *Heteropoda*, *Neoscona* and *Cyrtophora* with 3 species, *Cyrtarachne*, *Oedignatha*, *Ctenus*, *Hersilia*, *Scytodes*, *Olios*, *Larinia*, *Runcinia* and *Lepthyphante* with 2 species each along with the other 30 families (Table-4) with single species each Species diversity of the hills have been carefully studied from the collected field data of present study as well as the existing information available with National Zoological Collection of Zoological Survey of India and the published literature. Significant species diversity has been identified among the 23 spider families of Darjeeling hills (Figure-8). Family Araneidae is the richest one having 25 species followed by Lycosidae with 17, Tetragnathidae with 14 Thomisidae With 9, Sparassidae and Miturgidae each with 7 Corinnidae and Salticidae with 6 each Oxyopidae with 5, Clubionidae with 4 Gnaphosidae with 3, Ctenidae, Harshilidae, Linyphidae and Scytodidae all 4 families with 2 each whereas the rest 8 families with single species each among the whole 119 number of species from this area.

An account of comparative density of the spider species from the study areas also analysed. Density of the species of 23 different families here have been represented by percentage coverage of the total number of species and plotted in a comparative chart (Figure-9). Family Araneidae covers 21% followed by Lycosidae with 14.28%, Tetragnathidae with 11.76% Thomisidae With 7.56%, Sparassidae and Miturgidae each with 5.88% Corinnidae and Salticidae with 5.04% each Oxyopidae with 4.20% Clubionidae with 3.36% Gnaphosidae with 2.52%, Ctenidae, Harshilidae, Linyphidae and Scytodidae all 4 families with 1.68% each whereas the rest 8 families (Table-4) with 0.84% each of the whole 119 number of species from this area. Genus *Cheiracanthium* found as the richest with 5.89% density coverage of whole spider

fauna of Darjeeling hills followed by *Gasteracantha*, *Hippasa* and *Pardosa* 5.04% each, *Lycosa*, *Argiope* and *Oxyopes* 4.20% each, *Clubiona*, *Castianeira*, *Leucauge* and *Tetragnatha* 3.36% each *Xysticus*, *Nephila*, *Heteropoda*, *Neoscona* and *Cyrtophora* 2.52%, *Cyrtarachne*, *Oedignatha*, *Ctenus*, *Hersilia*, *Scytodes*, *Olios*, *Larinia*, *Runcinia* and *Lepthyphante* 1.68% each along with the other 30 families 0.84% each.

In the study of endemism (Table-6 & 7) among the spider fauna of Darjeeling hills it is significantly observed that about 5% of the spider which are endemic to India are available from this hill areas. Among them having only one species family Atypidae and Homalonichidae cover 100% of the Indian endemic species of those families. Like wise Corinnidae with about 26% coverage with 6 species, Trochanteriidae with about 25%, Scytodidae with about 20%, Tetragnathidae and Pisauridae with about 9% coverage by their single representative species. Similarly Ctenidae and Miturgidae cover about 15%. Family Clubionidae, Linyphidae, Araneidae covered about 12.5%, 10.5%, and 7% respectively. Rest of the 8 family's share about 1-2% of the Indian endemic spider's details of which is plotted in a chart (Figure-10) comparing the total number of Spiders from the representative families India and Darjeeling hills.

#### REMARKS

Studies on Taxonomy and Biodiversity of spider have immense important due to several aspects it contains. Spiders exhibit stunning morphological diversity and coloration. The coloration of spiders is varied and is paralleled only by insects (Oxford and Gillespie, 1998). They are not greatest of pest control agents, unless we consider all insects to be pests which are a very erroneous point of view, although they are cheap, and very useful. Spiders are, for the most part, such generalise feeders that they kill many useful insects as well as many pest species, however because pest species are by their nature more numerous than beneficial species they are still effective. Spiders also have a very significant role to play in the ecology as their exclusively predatory behavior (Wise, 1993) and thereby regulate insect populations.

Spiders may also serve as biocontrol agents (Raghavendra, 2001). They are of great value to the environment. While they tend to sample insect populations randomly, any population that becomes explosive in its growth will find more of its kind taken by spiders than otherwise. Thus, rather than specifically controlling certain insects, spiders have a general blanket or buffer effect, promoting evolution, helping keeping insect numbers under control in a broad sense and supplying food for many other animals and therefore keeping the flow of life moving. Studies on the feeding habit of *Argiope pulchella* Thorell from Darjeeling hills displayed evolutionary turn point of the wandering and web building spiders (Talukdar *et.al.*, 2007 & 2008) and supports academic values of this study. In particular the ability of spiders to exist in huge numbers on relatively little food gives them a useful role in damping out population fluctuations in a diverse environment.

All spiders are venomous but only a few species are venomous enough to harm humans. However, the venom of some spiders is useful in study of neuromuscular and cardiac pharmacology. It is likely that spider silk will be the material of the future as its silk is the toughest material known.

Some spiders are however being promoted in the battle against agricultural pests. Linyphiids and Lycosidae against aphids in wheat fields. Somewhere it has been shown that 20 spiders per square metre can reduce leaf hoppers in rice fields by up to 90%.

As with most conservation, spider conservation is habitat conservation. While this is really troublesome in the fragile hill areas like Darjeeling and can involve lots of money and special reserves it can also be simple as leaving some of our lawn unknown or setting a side strips of weedy ground around tea gardens and forest areas including other crop fields and newly developing areas. In spite of several applied values mentioned above, spiders have received cursory attention. In conservation efforts, often “charismatic” species like birds and mammals draw most attention and ecological significant groups like spiders are often neglected. Only tarantulas are included in Appendix II of CITES.

The 1990 Red Data book of America lists 16 species of spiders as threatened. This small number reflects how little we actually know about spider populations than the real extent of endangered species. As the Mexican Red-kneed Tarantula has already been so endangered by collecting for the pet trade that it is currently a Cites Appendix II species but not yet in India. Many of the Indian spiders have the same possibilities towards the conventional threatening regarding conservation point of view in coming future as beside the socio-economic development and natural calamities habitat destruction and different new mode of exploitations by direct use of these organisms are increasing day by day. In particular, Darjeeling hill is considered as the nursery of huge faunal biodiversity. People from different part of the world recognize this hill area as immense environmental resource and visit here for possible exploitations legally or illegally. Hence extensive care should be taken towards the conservation of spider in these areas.

#### **RECOMMENDATIONS**

1. Due to the fact that most species are nocturnal, due to lack of systematic surveys, there is limited information on the demography of spider populations; hence future projections are speculative.
2. Faunal diversity surveys and conservation efforts are often concerned with charismatic species like higher vertebrates. We need to pay attention to other faunal components also, like spiders because of the significant ecological role they play.

3. Monitoring the status of spider from this area in considerably shorter intervals is very much effective towards the planning and categorized the implementation of conservation strategies.
4. In order to formulate conservation measures a baseline data about a particular group is needed. For many of the arthropods particularly in Arachnids (spiders) of India such information is lacking and therefore needs to be generated.
5. Deforestation selectively reduces diversity and density of fauna like that of spiders. Additionally, use of pesticides may dramatically influence their diversity. It would be worthwhile designing insecticides such that they are less toxic to spiders.
6. Spiders appear to be promising candidates and can be used in biological control of pests.
7. Awareness on spider to remove the fear on them among the general people is requiring.
8. Popular studies on spider with general interests about them relating their utilities for mankind like medicinal uses, biological pest control in different agricultural field must be approached.
9. Suitable identification kit like pictorial hand books or colorful posters on spiders of different habitats must be prepared for availabilities as ready documents.
10. Captive cultures and rearing should be developed and learnt to gather substantial information on different spider species.
11. Genetic research on spider taxonomy considering the useful organs producing silk, poison and other fascinating morphological as well as physiological diversities should take care of with special impetus.

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PLATE-I

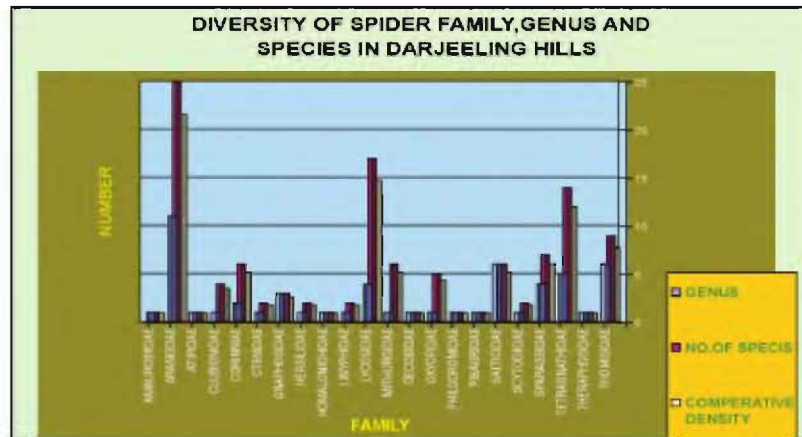


Figure 2.



Figure 3.

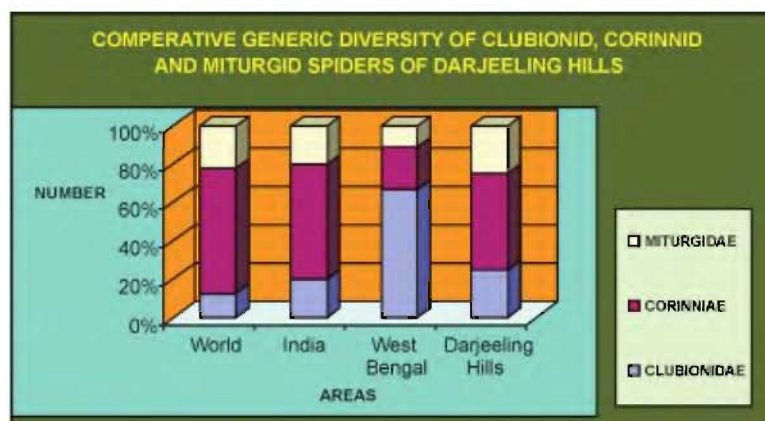


Figure 4.

PLATE-II

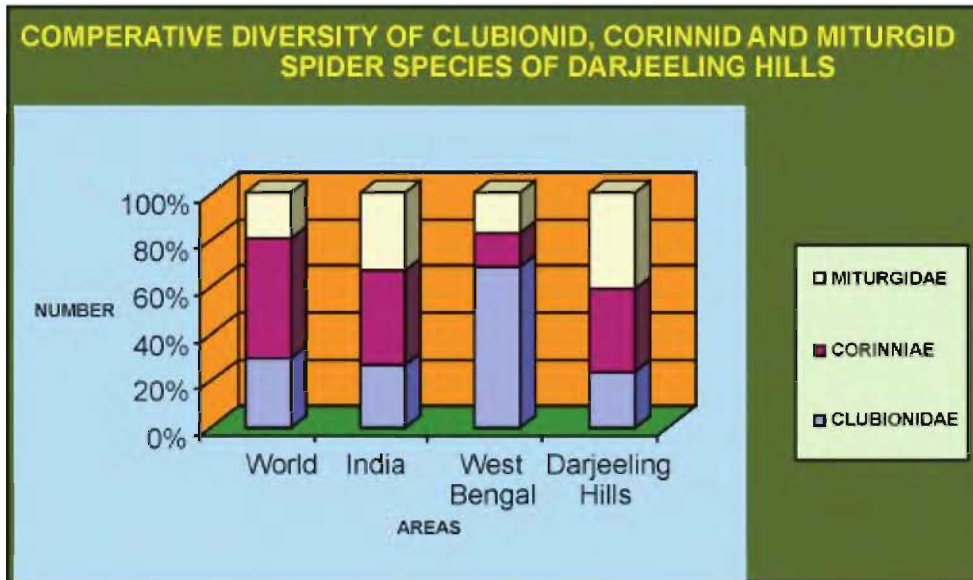


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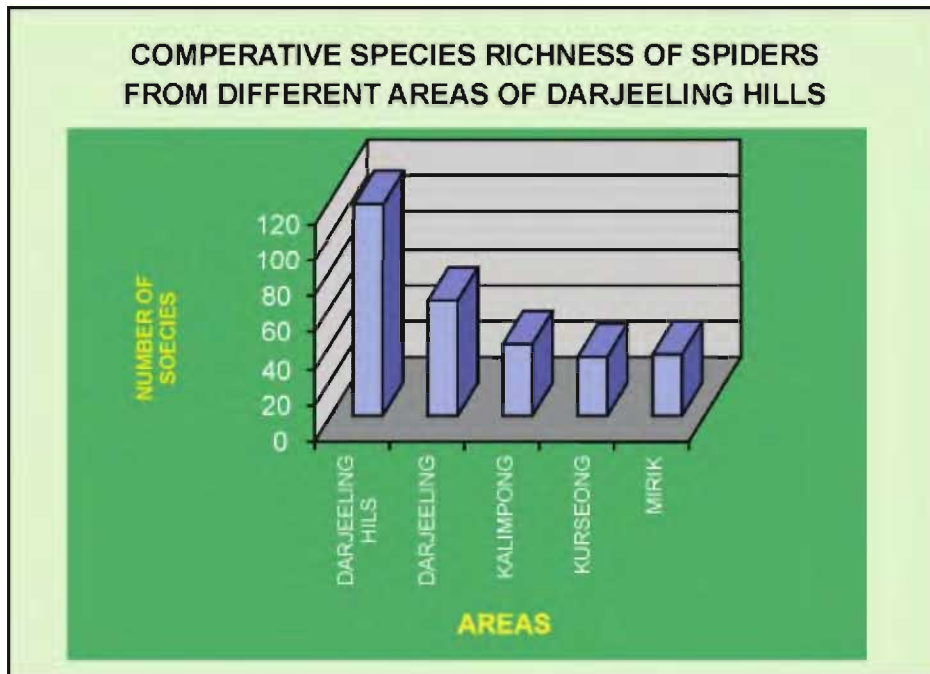


Figure 6.

PLATE-III

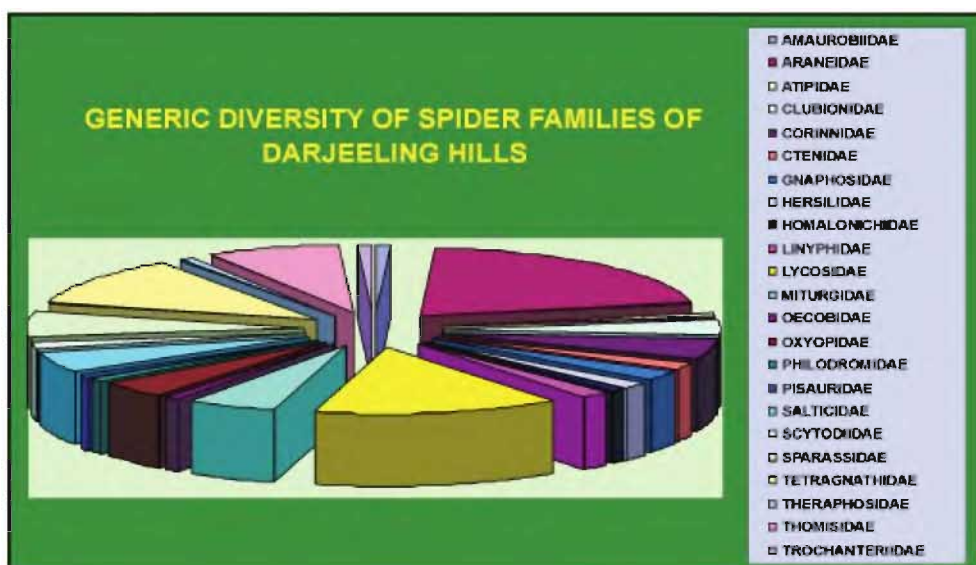


Figure 7.

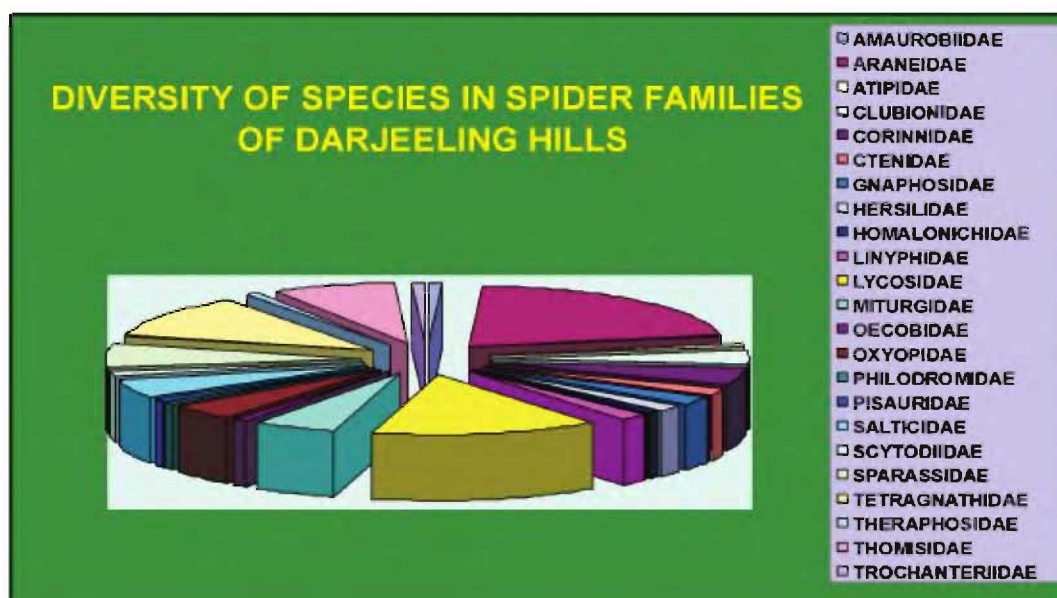


Figure 8.

PLATE-IV

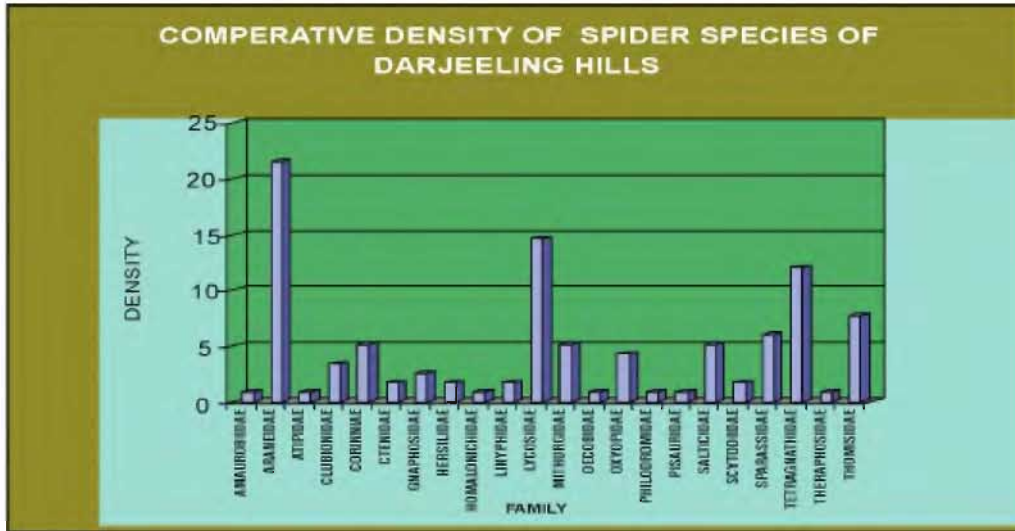


Figure 9.

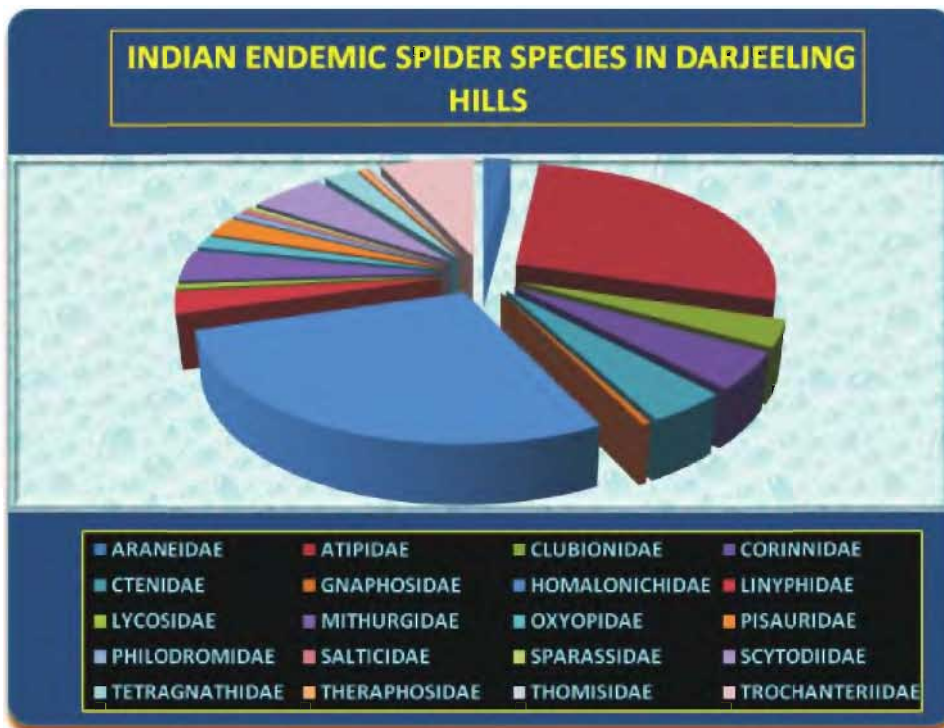


Figure 10.

**PLATE - V**



1. Spider Collection Site of Bagora Hills



2. Spider Collection Site of Pedong



3. Spider Collection Site of Kalijhora



4. Spider Collection Site of Kurshiong



5. Spider Collection Site of Langsong Valley



6. Spider Collection Site of Latpanchar

**PLATE - VI**



7. Spider Collection Site of Lava



8. Spider Collection Site of Mahananda Sanctuary



9. Spider Collection Site of Mirik



10. Spider Collection Site of Mohananda River Bed



11. Spider Collection Site of Neora Valley



12. Spider Collection Site of Rishop

**PLATE - VII**



13. Spider Collection Site of Sevok



14. Spider Collection Site of Sukna Forest



15. Spider Collection Site of Tea Gardens of Sukna



16. Spider Collection Site of Tindharia



17. Spider Collection Site of Way To Mirik



18. Spider Collection Site of Darjeeling

**PLATE - VIII**



19. Spider collection at Sukna forest



20. Spider collection at Mahananda forest



21. Spider collection at Latpanchar



22. Spider collection at Kurshiong

PLATE - IX



23. *Araneus himalayensis* Tikader, 1975 ( Dorsal View of Female)



24. *Argiope aemula* (Walckenaer, 1841) (Dorsal View of Female)



25. *Argiope aemula* (Walckenaer, 1841) (Dorsal View of Male)



26. *Argiope anasuja* Thorell, 1887 (Dorsal View of female )



27. *Argiope anasuja* Thorell, 1887 (Dorsal View of Male )



28. *Argiope minuta* Karsch, 1879 (Dorsal View of Female )

PLATE - X



29. *Argiope anasuja* Thorell, 1887 (Ventral View of Male )



30. *Argiope pulchella* Thorell, 1881 (Dorsal View of female)



31. *Argiope pulchella* Thorell, 1881 (Dorsal View of Male)



32. *Argiope pulchella* Thorell, 1881 (Dorsal View of Juvenile)



33. *Chorizopes bengalensis* Tikader, 1870 (Dorsal View of Female)



34. *Cyclosa insulana* (Costa,1834) (Dorsal View of Female )

PLATE - XI



35. *Cyrtarachne inequalis* Thorell, 1864 (Dorsal View of Female )



36. *Cyrtarachne inequalis* Thorell, 1864 (Ventral View of Female)



37. *Cyrtophora cicatrosa* (Stoliczka, 1869) (Lateral View of Female)



38. *Cyrtophora cicatrosa* (Stoliczka, 1869) (Dorsal View of Male)



39. *Cyrtophora moluccensis* (Doleshchall, 1857) (Dorsal View of Female)



40. *Cyrtophora moluccensis* (Doleshchall, 1857) (Dorsal View of Male)

PLATE - XII



41. *Eriovixia excels* (Simon, 1889) (Dorsal View of Female)



42. *Eriovixia excels* (Simon, 1889) (Dorsal View of Male )



43. *Gasteracantha brivispina* (Doleschall, 1857) ( Dorsal View of Female)



44. *Gasteracantha hasselti* Koch, 1838 (Dorsal View of Female )



45. *Gasteracantha kuhli* Koch, 1837 (Dorsal View of Female)



46. *Gasteracantha cancriformis* Linnaeus, 1758 (Dorsal View of Female)

**PLATE - XIII**



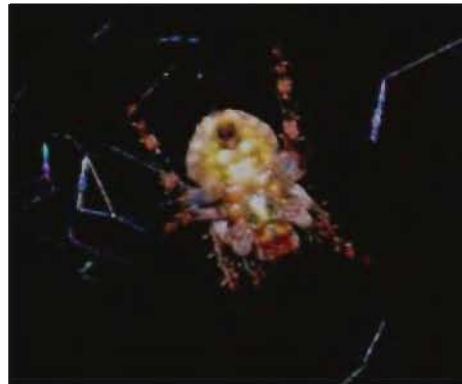
47. *Gibbaranea bituberculata* (Walckenaer, 1802) (Dorsal View of Female)



48. *Gibbaranea bituberculata* (Walckenaer, 1802) (Dorsal View of Male)



49. *Neoscona muckerjei* Tikader, 1980 (Dorsal View of Female)



50. *Neoscona nautica* Koch, 1875 (Dorsal View of Female)



51. *Neoscona nautica* Koch, 1875 (Dorsal View of Male)



52. *Neoscona nautica* Koch, 1875 (Female in Roosting Habitat)

PLATE - XIV



53. *Neoscona pavida* (Simon, 1906) (Dorsal View of Male)



54. *Clubiona drassodes* Cambridge, 1874 (Dorsal View of Male)



55. *Clubiona filicata* Cambridge, 1874 (Dorsal View of Female)



56. *Clubiona pogonius* Simon, 1906 (Dorsal View of Female)



57. *Clubiona shillongensis* Majumder & Tikader, 1991 (Dorsal View of Female)



58. *Castianeira albopicta* Gravely, 1931 (Dorsal View of Female)

PLATE - XV



59. *Castianeira himalayensis* Gravely, 1931 (Dorsal View of Female)



60. *Castianeira zetes* Simon, 1897 (Dorsal View of Female)



61. *Scotophaeus madalasa* Tikade & Gajbe, 1975 (Dorsal View of Female)



62. *Ctenus sikkimensis* Gravely, 1931 (Dorsal view of female)



63. *Ctenus himalayaensis* Gravely, 1921 (Dorsal view of female)



64. *Hersilia savignyi* Lucas, 1836 (Dorsal View of Female)

PLATE - XVI



65. *Hersilia savignyi* Lucas, 1836 (Dorsal View of Male)



66. *Hersilia sumatrana* Thorell, 1890 (Dorsal View of Female)



67. *Hippasa holmerae* Thorell, 1895 (Dorsal View of Female)



68. *Hogna himalayensis* Gravely 1924 (Dorsal View of Female )



69. *Pardosa pseudoannulata* Boes.et Str., 1906 (Dorsal View of Female)



70. *Cheiracanthium himalyensis* Gravely, 1931 (Dorsal View of Female)

PLATE - XVII



71. *Cheiracanthium indicum* Cambridge, 1874  
(Dorsal View of Female)



72. *Cheiracanthium insigne* Cambridge, 1874  
(Dorsal View of Female)



73. *Cheiracanthium melanostoma* Thorell, 1895  
(Dorsal View of Female)



74. *Cheiracanthium mysorensis* Majumder & Tikader, 1991 (Dorsal View of Female)



75. *Cheiracanthium trivialis* Thorell, 1895  
(Dorsal View of Female)



76. *Oxyopes shweta* Tikader, 1970 (Dorsal View of Female)

PLATE - XVIII



77. *Phylodromus malinae* Tikader, 1966  
(Dorsal View of Male)



78. *Marpisa decorata* Tikader, 1974  
(Dorsal View of Male)



79. *Myrmerachne orientalis* Tikader, 1973  
(Dorsal View of Male)



80. *Telamania dimidiata* (Simon, 1899) (Dorsal  
View of Female)



81. *Telamania dimidiata* (Simon, 1899) (Dorsal  
View of Male)



82. *Zygoballus narmadaensis* Tikader, 1975 (Dorsal  
View of Female)

**PLATE - XIX**



83. *Scytodes propinqua* Stoliczka, 1869 (Dorsal View of Female)



84. *Scytodes thoracica* (Latreille, 1804) (Dorsal View of Female)



85. *Heteropoda venatoria* Linnaeus, 1766 (Dorsal View of Female)



86. *Heteropoda venatoria* Linnaeus, 1766 (Dorsal View of Male)



87. *Heteropoda venatoria* Linnaeus, 1766 (Dorsal View of Juvenile)

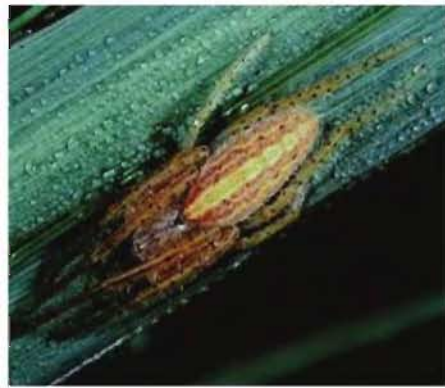


88. *Herennia ornatissima* (Doleschall, 1859) (Dorsal View of Female)

PLATE - XX



89. *Heremia ornatissima* (Doleschall, 1859)  
(Dorsal View of Male)



90. *Larinia phytica* (L.Koch, 1877) (Dorsal View of Female)



91. *Leucauge celebrasiana* (Walckenaer, 1841)  
(Dorsal View of Female)



92. *Leucauge celebrasiana* (Walckenaer, 1841)  
(Dorsal View of Male)



93. *Leucauge decorate* (Blackwall, 1864) (Dorsal View of Female)



94. *Leucauge decorate* (Blackwall, 1864) (Dorsal View of Male)

PLATE - XXI



95. *Leucauge tessellate* (Thorell, 1847) (Dorsal View of Female)



96. *Nephila clavata* Koch, 1878 (Dorsal View of Female)



97. *Nephila clavata* Koch, 1878 (Ventral View of Female)



98. *Nephila kuhllii* (Doleschal, 1859) (Dorsal View of Female)



99. *Nephila kuhllii* (Doleschal, 1859) (Ventral View of Female)



100. *Nephila pilipes* (Fabricius, 1793) (Dorsal View of Female)

PLATE - XXII



101. *Nephila pilipes* (Fabricius, 1793) (Ventral View of Female)



102. *Nephila pilipes* (Fabricius, 1793) (Ventral View of Male)



103. *Nephila pilipes* (Fabricius, 1793) (Dorsal View of Juvenile)



104. *Tetragnatha javanus* Thorell, 1895 (Dorsal View of Female)



105. *Tetragnatha mandibulata* Walckenaer, 1837 (Dorsal View of Female)



106. *Tetragnatha maxillosa* Thorell, 1895 (Dorsal View of Female)

PLATE - XXIII



107. *Tetragnatha sutherlandi* Gravely, 1921 (Dorsal View of Female)



108. *Haploclastus himalayensis* Tikader, 1976 (Dorsal View of Male)



109. *Camaricus formosus* Thorell, 1887 (Dorsal View of Female)



110. *Camaricus formosus* Thorell, 1887 (Ventral View of Female)



111. *Thomisus bulani* Tikader, 1960 (Dorsal View of Female)



112. *Xysticus bengalensis* Tikader & Biswas, 1974 (Dorsal View of Female)

**PLATE - XXIV**



113. *Xysticus kali* Tikader&Biswas, 1974 (Dorsal View of Female)



114. *Plator indicus* Simon, 1897 (Dorsal View of Female)

