SPIDER FAUNA OF RADHANAGARI WILDLIFE SANCTUARY, CHANDOLI NATIONAL PARK AND KOYNA WILDLIFE SANCTUARY

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ABSTRACT

Diversity of spiders from Radhanagari Wildlife Sanctuary, Chandoli National Park and Koyna Wildlife Sanctuary in Western Ghats is studied for the first time. A total of 247 species belonging to 119 genera and 28 families are recorded from the study area during 2010-2012 with a dominance of Araneid, Salticid and Lycosid spiders.

Key words: Spider diversity, Western Ghats

INTRODUCTION

Spiders comprise one of the largest (5-6th) orders of animals. The spider fauna of India has never been studied in its entirety despite of contributions by many arachnologists since Stoliczka (1869). The pioneering contribution on the taxonomy of Indian spiders is that of European arachnologist Stoliczka (1869). Review of available literature reveals that the earliest contribution by Blackwall (1867); Karsch (1873); Simon (1887); Thorell (1895) and Pocock (1900) were the pioneer workers of Indian spiders. They described many species from India. Tikader (1980, 1982), Tikader, and Malhotra (1980a,b) described spiders from India. Tikader (1980) compiled a book on Thomisid spiders of India, comprising two subfamilies, 25 genera and 115 species. Of these, 23 species were new to science. Descriptions, illustrations and distributions of all species were given. Keys to the subfamilies, genera, and species were provided. Tikader and Biswas (1981) studied 15 families, 47 genera and 99 species from Calcutta and surrounding areas with illustrations and descriptions. Pocock (1900) and Tikader (1980, 1987) made major contributions to the Indian Arachnology, have high lightened spider studies to the notice of other researcher. Pocock (1900) described 112 species of spiders from India. His book provided the first list of spiders, along with enumeration and new descriptions in British India based on spider specimens at the British Museum, London. Tikader (1987) also published the first comprehensive list of Indian spiders, which included 1067 species belonging to 249 genera in 43 families. From the last three decades, contribution of Gajbe (1995-2003) to the field of spiders is noteworthy. He described 147 new spider species from different habitats of India. He published 69 papers on Araneid, Gnaphosid, Lycosid, Thomisid and Oxyopid spiders and also State Fauna series (2007, 2008a, 2009).

The updated spider checklist given by Keswani et al. (2012) of SGB Amravati University Arachnology laboratory shows 1686 species from 438 genera and 60

So far nobody has worked out or studied the spider fauna of Radhanagari Wildlife Sanctuary, Chandoli National Park and Koyna Wildlife Sanctuary and hence we have decided to explore the spider diversity from above three localities.

The study area:
The Western Ghats constitute the range of hills running almost parallel to Arabian Sea through Kerala, Tamilnadu, Karnataka, Goa and Maharashtra. Western Ghats area of India is considered as an important biodiversity hot spot. Recently Western Ghats is declared as world heritage site.

The present study is restricted to Radhanagari Wildlife Sanctuary, Chandoli National Park and Koyna Wildlife Sanctuary, which forms the northern end of Western Ghats. The main geological formation of the area is the Deccan trap. The total area of the Radhanagari Wildlife Sanctuary is 351.16 sq. km. The plateau region is mostly covered with the grasses. The climate is moderate. During summer the mean temperature ranges from 30°C to 35°C, Maximum being 41°C. The minimum temperature during winter is 9°C to 16°C. The mean annual rainfall is about 2500 mm and maximum being 5000 mm. Chandoli Wildlife Sanctuary is spread 308.97 sq. km. Koyna Wildlife Sanctuary covers an area of 423.55 Sq. Kms. and comprises geographical area of 50 villages. The Sanctuary area is in the catchment of the river Koyna. Most of the area is dense semi-evergreen forest with a wide range of flora. The area prevails humid and moderate climate, heavy rain.

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METHODS

To document a comprehensive inventory of spiders from Radhanagari Wildlife Sanctuary, Chandoli National Park and Koyna Wildlife Sanctuary, well established sampling protocols for spider collection were adopted in different selected sampling plots. The collection techniques used were hand collection, vegetation beating, litter sampling and sweep netting. The collections were made during early morning hours (6 hours to 9 hours) and day time (16 hours to 18 hours), from different parts of the microhabitats, like, rolled or folded leaves, plant branches, leaf litter, tree trunks, rock surface, grass blades, etc. The Lycosids and Gnaphosids were collected from the soil surface and also from the river beds.

Each spider was identified mainly on the basis of morphological characteristics, epigyne and or palp structure after carrying out the necessary dissections and by using the literature (Kaston, 1978; Barrion and Litsinger, 1995; Tikader, 1987 and Mujumdar, 2007). The details of body parts of specimens were examined in 70% ethanol under a good quality stereo zoom microscope. The identification of species was carried out by the comparison of morphological features with the help of published literature, standard books and field guides.

OBSERVATIONS AND RESULTS

A total of 247 species (Table-1) belonging to 119 genera and 28 families were recorded from the study area during 2010-2012. Among all these 28 families, high diversity was observed in the families Araneidae (46 species) > Salticidae (38 species) > Lycosidae (30 species) > Thomisidae (24 species).

![Figure 1](image)

Figure 1, Family wise number of spider species from Radhanagari Wildlife Sanctuary, Chandoli National Park and Koyna Wildlife Sanctuary
Table 1: Diversity of spiders in Radhanagari Wildlife Sanctuary, Chandoli National Park and Koyna Wildlife Sanctuary:

1) **Family: Araneidae: 19 genera with 46 species**
   1. *Arachnura angura* Tikader, 1970
   2. *Araneus mitificus* (Simon, 1886)
   4. *Araneus himalayaensis* Tikader, 1975
   5. *Argiope aemula* (Walckenaer) Female and male
   6. *Argiope anasuja* (Thorell) Female
   7. *Argiope lobata* (Pallas, 1772)
   8. *Argiope trifasciata* (Forsskål, 1775)
   9. *Chorizopes anjanes* Tikader, 1965
   10. *Chorizopes bengalensis* Tikader, 1975
   11. *Chorizopes kastoni* Gajbe & Gajbe, 2004
   12. *Chorizopes khanjanes* Tikader, 1965
   13. *Cyclosa raniceps* Pocock, 1900
   14. *Cyclosa bifida* (Doleschall, 1859)
   15. *Cyclosa hexatuberculata* Tikader, 1982
   16. *Cyclosa confraga* (Thorell, 1892)
   17. *Cyclosa spirifera* (Simon, 1889)
   18. *Cyclosa moonduensis* (Tikader, 1963)
   19. *Cyclosa insulana* (Costa, 1934)
   20. *Cyrtophora cicatrosa* (Stoliczka, 1869)
   21. *Cyrtophora citricola* (Forsskål, 1775)
   22. *Cyrtophora moluccensis* (Doleschall, 1857)
   23. *Eriovixa laglaisei* (Simon, 1877)
   24. *Gasteracantha geminata* (Fabricius, 1798)
   25. *Gasteracantha dalyi* Pocock, 1900
   26. *Gasteracantha kuhli* (C. L. Koch) Female
   27. *Gasteracantha remifera* Butler, 1873
   28. *Telecantha brevispina* (Doleschall)
   29. *Gea spinipes* C. L. Koch, 1843
   30. *Larinia chloris* (Audouin, 1826)
   31. *Larinia emertoni* Gajbe & Gajbe, 2004
   32. *Lipocrea fusiformis* (Thorell, 1877)
   34. *Neoscona molemensis* Tikader & Bal, 1981
   35. *Neoscona mukerjei* (Tikader) Female
   36. *Neoscona nautica* (L. Koch, 1875)
   38. *Neoscona rumpfi* (Thorell, 1878)
   39. *Neoscona theisi* (Walckenaer, 1842)
   40. *Neoscona vigilans* (Blackwall, 1865)
41. Ordgarius hobsoni (O. P.-Cambridge, 1877)
42. Parawixia dehaani (Doleschall, 1859)
43. Poltys illepidus C. L. Koch, 1843
44. Poltys nagpurensis Tikader, 1982
45. Zilla globosa Saha & Raychaudhuri, 2004
46. Zygiella indica Tikader & Bal, 1980

II) Family: Clubionidae: 1 genus with 3 species
1. Clubiona drassodes O. P.-Cambridge, 1874
2. Clubiona bengalensis Biswas, 1984
3. Clubiona tikaderi Majumder & Tikader, 1991

III) Family: Corinnidae: 2 genera with 6 species
1. Castianeira zetes Simon, 1897
2. Castianeira bengalensis Biswas, 1984
3. Castianeira flavipes Gravely, 1931
4. Castianeira himalayensis Gravely, 1931
5. Castianeira indica Tikader, 1981
6. Trachelas oreophilus Simon, 1906

IV) Family: Dictynidae: 1 genus with 1 species
1. Dictyna turbida Simon, 1905

V) Family: Eresidae: 1 genus with 2 species
1. Stegodyphus sarasinorum Karsch, 1891
2. Stegodyphus tibialis (O.P.-Cambridge, 1869)

VI) Family: Filistatidae: 1 genus with 1 species
1. Pritha insularis (Thorell, 1881)

VII) Family: Gnaphosidae: 5 genera with 12 species
1. Drassodes sitae Tikader & Gajbe, 1975
2. Drassodes deopravagensis Tikader & Gajbe, 1975
3. Drassodes tikaderi (Gajbe, 1987)
4. Drassodes villosus (Thorell, 1856)
5. Drassodes viveki (Gajbe, 1992)
6. Gnaphosa poonaensis Tikader, 1973
7. Poecilochroa barmani Tikader, 1982
8. Scotophaeus bharatae Gajbe, 1989
9. Scotophaeus poonaensis Tikader, 1982
10. Zelotes naliniae Tikader & Gajbe, 1979
11. Zelotes nasikensis Tikader & Gajbe, 1976
12. Zelotes poonaensis Tikader & Gajbe, 1976

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VIII) Family: Hersiliidae: 1 genus with 2 species
1. Hersilia savignyi Lucas, 1836
2. Hersilia tibialis Baehr & Baehr, 1993

IX) Family: Linyphiidae: 1 genus with 1 species
1. Linyphia urbasae Tikader, 1970

X) Family: Lycosidae: 10 genera with 29 species
1. Arctosa indica Tikader & Malhotra, 1980
2. Arctosa mulani (Dyal, 1935)
3. Evippa banarensis Tikader & Malhotra, 1980
4. Evippa mandlaensis Gajbe, 2004
5. Evippa shivajii Tikader & Malhotra, 1980
6. Geolycosa carli (Reimoser, 1934)
7. Hippasa agelenoides
8. Hippasa greenalliae (Blackwall, 1867)
9. Hippasa hansae Gajbe & Gajbe, 1999
10. Hippasa holmerae Thorell, 1895
11. Hippasa loundesi Gravely, 1924
13. Hogna stictopyga (Thorell, 1895)
15. Lycosa bhatnagari Sadana, 1969
16. Lycosa fuscana Pocock, 1901
17. Lycosa geotubalis Tikader & Malhotra, 1980
18. Lycosa indagatrix Walckenaer, 1837
19. Lycosa poonaensis Tikader & Malhotra, 1980
21. Pardosa birmanica Simon, 1884
22. Pardosa leucopalpis Gravely, 1924
23. Pardosa mukundi Tikader & Malhotra, 1980
24. Pardosa partita Simon, 1885
25. Pardosa ranjani Gajbe, 2004
27. Trochosa gunturensis Patel & Reddy, 1993
28. Wadicosa quadrifera (Gravely, 1924)
29. Zoica puellula (Simon, 1898)

XI) Family: Miturgidae: 1 genus with 2 species
1. Cheiracanthium danieli Tikader, 1975 Comments: Endemic to India
2. Cheiracanthium indicum O.P.-Cambridge, 1874

XII) Family: Oonopidae: 1 genus with 2 species
1. Gamasomorpha nigripalpis Simon, 1893
2. Gamasomorpha taprobanica Simon, 1893
XIII) Family: Nephilidae: 2 genera with 3 species
1. Herennia ornatissima (Doleschall, 1859)
2. Nephila kuhlii Doleschall, 1859
3. Nephila maculata (Fabricius) 1793

XIV) Family: Oxyopidae: 2 genera with 15 species
1. Oxyopes bharatae Gajbe, 1999
2. Oxyopes birmanicus Thorell, 1887
3. Oxyopes boriensis Bodkhe & Vankhede, 2012
4. Oxyopes chitrae Tikader, 1965
5. Oxyopes indicus (Walckenaer, 1805)
6. Oxyopes javanus Thorell, 1887
7. Oxyopes kamalae Gajbe, 1999
8. Oxyopes ketani Gajbe & Gajbe, 1999
10. Oxyopes pawani Gajbe, 1992
11. Oxyopes shweta Tikader, 1970
12. Oxyopes sitae Tikader, 1970
14. Peucetia elegans (Blackwall, 1864)
15. Peucetia viridana Stoliczka, 1869

XV) Family: Philodromidae: 3 genera with 8 species
1. Philodromus barmani Tikader, 1980
2. Philodromus pali Gajbe, 2000
3. Thanatus ketani Bhandari and Gajbe, 2001
4. Thanatus dhakuricus Tikader, 1960
5. Thanatus indicus Simon, 1885
6. Tibellus elongatus Tikader, 1960
7. Tibellus poonaensis Tikader, 1962
8. Tibellus vitilis Simon, 1906

XVI) Family: Pholcidae: 4 genera with 4 species
1. Artema atlanta Walckenaer, 1837
2. Crossopriza lyoni Blackwall, 1867
3. Pholcus phalangioides (Fuesslin, 1775)
4. Smeringopus pallidus Blackwall, 1858

XVII) Family: Pisauridae: 4 genera with 5 species
1. Pisaura gitae Tikader, 1970
2. Pisaura putiana Barrion & Litsinger, 1995
3. Dendrolycosa gracilis Thorell, 1891
4. Nilus marginatus (Simon, 1888)
5. Thalassius albocinctus Doleschall, 1859

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XVIII) Family: Psechridae: 1 genus with 1 species
   1. Psechrus alticeps Pocock, 1899

XIX) Family: Salticidae: 22 genera with 38 species
   2. Aelurillus quadrimaculatus Simon, 1889
   3. Asemonea tenuipes (O.P.-Cambridge, 1869)
   4. Bianor angulosus (Karsch, 1879)
   5. Brettus albolimbatus Simon, 1900
   6. Cosmophasis miniaceomicans (Simon, 1888)
   7. Epeus albus Prószyński, 1992
   8. Epeus chilapataensis (Biswas & Biswas, 1992)
   9. Euophrys chriatapuensis Tikader, 1977
  10. Menemurus bivittatus (Dufour, 1831)
  11. Hasarius adansonii (Audouin, 1826)
  12. Hyllus semicupreus (Simon, 1885)
  14. Marpissa tigrina Tikader, 1965
  15. Menemurus bivittatus (Dufour, 1831)
  17. Myrmarachne jajpurensis Prószyński, 1992
  18. Myrmarachne maratha Tikader, 1973
  19. Myrmarachne orientales Tikader, 1973
  20. Myrmarachne plataeoides (O.P.-Cambridge, 1869)
  21. Myrmarachne poonaensis Tikader, 1973
  22. Myrmarachne providens (Peckham & Peckham, 1892)
  23. Myrmarachne saratensis Narayan, 1915
  24. Myrmarachne uniseriata Narayan, 1915
  25. Phintella vittata (C. L. Koch, 1846)
  26. Plexippus paykulli (Savingyny & Audouin, 1825)
  27. Plexippus petersi (Karsch, 1878)
  28. Portia fimbriata (Doleschall, 1859)
  29. Rhene danieli Tikader, 1973
  30. Rhene decorata Tikader, 1977
  31. Rhene flavicomans Simon, 1902
  32. Rhene haldanei Gajbe, 2004
  33. Rhene indica Tikader, 1973
  34. Telamonia dimidiata (Simon, 1899)
  35. Telamonia peckhami Thorell, 1891
  36. Thiania bhamoensis Thorell, 1887
  37. Thyene imperialis (Rossi, 1846)
  38. Zygoballus pashanensis Tikader, 1975

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XX) Family: Scytodidae: 1 genus and 4 species
1. Scytodes alfredi Gajbe, 2004
2. Scytodes fusca Walckenaer, 1837
3. Scytodes pallida Doleschall, 1859
4. Scytodes thoracica (Latreille, 1802)

XXI) Family: Sicariidae: 1 genus and 1 species
1. Loxosceles rufescens (Dufour, 1820)

XXII) Family: Sparassidae: 2 genera and 3 species
1. Heteropoda kandiana Pocock, 1899
2. Heteropoda venatoria Linnaeus, 1767
3. Olios milleti Pocock, 1901

XXIII) Family: Stenochilidae: 1 genus and 1 species
1. Stenochilus hobsoni O. P.-Cambridge, 1870

XXIV) Family: Tetragnathidae: 4 genera and 5 species
1. Leucauge decorata (Blackwall) 1864
2. Opadometa fastigata (Simon, 1877)
3. Tetragnatha javana (Thorell, 1890)
4. Tetragnatha viridora Gravely, 1921
5. Poecilotheria regalis Pocock, 1899

XXV) Family: Theridiidae: 11 genera and 15 species
1. Achaearanea mundulum (L. Koch) 1872
2. Achaearanea triangularis Patel nom. nov. 2003
3. Argyrodes flagellum (Doleschall, 1857)
4. Argyrodes jamkhedes Tikader, 1963
5. Arianes pavesii Leardi, 1902
6. Chrysso picturata (Simon, 1895)
7. Latrodectus hasselti Thorell, 1870
8. Phoroncidia testudo (O.P.-Cambridge, 1873)
9. Propostira quadrangulata Simon, 1894
10. Rhomphaea projiciens (O.P.-Cambridge, 1896)
11. Sactoda rufoannulata (Simon, 1899)
12. Theridion incertum O.P.-Cambridge, 1885
13. Theridion spinosissimum Caporiacco, 1934
14. Theridion tikaderi Patel, 1973
15. Theridula angula Tikader, 1970

XXVI) Family: Thomisidae: 12 genera and 24 species
1. Amyciaea forticeps (O.P.-Cambridge, 1873)
2. Camaricus bipunctatus Bastawade, 2002

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Thus the results indicate the dominance of ground dwelling spiders like Salticids, Gnaphosids and Salticids in these three adjacent Sanctuaries. The forest is semi-evergreen and rich in shrubs as understory habitats resulting into ground dwelling spiders.

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Koyna Wildlife Sanctuary is a wildlife sanctuary and natural World Heritage Site, which is located in Satara district of the Indian Koyna Dam Boating | Kaas Lake | Travel Video | Gopro India | Bamnoli | Satara, Maharashtra. 2030 anos atrás. Radhanagari wildlife sanctuary is Oldest sanctuary in Maharashtra situated in Biodiversity hotspot western ghats in kolhapur up.