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Diversity of Spider Fauna from Bamnoli region of Koyna Wildlife Sanctuary

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Abstract: ***The Western Ghats area is divided into major, minor, sub, mini and micro watershed Landslides. Western Ghats area of India is considered as an important biodiversity hot spot. The importance of the Western Ghats as hot spot of diversity is very well documented. Western Ghats are among the ecologically richest regions of India. The Sanctuary covers an area of 423.55 Sq. Kms. and comprises geographical area of 50 villages. The Sanctuary areas are in the catchments of the river Konya. Konya Wildlife Sanctuary is one of the important Protected Areas of the Maharashtra State, located in the Western Ghats. The Sanctuary area is home to several species rich endemic flora and harbors different species of fauna. Spiders are one of the most ubiquitous groups of predators in the animal kingdom commonly found in all terrestrial and many aquatic ecosystems The maximum temperature of summer ranges between 38^0 to 40^0 Celsius and minimum in winter ranges between 12^0 to 2^0 Celsius. Spiders have a very significant role to play in ecology by being exclusively predatory and thereby maintaining ecological equilibrium. Many terrestrial and particularly aquatic insects have been utilized as food. Swarming insects, locusts, grasshoppers, beetle grubs, some lepidopterist larvae and pupae and honey bees are consumed by spiders. The spiders from Family araneidae, thomisidae ,oxyopidae, lycosidae , salticidae, nephilidae are the characterstic families at Bamnoli region of Koyna Wildlife Sanctuary.***

Keywords: Spider, Western Ghats , Koyna Wildlife Sanctuary, Bamnoli

1. Introduction

Spiders comprise one of the largest orders of animals. The spider fauna of India has never been studied in its entirety despite of contributions by many arachnologists The pioneering contribution on the taxonomy of Indian spiders is that of European arachnologist[19]. Review of available literature reveals that the earliest contribution by Blackwall [3] , Karsch [9], Thorell [20] were the pioneer workers of Indian spiders. They described many species from India. Tikader [21,23] described spiders from India. Tikader [21] compiled a book on Thomisidae spiders of India, comprising two subfamilies, 25 genera and 115 species. Tikader [21, 24]) made major contributions to the Indian Arachnology, have high lightened spider studies to the notice of other researcher. Tikader [24] 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 [4] 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 .The updated spider checklist given by Keswani et al. [11] of SGB Amravati University Arachnology laboratory shows 1686 species from 438 genera and 60 families. According to world spider catalogue there are Spiders of protected areas in India, are studied by Gajbe [5] in lndravati Tiger Reserve and recorded 13 species. Rane and Singh[18] recorded five species and Gajbe [6] 14 species from Kanha Tiger Reserve, Madhya Pradesh. Gajbe[4] prepared a checklist of 186 species of spiders in 69 genera under 24 families distributed in Madhya Pradesh and Chhattisgarh. Patel [15] described 91 species belonging to 53 genera from Parabikulum Wildlife Sanctuary, Kerala. Manju Silwal et al. [13] recorded 116 species from 66 genera and 25 families of spiders from Puma wildlife Sanctuary, So far nobody has worked out or studied the spider fauna from Bamnoli region of Koyna Wildlife Sanctuary and hence we have decided to explore the spider diversity from this area. Hence with the present work I will try to fill up a gap of information regarding biodiversity of Spider fauna in these areas. Recently Western Ghats is declared as world heritage site. Most of the area is dense semi-evergreen forest with a wide range of flora.

2. Materials and Methods

Spider survey was made in different selected sampling plots. The techniques used for spider study was visual search, litter sampling, sweep netting and pitfall trapping. The survey was 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, dry hay and grasses, moist places, under stones, pebbles, humus, bushes, on the bark and branches of trees, water logged locations etc. The Lycosids and Gnaphosids were studied 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 by using the literature [10, 1, 24, 12] The details of body parts of specimens were examined 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

3. Observations and Results

A total of 150 species (Table-1) belonging to 78 genera and 24 families were recorded from the study area during 2011-2013. Among all these 24 families, high diversity was observed in the family's Araneidae and salticidae (12 species) > Thomisidae (10 species) Lycosidae (08 species).

Table 1: Diversity of spiders in Bamnoli region of Koyna Wildlife Sanctuary

1. Araneidae – Orb Web Spiders
1. Araneus mitifica (simon) Female
2. Arachnura anguraTikadar 1970
3. Araneus himalayaensis Tikadar 1975
4. Araneus ellipticus Tikadar and Bal ,1981
5. Argiopa lobota Pallas, 1972Argiope aemula (Walckenaer) Female
6. Argiope aemula Thorell Male
7. Argiope anasuja Female
8. Cyrtarachne raniceps Pocock 1900
9. Cyclosa bifida (Doleschall) Female
10. Cyclosa hexatuberculata TikadarFemale
11. Cyclosa confraga Thorell 1892
12. Cyclosa spirifera Simon 1889
13. Cyrtophora cicatrosa Forsskal, 1975
14. Cyrtophora moluccensis Ddoleschall 1857.
15. Gasteracantha remifera Butler 1873
16. Telecantha brevispina ,Doleschall Female
17. Larinia chloris Audouin, 1826
18. Larinia emertoni Gajbe and gajbe 2004
19. Neoscona mukerjei Tikader Female
20. Neoscona bengalensis Tikadar and Bal 1981.
21. Neoscona parambikulamensis Patel, 2003
22. Neoscona rumpfi Thorell, 1878
23. Neoscona theisi Walckenaer, 1842
24. Neoscona vigilans Blackwell, 1865.
25. Pasilohus kotigeharus Female
26. Poltys illepidus C. L. Koch 1843
27. Zygiella indica Tikadar and Bal, 1980

2. Clubionidae - Sac Spiders
28. Clubiona drassodes O. P. Cambridge 1874
29. Clubiona bengalensis Biswas ,1984

3. Corinnidae – Ant Mimicking Sac Spiders
30. Castianeira zetes Simon 1897Female
31. Castianeira bengalensis Biswas, 1984
32. Castianeira himalayansis Gravely 1931
33. Castianeira flavipes Gravely 1931.
34. Castianeira indica Tikadar 1981

4. Eresidae – Social Spiders
35. Stegodyphus sarasinorum Karsch, 1891Female
36. Stegodyphus tibialis O.P.Cambridges,1869.

5. Filistatidae – Crevice Weavers
37. Pritha insularis Thorell 1881

6. Gnaphosidae – Ground Spiders/Mouse Spiders
38. Drassodes viveki Gajbe 1992
39. Gnaphosa poonaensis Tikadar 1973
40. Scotophaesis bharatae Gajbe 1989
41. Poecilochroa harmani Tikadar 1982
42. Zelotes nasikensis Tikadar and Gajbe 1976
43. Zelotes poonaensis Tikadar 1982
44. Zelotes naliniae Tikadar and Gajbe 1979

7. Hersiliidae – Two Tailed Spiders/Bark Spiders
45. Hersilia Savignyi (Lucas) 1836 Female
46. Hersilia tibialis Baehr and Baehr 1993

8. Lycosidae – Wolf Spiders
47. Lycosa balaranai Patel and Reddy 1993
48. Lycosa bhatnagari Sadana 1969
49. Lycosa fuscana Pocock 1901
50. Lycosa geotubalis Tikadar and Malhotra 1980
51. Lycosa poonaensis Tikadar and Malhotra 1980
52. Lycosa thoracica Patel and Reddy 1993
53. Archtosa indica Tikadar and Malhotra 1980
54. Evippa baneraensis Tikadar and Malhotra 1980
55. Evippa mandlaensis Gajbe 2004
56. Evippa shivajii Tikadar and Malhotra 1980
57. Pardosa pseudoannulata Female
58. Wadicosa quadrifera Gravely 1924
59. Hippasa hansae Gajbe and Gajbe 1999
60. Hippasa holmerae Thorell 1895
61. Hippasa madhuae Tikadar and Malhotra 1980
62. Hanga stictopyga Thorell 1895.
63. Pardosa birmanica Simon 1884
64. Pardosa partita Simon 1885.
65. Pardosa ranjani Gajbe 2004

9. Miturgidae – Dark Sac Spiders
66. Cheircanthium danieli (Tikader) 1975 Female
67. Cheircanthium indicum O. P. Cambridge 1874

10. Nephilidae – Giant Wood Spiders
68. Nephila Kuhlii – Doleschall Female1859
69. Nephila pilipus. Fabricius 1793 Female

11. Oxyopidae – Lynx Spiders
70. Oxyopes chittrae (Tikader) Female
71. Oxyopes bharatae Gajbe 1999
72. Oxyopes biramanicus Thorell 1887
73. Oxyopes indicus Walekenaer 1805
74. Oxyopes kamalae Gajbe 1999 Gajbe and Gajbe 1999
75. Oxyopes ketani Gajbe and Gajbe 1999
76. Oxyopes pankaj Gajbe and Gajbe 2001
77. Oxyopes shweta Tikadar 1970
78. Oxyopes tikaderi Biswas and. Majumdar 1995
79. Peucetia viridian Stoliczka 1869.

12. Philodromidae – Running Crab Spiders/Elongated Crab Spiders
80. Philodromus .barmani Tikadar 1980
81. Philodromus pali Gajbe 2000
82. Thanatus ketani Bhandari and Gajbe 2001
83. Thanatus dhakuricus Tikadar 1960

13. Pholcidae – Daddy Long Leg Spiders
84. Grossopriza lyani Blackwell 1867
85. Pholcus phalangioides Fuesslin 1775

14. Pisauridae – Nursery Web Spiders
86. Pisaura gitae Tikadar 1970 Female
87. Pisaura putiana Barrion and litsinger 1995.
88. Nilus marginatus Simon 1888
89. Thalassius albocinctus (Doleschall) 1859

15. Psechridae - Jungle Cribellate Spiders
90. Psechrus alticeps Pocock 1899.

16. Salticidae – Jumping Spiders
91 Cosmophasis miniaceomicans Simon 1888

92 Apeus albus Proszynski 1992
93 Menemerus bivittatus Dufour 1831
94 Hasarius adansoni Audouin 1826
95 Hasarius adansoni Audouin 1826
96 Hyllus semicupreus Simon 1885
97 Marpissa tigrina Tikadar 1965
98 Marpissa singhi Monga , Singh and Sadana 1989
99 Myrmarachne incerta Narayan 1915
100 Myrmarachne jajpurensis Proszynski 1992
101 Phintella vittata C. L. Koch 1846
101. Plexippus paykulli Savingyny and Audouin 1825
102. Portia fimbriata Doleschall,1859
103 Rhene danieli Tikadar 1973 104.
104 Rhene decorate Tikadar 19771
105. Rhene flavicomans Simon 1902
106. Rhene haldanei Gajbe 2004
107. Telamonia dimidiata (simon 1899) Female
108. Telamonia peckhami Thorell 1891

17. Scytodidae – Spitting Spiders
109. Scytodes allfredi, Gajbe 2004
110 Scytodes fusca, Walckenaer ,1837
111 Scytodes pallidae Doleschall, 1859
112 Scytodes thoracica Latreille , 1802.

18. Sicariidae – Violin Spiders
113 Loxosceles rufescens Dufour, 1820

19. Sparassidae – Giant Crab Spiders
114 Heteropoda kandiana Pocock,1899 Female
115 Heteropoda venatoria , Linnaeus, 1767
116 Olios millet Pocock, 1901

20. Tetragnathidae
117. Leucauge decorate (Blackwall), 1864 Female
118 Tetragnatha mandibulata –Walckenaer (Male and Female)
119 Tetragnatha javanus, Thorell,1890.
120 Tetragnatha viridorufa, Gravely, 1921.

21. Theridiidae – Comb Footed Spiders/Cob Web Spiders
121. Achaearanae mundulum ,L. Koch 1872
122. Achaearanae triangularis Patel nom.nov.2003
123. Argyrodes flagellum Doleschall, 1857
124. Argyrodes jamkhedes Tikadar, 1963
125. Latrodectus hasselti Thorell, 1870
126. Phorodectus testudo O. P. Cambridge ,1873
127. Rhomphaea projiciens O. P. Cambridge. 1896

22. Thomisidae – Crab Spiders/Flower Spiders
128. Amyciaea forticeps O. P. Cambridge 187
129. Camaricus bipunctatus Bastawade, 2002
130. Misumena greenae ,Tikadar, 1965.
131. Misumena indra, Tikadar, 1963
132. Misumenops khandalaensis, Tikadar.1965
133. Oxylate elongate Tikadar 1980
134. Ozyptila chandosiensis Tikadar, 1980
135. Ozyptilia Maratha ,Tikadar 1971
136. Runcinia khandari Gajbe 2004
137. Runcinia pooneus Tikadar 1965
138. Thomisus granulifrons Simon 1906
139. Thomisus pathaki Gajbe 2004
140. Tmarus jabalpurensis Gajbe and Gajbe 1999
141. Tmarus kotigeharus Tikadar, 1963
142. Xysticus bharatae Gajbe and Gajbe 1999
143. Xysticus breviceps O. P. Cambridge 1885
144. Xysticus khasiensis Tikadar 1980
145. Xysticus tikaderi Bhandari and Gajbe 2001

23. Uloboridae
146. Uloborus khasiensis Tikadar, 1969
147. Uloborus krishnae Tikadar, 1970.
148. Zosis geniculata Oliver, 1789

24. Zodariidae
149. Lutica bengalensis Tikadar and Patel, 1975
150. Lutica deccanensis Tikadar and Malhotra 1976

4. Discussion

Thus the results indicate the dominance of ground dwelling spiders like Salticids , Gnaphosids and Lycosides in the Bamnoli region of this Sanctuary. The forest is semi ever green and rich in shrubs as undestroyed habitats resulting into ground dwelling spiders.The rich biodiversity of this area provides nice opportunity for research and education. Spiders have a very significant role to play in ecology by being exclusively predatory and thereby maintaining ecological equilibrium. Western Ghats are one of the region rich in biodiversity and endemic species and an account of spider fauna in this region is not available. Our expectation of finding a rich diversity of spiders in the Western Ghats was an educated guess. Taxonomy of spiders is an ambiguous area and consolidated information is lacking. Spiders of western Chats region are poorly worked out group compared to other parts of the country. The present study proposes to make an extensive study on the biology of spiders by using as bioindicator. It is presumed that this study would be instrumental to throw light into their habitat associations, species richness, abundance, diversity, and dominance. It is also expected that this study will expose the original nature of spider fauna across different geographic location of Western Ghats of Maharashtra. The density of spider was high during the pre-monsoon season and gradually decreased during monsoon. There was considerable variation in the members of *Araneidae* during rainy season and winter. In ficus plant *Gasteracantha* species are reported, which suggests that species prefer specific habitats. Members of Hersilidae, Clubionidae, Tetragnathidae, nephilidae are also observed. Spiders are clearly an integral part of global biodiversity since they play many important roles in ecosystem as predators and source of food for other creatures. Spiders also have utilitarian value. For many years spiders have been model organisms for research in ecology, behavior and communication.

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