

The Spider Fauna of Pariej Wetland, Gujarat, India

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Abstract: Present study documented systematic data of spiders biodiversity from Pariej wetland during January 2013 to April 2013. A total 59 species belonging to 42 genera of 16 families collected through various collection methods like visual searching, ground hand collection, aerial hand collection, vegetative beating and hand picking. During this study some new genera recorded for Gujarat such as *asperiophora*, *bavia*, *plegra*, *ptocasius*, *ebrechtella* and *asceua*. Specimens were deposited at B. R. Doshi school of Bioscience, S. P. University, Vallabh Vidyanagar.

Keyword: Spiders, Diversity, wetland, Gujarat.

1. Introduction

Arachnids are an important but generally poorly studied group of arthropods that play a significant role in the regulation of insect and other invertebrate populations in most ecosystems [17]. Araneae order is one of the larger orders in animal kingdom. Worldwide 45, 557 spider species described [26] and are estimated to number 60,000-170,000 species [1]. In numbers, 1686 species of 438 genera belongs to 60 families are recorded from India [4]. Total 266 species belong to 89 genera of 28 families are recorded from Gujarat state [6].

importance. This entire area lies between 22°33'05.69'' N and 72°36'52.69'' E in Matar taluka, Kheda district. The big lake of Pariej is approximately 2.5 kms. in area with depth varying between 4ft to 10ft. This lake storage 445 ha water supplies drinking water to 52 surrounding villages around Pariej through pipelines. Presently this lake comes under the purview of the irrigation department.

2. Methodology

2.1 Study Area

Pariej is one of the eight wetlands in Gujarat that has been declared by the Central Government as wetland of national

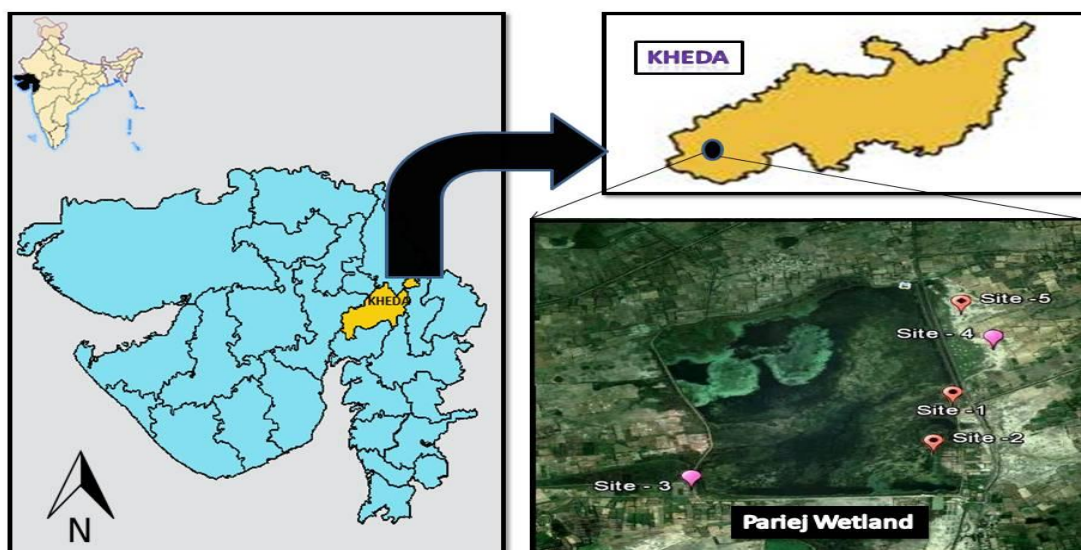


Figure 1: Map showing geographical location of Pariej Wetland

This study done in January to March, which were two seasons that are experienced by the Pariej wetland: (a) winter– January and February, temperature of maximum 24°C and a minimum temperature of around 12°C and (b)

summer - during March. A summer is very hot and temperatures soar to a maximum of forty three degrees (43°C). The minimum temperature will range around thirty

two degrees (32°C). Dry climate with annual rain fall is 900mm.

Lake supporting with algae and Typha sp. like aquatic vegetation. Around this area bamboo, acacia etc. like tree and other vegetation of shrub and grass included. There are 60 species of bird around Pariej Wetland. It is home to a variety of birds like kingfishers, egrets, jacanas, cormorant, ducks, lapwings etc. and migratory birds like storks, spoonbills, ibis, ducks, sandpipers etc. Saras crane is largest crane of region. Some reptiles like cobra, lizard, and varanus are seen. And frog and many invertebrates are present in Pariej wetland.

2.2 Collection

The spiders were sampled with five sites of this Pariej wetland. This work had done during January 2013 to April 2013. The sampling was mainly three time in day with morning at 8am to 10am, in evening at 4pm to 6pm and at night at 9pm to 11pm. This time is requiring for spiders behaviour of come out from its nest. E.g. Because of some Salticidae family's spider come with day light and some Araneidae spider come out from its nest in night. Spider are found in everywhere: on trees, their bark and foliage, in leaf fold, between branches (on web), on flowers, under stone and logs and in rubbish and leaf litter on forest floors [18]. In entire work, five technics were used. There were Visual searching, Ground hand collection, Aerial hand collection, vegetative beating and hand picking.

2.3 Preservation and Identification of Specimens

Collected specimens are transferred in 70% ethyl alcohol. All specimens kept collectively in tube properly labelled with date, locality and other notes for important.

For detailed examination of all specimens a stereo zoom microscope with objective 1 to 4 and eyepieces of 10x and 20x magnification were used. The specimens were kept in glass box of 10 x 10 cm. and 6.25 x 6.25 cm. Standard references and monographs [11], [16],[18],[21],[22],[23], [27] used for identification of spiders.

Accurate identification on the family, genus and species level is only feasible with adult specimen. The identification of the spider relies heavily on the genitalia. Thus identifying

immature spiders to species level is considered impractical as sexual characters are needed for species level identification [3]. Identification and classification was also done on the basis of morphometric characters of various body parts. The identification is also based on salient features like, presence of two or three claws, presence or absence of cribellum, paraxial or diaxial chelicerae. A detailed taxonomic study was carried out based on the various keys and catalogues provided by arachnologists and other relevant literatures. Specimens were deposited at B.R.Doshi school of Bioscience, S.P.University, Vallabhvidyanager.

3. Result

In this study, a total of 59 species belonging to 42 genus and 16 families were collected. The most dominant family was Araneidae 22% (13 species): followed by Salticidae 15.2% (9 species); Tetragnathidae 10.16% (6 species); Theridiidae and Thomisidae 8.47% (5 species); Lycosidae 6.7% (4 species); Oxyopidae and Pholcidae 5.08 % (3 species); Pisauridae and Hersilidae 3.3% (2 species); Gnaphosidae, Scytodidae, Uloboridae and Zodariidae 1.6% (1species). This was surprising to find that our sampling programme cover only small region Pariej Wetland, in different habitats located in a small region has detected more than 4%of Indian spiders.

4. Conclusion

The present study is the first documentation of the spider fauna in Pariej Wetland. Previously not serious work on spiders has been conducted in this area thus the study represents new distribution records for all species recorded. During this study some new genera recorded for Gujarat such *aseriophora*, *bavia*, *plegra*, *ptocasius*, *ebrechtella* and *asceua*. Some rare spiders such as *Zygiella indica* (Araneidae), *Heteropoda nilgirina* (Sparassidae), *Tetragnatha viridorufa* (Tetragnathidae), and *Asceua sp.*(Zodariidae) were collected during the study. Several genera that are endemic to India occur in this area which further highlights the importance of maintaining the conservation status of this landscape.

This study indicates, the Pariej Wetland is highly rich area in Spiders diversity.

Table 1: Species of spiders captured during entire field work

Family	Genus	Species
1. Araneidae	<i>Araneus</i>	<i>Araneus mitificus</i> , Simon 1886
	<i>Argiope</i>	<i>Argiope anasuja</i> , Thorell 1887
		<i>Argiope sp.1</i>
		<i>Argiope sp.2</i>
	<i>Cyrtophora</i>	<i>Cyrtophora cicatrosa</i> , Stoliczka 1869
	<i>Eriophora</i>	<i>Eriophora sp.</i>
	<i>Larinia</i>	<i>Larinia phthisica</i> , L. Koch 1871
	<i>Neoscona</i>	<i>Neoscona mukerjei</i> , Tikader, 1980
		<i>Neoscona rumpfi</i> , Thorell 1899
		<i>Neoscona sp.1</i>
		<i>Neoscona sp.2</i>
	<i>Zygiella</i>	<i>Zygiella indica</i> , Tikader & Bal, 1980
		<i>Zygiella sp.</i>

2. Corinnidae	<i>Castineira</i>	<i>Castineira sp.</i>
3. Gnaphosidae	<i>Drassodes</i>	<i>Drassodes sp.</i>
4. Hersiliidae	<i>Hersilia</i>	<i>Hersilia savignyi, Lucas, 1836</i>
		<i>Hersilia sp.</i>
5. Lycosidae	<i>Hippasa</i>	<i>Hippasasp.</i>
	<i>Lycosa</i>	<i>Lycosa sp. 1</i>
		<i>Lycosa sp. 2</i>
	<i>Pardosa</i>	<i>Pardosa sp.</i>
6. Oxyopidae	<i>Oxyopes</i>	<i>Oxyopes javanus, Thorell, 1887</i>
		<i>Oxyope sp.</i>
	<i>Peucetia</i>	<i>Peucetia sp.</i>
7. Pholcidae	<i>Artema</i>	<i>Artema atlanta, Walckenaer, 1837</i>
	<i>Crossopriza</i>	<i>Crossopriza lyoni, Blackwall, 1867</i>
	<i>Pholcus</i>	<i>Pholcus sp.</i>
8. Pisauridae	<i>Pisaura</i>	<i>Pisaurasp.1</i>
		<i>Pisaurasp.2</i>
9. Salticidae	<i>Bavia</i>	<i>Baviasp.</i>
	<i>Epocilla</i>	<i>Epocilla aurantiaca, Simon, 1885</i>
	<i>Hyllus</i>	<i>Hyllus semicupreus, Simon, 1885</i>
	<i>Myrmarachne</i>	<i>Myrmarachnesp.</i>
	<i>Plexippus</i>	<i>Plexippus paykulli, Audouin, 1826</i>
	<i>Phlegra</i>	<i>Phlegra sp.</i>
	<i>Ptocasius</i>	<i>Ptocasius sp.</i>
	<i>Rhene</i>	<i>Rhene flavigera, CLKoch, 1846</i>
	<i>Telamonia</i>	<i>Telamonia sp.1</i>
		<i>Telamonia sp.2</i>
10. Scytodidae	<i>Scytodes</i>	<i>Scytodes thoracica, Latreille, 1802</i>
11. Sparassidae	<i>Heteropoda</i>	<i>Heteropoda nilgirina, Pocock, 1901</i>
		<i>Heteropoda sp.</i>
12. Tetragnathidae	<i>Leucauge</i>	<i>Leucauge decorata, Blackwall, 1864</i>
	<i>Tetragnatha</i>	<i>Tetragnatha mandibulata, Walckenaer, 1842</i>
		<i>Tetragnatha viridorufa, Gravely, 1921</i>
		<i>Tetragnathasp.</i>
		<i>Tetragnathasp.</i>
	<i>Tylorida</i>	<i>Tyloridasp.</i>
13. Theridiidae	<i>Achaeearanea</i>	<i>Achaeearanea tepidariorum, CLKoch, 1841</i>
		<i>Achaeearaneasp.</i>
	<i>Argyrodes</i>	<i>Argyrodesp.1</i>
		<i>Argyrodesp.2</i>
	<i>Chrysso</i>	<i>Chryssosp.</i>
14. Thomisidae	<i>Ebrechtella</i>	<i>Ebrechtella concinna, Thorell, 1877</i>
	<i>Synema</i>	<i>Synema decoratum, Tikader, 1960</i>
	<i>Thomisus</i>	<i>Thomisus sp.1</i>
		<i>Thomisus sp.2</i>
	<i>Xysticus</i>	<i>Xysticus minutesikader, 1960</i>
15. Uloboridae	<i>Uloborus</i>	<i>Uloborussp.</i>
16. Zodariidae	<i>Asceua</i>	<i>Asceuaspp.</i>

Families: 16 Genera: 42 Species: 59

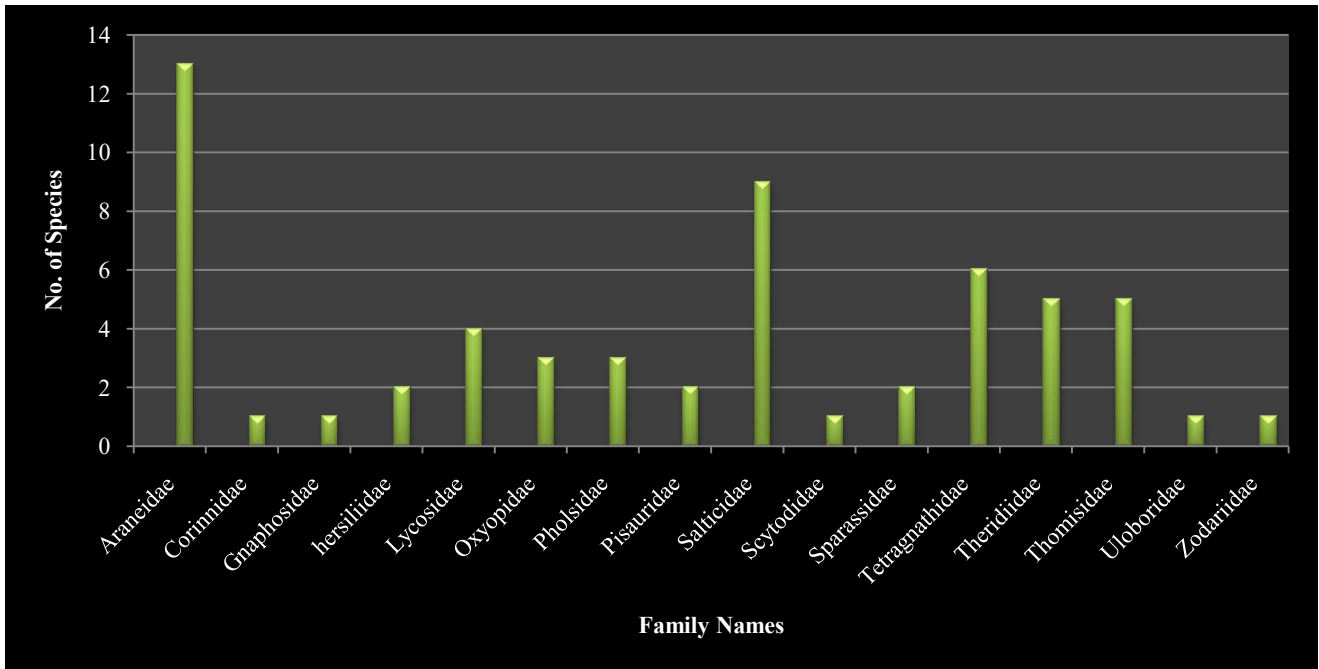


Figure 2: No of species in families

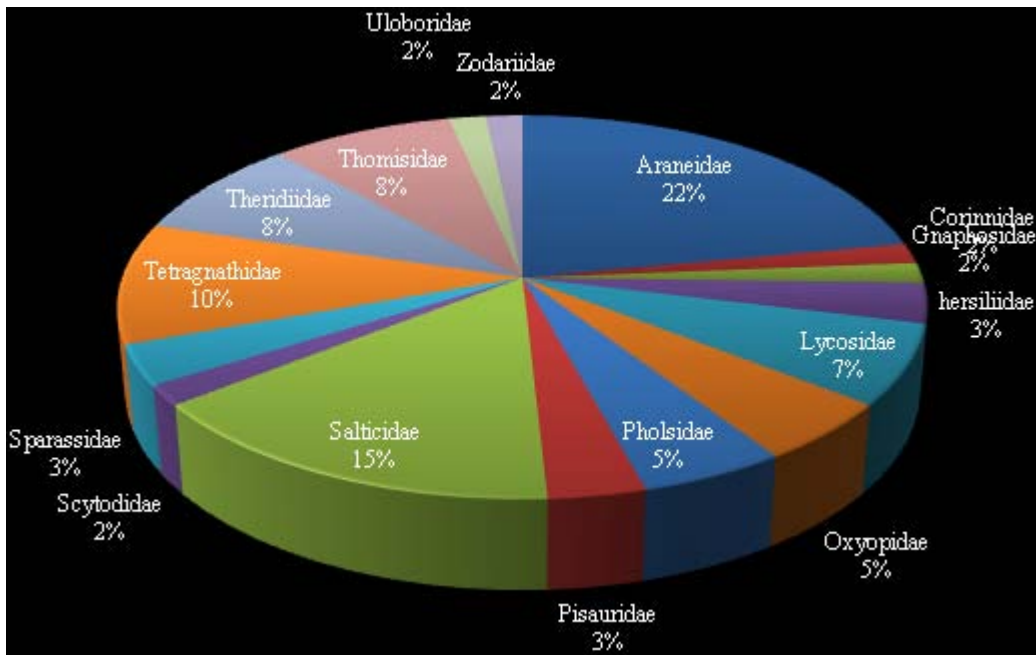


Figure 3: Present occurrence of spider species from Pariej Wetland

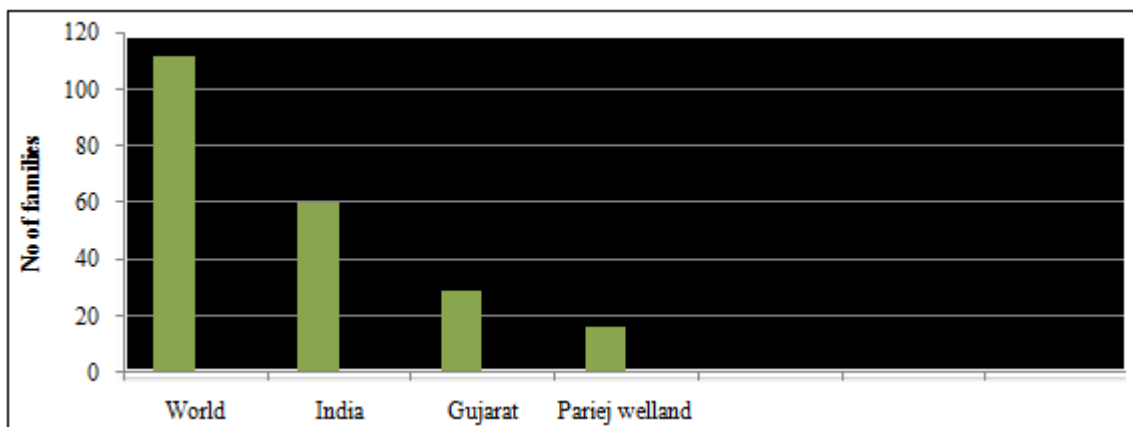


Figure 4: No of families (In World, India, Gujarat and Pariej)

Table 2: Common name and guild of Spiders families in Pariej

No.	Family	Common name	Guild
1.	Araneidae	Orb- Weavers	Orb web builder
2.	Corinnidae	Ant-mimicking sac spiders	Ground runner
3.	Gnaphosidae	Mouse spider	Ground runner
4.	Hersiliidae	Long-spinneret spiders or Two tail spider	Foliage runner or Bark runner
5.	Lycosidae	Wolf spiders	Ground runner
6.	Oxyopidae	Lynx Spiders	Foliage runner
7.	Pholcidae	Cellar spiders or Daddy long legs	Scattered line weaver
8.	Pisauridae	Nursery Web Spiders	Foliage weaver
9.	Salticidae	Jumping spiders	Foliage runner
10.	Scytodidae	Spitting spiders	Ground runner
11.	Sparassidae	Huntsman spiders	Ground runner
12.	Tetragnathidae	Long jawed orb weavers	Orb web builder
13.	Theridiidae	Cob web weavers	Scattered line weaver
14.	Thomisidae	Crab Spiders	Ambusher
15.	Uloboridae	Hackled-Orb-webspiders	Orb web builder
16.	Zodariidae	Armoured spiders	Ground runner

Table 3: Spiders species present or absent in study site

No.	Species	Site 1	Site 2	Site 3	Site 4	Site 5
1	<i>Araneus mitificus</i>	✓	×	×	×	×
2	<i>Argiope anasuja</i>	✓	✓	✓	✓	✓
3	<i>Argiope sp.1,</i>	✓	✓	×	×	×
4	<i>Argiope sp.2,</i>	✓	✓	×	×	×
5	<i>Cyrtophora cicatrosa</i>	✓	✓	✓	✓	✓
6	<i>Eriophora sp.</i>	✓	✓	×	×	×
7	<i>Larinia phthisica</i>	✓	✓	×	×	×
8	<i>Neoscona mukerjei</i>	✓	✓	✓	×	✓
9	<i>Neoscona rumpfi,</i>	✓	✓	✓	×	✓
10	<i>Neoscona sp.1</i>	✓	×	×	×	×
11	<i>Neoscona sp.2</i>	✓	×	×	×	×
12	<i>Zygiella indica</i>	✓	×	×	×	×
13	<i>Zygiella sp.</i>	✓	×	×	×	×
14	<i>Castianeira sp.</i>	✓	×	×	×	×
15	<i>Drassodes sp.</i>	✓	✓	×	×	×
16	<i>Hersilia savignyi</i>	✓	✓	✓	×	×
17	<i>Hersilia sp.</i>	✓	✓	✓	×	×
18	<i>Hippasa sp.</i>	✓	✓	×	×	×
19	<i>Lycosa sp.1</i>	✓	✓	✓	✓	✓
20	<i>Lycosa sp.2</i>	✓	✓	✓	✓	✓
21	<i>Pardosa sp.</i>	✓	✓	✓	✓	✓
22	<i>Oxyopesjavanus</i>	✓	✓	✓	×	×
23	<i>Oxyopes sp.</i>	✓	✓	✓	×	×
24	<i>Peucetia sp.</i>	×	✓	×	×	×
25	<i>Artemaatlanta</i>	✓	×	×	×	×
26	<i>Crossoprizalyoni</i>	✓	✓	✓	×	×
27	<i>Pholcus sp.</i>	✓	×	×	×	×
28	<i>Pisaura sp.1</i>	✓	×	✓	×	×
29	<i>Pisaura sp.2</i>	✓	×	✓	×	×
30	<i>Bavia sp.</i>	✓	×	×	×	×
31	<i>Epocillaaurantiaca</i>	✓	✓	×	×	×
32	<i>Hyllussemicupreus</i>	✓	×	×	×	×
33	<i>Myrmarachne sp.</i>	✓	✓	×	×	×
34	<i>Plexippuspaykulli</i>	✓	×	×	×	×
35	<i>Phlegra sp.</i>	✓	×	×	×	×
36	<i>Ptocasius sp.</i>	✓	✓	✓	×	×
37	<i>Rhenefflavigera</i>	✓	✓	✓	×	×
38	<i>Telamonia sp.</i>	✓	✓	✓	×	×
39	<i>Telamonia sp</i>	✓	✓	✓	×	×
40	<i>Scytodesthoracica</i>	✓	×	×	×	×
41	<i>Heteropodanilgirina</i>	✓	✓	×	×	×
42	<i>Heteropoda sp.</i>	✓	✓	×	×	×
43	<i>Leucaugedecorata</i>	✓	×	×	×	×

44	<i>Tetragnatha mandibulata</i>	✓	✓	✓	×	×
45	<i>Tetragnathaviridorufa</i>	✓	✓	✓	×	×
46	<i>Tetragnatha sp.1</i>	✓	✓	×	×	×
47	<i>Tetragnatha sp.2</i>	✓	✓	✓	×	✓
48	<i>Tylorida sp.</i>	✓	×	×	×	×
49	<i>Achaearaneatepidariorum</i>	✓	✓	×	×	×
50	<i>Achaearanea sp.</i>	✓	✓	✓	✓	✓
51	<i>Argyrodes sp.1</i>	✓	✓	✓	✓	✓
52	<i>Argyrodes sp.2</i>	✓	✓	✓	✓	✓
53	<i>Chryso sp.</i>	✓	✓	×	×	×
54	<i>Ebrechtellaconcinna</i>	✓	✓	×	×	×
55	<i>Synemadecoratum</i>	✓	×	×	×	×
56	<i>Thomisus sp.1</i>	✓	✓	✓	×	×
57	<i>Thomisus sp.2</i>	✓	✓	✓	×	×
58	<i>Xysticus minutus</i>	✓	×	✓	×	×
59	<i>Uloborus sp.</i>	✓	✓	✓	✓	✓
60	<i>Asceua sp.</i>	✓	×	×	×	×
	Total no	60	40	28	09	12

References

- [1] **Coddington, J.A., Levi, H.W.**, 1991. Systematics and evolution of spiders (Araneae). Annual Review of Ecology and Systematics 22, 565-592.
- [2] **Coddington, J.A, Line L. Sorensens, and Nikolaj S.**, 2002. Inventorying and Estimating Subcanopy Spider Diversity Using Semiquantitative Sampling Methods in an Afromontane Forest Environment. *Entomology*. 31(2): 319-330.
- [3] **Edwards, R.L.**, 1993. Can species richness of spiders be determined? *Psyche*. 100: 185-208.
- [4] **Keswani, S., P. Hadole and A. Rajoria**, 2012. Check list of Spiders (Arachnida: Araneae) from India, *Indian Journal of Arachnology* 1 (1) 1-129.
- [5] **S.B. Patel, N.B. Bhatt AND K. B. Patel**, 2012. Diversity of spider fauna Of Ratanmahal sloth Bear Sanctuary, Gujarat. *Life science leaflets* 7:74-79.
- [6] **Manju Siliwal, B. Suresh & Bonny Pilo**, 2003. Spiders of Purna Wild life Sanctuary, Dangs, Gujarat. *Zoos Print Journal*. 18(11):1259-1263.
- [7] **Manju Siliwal**, 2010. Spiders of Gujarat. *Gujarat State Forest Department*, Gandhinagar.
- [8] **N.C. Vachhani, M.D. Visavadia And S.K. Patel**, 2012. A brief account of spiders of Junagadh district, Gujarat *Life science leaflets* 7:80-83.
- [9] World Spider Catalog Version **Coddington, J.A., Young, L.H. and Coyle, F.A**, 1996. Estimating spider species richness in a southern Appalachian cove hardwood forest. *The Journal of Arachnology*, 24: 111-
- [10] **New, T.R.**, 1999b. Untangling the web: spiders and the challenges of invertebrate conservation. *Journal of Insect Conservation* 3, 251-256.
- [11] **Nentwig, W., Hänggi, A., Kropf, C. and Blick, T.** 2003. Central European spiders – determination key version 8.12.2003. Available at: <http://www.araneae.unibe.ch> accessed 9 January 2013.
- [12] **Nikunj Bhatt**, 2008. Study of biodiversity of order Araneae from Narmada District, Gujarat. *Research digests*. 34 (4): 26-28 .
- [13] **Parmar, B.M.**, 2013. “Short term study of spider diversity of Pariej wetland”. M.Sc. dissertation thesis, S.P. University.
- [14] **Parmar, B.M. and K. B. Patel**, 2015. Study of spider diversity from Vadnagar Taluka, Gujarat. *Life science leaflets* 64:94 – 101.
- [15] **Parmar, B.M., K.B. PATEL., J.D. Joshi and N.R. Chaudari.**, 2015. Faunistic study of spiders diversity from islands and coastal areas of Gulf of Kutch, India. *Life science leaflets* 67:12-23.
- [16] **Patel, B.H.**, 2003. Spiders of Vansda National Park, Gujarat. *Zoos Print Journal*. 18 (4): 1279-1083.
- [17] **Patel, B. H. and R. V. Vyas**, 2001. Spiders of Hingolghadh Nature Sanctuary, Gujarat, India. *Zoos Print Journal*. 16(9): 589-590.
- [18] **Pocock, R.I.** (1900). Fauna of British India-Arachnida, Taylor and Francis, London.
- [19] **Russell-Smith, A.**, 1999. The spiders of Mkomazi Game reserve. In Coe, M. et al. (Eds.), Mkomazi: The Ecology, Biodiversity and Conservation of a Tanzanian Savanna. Royal Geographical Society, London.
- [20] **Sebastian, P.A. and Peter, K.V.**, 2009. Spiders of India, First edition, *Universities Press, Hyderabad*. pp 398.
- [21] **Siliwal, M., S. Molur, and B. K. Biswas**, 2005. Indian Spiders (Arachnida: Araneae): Updated Checklist 2005. *Zoos, Print Journal*. 20(10): 1999-2049.
- [22] **Tikader, B. K.**, 1987. *Handbook Indian Spiders*. Zoological Survey of India, Calcutta. 1-251pp.
- [23] **Tikader, B. K.**, 1980. Fauna of India. Spider (Thomisidae and Lycosidae). Zoological survey of India, Calcutta. 1-443pp.
- [24] **Tikader, B. K.**, 1982. Fauna of India. Spider (Araneidae and Gnaphosidae). Zoological survey of India, Calcutta. 1-533pp.
- [25] **Upamanyu, Hore**, 2009. “Diversity and Structure of Spider Assemblages in Terai Conservation Area”, thesis PhD, *Saurashtra University*
- [26] **Uniyal, V.P., Sivakumar, K. and Quasin, S.**, 2011. Diversity of Spiders in Nanda Devi Biosphere Reserve. Wildlife Institute of India, Dehradun. (*DST Project Completion Report*).
- [27] **Vijaylakshmi, K., Ahimaz, P.**, 1993. Spiders: An Introduction. Madras
- [28] **World spider catalogue virgin**, 2015. Online at <http://www.wsc.nmbe.ch/>