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Agriculture Spiders (Araneae) from Vijapur Taluka, North Gujarat, India

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Abstract

The survey of order: Araneae was done in the agricultural area of Vijapur Taluka, Mahesana district, North Gujarat. The spider samples collection and survey were conducted from 2016 to 2018, using handpicking method. Hundred spider species and sixty-two genera, with nineteen families were identified from collections. In which, families Araneidae and salticidae were numerically dominant compared to others. In collected specimens, thirty-four species were web builders, and sixty-six species were non-web builders. The study area was connected to a forest and wasteland area, which provided an alternative habitat for the spider community. In this way, alternative habitats were conserved for spider communities, whenever agricultural areas were disturbed due to farming.

Keywords: Spider, Agriculture, Vijapur, Biodiverversity, North Gujarat.

Introduction

In Class Arachnida, Order Araneae is larger orders. Spiders fall in Order Araneae. Spiders play an important role in ecosystem services by affecting the terrestrial insect population. Because of their service in ecosystem service, considered biological control agents of the ecosystem. Their richness and diversity are high in all terrestrial and agricultural habitats, which is why gives benefits to easy speciemen collection and field observation. The study aimed to make a checklist of the Spider biodiversity as useful against crop insects. The survey of spiders was done in Vijapur Taluka to give reference line data for future studies.

Study Area: Vijapur taluka (23.57°N and 72.75°E) has 556.07 sq. km. areas with 64 villages, situated in the northern part of Mehasana District. The study area is boundary-covered with Banaskantha and Gandhi agar districts in the eastern part with parallel Sabarmati river flowing which is the main source of irrigation. The climatic condition of the study area is semi-arid, summer has around 36-46°C temperature with hot conditions and winter has 17-27°C temperature with cold conditions. Monsoon is irregular, with rainfall of approximately 700mm to 1000mm. The main river in the study area is Sabarmati; other rivers are Rupen & Pushpavati. Farmers in the study area have a fixed crop calendar for their farming (like cash crops, cereals, pulsed, and oil seeds).

Methodology

Spider sample collection and survey were done through the hand-picking method, in which spiders were actively collected directly in sample vials. Collection and survey of Spiders were done three times of day at different parts of the study area. These collected spider specimens were transferred to 75% ethanol-containing vials for preservation purposes.

All specimens were carried into the laboratory for further identification. Spider identification was conducted under a stereo zoom microscope using field notes, observation, and spider identification literature[1-4].

Results and Discussion

In identifying Order Araneae species, 657 samples were collected and 100 species of spider were identified from the agriculture area (Table-1). A total of 19 families were recorded, in which the family Salticidae was numerically dominant with 22 species. The second most dominant family was Araneidae with 21 species and other families were less than 12 species. In collected specimens, thirty-four species were web builders, and sixty-six species were non-web builders. Recorded 100 spider species, which was 24.09% of spider species from Gujarat[5], 62 genera which were 15.12% spider genera from India[6], recorded 19 families were recorded which were 47.5% of families from Gujarat[5], 36.53% families in India[6] and 13.97% families in World[7]. In 19 families of spiders total of nine guilds were recorded (Table-2) from the study area. Which, foliage runner guilds spiders were most dominant with 32 species followed by Orb web builder (24), Ground Runner (20), and Ambusher (12), other guilds had less than 5 species.

Conclusion

All 100 species of agriculture spiders were recorded from various microhabitats. The present study shows the diversity of agricultural spiders was very rich in normal farms and less in this area where more pesticides and other disturbances of anthropogenic activities. The abuse of pesticides also influences the populace of the prey of the spider leading to the decline of spider diversity.

Table-1: Checklist of spider species.

Sr. no	Name of species	Family	Common name
1.	*Cyclosa bifida*	Araneidae	Orb- Weavers
2.	*Cyclosa confraga*		
3.	*Araneus bilunifer*		
4.	*Araneus ellipticus*		
5.	*Araneus mitificus*		
6.	*Cyrtophora cicatrosa*		
7.	*Cyrtophora citricola*		
8.	*Argiope anasuja*		
9.	*Eriovixia excels*		
10.	*Eriovixia laglaizei*		
11.	*Neoscona vigilans*		
12.	*Neoscona theisi*		
13.	*Neoscona odites*		
14.	*Neoscona nautical*		
15.	*Neoscona mukerjei*		
16.	*Neoscona subfusca*		
17.	*Neoscona bengalensis*		
18.	*Neoscona achine*		
19.	*Neoscona sp.*		
20.	*Poltys bhabanii*		
21.	*Poltys sp.*		
22.	*Clubiona Drassodes*	Clubionidae	Leaf-curling sac spiders
23.	*Ctenus sp.*	Ctenidae	Wandering Spiders
24.	*Stegodyphus sarasinorum*	Eresidae	Velvet Spiders
25.	*Stegodyphus pacificus*		
26.	*Cheiracanthium sp.*	Eutichuridae	Long-Legged Sac Spiders
27.	*Zelotes sp.*	Gnaphosidae	Flat-bellied Ground Spiders
28.	*Nomisia sp.*		
29.	*Haplodrassus sp.*		
30.	*Drassodes sp.*		
31.	*Hersilia savignyi*	Hersiliidae	Two-Tailed Spiders
32.	*Linyphia sp.*	Linyphiidae	Sheet web spiders
33.	*Arctosa indica*	Lycosidae	Wolf spiders
34.	*Acantholycosa sp*		
35.	*Hippasa agelenoides*		
36.	*Lycosa tista*		
37.	*Lycosa poonaensis*		
38.	*Lycosa sp.*		
39.	*Pardosa pseudoannulata*		
40.	*Pardosa birmanica*		
41.	*Pardosa sp.*		

42.	*Hamataliwa sp.*	Oxyopidae	Lynx Spiders
43.	*Hamadruas sp.*		
44.	*Oxyopes javanus*		
45.	*Oxyopes ryvesi*		
46.	*Oxyopes bharatae*		
47.	*Oxyopes sp.*		
48.	*Peucetia viridana*		
49.	*Peucetia akwadaensis*		
50.	*Peucetia elegans*		
51.	*Philodromus sp.*	Philodromidae	Running Crab Spider
52.	*Crossopriza lyoni*	Pholcidae	Cellar spiders or Daddy long legs
53.	*Pholcus phalangioides*		
54.	*Perenethis sp.*	Pisauridae	Nursery Web Spiders
55.	*Pisaura sp*		
56.	*Epeus indicus*	Salticidae	Jumping spiders
57.	*Carrhotus sp.*		
58.	*Chrysilla lauta*		
59.	*Hasarius adansoni*		
60.	*Epocilla aurantiaca*		
61.	*Hyllus semicupreus*		
62.	*Menemerus brachygnathus*		
63.	*Menemerus fulvus*		
64.	*Menemerus bivittatus*		
65.	*Myrmarachne tristis*		
66.	*Myrmarachne plataleoides*		
67.	*Myrmarachne sp.*		
68.	*Phintella sp.*		
69.	*Phintella vittata*		
70.	*Plexippus paykulli*		
71.	*Phlegra dhakuriensis*		
72.	*Telamonia dimidiate*		
73.	*Stenaelurillus lesserti*		
74.	*Stenaelurillus sp.*		
75.	*Siler semiglaucus*		
76.	*Thyene imperialis*		
77.	*Thiania sp.*		
78.	*Heteropoda venatoria*	Sparassidae	Huntsman spiders
79.	*Heteropod sp.*		
80.	*Olios millet*		
81.	*Olios tikaderi*		
82.	*Olios bhavnagarensis*		
83.	*Olios iranii*		
84.	*Leucauge decorate*	Tetragnathidae	Long jawed orb weavers

85.	*Argyrodes sp.*	Theridiidae	Cob web weavers
86.	*Chrysso angula*		
87.	*Chrysso sp.*		
88.	*Indoxysticus minutus*	Thomisidae	Crab Spiders
89.	*Diaea sp.*		
90.	*Oxytate sp.*		
91.	*Misumena sp.*		
92.	*Synema decoratum*		
93.	*Xysticus sp.*		
94.	*Thomisus projectus*		
95.	*Thomisus lobosus*		
96.	*Thomisus sp.1*		
97.	*Thomisus sp.2*		
98.	*Runcinia sp.*		
99.	*Miagrammopes sp.*	Uloboridae	Hackled-Orb-web spiders
100.	*Uloborus sp.*		

Table-2: Spider Family and its guilds.

Sr. No.	Guilds	Number of species	Families
1.	Foliage runner	32	Eutichuridae, Oxyopidae, Salticidae
2.	*Orb web builder*	24	Araneidae, Tetragnathidae, Uloboridae
3.	Ground runner	20	Ctenidae, Gnaphosidae, Lycosidae, Sparassidae
4.	*Scattered line weaver*	5	Pholcidae, Theridiidae
5.	*Ambusher*	12	Philodromidae, Thomisidae
6.	*Foliage hunter*	2	Clubionidae, Hersiliidae
7.	*Snare/sheet web builder*	2	Eresidae
8.	*Foliage weaver*	2	Pisauridae
9.	*Sheet line weavers*	1	Linyphiidae

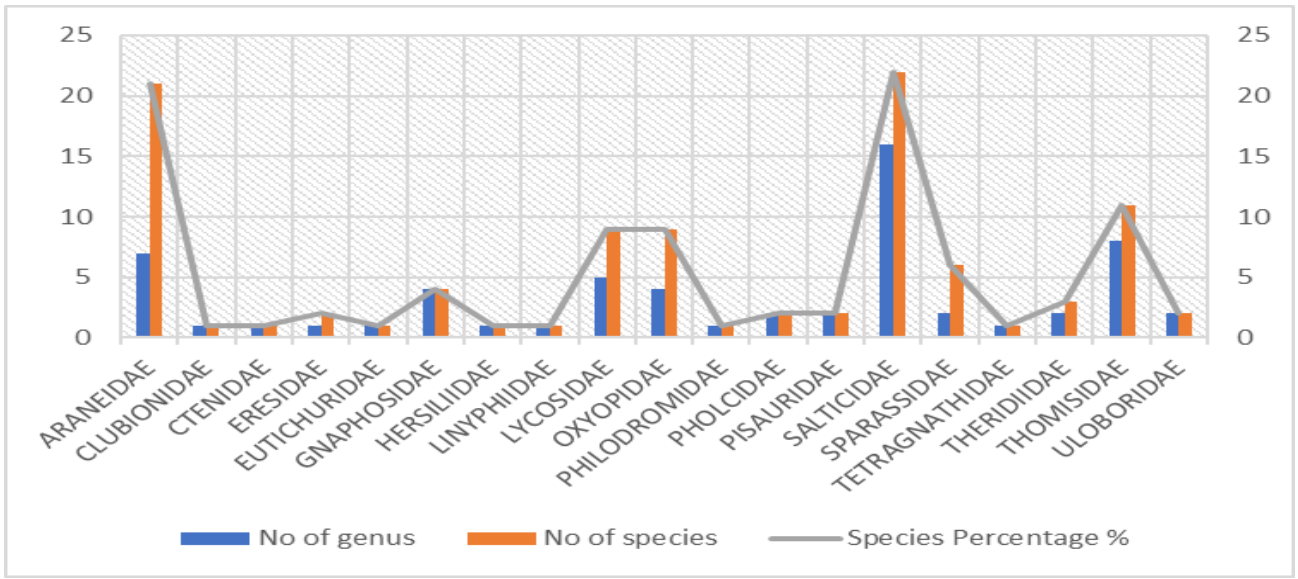

Figure-1: Percentage of Species contribution.

In this way, pesticides decline biocontrollers and effective components of the ecosystem. This activity of the farmer affects in food chain of the ecosystem, in these ways, spiders can't play a role as biological controllers. Further Study is needed to evaluate the influences of insecticide used in the agriculture spider community.

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