

A preliminary study on the spiders Diversity found in Auxilium college (Autonomous) Campus, Tamil Nadu, India.

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Abstract

A study on spider diversity of Auxilium College campus, Gandhi Nagar, Vellore District, Tamil Nadu, India's was done. 34 species, 30 genera, and 10 families were identified. Araneidae (8 species), Hersillidae (1 species), Lycosidae (2 species), Oxyopidae (6 species), Pholcidae (2 species), Salticidae (8 species), Sparassidae (3 species), Tetragnathidae (2 species), Thomisidae (1 species), and Uloboridae (1 species) were the major families, with Sparassidae (1 species) being the least prevalent group. The many habitat types and biological elements on campus are demonstrated by the wide variety of spider species. The current study creates a baseline of information for more arachnology research, and it is the first of its kind for the Vellore District in Tamil Nadu.

Keywords: Diversity, Spider, Survey, Auxilium college campus

1. Introduction:

One of the most interesting and common arthropods is the spider. They serve as essential bioindicators and biocontrol agents since they are found in a variety of microhabitats (Riechert and Bishop, 1990). They are the paramount order of arachnids and the fifth most diverse group of creatures overall in terms of species diversity (Sebastian, 2009). As predators and prey to other living things in nature, they control the populations of terrestrial arachnids (Salomon et al., 2015). One of the most significant elements of the world's biodiversity is represented by spiders. They are numerous and widespread in all environments and contribute significantly to ecology by only being predatory, which preserves the ecological balance (Sebastien and Peter, 2009).

According to world Spider catalogue 2023 version 24.5 51'478 accepted species are included, descriptions of 44,540 spider species from 3,924 genera and 112 families have been made (Platnick, 2014). According to Siliwal et al., (2005), 2,299 different spider species from 67 different families have been identified throughout South Asia. India identified 1,686 species altogether, divided into 438 genera and 60 families (Keswani et al., 2012). Spiders' dates back Devonian era, about 400 million years ago. According to various sources (including Masterman (1888), Paul Hilliard (1994), Mark Carwardine (1995), and Rainer Foelix (1996), the early Tertiary period (about 70 million years ago) is when spiders were abundant and most like their current relatives. Blackwall (1864), Stoliczka (1869), Bonnet (1945,1955,1961), Simon (1897a, 1897b), Pocock (1899, 1900a, 1900b,1901), Sheriffs (1919,1927,1928,1929), Thorell (1877) and Cambridge (1897) are among the researchers who recorded the diversity of spiders in various parts of the world.

Beside few niches in the Arctic and Antarctica, spiders are a diverse and important creature that may be found in a variety of habitats, including under bark, stones, fallen logs, foliage, house shelters, grass leaves, subterranean tunnels etc (Tikarder, 1977). Spiders are a diverse group of Invertebrates classified as Arthropods in the family Araneae. One of the most significant elements of the world's biodiversity is represented by spiders. They are numerous and ubiquitous in nearly all environments and contribute significantly to ecology by just being predators, preserving the ecological balance (Sebastien and Peter, 2009; Riechert and Bishop, 1990). Spiders are a reliable indication of the condition of the environment. They are sensitive to environmental changes, such as habitat loss and climate change and they play significant roles in the dynamics of a particular ecosystem (Chetia et al., 2012). Spiders are a prospective focus group due to their ubiquity, variety and ecological significance (Hore, 2009). Spiders are a reliable indication of the condition of the environment. They are vulnerable to habitat loss, climate change and environmental upheavals and play significant roles in the dynamics of a particular ecosystem (Chetia et al., 2012; Wyman, 1990; Daniel, 2002). However, despite playing crucial roles in the majority of natural ecosystems, research on conservation have generally disregarded them.

All spiders produce silk that shoots from their spinnerets. Six spinnerets on a spider allow it to produce up to seven distinct types of silk (Candelas and Cintron, 1981). When air is introduced to the fluid form of silk, it hardens into strands of silky line. The world's strongest naturally manufactured material, a protein fibre, makes up silk (Gosline et al., 1999). Spiders employ silk for a variety of purposes, including draglines, webs, egg casings, holding prey, creating nurseries, transportation (like in ballooning) and entangling prey (Tikader, 1987). While every spider has

a poison gland, only a small number of them are harmful to humans (Gupta et al., 2008). Although all spiders have venom, only a few species are dangerous to humans.

Some spiders, such as the Black widow spider, may be harmful. Humans can get sick from the brown recluse spider's poison. The chemical makeup and mechanisms of action of spider venoms vary greatly (Adams and Olivera, 1994; McCrone, 1969). Spider venom comes in two primary forms. Some spider venom is neurotoxic, meaning it has an impact on the nervous system of humans. While ordinary spider venom is necrotic and causes skin lesions, ulcers, etc., black widow venom is neurotoxic. An investigation of the spiders' early research was conducted on the campus of Auxilium College.

2. Materials and Methods

2.1 Study Area

The colleges coordinates are 10.5609°N and 79.1242°E. The climate of Vellore is classified as tropical savanna (Koppen climatic classification Aw). From 13 °C (55 °F) to 39.4 °C (102.9 °F), the temperature is. In line with the rest of the state, the warmest months are April through June and the coolest are December through January. The rainy season in Vellore is hot, oppressive, and cloudy, whereas the dry season is oppressively hot, muggy, and partially cloudy. The average annual temperature ranges from 62 to 104 degrees Fahrenheit, seldom falling below 57°F or above 111°F.

2.2 Sampling methods

The research was carried out between January to December of 2021. At random locations, 20 x 20 m quadrates were taken. Every day from 4 to 6 p.m., samples were taken since many spiders are active in the evening and at night. Standard techniques including visual searching, hand picking, the inverted umbrella method, and sweep nets were used to catch the spiders. Spiders were gathered from flowers, leaves, webs, tree trunks, beneath stones, on the grounds, and from buildings and taken with a Finepix s3300 digital camera due to their widespread dispersion.

2.3 Identification

The spiders were collected, identified using a field guide (Sebastian and Peter, 2017; Tikader, 1987), and then released back into their native environment.

3. Result and Discussion

The campus of Auxilium College is discovered to have a wide variety of spiders. The research found that 34 species from 30 genera and 10 families were present (Table 1). Araneidae (8 species), Hersillidae (1 species), Lycosidae (2 species), Oxyopidae (6 species), Pholcidae (2 species), Salticidae (8 species), Sparassidae (3 species), Tetragnathidae (2 species), Thomisidae (1 species), and Uloboridae (1 species) were the major families, with Sparassidae (1 species) being the least

prevalent group. When there is a wider range of habitat types present, diversity typically rises (Ried, Miller 1989; Noss 1990). The architecturally more complicated bushes could be able to host a wider variety of spiders (Uetz, 1991). As a result, the university's campus contains a number of densely vegetated gardens that helped maintain the study area's vast diversity of spiders.

The following foraging behaviours were observed in the spiders at Auxilium College. The Orb web weavers (*Argiope anasuja*, *Cyrtophora ciatrosa*, *Gasteracantha geminate*, *Hamataliwa* sp., *Neoscona* sp., *Leucauge decorate*, *Tetragnatha* sp., *Uloborus* sp.), Ambushers (*Hersila* sp., *Thomisus* sp.), Ground runners (*Pardosa* sp.), Stalkers (*Oxyopes Shweta*, *Oxyopes* sp., *Peucetia viridana*, *Menemerus* sp., *Hyllus semicupreus*, *Phincelloides* sp., *Plexippus paykulli*, *Plexippus petersi*, *Proszynskia diatrete*, *Telamonia dimidiata*), Scattered line weavers (*Crossopriza lyoni*, *Crossopriza* sp.), Foliage hunters (*Heteropoda venatoria*, *Palystes flavidus*) (Figure 1). According to Ann Kronk and Susan Riechert (1979) and Uetz et al. (1999), spiders choose their environment in ways that limit interspecific competition within the groups they inhabit. The majority of spiders favoured dense, damp foliage. Spider species richness is much higher in less-manipulated settings, according to Culin and Yeargan (1983).

The bulk of web makers are spiders that create orb webs. The database has to be updated immediately. It is essential to explore species variety and understand habitat ecology, behaviour, and other aspects of the environment for the Auxilium College campus in Gandhi Nagar, Vellore District, Tamil Nadu, India. According to the Figure, only a small number of marshland spiders are discovered in the area, whereas wild spiders are much more common than domestic ones. According to the study, spiders are best collected aerially rather than using any other types of traps. We have gathered more than half of the spider samples for our investigation using an airborne technique. According to the survey, the summer season had the highest concentration of families and species, while the monsoon and winter had the lowest. Hence, it is made clear that they are more active in the summer.

Currently, the world spider inventory (2022) describes 49,713 different spider species from 4,257 different genera and 132 different families. Studies on 18 families, 34 genera, and 56 species were conducted in India. Spiders from Kerala, India have been documented by Tikader (1963,1970,1976,1980,1982a,1982b,1987), Gajbe (1979), Murthy (1977), Sharma and Bastawade (2001), Bastawade (2001, 2002), Bastawade and Bokar (2008), Sebastin et al. (2005), and Patel (2003a, 2003b). In the Western Himalayas' Milam Valley Nanda Devi Biosphere Reserve, Quasin, Uniyal (2011), Archana (2011), Chetia (2011) and Kalita (2012) conducted research on Assamese spiders. According to Keswani et

al., (2013), India is home to 1685 spider species that are divided into 438 genera and 60 families.

Table 1: Family and species list

S. No	Family	Species	Natural History
1	Araneidae	Argiope anasuja (Thorell, 1887)	Orb web weavers
		Argiope sp.	Orb web weavers
		Argiope sp.	Orb web weavers
		Cyrtophora ciatrosa (Stoliczka, 1869)	Orb web weavers
		Gasteracantha geminate (Fabricius, 1798)	Orb web weavers
		Hamataliwa sp.	Orb web weavers
		Neoscona sp.	Orb web weavers
		Neoscona sp.	Orb web weavers
2	Hersillidae	Hersila sp.	Ambushers
3	Lycosidae	Pardosa sp.	Ground runners
		Pardosa sp.	Ground runners
4	Oxyopidae	Oxyopes Shweta (Tikarder, 1970)	Stalkers
		Oxyopes sp.	Stalkers
		Oxyopes sp.	Stalkers
		Oxyopes sp.	Stalkers
		Oxyopes sp.	Stalkers
		Peuceitia viridana (Stolicka, 1869)	Stalkers
5	Pholcidae	Crossopriza lyoni (Blackwall, 1867)	Scattered line weavers
		Crossopriza sp.	Scattered line weavers
6	Salticidae	Hyllus semicupreus (Simon, 1885)	Stalkers
		Menemerus sp.	Stalkers
		Phincelloides sp.	Stalkers
		Plexippus paykulli (Audoulin, 1826)	Stalkers
		Plexippus petersi (Karsch, 1878)	Stalkers
		Plexippus sp.	Stalkers
		Proszynskia diatrete (Simon, 1902)	Stalkers
		Telamonia dimidiata (Simon, 1899)	Stalkers
7	Sparassidae	Heteropoda venatoria (Linnaeus, 1767)	Foliage hunters
		Heteropoda sp	Foliage hunters
		Palystes flavidus (Simon, 18976)	Foliage hunters
8	Tetragnathidae	Leucauge decorate (Blackwall, 1864)	Orb web weavers
		Tetragnatha sp.	Orb web weavers
9	Thomisidae	Thomisus sp.	Ambushers
10	Uloboridae	Uloborus sp.	Orb web weavers

Table 2. Total species of spiders

S. No	Family	Genera	No. of Species
1	Araneidae	9	8
2	Hersillidae	1	1
3	Lycosidae	2	2
4	Oxyopidae	2	6
5	Pholcidae	3	2

6	Salticidae	6	8
7	Sparassidae	1	3
8	Tetragnathidae	3	2
9	Thomisidae	2	1
10	Uloboridae	1	1
Total	10 Family	30	34

Figure 1: Spiders and their numbers recorded during the study

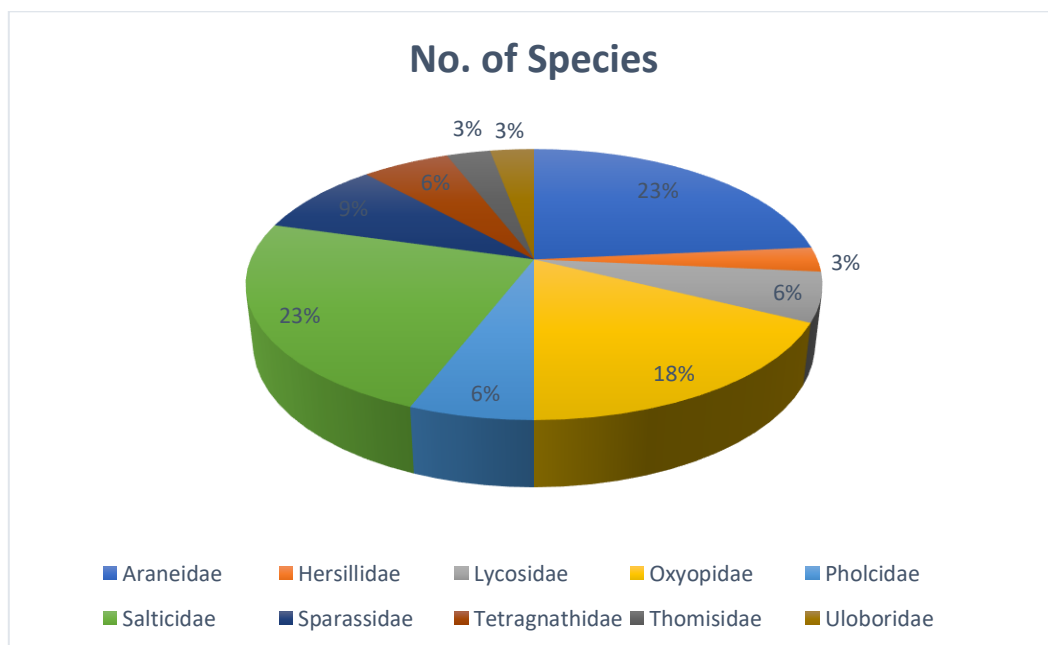
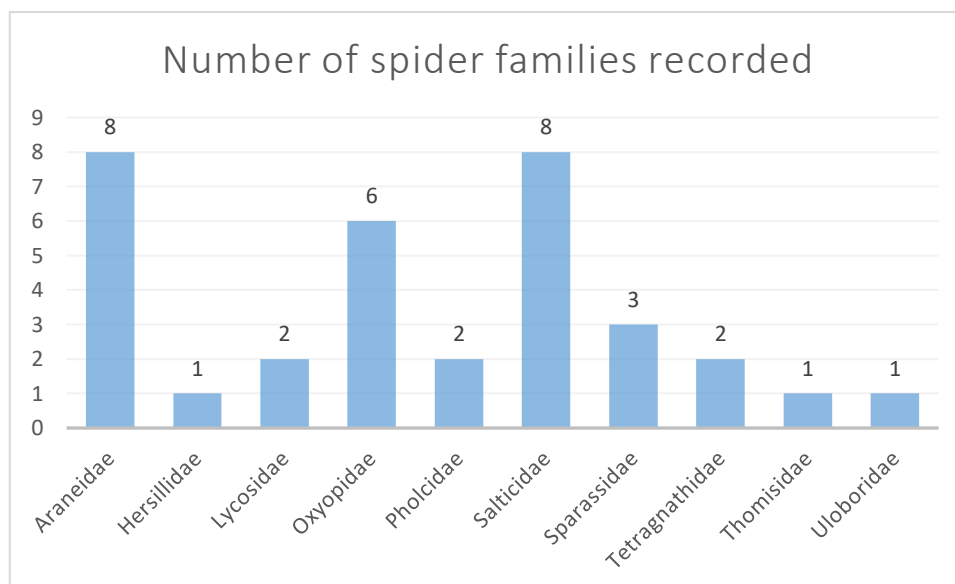


Figure 2: Number of Spider Families Recorded



The studies on spiders are limited in Tamilnadu. Taxonomic studies on spiders in Tamil Nadu were carried out by Simon (1880, 1885a,b), Pocock (1899, 1901), Narayan (1915), Gravely (1921, 1924, 1931, 1935), Reimoser (1934), Tikader (1972 a,b, 1977, 1980, 1987), Tikader and Gajbe (1976, 1977), Majumder and Tikader (1991), Vijayalakshmi and Ahimaz (1993), Barrion and Litsinger (1995), Coyle (1995), Smith (2004), Gajbe (1999, 2008), Ganeshkumar and Mohanasundaram (1998), Logunov (2001), Logunov and Hereward (2006), Platnick et al., (2013), Baehr and Baehr (1993), Baehr et al., (2012), Gupta et al., (2013), Caleb and Mathai (2013, 2014a,b,c), Caleb et al., (2014, 2015,2020), Karthikeyani and Kannan (2013) and Tanasevitch (2015). Sugumaran et al., (2007), Kapoor (2008), Jayakumar and Sankari (2010), Shunmugavelu and Karthikeyani (2010), Karthikeyani and Kannan (2012), Karthikeyani and Muthuchelian (2014); Muthuchelian and Karthikeyani (2015) have conducted studies on the biodiversity of spiders. Karthikeyani (2017) reported 226 species of spiders from 120 genera and 33 families based on the state of Tamil Nadu's spider check list. Currently, Tamilnadu is home to 250 different species of spiders, according to Caleb and Karthikeyani (2020). The current study is a preliminary examination of the diversity of spiders in Gandhi Nagar's Auxilium College (Autonomous), in the Tamilnadu district of Vellore.

4. Conclusion

In conclusion, the preliminary study on the spiders found in Auxilium College campus has provided valuable insights into the arachnid diversity within this educational institution's environment. Through systematic field surveys and taxonomic identification, we have documented a wide range of spider species inhabiting various microhabitats on the campus grounds. The study has not only contributed to our

understanding of local biodiversity but has also shed light on the ecological roles of spiders in maintaining balanced ecosystems. Spiders are fundamental to the general health of the ecosystem and serve a critical role in regulating insect populations. According to the study, the local agro-ecosystem has a muted impact on orb weaver spider diversity. One of the most crucial elements for spiders is the structure of the vegetation. The environmental choices determined by the spiders' physical and behavioural traits can be used to explain variations in species composition. All spiders are predators that mostly consume other arthropods, particularly insects. Some spiders hunt actively, pursuing and outnumbering their victim. These often have keen eyesight or tactile senses.

For the purpose of capturing food, other spiders create silk snares or webs. Webs are built automatically and efficiently catch flying insects. While some spiders first immobilise their prey with silk wrappings, others first inject their prey with venom to rapidly kill it. Often, "charismatic" species like birds and animals receive the greatest attention in conservation efforts, whereas ecologically significant groups like spiders are frequently neglected.

Additionally, this exploratory research lays the groundwork for future investigations on the behaviour, ecology, and distribution of spider species on the campus of Auxilium College. This information can be useful for conservation efforts and for raising awareness of the significance of protecting these priceless elements of our natural world. In conclusion, the study has been an important step in revealing the secretive world of spiders on the campus of Auxilium College. We hope that our research will stimulate other research and develop a broader understanding of the astonishing diversity of life that exists within the campus's bounds.

5. References

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