



Research Article



Diversity and distribution of spiders from Tenkasi district, India

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ABSTRACT

Biodiversity can be simply defined as the variety of all types of living organism. Spiders are among the most diverse groups on earth, which received the seventh ranking in global diversity after the sixth largest insect orders. Spiders are major playing a vital role in the forest ecosystem is the spiders. The spotted spider specimens were taken photographed identified without disturbing it. A total of 17 species of spiders under 15 genera and 9 families were recorded during the Four months survey in five falls in Coutrallam, Tenkasi district, Tamilnadu state, India.

Keywords: Spider, Arachnida, Biological control, Diversity.

INTRODUCTION

As one of the most widely recognized group of arthropods, spiders make up a diverse portion of the world's invertebrates (Coddington, J.A *et al* 1991). They are distributed on every continent except Antarctica and have adapted Spiders are clearly an integral part of the global biodiversity since they play an important role in ecosystems as predators and source of food for other creatures (Sharma S *et al* 2010). They primarily feed on insects, but also eat other arthropods, including other Araneae. They are suitable biological indicators of ecosystem changes and habitat modifications due to their small body size, short generation time, and high sensitivity to temperature and moisture changes (Kremen, C *et al* 1991).

Spiders form the seventh largest animal order in terms of numbers of known species and are common predatory arthropods in all terrestrial and many aquatic ecosystems. This is the most diverse, female-dominated and entirely predatory order in the arthropod world. Spiders are key components of all ecosystems in which they live and are considered to be useful indicators of the overall species richness and health of terrestrial communities. However, spiders of the Western Ghats are a poorly explored group and detailed information about their systematic, diversity and ecology in this 'biodiversity hotspot' is scarce.

Spider has also an important role in the ecosystem maintenance. They are considered as the prospective biological control agents (Riechert and Bishop, 1990). They feed on small insect and in turn eaten by birds and other carnivores maintaining the trophic balance of nature.

Araneae is the largest entirely carnivorous group of animals on the planet. Researchers have described over 75,000 species of arachnids worldwide with many more undescribed. Spider diversity, distribution and insectivorous feeding habits are suspected of playing an important role in the balance of nature (Oyeniyi Abiola Oyewole, 2014). Globally, the loss and degradation of natural habitats results in the loss of biodiversity (Foelix, 1996). This may disrupt ecosystem functions and constitute a major threat to the long-term biodiversity conservation.

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Taxonomic studies of different spider species from wildlife sanctuaries, paddy fields and cotton fields were investigated by many researchers (Vungsilabutr, 1988; Sahu *et al.*, 1996; Patal, 2003; Mathirajan and Raghubathy, 2003; Vanitha *et al.*, 2009; Bhatkar, 2011;

Chetia and Kalita, 2012). The present study aimed to carry out survey of the spider fauna in the five falls in Coutrallam, Tenkasi District, Tamilnadu State, India. It is the first approach in this region, to study the spider fauna, thus providing base line information for future studies.

MATERIALS AND METHODS

Study Area

The spiders were observed from photographs taken in Coutrallam Falls (8°55'55"N 77°16'09"E / 8.93194°N), Tenkasi district, Tamilnadu. It is located in Western Ghats to the South of Coutrallam town and to the north of Coutrallam Lower.

Identification of spiders

The diversity and density of spiders throughout the study period was investigated by the hand picking method from December 2020 to March 2021. The spotted spider specimens were photographed in the same environment without disturbing it. All specimens were identified using the taxonomic keys for Indian spiders given by Tikader (1987); Biswas and Biswas (1992) and Sebastian and Peter (2009).

RESULTS AND DISCUSSION

Spider diversity, distribution and their insect feeding habits play an important role in the balance of nature (Yong and Edward, 1990). They are potential biological indicators of natural habitats and are used for determining how communities react to environmental changes or disturbances (Marc and Canard, 1997). The status of spider diversity is an important constraint to evaluate the community level of biological organization. Higher species diversity is an indicator of a healthier and complex community because a greater variety of species allows more interactions, hence greater system stability which in turn indicates good environmental conditions (Hill, 1973).

The results show that there are 17 species of spiders, 15 genera and 9 families found. The abundance and the number of family species that are mostly found is Araneidae (5 species), followed by Salticidae (4 species), followed by Thomisidae (2 species), followed by the family of Cheiracanthiidae, Pholcidae, Sicariidae, Oxyopidae, Gnaphosidae, Theridiidae, are each family one species recorded (Table 1 and figure 2).

Ambily and Antony (2016) reported total 40 species of spiders belonging to 14 families from Kerala. Among all families, Araneidae was most dominant family followed by Salticidae. Under the present study Araneidae was the most dominant family comprising of seven genera and 16 species with 33.33 per cent species distribution. This may be more or less in accordance with the earlier work. Further, More (2015) from Maharashtra also recorded Araneidae as one of the most dominant family, thus closely support the present findings. In the present investigation, a total of 48 species of agrobiont spiders in 34 genera belonging to 12 families were recorded and

the pictorial checklist of different agrobiont spiders from the study area was prepared (J.N. Prajapati et al,2018).

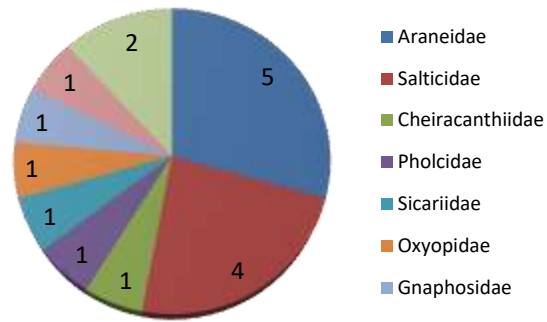


Figure 1. Species distribution in different families found in five falls in Coutrallam, Tenkasi District, Tamilnadu State, India

Table 1. Spider species recorded during the study

Family	genus	species
Araneidae	<i>Argiope</i>	<i>Argiope argentata</i> (Fabricius, 1775)
Araneidae	<i>Argiope</i>	<i>Argiope bruennichi</i> (Scopoli, 1772)
Araneidae	<i>Argiope</i>	<i>Argiope pulchella</i> (Thorell, 1881)
Araneidae	<i>Gasteracantha</i>	<i>Gasteracantha geminata</i> (Fabricius, 1798)
Araneidae	<i>Nephila</i>	<i>Nephila pilipes</i> (Fabricius, 1793)
Salticidae	<i>Colonus</i>	<i>Colonus sylvanus</i> (Hentz, 1846)
Salticidae	<i>Hasarius</i>	<i>Hasarius adansoni</i> (Audouin, 1826)
Sicariidae	<i>Loxosceles</i>	<i>Loxosceles rufescens</i> (Dufour, 1820)
Salticidae	<i>Menemerus</i>	<i>Menemerus bivittatus</i> (Dufour, 1831)
Salticidae	<i>Plexippus</i>	<i>Plexippus paykulli</i> (Audouin, 1826)
Thomisidae	<i>Thomisus</i>	<i>Thomisus spectabilis</i> (Doleschall, 1859)
Thomisidae	<i>Misumena</i>	<i>Misumena vatia</i> (Clerck, 1757)
Cheiracanthiidae	<i>Cheiracanthium</i>	<i>Cheiracanthium mildei</i> (L. Koch, 1864)
Pholcidae	<i>Crossopriza</i>	<i>Crossopriza lyoni</i> (Blackwall, 1867)
Gnaphosidae	<i>Scotophaeus</i>	<i>Scotophaeus blackwalli</i> (Thorell, 1871)
Theridiidae	<i>Steatoda</i>	<i>Steatoda nobilis</i> (Thorell, 1875)
Oxyopidae	<i>Peucetia</i>	<i>Peucetia viridans</i> (Hentz, 1832)

Some previous studies reported similar kind of findings. Quasin (2011) reported Araneidae as the dominant family (18%) followed by Salticidae and Thomisidae (11.5%), Theridiidae (8.6%), Linyphiidae (7.4%), Uloboridae and Tetragnathidae (4.5%), and Gnaphosidae, Oxyopidae, Sparassidae and Lycosidae (4.1%) in Nanda Devi Biosphere Reserve, Dehradun, Uttarakhand. On the other hand, some studies also reported Salticidae as the dominant family. Kazim et al (2014) reported family Salticidae as the most common family that represents the highest species diversity while Araneidae is second largest in species diversity and rest of the families has equal quantity. Deshmukh and Raut (2014) also found Salticidae as the most abundant

(19.23%) followed by Aranidae (18.26%), Thomisidae (12.05%), Oxyopidae (8.65%), Lycosidae (7.69%), Gnaphosidae (6.73%), Philodromidae (4.76%), Eresidae (3.84%), Tetragnathidae (3.84%), Pholcidae (2.88%), Theridiidae (2.88%), Clubionidae (1.92%) and Uloboridae (1.92%). The least species diversity was recorded in the families of Hersilidae, Miturgidae, Nephilidae, Scytodidae and Sparacidae with 0.96% in each family. Study conducted in Jahangirnagar University campus at Bangladesh also reported Salticidae as the dominant family (Rain et al., 2016).

The checklist of the Araneae of different countries/continents/ecozones were published in recent past by several authors, like Gajbe (2003), Dandria et al., (2005), Siliwal et al., (2005), Namkung et al., (2009), Ursani and Soomro (2010), Khan (2011), Perveen and Jamal (2012), Sial et al., (2012), Adarsh and Nameer (2015), Lawania and Trigunayat (2015), Perveen and Khan (2015), Adarsh and Nameer (2016), Ghazanfar et al., (2016) and Prajapati et al., (2016).

CONCLUSION

This was the first attempt to document spider diversity in Five falls in Southern India. The diversity at ecosystem level supports large number spiders in the Coutrallam area. Since the study area is a human dominated landscape, they are facing threats like habitat loss, pollution and changes in land use pattern. Appropriate conservation strategies should be developed and implemented to conserve the faunal and floral diversity of the region.

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