



Diversity and distribution of Spider fauna (family- Araneidae) in and around Katepurna Sanctuary, Akola, India

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Abstract

A study on the diversity and distribution of spider fauna (Family- Araneidae) in and around the Katepurna Sanctuary, Akola India was conducted during February 2015 to December 2016. A total 11 genus and 26 species of family Araneidae (Arachnida: Araneae) were recorded. The generic diversity is in the order of *Neoscona* (9), *Cyclosa* (3), *Larinia* (3), *Cyrtophora* (2), *Eriovixia* (2), *Polys* (2), *Araneus* (1), *Argiope* (1), *Chorizopes* (1), *Gasteracantha* (1), *Zygiella* (1).

Keywords: Araneidae, Diversity and distribution, Katepurna, Sanctuary, Spider.

Introduction

Orb-weaver spiders or araneids are members of the spider family Araneidae. They are the most common group of builders of spiral wheel-shaped webs often found in gardens, fields and forests. Araneids have eight similar eyes, hairy or spiny legs and no stridulating organs. The family is cosmopolitan, including many well-known large or brightly coloured garden spiders. With around 3122 species in 172 genera worldwide (World Spider Catalog), Araneidae is the third-largest family of spiders. Araneid webs are constructed in a stereotyped fashion. Spiders of protected areas in India are studied by Gajbe (1995a) in Indravati Tiger Reserve and recorded 13 species. Rane and Singh (1977) recorded five species and Gajbe (1995b) 14 species from Kanha Tiger Reserve, Madhya Pradesh. Gajbe (2003) prepared a checklist of 186 species of spiders in 69 genera under 24 families distributed in Madhya Pradesh and Chhattisgarh. Patel (2003) described 91 species belonging to 53 genera from Parabikulum Wildlife Sanctuary, Kerala. Manju Silwal et al. (2003) recorded 116 species from 66 genera and 25 families of spiders from Purna wildlife Sanctuary, Dangs, Gujarat. Majumdar (2004a) studied about

the wolf spider of Sundarbans and described a new species *Pardosa* Koch (Majumdar, 2004b). Sivaperuman et al., (2004) studied the spiders in Desert National Park, Rajasthan. Bastawade (2004) described arachnid fauna of orders Araneae, Scorpionida and Solifugi from Melghat Tiger Reserve, Amravati, Maharashtra State. Hippargi, et al. (2011b) reported occurrence of spiders from 19, 25, 31 families from Lonar, Melghat and Southern Tropical thorn forest, Solapur respectively. Uniyal (2006) recorded a total of 19 species of spiders belonging to 10 families from Indian-Trans Himalayan region. Centre for Indian Knowledge System, Chennai has also conducted ecological studies of spiders in a cotton agro ecosystem of Guindy National Park. De (2001) listed 19 species of spider from Dudhwa Tiger Reserve in his management plan. Hore and Uniyal (2008a, 2008b) worked on the spider assemblage and the diversity and composition of spider assemblages in different vegetation types in Terai Conservation Area (TCA). Hore and Uniyal (2008) worked on spiders as indicator species for monitoring of habitat condition in TCA. Uniyal and Hore (2008) also studied on the effect of prescribed fire on spider assemblages in TCA. Biswas and Biswas (2004) contributed significantly to spider diversity by rendering comprehensive lists of new recorded spider species from Manipur and West Bengal. Siliwal, et al. (2005) prepared an updated Checklist

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of Indian spider and provided taxonomic reevaluation of described species, referred 1442 species belonging to 361 genera of 59 families from the Indian Region. Of the 1442 species, 1002 were endemic to the Indian mainland. Quasin and Uniyal (2010) studied spider diversity from Kedarnath wildlife Sanctuary. Sharma et. al. (2010) studied Diversity and abundance of spider fauna of Narmada river at Rajghat Barwani (M.P.) India. Vairale and Vankhede (2010) reported 517 spider species from Melghat Sanctuary. Meshram, (2011) also worked on Spiders From Toranmal Sanctuary, Maharashtra, India. Vyas, (2012) also reported 95 species from 60 genera and 24 families. Thereafter Shirbhate and Vyas (2012) reported 23 species from 10 genera of family Araneidae from middle plains of Narmada basin (MP). The knowledge on diversity and distribution of spiders in other sanctuaries is sparse as compared to other sanctuaries of the India listed above. Meshram (2011) reported 117 spider species from Toranmal Sanctuary. Spiders, are the least studied or understood fauna in relation to conservation and fragmentation of habitats in India. Hence, it was felt to explore spider diversity in the Katepurna Sanctuary.

Material and Methods

Study area: The Katepurna Sanctuary in Akola, Maharashtra is an exotic sanctuary dotted with an abundance of flora and fauna. Positioned in Akola district in Vidarbha region of the state of Maharashtra, the sanctuary lies in close proximity to the catchments area of Katepurna reservoir (Mahan Dam). Its area is geographically located at - 20°25'0.54"N 77°10'50.14"E. The land vegetation at Katepurna Sanctuary is southern tropical dry deciduous forest. There are over 115 species of plants at this sanctuary such as Bihada, Dhawada, Moha, Tendu, Khair, Salai, Aola, Tendu, etc. Katepurna Wildlife Sanctuary is renowned for the four-horned antelope and barking deer. Other animals that can see at the sanctuary include Black buck, Leopard, Wolf, Wild boar, Hyaena, Hare, Nilgai, Jungle cat and Monkeys. The Katepurna water reservoir attracts many water birds. Spider survey is carried out for ground spiders and spiders along slow flowing shallow streams, spiders from

decaying barks of trees, from shrubs and crevices of rocks.

Well established sampling protocols for spider collection are adopted in different selected sampling spots. The detailed descriptions of the collection techniques are as follows-

(i) Sweep Netting – This sampling method is applied to collect the foliage spiders from low level vegetation of shrubs (up to 2 m in height). The sweep net consists of a 90 cm handle; 40 cm ring and the collection are poured on white canvas. The net was emptied at regular intervals to avoid loss and destruction of the specimen. During sampling time sweep net was moved back and forth to cover all ground layer herbs and shrubs till all vegetation in the sampling plots were swept thoroughly.

(ii) Ground Hand Collecting – Ground Hand collection involved the collection of spider samples from ground to knee level. This method of sampling is used to collect the spiders, which are found to be visible in the ground, litter, in broken logs, rocks etc.

(iii) Aerial Hand Collecting – Aerial Hand collection involved the collection of spiders samples from knee level to arm length level. This method accessed web-building and free-living spiders on the foliage and stems of living or dead shrubs, high herbs, tree trunks etc.









(iv) Vegetation Beating: The method is employed to accesses spiders living in the shrub, high herb vegetation, bushes, and small trees and branches. The spiders are collected by beating the vegetation with a stick and collecting the samples on a cloth (1 m by 1.2 m).








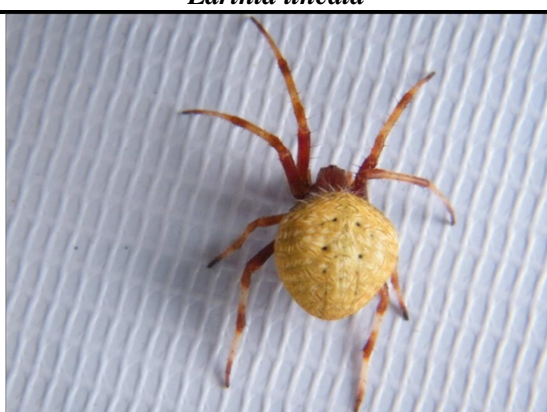
(v) Litter sampling: Litter i.e. deciduate from the ground was collected by hand and was put in a big tray. Litter sampling involved sorting of spiders from the litter collection tray.

With the above methods of collections the spiders were collected and observed under stereo-zoom binocular microscope (for small/tiny spiders) wherever necessary in the field itself. Later all the spiders were photographed by Canon 60 D with macro lens in their natural habitat (Specimens were not collected - as per the directions by Office of the Chief Conservator of Forests and Field Director, Melghat Tiger Reserve, Camp, Amravati, Office of the Principal Chief Conservator of Forest (HOFF) Maharashtra state, Nagpur and Maharashtra State Biodiversity Board, Nagpur.)











Fig.- 1. Photograph showing the generic diversity of family Araneidae from Katepurna Sanctuary, Akola (Maharashtra, India).

	
<i>Araneus ellipticus</i>	<i>Argiope aemula</i>
	
<i>Chorizopes bengalensis</i>	<i>Cyclosa bifida</i>
	
<i>Cyclosa hexatuberculata</i>	<i>Cyclosa insulana</i>
	
<i>Cyrtophora cicatrosa</i>	<i>Cyrtophora citricola</i>

	
<i>Eriovixia excelsa</i>	<i>Eriovixia laglaizei</i>
	
<i>Gasteracantha cancriformis</i>	<i>Larinia chloris</i>
	
<i>Larinia argiopiformis</i>	<i>Larinia lineata</i>
	
<i>Neoscona adianta</i>	<i>Neoscona bengalensis</i>

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<i>Neoscona crucifera</i>	<i>Neoscona mukerjei</i> Tikader
	
<i>Neoscona nautica</i>	<i>Neoscona punctigera</i>
	
<i>Neoscona subfusca</i>	<i>Neoscona theisi</i>
	
<i>Neoscona vigilans</i>	<i>Poltys nagpurensis</i>

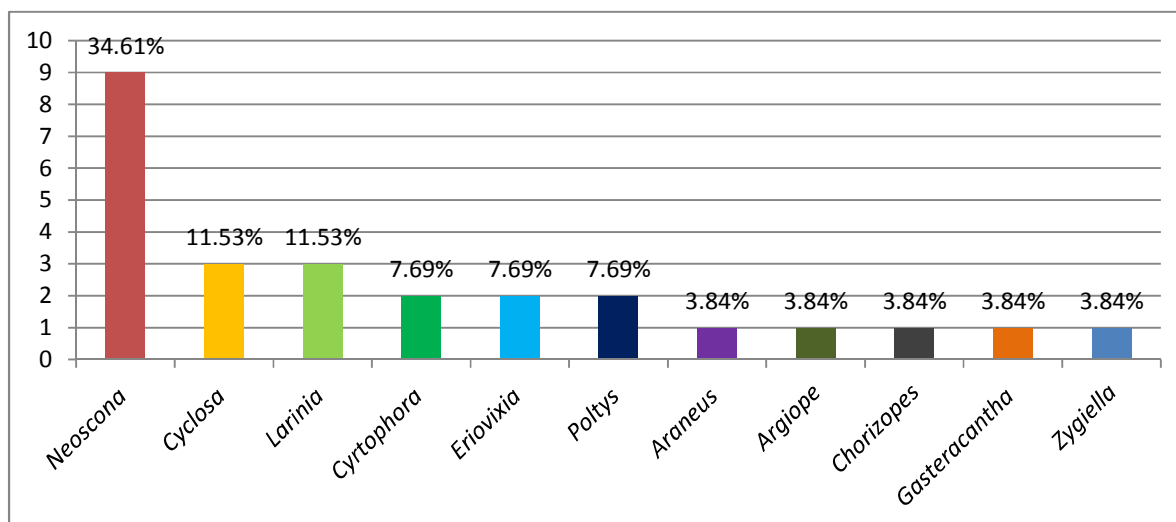
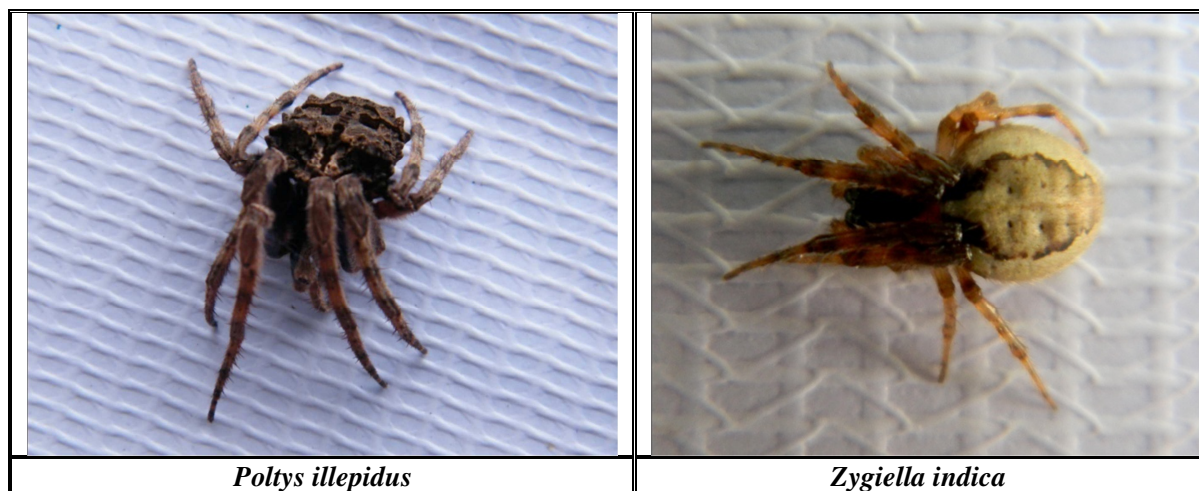


Fig. 2- Generic Diversity of Family Araneidae in Katepurna Sanctuary Akola, India

Results and Discussion

During the present study A total 11 genus and 26 species of family Araenidae (Arachnida: Araneae) were recorded from the study area during February 2015 to December 2016. (Table -1). *Neoscona* was the numerically predominant genus having 9 species (34.61%), followed by *Cyclosa* (11.53%), *Larinia* (11.53%), *Cyrtophora* (7.69%), *Eriovixia* (7.69%), *Poltys* (7.69%), *Araneus* (3.84%), *Argiope* (3.84%), *Chorizopes* (3.84%), *Gasteracantha* (3.84%), and *Zygiella* (3.84%). The actual photographs and percent occurrence of spiders from study area are given in Fig. 1 & Fig. 2. Most of the araneids are found on shrubs, herbs, tall trees, crevices etc. In *Neoscona* abdominal variations are

noted with respect to colour patterns.

The genus *poltys* is found on humps of tall trees. *Gasteracantha* on Lantana camera shrub during rainy season and genus *Larinia* on back side of leaves of *Lantana camera*. Earlier no work has been carried out in Katepurna sanctuary for spider diversity specially on family Araneidae, and this is the first report. During the present survey it is found that the diversity of genera is more around riparian habitats than that in the grassland. Season wise, maximum number of genera is recorded from September to December. Thus Katepurna contains various habitats with a rich spider fauna specially for Araneids.

Table-1: Spider genera and species of family Araneidae from Katepurna Sanctuary Akola (Maharashtra, India) during 2015-2016.

S. No.	Genus and Species
1.	<i>Araneus ellipticus</i> Tikader & Bal, 1981 Female
2.	<i>Argiope aemula</i> Walckenaer, 1842 Female
3.	<i>Chorizopes bengalensis</i> Tikader, 1975 Female
4.	<i>Cyclosa bifida</i> Doleschall, 1859 Male, Female
5.	<i>Cyclosa hexatuberculata</i> Tikader, 1982 Female
6.	<i>Cyclosa insulana</i> (Costa 1834) Female
7.	<i>Cyrtophora cicatrosa</i> Stoliczka, 1869 Female
8.	<i>Cyrtophora citricola</i> (Forsskal, 1775) Female
9.	<i>Eriovixia excelsa</i> Simon 1889 Female
10.	<i>Eriovixia laglaizei</i> Simon, 1877 Female
11.	<i>Gasteracantha cancriformis</i> Female
12.	<i>Larinia chloris</i> Audoin, 1825 Female
13.	<i>Larinia argiopiformis</i> Female
14.	<i>Larinia lineata</i> Female
15.	<i>Neoscona adianta</i> Female
16.	<i>Neoscona bengalensis</i> Female
17.	<i>Neoscona crucifera</i> Female
18.	<i>Neoscona mukerjei</i> Tikader, 1980 Female
19.	<i>Neoscona nautica</i> L. Koch, 1875 Female
20.	<i>Neoscona punctigera</i> , Male, Female
21.	<i>Neoscona subfusca</i> (C. L. Koch, 1837) Female
22.	<i>Neoscona theisi</i> Walckenaer, 1842 Female
23.	<i>Neoscona vigilans</i> Blackwall, 1865 Female
24.	<i>Poltys nagpurensis</i> Tikader, 1982 Female
25.	<i>Poltys illepidus</i> C. L. Koch, 1843 Female
26.	<i>Zygiella indica</i> Tikader & Bal, 1980 Male, Female

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