

PRELIMINARY INVESTIGATION OF SPIDER DIVERSITY IN KEDARNATH WILDLIFE SANCTUARY, UTTARAKHAND, INDIA

S. QUASIN AND V. P. UNIYAL

*Wildlife Institute of India, Chandrabani,
Dehradun, Uttarakhand (India).*

Introduction

Spiders (Order: Araneae) are one of the diverse and functionally important predators regulating the terrestrial arthropod populations (Riechert and Bishop, 1990; Coddington and Levi, 1991). Despite of their fundamental roles in the natural ecosystem, they have largely been ignored in conservational studies. India being a mega diverse country is rich in both flora and fauna, but sparse knowledge about the Himalayan diversity and distribution of spider fauna is known. The present study is carried out in the Himalayan region of Kedarnath Wildlife Sanctuary, Chamoli district (Uttarakhand), India. It is the first approach in this region to study the spider fauna. The aims of this study were to investigate the spider fauna in this region, thus, providing base line information for future studies.

Study Area

The study was conducted in Kedarnath Wildlife Sanctuary (30°25'-30°41'N, 78°55'-79°22'E), which is situated in Chamoli district, Uttarakhand (India). It has an altitudinal range from 1160 m to 7068 m amsl, covering an area of about 975 kms. It has dense forest of Chir pine (*Pinus roxburghii*), Oak (*Quercus semicarpifolia*), Birch (*Quercus leucotracophora*) and *Rhododendrons*. This region receives high precipitation and has diverse climatic conditions; thus is very diverse in both flora and fauna.

Material and Methods

Spider sampling was carried out in different forest types of Oak, *Rhododendrons* and Chir pine in Kedarnath Wildlife Sanctuary (KWS) during April - May, 2010. Spiders were collected by using mainly three methods: aerial hand collection; ground Hand collection and vegetation beating method. Spiders were also visually searched under rocks, fallen trees and logs. After collection the spider samples were preserved in 70% ethanol for further identification. All specimens were identified following the various keys and catalogues provided by Dayal (1935), Kaston (1978), Tikader (1980,1981), Tikader and Biswas (1981), Brignoli (1983), Davis and Zabka (1989), Platnick (2010), Biswas and Biswas (1992,2003,2004), Barrion and Litsinger (1995), Yin *et al.*, (1997) and Song and Zhu (1997).

Results and Discussion

A total of 64 species/morphospecies under 40 genus and 19 families (Table 1) were recorded during the six day survey in KWS. This area has very rich floral diversity. This attributes to the high diversity of invertebrate fauna. The moist climatic conditions of this area give way to dense vegetation in the forests which in turn helps web building spiders to build their webs in the tree foliages. This may be one possible reason that we collect the web builders in abundance from this area. Forest litter was about 3-5cms and was home for many

ground dwelling spiders like Sparassidae, Lycosidae and few species of Thomisidae like *Xysticus* sp. In six days of sampling, we documented 19 families which is about 11.4% of the total families found in India Sebastian

and Peter, (2009), thus this region promises to have a high diversity of spiders (Fig.1). Further investigation and sampling in this area will help in formulating a complete database of spider fauna from this region.

Table 1
Checklist of the Spider species/morphospecies from Kedarnath Wildlife Sanctuary, Uttarakhand, India.

Family	Genus/Species
1	2
Araneidae	<i>Araneus</i> sp.1
	<i>Araneus</i> sp.2
	<i>Argiope</i> sp.1
	<i>Cryptophora</i> sp.1
	<i>Cyclosa confragra</i> (Thorell, 1892)
	<i>Cyclosa</i> sp.1
	<i>Neoscona mukerjei</i> (Tikader, 1980)
	<i>Neoscona nautica</i> (L.Koch, 1875)
	<i>Neoscona</i> sp. 1
	<i>Parawixia dehaani</i> (Doleschall, 1859)
	<i>Parawixia</i> sp.1
Clubionidae	<i>Clubiona</i> sp.1
Dictynidae	<i>Dictyna</i> sp.1
	<i>Dictyna</i> sp.2
Gnaphosidae	<i>Gnaphosa</i> sp.1
	<i>Zelotes</i> sp.1
Linyphiidae	<i>Linyphia</i> sp.1
	<i>Linyphia</i> sp.2
	<i>Nerienne</i> sp.1
Lycosidae	<i>Hippasa agelenoides</i> (Simon, 1884)
	<i>Lycosa</i> sp.1
	<i>Pardosa</i> sp.1
	<i>Pardosa</i> sp.2
	<i>Pardosa sumatrana</i> (Thorell, 1890)
Miturgidae	<i>Cheiracanthium</i> sp.1
	<i>Cheiracanthium</i> sp.2
Oxyopidae	<i>Oxyopes javanus</i> (Thorell, 1887)
	<i>Oxyopes</i> sp.1
	<i>Oxyopes</i> sp.2

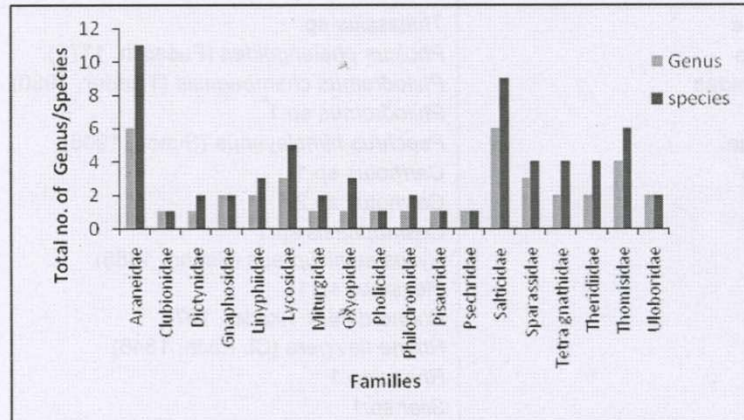
Contd...

1	2
Pisauridae	<i>Thalassius</i> sp.
Pholicidae	<i>Pholcus phalangoides</i> (Fuesslin, 1775)
Philodromidae	<i>Philodromus chambaensis</i> (Tikader, 1980)
	<i>Philodromus</i> sp.1
Psechridae	<i>Psechrus himalayanus</i> (Simon, 1906)
Salticidae	<i>Carrhotus</i> sp.1
	<i>Carrhotus</i> sp.2
	<i>Cosmophasis</i> sp.1
	<i>Hyllus semicupreus</i> (Simon, 1885)
	<i>Plexippus</i> sp.1
	<i>Rhene danieli</i> Tikader, 1973
	<i>Rhene flavigera</i> (Cl. Koch, 1846)
	<i>Rhene</i> sp.1
	<i>Siler</i> sp.1
Selenopidae	<i>Selenops radiatus</i> (Latreille, 1819)
	<i>Heteropoda</i> sp.1
Sparassidae	<i>Heteropoda venatoria</i> (Linnaeus, 1767)
	<i>Olios</i> sp.1
	<i>Pseudopoda promta</i> (O.P. Cambridge, 1885)
Tetragnathidae	<i>Leucage decorata</i> (Blackwall, 1864)
	<i>Leucage</i> sp.1
	<i>Tetragnatha</i> sp.1
	<i>Tetragnatha</i> sp.2
Theridiidae	<i>Achaearanea mundula</i> (L. Koch, 1872)
	<i>Achaearanea</i> sp.1
	<i>Argyrodes</i> sp.1
	<i>Argyrodes</i> sp.2
Thomisidae	<i>Diaea</i> sp.1
	<i>Lysiteles</i> sp.1
	<i>Lysiteles</i> sp.2
	<i>Thomisus</i> sp.1
	<i>Xysticus crocerus</i> (Fox, 1937)
	<i>Xysticus</i> sp.1
Uloboridae	<i>Ulobous</i> sp.1
	<i>Zosis geniculata</i> (Olivier, 1789)

Acknowledgements

We are thankful to Director and Dean, Wildlife Institute of India for providing necessary facilities. Thanks also to the Department of Science and Technology (DST) for providing financial assistance. Uttarakhand Forest Department is also thanked for providing necessary permissions and logistic support.

Fig. 2



Spiders recorded in KWS.

SUMMARY

A study was conducted to document spider diversity in Kedarnath Wildlife Sanctuary, Chamoli district, Uttarakhand. The Area is dense forest of Chir pine (*Pinus roxburghii*), Oak (*Quercus semicarpifolia*), Birch (*Quercus leucotrichophora*) and Rhododendrons. A total of 64 species/morphospecies under 40 genus and 19 families were recorded. Majority of the spiders collected were web forming due to moist climate and dense vegetation.

Keywords: Spider diversity, Kedarnath Wild life Sanctuary, Sparassidae, Lycosidae, Thomisidae, *Xysticus* sp.

केदारनाथ वन्यप्राणी अभयारण्य, उत्तराखण्ड, भारत में मकड़ियों की विविधता का प्रारम्भिक अन्वेषण
एस० कासिन व वी० पी० उनियाल

सारांश

केदारनाथ वन्य प्राणी अभयारण्य, जिला चमोली उत्तराखण्ड में मकड़ियों की विविधता प्रलेखित करने के लिए एक अध्ययन संचालित किया गया। यह क्षेत्र सामान्य चीड़ (*पाइनस राक्सबर्घिआई*), बांज (*क्वेरकस सेमेकार्पिफोलिया*), बर्च (*क्वेरकस ल्यूकोट्रिकोफोरा*) और रहाडोड्रेण्डनो का सघन वन है। यहां से 19 वंशों और 40 प्रजातियों में पड़ती 64 जातियाँ/उपजातियाँ आलेखित की गईं। यहाँ से संगृहित हुई अधिकांश मकड़ियाँ आर्द्र जलवायु और सघन वनस्पति होने के कारण मकड़जाल बुनने वाली जातियाँ हैं।

References

- Biswas, B. and K. Biswas (2004). Araneae: Spiders. In: Fauna of Manipur, *State Fauna Series* 10, Zoological Survey of India: 25-46.
- Biswas, B. and K. Biswas (2003). Fauna of Sikkim (Araneae: Spiders), *State fauna series*, 9: 67-100.
- Biswas, B. and K. Biswas (1992). Fauna of West Bengal (Araneae: Spiders), *State fauna Series*, 3: 357-500.
- Barrion, A. T and J. A. Litsinger (1995). *Riceland spiders of south and Southeast Asia*, CAB International, Cambridge, UK: 1-700
- Brignoli, P. M. (1983). *A catalogue of the Araneae: described between 1940 and 1981*. Manchester Univ. Press. 755 pp.
- Coddington, J. A. and H. W. Levi (1991). Systematics and evolution of spiders. *Ann. Rev. Ecol. Syst.*, 22: 565-592.
- Davies, V. T. and M. Zabka (1989). Illustrated keys to the genera of jumping spiders (Araneae: Salticidae) in Australian. *Mem. Qd. Mus.* 27: 189-266.
- Dayal, S. (1935). Spiders of Lahore. *Bulletin of the Department of Zoology*, Punjab University 1: 117-252.
- Kaston, B. J. (1978). *How to know spiders? The pictured key Nature series*. Wm. C. Brown. Co. Publishers. Dubuque, Iowa, USA: 1-272.
- Platnick, N. I. (2010): The world spider catalog, version 10.5. American Museum of Natural History. <http://research.amnh.org/iz/spiders/catalog/INTRO3.html>.
- Sebastian, P. A. and K. V. Peter (2009). *Spiders of India*, First edition, Universities Press, Hyderabad
- Song, D. X and M. S. Zhu (1997). *Fauna Sinica: Arachnida: Aranaea: Thomisidae, Philodromidae*, Science Press, Beijing, China: 1-256.
- Tikader, B. K. (1980). *Fauna of India - Araneae: Spiders*, Vol. I (Araneidae & Gnaphosidae). Zoological Survey of India. 448 pp.
- Tikader, B. K. and B. Biswas (1981). *Spider fauna of Calcutta and vicinity: Part 1*. Records of Zoological survey of India, Occasional Paper 30: 1-49.
- Tikader, B. K. (1982). *Fauna of India - Araneae: Spiders*, Vol. II (Thomisidae and Lycosidae). Zoological Survey of India. 533 pp.
- Yin, C. M., J. F. Wang, M. S. Zhu, L. P. Xie, X. J. Peng and Y. H. Bao (1997). *Fauna Sinica: Arachnida: Araneae: Araneidae*. Science Press, Beijing, China: 1-460.
-

Plate 1



Pritha sp.



Thalassius sp.



Linyphia sp.



Parwixia dehaani



Leucage decorata sp.



Heteropoda venatoria

Spiders collected from the KWS