Impact Factor (SJIF): 6.092 E-ISSN: 2583-1615

International Journal of Research in Academic World

Received: 25/June/2024 IJRAW: 2024; 3(8):72-77 Accepted: 30/July/2024

Diversity of Jumping Spiders in and around Khamgaon Region, District Buldhana (M.S).

[*1]Jyoti N Sharma

[*1]Department of Zoology, S. Science, Arts and Commerce College, Khamgaon, Buldhana, Maharashtra, India.

Abstract

Jumping spiders belongs to Family Salticidae it is the largest family of Order Araneae. Jumping spider are ubiquitous and found mostly in a variety of habitats around the world and have excellent vision as compared to other Arthropods. They are able to jump 50 times over their body length. They play a vital role in ecosystem and agricultural area. The main objective of the present study is to explore the diversity of jumping spiders in and around Khamgaon region of Maharashtra. The present study was conducted over a period of July 2023 to April 2024 to determine diversity and occurrence of jumping spiders. A total 10 number of Jumping spider species belonging to Family Salticidae were collected by using Hand picking, Inverted umbrella technique and Visual search method. The Jumping Spiders were identified up to family level. In Family Salticidae the jumping spider species belonging to genus Plexippus, is most abundant followed by genus Hasarius and Phintella observed more than other species of the same family. The genus Plexippus show rich diversity in and around the study area as compared to other species of family Salticidae.

Keywords: Jumping spider, diversity, hand picking, inverted umbrella technique and visual search, plexippus, salticidae

Introduction

Jumping spiders, belonging to the family Salticidae are fascinating creatures known for their agility and unique hunting techniques. The Salticidae family includes over 600 described genera and more than 6,000 species making it the largest family of spiders accounting for 13% of all spiders species. Jumping spiders (salticidae) are ubiquitous pets, taxonomically different, locally abundant, diurnal and fairly easy to capture. The jumping spiders found mostly in a variety of habitats around the world. They mostly live in Tropical forest, Temperate forest, Deserts, Mountains, Micro habitat such as garden, under rock, sand, tree canopies, leaf litters and also found in and around residential area. Jumping spiders have excellent vision among arthropods. Jumping spiders (Salticidae) can move by walking, running, jumping or leaping and their body structure is perfectly adapted for prey capture. They are small and scrappy carnivores, their average body length measures about 1 centimeter. Even the biggest among them is measures about 2 centimeters. The jumping spider has the ability to jump quite well reaching distances over 50 times its body length. (Richman *et al* 1992) [18].

Jumping Spiders (Salticidae) can Easily Distinguished by the Following Features

Jumping spiders are easily distinguishable from other spider families due to their eye patterns and the shape of their cephalothorax. Their front four legs are generally larger than the hind four, and they use their legs for jumping. Unlike other families, their faces are roughly rectangular surfaces perpendicular to their direction of motion. A chitin-containing exoskeleton surrounds the body and separates it into two parts: the cephalothorax (head) and abdomen. Jumping spiders have a varied diet, feed on a variety of insects. Their prey is usually smaller than themselves, but they have been observed tackling larger prey as well. Common insect prey includes flies, crickets, moths, and beetles. They are skilled hunters, using their excellent vision and agility to stalk and capture their prey. Mating in jumping spiders typically involves elaborate courtship rituals. Jumping spiders have an average lifespan of 6 to 12 months in the wild, but they can live up to 18 months in captivity.

Jumping spiders are skilled insect hunters. By keeping populations of various insects in check, they help to maintain a healthy balance in the ecosystem. They contribute to the reduction of agricultural pests, thus aiding in crop protection without the need for excessive pesticide use. There was no previous study on jumping spider species in Khamgaon taluka, so the present study was conducted over a period of July 2023 to April 2024.There is seasonal and habitat based occurrences of jumping spiders observed in the present research work. Hence a very vast and thorough investigation on spider diversity is recommended. As these tiny creature are one of the basic link in the food web.

***Corresponding Author:** Jyoti N Sharma

Study Area

Khamgaon taluka is known for being biggest emerged city in Buldhana district of Maharashtra. It is the largest city in Buldhana district. Khamgaon is a major center for Silver and Cotton textile production. It co-ordinate for latitude 20,6833 and longitude is 76,5666. It has extreme weather the winter was very cold and where summer has very hot Khamgaon is known for being one of the hottest cities in Maharashtra with temperature often hitting 47-48 degrees Celsius during summer. Also, the rainfall is pretty low in the region which has led to water scarcity many times in the city over the past but but in recent year the rainfall was quite good

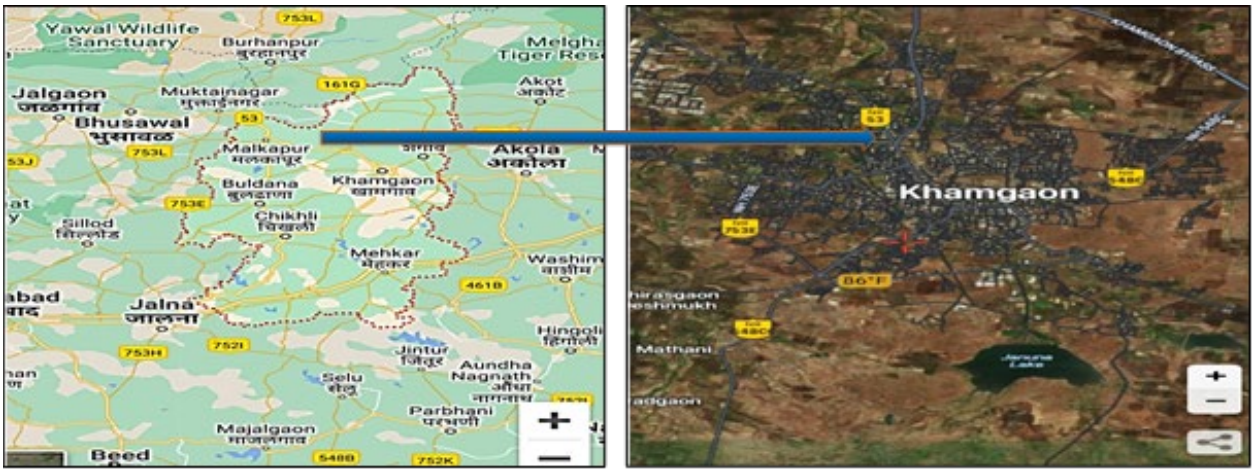


Fig 1: Geographical location of study area

Material and Methods

There was no previous study on jumping spider species in Khamgaon taluka, so the present study was conducted over a period of July 2023 to April 2024 the main objective is to gather data on jumping spiders in the study area and To gain knowledge about the diversity of jumping spiders (salticidae) living in and around the Khamgaon area.

Collecting Methods

Hand Collection: the simplest method involves placing a collection tube or container beside the spider and gently tapping it into the tube with the lid.

Inverted Umbrella Technique: to collect spiders living among foliage and shrubs, use a light-colored inverted umbrella. Shake branches with one hand while holding the umbrella with the other. Spiders will dislodge and fall into the umbrella below.

Visual Search: walk through the habitat and search visually for jumping spiders, they are often spotted by carefully scanning with suitable habitat such as checking under loose bark, fallen wood, debris, rocks etc. Walls of houses, buildings and especially basements are also excellent spider hunting grounds. This method can be especially interesting at night because a completely different fauna emerges after dark because some species of jumping spiders are more active at night time. Collected species are Photographed and identified with the help of World spider catalogue (2021). (Pawan U. Gajbe) (2021), available literature, Research paper and Identification keys etc.

Observation and Result

A comprehensive survey was carried out in various habitat of region to study the diversity and occurrence of Jumping spider this survey was carried out from July 2023 to April 2024 in an around the Khamgaon area. In the present study total 10 species of Jumping spider belonging to Order-Araneae of Family Salticidae where recorded from all the study sites ecosystems in and around the study area. They are distributed in 10 genera Viz. *Cosmophasis, Habronattus, Hasarius, Lyssomanes, Menemerus, Metacyrba, Paramaevia, Phintella, Plexippus and Telamonia.*

Table 1: Jumping Spider species of Khamgaon.

Sr. No.	Common Name	Order	Family	Genus	Species
1	Shiny jumping spider	Araneae	Salticidae	Cosmophasis	*Cosmophasis umbratica*
2	Paradise spider	Araneae	Salticidae	Habronattus	*Habrocestum mexicanum*
3	Adanson House Jumper	Araneae	Salticidae	Hasarius	*Hasarius adansonii*
4	Mongolia green spider	Araneae	Salticidae	Lyssomanes	*Lyssomanes viridis*
5	Half edged wall jumping spider	Araneae	Salticidae	Menemerus	*Menemerus semilimbatus*
6	Ribbon jumping spider	Araneae	Salticidae	Metacyrba	*Metacyrba taeniola*
7	Jumping spider	Araneae	Salticidae	Paramaevia	*Paramaevia poultoni*
8	Jumping spider	Araneae	Salticidae	Phintella	*Phintella vittata*
9	Pantropical jumping spider	Araneae	Salticidae	Plexippus	*Plexippus paykulli*
10	Two striped jumping spider	Araneae	Salticidae	Telamonia	*Telamonia dimidiata*

Table 2: Family and Genus wise Distribution of Jumping Spider species.

Sr. No.	Family	Genus	Species Richness	Percentage
1	Salticidae	Cosmophasis	01	7.14%
2	Salticidae	Habronattus	01	7.14%
3	Salticidae	Hasarius	02	14.28%
4	Salticidae	Lyssomanes	01	7.14%
5	Salticidae	Menemerus	01	7.14%
6	Salticidae	Metacyrba	01	7.14%
7	Salticidae	Paramaevia	01	7.14%
8	Salticidae	Phintella	02	14.28%
9	Salticidae	Plexippus	03	21.42%
10	Salticidae	Telamonia	01	7.14%
		Total	14	100%

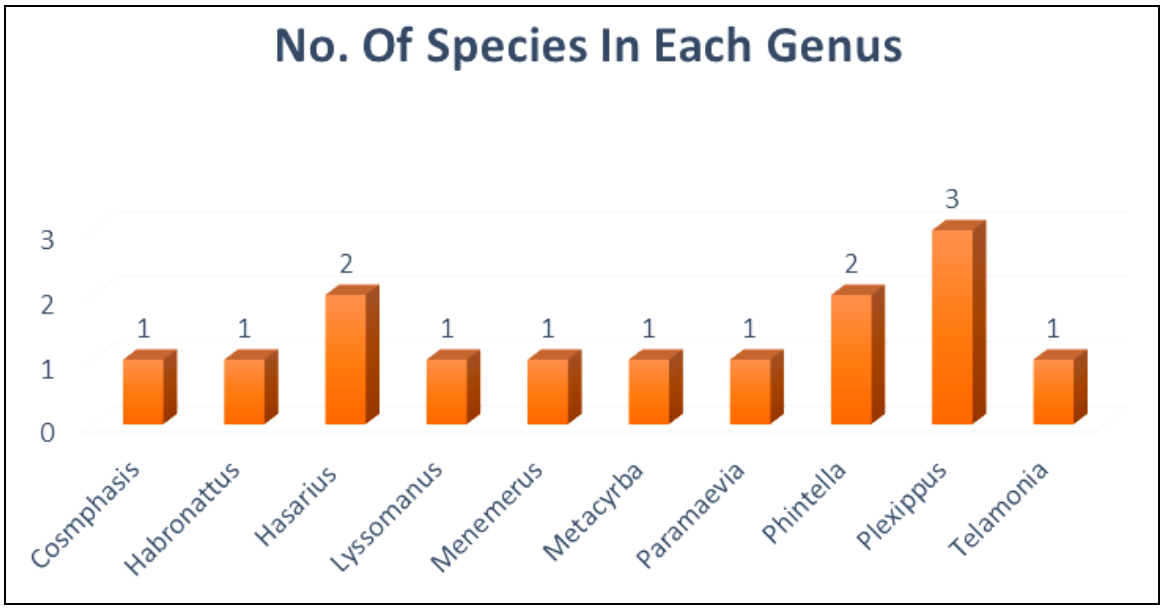


Fig 2: Jumping spider Species in each Genus

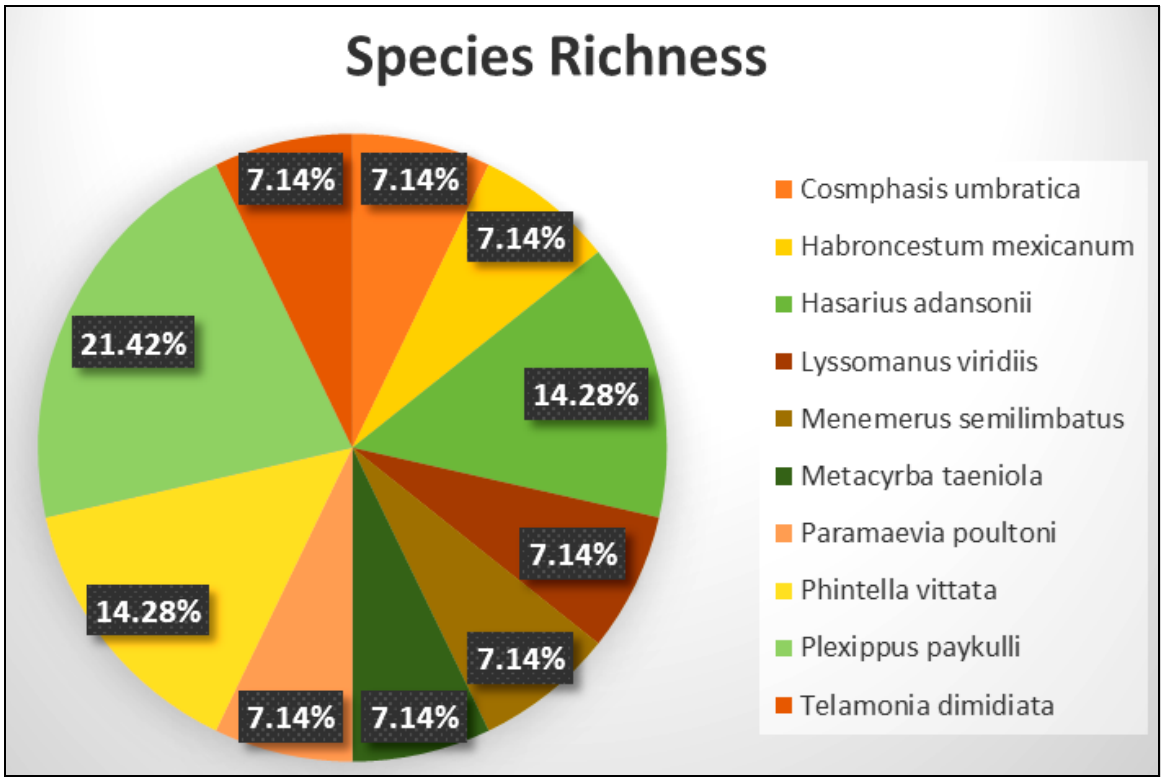


Fig 3: Species Richness and percentage

1. *Cosmophasis umbratica*

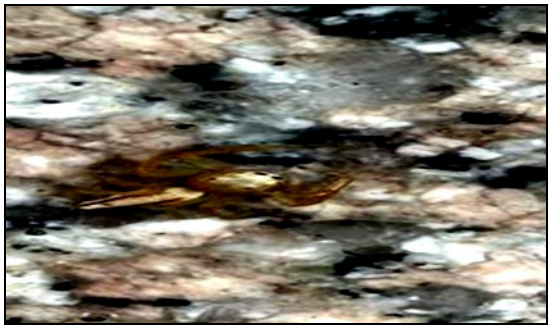
2. *Habrocestum mexicanum*

3. *Hasarius adansonii*

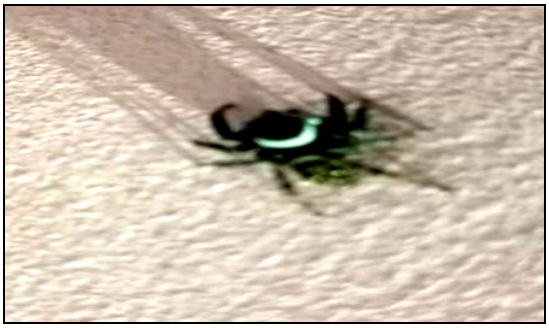
4. *Lyssomanes viridis*

5. *Menemerus semilimbatus*

6. *Metacyrba taeniola*



7. *Paramaevia poultoni*



8. *Phintella vittata*

9. *Plexippus paykulli*

10. *Telamonia dimidiata*

Fig 4: Photographs of jumping spider species of Khamgaon area.

Discussion

A comprehensive survey p was made July 2023 to April 2024 in an around Khamgaon region regarding to study the diversity and distribution of Jumping spider. The topic tries to cover all of Jumping spider diversity and its composition in respective area for comparison of study sites the diversity of living organism classified in the level of organisation such as order family genus and species. A total 10 number of spider species belonging to 10 genera and 1 Family were recorded from the study site. The Pantropical jumping spider species belonging to genus Plexippus is most abundant and observed more than other species of the same family. The pantropical jumping spider has rich diversity in and around the area. followed by Hasarius and Phintella which belonging to the same family salticidae.

Also same study was carried out in various region of India and other countries to gain a knowledge of diversity of jumping spiders in various habitats. In Western Ghats throws up a new species of jumping spiders has been discovered from the Shendurney Wildlife Sanctuary. The new species, which belongs to the jumping spider genus Pancorius by Sebastian P.A in 2023. Maheshwari R Nayan and Chopda Z Manoj Kumar in 2017 studied on S. Jagannathae is recorded from North Maharashtra Region, for the first time Record of Stenaelurillus jagannathae from Jalgaon, Maharashtra, India. Kanesharatnam Nilani & Benjamin P Suresh in 2018 recorded A new genus and three new species of jumping spiders (Araneae: Salticidae) from Sri Lanka. National Institute of Fundamental Studies, Hantana Road, Kandy, Sri Lanka. Gajbe U Pawan (2020) [9] First record of some jumping spiders (Arachnida: Araneae: Salticidae) from Pench National Park, Maharashtra State, India. Studying in animal diversity in Pench National Park, Maharashtra State, India, five species of jumping spiders were identified. Dar Ahmed Feroz (2014): Study of Spiders fauna from Wadali Lake, Amravati of Vidarbha Region. Wadali Lake and Vidarbha Campus. Over all 35 mature male and female spiders were collected, belonging to 13 families, and 21 species. You-Hui Bao and Xian Jin Peng (2002) [3]: six new species of jumping spiders (salticidae) Hui sun experiment Forest station, Taiwan. Jackson R Robert, Pollard D Simon, Nelson J Ximena, Edwards G. B. and Barrion T Alberto. (2000): studied on Jumping spiders (Araneae: Salticidae) that feed on nectar New Zealand. The world spider catalog (WSC, 2021) took account of 49,783 species in 4234 genera belonging to 129 families. Out of them, only 1877 species belonging to 479 genera in 60 families are reported in India, though in recent updates, 2344 species under 596 genera grouped into 65 families are recorded in India. (Rajendra Singh, Garima Singh 2022) [21].

Conclusion

In present there is no report on diversity of Jumping spider in Khamgaon taluka till a date, hence this topic is selected to study the diversity of Jumping spiders and Conducted over the period from July 2023 to August 2024.The salticidae family is most diverse family in term of species richness in the study area. Jumping spider are harmless and highly beneficial. They don't sting, bite or carry diseases. Jumping spider, both at larval and adults are also important food for many animals. They hold an important positions in many food webs. The study range support the rich diversity of Jumping spider with the wide variety of vegetation and tropical area and manmade structures. Which provide them a ideal breeding habitat. And attempt made in the study to show the importance of a local area. As a model geographical regions. With diverse Habitat and suggesting the importance of local population in long term biodiversity studies and conservation. Therefore it is imperative to understand the relative dependence on the jumping spider spaces on their habitat. Considering some correlations will help in putting a check under decreasing number of Jumping spider due to rapid urbanization and habitat destruction. Further studies on local jumping spider covering various otherwise aspects would undoubtedly contribute a lot towards solving the global issues of conservation of Nature and it's depleting studies.

References

1. Ahmed J, Khalap R, Kumbhar S. Hill DE, Pearce RJ, Mohan k. 2019: Field notes on jumping spider Telemonia diamata in Maharashtra (Araneae: Salticidae; Plexippina). Peckhmia.
2. A Kanesharatnam Nilani & Benjamin P Suresh. New genus and three new species of jumping spiders (Araneae: Salticidae) from Sri Lanka. 1, 2 National Institute of Fundamental Studies, Hantana Road, Kandy, Sri Lanka, 2018.
3. Bao Hui You and Peng Jin Xian. Six New Species of Jumping Spiders (Araneae: Salticidae) from Hui-Sun Experimental Forest Station, Taiwan. Department of Zoology, Hunan Normal University, Changsha 410081, China and Institute of Zoology, Chinese Academy of Sciences, Beijing 100080, China, 2002.
4. Brandt E Erin. Sasiharan Yoshan, Elias O Damian, Mhantre. Natasha. Jump takeof in a small jumping spider Department of Environmental Sciences, Policy, and Management, University of California, Berkeley, USA and Department of Biology, University of Western Ontario, London, ON, Canada, 2021.
5. Dar Ahmed Feroz. Study of Spiders fauna from Wadali Lake, Amravati of Vidarbha Region. Department of Zoology, Govt. Vidharbha Institute of Science & Humanities, Amravati 444604(MS) India, 2015.
6. David E. Hill. Jumping spider feet (Araneae, Salticidae) Version 3 213 Wild Horse Creek Drive, Simpsonville, South Carolina, 2006.
7. Ehmaan J William, Heins Chad, Jacobsmeyer Diana, Moravec Julia and Sandrich Matthew. New records for Minnesota jumping spiders (Araneae: Salticidae) including Habronattus spp. with consideration of future state Special Concern and Threatened species listings, Seattle University, 901 12th Avenue, Seattle, WA 98112 Bethany Lutheran College, 2016.
8. Ehmann J William. "Conservation Biology of Special Concern Jumping Spiders (Araneae: Salticidae) of Minnesota Associate Professor of Biology Plattsburgh State University of New York (SUNY), 2002.
9. Gajbe U. Pawan. First record of some jumping spiders (Arachnida: Araneae: Salticidae) from Pench National Park, Maharashtra State, India. Department of Zoology, Shri Mathuradas Mohota College of Science, Nagpur 440009, Maharashtra, India, 2020.
10. Heinze Stanley. Neurobiology: Jumping Spiders Getting On Board Department of Gynecology and Obstetrics, Stanford University School of Medicine, Stanford, CA 94305, USA, 2014.
11. Hill E David. The jumping behavior of jumping spiders: a review (Araneae: Salticidae). This paper is released under a Creative Commons Attribution International 4.0

(CC BY 4.0) license. 213 Wild Horse Creek Drive, Simpsonville, SC 29680-6513, USA, 2018.
12. Huseynov F. Elchin. Natural prey of the jumping spider Menemerus taeniatus (Araneae: Salticidae). Institute of Zoology, Azerbaijan Academy of Sciences, Block 504, Passage 1128, Baku 370073, Azerbaijan, 2005.
13. Jackson RR and Pollard SD. Predatory Behaviour of Jumping Spider. Department of Zoology, University of Canterbury, Christchurch, New Zealand, 1996.
14. Jakson R Robert, Pollard D Simon, Nelson J Ximen, Edward G. B and Barrion T Alberto. Jumping spiders (Araneae: Salticidae) that feed on nectar. Department of Zoology, University of Canterbury, Christchurch 8002, New Zealand, 2001.
15. Madee T and S Bumroongsook. Life History of Jumping Spiders, Plexippus paykulli Department of Plant Production Technology, Faculty of Agricultural Technology King and Mongkut's Institute of Technology Ladkrabang, Bangkok 10520, Thailand, 2017.
16. Maheshwari R Nayan and Chopda Z Manoj Kumar. Record of Stenaelurillus jagannathae from Jalgaon, Maharashtra, India. Department of Zoology, Animal house Division, Moolji Jaitha College, North Maharashtra University, Jalgaon, Maharashtra, India. Seven species of Genus Stenaelurillus 'Simon (1885) are reported from India. Out of this S. jagannathae has been recorded, 2017.
17. Nyffeler Martin Edward GB and Krysko L Kenneth. A vertebrate-eating jumping spider (Araneae: Salticidae) from Florida, USA Section of Conservation Biology, Department of Environmental Sciences, University of Basel, CH-4056, Basel, Switzerland, 2017.
18. Richman B David and Jackson R Robert. A review of the ethology of jumping spiders (Araneae, Salticidae). Department of Entomology, Plant Pathology and Weed Science, New Mexico State University, Las Cruces, New Mexico 88003, USA and Robert R. Jackson Department of Zoology, University of Canterbury, Christchurch, New Zealand, 1992.
19. Samuel Aguilar-Arguello1 & Nelson J Ximena: Jumping spiders: An exceptional group for comparative cognition studies. School of Biological Sciences, University of Canterbury, 2021.
20. Schadegg Philip and King R Joshua. Feeding habits of the jumping spider Anasaitis canosa (Araneae: Salticidae) in the field. University of Central Florida, Biology Department, 410 Libra Drive, Orlando, Florida 32816, USA, 2024.
21. Singh Rajendra Singh, Garima. Diversity of spiders (Chelicerata: Araneae) in Uttar Pradesh and Uttarakhand, India Department of Zoology, Deendayal Upadhyaya University of Gorakhpur, Gorakhpur, Uttar Pradesh, India, 2022.
22. SunYuheng Brandt E. rin. Elias O Damian · Rosenthal Malcolm Kamath Ambika. Jumping Spiders (Habronattus clypeatus) Exhibit Substrate Preferences that Partially Maximize Vibration Transmission Efciency. Department of Environmental Science, Policy and Management, University of California Berkeley, Berkeley, CA 94720, USA, 2021.
23. https://www.asianarachnology.com/field-equipment-techniques-for-spider-collection/
24. Caleb John TD and Acharya Shelley 2020: Jumping spiders of the genus Phintelloides from india, with the description of a new species (Aranea : Salticidae: Chrysillini)
25. World Spider Catalog 2020: World Spider Catalog. Natural History Museum Bern. Available at https://wsc.nmbe.ch, version 20.5