

## A Checklist of family Salticidae (Arachnida: Araneae) from some localities of Pakistan

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### ABSTRACT

Salticid fauna of Pakistan had not been comprehensively explored. This study was an attempt to provide inventory of salticids, which would be the baseline documentation for future studies in Pakistan. This survey was conducted from June 2013 to May 2017, to collect jumping spiders from twelve different localities of Pakistan. Specimens (2556) were collected which belong to twenty-eight species and twenty-one genera. This study added twenty-three first records of species from ten genera. The female of *Phintella indica* is in this study for the first time.

**Key words:** Distribution, taxonomy, jumping spiders, diurnal hunters

### INTRODUCTION

Salticidae is the largest family of spiders that comprises of 625 genera and 5979 species (World Spider Catalog, 2017). Jumping spiders have diverse body forms and behaviors (Maddison *et al.*, 2014). Despite the highest diversity of jumping spiders in the world among the Araneae fauna (Bao & Peng, 2002), they have been poorly studied in Pakistan. In Global Species Database of Salticidae, thirty three salticid species have been reported from Pakistan (Proszynski, 2016). Among these eleven were reported from Punjab, only one from Kashmir and Balochistan each and nineteen are uncertain species. However, according to worldwide database of jumping spiders thirty nine species of salticidae were recorded from Pakistan (Metzner, 2017). Due to diverse range of habitats such as grasslands, forests, deserts, mountains and other ecosystems, there is a possibility of greater diversity of salticids in Pakistan

Perveen *et al.* (2012) reported only two species, that belong to different genera from Peshawar. Parveen *et al.* (2007) recorded nine genera with twenty-seven salticid species from Punjab. Four species of salticids were reported from Sargodha by Mukhtar *et al.* (2012). The checklist of spider fauna from Cholistan and

neighbouring areas has not reported any salticid species (Sial *et al.*, 2012). Another checklist of spider fauna from Sheringal, Khyber Pakhtunkhwa has not presented any record of salticids (Perveen & Khan, 2015). Only two species, *Plexippoides flavescens* (O. Pickard-Cambridge, 1872) and *Menemerus marginatus* (Kroneberg, 1875) were recorded from Balochistan province (Bauer *et al.*, 2015). Ghazanfar *et al.* (2016) reviewed all checklists of spiders and concluded that only seven species of salticids were recorded from Punjab, twenty six from Sindh and one from Khyber Pakhtunkhwa. More extensive and serious efforts are needed to explore salticid diversity in Pakistan. This study aimed to develop a comprehensive biodiversity inventory of family salticidae from Pakistan.

### MATERIALS AND METHODS

Salticids were collected from localities like Jallo park (Lahore), Jinnah garden (Lahore), Botanical garden of University of the Punjab (Lahore), Kallar Kahar lake (Chakwal), Hastal village (Chakwal), Hazara University (Mansehra), Pai Reserve Forest (Sakrand), Lal Suhanra National Park (Bhawalpur), Derawar Fort (Bhawalpur), Islamia University

(Bahawalpur), Bhakkar and Dera Bakha at Sutlej river (Bahawalpur) as shown in(Fig.1).

Hand picking and jerking were the most effective and useful method due to their wandering and predatory nature. Specimens were collected directly from the ground or by picking up substrate e.g. leaf litter, bunches of grass. For the jerking method, a cloth was laid on the ground underneath contiguous branches of trees/shrubs. The sampled branches were shaken by hand, beating the foliage and their trunks with mallets for 30 seconds to dislodge spiders. Then spiders dropped on the cloth were collected. The plastic bags and glass vials were

also used to capture the spiders because they were very active. Specimens were washed with 95% alcohol and preserved in absolute alcohol with the proper labeling of collection site, date of collection, collector name and other important notes. Identifications up to species level was done by using the historic keys to the salticid groups by Simon (1897-1903), literature cited within the “World Spider Catalog” (2017) and the “Global Species Database of Salticidae” (Proszynski, 2016). Specimens housed at room temperature in Arachnology Lab, Department of Zoology, University of the Punjab, Quaid-i-Azam Campus, Lahore, Pakistan.

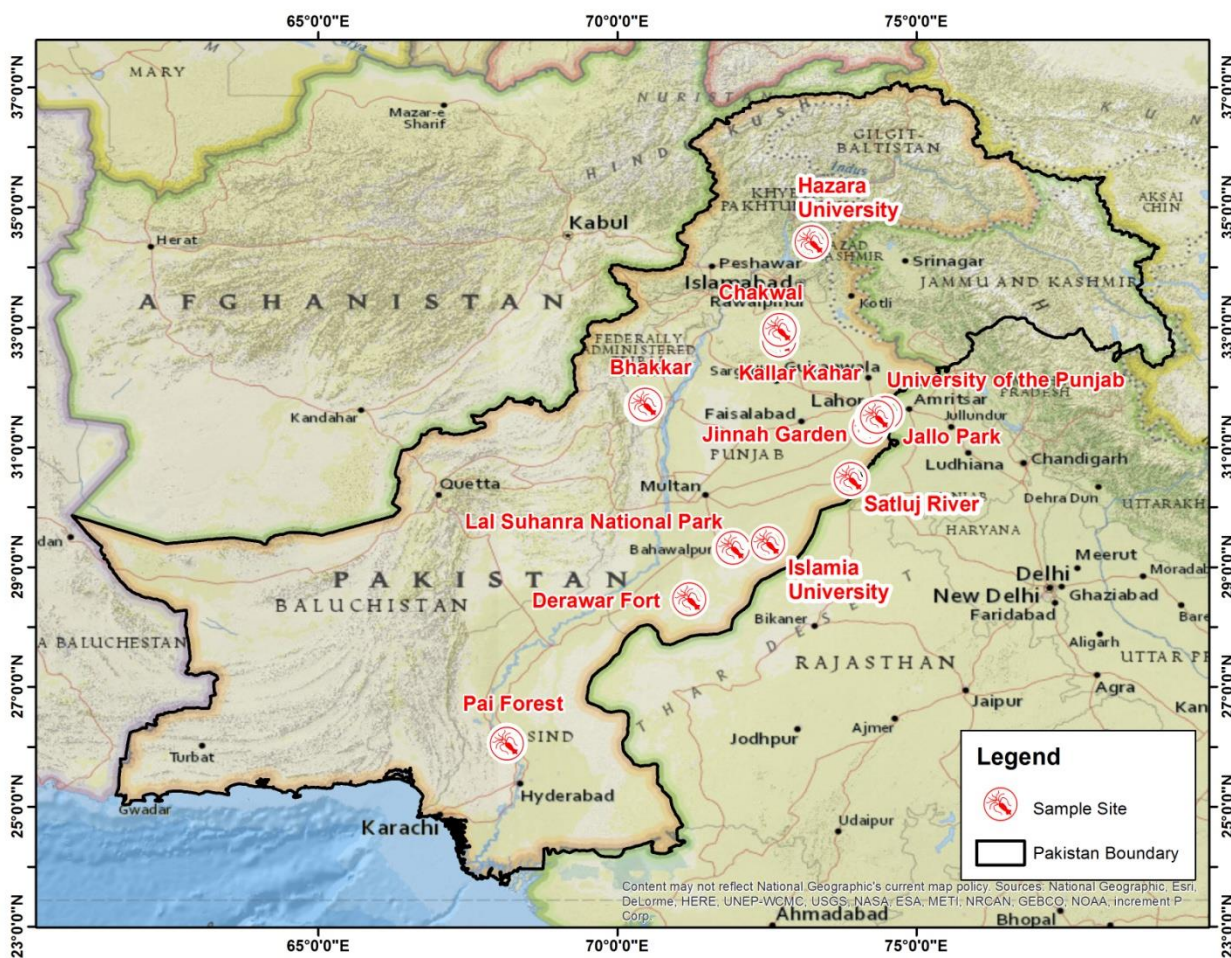


Fig. 1: Map showing different collection sites of salticids from Pakistan

## RESULTS

A total of 2556 salticids were collected from twelve localities and identified to species level (Table I). Collected specimens belong to twenty two genera and twenty eight species. Due to immature specimens in genera *Siler*, *Rhene*, and *Sitticus*, their species could not be identified. The most speciose genus was *Myrmarachne* with four species. The most

dominant species were *Thyene imperialis*, *Menemerus marginatus*, *Menemerus bivittatus* and *Carrhotus tristis*. However, the least number of specimens were recorded from *Sitticus sp.*, *Titanattus cretatus*, *Siler sp.*, *Rhene sp.* and *Chrysilla lauta*. This study added first record of twenty-three species and ten genera listed in (Table I). This suggests that Pakistan has reasonable high diversity of salticids that needs to be explored more extensively.

**Table I:** Checklist of salticids biodiversity from Pakistan. All species are new records to Pakistan except no. 9, 12 and 20.

Sr. #	Species	No of specimens	Sex	Distribution	Coordinates
1	<i>Bianor maculatus</i> (Keyserling, 1883)	180	♂ ♀	Botanical garden, University of the Punjab, Lahore Hastal village, Chakwal	31.5004N, 74.3008E  28.6377N, 77.0490E
2	<i>Carrhotus tristis</i> Thorell, 1895	250	♂	Pai Forest, Sakrand Islamia University Bhawalpur	26.0593N, 68.1346E 29.3960N, 71.6626E
3	<i>Chrysilla lauta</i> Thorell, 1887	12	♂	Lal Suhanra National Park, Bhawalpur	29.3170N, 71.9045E
4	<i>Harmochirus brachiatus</i> (Thorell, 1877)	44	♂ ♀	Botanical garden , University of the Punjab, Lahore Hastal village, Chakwal	31.5004N, 74.3008E  28.6377N, 77.0490E
5	<i>Hasarius adansoni</i> (Audouin, 1826)	59	♂ ♀	Botanical garden , University of the Punjab, Lahore	31.5004N, 74.3008E
6	<i>Icius alboterminus</i> (Caleb, 2014)	10	♂	Hastal village, Chakwal Pai Forest, Sakrand	28.6377N, 77.0490E 26.0593N, 68.1346E

7	<i>Langona bristowei</i> Berland & Millot, 1941	140	♂	Botanical garden , University of the Punjab, Lahore Pai Forest, Sakrand	31.5004N,74.3008E  26.0593N, 68.1346E
8	<i>Langona alfensis</i> Heciak & Prószyński, 1983	100	♀	Pai Forest, Sakrand	26.0593N, 68.1346E
9	<i>Marpissa tigrina</i> Tikader, 1965	36	♂	Kallar Kahar, Lahore Jallo Park, Lahore Jinnah Garden, Lahore Botanical garden , University of Punjab Lahore	32.7760N, 72.7008E 31.5755N, 74.4943E 33.5723N, 73.1748E 31.5004N, 74.3008E
10	<i>Menemerus marginatus</i> (Kroneberg, 1875)	291	♂	Kallar Kahar, Chakwal Jallo Park, Lahore Jinnah Garden, Lahore Lal Suhanra National Park, Bhawalpur Derawar Fort, Bhawalpur Hastal village, Chakwal Botanical garden, University of the Punjab, Lahore	32.7760N, 72.7008E 31.5755N, 74.4943E 33.5723N,73.1748E 29.3170N, 71.9045E  28.4622N, 71.2019E 28.6377N, 77.0490E 31.5004N, 74.3008E
11	<i>Menemerus bivittatus</i> (Dufour, 1831)	276	♂	Kallar Kahar, Lahore Jallo Park, Lahore Jinnah Garden, Lahore Botanical garden University of the Punjab,Lahore Lal Suhanra National Park, Bhawalpur Derawar Fort, Bhawalpur Hastal village, Chakwal	32.7760N, 72.7008E 31.5755N, 74.4943E 33.5723N, 73.1748E 31.5004N,74.3008E  29.3170N, 71.9045E  28.4622N, 71.2019E 28.6377N, 77.0490E
12	<i>Myrmarachne melanotarsa</i> Wesolowska & Salm, 2002	135	♂	Jallo Park, Lahore Jinnah Garden, Lahore Hazara university, Mansehra Islamia University, Bhawalpur Lal Suhanra National Park, Bhawalpur Botanical garden, University of the Punjab, Lahore	31.5755N, 74.4943E 33.5723N,73.1748E 34.4207N, 73.2506E  29.3960N, 71.6626E  29.3170N, 71.9045E  31.5004N, 74.3008E

13	<i>Myrmarachne melanocephala</i> MacLeay, 1839	60	♀	Lal Suhanra National Park, Bhawalpur Botanical garden, University of the Punjab, Lahore	29.3170N, 71.9045E  31.5004N, 74.3008E
14	<i>Myrmarachne tristis</i> (Simon, 1882)	60	♂	Lal Suhanra National Park, Bhawalpur Botanical garden, University of the Punjab, Lahore	29.3170N, 71.9045E  31.5004N, 74.3008E
15	<i>Myrmarachne plataleoides</i> (O. Pickard-Cambridge, 1869)	53	♂	Lal Suhanra National Park, Bhawalpur Botanical garden, University of the Punjab, Lahore Pai Forest, Sakrand	29.3170N, 71.9045E  31.5004N, 74.3008E  26.0593N, 68.1346E
16	<i>Napoca insignis</i> (O. Pickard-Cambridge, 1872)	43	♂	Lal Suhanra National Park, Bhawalpur Botanical garden, University of the Punjab, Lahore Pai Forest, Sakrand	29.3170N, 71.9045E  31.5004N, 74.3008E  26.0593N, 68.1346E
17	<i>Phintella indica</i> (Simon, 1901)	20	♂ ♀	Hastal village, Chakwal Pai Forest, Sakrand	28.6377N, 77.0490E 26.0593N, 68.1346E
18	<i>Plexippus clemens</i> (O. Pickard- Cambridge, 1872)	130	♂ ♀	Lal Suhanra National Park, Bhawalpur Botanical garden, University of the Punjab, Lahore Pai Forest, Sakrand Bhakkar	29.3170N, 71.9045E  31.5004N, 74.3008E  26.0593N, 68.1346E 31.6266N, 71.0617E
19	<i>Plexippus petersi</i> (Karsch, 1878)	81	♂ ♀	Botanical garden, University of the Punjab, Lahore Pai Forest, Sakrand Bhakkar	31.5004N, 74.3008E  26.0593N, 68.1346E 31.6266N, 71.0617E
20	<i>Plexippoides flavescens</i> (O. Pickard-Cambridge, 1872)	6	♂	Pai Forest, Sakrand	26.0593N, 68.1346E

21	<i>Pseudicius admirandus</i> Logunov, 2007	89	♂ ♀	Botanical garden, University of the Punjab,Lahore Jallo Park, Lahore Jinnah Garden, Lahore Hazara university, Mansehra	31.5004N, 74.3008E  31.5755N, 74.4943E 33.5723N,73.1748E 34.4207N, 73.2506E
22	<i>Rhene sp.</i>	10	Im mat ure	Hazara university, Mansehra	34.4207N, 73.2506E
23	<i>Siler sp.</i>	5	Sub adul t	Hastal village, Chakwal	28.6377N, 77.0490E
24	<i>Sitticus sp.</i>	2	Im mat ure	Derawar Fort,Bhawalpur	28.4622N, 71.2019E
25	<i>Stenaelurillus lesserti</i> Reimoser, 1934	50	♂ ♀	Botanical garden, University of the Punjab,Lahore	31.5004N, 74.3008E
26	<i>Telamonia dimidiata</i> (Simon, 1899)	120	♂ ♀	Botanical garden, University of the Punjab,Lahore Lal Suhanra National Park, Bhawalpur Jallo Park, Lahore Jinnah Garden, Lahore	31.5004N, 74.3008E  29.3170N, 71.9045E 31.5755N, 74.4943E 33.5723N,73.1748E
27	<i>Thyene imperialis</i> (Rossi, 1846)	292	♂ ♀	Botanical garden, University of the Punjab,Lahore Jallo Park, Lahore Jinnah Garden, Lahore Pai Forest, Sakrand Lal Suhanra National Park, Bhawalpur Kallar Kahar, Chakwal	31.5004N, 74.3008E  31.5755N, 74.4943E 33.5723N,73.1748E 26.0593N, 68.1346E 29.3170N, 71.9045E 32.7760N, 72.7008E
28	<i>Titanattus cretatus</i> Chickering, 1946	2	♀	Dera Bakha near Sutlej river, Bahawalpur	29.2641N, 71.5134E

## DISCUSSION

The salticid fauna of Pakistan is rich like neighboring countries. According to Worldwide Database of Jumping Spiders (Metzner, 2017), 319 salticids from India, 498 from China, nine from Bangladesh and 106 from Sri Lanka have been recorded. However, in Pakistan serious efforts are required to explore the diversity of salticids. Few species of salticids are recorded from Pakistan which reflects the incomplete indigenous fauna. Majority of presently explored salticids were not reported earlier from Pakistan as previous work mentioned in the introduction. Most of the efforts done before this study focused on the spider fauna generally and not the salticids specifically. This is a preliminary survey on salticids and more extensive survey and collection of this diverse family in the Pakistan is required. It is expected that further studies will explore more and some interesting salticid species from Pakistan.

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## REFERENCES

- Bao, Y. H., & Peng, X. J., 2002. Six New Species of Jumping Spiders (Araneae: Salticidae) from the Hui-Sun Experimental Forest Station, Taiwan. *Zoological Stud.*, **41(4)**: 403-411.
- Bauer, T., Freudenschuss, M., Grabolle, A., Aaoao, O., Ooeaaiuphn, I., & Aoaiaieea, A., 2015. *Plexippoides flavescens* (O. Pickard-Cambridge, 1872) and *Menemerus marginatus* (Kroneberg, 1875), new records for Pakistan (Aranei: Salticidae). *Arthropoda Sel.*, **24(1)**: 87-90.
- Ghazanfar, M., Hussain, M., Hashim, M., & Ul, A., 2016. Check list of spider (Araneae) fauna of Pakistan. *J. Entomol. Zool. Stud.*, **4(1)**: 245-256
- Maddison, W. P., Li, D., Bodner, M., Zhang, J., Xu, X., Liu, Q., & Liu, F., 2014. The deep phylogeny of jumping spiders (Araneae, Salticidae). *ZooKeys*. **440**: 57-87.
- Metzner, H., 2017. Jumping spiders (Arachnida: Araneae: Salticidae) of the world. Available at: <http://www.jumping-spiders.com> (accessed 20 August 2017).
- Mukhtar, M. K., Khan, S. Y., Jabeen, S., Tahir, H. M., Qadir, A., Ahmad, K. R., Butt, A., & Arshad, M., 2012. A Preliminary Checklist of the Spider Fauna of Sargodha (Punjab), Pakistan. *Pakistan J. Zool.*, **44(5)**:1245-1254.
- Perveen, F., & Khan, N., 2015. Checklist of the first recorded spider fauna in Sheringal, Khyber Pakhtunkhwa, Pakistan. *AdvEntomol.*, **3(03)**:94-100.
- Perveen, F., Jamal, A., Yasmin, S., & Khatak, K.U., 2012. Biodiversity of spidersfauna in the Frontier Region, Peshawar, Pakistan. *J. Entomol. Nematol.*, **4(3)**:22-33.
- Parveen, R., Khan, A. A., Mushtaq, S., & Rana, S., 2007. A checklist of the spiders of the Punjab. *Pakistan J. Agri. Sci.*, **44(4)**: 625-626.
- Proszynski, J., 2016. Monograph of Salticidae (Araneae) of the World 1995-2015. Part II: Global Species Database of Salticidae (Araneae). Available at: <http://www.peckhamia.com/salticidae/> (accessed 12 September 2017).
- Sial, N., Ruby, T., Malik, S., & Mushtaq, S., 2012. A checklist of the spiders of Cholistan and neighbouring areas. *Pakistan J. Agri. Sci.*, **49(3)**:301-304.
- World Spider Catalog., 2017. World Spider Catalog. Natural History Museum Bern. Available at: <http://wsc.nmbe.ch>, version **18.5**,(accessed 12 September 2017).