



Diversity and Distribution of Pholcidae (Araneae: Araneomorphae: Arachnida) in India

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ABSTRACT

The present article deals with the faunal diversity and distribution of one of the spider family Pholcidae (Araneae: Arachnida), commonly known as cellar spiders, daddy long-legs spiders, carpenter spiders, vibrating spiders, etc., in different Indian states and union territories and provides an update checklist based on the literature published up to April 18, 2021. It includes 20 species of spiders described under 12 genera in 26 states (except Nagaland and Tripura) and 3 union territories (Andaman and Nicobar Islands, Jammu and Kashmir and Puducherry), out of which 5 species are endemic. In India, *Pholcus Walckenaer*, 1805 is the largest genus consisting of 6 species. The records demonstrated that only 4 species of these spiders are distributed widely: *Crossopriza lyoni* (Blackwall, 1867) (22 Indian states, 1 union territory), *Artema atlanta Walckenaer*, 1837 (17 Indian states, 2 union territories), *Pholcus phalangioides* (Fuesslin, 1775) (15 Indian states, 3 union territories) and *Smeringopus pallidus* (Blackwall, 1858) (9 Indian states, 2 union territories). Maximum 9 species of these spiders were recorded in Karnataka followed by 8 species in Kerala. Despite their role as insect predators and being crucial to the health of terrestrial ecosystems, none of the species recorded in India is listed in IUCN Red List.

Keywords: Pholcidae, cellar spiders, daddy long-legs spiders, faunal diversity, checklist.

INTRODUCTION

Spider is the common name of the members of the order Araneae of class Arachnida (Chelicerata: Arthropoda) with 49,356 described species under 4,213 genera (WSC, 2021). However, several species of spiders escaped the human eye to this day and many specimens stored in collections waiting to be described and classified. It is estimated that only one third to one fifth of existing species have been described. Spiders constitute an array of arthropod predators in several ecosystems and have been

observed to act as sensitive bioindicators of the environmental changes (Jansen, 1997). Almost all spiders predate mostly insects and like them, are most omnipresent and numerous in both agricultural and natural ecosystems. For example, about 300 to 800 species of spiders may inhabit one hectare of tropical forest (Coddington *et al.*, 1991) and over one lac individuals may be present in one hectare in vegetated areas (Zahl, 1971). Spiders are also known to kill as much as 50 times the number of prey they actually consume (Kajak, 1978). However, there are few spiders which are poisonous such as the black widow spiders which venom is more poisonous than snakes (Gertsch, 1979). The most remarkable feature of the life of spiders is the use of its silk, the spider has mechanism to turn its food into silk and using it to catch more food.

The number of spider species reported from India have increased gradually from 1067 species in 1987 (Tikader, 1987), 1442 species in 2005 (Siliwal *et al.*, 2005), 1520 species in 2009 (Sebastian and Peter, 2009), 1686 species in 2012 (Keswani *et al.*, 2012) to 1864 species at present (Caleb and Sankaran, 2021). In spite of applied values of spiders, very little attention has been paid regarding their conservation and only few mygalomorph spiders in India are scheduled in IUCN Red List (Molur *et al.*, 2008). Most of the species described in India and abroad are still known from their type locality. In spite of current researches on the diversity of spiders in India, their number is inadequate than other parts of the world. Recently, Sharma *et al.* (2020a, b, 2021), Singh and Singh (2020, 2021), and Singh *et al.* (2020a, b, c, d, e, f, 2021) updated the distribution pattern of 28 families of spiders in India. In this continuation, this article describes the diversity and distribution of another family of spider, the Pholcidae in India.

The Pholcidae are a family of haplogyne araneomorph spiders and have several common names, such as carpenter spiders, cellar spiders, daddy long-leggers, daddy long-legs spiders, granddaddy long-legs spiders, gyrating spiders, long daddies, skull spiders and vibrating spiders depending upon the species. These spiders are thin and delicate, gray to brown, and 2-10 mm long. The legs are about 5 times longer than body. Number of eyes may be 6 or 8. In case of 8 eyed spiders, eyes are arranged in two lateral groups of three and two smaller median contiguous eyes. In case of 6 eyes spiders, eyes are arranged in two groups of three.

The cellar spiders are found in naturally protected areas such as caves and rock piles, and also in damp cellars, basements, crawl spaces, garages, and dark, undisturbed places. In human dwellings, they make their webs in the corner of a wall or a ceiling. The spider hangs upside down in the web, if the web becomes too dirty, then it is discarded and a new web is built. When they are disturbed, they begin to vibrate violently to deject their enemies (Jackson, 1992). The web of cellar spiders has no adhesive quality, hence the spiders when detect prey within their webs, they quickly envelope it with silk-like material before a bite. Some pholcid spiders even attack webs of other spiders to feed them, their eggs and the prey captured by them (Jackson and Brassington, 2009). The female cellar spiders deposit 10-60 eggs per eggsac and over a lifetime they usually produce 3 eggsacs. The females carry the eggsacs in their mouthparts until the spiderlings hatch.

The family Pholcidae ranks among the most diverse of web-building spider families, currently with 95 genera and 1826 species distributed worldwide, mostly in temperate, tropical and subtropical forests (WSC, 2021). Our knowledge on diversity and distribution of Indian Pholcidae is scanty and highly patchy because extensive surveys for these spiders were performed only in a few places and most of the Indian states are still unexplored. There are several species of these spiders which are yet to be described and several species recorded from India have also been misidentified. Hence, these reports need re-examination. At present, the available knowledge of diversity and distribution of Pholcidae is scattered in literature and so far no consolidated account is available regarding their distribution pattern across the country. Therefore, this present work was taken up to provide up-to-date information of this family.

MATERIALS AND METHODS

This checklist is based on the literature published in recent past books, journals and few authentic theses, websites, and World Species Catalog up to 18 April, 2021 (WSC, 2021). In most of the literature, published earlier, several errors crept in their scientific names even in the recent ones. It happened because such contents become outdated quickly and, due to their perceived comprehensiveness, readers sometimes overlook newer sources of data. Additionally, the

researches on spider taxonomy are continued with the description of new taxa, their modified status, and the publication of other nomenclatural decisions (Singh *et al.*, 2021). If a spider species is identified only up to generic level, it was considered as species if no other species of that genus is reported within the state. In the present checklist, attempts have been made to correct the errors in the scientific names of the spiders following World Spider Catalog. Only those synonymies were mentioned that were reported in India. All the endemic species are marked with (*). If the spider species is not endemic, its elsewhere distribution is also provided.

RESULTS AND DISCUSSION

In India, Blackwall (1867) seems the first to describe a pholcid spider, *Crossopriza lyoni* collected from Uttar Pradesh (Agra, Meerut) and Delhi and also recorded another pholcid, *Artema atlanta* Walckenaer, 1837 from the same state. Latter species was subsequently recorded from Karnataka and Tamil Nadu in 1885 by Simon (1885a, b). Consequently, two more species were reported from Andaman and Nicobar Islands, viz. *Pholcus phalangioides* (Fuesslin, 1775) (Thorell, 1891) and *Smeringopus pallidus* (Blackwall, 1858) (Thorell, 1892). Then, in 1900, Pocock (1900) recorded several species of pholcid spiders such as *Artema atlanta* Walckenaer, 1837 from Maharashtra, Tamil Nadu and Uttar Pradesh; *Crossopriza lyoni* (Blackwall, 1867) from Tamil Nadu and Uttar Pradesh; and *Smeringopus pallidus* (Blackwall, 1858) from Andaman and Nicobar Islands, Kerala and Puducherry. After a year, Leardi in Airaghi (1901) recorded four pholcid species from Puducherry, *Artema atlanta* Walckenaer, 1837; *Cantikus v-notatus* (Thorell, 1878); *Holocnemus pluchei* (Scopoli, 1763) and *Pholcus phalangioides* (Fuesslin, 1775).

In eighth decade of the last century, among the Indian authors, Tikader (1977) was first to described a single species of Pholcidae, *Pholcus kapuri* Tikader, 1977 from Andaman and Nicobar Islands. In the present century, only three species were described from India, *Belisana marusiki* Huber, 2005 from Himachal Pradesh (Huber, 2005), *Pholcus alagarkoil* (Huber, 2011) from Tamil Nadu (Huber, 2011) and *Pholcus viveki* Sen *et al.*, 2015 from West Bengal (Sen *et al.*, 2015). At present, 20 species are described or recorded under 12 genera in 26 Indian states (except Nagaland and Tripura) and

3 union territories (Andaman and Nicobar Islands, Jammu and Kashmir, and Puducherry) and only 25% (5 species) of them are endemic. However, Caleb and Sankaran (2021) enlisted only 13 species of Pholcidae described under 6 genera and the rest of the species recorded in India are either overlooked by them or are cases of misidentification. Indian record is only 1.1% of the world pholcid fauna (94 genera and 1812 species, World Spider Catalog, 2021). None of the species of these spiders are described during the last 5 years.

In India, the type genus, *Pholcus* Walckenaer, 1805 is the largest one consisting of 6 species. Maximum 9 species of these spiders were recorded in Karnataka followed by 8 species in Kerala, 7 species each in Maharashtra and Tamil Nadu, 6 species in Gujarat, 5 species each in Assam, Goa, Puducherry and Uttar Pradesh, and so on, and no species is recorded in Nagaland and Tripura and need extensive research work.

Out of 20 species of Pholcidae recorded in India, only four species are widely distributed, viz. *Crossopriza lyoni* (Blackwall, 1867) (22 Indian states, 1 union territory), *Artema atlanta* Walckenaer, 1837 (17 Indian states, 2 union territories), *Pholcus phalangioides* (Fuesslin, 1775) (15 Indian states, 3 union territories) and *Smeringopus pallidus* (Blackwall, 1858) (9 Indian states, 2 union territories).

Following is the detailed list of these spiders distributed in Indian states and union territories and elsewhere.

1. *Artema atlanta* Walckenaer, 1837

syn. *Artema mauricia* (Walckenaer, 1837); *Artema convexa* Blackwall, 1858

- Andhra Pradesh (Rao *et al.*, 2005; Bastawade and Khandal, 2006; Bastawade and Borkar, 2008; Palem *et al.*, 2016)
- Andaman and Nicobar Islands (Tikader, 1977; Sebastian *et al.*, 2012)
- Assam (Chetia and Kalita, 2012; Singh *et al.*, 2012; Das *et al.*, 2015; Ahmed *et al.*, 2018)
- Goa (Bastawade and Borkar, 2008; Pandit and Pai, 2017; Pandit and Dharwadkar, 2020)
- Gujarat (Patel and Vyas, 2001; Patel, 2003b; Siliwal *et al.*, 2003a, b; Parmar, 2013; Yadav *et al.*, 2017)
- Haryana (Malik and Goyal, 2017)

- Karnataka (Simon, 1885a; Sherriffs, 1927; Nalini Bai and Ravindranatha, 2012; Vaibhav *et al.*, 2017; Tabasum *et al.*, 2018)
 - Kerala (Tikader, 1966; Joseph *et al.*, 1998; Patel, 2003a; Sudhikumar *et al.*, 2005; Bastawade and Khandal, 2006; Sunil Jose *et al.*, 2008)
 - Madhya Pradesh (Gajbe, 2003, 2004; Patil, 2012)
 - Maharashtra (Pocock, 1900; Tikader, 1966; Tikader and Biswas, 1981; Majumder and Biswas, 1992; Majumder, 2005; Bastawade and Khandal, 2006; Bastawade and Borkar, 2008; Rithe, 2012)
 - Odisha (Gravely, 1921; Biswas, 1987)
 - Puducherry (Leardi in Airaghi, 1901)
 - Punjab (Tikader, 1966; Tikader and Biswas, 1981; Majumder and Biswas, 1992; Majumder, 2005)
 - Rajasthan (Tikader 1961, 1966; Kaur *et al.*, 2014; Lawania and Trigunayat, 2015; Lawania *et al.* 2013; Lawania and Mathur, 2017)
 - Tamil Nadu (Simon, 1885b; Pocock, 1900; Sherriffs, 1919; Tikader, 1966; Biswas and Biswas, 1992; Majumder and Biswas, 1992; Majumder, 2005; Karthikeyani *et al.*, 2017; Caleb, 2020b)
 - Telangana (Sailu *et al.*, 2017)
 - Uttar Pradesh (Blackwall, 1867; Pocock, 1900; Tikader, 1966; Tikader and Biswas, 1981; Bastawade and Khandal, 2006; Bastawade and Borkar, 2008)
 - Uttarakhand (Gupta and Siliwal, 2012)
 - West Bengal (Tikader, 1977; Tikader and Biswas, 1981; Biswas and Biswas, 1992; Majumder and Biswas, 1992; Majumder, 2005)
- Elsewhere: Africa, America (both), Asia, Australia, Belgium, Britain, China, Greece, Japan, Middle East., Pacific Islands, Taiwan, Turkey

2. *Artema* sp.

- Chhattisgarh (Ekka and Kujur, 2015)
- Kerala (Sudhikumar, 2007)
- Rajasthan (Kumari *et al.*, 2017)
- Uttar Pradesh (Hore and Uniyal, 2008)

3. *Belisana dodabetta* Huber, 2005 *

- Tamil Nadu (Huber, 2005; Karthikeyani *et al.*, 2017)

4. *Belisana marusiki* Huber, 2005 *

- Himachal Pradesh (Huber, 2005)

5. *Belisana* sp.

- Kerala (Joseph and Premila, 2016)

6. *Cantikus v-notatus* (Thorell, 1878)

syn. *Pholcus v-notatus* Thorell, 1878

- Puducherry (Leardi in Airaghi, 1901)
- Elsewhere: Myanmar to Indonesia

7. *Crossopriza lyoni* (Blackwall, 1867)

syn. *Pholcus lyoni* Blackwall, 1867

- Andhra Pradesh (Rao *et al.*, 2005)
- Arunachal Pradesh (Chetry and Moran, 2019)
- Assam (Chetia and Kalita, 2012; Singh *et al.*, 2012; Das *et al.*, 2015; Ahmed *et al.*, 2018)
- Bihar (Priyadarshini *et al.*, 2015)
- Uttar Pradesh (Blackwall, 1867)
- Goa (Pandit and Pai, 2017; Pandit and Dharwadkar, 2020)
- Gujarat (Majumder and Biswas, 1992; Patel and Vyas, 2001; Patel, 2003b; Siliwal *et al.*, 2003a, b; Parmar, 2013; Prajapati *et al.* 2016; Yadav *et al.*, 2017; Yadav and Kumar, 2019)
- Haryana (Malik and Goyal, 2017)
- Jammu and Kashmir (Caporiacco, 1935)
- Karnataka (Nalini Bai and Ravindranatha, 2012; Vaibhav *et al.*, 2017; Tabasum *et al.*, 2018)
- Kerala (Joseph *et al.*, 1998; Patel, 2003a; Sunil Jose *et al.*, 2008; Joseph and Premila, 2016)
- Madhya Pradesh (Keswani, 2014; Sharma and Sharma, 2015)
- Maharashtra (Bastawade, 2008; More and Sawant, 2013; Keswani and Vankhede, 2014; Nerlekar *et al.*, 2016)
- Manipur (Biswas and Biswas, 2004; Kananbala *et al.*, 2018)
- Mizoram (Biswas and Biswas, 2007)
- Odisha (Majumder, 2005; Siliwal *et al.*, 2008; Chetry and Moran, 2019)
- Punjab (Tikader, 1966; Tikader and Biswas, 1981; Majumder and Biswas, 1992; Biswas and Biswas, 2004; Majumder, 2005)
- Rajasthan (Tikader 1961, 1966; Tikader and Biswas, 1981; Majumder and Biswas, 1992; Biswas and Biswas, 2004; Majumder, 2005; Lawania and Trigunayat, 2015; Lawania and Mathur, 2017)
- Sikkim (Biswas and Biswas, 2007)
- Tamil Nadu (Pocock, 1900; Sherriffs, 1919; Tikader, 1966; Tikader and Biswas, 1981; Majumder and Biswas, 1992; Majumder, 2005; Caleb, 2020a, b)
- Telangana (Sailu *et al.*, 2017)
- Uttar Pradesh (Blackwall, 1867; Pocock, 1900; Tikader, 1966; Tikader and Biswas, 1981; Majumder and Biswas, 1992; Biswas and Biswas, 2004, 2007; Majumder, 2005; Hore and Uniyal, 2008; Uniyal and Hore, 2009; Kumar *et al.*, 2017; Sharma and Singh, 2018a, b)

- Uttarakhand (Gupta and Siliwal, 2012; Siddhu *et al.*, 2020)
 - West Bengal (Tikader and Biswas, 1981; Biswas and Biswas, 1992; Majumder and Biswas, 1992; Majumder, 2005, 2007; Sen *et al.*, 2015)
- Elsewhere: Africa, tropical Asia, Australia, China, Germany, Japan, Korea, USA, Venezuela

8. *Crossopriza* sp.

- Kerala (Sudhikumar, 2007; Mathew *et al.*, 2014)
- Maharashtra (Lanka *et al.*, 2017)
- Tamil Nadu (Kapoor, 2008)

9. *Holocnemus pluchei* (Scopoli, 1763)

syn. *Pholcus rivulatus* Forsskål, 1775

- Puducherry (Leardi in Airaghi, 1901)

Elsewhere: Argentina, Australia, Azerbaijan, north Africa, Europe, Turkey, USA.

10. *Leptopholcus kandy* Huber, 2011

- Karnataka (Huber, 2011)

Elsewhere: Sri Lanka

11. *Leptopholcus podophthalmus* (Simon, 1893)

syn. *Pholcus podophthalmus* Simon, 1893

- Bihar (Priyadarshini *et al.*, 2015)
- Rajasthan (Malhotra *et al.*, 2019)

Elsewhere: China, Sri Lanka

12. *Leptopholcus* sp.

- Goa (Pandit and Dharwadkar, 2020)
- Karnataka (Abhijith, 2019)
- Maharashtra (Rithe, 2012)

13. *Micropholcus fauroti* (Simon, 1887)

- Karnataka (Huber, 2011)

Elsewhere: Africa, both Americas, Asia, Belgium, Germany, Sri Lanka, Southeast Asia, Australia, Pacific Islands

14. *Pholcus alagarkoil* (Huber, 2011) *

syn. *Sihala alagarkoil* Huber, 2011

- Tamil Nadu (Huber, 2011)

15. *Pholcus djelalabad* Senglet, 2008

- Himachal Pradesh (Huber, 2011)
- Uttar Pradesh (Huber, 2011)

Elsewhere: Afghanistan

16. *Pholcus fragillimus* Strand, 1907

- Gujarat (Solanki and Kumar, 2015; Yadav *et al.*, 2017; Solanki *et al.*, 2020)
 - Jharkhand (Huber, 2011)
 - Karnataka (Huber, 2011)
 - Maharashtra (Keswani and Vankhede, 2014)
 - Odisha (Choudhury *et al.*, 2019)
 - Tamil Nadu (Huber, 2011)
- Elsewhere: China, Japan, Sri Lanka

17. *Pholcus kapuri* Tikader, 1977 *

- Andaman and Nicobar Islands (Tikader, 1977; Majumder and Biswas, 1992)
- Kerala (Adarsh and Nameer, 2015)
- Maharashtra (Rithe, 2012)

18. *Pholcus medog* Zhang *et al.*, 2006

- Meghalaya (Huber, 2011)

Elsewhere: China

19. *Pholcus phalangioides* (Fuesslin, 1775)

- Andaman and Nicobar Islands (Thorell, 1891)
- Andhra Pradesh (Rao *et al.*, 2005; Palem *et al.*, 2016; Saha *et al.*, 2017)
- Assam (Singh *et al.*, 2012; Ahmed *et al.*, 2018)
- Goa (Pandit and Pai, 2017)
- Gujarat (Patel and Vyas, 2001; Solanki and Kumar, 2015; Yadav *et al.*, 2017; Solanki *et al.*, 2020)
- Jammu and Kashmir (Punjoo and Bhat, 2015)
- Karnataka (Nalini Bai and Ravindranatha, 2012; Vaibhav *et al.*, 2017; Tabasum *et al.*, 2018)
- Kerala (Patel, 2003a; Sumesh and Sudhikumar, 2020)
- Madhya Pradesh (Sharma and Sharma, 2015; Saha *et al.*, 2017)
- Maharashtra (Bastawade and Khandal, 2006; Rithe, 2012; Wankhade *et al.*, 2012; Saha *et al.*, 2017)
- Manipur (Kananbala *et al.*, 2018)
- Puducherry (Leardi in Airaghi, 1901)
- Rajasthan (Kaur *et al.*, 2014; Lawania *et al.* 2013; Lawania and Trigunayat, 2015; Kumari *et al.*, 2017; Lawania and Mathur, 2017; Malhotra *et al.*, 2019)
- Tamil Nadu (Simon, 1905; Karthikeyani *et al.*, 2017; Caleb, 2020b)
- Telangana (Sailu *et al.*, 2017)
- Uttar Pradesh (Wankhade *et al.*, 2012; Lawania and Mathur, 2014b; Singh and Singh, 2014; Kumar *et al.*, 2017; Sharma and Singh, 2018a, b)
- Uttarakhand (Quasin and Uniyal, 2011)
- West Bengal (Sen *et al.*, 2015; Saha *et al.*, 2017)

Elsewhere: Cosmopolitan

20. *Pholcus* sp.

- Assam (Das et al., 2015)
- Goa (Pandit and Dharwadkar, 2020)
- Gujarat (Siliwal et al., 2003a; Yadav et al., 2017)
- Karnataka (Bhat et al., 2013)
- Kerala (Sudhikumar, 2007; Mathew et al., 2014; Adarsh and Nameer, 2015; Joseph and Premila, 2016)
- Madhya Pradesh (Gajbe, 2003, 2004; Patil, 2012)
- Maharashtra (Lanka et al., 2017)
- Odisha (Siliwal et al., 2008; Chetry and Moran, 2019)
- Rajasthan (Lawania and Trigunayat, 2015)
- Tamil Nadu (Siliwal et al., 2008)
- Uttar Pradesh (Lawania and Mathur, 2014a, b)
- Uttarakhand (Gupta and Siliwal, 2012)
- West Bengal (Saha et al., 2017; Ghosh et al., 2018)

21. *Pholcus viveki* Sen et al., 2015 *

- West Bengal (Sen et al., 2015)

22. *Physocyclus globosus* (Taczanowski, 1874)

- Jammu and Kashmir (Punjoo and Bhat, 2015)
 - Karnataka (Tabasum et al., 2018)
 - Gujarat (Parmar, 2020)
- Elsewhere: Africa, north America, Australia, China, Czechia, Indonesia, Japan, Pacific islands, Philippines, Iran, Sri Lanka

23. *Pribumia atrigularis* (Simon, 1901)

- syn. *Uthina atrigularis* Simon, 1901
- Assam (Singh et al., 2012)
 - Karnataka (Bhat et al., 2013; Vaibhav et al., 2017)
 - Kerala (Ambily and Antony, 2016)
- Elsewhere: Indonesia, Malaysia, Singapore

24. *Smeringopus pallidus* (Blackwall, 1858)

- syn. *Pholcus elongatus* Vinson, 1863; *Smeringopus elongates* (Vinson, 1863)
- Andaman and Nicobar Islands (Thorell, 1892; Pocock, 1900; Bastawade and Borkar, 2008)
 - Assam (Singh et al., 2012; Ahmed et al., 2018)
 - Deccan (Pocock, 1900)
 - Goa (Bastawade and Borkar, 2008)
 - Gujarat (Thumar, 2019)
 - Karnataka (Sherriffs, 1927; Fernandes and Ganesh, 2020)
 - Kerala (Pocock, 1900; Bastawade and Borkar, 2008; Sumesh and Sudhikumar, 2020)
 - Maharashtra (More and Sawant, 2013; Nerlekar et al., 2016)
 - Manipur (Kananbala et al., 2018)

- Puducherry (Pocock, 1900; Simon, 1905; Bastawade and Borkar, 2008)
 - Tamil Nadu (Sherriffs, 1919; Bastawade and Borkar, 2008)
 - Uttar Pradesh (Uniyal and Hore, 2009)
- Elsewhere: Africa, Australia, the Caribbean, China, Indonesia, Laos, Pacific Islands, Philippines, Sri Lanka, South America

25. *Smeringopus* sp.

- Odisha (Gravely, 1921)
- Tamil Nadu (Kapoor, 2008)

26. *Uthina* sp.

- Kerala (Sudhikumar, 2007; Sumesh and Sudhikumar, 2020)

CONCLUSIONS

A total of only 20 species under 12 genera of cellar spiders belonging to the family Pholcidae were recorded in almost all states except Nagaland and Tripura. Maximum species of these spiders were recorded from Karnataka (9 species) and Kerala (8 species) followed by Maharashtra and Tamil Nadu (7 species in each), Gujarat (6 species), and less number of species in other areas. Extensive survey for these spiders is required in almost all states and union territories.

Conflict of interest

The authors declare that they have no conflict of interest.

Authors' contribution

Authors contributed equally

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