

First report of the brown widow spider, *Latrodectus geometricus* C. L. Koch (Araneae: Theridiidae) from India

The Theridiids or comb-footed spiders comprise a large and diverse family. They are nocturnal and web-living. Spiders of the Theridiidae family build irregular snares, from the threads of which they suspend themselves in an inverted position waiting for their prey. They are distinguished from other spiders by the presence of a distinct comb on the tarsus of the fourth pair of legs, consisting of a row of strong curved and toothed setae, bristles of which are longer than those on the dorsal side of tarsus IV, and their labium is not rebordered^{1,2}. The family is best known due to the notoriety of its genus *Latrodectus*, also called widow spider.

The widow spider genus *Latrodectus* Walckenaer, 1805, shows a worldwide distribution, occurring across multiple continents and oceanic islands³. Several species of *Latrodectus* are found across the world. These include *Latrodectus geometricus* (brown widow) and *L. indistinctus* in Africa, *L. mactans* (black widow) in the West Indies and North America, *L. tredecimguttatus* (Karakurt or black wolf) in South Europe, *L. bishopi* (red widow spider), *L. variolus* (northern widow spider) in the United States and *L. hasselti* (red-back spider) in the Australian continent, Japan and India⁴⁻⁶.

Members of this genus are notorious due to the highly potent neurotoxin. The black widow venom, which contains α -latrotoxin, triggers massive neurotransmitter release upon injection in vertebrates, and is known to form pores in cell membranes⁷. *Latrodectus* species are generalist in their predation and are known to feed on a wide array of organisms such as insects, crustaceans, other arachnids, and on small vertebrates, including lizards and geckos⁸. This broad diet may in part explain the presence of toxins in their venom that are known to affect vertebrates. *Latrodectus* species are known to have an affinity for disturbed habitats. *Latrodectus hasselti* is the only reported species of the genus *Latrodectus* from India so far^{1,9}. In 1900, Pocock¹⁰ reported *L. geometricus* from what was then British India. His specimen was collected from only one location: Karachi (below 10 m asl), which is now in Pakistan. In 1902, Cambridge¹¹ revised the genus *Latrodectus*, according to which Karachi

and Manora (near Karachi, in Pakistan) were the only two locations in the Indian subcontinent where *L. geometricus* was known to occur. Later Levi¹² and Garb *et al.*⁶ too included India in the species distribution range, citing Pocock¹⁰ and Cambridge¹¹. However, the reports of Pocock and Cambridge pertain to Pakistan. No subsequent reports of this species were found from present-day Indian territory, including Tikader¹ and Siliwal *et al.*⁹. Thus, this report is the first formal record of occurrence of the species *L. geometricus* C. L. Koch, 1841 from India³.

L. geometricus has a cosmopolitan distribution ranging from United States, South America, South Africa, and other parts of Africa^{3,12}. *L. geometricus* is considered to have been introduced to many parts of America, Japan and Australia, as it was detected relatively recently in each of these locations and in association with urban environments. Despite its broad distributional range, *L. geometricus* may be native to parts of Africa, as it appears to be extremely widespread there, but in isolated and narrow ranges elsewhere^{6,12}.

We collected the specimen (single adult female) of *L. geometricus* on the forest floor. Therefore, details of the spider's web structure and microhabitat preference could not be recorded. However, the webbing has been reported to be dirty and unkempt, and egg sacs are covered with little pulpules on their outer surface, often in well-illuminated places¹³. The web consists of a small retreat (approx 1.5 m above the ground) which opens to a dome-shaped sheet that leads down close to the ground. The sheet then turns into a characteristic cobweb mesh, with gumfoot lines leading to the ground¹⁴.

We confirmed the genus of our specimen by comparing the following characters from Levi¹², and Levi and Randolph¹⁵. The following diagnostic characters characterize the genus *Latrodectus*. Carapace, normal in form, with clypeus equal in height to the ocular area, and the lateral eyes being widely separated. The chelicerae are without teeth. Legs are long, first pair of legs longer than the fourth pair, superior claws are toothed almost to apex, have a large globular abdomen, and a large cololus; males are much smaller

than females and the female genitalia has dumb-bell-shaped seminal receptacles^{12,15}.

The body measurements of the single adult female of *L. geometricus* are given in Table 1. The specimen is described as follows. Carapace is brown, covered with fine hair. Eyes in two distinct rows, both slightly recurved. Eyes of anterior lines subsequently spaced, and the median a little larger than laterals. Abdomen is globular, slightly compressed laterally, light to golden brown. Dorsally, symmetrical markings consisting of dark brown spots with brown loop-like markings on the sides (Figure 1). Each marking con-

Table 1. Body measurement of an adult female *Latrodectus geometricus*

Character	Measurement (in mm)
Total body length	8.6
Carapace length	3.1
Carapace width	2.7
Abdomen length	5.5
Leg I	17.8
Leg II	10.8
Leg III	9.0
Leg IV	14.6



Figure 1. *Latrodectus geometricus*, dorsal view.

sists of a brown centre and a light brown to yellow periphery that is bordered dark brown. Longitudinally, dorsum with 3–4 similar markings in the centre, anterior-most being circular, proceeding ones somewhat triangular. Spinnerets clustered in a striated ring-like form, slightly on the ventral side. Distinct bright orange hourglass marking on the ventral surface present (Figure 2a). Laterally, abdomen shows loop-like markings extending towards the hourglass markings (Figure 2b). All legs faint, with patella and tip of their tibia darker.

Epigynum with lower lip projecting on the sides beyond the upper lip of the opening. Spermathecae paired, copulatory ducts coiled (Figure 2c). The species-level identity of the specimen was established by comparing its genital structure to that described by Levi¹², and Levy and Amitai¹⁶. D. B. Bastawade (Zoological Survey of India, Pune) confirmed the species identity.

The spider was collected by S.S. in a patch of deciduous forest (18°22'N, 73°46'E), at an elevation of 800 m amsl, approximately 20 km southwest of Pune city on 29 August 2004 in the afternoon.

The site is a part of one of the Westerly spurs of the Western Ghats, having a maximum altitude of about 1300 m and an average annual rainfall of 1050 mm. The vegetation in the region is dominated by *Tectona grandis*, *Terminalia crenulata* and *Anogeisus latifolia*. The valley has many seasonal streams flowing only during the monsoons, when it harbours rich seasonal herbs. The area has a dry period length of seven to eight months. The vegetation is degraded, secondary deciduous type, with planted teak and poor undergrowth. The forest composition consisted mainly of fire-resistant species, with mature trees observed rarely. Grazing and human settlements were observed, with agriculture at the periphery.

Compared to other *Latrodectus* species like the American black widow spiders, whose envenomation is often referred to as 'latrodectism', similar effects are less common from *L. geometricus* bites¹⁷. However, according to a study in South Africa, *L. geometricus* bites in humans cause localized pain and cramps with profuse sweating and increased blood pressure¹⁸. In addition, females may be

more venomous and intensity of the bite may depend on the size of the spider inflicting the bite^{17,19}. Though non-aggressive, these spiders bite only when handled or trapped, preferring to retreat most of the times when simply threatened¹⁷.

In captivity, the spider maintained an inverted position in the container. It mostly maintained a constricted position with its legs pulled inwards, and spun a few irregular strands on the lower surface of the lid that extended down up to the inner walls of the container. Cockroaches of *Blatella* sp., measuring 1 cm in length, were placed as food in the container. The spider preferred to eat in privacy. The intact remains of the cockroach's exoskeleton were always observed after feeding. The spider was often seen putting her first pair of legs near her fangs, especially before feeding and when aggravated.

L. geometricus is among those spiders that have been reported from Pakistan, but have not yet been reported from India. The distribution of many species from Pakistan may extend up to India⁹. Further studies are needed to discover such spe-

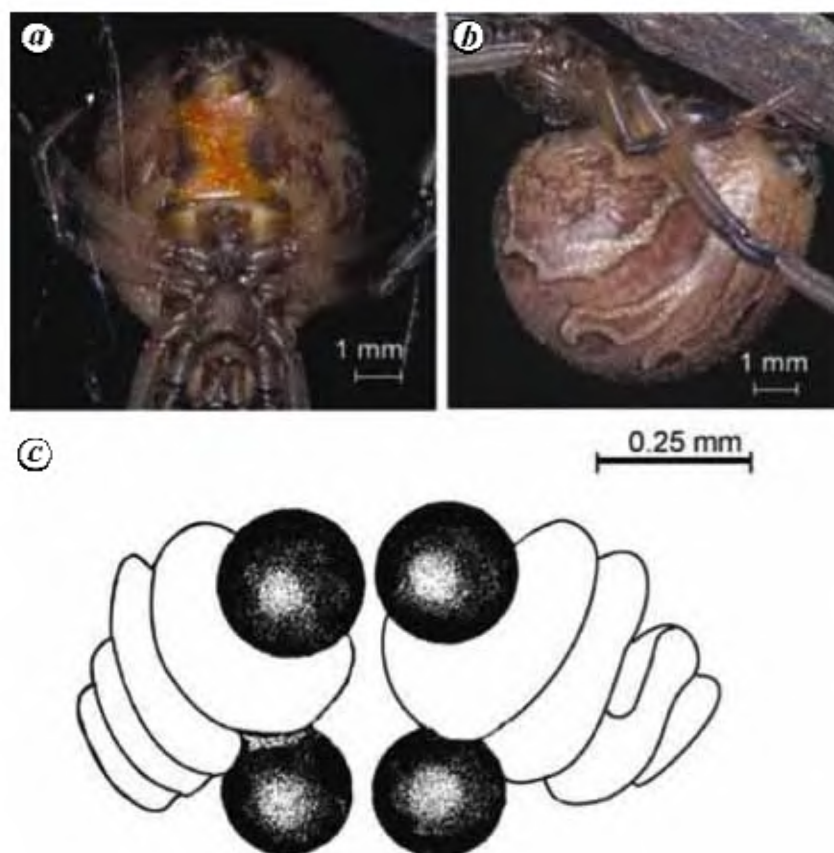


Figure 2. Identification characters of *L. geometricus*. *a*, Ventral view of abdomen of *L. geometricus* showing orange hourglass marking. *b*, Lateral view. *c*, Dorsal view of spermathecae.

cies. Also, further studies are needed to explore the spider diversity of the Western Ghats and other parts of India. Since this spider species has medical significance, a study on the effect of spider bites and their antidote, pertaining to the Indian context is necessary.

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ACKNOWLEDGEMENTS. We thank Dr D. B. Bastawade, for critically reading the manuscript and helping with microscopic preparations and observations; Prof. Herbert Levi for comments and Prof. R. Gadagkar, IISc, Bangalore for support and guidance, Mr Milind Kolatkar for figures. We also thank Dr Shonil Bhagwat and Mr Neelesh Dahanukar and Dr Thresi for help, and Dr M. G. Watve for encouragement and support.

Received 13 March 2006; revised accepted 24 July 2007

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