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A new species, *Pandava arunae* (Araneae: Titanoecidae) from Lonar Crater Sanctuary, India

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Abstract

A new species of the spider genus *Pandava* Lehtinen, 1967 is described from Lonar Crater Sanctuary, India. The description of *Pandava arunae* sp. nov., its morphological characters, and illustrations are presented here. *P. arunae* sp. nov. resembles *P. laminata* (Thorell, 1878), *P. ganisha* Almeida-Silva, Griswold & Brescovit, 2010, and *P. sarasvati* Almeida-Silva, Griswold & Brescovit, 2010 in the general shape of the epigynum, but differs by epigynal rim attached, looped spermathecae and long, strongly sclerotized copulatory ducts that are visible through the cuticle.

Keywords: Araneae, Titanoecidae, *Pandava*, new species, Lonar, India.

Introduction

The spider family Titanoecidae Lehtinen, 1967 presently includes five genera and 53 species in the world (World Spider Catalog, 2017). The spider genus *Pandava* Lehtinen, 1967 is currently represented by 9 species in the world among which six are found in India. They are: *P. andhraca* (Patel & Reddy, 1990), *P. ganisha* Almeida-Silva, Griswold & Brescovit, 2010, *P. ganga* Almeida-Silva, Griswold & Brescovit, 2010, *P. kama* Almeida-Silva, Griswold & Brescovit, 2010, *P. nathabharii* (Patel & Patel, 1975), and *P. shiva* Almeida-Silva, Griswold & Brescovit, 2010.

Yin & Bao (2001) described *P. hunanensis* from Hunan Province, China. Jäger (2008) reported *P. laminata* (Thorell, 1878) in Germany for the first time at Cologne Zoo saying that "The species was most likely introduced with plants or cargo from Southeast Asia" and presented the characters important for identification of the species.

Genus *Pandava* is diagnosed by "the reduced tegular process on the male palp and the anterior position of the copulatory openings on the female epigynum" (Almeida-Silva *et al.*, 2010). The revision of the Asian genus *Pandava* and the updated description of known species, added five new species viz., *P. shiva* from Pakistan, *P. ganesh*, *P. kama* and *P. ganga* from India and *P. sarasvati* from Myanmar and the first record of *Pandava* from Africa by Almeida Silva *et al.* (2010)*.

Marusik *et al.* (2012) transferred four species from India and Nepal which were incorrectly assigned to *Amaurobius* to three genera of Titanoecidae including *P. andhraca* and *P. nathabhahi*.

The current paper presents the description and illustrations of the new species *Pandava arunae* sp. nov. from Lonar crater Sanctuary, India.

Material and Methods

The present study is based on material collected in 2012, 2015, and 2016 from the Lonar Crater Sanctuary and J.D. Patil Mahavidyalaya campus Daryapur, District-Amravati, Maharashtra, India. Four female specimens were collected by active search method and hand picking. All specimens were preserved in 70% ethanol and female genitalia were excised using fine surgical scalpel. The epigynum was then cleared in 10% KOH aqueous solution. The basic identification of specimens was made by a Carl-Zeiss Stemi 2000-c stereo-zoom microscope mounted with Axio Cam ERc5s camera (Germany). All specimens were currently deposited in the Spider Research Lab of J.D.P.S.M, Daryapur. All measurements are in millimetres.

Abbreviations used: ALE = anterior lateral eye; AME = anterior median eye; CD = copulatory duct; CO = copulatory opening; ER = epigynal rim; FD = fertilization duct; MF = median field of the epigynum; PLE = posterior lateral eye; PME = posterior lateral eye; S = spermatheca; SD = sinuous depression.

Results

Pandava Lehtinen, 1967

Type-species by monotype and original designation: *Amaurobius laminatus* Thorell, 1878: 168; *Pandava* Lehtinen, 1967: 255, figs. 425–426, 440; World Spider Catalog (2017).

Pandava arunae sp. nov. (Figs. 1-13)

Material examined: Holotype ♀, from Lonar Crater Sanctuary, District-Buldhana, Maharashtra, India (19°58'23.63"N, 76°30'23.03"E), 6-10-2012, Collected by A.K. Bodkhe (SR lab JDPSM); 2♀♀ paratypes from J.D. Patil Mahavidyalaya campus Daryapur, District-Amravati, Maharashtra, India, 05-08-2015 & 15-11-2016, Collected by Shripad Manthen & Subhash Kamble (SR Lab JDPSM, Daryapur).

Etymology: The specific name is a noun in apposition of Adv. Arun Shelke, President of Shri Shivaji Education Society Amravati, Maharashtra, India.

Diagnosis: *Pandava arunae* sp. nov. resembles *P. ganesh*, *P. laminata*, and *P. sarasvati* in the general shape of the epigynum, but differs by epigynal rim attached, the narrow posterior portion, spermathecae looped and long, strongly sclerotized copulatory ducts that are visible through the cuticle.

* Editorial note. I think that Almeida Silva *et al.* (2010) meant the first record of *Pandava* not Titanoecidae from Africa. Both *Nurscia* Simon, 1874 and *Titanoeca* Thorell, 1870 are known from Africa before 2010.

Description: Female (Holotype) Total length 5.90; Cephalothorax 2.54 long, 1.60 wide; abdomen 3.24 long, 2.20 wide. Eyes and interdistances AME 0.11; ALE 0.12; PME 0.10; PLE 0.12; AME-AME 0.09; AME-ALE 0.12; PME-PME 0.16; PME-PLE 0.23, AME-PME 0.12; ALE-PLE 0.04.

Medium sized, araneomorph, cribellate, dark coloured, entelegyne spider. Carapace with cephalic region dark coloured, elevated cephalic region which is higher in position. Less wide than thoracic region. Anterior tip flat. Eyes situated at anterior tip. Thoracic region flat, posterior margin centrally constricted, fovea distinct light coloured, shallow. Radial furrow light coloured. Smooth surface. (Figs. 1-5 & 9)

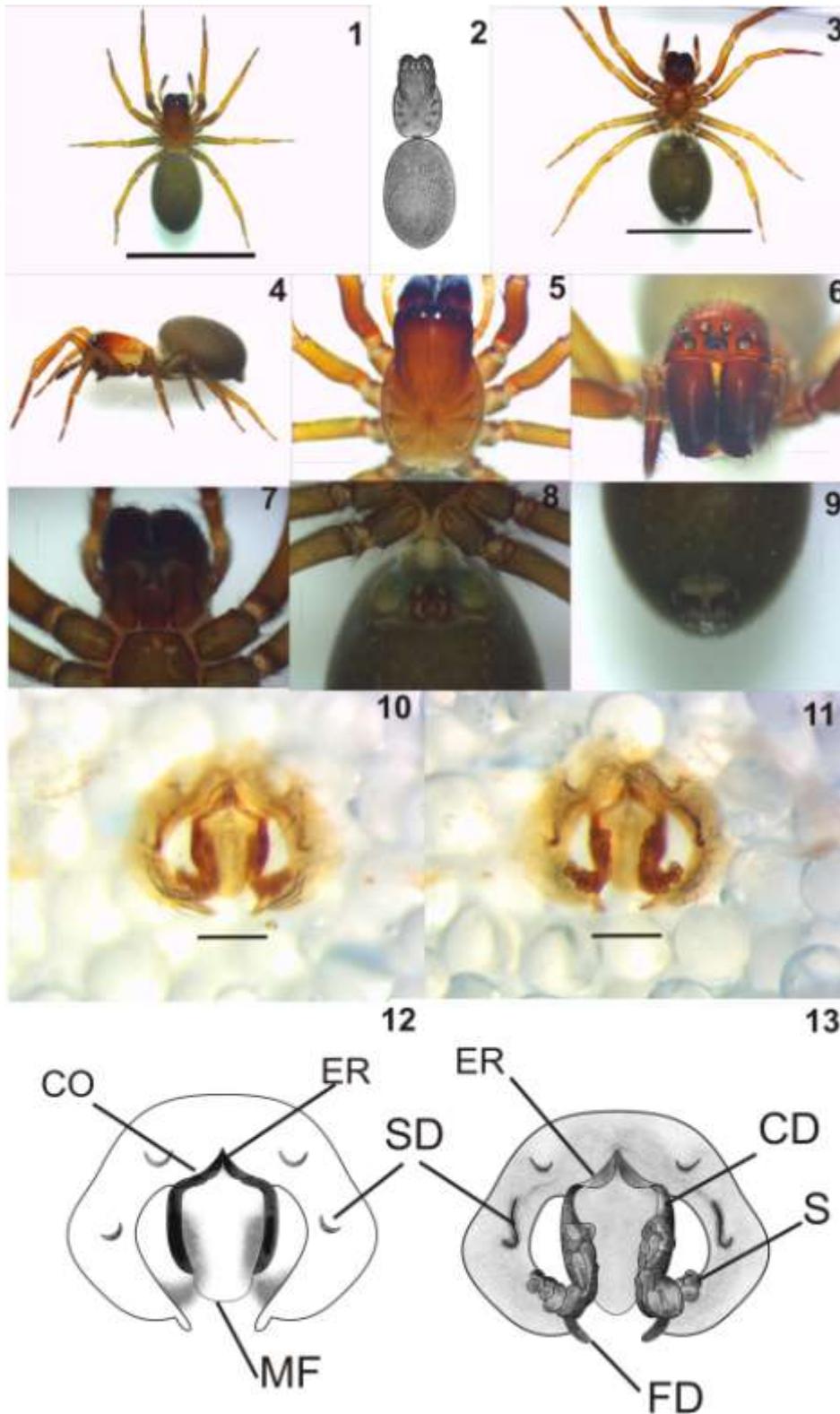
Eyes eight, arranged in two rows; anterior row straight, situated slope or downwardly directed; posterior row slightly recurved; lateral eyes close together, slightly higher in position or on tubercle. Eye region surrounded by curved and straight setae. Medians well separated, slightly smaller than laterals. AME and ALE joining are black coloured. Eyes projected outside (Fig. 6). Smaller clypeus with a few setae over it, without distinct chilum. Sternum pointed at posterior tip, flat at anterior tip lateral boarder truncated rough margin, clothed with black hairs. Dirty yellowish brown coloured. Roughly shield shaped. Labium longer than wide anterior pointed posterior flat middle broad than posterior end. Endites strong reddish brown, medially compressed lateral margins, with numerous black setae over it, bunch of scopulae at anterior promarginal tip, single row of serrulae at its proximal tip (Fig. 7). Chelicerae reddish black, straight, strong, three teeth at promargin, among its first one is smaller, rest larger. Two teeth at retromargin of same size but like small denticles. Fangs strong, less curved pointed with serrated margins. Chelicerae with numerous long and curved black setae. Boss single, small. Leg formula 1423, leg I & II dark coloured, III & IV light coloured. Entirely covered with black plumose setae, measurements of leg segments as in table (1). Long coxae, short trochanters, lack spines at coxa, trochanter, femur patella and tarsus, spines are present on metatarsus and tibia. Short slightly curved projection at retro-lateral side on patella. Female palp with single claw, tarsus and tibia dark brown, rest of the segments are light or yellow coloured. Spination as in table (2).

Abdomen oval entirely clothed with black plumose hairs and dorsum without banding, but having numerous small circular white spots randomly distributed all over the abdomen. Ventrally with epigastric scuta beneath epigynum and lungs are situated. Small white spots present dorsally as well as laterally, absent in middle margin. Cribellum bi-divided.

Epigynum with the narrow posterior portion, epigynal rim attached, spermathecae looped and long, strongly sclerotized copulatory ducts that are visible through the cuticle (Figs. 10-13).

Table 1. Measurements of leg segments of *Pandava arunae* sp. nov. ♀ (in mm).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total length
I	1.76	0.96	2.06	1.68	0.94	7.40
II	1.45	0.93	1.67	1.60	0.98	6.63
III	0.86	0.83	1.32	1.43	0.75	5.19
IV	1.38	0.92	1.86	1.77	0.79	6.72



Figs. 1-13. *Pandava arunae* sp. nov. 1-4. Habitus. 1-2. dorsal view. 3. ventral view. 4. lateral view. 5-6. Cephalothorax. 5. dorsal view. 6. frontal view. 7. Labium and endites. 8. Epigynum, ventral view before dissection. 9. Spinnerets and cribellum. 10-13. Epigynum, cleared. 10, 12. ventral view. 11, 13. vulvae, dorsal view. Scale bars: (1 & 3) 5 mm, (10 & 11) 0.2 mm.

Table 2. Spination of legs of *Pandava arunae* sp. nov. ♀.

Leg	Femur	Tibia	Metatarsus
I	Pl 1	Pl 1, v 2-2	Pl 1-1, v 2-2-2
II	-	Pl 1-1, v 2	Pl 1-1, v 2-2-3
III	-	d1, rl 1, pl 1	Pl2, rl2, v2-2-3
IV	-	Pl1, rl1, v1	Pl1, rl1, v 2-2-3

d = dorsal, Pl = prolateral, rl = retrolateral, v = ventral.

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