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On the taxonomic validity of Indian ground spiders: II. Genera *Drassyllus* Chamberlin, 1922 and *Nodocion* Chamberlin, 1922 (Araneae: Gnaphosidae)

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Abstract. Indian species of *Drassyllus* and *Nodocion* are revised, mostly based on the type material available in the National Zoological Collection, Zoological Survey of India, Kolkata. All the Indian representatives of the former genus are transferred to *Cryptodrassus*, with a synonymy of *Drassyllus jabalpurensis* syn. nov. with *Cryptodrassus khajuriae* comb. nov., while the Indian species of the latter genus are transferred to *Setaphis*, with a provisional transfer of *Nodocion solanensis*. All the examined type specimens are imaged and supplementary descriptions are provided.

Keywords. *Cryptodrassus*, *Setaphis*, transfer, type material, Zoological Survey of India.

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Introduction

This paper, the second in a series on the taxonomic validity of Indian ground spiders of the family Gnaphosidae Pocock, 1898, deals with the species described under the Holarctic genus *Drassyllus* Chamberlin, 1922 and the Nearctic genus *Nodocion* Chamberlin, 1922. The former genus includes five nominal species in India, viz. *Drassyllus jabalpurensis* Gajbe, 2005, *Drassyllus khajuriae* Tikader & Gajbe, 1976, *Drassyllus mahabalei* Tikader, 1982, *Drassyllus platnicki* Gajbe, 1987 and *Drassyllus ratnagiriensis* Tikader & Gajbe, 1976, whereas the latter has two species, viz. *Nodocion solanensis* Tikader & Gajbe, 1977 and *Nodocion tikaderi* (Gajbe, 1993) (World Spider Catalog 2020). One Indian species from the latter genus, *Nodocion mandae* (Tikader & Gajbe, 1977), has already been transferred

to *Setaphis* Simon, 1893 and synonymized with *Setaphis browni* (Tucker, 1923) (Platnick & Murphy 1996). All the Indian species of *Drassyllus* and *Nodocion* are known from the females only and are poorly described and illustrated, making their identification difficult. Moreover, the original illustrations of all these species are clearly differing from the generic features and female genital morphology of the type species of both genera, indicating the possibility of misplacement of Indian representatives under these genera. To clarify the taxonomic ambiguity on Indian species of *Drassyllus* and *Nodocion* and to make their identity more transparent, we examined the types of these species available in the National Zoological Collection, Zoological Survey of India, Kolkata and the results are presented below.

Material and methods

The specimens were studied under a Leica EZ4 HD stereo microscope. All measurements are in millimetres (mm). Lengths of palp and leg segments are given as: total (femur, patella, tibia, metatarsus (except for palp), tarsus). The micrographic images were taken with a Leica DFC500 digital camera attached to a Leica M205A stereo microscope with the software package Leica Application Suite (LAS, ver. 3.8) for stacking images taken at different focal planes.

Abbreviations

ALE	=	anterior lateral eye
AME	=	anterior median eye
PLE	=	posterior lateral eye
PME	=	posterior median eye
I–IV	=	1 st to 4 th leg
NZC-ZSI	=	National Zoological Collection, Arachnida Section, Zoological Survey of India, Kolkata

Results

Class Arachnida Lamarck, 1801
Order Araneae Clerck, 1757
Family Gnaphosidae Pocock, 1898
Genus *Cryptodrassus* Miller, 1943

Cryptodrassus khajurii (Tikader & Gajbe, 1976) comb. nov.
Figs 1–2

Drassyllus khajurii Tikader & Gajbe, 1976: 432, figs 5–8.

Drassyllus jabalpurensis Gajbe, 2005: 136, figs 23–27. **Syn. nov.**

Drassyllus khajurii – Tikader 1982: 512, figs 490–494. — Gajbe 2007: 489, figs 208–212.

Diagnosis

Cryptodrassus khajurii comb. nov. seems closely related to *Cryptodrassus helvolus* (O. Pickard-Cambridge, 1872), as both have a large epigynal atrium. However, the former species can be distinguished from the latter by the following combination of characters: epigyne with anterior hood (epigyne of *C. helvolus* lacks anterior hood), highly coiled copulatory ducts with thick proximal and thin distal parts (copulatory ducts of *C. helvolus* less coiled and nearly uniform in diameter along the entire length) and globular receptacles (*C. helvolus* with nearly oval receptacles) (compare Figs 1C–D, 2C–D with Chatzaki & Russell-Smith 2017: figs 5–6).

Material examined

Holotype of *D. khajuriai*

INDIA • ♀; Madhya Pradesh, Jabalpur, rest house in Madla; 28 Feb. 1974; H. Khajuria leg.; NZC-ZSI, Kolkata 5043/18.

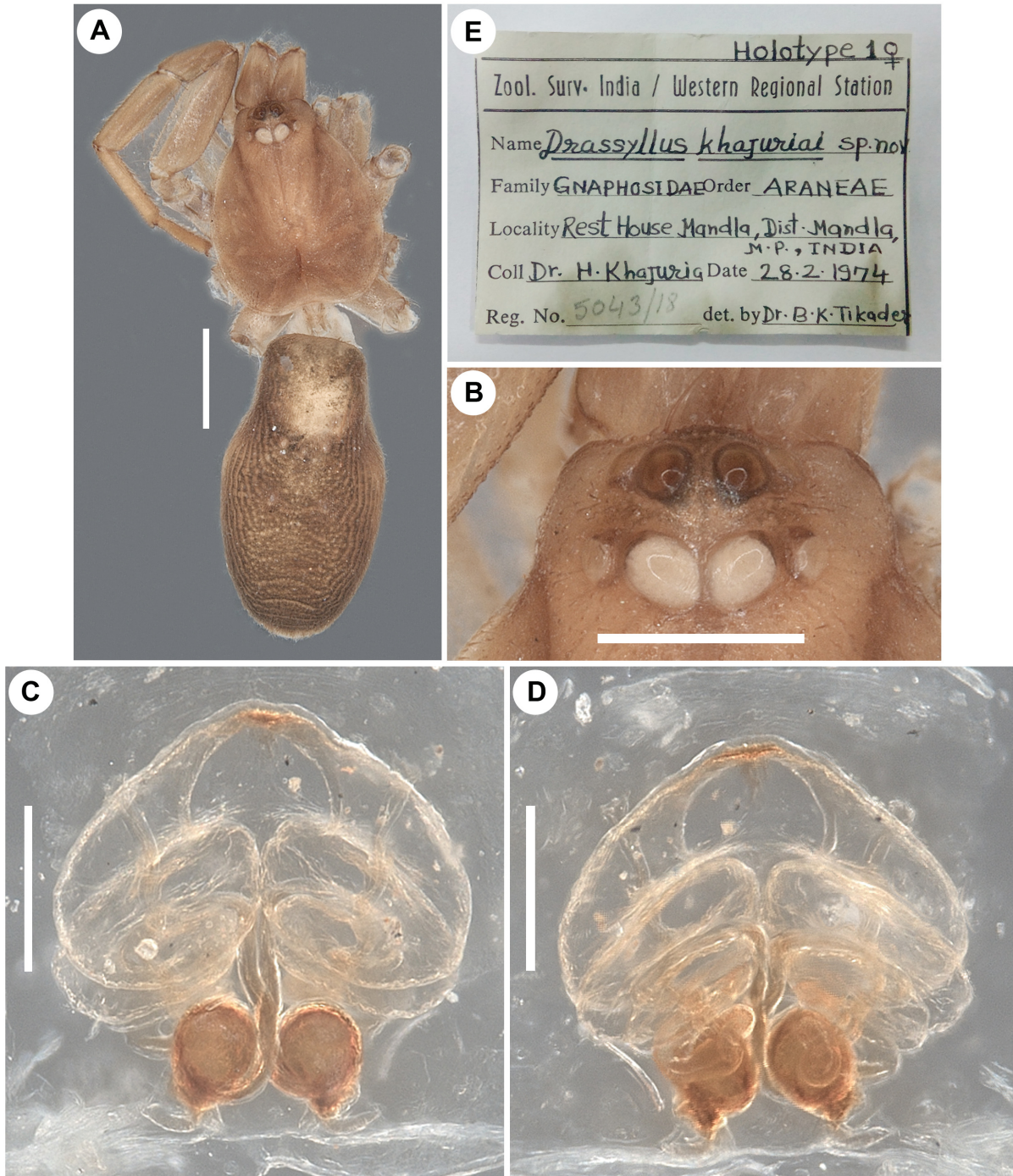


Fig. 1. *Cryptodrassus khajuriai* (Tikader & Gajbe, 1976) comb. nov., ♀, holotype of *Drassyllus khajuriai* Tikader & Gajbe, 1976 (NZC-ZSI-5043/18). **A.** Habitus, dorsal view. **B.** Eyes of the same, dorsal view. **C.** Epigyne, ventral view. **D.** Same, dorsal view. **E.** Label from type bottle. Scale bars: A = 1 mm; B = 0.5 mm; C–D = 0.2 mm.

Holotype of *D. jabalpurensis*

INDIA • ♀; Madhya Pradesh, Jabalpur, Bhirki Village on Jabalpur-Chargawan road; 24 Nov. 1970; D.K. Ghosal leg.; NZC-ZSI, Kolkata 5452/18.

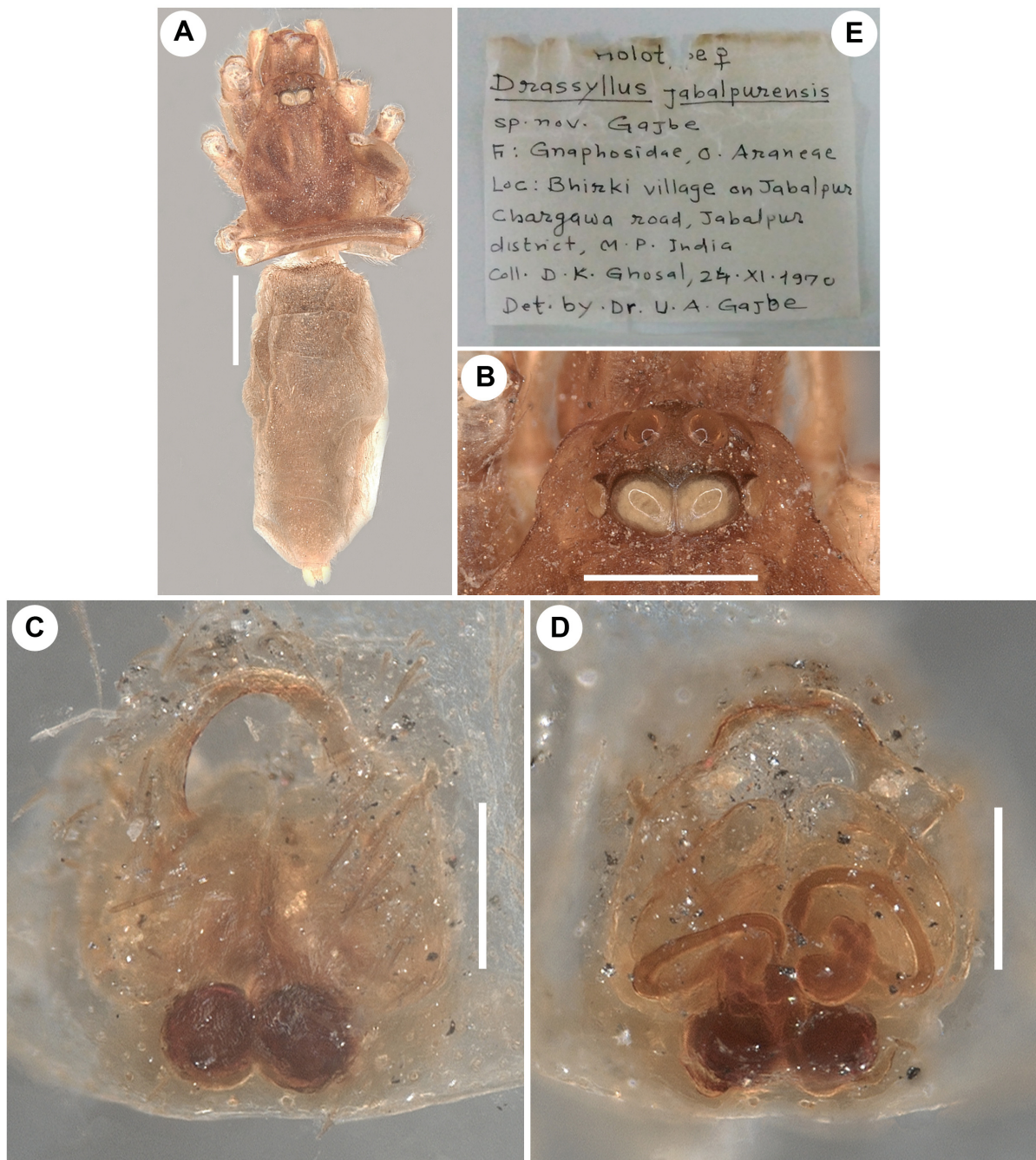


Fig. 2. *Cryptodrassus khajurii* (Tikader & Gajbe, 1976) comb. nov., ♀, holotype of *Drassyllus jabalpurensis* Gajbe, 2005 (NZC-ZSI-5452/18). **A.** Habitus, dorsal view. **B.** Eyes of the same, dorsal view. **C.** Epigyne, ventral view. **D.** Same, dorsal view. **E.** Label from type bottle. Scale bars: A = 1 mm; B = 0.5 mm; C–D = 0.2 mm.

Supplementary description

Female (holotype, Fig. 1)

Body length 5.38. Prosoma: length 2.18, width 1.76. Opisthosoma: length 3.20, width 1.71. Eye diameters: ALE 0.12, AME 0.13, PLE 0.11, PME 0.19. Eye interdistances: AME–AME 0.05, AME–PME 0.09, PME–PLE 0.04. Chelicerae length 0.67. Measurement of leg II 5.27 [1.51, 0.87, 1.03, 1.13, 0.73]. Epigyne (holotype, Fig. 1C–D): Epigynal plate moderately sclerotized, triangular, with smoothly triangular atrium with anterior hood (Fig. 1C). Copulatory openings indistinct. Copulatory ducts long, tubular, thick proximally and narrowed distally, obliquely twisted (Fig. 1D). Receptacles small, spherical, nearly contiguous, lying adjacent to posterior epigynal margin (Fig. 1D). Fertilization ducts narrow, diverging (Fig. 1D).

Male

Unknown.

Justification of the transfer

Tikader & Gajbe (1976) described *D. khajuriai* on the basis of a female specimen collected in Madhya Pradesh. It resembles *Drassyllus* spp. only in the posterior median eyes, which are the largest and remaining contiguous in both *Cryptodrassus* and *Drassyllus* (see Murphy 2007: figs 184, 528; herein Fig. 1B). Detailed examination of the holotype of *D. khajuriai* revealed that it has all of the characteristic features of *Cryptodrassus* spp. as described and illustrated for *Cryptodrassus hungaricus* (Balogh, 1935), the type species of the genus (Murphy 2007: figs 528–529; Kovblyuk & Nadolny 2010: figs 7–8), *Cryptodrassus helvolus* (O. Pickard-Cambridge, 1872) (Levy 1998: fig. 126; Chatzaki & Russell-Smith 2017: fig. 5) and *Cryptodrassus helvoloides* (Levy, 1998) (Chatzaki & Russell-Smith 2017: fig. 11): PMEs largest, irregular, all other eyes round, cheliceral promargin with three and retromargin with one tooth and epigyne with wide, anterior atrium. Considering these observations, we propose to transfer *D. khajuriai* to *Cryptodrassus*.

Justification of the synonymy

A detailed examination of the holotype of *D. jabalpurensis* shows that it has diagnostic features of *D. khajuriai*: triangular epigynal atrium with single anterior hood, highly coiled obliquely twisted copulatory ducts with thick proximal and narrow distal parts and spherical and contiguous receptacles (compare Fig. 1C–D with Fig. 2C–D). Based on these observations, we propose to consider *D. jabalpurensis* as a junior synonym of *D. khajuriai*.

Remarks

The ZSI collection has one glass bottle for *D. khajuriai*, labeled as ‘holotype’ (5043/18), containing a female specimen in fairly good condition, with only left leg II. The same bottle has a small glass vial containing the dissected epigyne. The ZSI collection has one glass bottle for *D. jabalpurensis*, labeled as ‘holotype’ (with no register number), containing a female specimen in bad condition. The same bottle has a small glass vial containing the dissected epigyne.

Cryptodrassus mahabalei (Tikader, 1982) comb. nov.

Fig. 3

Drassyllus mahabalei Tikader, 1982: 510, figs 485–489.

Drassyllus mahabalei – Gajbe 2007: 490, figs 213–217.

Diagnosis

Cryptodrassus mahabalei comb. nov. resembles *C. khajuriai* comb. nov. in having a large, epigynal atrium and copulatory ducts with thick proximal and thin distal parts, but differs from the latter by the following combination of characters: epigyne with wide circular atrium (epigyne of *C. khajuriai* comb. nov. with triangular atrium), less coiled copulatory ducts (copulatory ducts of *C. khajuriai* comb. nov. highly coiled) and oval receptacles (*C. khajuriai* comb. nov. with globular receptacles) (compare Figs 1C–D, 2C–D with Fig. 3C–D).

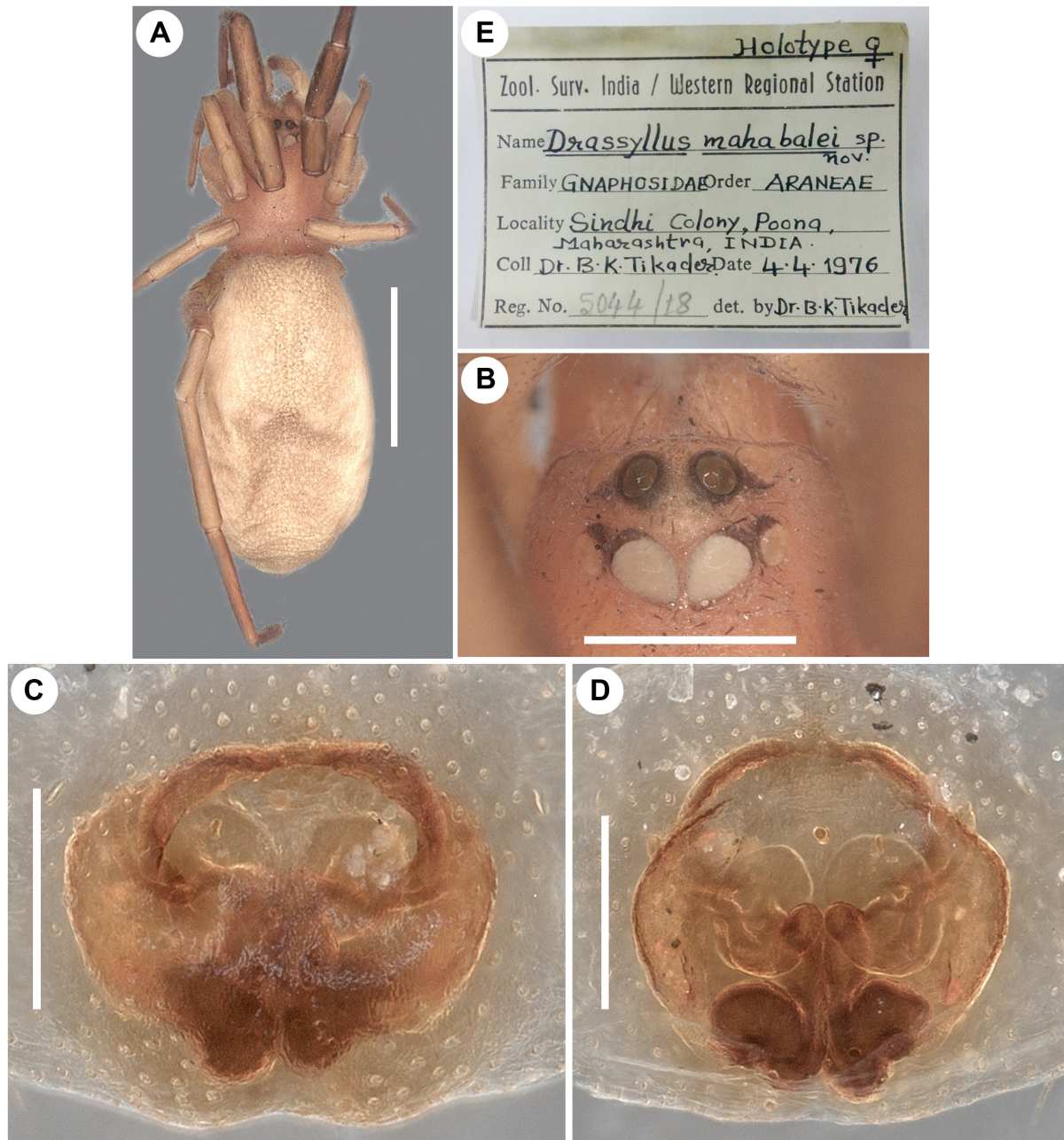


Fig. 3. *Cryptodrassus mahabalei* (Tikader, 1982) comb. nov., ♀, holotype of *Drassyllus mahabalei* Tikader, 1982 (NZC-ZSI-5044/18). **A.** Habitus, dorsal view. **B.** Eyes of the same, dorsal view. **C.** Epigyne, ventral view. **D.** Same, dorsal view. **E.** Label from type bottle. Scale bars: A = 2 mm; B = 0.5 mm; C–D = 0.2 mm.

Material examined

Holotype

INDIA • ♀; Maharashtra, Pune (formerly Poona), Sindhi Colony; 18°33'32.29" N, 73°48'39.70" E; 571 m a.s.l.; 4 Apr. 1976; B.K. Tikader leg.; NZC-ZSI, Kolkata 5044/18.

Supplementary description

Female (holotype, Fig. 3)

Body length 6.29. Prosoma: length 1.90, width 1.52. Opisthosoma: length 4.39, width 2.39. Eye diameters: ALE 0.12, AME 0.13, PLE 0.10, PME 0.17. Eye interdistances: AME–AME 0.06, AME–PME 0.09, PME–PLE 0.02. Chelicerae length 0.57. Measurements of palp and legs. Palp 1.82 [0.69, 0.34, 0.26, 0.53], I 6.01 [1.61, 0.94, 1.31, 1.25, 0.90], II 4.29 [1.17, 0.65, 0.80, 0.96, 0.71], III 3.92 [1.03, 0.58, 0.71, 0.99, 0.61], IV 7.74 [1.97, 0.93, 1.69, 2.01, 1.14]. Leg formula: 4123. Palpal tarsus bears spines. Epigyne (holotype, Fig. 3C–D): Epigynal plate moderately sclerotized, nearly rectangular, with wide circular atrium with anterior hood (Fig. 3C). Copulatory openings indistinct. Copulatory ducts long, tubular, narrowed medially and thick distally, weakly twisted (Fig. 3D). Receptacles small, reniform, obliquely placed, lying adjacent to posterior epigynal margin (Fig. 3D). Fertilization ducts narrow, diverging (Fig. 3D).

Male

Unknown.

Justification of the transfer

Tikader (1982) described this species on the basis of a female specimen collected in Maharashtra. Like the former species, it has resemblance to *Drassyllus* spp. only in the posterior median eyes (Fig. 3B). A detailed examination of the holotype of *D. mahabalei* revealed that it has all of the characteristic features of *Cryptodrassus* spp. as noted in the case of previous species. Thus we propose to transfer *D. mahabalei* to *Cryptodrassus*.

Remarks

The ZSI collection has one glass bottle for this species, labeled as 'holotype' (5044/18), containing a female specimen in good condition, without right leg IV only. The same bottle has a small glass vial containing the dissected epigyne.

Cryptodrassus platnicki (Gajbe, 1987) comb. nov.

Drassyllus platnicki Gajbe, 1987: 289, figs 1–5.

Type material

Holotype (not examined)

INDIA • ♀; Maharashtra, Nagpur, Kachari Sawanga village/Kachari (sa) village; 21°11'41.53" N, 78°39'12.05" E; 448 m a.s.l.; 5 Mar. 1984; U.A. Gajbe leg.; NZC-ZSI, Kolkata 5144/18.

Justification of the transfer

Even though we did not examine the type of *D. platnicki*, which may either be lost or misplaced somewhere in the collection, this species agrees with *Cryptodrassus* spp. in generic features such as obliquely placed, large, contiguous PMEs, cheliceral promargin with three and retromargin with single tooth and epigyne with anteriorly placed atrium. All these indicate that this species in fact belongs to *Cryptodrassus*. The structure of vulvae of this species looks closely similar to the vulvae of *C. khajuriae* comb. nov., suggesting a possible synonymy of the former species with the latter one (compare

Figs 1C–D, 2C–D with Gajbe 1987: figs 3–4); however, confirmation requires the examination of the type or topotype materials of *C. platnicki* comb. nov.

Remarks

We were unable to find the type of *D. platnicki* in the arachnid collection of ZSI, even though the author claimed that the type was deposited here (Gajbe 1987).

Cryptodrassus ratnagiriensis (Tikader & Gajbe, 1976) comb. nov.

Fig. 4

Drassyllus ratnagiriensis Tikader & Gajbe, 1976: 431, figs 1–4.

Drassyllus ratnagiriensis – Tikader 1982: 514, figs 495–499.

Diagnosis

Cryptodrassus ratnagiriensis comb. nov. can be distinguished from all other known species of *Cryptodrassus* by a disto-medially placed small, circular epigynal atrium and uniformly thick, C-shaped copulatory ducts that are confronting each other (Fig. 4C–D).

Material examined

Holotype

INDIA • ♀; Maharashtra, Ratnagiri, Chiplun, Kashedi Ghats; 17°54'14.77" N, 73°26'00.67" E; 386 m a.s.l.; 14 Feb. 1973; M. Babu Rao leg.; NZC-ZSI, Kolkata 5042/18.

Supplementary description

Female (holotype, Fig. 4)

Body length 8.58. Prosoma: length 2.77, width 2.43. Opisthosoma: length 5.81, width 3.07. Eye diameters: ALE 0.15, AME 0.16, PLE 0.14, PME 0.21. Eye interdistances: AME–AME 0.06, AME–PME 0.13, PME–PLE 0.04. Chelicerae length 0.87. Measurements of palp and legs. Palp 2.84 [1.08, 0.53, 0.45, 0.78], III 6.19 [1.69, 1.00, 1.17, 1.53, 0.80], IV 11.78 [3.27, 1.42, 2.75, 3.10, 1.24]. Palpal tarsus bears spines. Epigyne (holotype, Fig. 4C–D): Epigynal plate membranous, with circular atrium, with paired anterior hoods (Fig. 4C). Copulatory openings indistinct. Copulatory ducts short, thick, weakly twisted (Fig. 4D). Receptacles small, globular, contiguous, lying adjacent to posterior epigynal margin (Fig. 4D). Fertilization ducts narrow, diverging (Fig. 4D).

Male

Unknown.

Justification of the transfer

Tikader & Gajbe (1976) described this species on the basis of a female specimen collected in Maharashtra. Like all the former species, this species also resembles *Drassyllus* spp. only in the posterior median eyes (Fig. 4B). A detailed examination of the holotype of *D. ratnagiriensis* revealed that its features fit those of *Cryptodrassus* spp. as noted for previous species. We therefore propose to transfer *D. ratnagiriensis* to *Cryptodrassus*.

Remarks

The ZSI collection has one glass bottle for this species, labeled as ‘holotype’ (5042/18), containing a female specimen in fairly good condition, with only left legs III and IV. The same bottle has a small glass vial containing the dissected epigyne.

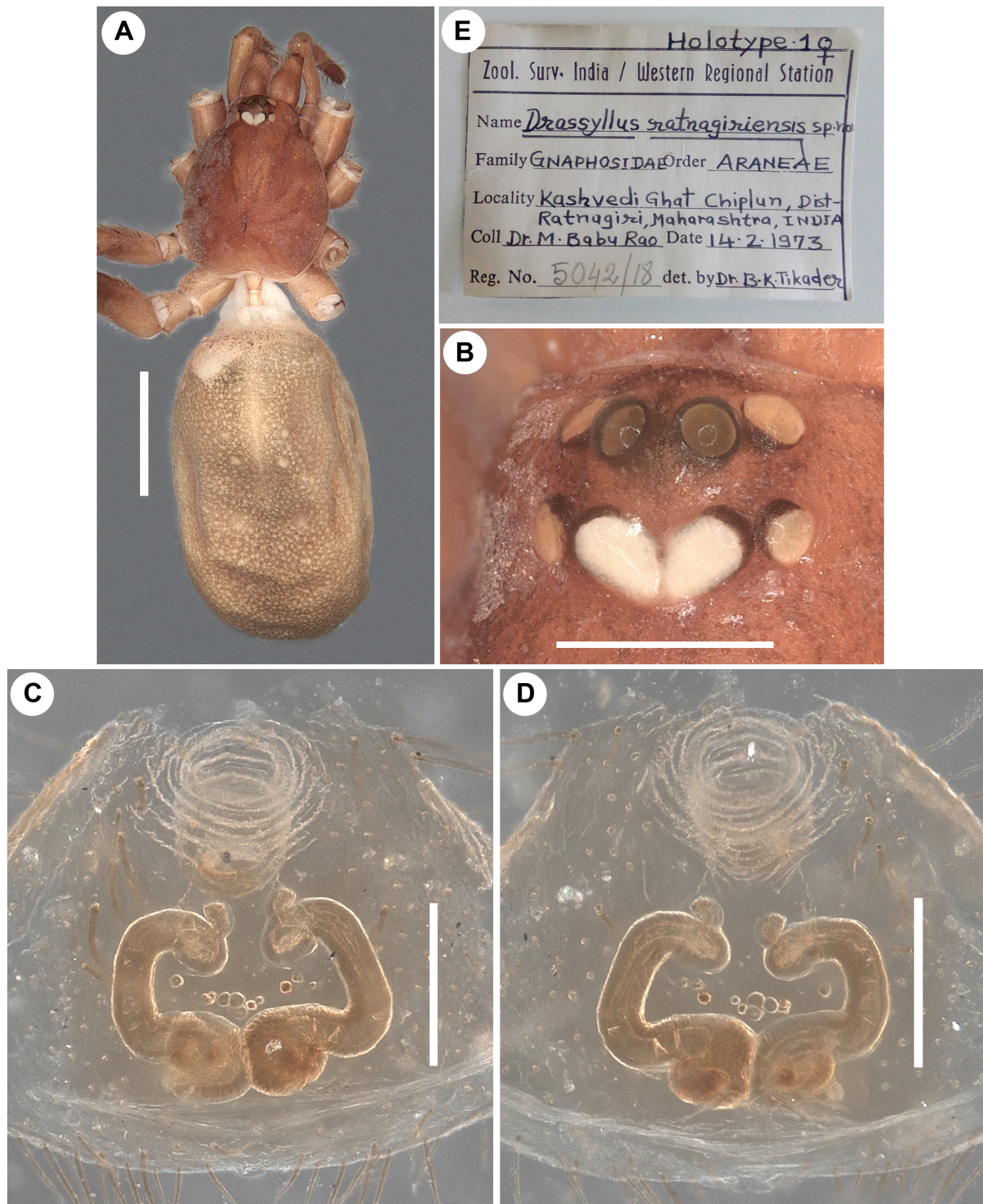


Fig. 4. *Cryptodrassus ratnagiriensis* (Tikader & Gajbe, 1976) comb. nov., ♀, holotype of *Drassyllus ratnagiriensis* Tikader & Gajbe, 1976 (NZN-ZSI-5042/18). **A.** Habitus, dorsal view. **B.** Eyes of the same, dorsal view. **C.** Epigyne, ventral view. **D.** Same, dorsal view. **E.** Label from type bottle. Scale bars: A = 2 mm; B = 0.5 mm; C–D = 0.2 mm.

Genus *Setaphis* Simon, 1893

Setaphis tikaderi (Gajbe, 1993) comb. nov.

Liodrassus tikaderi Gajbe, 1993: 247, figs 1–5.

Nodocion tikaderi Brignoli, 1983.

Liodrassus tikaderi – Gajbe 2007: 467, figs 120–124.

Type material

Holotype (not examined)

INDIA • ♀; Madhya Pradesh, Jabalpur, Amjhar Ghati on Jabalpur-Dindori road; 27 Nov. 1965; H.P. Agrawal leg.; NZC-ZSI, Kolkata (no register number).

Justification of the transfer

Although we could not examine the type of *L. tikaderi*, this species agrees with *Setaphis* in generic features such as PME largest and irregularly rectangular, epigyne with anterior margins, epigynal mid-piece surrounded by median ridges and highly twisted copulatory ducts (Platnick & Murphy 1996). All these suggest that this species belongs to *Setaphis*. The original illustrations of the epigyne of this species show a close resemblance with that of *S. browni* in the shape of epigynal mid-piece, the path of internal ducts and the shape and orientation of the receptacles, indicating its possible synonymy with the latter species (compare Gajbe 1993: figs 3–4 with Fig. 6C–D). However, confirmation requires the examination of the type or topotype materials of *S. tikaderi* comb. nov..

Remarks

We found the holotype bottle of *L. tikaderi* in the arachnid collection of ZSI. However, it did not contain the holotype female; instead it contains a juvenile gnaphosid specimen, indicating that the holotype of *L. tikaderi* may either be lost or misplaced somewhere in the collection. We found the holotype bottle of *Liodrassus mandae* Tikader & Gajbe, 1977 in the arachnid collection of ZSI (Fig. 6). The glass bottle, labeled as ‘holotype’ (5018/18), contains a female specimen in fairly good condition, with broken legs except the first pair. The same bottle has a small glass vial containing the dissected epigyne.

“*Setaphis*” *solanensis* (Tikader & Gajbe, 1977) comb. nov.

Fig. 5

Nodocion solanensis Tikader & Gajbe, 1977: 73, fig. 6A–D.

Nodocion solanensis – Tikader 1982: 456, figs 363–367.

Diagnosis

“*Setaphis*” *solanensis* comb. nov. resembles *Setaphis subtilis* (Simon, 1897) in having a large, flat proximal part of the copulatory ducts, but can be distinguished by the narrow, highly twisted distal part of the copulatory ducts (copulatory ducts of *S. subtilis* with broad, uncoiled distal part) (compare Fig. 5C–D with Platnick & Murphy 1996: fig. 24).

Material examined

Holotype

INDIA • ♀; Himachal Pradesh, Solan, Kasauli (= Kasoli); 30°54'04.64" N, 76°57'53.55" E; 1817 m a.s.l.; 22 Dec. 1972; H.P. Agarwal leg.; NZC-ZSI, Kolkata 5002/18.

Supplementary description

Female (holotype, Fig. 5)

Body length 7.54. Prosoma: length 2.97, width 2.20. Opisthosoma: length 4.57, width 2.77. Eye diameters: ALE 0.17, AME 0.16, PLE 0.16, PME 0.14. Eye interdistances: AME–AME 0.08, AME–PME 0.16, PME–PLE 0.12, PME–PME 0.08. Chelicerae length 0.90. Measurements of palp and legs. Palp (right) 2.97 [1.08, 0.53, 0.51, 0.85], III (right) 6.30 [1.78, 1.02, 1.23, 1.53, 0.74], IV 9.00 [2.32,

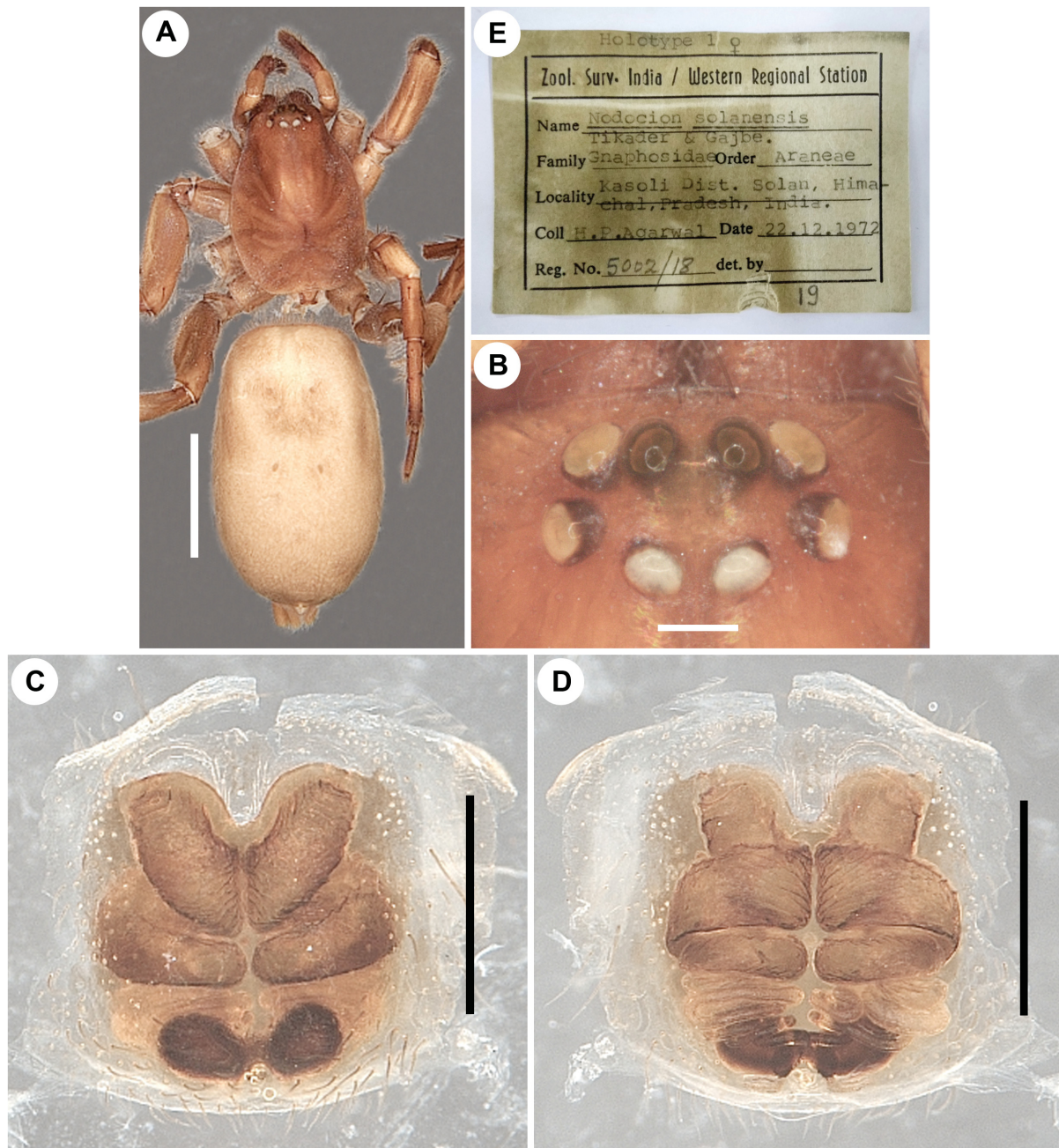


Fig. 5. “*Setaphis*” *solanensis* (Tikader & Gajbe, 1977) comb. nov., ♀, holotype of *Nodocion solanensis* Tikader & Gajbe, 1977 (NZC-ZSI-5002/18). **A.** Habitus, dorsal view. **B.** Eyes of the same, dorsal view. **C.** Epigyne, ventral view. **D.** Same, dorsal view. **E.** Label from type bottle. Scale bars: A = 2 mm; B = 0.2 mm; C–D = 0.5 mm.

1.33, 2.01, 2.37, 0.97]. Epigyne (holotype, Fig. 5C–D): Epigynal plate sclerotized, with nearly M-shaped anterior ridge (Fig. 5C). Copulatory openings indistinct. Copulatory ducts long, highly twisted, with large, flat proximal part and narrow, tubular distal part (Fig. 5D). Receptacles small, oval, obliquely placed, diverging, lying adjacent to posterior epigynal margin (Fig. 5D). Fertilization ducts narrow, diverging.

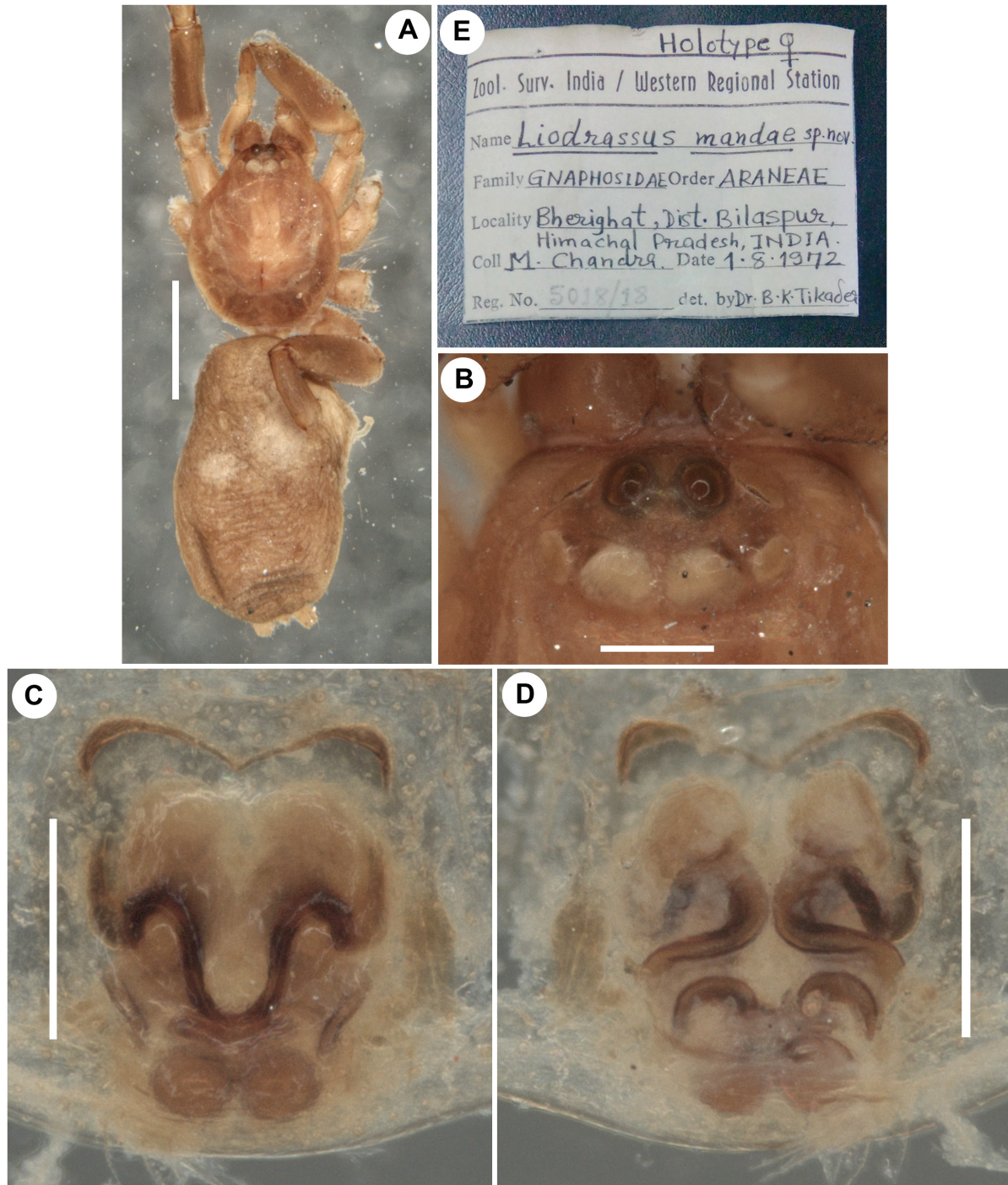


Fig. 6. *Setaphis browni* (Tucker, 1923), ♀, holotype of *Liodrassus mandae* Tikader & Gajbe, 1977 (NZN-ZSI-5018/18). **A.** Habitus, dorsal view. **B.** Eyes of the same, dorsal view. **C.** Epigyne, ventral view. **D.** Same, dorsal view. **E.** Label from type bottle. Scale bars: A = 1 mm; B–D = 0.2 mm.

Male

Unknown.

Justification of the transfer

Tikader & Gajbe (1977) described this species on the basis of a female specimen collected in Himachal Pradesh. The original illustration of the epigyne of this species (Tikader & Gajbe 1977: fig. 6b) clearly deviated from the epigyne of *Nodocion mateonus* Chamberlin, 1922 (Platnick & Shadab 1980: figs 3–4), indicating its misplacement under *Nodocion* Chamberlin, 1922. Detailed examination of the holotype of *N. solanensis* revealed that its features do not fit those of any known gnaphosid genera, indicating that this species probably represents an unknown Indian gnaphosid genus. However, this will not be confirmed until the male pedipalp of this species will have been examined. Until then, we tentatively place this species in *Setaphis* due to the distant similarities in the following features: PME irregular, epigyne with a mid-piece and highly twisted internal ducts with wide proximal part (Fig. 5B–D).

Remarks

The ZSI collection has one glass bottle for this species labeled as ‘holotype’ (5002/18), containing a female specimen in fairly good condition, with broken legs and detached opisthosoma. The same bottle has a small glass vial containing the dissected epigyne.

Discussion

Even though the gnaphosid spiders described from India are numerically rich, the majority of them are known from poor descriptions and illustrations. A recent revision of the Indian species that had been attributed to the Nearctic genus *Scopoides* Platnick, 1989 clearly indicated the misidentification of Indian gnaphosid spiders (Sankaran *et al.* 2019). The present study provides further clarification to the taxonomy of the Indian gnaphosid fauna and strengthens the need of a thorough revision of all the known Indian gnaphosid spiders, in order to obtain clarity on the actual diversity of gnaphosid fauna in India.

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