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New species and records of the jumping spiders from India and Nepal (Aranei: Salticidae)

Новые виды и находки пауков-скакунчиков из Индии и Непала (Aranei: Salticidae)

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КЛЮЧЕВЫЕ СЛОВА: Araneae, описания, таксономия, фаунистика.

ABSTRACT. The paper presents new taxonomic and faunistic data on 12 species of the jumping spiders (Salticidae) from India and Nepal. A new species from east India (Odisha) is described: *Carrhotus spiridonovi* sp.n. (♂). Unknown females are described for two species for the first time: *Colopsus cinereus* Kanesharatnam et Benjamin, 2021 and *Thyene bivittata* Xie et Peng, 1995. New species records are provided for the faunas of India (three species) and Nepal (two species).

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РЕЗЮМЕ. В статье приводятся данные по таксономии и фаунистике для 12 видов пауков-скакунчиков (Salticidae) из Индии и Непала. Описан новый вид из восточной Индии (Орисса): *Carrhotus spiridonovi* sp.n. (♂). Для двух видов впервые описаны самки: *Colopsus cinereus* Kanesharatnam et Benjamin, 2021 и *Thyene bivittata* Xie et Peng, 1995. Новые виды отмечены для фаун Индии (три вида) и Непала (два вида).

Introduction

The jumping spiders (Salticidae) of South Asia constitute a very rich and insufficiently studied fauna. For instance, according to Caleb & Sankaran [2021], the salticid fauna of India consists of 280 species in 100 genera, plus at least 10 doubtful or erroneous names [Caleb, 2019]. Of these, some 123 species remain known from a single sex [Caleb, 2019], and many earlier records are in need of revision: e.g., those of *Marpissa* and *Myrmarachne* species (8 and 23 species, correspondingly). Yet, a total number of the currently known salticid species in India is about twice as small as that of Europe (including the Mediterranean), accounting for 508 valid species in 61 genera (plus 73 invalid names) [Canard, 2005]. There is no doubt that the actual number of Salticidae occurring in South Asia is hardly less than that in Europe (*sensu* Canard [2005]), but likely to be higher. Hence, it is not surprising that any new collection of Salticidae from South Asia brings new records and species. In recent years, two salticid collections from India and Nepal fell into the author's hands; both prove to be interesting, containing both undescribed species and new records to the regional faunas.

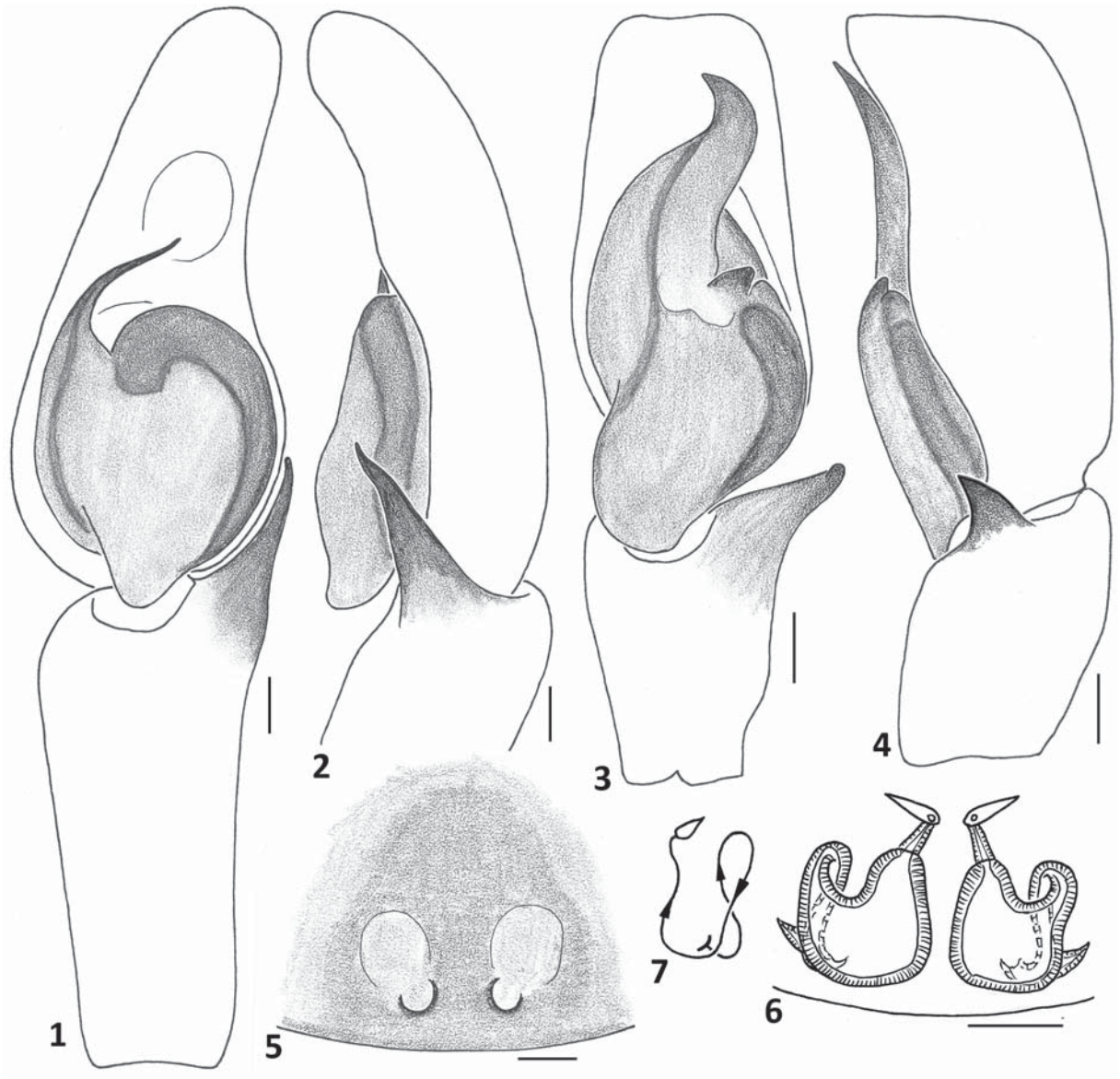
The aims of the present paper are as follows: (1) to provide new faunistic data from Nepal and India for 11 salticid species; (2) to describe a new *Carrhotus* species from India; and (3) to describe unknown females for two poorly known or recently described species.

Material and methods

This work is based on museum collections of jumping spiders which were sent to the author for identification. A total of 35 adult specimens, including those of *Thyene imperialis* (Rossi, 1846) from the Mediterranean used for comparative purposes, belonging to 12 species of Salticidae have been studied. The depositories of the studied material are abbreviates in the text as follows: BMNH — British Museum of Natural History, London, UK (J. Beccaloni); MMUE — Manchester Museum, University of Manchester, Manchester, UK (D.V. Logunov); ZMMU — Zoological Museum of the Moscow University, Moscow, Russia (K.G. Mikhailov).

Digital photographs of the general appearance were made at the Manchester Museum, using an Olympus SZX16 stereo microscope with a DP27 Digital Colour Camera, and Helicon Focus 7.7.2 as the processing software. Distributional maps were produced using the online mapping software SimpleMappr (Shorthouse 2010).

The abbreviations used in the text: *Eyes*: AME — anterior median eye, PLE — posterior lateral eye(s). *Leg segments*: Fm — femur, Pt — patella, Tb — tibia, Mt — metatarsus. *Position of spines on legs*: ap — apical, d — dorsal, pr — prolateral, rt — retrolateral, v — ventral. *Other*



Figs 1–7. Copulatory organs of *Carrhotus assam* Caleb, 2020 (1, 2; Nepal, Pohara), *C. erus* Jastrzębski, 1999 (3, 4; India, Uttarhand) and *C. sannio* (Thorell, 1877) (1, 2; Nepal, Beni): 1, 3 — male palp, ventral view; 2, 4 — same, retrolateral view; 5 — epigyne, ventral view; 6 — vulva, dorsal view; 7 — diagrammatic course of insemination ducts. Scale bars: 0.1 mm.

Рис. 1–7. Копулятивные органы *Carrhotus assam* Caleb, 2020 (1, 2; Непал, Похара), *C. erus* Jastrzębski, 1999 (3, 4; Индия, Уттаракханд) и *C. sannio* (Thorell, 1877) (1, 2; Непал, Бени): 1, 3 — пальпа самца, вид снизу; 2, 4 — тоже, вид сзади-сбоку; 5 — эпигина, вид снизу; 6 — вульва, вид сверху; 7 — схематический ход оплодотворительных канальцев. Масштаб: 0.1 мм.

abbreviations: D — described, nr. — near, RTA — retrolateral tibial apophysis. For the leg spination the system adopted is that used by Ono [1988]. The term 'spine' is used to describe pointed, rigid and usually articulating macrosetae on legs, the term 'vulva' is used for internal structures of female copulatory organs, and the term 'receptacle' is used as a synonym of 'spermatheca' [Jocque, Dippenaar-Schoeman, 2006: 25]. The sequence of leg segments in measurement data is as follows: femur + patella + tibia + metatarsus + tarsus (total). All measurements are in mm. In the following species accounts only references to the original descriptions are provided; for the complete sets of taxonomic references see World Spider Catalog [WSC, 2021] and for the earlier records from India see Caleb [2019] and Caleb & Sankaran [2021].

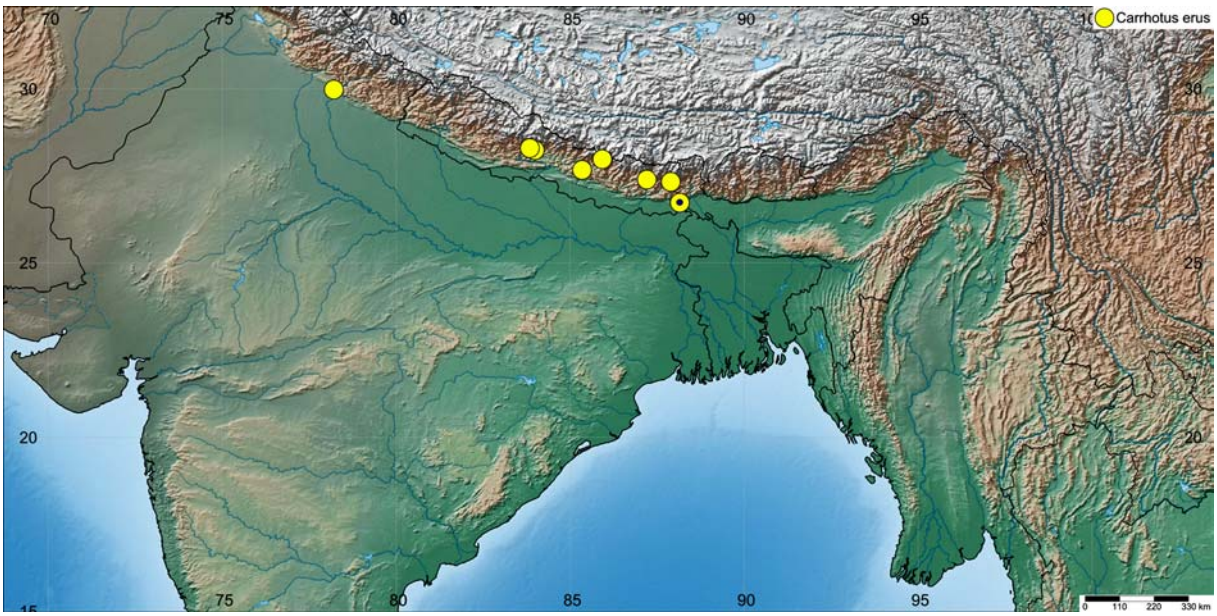
Species survey

Bianor albobimaculatus (Lucas, 1846)

Salticus albobimaculatus Lucas, 1846: 170, pl. 8, fig. 10 (D♀).

MATERIAL. NEPAL: 1 ♂ (BMNH), Darapani (28°27′N, 83°23.5′E), on ground, 3–6000 ft, 17.06.1954, K.H. Hyatt.

COMMENTS. It is a common, widespread species known from South Africa to the Mediterranean, with Algeria and Portugal lying at the westernmost limits of its range, east-



Map 1. Collecting localities *Carrhotus erus* Jastrzębski, 1999. Black dot indicates the type locality.
Карта 1. Точки сбора *Carrhotus erus* Jastrzębski, 1999. Чёрная точка указывает на типовой локалитет.

ward to Central Asia [Logunov, 2001] and NW India [Kaur *et al.*, 2014; Caleb, 2019; Logunov, 2019]. New species for the fauna of Nepal, representing the easternmost limit of the species range.

Carrhotus assam Caleb, 2020
Figs 1, 2, Map 2.

Carrhotus assam Caleb, in Caleb *et al*., 2020: 54, figs 11–17, 20–21 (D♂).

MATERIAL. NEPAL: 3 ♂♂ (BMNH), Pohara (28°14′N, 83° 59′E), running on sandy cliff face, 3000 ft, 12.04.1954, K.H. Hyatt.

COMMENTS. To date, the species has been known from the original description and type locality only: viz., Dehing Patkai Wildlife Sanctuary in Assam state of India [Caleb *et al.*, 2020: map 1]. New species for the fauna of Nepal, and the second record of the species after its description (Map 2). Yet, the female of this species remains unknown.

Carrhotus erus Jastrzębski, 1999
Figs 3, 4, Map 1.

Carrhotus erus Jastrzębski, 1999: 4, figs 12–15 (D♂).

MATERIAL. INDIA: 1 ♂, only left palp present (ZMMU), Uttarhand, Rishikesh env., Chilla (29.976°N, 78.209°E), 300 m, 14–16.04.2012, K. Tomkovitch. — NEPAL: 1 ♂ (BMNH), N of Pohara (28°14′N, 83°59′E), on tent, 3000 ft, 16.04.1954, K.H. Hyatt; 1 ♂ (BMNH), same locality, on tree trunk, 13.04.1954, K.H. Hyatt.

COMMENTS. To date, this species has been known from the original description only [Jastrzębski, 1999], being reported from Kathmandu, Sankhua Sabha, Taplejung, Kaski and Mustang districts of Nepal [Jastrzębski, 1999; present data]. New species for the fauna of India, with Uttarhand lying at the westernmost limit of the species range (Map 1).

Carrhotus sannio (Thorell, 1877)
Figs 5–7.

Plexippus sannio Thorell, 1877: 617 (D♂).

MATERIAL. INDIA: 1 ♂ (ZMMU), Uttarhand, Uttarkashi (30.7541°N, 78.4558°E), *Pinus*-broad-leaved forestry slope, 1180 m, 21–23.05.2012, K. Tomkovitch. — NEPAL: 1 ♀ (BMNH), on road along Mayangdi Khola nr. Beni (28°20.5′N, 83°34′E), 3000 ft, 15.06.1954, K.H. Hyatt.

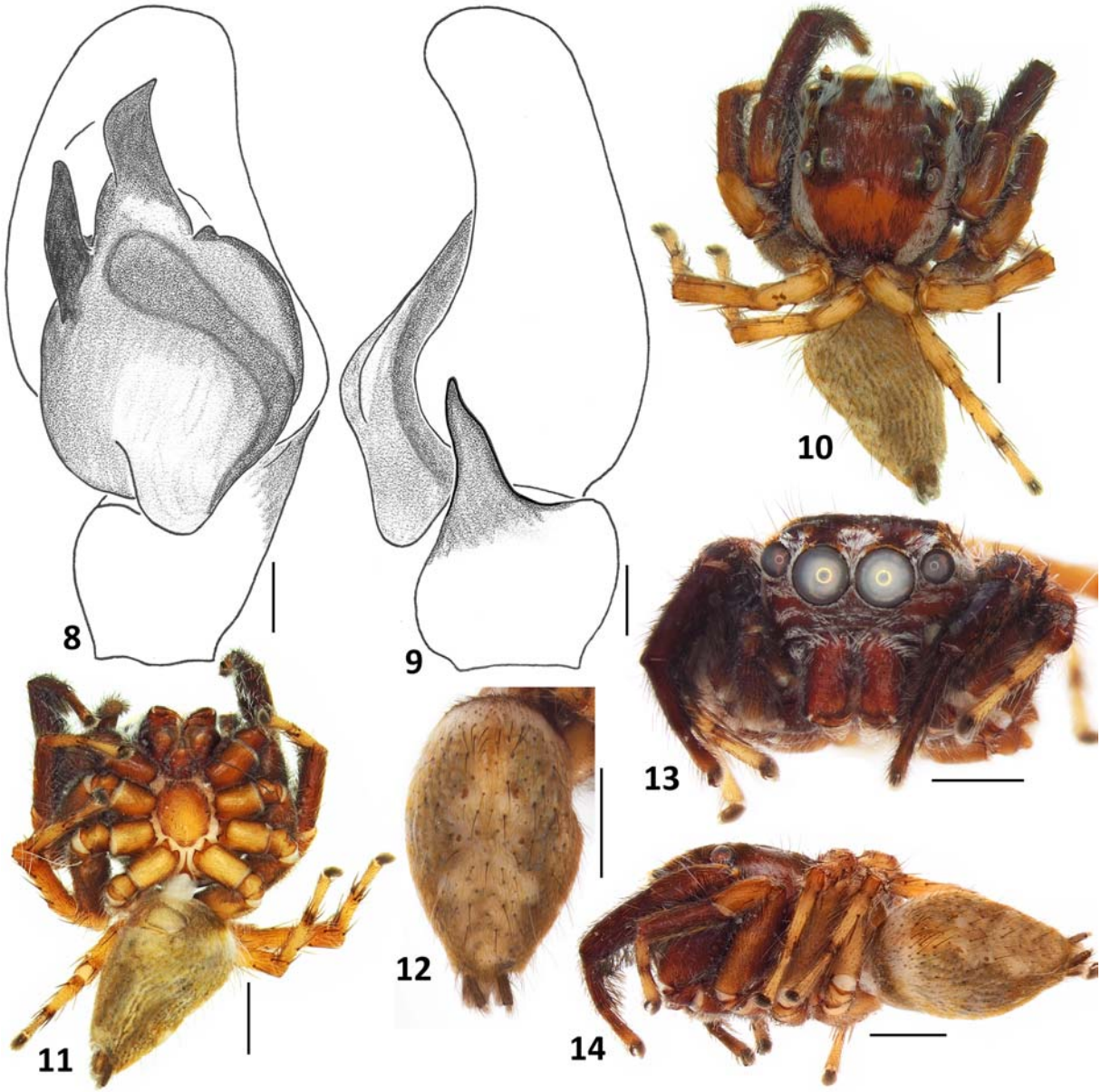
COMMENTS. The species is known from Réunion island, and India to Indonesia (Sulawesi) [WSC, 2021]. To date, in South Asia, the species has been found in Odisha, West Bengal and Uttarhand states of India [Caleb, 2019; Caleb *et al.*, 2020: map 1; present data] and in Gorkha, Myagdi and Taplejung districts of Nepal [Jastrzębski, 1999; present data].

Carrhotus spiridonovi **sp.n.**
Figs 8–14, Map 2.

TYPES. Holotype ♂ (ZMMU, Ta-8156), India, Odisha, Banigosha-Daspalla (20.382°N, 84.771°E), 17–25.01.2014, K. Tomkovitch. Paratypes: 1 ♂ (ZMMU, Ta-8157), 1 ♂ (MMUE, G7662.3), together with the holotype.

ETYMOLOGY. The new species is dedicated to the late colleague of mine, Dr Vassily A. Spiridonov (1957–2020), a famous Russian carcinologist and one of the founders of the journal ‘Arthropoda Selecta’; see Spiridonova *et al.* [2021] about him.

DIAGNOSIS. In the presence of the prolateral protrusion of the bulb, the new species is most similar to *C. andhra* Caleb, 2020 from Andhra Pradesh state of India (cf. figs. 5–10 in Caleb *et al.* [2020]), from which it can be easily distinguished by the following characters: the pointed, cone-shaped prolateral protrusion (Fig. 8; blade-shaped in *C. andhra*) and the pointed tibial apophysis (Fig. 9; with the bifurcated tip in *C. andhra*). The female of *C. spiridonovi* sp.n. is unknown.



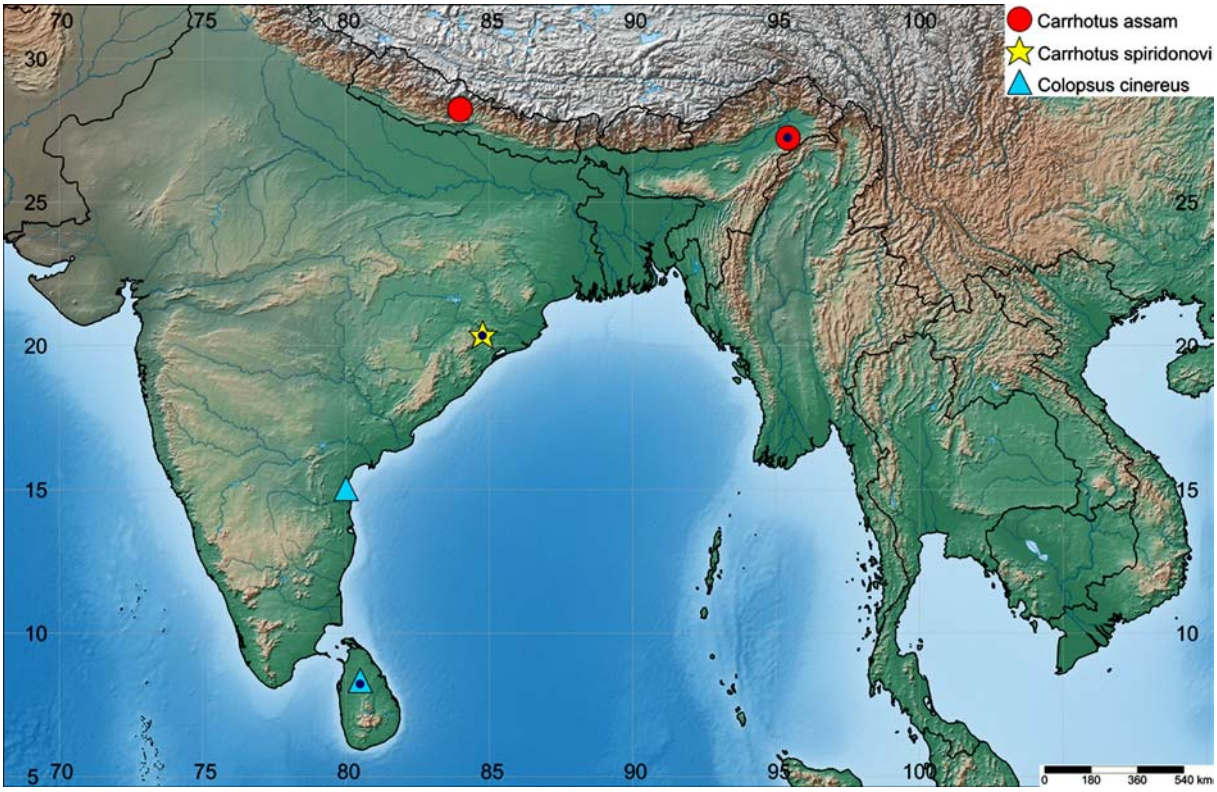
Figs 8–14. Male holotype of *Carrhotus spiridonovi* sp.n.: 8 — palp, ventral view; 9 — same, retrolateral view; 10 — body, dorsal view; 11 — same, ventral view; 12 — abdomen, dorsal view; 13 — carapace, frontal view; 14 — body, lateral view. Scale bars: 0.1 mm (8, 9), 1 mm (10–14).

Рис. 8–14. Самец-голотип *Carrhotus spiridonovi* sp.n.: 8 — пальпа, вид снизу; 9 — то же, вид сзади-сбоку; 10 — тело, вид сверху; 11 — то же, вид снизу; 12 — брюшко, вид сверху; 13 — головогрудь, вид спереди; 14 — тело, вид сбоку. Масштаб: 0,1 мм (8, 9), 1 мм (10–14).

COMMENTS. The presence of the well-developed prolateral protrusion of the bulb is the unique feature of *C. andhra* and *C. spiridonovi* sp.n., not known in any other *Carrhotus* species described to date. The generic assignment of both these species requires further clarification when their females have been found and described.

DISTRIBUTION. Only the type locality (Map 2).

DESCRIPTION. MALE (holotype). *Measurements*. Carapace 2.65 long, 2.20 wide and 1.40 high at PLE. Ocular area 1.60 long, 2.00 wide anteriorly and 1.90 wide posteriorly. Diameter of AME 0.63. Clypeus height 0.18, chelicera length 1.00. Abdomen 2.55 long, 1.70 wide. Length of leg segments: I: 1.70 + 1.10 + 1.35 + 1.00 + 0.65 (5.80); II: 1.55 + 0.80 + 1.00 + 0.80 + 0.50 (4.65); III: 2.10 + 0.90 + 1.08 + 1.20 + 0.60 (5.88); IV: 1.70 + 0.70 + 1.05 + 1.20 + 0.60 (5.25). *Leg formula*: III,I,IV,II. *Leg spination*. Leg I: Fm d 0-1-1-4; Pt pr 0-1-0; Tb pr 1-1, v 2-2-2; Mt v 2-2ap. Leg II: Fm d 0-1-1-5; Pt pr and rt 0-1-0; Tb pr 1-1, v 1-1-2; Mt v 2-2ap. Leg III: Fm d 0-1-1-4; Pt pr and rt 0-1-0; Tb d 1-0-0, pr and rt 1-1-1-1, v 1-0-2ap; Mt pr and rt 1-0-2ap, v 2-0-2ap. Leg IV: Fm d 0-1-1-3; Pt pr and rt 0-1-0; Tb d 1-0-0, pr and rt 1-1-1-1, v 1-0-2ap; Mt pr and rt 1-1-2ap, v 1-0-2ap.



Map 2. Collecting localities of *Carrhotus assam* Caleb, 2020 (red cicles), *C. spiridonovi* sp.n. (yellow star) and *Colopsus cinereus* Kanesharatnam et Benjamin, 2021 (blue triangles). Black dots indicate the type localities.

Карта 2. Точки сбора *Carrhotus assam* Caleb, 2020 (красные кружки), *C. spiridonovi* sp.n. (желтая звезда) и *Colopsus cinereus* Kanesharatnam et Benjamin, 2021 (голубые треугольники). Чёрные точки указывают на типовые локалитеты.

Colouration (in alcohol, Figs 10–14). Carapace brownish orange, densely covered with brown recumbent scales, and with two longitudinal wide white stripes of recumbent scale on its lateral sides (Fig. 10); eyes of the first row are surrounded by dense white and orange scales. Clypeus brown, with transverse lines of white hairs and scales (Fig. 13). Sternum yellow, with brownish margins (Fig. 11), sparsely covered with thin white hairs. Labium light brown. Endites brown, but their distal ectal projections dark brown. Chelicerae brown. Abdomen grey yellowish, on dorsum with a wide longitudinal light yellow stripe with wavy edges (Fig. 12). Book-lung covers yellow. Spinnerets yellowish brownish. Legs I–II: Fm, Pt and Tb brownish yellow, Tb and Mt brown; Pt, Tb and Mt with dense ventral fringes of black hairs. Legs III–IV: yellow, tinged with brown. Palps brown, their structure as in Figs 8, 9; tibia short, 2.8 times shorter than cymbium; RTA thick, strong and pointed, as long as Tb, directed anteriad; cymbium simple, without projections or ridges; bulbus slightly oval, almost as long as wide, with a visible proximal outgrowth directed posteriad; tegulum with a cone-shaped prolateral protrusion; embolus wide and flat, situated at the anterior end of the bulb, embolic pointed tip visibly bent retro-laterad.

FEMALE unknown.

Colopsus cinereus Kanesharatnam et Benjamin, 2021
Figs 15–26, Map 2.

Colopsus cinereus Kanesharatnam et Benjamin, 2021: 2779, figs 8a–e, 9a–b (D♂).

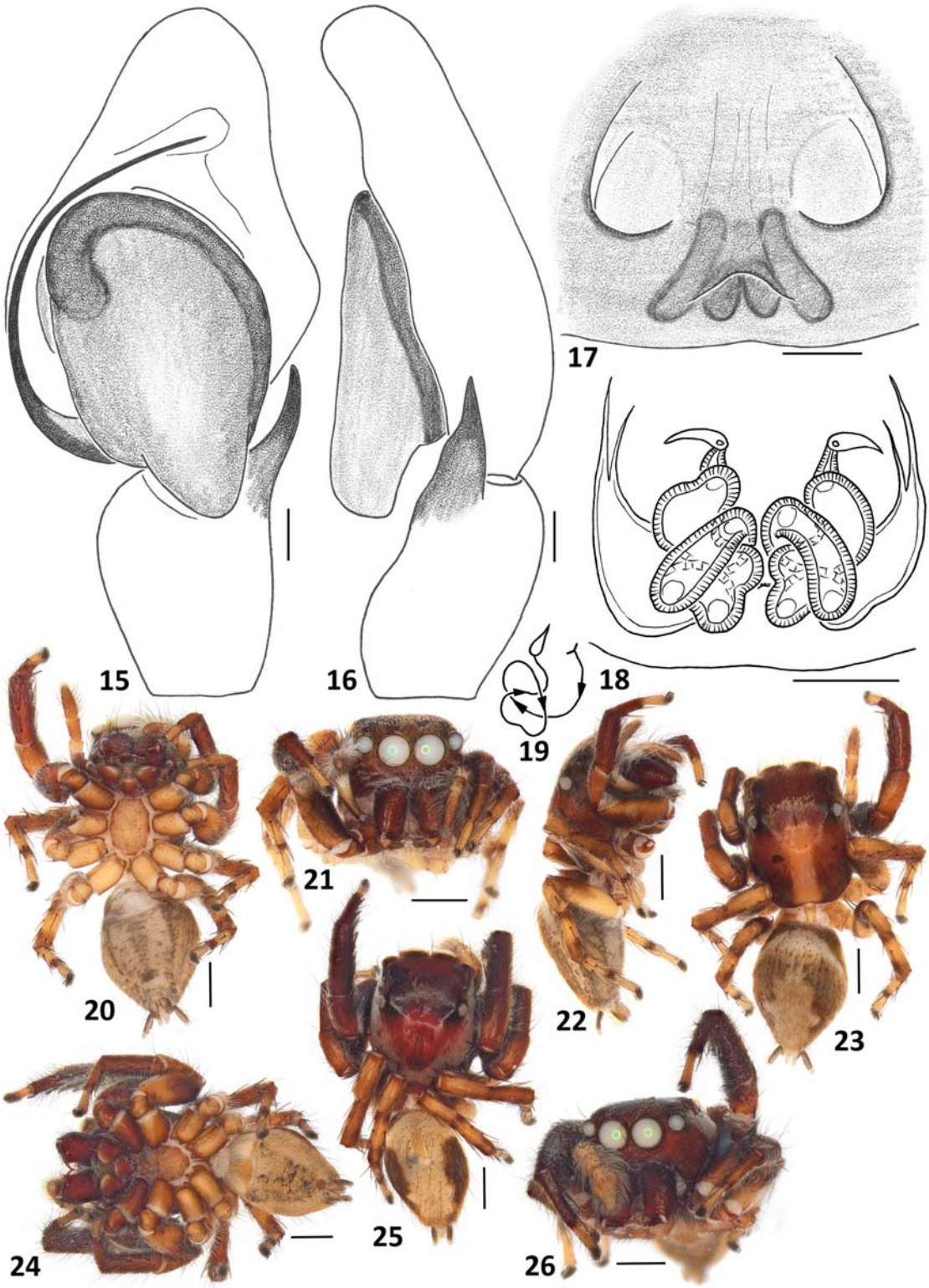
MATERIAL. INDIA: 3 ♂♂ 1 ♀ (ZMMU), 3 ♂♂ 1 ♀ (MMUE, G7662.1), Andhra Pradesh, Tettu (15.041°N, 80.007°E), 6–12.03. 2014, K. Tomkovitch.

DIAGNOSIS. From all the described *Colopsus* species (see Kanesharatnam & Benjamin [2021]), *C. cinereus* differs in having the tibial apophysis being twice as short as the cymbium (Fig. 16; about equal in other species) and the obtuse proximal extension of the tegulum (Fig. 15; absent in other species) in the male, and the poorly marked, central epigynal pocket (Fig. 17; two widely-separated pockets in other species) and the vulva conformation (Figs 18, 19) in the female. The female of *C. cinereus* is described here for the first time.

The scope of *Colopsus* seems to require a revision, as the genus is likely to also include the congeners of *Evacin* Prószyński, 2018 and *Cheliceroides* Żabka, 1985; see Logunov [2021] for a discussion and further details.

DISTRIBUTION. Sri Lanka (the type locality) and east India (Map 2). New species for the fauna of India, and the second record of the species after its description.

DESCRIPTION. MALE (the largest specimen from MMUE). *Measurements*. Carapace 3.25 long, 2.50 wide and 1.80 high at PLE. Ocular area 1.60 long, 2.20 wide anteriorly and 2.10 wide posteriorly. Diameter of AME 0.65. Clypeus height 0.18, chelicera length 1.38. Abdomen 2.85 long, 1.38 wide. Length of leg segments: I: 2.05 + 1.30 + 1.75 + 1.20 + 0.70 (7.00); II: 1.75 + 1.00 + 1.15 + 1.00 + 0.60 (5.50); III: 2.25 + 1.10 + 1.15 + 1.20 + 0.70 (6.40); IV: 1.85 + 0.88 + 1.10 + 1.15 + 0.70 (5.68). *Leg formula*: I,III,IV,II. *Leg spination*. Leg I Fm d 0-1-1-3; Pt pr 0-1-0; Tb pr 1-1, v 2-2-



Figs 15–26. Copulatory organs and habitus of *Colopsus cinereus* Kanesharatnam et Benjamin, 2021 (India, Andhra Pradesh) (15, 16, 24–26: male; 17–23: female): 15 — palp, ventral view; 16 — same, retrolateral view; 17 — epigyne, ventral view; 18 — vulva, dorsal view; 19 — diagrammatic course of insemination ducts; 20, 24 — body, ventral view; 21, 26 — carapace, frontal view; 22 — body, lateral view; 23, 25 — same, dorsal view. Scale bars: 0.1 mm (15–18), 1 mm (20–26).

Рис. 15–26. Копулятивные органы и габитус *Colopsus cinereus* Kanesharatnam et Benjamin, 2021 (Индия, Андхра-Прадеж) (15, 16, 24–26: самец; 17–23: самка): 15 — пальпа, вид снизу; 16 — то же, виз сбоку-сзади; 17 — эпигина, вид снизу; 18 — вульва, вид сверху; 19 — схематический ход оплодотворительных канальцев; 20, 24 — тело, вид снизу; 21, 26 — головогрудь, вид спереди; 22 — тело, вид сбоку; 23, 25 — то же, виз сверху. Масштаб: 0,1 мм (15–18), 1 мм (20–26).

2ap; Mt v 2-2ap. Leg II: Fm d 0-1-1-5; Pt pro and rt 0-1-0; Tb pr 1-1, v 1-1-2ap; Mt v 2-2ap. Leg III: Fm d 0-1-1-5; Pt pr and rt 0-1-0; Tb pr and rt 1-1-1, v 2ap; Mt pr and rt 2-2ap, v 2ap. Leg IV: Fm d 0-1-1-4; Pt pr and rt 0-1-0; Tb pr and rt 1-1-1, v 1-2ap; Mt pr and rt 1-1-2ap, v 1-0-2ap. *Colouration* (in alcohol, Figs 24–26). Carapace yellowish orange, with brown eye field, densely covered with brown recumbent scales; on each sides, wide longitudinal stripes of recumbent scales connecting on thorax and forming a V-shaped figure (Fig. 25). Clypeus brown, without hairs or scales (Fig. 26). Sternum yellow, sparsely covered with protruding brown hairs. Labium and endites brown, with white apexes. Chelicerae dark brown. Abdomen orange-yellow, with dark brown sides; venter yellow greyish. Book-lung covers bright yellow. Spinnerets yellow, tinged with brown. Leg I: strongest and longest, brown with yellow Tb; Fm, Pt and Tb bear dense ventral fringes of black hairs. Leg II: brown, but proximal halves of Fm and Tr yellow; Pt and Tb bear weak ventral fringes of black hairs. Legs III–IV: yellowish brown, but proximal halves of Fm, trochanters and coxae bright yellow. Palps: coxae and proximal halves of Fm brown, remaining segments yellow and covered with white hairs (Fig. 26); palpal structure as in Figs 15, 16; tibia short, two times shorter than cymbium; RTA medium-sized and pointed (1.8 times shorter than tibium), visibly concaved at its ventral edge, directed anteriad; cymbium simple, without projections or ridges, but its prolateral edge visibly swollen; bulb ovoid (1.7 times longer than wide), with a proximal outgrowth directed posteriad; embolus epee-shaped, slightly bent, originating at 7 o'clock and making a revolution of about 180 degrees.

FEMALE (from MMUE). *Measurements*. Carapace 2.70 long, 2.00 wide and 1.15 high at PLE. Ocular area 1.45 long, 1.85 wide anteriorly and 1.85 wide posteriorly. Diameter of AME 0.55. Clypeus height 0.15, chelicera length 0.70. Abdomen 2.75 long, 1.85 wide. Length of leg segments: I: 1.50 + 1.00 + 1.05 + 0.80 + 0.55 (4.90); II: 1.40 + 0.75 + 0.83 + 0.70 + 0.45 (4.13); III: 1.90 + 0.90 + 0.90 + 0.95 + 0.55 (5.20); IV: 1.60 + 0.75 + 0.95 + 1.00 + 0.55 (4.85). *Leg formula*: III,I,IV,II. *Leg spination*. Leg I Fm d 0-1-1-3; Pt pr 0-1-0; Tb pr 1-1, v 2-2-2ap; Mt v 2-2ap. Leg II: Fm d 0-1-2-4; Pt pr and rt 0-1-0; Tb pr 1-1, v 1-2-2ap; Mt v 2-2ap. Leg III: Fm d 0-1-2-4; Pt pr and rt 0-1-0; Tb pr and rt 1-1-1, v 1-0-2ap; Mt pr and rt 2-2ap, v 2ap. Leg IV: Fm d 0-1-1-3; Pt pr and rt 0-1-0; Tb pr and rt 1-1-1, v 1-0-2ap; Mt pr and rt 1-1-2p, v 1-0-2ap. *Colouration* (in alcohol, Figs 20–23) as in the male, but lighter and differs as follows: carapace with a median longitudinal yellow stripe on thorax (Fig. 23); clypeus and areas below ALEs covered with white hairs (Fig. 21); legs I and II without ventral fringes of black hairs; all legs yellow, with brown (semi)rings at segment ends. Epigyne and spermathecae as in Figs 17–19; epigyne flat, without a median septum; a single, central, poorly-visible epigynal pocket present; copulatory openings large and ovoid, their entrances form fossae facing each other and being separated by the space equal their width; insemination ducts long and coiled; receptacles as wide as insemination ducts, directed anteriad; fertilization ducts prominent, directed laterad.

Pancorius tagorei Prószyński, 1992

Pancorius tagorei Prószyński, 1992: 193, figs 125–128 (D♂♀).

MATERIAL. INDIA: 1 ♂ (ZMMU), West Bengal, Kalimpong (Lower Tanek) (27.06°N, 88.43°E), 450–500 m, 16–30.11.2013, K. Tomkovitch.

COMMENTS. To date, this species has been known from West Bengal state of India only [Prószyński, 1992; Caleb *et al.*, 2019: map; present data].

Plexippus paykulli (Audouin, 1826)

Attus paykullii Audouin, 1826: 409, pl. 7, fig. 22 (D♂).

MATERIAL. INDIA: 1 ♀ (ZMMU), West Bengal, Kalimpong (Lower Tanek) (27.06°N, 88.43°E), 450–500 m, 16–30.11.2013, K. Tomkovitch; 1 ♂ (ZMMU), Uttarhand, Rishikesh env., Chilla (29.976°N, 78.209°E), 300 m, 14–16.04.2012, K. Tomkovitch; 1 ♂ (ZMMU), Odisha, Chilika lake (19.681°N, 85.183°E), 4–9.02.2014, K. Tomkovitch; 1 ♂ (ZMMU), Uttarhand, Rishikesh env., Chilla (29.976°N, 78.209°E), 300 m, 14–16.04.2012, K. Tomkovitch; 2 ♂♂ (ZMMU), Uttarhand, Haridwar (29.9454°N, 78.1814°E), Rajaji Nat. park, forestry stream, 322 m, 7–9.05.2012, K. Tomkovitch; 3 ♂♂ 2 ♀♀ (ZMMU), Uttarhand, Uttarkashi (30.7541°N, 78.4558°E), *Pinus*-broad-leaved forestry slope, 1180 m, 21–23.05.2012, K. Tomkovitch.

COMMENTS. A common, pantropical species [Metzner, 2021; WSC, 2021]. In India, the species is known from Lakshadweep Islands, Maharashtra, Sikkim, Odisha, Uttarhand and West Bengal states [Caleb, 2019; present data].

Plexippus petersi (Karsch, 1878)

Euophrys petersii Karsch, 1878: 332, pl. 2, fig. 7 (D♂).

MATERIAL. INDIA: 1 ♀ (ZMMU), Andhra Pradesh, Surya Lanka (15.847°N, 80.515°E), 19–21.02.2014, K. Tomkovitch.

COMMENTS. A common tropical Asian species that has been introduced to the Afrotropical region and Pacific islands [Metzner, 2021; WSC, 2021]. In India, the species is known from Andhra Pradesh, Tamil Nadu and West Bengal states [Caleb, 2019; present data].

Thyene bivittata Xie et Peng, 1995
Figs 27–39, Map 3.

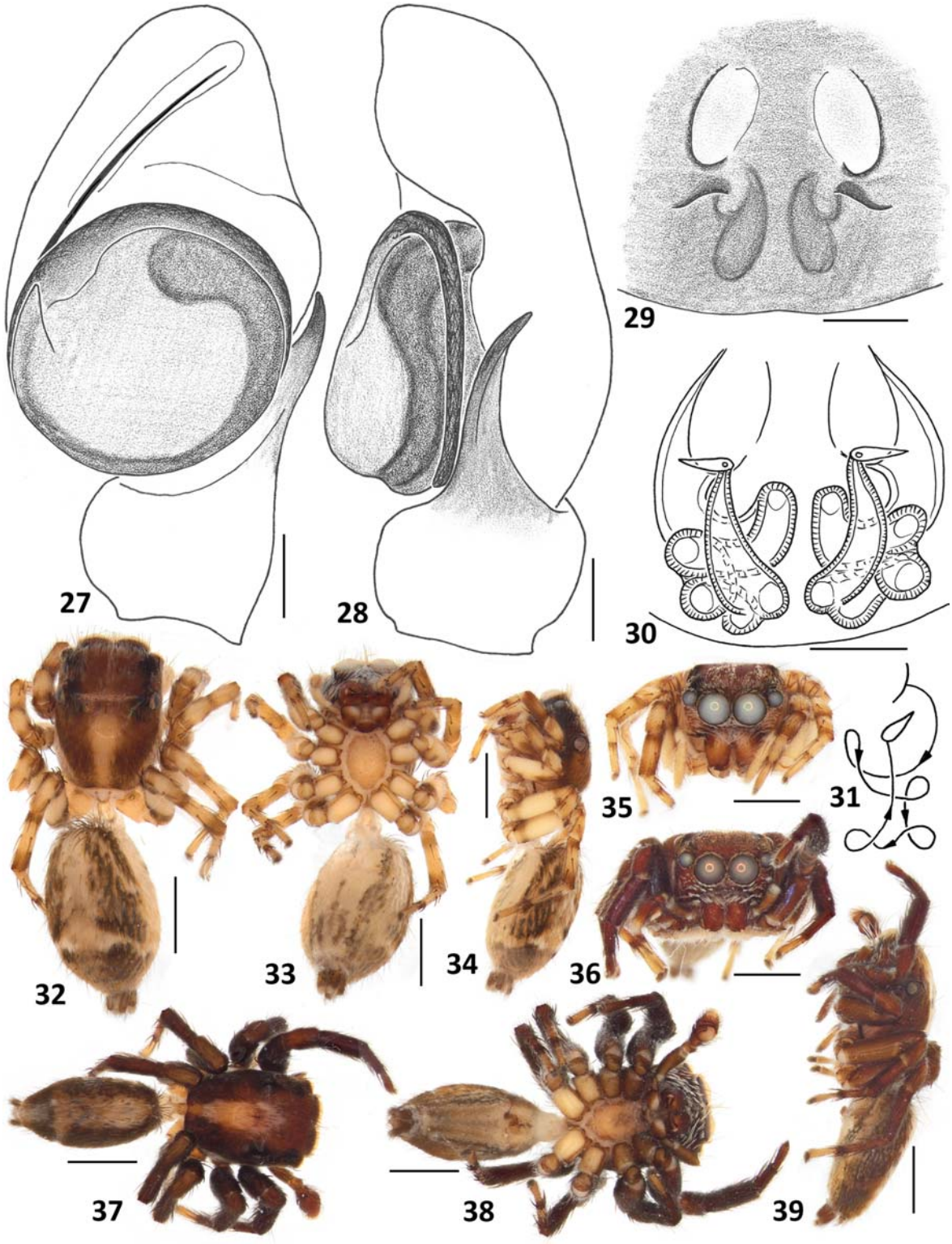
Thyene bivittata Xie et Peng, 1995: 105, figs 1A–E (D♂).

MATERIAL. INDIA: 3 ♂♂ 1 ♀ (ZMMU), Uttarhand, Haridwar (29.9454°N, 78.1814°E), Rajaji Nat. park, forestry stream, 322 m, 7–9.05.2012, K. Tomkovitch; 1 ♂ (MMUE, G7662.2), Uttarhand, nr. Rishikesh, Chilla (29.976°N, 78.209°E), 300 m, 14–16.04.2012, K. Tomkovitch.

DIAGNOSIS. This species is closest to the Oriental *Thyene orientalis* Żabka, 1985 (cf. Figs 144–150 in Logunov [2021]), from which it can be easily distinguished by the following characters: the finger-shaped tegular outgrowth originates at 9 o'clock (Fig. 27; 4–6 in *T. orientalis*) and the 1.5 times thicker retrolateral tegular apophysis (Fig. 28) in the male, and the presence of the paired shallow epigynal pockets (Fig. 29; absent in *T. orientalis*) and the vulva conformation (Figs 30, 31) in the female. Both species have markedly different body colouration (Figs 32–39; cf. with figs 136–143 in Logunov [2021]). The female of *T. bivittata* is described here for the first time.

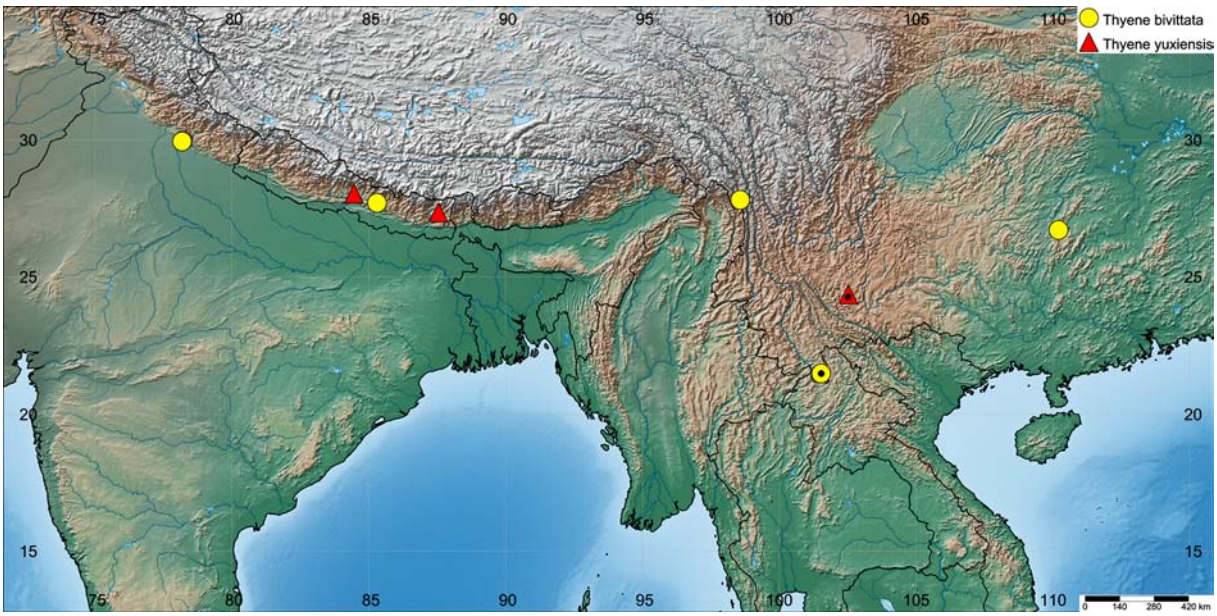
DISTRIBUTION. To date, the species is known from north India, throughout Nepal, to south-west regions of China (Map 3). New species for the fauna of India, with Uttarhand lying at the westernmost limit of the species range.

DESCRIPTION. MALE. *Measurements*. Carapace 2.15 long, 1.58 wide and 1.13 high at PLE. Ocular area 1.18 long, 1.48 wide anteriorly and 1.53 wide posteriorly. Diameter of AME 0.45. Clypeus height 0.13, chelicera length 0.63. Abdomen 2.05 long, 1.15 wide. Length of leg segments: I: 1.20 + 0.55 + 0.83 + 0.68 + 0.48 (3.74); II: 1.15 + 0.55 + 0.70 + 0.60 + 0.30 (3.30); III: 1.40 + 0.65 + 0.80 + 0.88 + 0.50



Figs 27–39. Copulatory organs and habitus of *Thyene bivittata* Xie et Peng, 1995 (India, Uttarhand) (27, 28, 36–39: male; 29–35: female): 27 — palp, ventral view; 28 — same, retrolateral view; 29 — epigyne, ventral view; 30 — vulva, dorsal view; 31 — diagrammatic course of insemination ducts; 32, 37 — body, dorsal view; 33, 38 — same, ventral view; 34, 39 — same, lateral view; 35, 36 — carapace, frontal view. Scale bars: 0.1 mm (27–30), 1 mm (32–39).

Рис. 27–39. Копулятивные органы и габитус *Thyene bivittata* Xie et Peng, 1995 (Индия, Уттаракханд) (27, 28, 36–39: самец; 29–35: самка): 27 — пальпа, вид снизу; 28 — то же, виз сбоку-сзади; 29 — эпигина, вид снизу; 30 — вульва, вид сверху; 31 — схематический ход оплодотворительных канальцев; 32, 37 — тело, вид сверху; 33, 38 — то же, вид снизу; 34, 39 — то же, вид сбоку; 35, 36 — головогрудь, вид спереди. Масштаб: 0,1 мм (27–30), 1 мм (32–39).



Map 3. Collecting localities *Thyene bivittata* Xie et Peng, 1995 (yellow circles) and *T. yuxiensis* Xie et Peng, 1995 (red triangles). Black dots indicate the type localities.

Карта 3. Точки сбора *Thyene bivittata* Xie et Peng, 1995 (желтые кружки) и *T. yuxiensis* Xie et Peng, 1995 (красные треугольник). Чёрные точки указывают на типовые локалитеты.

(4.23); IV: 1.43 + 0.63 + 0.90 + 1.00 + 0.53 (4.49). *Leg formula*: IV,III,I,II. *Leg spination*. Leg I: Fm d 0-1-1-5; Pt pr 0-1-0; Tb pr and rt 1-1-1, v 2-2-2ap; Mt pr and rt 1-1ap, v 2-2ap. Leg II: Fm d 0-1-1-5; Pt pr and rt 0-1-0; Tb pr and rt 1-1-1, v 1-2-2ap; Mt pr and rt 1-1ap, v 2-2ap. Leg III: Fm d 0-1-1-4; Pt pr and rt 0-1-0; Tb d 1-0-0, pr and rt 1-1-1, v 1-0-2ap; Mt pr and rt 1-2ap, v 2-2ap. Leg IV: Fm d 0-1-1-4; Pt pr and rt 0-1-0; Tb d 1-0-0, pr and rt 1-1-1, v 1-0-2ap; Mt pr and rt 1-1-2ap, v 2-0-2ap. *Colouration* (in alcohol, Figs 37–39). Carapace yellowish brownish, densely covered with dark brown recumbent scales, and with a median and two lateral stripes of white recumbent scales (Fig. 37); median stripe is restricted to thorax. Clypeus brown, with transverse lines of white hairs and scales (Fig. 36). Sternum yellow, covered with thin white protruding hairs. Labium and endites yellowish brown, with white apexes. Chelicerae brown. Abdomen grey yellowish, dorsum and sides densely covered with brown recumbent scales; dorsum with a wide median longitudinal stripe of white recumbent scales (Fig. 37). Booklung covers yellow. Spinnerets yellowish brown. Legs I–II: brown, with yellow Tr, Pt and Tb bear ventral fringes of black hairs. Legs III–IV: coxae, trochanters and Tr yellow, remaining segments brown. Palps yellowish brownish, their structure as in Figs 27, 28; tibia short, 2.9 times shorter than cymbium; RTA flat, pointed and flat (saber-shaped in lateral view), as long as tibia, directed dorso-apicad; cymbium simple, without projections or ridges; bulb flat, round, with a finger-shaped outgrowth originating at 9 o'clock and directed anteriad; embolus whip-shaped, coiled, originating at 9–10 o'clock and making slightly more than one revolution.

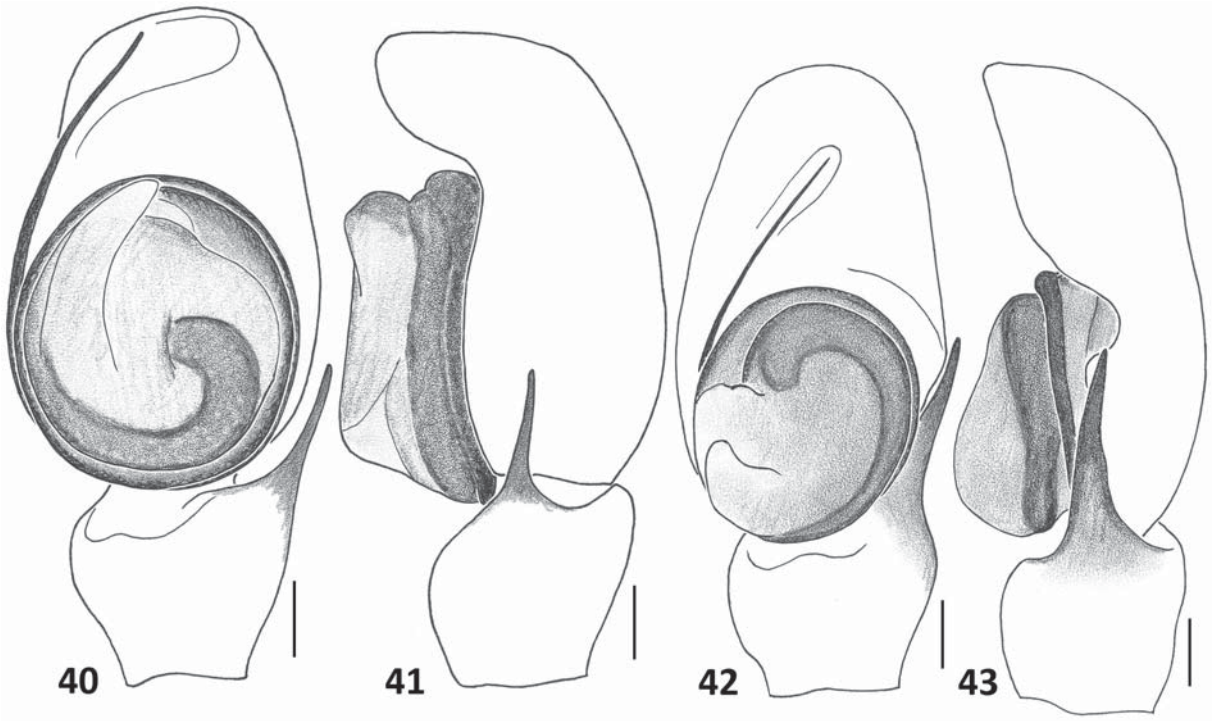
FEMALE. *Measurements*. Carapace 2.10 long, 1.43 wide and 1.00 high at PLE. Ocular area 1.05 long, 1.43 wide anteriorly and 1.45 wide posteriorly. Diameter of AME 0.48. Clypeus height 0.10, chelicera length 0.63. Abdomen 2.23 long, 1.53 wide. Length of leg segments: I: 0.93 + 0.55 + 0.58 + 0.53 + 0.40 (2.99); II: 0.95 + 0.53 + 0.50 + 0.48 + 0.40 (2.86); III: 1.20 + 0.58 + 0.68 + 0.78 + 0.48 (3.72); IV: 1.20 + 0.58 + 0.80 + 0.93 + 0.50 (4.01). *Leg formula*: IV,III,I,II. *Leg spination*. Leg I Fm d 0-1-1-4; Pt pr 0-1-0; Tb pr 1-1-1, v 2-2; Mt pr and rt 1-1ap, v 2-2ap. Leg II: Fm d 0-1-1-4; Pt pr and rt 0-1-0; Tb pr 1-1, v 1-1-1ap; Mt pr, rt and v 1-0-2ap. Leg III: Fm d 0-1-1-4; Pt pr and rt 0-1-0; Tb d 1-0-0, pr and rt 1-1-1, v 1-0-1ap; Mt pr and rt 2-2ap, v 2ap. Leg IV: Fm d 0-1-1-4; Pt pr and rt 0-1-0; Tb d 1-0-0, pr and rt 1-1-1, v 1-0-2ap; Mt pr and rt 1-1-2p, v 1-0-2ap. *Colouration* (in alcohol, Figs 32–35) as in the male but much lighter, predominantly yellow (Figs 32, 33), differs as follows: clypeus brownish yellow, covered with white hairs (Fig. 35); all legs bright yellow, with pale brown rings at the ends of segments; palps bright yellow; dorsum with a wide longitudinal white stripe occupying its anterior two-thirds only and markedly widened at its posterior end (Fig. 32). Epigyne and spermathecae as in Figs 29–31; epigyne flat, without a median septum or fossae; paired epigynal pockets present; copulatory openings large and ovoid, facing each other and separated by the space equal their width; insemination ducts long and coiled; receptacles as wide as insemination ducts, directed anteriad; fertilization ducts prominent, directed laterad.

Thyene imperialis (Rossi, 1846)
Figs 40, 41.

Attus imperialis Rossi, 1846: 12 (D♂).

MATERIAL. INDIA: 1 ♂ (ZMMU), Uttarhand, nr. Rishikesh, Chilla (29.976°N, 78.209°E), 300 m, 14–16.04.2012, K. Tomkovitch.

COMPARATIVE MATERIAL. GREECE: 1 ♂ (MMUE, G7572.22793), Crete, Mallia, 500 m a.s.l., shrubs, stones, 13.04.1972, J. & F. Murphy; 1 ♂ (MMUE, G7572.966), Halkidiki, Gerakina, reed bed, 19.04.1978, J. Murphy. — PORTUGAL: 1 ♂ (MMUE, G7572.104), Algarve, Monte Gordo, marshes, 15.04.1971, J. Murphy.



Figs 40–43. Male palps of *Thyene imperialis* (Rossi, 1846) (40, 41; India, Uttarhand) and *T. yuxiensis* Xie et Peng, 1995 (42, 43; Nepal, Maewa Khola): 40, 42 — ventral view; 41, 43 — retrolateral view. Scale bars: 0.1 mm.

Рис. 27–39. Пальпы самцов *Thyene imperialis* (Rossi, 1846) (40, 41; Индия, Уттаракханд) и *T. yuxiensis* Xie et Peng, 1995 (42, 43; Непал, Маева Кхола): 40, 42 — вид снизу; 41, 43 — вид сбоку-сзади. Масштаб 0,1 мм.

COMMENTS. A trans-Eurasian subboreal-subtropical species, known from the Canaries, throughout the Mediterranean and northern Africa, to China and India [Logunov, 2015]. In India, the species is known from Punjab, Uttarhand and Tamil Nadu states [Caleb, 2019; present data].

Since *T. imperialis* is very similar to *T. benjamini* Prószyński et Deeleman-Reinhold, 2010 described from Malaysia [Prószyński, Deeleman-Reinhold, 2010], the records of the former species from India caused some doubts. These species differ only in the length and thickness of their tibial apophyses, which is much thinner and longer in *T. imperialis* (Fig. 41; cf. figs 159, 160 in Prószyński & Deeleman-Reinhold [2010]). A direct comparison of the studied Indian male (Figs 40, 41) with those from the Mediterranean leave no doubts that indeed it is true *T. imperialis*, and hence the occurrence of the latter species in India has been confirmed.

Thyene yuxiensis Xie et Peng, 1995
Figs 42, 43, Map 3.

Thyene yuxiensis Xie et Peng, 1995: 106, figs 4A–E (D♂).

MATERIAL. NEPAL: 1 ♂ (BMNH), east part, no exact locality, 7000 ft, 15.06.1954, K.H. Hyatt; 1 ♂ (MMUE, G7662.4), Maewa Khola: Sanghu (27°21′N, 87°33′E), swept in small patch of primary forest above base camp, 6000 ft, 25.10.1961, K.H. Hyatt; 1 ♂ (BMNH), same locality, in tent at base camp, 27.10.1961, K.H. Hyatt.

COMMENTS. To date, the species has been known from Tanhu and Taplejung districts of Nepal and south China (Yunnan) (Map 3) [Xie, Peng, 1995; Jastrzębski, 2006; present data].

The present identification is based on the illustrations by Jastrzębski [2006: figs 6–10] and is to be considered provisional. Both records of *T. yuxiensis* from Nepal [Jastrzębski, 2006; present data] are to be further verified and confirmed by comparison with the holotype male of *T. yuxiensis* from Yunnan (cf. figs 4A–E in Xie & Peng [1995]).

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