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Taxonomic notes on two lynx spiders (Araneae: Oxyopidae) from India

Таксономические заметки о двух пауках-рысях (Araneae: Oxyopidae) из Индии

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KEY WORDS: Aranei, lynx spiders, taxonomy, new synonymy, new combination, type specimens.

КЛЮЧЕВЫЕ СЛОВА: Aranei, пауки-рыси, таксономия, новая синонимия, новая комбинация, типовые экземпляры.

ABSTRACT: The type specimens of two *Oxyopes* species housed in the National Zoological collection of the Zoological Survey of India, Kolkata are re-examined. *Oxyopes kamalae* Gajbe, 1999 is synonymised with *O. hindostanicus* Pocock 1901, and a new taxonomic combination is proposed: *Hamadruas rukminiae* (Gajbe, 1999) comb.n. (ex *Oxyopes*).

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РЕЗЮМЕ: Исследованы типовые экземпляры двух видов рода *Oxyopes*, хранящиеся в Национальной зоологической коллекции Зоологического обследования Индии в Колкате. *Oxyopes kamalae* Gajbe, 1999 сведен в синонимы к *O. hindostanicus* Pocock 1901, и предложена новая таксономическая комбинация: *Hamadruas rukminiae* (Gajbe, 1999) comb.n. (ex *Oxyopes*).

Introduction

The spider family Oxyopidae Thorell, 1869, commonly known as lynx spiders, currently comprises 89 species belonging to four genera in India [Caleb, Sankaran, 2024]. Among these, more than half of the species belongs to the genus *Oxyopes* Latreille, 1804, while the rest are assigned to *Hamadruas* Deeleman-Reinhold, 2009, *Hamataliwa* Keyserling, 1887, and *Peucetia* Thorell, 1869 [Caleb, Sankaran, 2024]. The majority of the Indian lynx spiders are known only from a single sex, along with outdated descriptions and highly schematic illustrations, which are not very useful for species-level identification. Furthermore, no revisionary studies have been carried out on Indian species since their original descriptions. Therefore, further evaluation with relevant type specimens is needed to resolve the taxonomic uncertainty of this group. In this paper, we re-examined the two type specimens of *Oxyopes* species deposited in the National Zoological Collections in Kolkata. The present paper thus aims to (1) propose a new combination for *Oxyopes rukminiae* Gajbe, 1999, which is being transferred to *Hamadruas*, and (2) establish the synonymy of *O. kamalae* Gajbe, 1999, with *O. hindostanicus* Pocock, 1901.

Material and methods

The type specimens were examined under Leica M205A stereomicroscope. Detailed images of the habitus and genitalia were taken by Flexacam C3 camera attached to the Leica M205A stereomicroscope and processed using extended focus montage LAS X software. All measurements are given in millimetres (mm). Leg measurements are taken as follows: total length [femur, patella, tibia, metatarsus, tarsus]. The distribution map was prepared by using QGIS version 3.36.1.

Abbreviations used in the text and figures: AME — anterior median eye, ALE — anterior lateral eye, CD — copulatory duct, CO — copulatory opening, FD — fertilization duct, NP — National Park, PME — posterior median eye, PLE — posterior lateral eye, S — spermathecae, TR — Tiger Reserve, WLS —Wildlife Sanctuary. National Zoological Collections of the Zoological Survey of India (NZC-ZSI).

Taxonomy

Oxyopidae Thorell, 1869

Hamadruas Deeleman-Reinhold, 2009

TYPE SPECIES: *Oxyopes hieroglyphicus* Thorell, 1887 from Burma (Myanmar).

COMMENT. It can be easily distinguished from other oxyopid genera by characteristic abdominal pattern, the structure and shape of the epigyne and the shape of the embolus tip, conductor, and distal chitin bulge on the retrolateral tibial apophysis [Deeleman-Reinhold, 2009]. The distribution of this genus is restricted to Southeast Asia, including Bangladesh, China, India, Indonesia, Myanmar, Singapore, Thailand, and Taiwan. Currently, the genus comprises nine valid species, with three species known from India: *H. hieroglyphica* (Thorell,

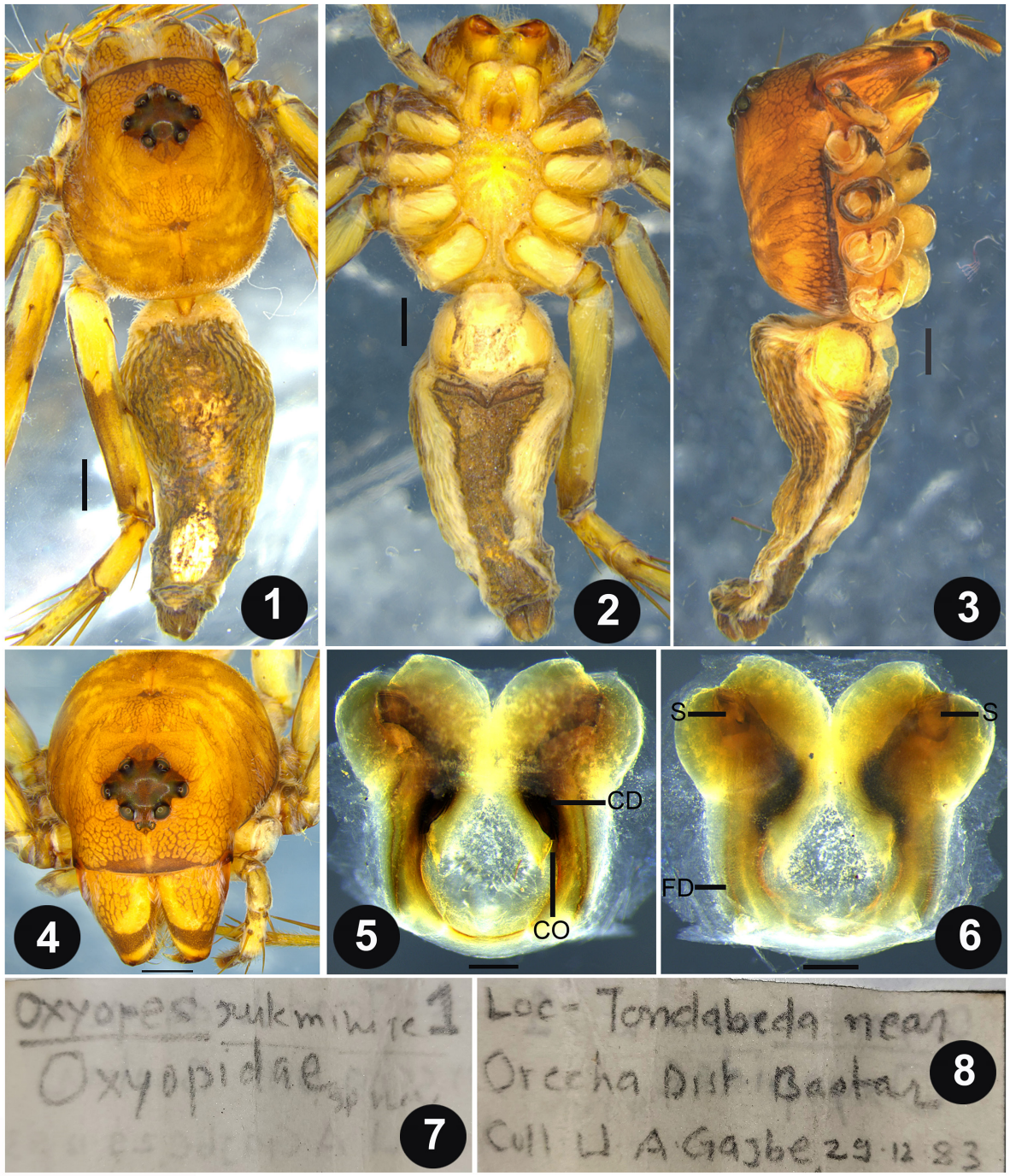


Fig. 1–8. *Hamadruas rukminiae* (Gajbe, 1999), comb.n., female holotype (1–8): 1 — dorsal; 2 — ventral; 3 — lateral; 4 — frontal; 5 — epigyne, ventral; 6 — vulva, dorsal; 7–8 — original labels. Scale bars: 1 mm (1–4), 0.2 mm (5–6).

Рис. 1–8. *Hamadruas rukminiae* (Gajbe, 1999), comb.n., голотип самка (1–8): 1 — дорсально; 2 — вентрально; 3 — латерально; 4 — фронтально; 5 — эпигина, вентрально; 6 — вульва, дорсально; 7–8 — оригинальные этикетки. Масштаб: 1 мм (1–4), 0,2 м (5–6).

1887), *H. keralensis* Sen et Sudhin, 2023, and *H. sikkimensis* (Tikader, 1970) [Caleb, Sankaran, 2024; WSC, 2024].

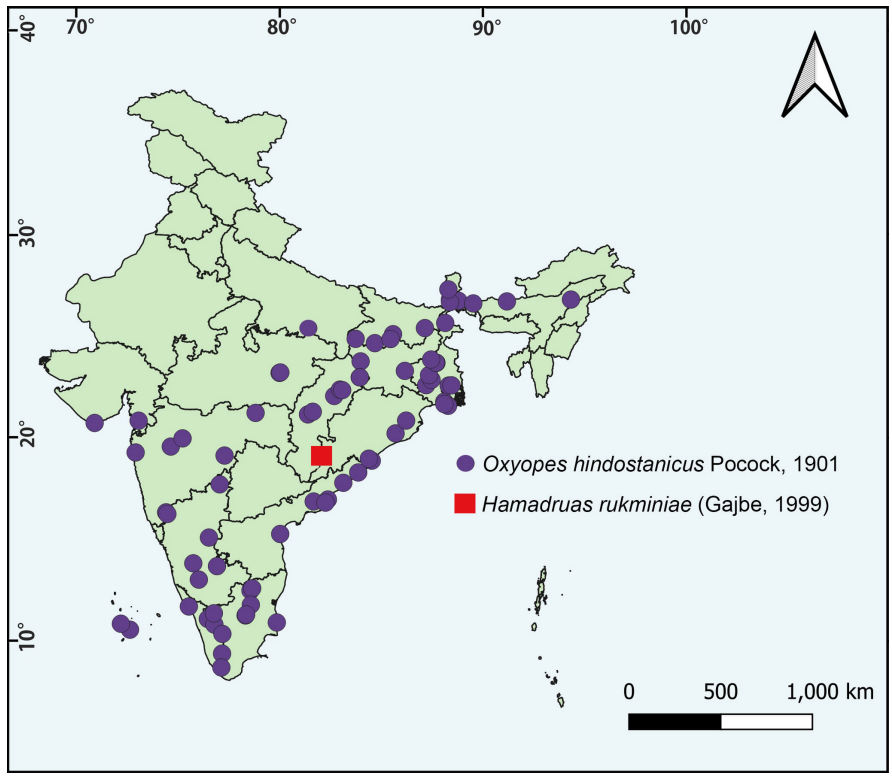
***Hamadruas rukminiae* (Gajbe, 1999), comb.n.**
Figs 1–8, Map 1.

Oxyopes rukminiae Gajbe, 1999: 54, figs 48–51 (♀). Gajbe, 2008: 78, figs 164–167 (♀).

TYPE. INDIA: Holotype ♀, Madhya Pradesh (now Chhattisgarh), Bastar Dist., nr Orcha, Tondabeda Vill., 20.12.1983, U.A. Gajbe (NZC-ZSI, No. 5499/18), examined.

DIAGNOSIS. The female of *H. rukminiae* can be easily distinguished from those of all other *Hamadruas* species by the rectangular, and widely separated spermathecae with thick outer tegument, and widely spaced copulatory ducts (Figs 5–6).

JUSTIFICATION OF TRANSFER. *Oxyopes rukminiae* was described based on the holotype female. A detailed re-examina-



Map. Collecting localities of *Hamadruas rukminiae* (Gajbe, 1999), and *Oxyopes hindostanicus* Pocock, 1901 in India.
Карта. Местонахождения *Hamadruas rukminiae* (Gajbe, 1999) и *Oxyopes hindostanicus* Pocock, 1901 в Индии.

tion of the holotype shows that it has all the diagnostic features of *Hamadruas*: lower carapace with head having straight sides that sinuate towards the thorax; dorsal part of carapace with a shallow saddle, and is higher in front than behind; relatively long legs; and abdomen significantly longer than carapace, with dark yellow-brown geometric colour pattern dorsally (Fig. 1) [Deeleman-Reinhold, 2009]. Based on these observations, the species is thus transferred to *Hamadruas*.

REDESCRIPTION. FEMALE (Figs 1–8). Measurements: body length 11.13. Carapace 4.65 long, 4.21 wide. Abdomen 6.48 long, 2.79 wide. Eye sizes and interdistances: AME 0.10, ALE 0.24, PME 0.19, PLE 0.23; AME–AME 0.16, AME–ALE 0.10, ALE–ALE 0.38, PME–PME 0.44, PME–PLE 0.36, PLE–PLE 1.36, AME–PME 1.01, ALE–PLE 0.30, ALE–PME 0.69, AME–PLE 0.69. Clypeus at AME 0.62, at ALE 0.80. Carapace yellowish orange, narrowing in front, with high cephalic area, covered with black reticulations, carapace margin with narrow black lines (Fig. 1); eyes transparent, encircled by black rings, eye field dark (Figs 1, 4); clypeus high, yellowish orange, covered with black reticulations, base with black transverse patch (Fig. 4); chelicerae yellowish orange, frontal face with black reticulations, basally with black transverse band (Fig. 4), promargin with 1 minute tooth, and retromargin with 2 teeth. Endites, labium, and sternum pale yellow (Fig. 2). Legs pale yellow, with black patches. Abdomen elongate oval, narrowing posteriorly, dorsum light brown with greyish tinge, and several dark brown irregular markings, and lines, posterior half with broad creamy white oval marking, lateral sides with pale white and dark brown longitudinal lines (Fig. 1); venter whitish yellow, medially with a broad longitudinal stripe extending from epigastric furrow to posterior tip (Fig. 2).

Epigyne as in Figs 5–6: plate about as long as wide; copulatory openings widely separated from each other, situated mediolaterally; copulatory ducts highly sclerotized; spermathecae rectangular with highly sclerotized outer tegument.

DISTRIBUTION. India (Chhattisgarh).

Oxyopes Latreille, 1804

Oxyopes hindostanicus Pocock, 1901

Figs 9–25, Map.

Oxyopes hindostanicus Pocock, 1901: 482 (♂♀); Sherriffs, 1951: 657, figs 8–13 (♂♀); Sherriffs, 1955: 304, fig. 34 (♂); Caleb, 2020: 15727, figs 14A–E, 27D (♂♀); Caleb, Wijesinghe, 2022: 14, figs 1–2, 4–29 (♂♀).

Oxyopes kamalae Gajbe, 1999: 56, figs 52–55 (♀); Gajbe, 2008: 56, figs 114–117 (♀). **Syn.n.**

For complete list of taxonomic references of *O. hindostanicus* see WSC [2024].

TYPE. INDIA: Holotype ♀ of *O. hindostanicus* Nilgiri Hills, Tamil Nadu, G. F. Hampson (BMNH 1954.7.6.8); 1♂ (syntype) with same data, not examined.

TYPE. INDIA: Holotype ♀ of *Oxyopes kamalae* from Jabalpur, Madhya Pradesh, 16.09.1979, U.A. Gajbe (NZC-ZSI, No. 5503/18), examined.

ADDITIONAL MATERIAL. INDIA: *Andhra Pradesh*: 1 ♀, 1 ♂, Visakhapatnam (17°46′53″N, 83°07′25″E), 3.12.2020, R. Kumar; 1 ♀, Anantapur (18°52′09″N, 84°30′47″E), 2.12.2020, R. Kumar; 1 ♀, 2 ♂♂, Prakasam (15°15′58″N, 80°01′02″E), 6.12.2020, R. Kumar; 1 ♀, Srikakulam (18°17′19″N, 83°50′53″E), 3.12.2020, R. Kumar; 4 ♀♀, Krishna (16°51′45″N, 81°39′40″E), 4.12.2020, R. Kumar. *Assam*: 1 ♂, Manas NP (26°41′24″N, 91°09′E), 5.04.2023, D. Mondal. *Bihar*: 8 ♀♀, 1 ♂, Kaimur (24°51′09″N, 83°43′15″E), 6.02.2023, R. Kumar; 3 ♀♀, Bhagalpur (25°22′50″N, 87°07′23″E), 9.10.2021, M.E. Hassan; 2 ♀♀, Gaya (24°38′29″N, 84°39′52″E), 2.09.2021, M.E. Hassan; 1 ♀, Durgapur (25°04′53″N, 85°33′28″E), 28.08.2021, M. E. Hassan; 2 ♀♀, Nawada (24°50′31″N, 85°26′12″E), 29.08.2021, M.E.

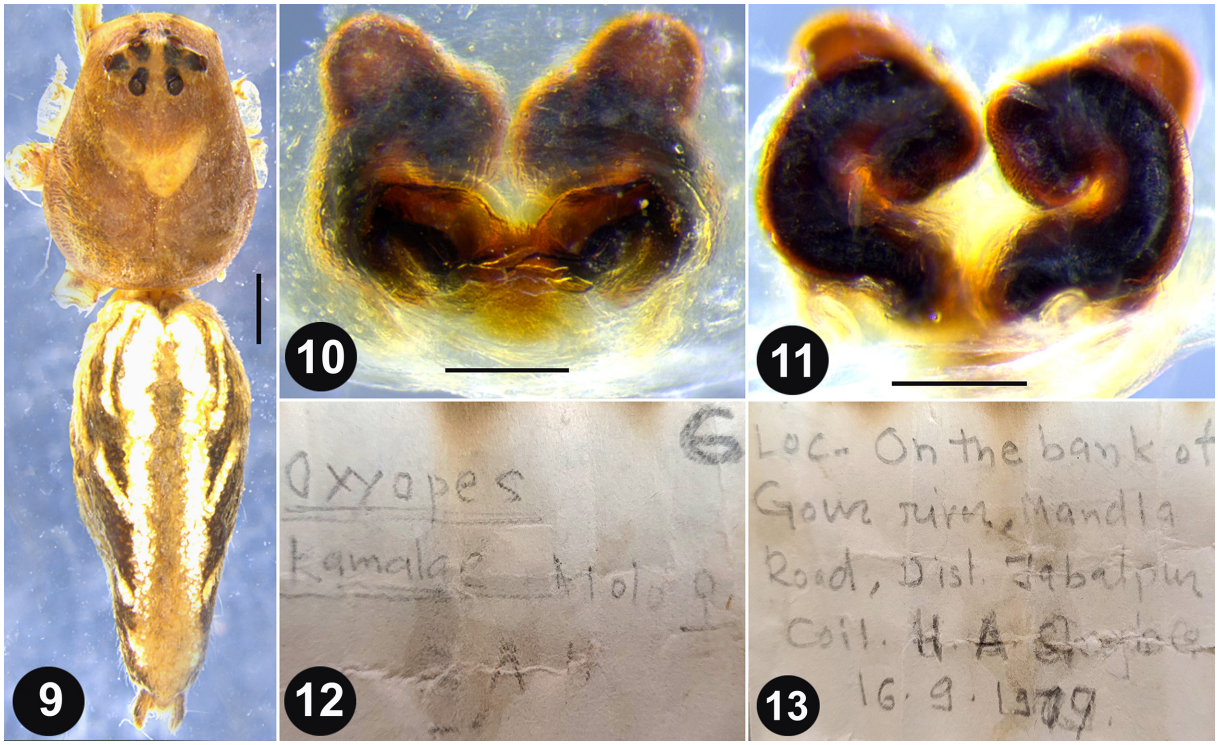


Fig. 9–13. *Oxyopes hindostanicus* Pocock, 1901 (holotype female of *O. kamalae* Gajbe, 1999): 9 —dorsal view; 10 — epigyne, ventral; 11 — vulva, dorsal; 12–13 — original labels. Scale bars: 1 mm (9), 0.2 mm (10–11).

Рис. 9–13. *Oxyopes hindostanicus* Pocock, 1901 (голотип O. kamalae Gajbe, 1999, самка): 9 —дорсально; 10 — эпигина, вентрально; 11 — вульва, дорсально; 12–13 — оригинальные этикетки. Масштаб: 1 мм (9), 0,2 мм (10–11).

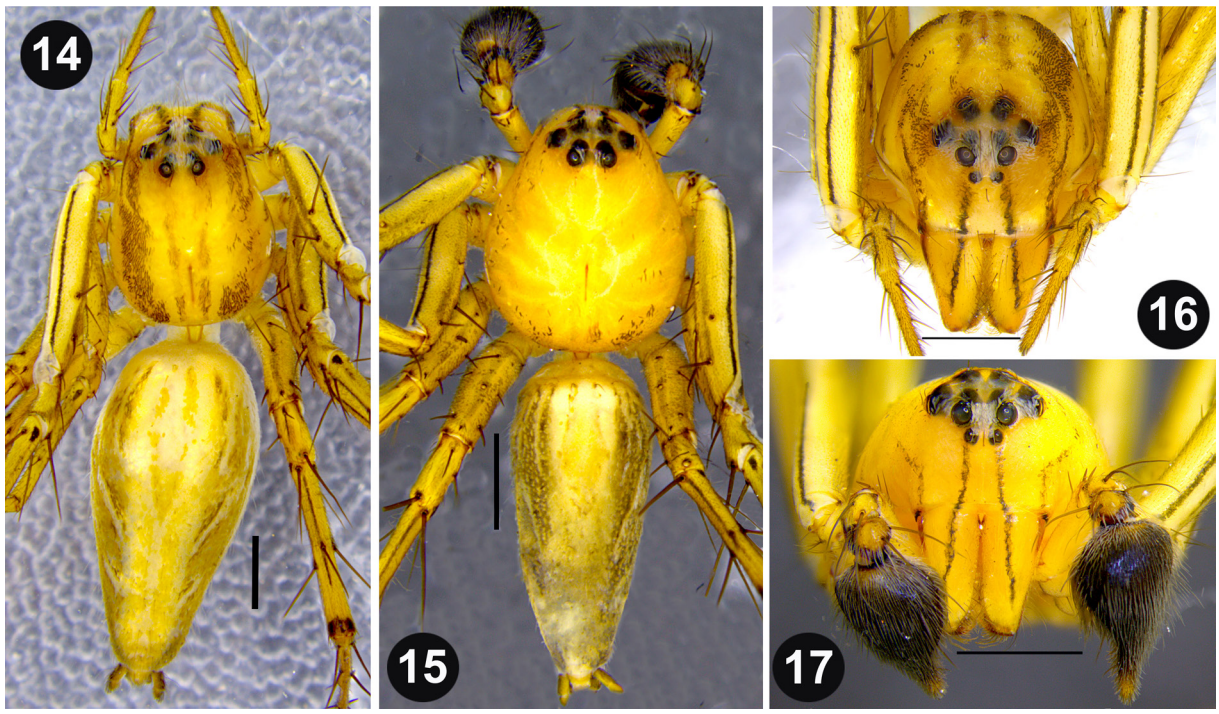


Fig. 14–17. *Oxyopes hindostanicus* from Karnataka, female (14, 16), male (15, 17): 14, 15 — dorsal; 16–17 — frontal. Scale bars: 1 mm (14–17).

Рис. 14–17. *Oxyopes hindostanicus* из Карнатаки, самка (14, 16), самец (15, 17): 14, 15 — дорсально; 16–17 — фронтально. Масштаб: 1 мм (14–17).

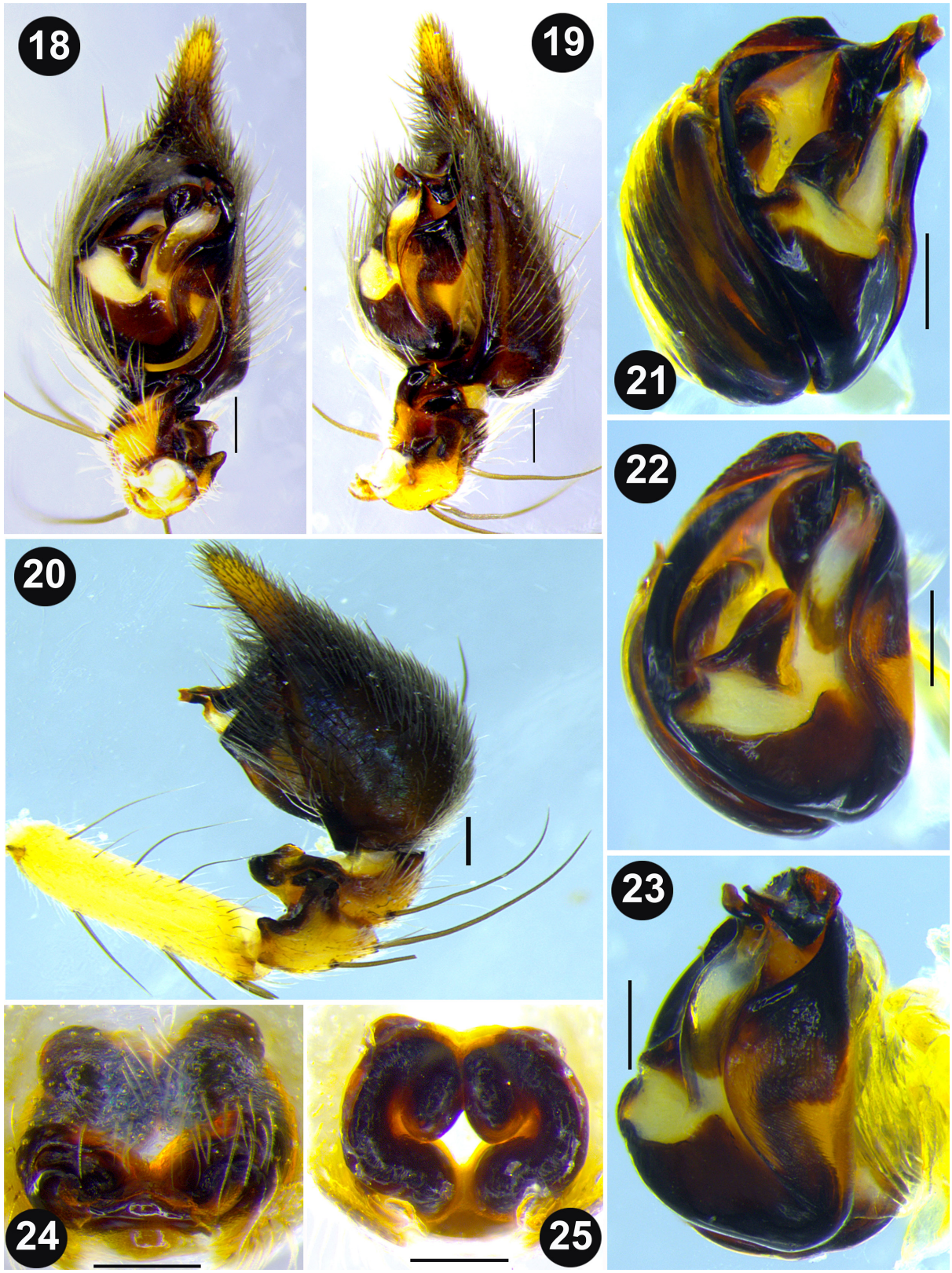


Fig. 18–25. *Oxyopes hindostanicus* from Karnataka, male (18–23), female (24–25): 18 — male palp, ventral; 19–20 — same, retrolateral; 21 — bulb, prolateral; 22 — same, ventral; 23 — same, retrolateral; 24 — epigyne, ventral; 25 — vulva, dorsal. Scale bars: 0.2 mm.

Рис. 18–25. *Oxyopes hindostanicus* из Карнатаки, самец (18–23), самка (24–25): 18 — пальпус самца, вентрально; 19–20 — то же, ретролатерально; 21 — бульбус, пролатерально; 22 — то же, вентрально; 23 — то же, ретролатерально; 24 — эпигина, вентрально; 25 — вульва, дорсально. Масштаб: 0,2 мм.

Hassan. *Gujarat*: 1 ♀, Navsari (20°49′56″N, 73°03′57″E), 16.12.2020, R. Kumar. *Jharkhand*: 2 ♀♀, Garhwa (23°44′40″N, 83°57′56″E), 26.10.2021, R. Kumar. *Karnataka*: 3 ♀♀, Belgaum (16°19′48″N, 74°24′57″E), 12.12.2020, R. Kumar; 6 ♀♀, 7 ♂♂, Mookambika WLS (13°49′34″N, 75°44′56″E), 2.12.2022, P.P. Sudhin; 4♂♂, Belagavi (16°15′58″N, 74°28′35″E), 9.02.2023, D.S. Chand; 1 ♀, 1 ♂, Tumkur (13°41′10″N, 76°54′47″E), 7.02.2023, D.S. Chand; 1 ♀, 1 ♂, Bidar (17°42′16″N, 77°02′45″E), 20.09.2022, R. Kumar; 1 ♀, 1 ♂, Hassan (13°01′25″N, 76°01′18″E), 7.10.2023, P. C. Saha; 1 ♀, 3 ♂♂, Bellari (15°05′25.188″N, 76°31′22.8″E), 1.10.2023, P.C. Saha. *Kerala*: 1 ♀, Pathanamthitta (9°23′26″N, 77°09′41″E), 6.11.2021, P.M. Sureshan; 2 ♂♂, Neyyar WLS (11°16′20″N, 76°40′45″E), 2.12.2021, P. Girish Kumar; 1 ♀, 1 ♂, Shendurney WLS (08°42′28″N, 77°07′42″E), 20.01.2019, P.M. Sureshan; 1♂, Palakkad (11°05′33″N, 76°27′51″E), 5.09.2023, S. Sen. *Maharashtra*: 3 ♀♀, 1 ♂, Thane (19°16′17″N, 72°55′18″E), 15.12.2020, R. Kumar; 1 ♂, Ahmadnagar (19°33′36″N, 74°38′41″E), 10.09.2022, R. Kumar; 1 ♀, 2 ♂♂, Nanded (19°07′08″N, 77°17′29″E), 21.09.2022, R. Kumar; 4 ♀♀, 5 ♂♂, Aurangabad (19°57′45″N, 75°13′20″E), 11.09.2022, R. Kumar; 1 ♀, 1 ♂, Nagpur (21°12′52″N, 78°48′27″E), 7.09.2022, R. Kumar. *Odisha*: 1 ♀, Ganjam (18°58′19″N, 84°22′08″E), 2.10.2021, Jasmine P.; 1 ♀, 2 ♂♂, Khordha (20°12′30″N, 85°40′55″E), 30.11.2020, R. Kumar; 2 ♀♀, Jajapur (20°50′11″N, 86°12′26″E), 30.11.2020, R. Kumar; *Tamil Nadu*: 1 ♀, 1 ♂, Namakkal (11°15′49″N, 78°19′08″E), 18.01.2019, S. Dash; 3 ♀♀, 2 ♂♂, Tiruneveli (12°29′32″N, 78°33′22″E), 22.10.2019, J. Thilak; 2 ♀♀, 1 ♂, Tirupattur (12°35′56″N, 78°38′26″E), 23.10.2019, J. Thilak; 1 ♀, Salem (11°47′16″N, 78°34′30″E), 17.10.2019, J. Thilak; 1 ♀, Sathyamangalam TR (10°21′32″N, 77°10′36″E), 12.07.2023, R. Venkitesan. *West Bengal*: 1 ♂, Sukna (26°49′19″N, 88°23′10″E), 7.11.2017, M.E. Hassan; 1 ♀, South 24 Parganas (21°45′51″N, 88°04′27″E), 1.08.2019, R. Kumar; 1 ♀, 2 ♂♂, Pirakata (22°34′39″N, 87°11′47″E), 18.10.2022, S. Sheela; 1 ♀, 3 ♂♂, Arsha (23°16′43″N, 86°8′21″E), 13.10.2022, S. Sheela; 1 ♀, Jhargram (22°50′31″N, 87°26′50″E), 16.10.2022, S. Sheela; 3 ♀♀, 4 ♂♂, Bankura (23°04′22″N, 87°19′34″E), 22.07.2022, K. S. Suresh; 1 ♀, Ramnabagan WLS (23°40′28″N, 87°41′25″E), 20.09.2022, S. Sarkar; 1 ♀, Ballavpur WLS (23°41′21″N, 87°39′46″E), 19.09.2022, S. Dey; 1♀, Uttar Dinajpur (25°38′06″N, 88°07′12″E), 25.09.2023, R. Kumar; 1 ♀, Bankura (23°50′17″N, 87°25′37″E), 29.07.2023, D. Mondal. *Puducherry*: 2 ♀♀, 1 ♂, Karaikal (10°55′54″N, 79°50′59″E), 8.12.2021, D. Mondal.

DESCRIPTION AND DIAGNOSIS. For description, and diagnosis of the species, see Sherriffs [1951] and Caleb & Wijesinghe [2022].

JUSTIFICATION OF SYNONYMY. *Oxyopes kamalae* was described based on holotype female. Detailed morphological examination of the holotype revealed that it has all the diagnostic features of *O. hindostanicus*: highly sclerotized, eye mask shaped epigyne with a dark and highly sclerotized epigynal plate having wide V-shaped depression in its anterior margin, and broad, C-shaped and strongly sclerotized copulatory ducts (cf. Figs 10–11 with Figs 24–25). Based on these diagnostic characters *O. kamalae* is thus considered a junior synonym of *O. hindostanicus*.

DISTRIBUTION. India (south western, south, south eastern, central, eastern, and north east state of Assam), Bangladesh, Maldives, Pakistan, Sri Lanka [Dyal, 1935; Pocock, 1901, 1904; Sherriffs, 1951; Caleb, 2020; Caleb, Wijesinghe, 2022; WSC, 2024] (Map).

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Compliance with ethical standards

Conflict of interest: The authors declare that they have no conflict of interest.

Ethical approval: No ethical issues were raised during our research.

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