A new spider species of the genus Cocalus C.L. Koch, 1846 (Araneae: Salticidae: Spartaeinae) from Western Ghats of India

Новый вид пауков из рода Cocalus C.L. Koch, 1846 (Araneae: Salticidae: Spartaeinae) из Западных Гат Индии

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ABSTRACT. A new species of the jumping spider genus Cocalus C.L. Koch, 1846 — C. lacinia sp.n. (♂♀) — is diagnosed and described from the Wayanad Wildlife Sanctuary, Western Ghats, Kerala, India. A detailed morphological description, diagnostic features and illustrations of the copulatory organs of both sexes are given. The current distribution of the genus in India is mapped as well.


Introduction

The Spartaeine genus Cocalus C.L. Koch, 1846 is a poorly studied salticid group confined to the Oriental and Australian Regions. The genus is characterized by the presence of an elevation in the posterior ocular quadrangle in both sexes and the sinuous finger-like projection resting on the male palpal retrolateral tibial apophysis [Wanless, 1981]. Currently, the genus consists of five valid species, of which the only one, Cocalus murinus Simon, 1899, has been reported from the Indian subcontinent [Roy et al., 2016; WSC, 2018]. In the present paper, we aim to describe and illustrate a new species, Cocalus lacinia sp.n. (♂♀), collected from the Wayanad Wildlife Sanctuary lying in Western Ghats in Kerala, one of the biodiversity hotspots of the world [Myers et al., 2000]. The current geographic distribution of the genus in India is mapped as well.

Materials and methods

Field photos were taken with a Canon EOS 5D Mark-III using Canon EF 100 mm f2.8 Macro USM Lens, Canon MP-E 65 mm 1–5x Macro Lens and Canon MT-24EX Macro Twin Lite Flash. Spiders were hand-collected, and the specimens were stored in 70% ethanol. A morphological examination was undertaken under a Leica M205 C stereomicroscope. The microphotographic images were taken by means of Leica DMC4500 digital camera attached to Leica M205 C stereomicroscope, with the software package Leica Application Suite (LAS), version 4.3.0. LAS montage facility. All measurements are in mm. Measurement data for palps and legs are as follows: total length [femur, patella, tibia, metatarsus (except palp), tarsus]. The studied specimens are deposited in the reference collection at the Centre for Animal Taxonomy and Ecology (CATE), Department of Zoology, Christ College (Autonomous), Irinjalakuda, Kerala, India.

Abbreviations used in the text and figure plates: ALE — anterior lateral eyes, AME — anterior median eyes, co — copulatory opening, do — dorsal, e — embolus, ec — extension of cymbium, fd — fertilization duct, pl — prolateral, PLE — posterior lateral eyes, PME — posterior median eyes, plv — prolateral ventral, rl — retrolateral, RTA — retrolateral tibial apophysis, rlv — retrolateral ventral, t — tegulum, v — ventral, VTA — ventral tibial apophysis, vto — ventral tibial outgrowth. The terminology follows Reiskind [1969]; that for leg spination follows the format by Bosselaers & Jocque [2000].
**Description**

Genus *Cocalus* C.L. Koch, 1846

Type species: *C. concolor* C.L. Koch, 1846

*Cocalus lacinia* sp.n.

Figs 1–19, Map.

**TYPE.** Holotype ♂ (CATE, 8402A) from the Wayanad Wildlife Sanctuary (11°45′27.6″N, 76°14′50.5″E), Kurichad Range, Wayanad District, Kerala, India, 916 m a.s.l., 10.06.2015, P.P. Sudhin & K.S. Nafin.

**PARATYPE: INDIA:** 1 ♀ (CATE, 8402B), the same locality (11°45′56.3″N, 76°14′57.9″E), 842 m a.s.l., 9.06.2015, P.P. Sudhin & K.S. Nafin.

**ETYMOLOGY.** The specific epithet is a noun in apposition originated from the Latin word *lacinia*, meaning a flap and referring to the origin of the presence of a flap-like structure on the basal tibia of the male palp.

**DIAGNOSIS.** The male of *C. lacinia* sp.n. is similar to that of *C. gibbosus* Wanless, 1981 from Australia (Queensland), but differs from it in the following combination of characters: the abdomen elongated and robust (slightly shorter and more stout and truncate in *C. gibbosus*); the VTA thumb-shaped, with a sub-acute tip (more stout and truncate in *C. gibbosus*); the palpal tibia basally with a flap-like ventral outgrowth (which is absent from *C. gibbosus*). The female of *C. lacinia* sp.n. is closest to that of *C. menglaensis* Cao, Li et Zakba, 2016 from China (Yunnan), but can be distinguished by the following characters: the abdomen elongated and robust (slightly shorter and linear in *C. menglaensis*); the epigynal plate without prominent posterior projections (prominent, heavily sclerotized and rectangular in *C. menglaensis*); the copulatory openings are located posteriorly (slightly below the middle area in *C. menglaensis*); the spermathecae globular, with a posterior extension originated from the Latin word *lacinia*, meaning a flap and referring to the presence of a flap-like structure on the basal tibia of the male palp.

**DISTRIBUTION.** The type locality only (Map).

**DESCRIPTION.** MALE (holotype; Figs 1, 3–6, 11–13, 16–17). Measurements: body length 8.32. Carapace length 3.62, width (at the middle) 2.47, height at PLE 1.79. Abdomen length 4.41, width (at the middle) 1.81. Ocular area length 1.81, width 2.02. Eye diameters: AME 0.59, ALE 0.29, PME 0.16, PLE 0.31. Eye interdistances: AME–ALE 0.08, PME–PME 1.64, ALE–ALE 1.34, PME–PLE 0.47, PLE–PME 1.64, ALE–PME 0.48. Clypeus height 0.32. Length of chelicera 1.01. Palp and leg measurements: palp 3.12 [0.84, 0.59, 0.52, 1.17], leg 1 8.51 [2.14, 1.2, 2.28, 1.88, 1.01], II 9.49 [2.41, 1.09, 2.69, 2.29, 1.01], III 7 [1.96, 0.78, 1.76, 1.63, 0.87], IV 9.23 [2.48, 1.05, 2.24, 2.42, 1.04]. Leg formula: 2413. Spination. Palp: femur rl 1, do 2, pl 1; tarsus rl 1 pl 1; Legs: femur I–II rl 1 do 3 pl 2, III–IV rl 1 do 3 pl 2; patellae I–IV rl 1 pl 1; tibia I–II rl 3 rv 3 do 3 pl 3 plv 3, III–IV rl 3 rv 3 do 3 pl 3 plv 3; metatarsi I–II rl 3 rv 2 do 1 pl 2 plv 1 v 1, III–IV rl 3 rv 2 do 1 pl 3 plv 2 v 1; tarsi I–IV spineless. Carapace light yellowish brown, covered with white, brown and black setae, laterally with a white band extending from ALE to the rear end, narrowing towards it; carapace margins with a row of small black hairs (Figs 3, 6); eye field covered with chocolate white hairs; fovea light reddish brown, situated just behind PLEs (Fig. 3); clypeus low, vertical, covered with long white setae (Fig. 5); chelicerae light reddish brown, sub-vertical, frontal face with brown and white hairs (Fig. 5), pro- and retromargins with three teeth, fangs medium-sized, reddish brown; endites yellowish brown, with dull white inner tips and dark grey hairs on inner margin, margin of endites with narrow dark brown lines (Fig. 4). Labium light brown, scopulate, with a dull white tip. Sternum almost oval, yellowish brown, covered with brown and white hairs (Fig. 4). Pedicel light yellowish, with reddish-brown lateral stripes (Figs 3, 6). Abdomen pale yellow, ovoid, posteriorly narrowing, covered with black and white hairs, dorsally with irregular light brown transverse patches, laterally with continuous irregular black stripes (Figs 3, 6). Venter yellowish brown, covered with numerous brown hairs, its posterior tip with dense white hairs (Fig. 4). Spinnerets yellowish brown, covered with dark brown hairs. Legs yellow, covered with hairs, setae and spines, all trochanters with a row of prolabial and retrolateral black setae, tarsal claw with eleven teeth.

**DESCRIPTION.** FEMALE (paratype; Figs 2, 7–10, 18–19). Measurements: body length 7.34. Carapace length 2.72, width (at the middle) 2.05, height at PLE 1.53. Abdomen length 4.01, width (at the middle) 1.67. Ocular area length 1.51, width 1.73. Eye diameters: AME 0.35, ALE 0.16, PME 0.1, PLE 0.24. Eye interdistances: AME–ALE 0.05, PME–PME 1.44, ALE–ALE 1.07, PME–PLE 0.5, PLE–PME 1.48, ALE–PME 0.54. Clypeus height 0.26. Length of chelicera 0.93. Palp and leg measurements: palp 2.96 [0.92, 0.58, 0.5, 1.34], leg 1 7.07 [1.83, 1.09, 2.56, 2.52, 1.11], II 7.95 [2.24, 1.15, 2.72, 2.35, 1.08], III 6.09 [1.93, 0.72, 2.35, 2.19, 1.06], IV 8.3 [2.41, 1.11, 2.81, 2.45, 1.08]. Leg formula: 126P.P. Sudhin

**Figs 1–2. General appearance of Cocalus lacinia** sp.n. from the Wayanad Wildlife Sanctuary, Kerala, India: 1 — holotype male, dorsal view; 2 — paratype female, dorsal view.

Рис. 1–2. Общий вид Cocalus lacinia sp.n. из Уэйнадского заповедника, Керала, Индия: 1 — самец голотипа, сверху; 2 — самка паразипт, сверху.
Palp as shown in Figs 11–13, 16–17. Palp moderately long, pale yellowish, densely covered with hairs; tibia base with a flap-like ventral outgrowth, which is retrolaterally oriented (Figs 12, 16); VTA thumb like, wide at the base, with sub-acute tip (Figs 12, 16: vto); RTA dark reddish brown, with wide sinuous edge (Figs 12–13, 16–17: rta); cymbium broad, moderately long, distally truncate, with posterior triangular extension (Fig. 12: ec); tegulum ovoid, light brown with tegular furrow, retrolateral striae and dark reddish brown peripheral seminal duct (Figs 12, 16); embolus robust, hook-shaped, with the pointed tip curving inwards, towards the alveolar cavity (Figs 12–13, 16–17: e).

FEMALE (paratype; Figs 2, 7–10, 14–15, 18–19): Measurements: body length 12.71. Carapace length 3.88, width (at the middle) 2.83, height at PLE 2.25. Abdomen length 8.34, width (at the middle) 4.01. Ocular area length 1.72, width 2.21. Eye diameters: AME 0.66, ALE 0.33, PME 0.22, PLE 0.32. Eye interdistances: AME–ALE 0.09, PME–
Figs 11–15. Copulatory organs of *Cocalus lacinia* sp.n. (holotype male and paratype female): 11 — male left palp, prolateral view; 12 — ditto, ventral view; 13 — ditto, retrolateral view; 14 — epigyne, ventral view; 15 — spermathecae, dorsal view. Scale bar: (11–13) 0.5 mm, (14–15) 0.2 mm.

Рис. 11–15. Копулятивные органы *Cocalus lacinia* sp.n. (самец-голотип и самка-параптип): 11 — левая пальпа самца, спереди-сбоку; 12 — то же, сверху; 13 — то же, сзади-сбоку; 14 — эпигина, сверху; 15 — сперматеки, сверху. Масштаб: (11–13) 0,5 мм, (14–15) 0,2 мм.

PME 1.73, ALE–ALE 1.47, PME–PLE 0.32, PLE–PLE 1.88, ALE–PME 0.31. Clypeus height 0.35. Length of chelicera 1.51. Palp and leg measurements: palp 3.81 [1.08, 0.62, 0.77, 1.34], leg I 8.11 [2.28, 1.30, 2.18, 1.49, 0.86], II 7.73 [2.21, 1.21, 1.99, 1.44, 0.88], III 7 [2.21, 0.83, 1.88, 1.40, 0.68], IV 10.03 [2.72, 1.19, 2.43, 2.68, 1.01]. Leg formula: 4123. Spination. Palp: femur rl 1 do 2 pl 1, tibia rl 1, tarsus rl 2 rlv 1 pl 1 plv 1; Legs: femur I–II rl 3 do 3 pl 2, III–IV rl 2 rlv 1 pl 1 plv 1 v 1; Legs: femur I–II rl 3 do 3 pl 2, III–IV rl 2 rlv 1 pl 1 plv 1 v 1; Legs: femur I–II rl 3 do 3 pl 2, III–IV rl 2 rlv 1 pl 1 plv 1 v 1.
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Figs 16–19. Copulatory organs of *Cocalus lacinia* sp.n. (holotype male and paratype female): 16 — male left palp, ventral view; 17 — ditto, retrolateral view; 18 — epigyne, ventral view; 19 — spermathecae, dorsal view. Scale bar: (16–17) 0.5 mm, (18–19) 0.2 mm.

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