



An atypical new species of *Bothryonopa* (Coleoptera, Chrysomelidae, Cassidinae, Bothryonopini) from south India

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Abstract

Bothryonopa sahyadrica n. sp., an atypical new species of the genus from southern Western Ghats biodiversity hot-spot in India is described and illustrated. The new species lacks ventral spine on all femora, in contrast to majority of the members of the genus, including the type species. Pronotum is anteriorly distinctly narrower than posteriorly with evenly curved anterolateral corners in the new species, while pronotum in the typical species is widest medially and not distinctly narrowed anteriorly. Host plant of *B. sahyadrica* n. sp. is *Calamus gamblei* Becc. & Hook. f. (Arecaceae).

Key words: *Bothryonopa sahyadrica* n. sp., Arecaceae, *Calamus*, India

Introduction

The Old World hispine tribe Bothryonopini includes 70 described species in five genera: *Bothryonopa* Guérin-Méneville, 1840, *Wallacea* Baly, 1859, *Pistosia* Weise, 1905, *Neodownesia* Gressitt, 1953, and *Macrispa* Baly, 1859 (Sekerka 2015; Staines 2015a, b). It was Chapuis (1875) who proposed the ‘Groupe Botryonopites’ for the single genus ‘*Botryonopa*’. Weise (1911) latinized the group name and added *Macrispa*. Würmli (1976) synonymized *Macrispa* with *Bothryonopa*, and the tribe remained monotypic till Sekerka (2015) transferred *Wallacea* from Gonophorini to Bothryonopini and split it to *Pistosia* and *Neodownesia*, and formally resurrected *Macrispa*. The tribe is characterized by the mouth parts placed close to the antennal insertions with the clypeus reduced; the pronotum without seta bearing puncture in any angle; and the scutellum in dorsal view is flat, the visible portion being on the same plane as the base of the pronotum. Members of the tribe lack an inter-antennal projection and spines or tubercles on the pronotum and elytra. Confirmed host plants of Bothryonopini are palms (Arecaceae) and a few of them are economically important crop pests (Prathapan & Shameem 2017). Sekerka (2015) provided key to the genera of Bothryonopini.

Bothryonopa, the largest genus of the tribe, comprises 32 species, mostly distributed in the Indo-Malayan subregion. Host plants are known for three species: *B. grandis* (Baly, 1859), *B. sanguinea* Guérin-Méneville, 1840 and *B. spectabilis* Baly, 1859 (Staines 2015a), of which immatures are known for only *B. sanguinea* (Maulik 1949). The genus in India is represented by two species, *B. sanguinea* and *B. sheppardi* Baly. A new atypical species of *Bothryonopa* from southern India is described here.

Material and methods

The specimens were collected from a rattan cane (Arecaceae: Arecoideae: *Calamus gamblei* Becc. & Hook. f.) in the southern Western Ghats region in south India, which is a hotspot of biodiversity (Myers *et al.* 2000). Descriptive terminology follows Chaboo (2007). The endophallic sclerites were dissected and described after Tishechkin *et al.* (2011) with suitable modification.

Habitat. The specimens were collected in evergreen forest at an altitude of about 900 to 1100 m.

Host plant. This is a climbing rattan cane that put forth spiny whips and scramble through the lower canopy. Inflorescence or fruits could not be collected during our visits to the locality.

The holotype of the new species is deposited in the Natural History Museum, London (BMNH). Paratypes will be deposited in the Natural History Museum, London; National Bureau of Agricultural Insect Resources, Bengaluru, India (NBAIR); National Pusa Collection, Indian Agricultural Research Institute, New Delhi, India (NPC); University of Agricultural Sciences, Bengaluru, India (UASB); National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (USNM); Lukáš Sekerka Collection, Prague, Czech Republic (LSPC) and in the personal collection of the authors (PKDC).

A voucher specimen of the host plant is deposited in the Calicut University Herbarium (Accession no. 6956).

In the descriptions below, a forward slash (/) separates different lines on data labels and parenthesis [()] includes explanatory or label color information.

Results

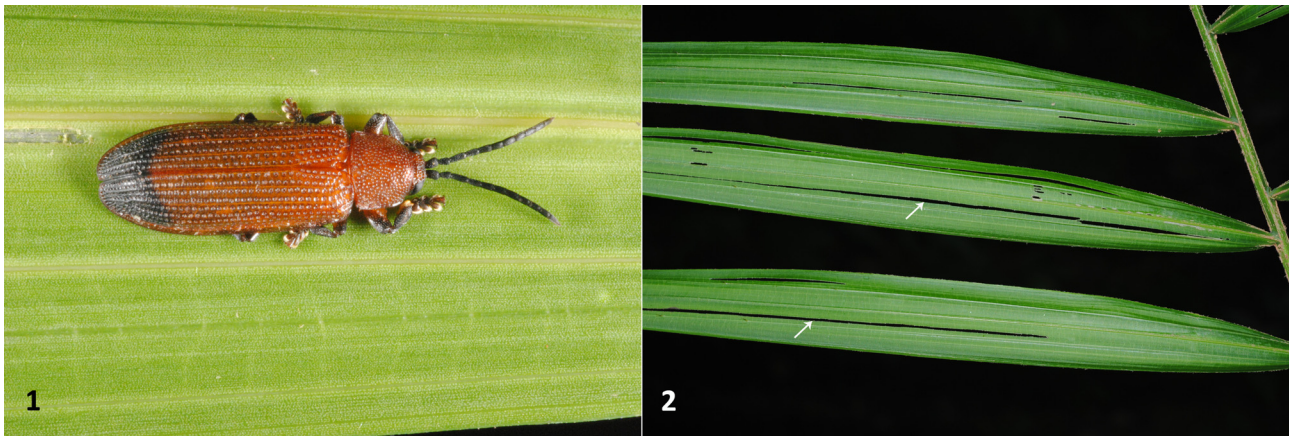
Generic diagnosis of *Bothryonopa* Guérin-Ménéville. Adults elongate, flat, neither spiny nor tuberculate, 7.5–24 mm long. Head visible in dorsal and ventral views, nearly rounded, not produced between antennae; frontoclypeus lacking or transverse and narrow; labrum transverse, with long setae. Antenna robust, reaching humerus or little beyond; first antennomere thick, subglobose. Oral cavity broader than long; in close proximity to the antennal sockets. Pronotum transverse, without seta bearing puncture in any angle; scutellum oblong, apex rounded, flat; visible portion of scutellum being on the same plane as the base of the pronotum. Elytra moderately convex, flattened along disc, nearly parallel-sided, punctate-striate with 10 rows of punctures, including short scutellar row, with additional rows arising near middle. In ventral view, apex of abdomen reaching almost near apex of elytra. Claws with obtuse appendix. Claw tarsomere extends beyond bilobed tarsomere.

Bothryonopa sahyadrica, new species

(Figs 1, 3–28)

Description (n=10). Adults 9.08–13.15 mm long; 3.15–4.51 mm wide, 2.82–3.04 times longer than wide, 6.31–6.85 times longer than high. Color highly variable. In dorsal view head, pronotum and elytra uniformly rufous brown to piceous (Figs 3, 5, 7). In three brown specimens, elytral apex piceous (Figs 1, 6). Antenna black, except last antennomere apically brown. Mandibles black, labium and maxilla rufous brown to dark brown; labrum darker than labium. Hypomeron concolorous with pronotum. Pro- and mesosternum rufous brown to dark brown, depending on the colour of the dorsum. Anterior transverse part of prosternum darker than intercoxal prosternal process. Mesepisternum darker than prosternal intercoxal process and mesepimeron. Metasternum darker laterally than medially. Color of metasternum varies from rufous brown to dark brown. Color of abdominal ventrites varies from rufous brown to dark brown (Figs 4, 8, 9, 10). Distal ventrites are darker than proximal ones. General color of legs variable: dark rufous brown to brown to piceous. Coxa, trochanter and tarsomeres mostly lighter than femur and tibia.

In dorsal view, widest near posterior 1/3 of elytra. Vertex coarsely punctate; punctures on vertex deep, rounded, larger and coarser than those on anterior portion of pronotum. Supraorbital puncture near to dorso-mesal margin of eye, with a single seta. Vertex posteriorly without transverse striae of stridulatory file. Midcranial suture present anteriorly on vertex, obscure posteriorly, continues as midfrontal sulcus. Midfrontal sulcus narrow, not deep, reaches frons. Antennal calli poorly developed, shiny, without deep punctures. Gena granulate, coarsely punctate ventrally near fronto-genal suture. Fronto-clypeus without deep punctures, epistomal suture not discernible. Frontoclypeus longer than hypostomal area. Antenna extends beyond humerus over pronotum (0.41–0.46 times longer than body). Proportionate length of antennomeres I–XI: 1 : 0.6–0.68 : 1.04–1.26 : 0.76–0.94 : 0.79–0.89 : 0.75–0.84 : 0.76–0.89 : 0.75–0.84 : 0.71–0.84 : 0.71–0.84 : 1.00–1.16. Antennomeres II–VII apically wider than proximally. Antennomere I thickest, I–IV distinctly punctate; punctures on antennomere I coarse and rounded, those on antennomeres II–IV elongate. Distal seven antennomeres densely covered with thin, minute setae. Labrum proximally with two irregular transverse rows of punctures bearing long setae; distally with shorter,



FIGURES 1 & 2. *Bothryonopa sahyadrica* n. sp., 1) adult, 2) linear incisions on the leaf lamina due to adult feeding.

thicker setae near gently emarginate anterior margin. Maxillary palpomeres II–IV each longer than preceding one. Labial palpus with third palpomere longest, second longer than first, shorter than third.

Pronotum 0.74–0.81 times longer than wide (1.23–1.35 times wider than long); in dorsal view, anteriorly narrower than posteriorly. Anterolateral angles evenly rounded, callosity poorly developed; lateral margin anteriorly narrower than posteriorly, weakly scalloped. Posterolateral angles notched, forming a denticle with the posterior margin. Anterior margin of pronotum weakly, but convexly arched, narrowly margined. Posterior margin weakly sinuate, forming an indistinct lobe in middle, distinctly margined with minute crenulations which are absent along middle. Disc of pronotum moderately convex, without impressions; profusely, uniformly punctate, punctures rounded, smaller than those on elytra, distance between punctures less than half the diameter of a puncture. Hypomeron deeply punctate; punctures stronger than those on pronotum towards tergosternal suture, punctures sparse and weaker than those on pronotum towards lateral margin. Punctures on pronotum denser than those on hypomeron. Prosternum broadened posteriorly, with weakly convex posterior margin. Maximum width of prosternal process near apex equals 4.00–4.54 times minimum width between procoxae. Prosternal process without punctures, gently depressed along middle, and across broad apical portion.

Mesoscutellum longer than wide, with narrowly rounded apex, minutely punctate and nearly flat on top. Mesepisternum and mesepimeron punctate, punctures being smaller than those on hypomeron. Mesosternum nearly flat on top, without strong punctures. Metasternum almost flat on top, except for gentle protuberance posterolaterally; nearly impunctate, except for shallow punctures laterally. Elytral apex rounded, forms denticle with sutural apex. Elytral punctures nearly rounded, diameter of a puncture subequal to three times width of an interstice. Interstices flat, except on distal 1/3. Elytral punctures regularly arranged in 10 rows including short scutellar row of 5–9 punctures. Seventh additional row arise near anterior 1/3. Interstices costate towards apical 1/4. Epipleuron widest anteriorly, reaching apex narrowly. All femora widest in middle, at least twice as wide as thick, without ventral spine. All tibiae apically notched, canaliculate dorsally from proximal end to middle or a little beyond. Posterior margin of protibia emarginate preapically. Emargination with characteristic row of stiff bristles, the longest and thickest being proximal and the distal shortest. Protibia with fine, large punctures and striations. Anterior margin forms sharp ridge. Tarsomeres 1–3 ventrally with rows of ribbon like setae with plumose apex.

Median lobe of aedeagus in lateral view slightly curved, apex short and recurved (Fig. 15). Basal piece unsclerotized (Figs 15, 17). Ventral surface convex proximally, flattened towards apex. In ventral view, widened towards apex, apex narrowed forming a nearly triangular denticle (Fig. 17). Distal opening covered with transparent laminae, not reaching apex (Fig. 16). Tegmen with each arm a little longer than stem (Figs 18, 19). Stem of tegmen characteristic with a laminate vertical process along middle (Fig. 18). Parameres longer than arms of tegmen (Fig. 20). Endophallic sclerites (Figs 21–28) comprise one anterior, one posterior-dorsal and paired posterior-ventral. Anterior sclerite horse-shoe shaped with a narrow, elongate process in the middle (Figs 21, 22, 23, 27, 28). Posterior-dorsal sclerite in lateral view with a thick cap-shaped process on ventral side (Figs 21, 22); in dorsal view, incised along middle (Figs 25, 26). Posterior-ventral sclerites in ventral view elongate, flat, gently curved near middle, apex narrowed and recurved (Figs 23, 24).



FIGURES 3–10. *Bothryonopa sahyadrica* n. sp. 3–8. adult habitus, 3) dorsal, 4) ventral, 5) lateral; 6–8) color variants; 9) male abdominal ventrites, 10) female abdominal ventrites.

Spermatheca (Fig. 11) with receptacle about as long as broad, subspheroid, not distinctly separated from pump. Pump longer than receptacle, with a terminal, pointed, unsclerotized appendix. Vaginal palpi (Figs 12, 13) broad, membranous, with thick, short setae postero-mesally; partially sclerotized in proximal half, unsclerotized and membranous posteriorly. Tergum 9 (Figs 12, 13) elongate, dagger-like, sharply narrowed towards apex. Spiculum gastrale (Fig. 14) sclerotized along lateral and posterior regions, enclose membranous area in middle; posterior margin of membranous area with a thick row of setae, discontinuous in middle.



FIGURES 11–20. *Bothryonopa sahyadrica* n. sp. 11) spermatheca, 12) coxites, tergum-VIII, tergum-IX (ventral view), 13) coxites, tergum-VIII, tergum-IX (outspread lateral view), 14) spiculum gastrale, 15) aedeagus, lateral view, 16) aedeagus, apical foramen, 17) aedeagus, ventral view, 18) tegmen, lateral view, 19) tegmen, dorsal view, 20) spicule.

Sexual dimorphism. The male is smaller (9.08–10.08 mm) than the female (12.85–13.15 mm). Female last ventrite with a characteristic, inverted U-shaped transverse row of thick setae and its posterior margin is distinctly concave in the middle and convex on either side, thus appearing sinuate. Posterior end of last visible tergite in female forms a broad, oblique brace (Fig. 10). Male last ventrite lacks the characteristic curved transverse row of setae and its posterior margin is evenly concave. Posterior end of last visible tergite forms a smaller, narrower brace in male (Fig. 9) compared to that in the female (Fig. 10).

Etymology. The species name *sahyadrica* refers to Sahyadri, Sanskrit name of the Western Ghats chain of mountains, where the insect occurs.

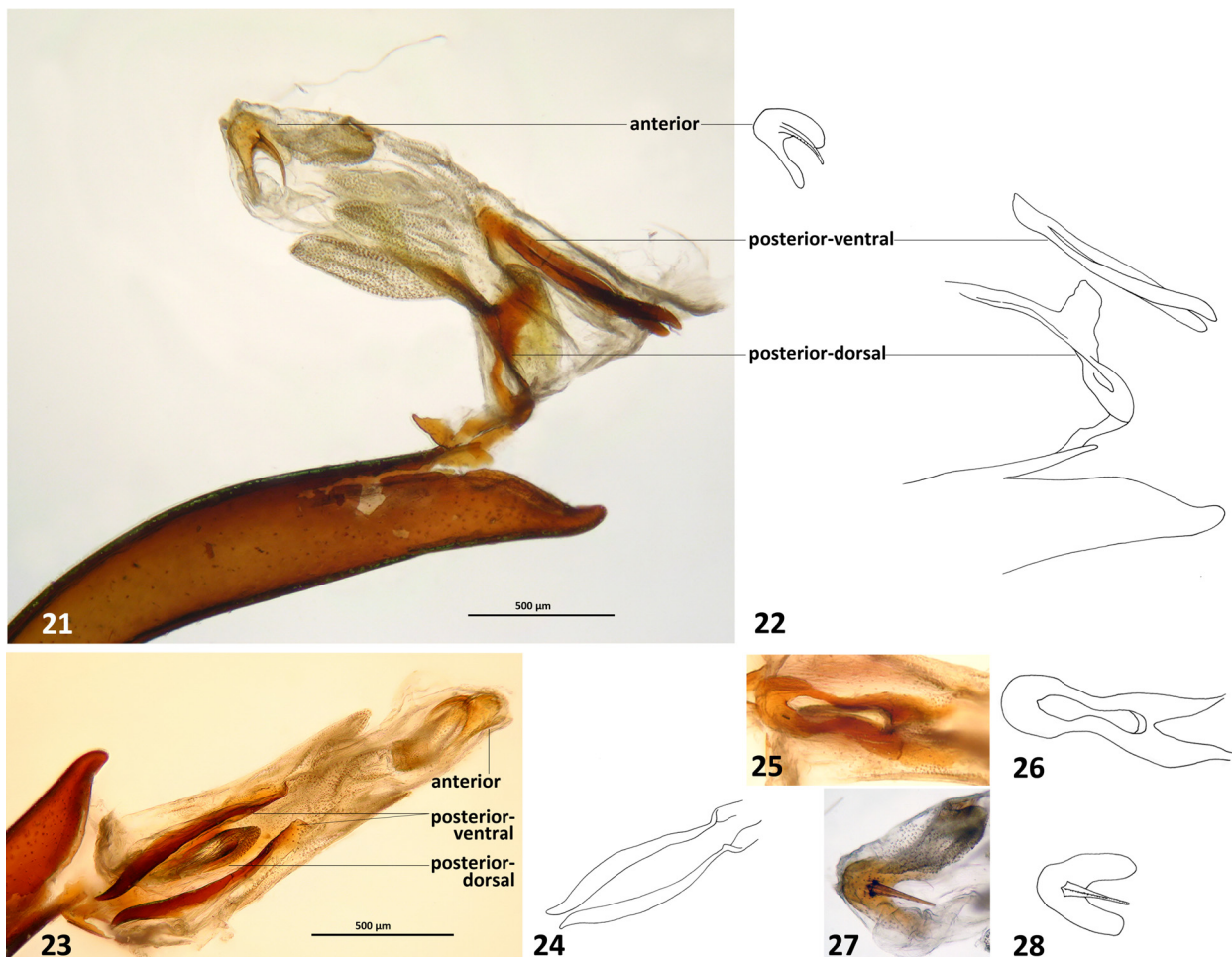
Distribution. India (Kerala).

Host plants. *Calamus gamblei* Becc. ex. Becc. & Hook. f. (Arecaceae).

Biology. The adults were collected on the tender leaves of *Calamus gamblei* Becc. & Hook. f. (Arecaceae) (Fig. 1). They make linear incisions on the leaves by feeding (Fig. 2).

Diagnosis. The new species can be separated from most members of *Bothryonopa*, including the two Indian species, by the absence of ventral spine on all femora, while at least one of the femora will be armed with a spine ventrally in most species of the genus. *Bothryonopa daiacca* Würlmi and *B. schultzei* Umann are similar to *B. sahyadrica* n. sp. *Bothryonopa daiacca* differs from *B. sahyadrica* n. sp. by the pronotum anteriorly nearly as wide as posteriorly. In *B. schultzei*, denticle on sutural apex of elytra is distinctly prominent compared to that in *B. sahyadrica* n. sp. Moreover, the above two species are geographically widely separated from *B. sahyadrica* n. sp.

Material examined. Holotype: ♂, with labels as follows: “(1) India: Kerala / Bonacaud / N 08° 41' 01.6" / E 77° 11' 24.0" 1276 m / 25.v.2013 / Prathapan & Shameem Coll. / Ex *Calamus* (2) HOLOTYPE / *Bothryonopa sahyadrica* n. sp. / des. Shameem & Prathapan, 2017” (red label) (BMNH)”. Paratypes (9 specimens, all specimens with a white locality label as given below, besides a second pink label: “PARATYPE / *Bothryonopa sahyadrica* n. sp. / des. Shameem & Prathapan, 2017”): 2 ♂, 2 ♀ with the same labels as for holotype; 2 ♂, 2 ♀, 1 unsexed (in alcohol). India: Kerala / Bonacaud / N 08° 41.352' / E 77° 11.200' 1083 m / 9.iv.2017 1083 m / Prathapan & Shameem Coll. / Ex *Calamus* (1 BMNH, 1 LSPC, 2 NBAIR, 1 NPC, 1 PKDC, 1 UASB, 2 USNM).



FIGURES 21–28. endophallic sclerites in *Bothryonopa sahyadrica* n. sp. 21 & 22) lateral view, 23) ventral view, 24) posterior-ventral, ventral view, 25 & 26) posterior-dorsal, dorsal view, 27 & 28) anterior.

Discussion

Bothryonopa sahyadrica n. sp. is remarkably different from most members of the genus, including the type species

B. sanguinea. A ventral spine or ridge, at least on one of the femora, has been described as a character of the genus (Maulik 1919; Kimoto 1999). However, this character is variable within and between members of the genus (L. Sekerka, personal communication). The ventral spine is absent in the new species. Pronotum is anteriorly narrowed with evenly rounded anterolateral corners in *B. sahyadrica* n. sp., while in most species, pronotum is medially widened and the anterolateral corners are more or less subquadrate or obtusely angulate. Moreover, *B. sahyadrica* n. sp. is smaller than the type species and allied ones. *Bothryonopa schultzei* Uhmann (Würmli 1975) and *B. daiacca* Würmli (Würmli 1976) are similar to *B. sahyadrica* n. sp. in the structure of the pronotum and legs. *Bothryonopa sahyadrica* n. sp., along with these two species, may form the basis of a new genus when more studies, including discovery of additional species, are carried out.

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