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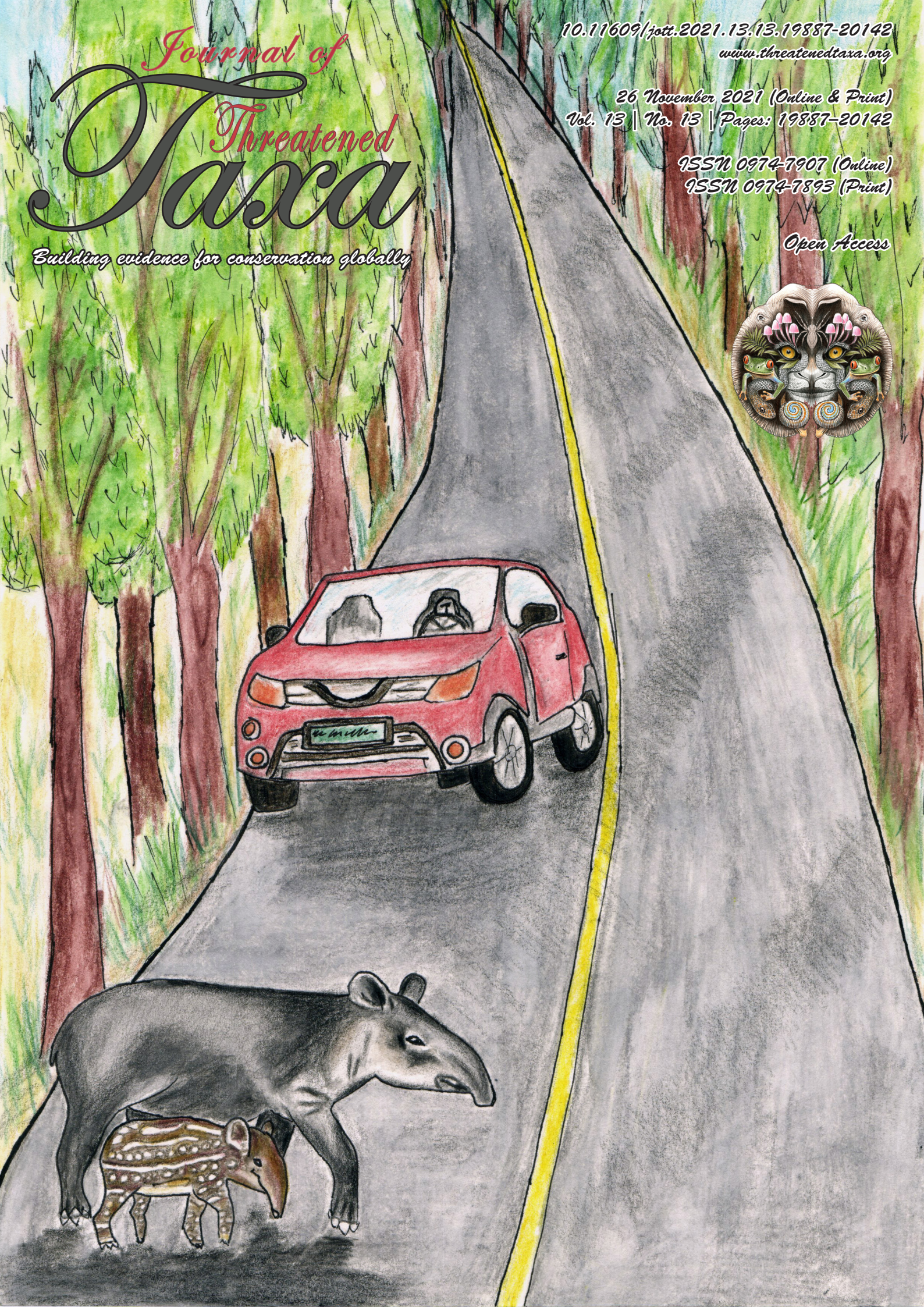
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Caption: Lowland Tapir *Tapirus terrestris* (Medium—watercolours on watercolour paper) © Aakanksha Komanduri.

INTRODUCTION

Cryptalaus Ôhira, 1967 was established as a subgenus of *Alaus* Eschscholtz, 1829 to include species with the presence of mesometaventral junction. Eventually, it was elevated to generic level and *Paracalais* Neboiss, 1967 was synonymized with it by Ôhira (1990). Cate (2007) reported 15 species from the Palaearctic region, five of which, namely, *C. cenchris* (Candèze, 1857), *C. eryx* (Candèze, 1874), *C. lynceus* (Candèze, 1874), *C. sculptus* (Westwood, 1848) and *C. sordidus* (Westwood, 1848), were from the North Indian region. Only two, *C. lynceus* (Candèze, 1874) and *C. sculptus* (Westwood, 1848), are represented from India by the type locality. Chandra et al. (2018) catalogued two more species, *C. berus* (Candèze, 1865) and *C. griseofasciatus* (Schwarz, 1902), from the Indian Himalayan region. The present knowledge on *Cryptalaus* species from the Indian region is scarce because it is based mainly on the above recent checklist or catalogue. Therefore, this study aims to evaluate and validate the actual presence of *Cryptalaus* species from the Indian subcontinent, describe a new species, and provide an identification key to the Indian species of this genus.

MATERIALS AND METHODS

The study is based on the materials examined from the following collections:

BNHS—Bombay Natural History Society, Mumbai, India

FRI—Forest Research Institute, Dehradun, India

ZKJSSC—Zoology Department, K.J. Somaiya College, Mumbai, India

This study was carried out by examining the adult morphology of *Cryptalaus* species. The definition of *Cryptalaus* follows Ôhira (1967, 1990) and Johnson (2001). Morphological terminology used for the study follows Calder (1996), Casari (2008), and Costa et al. (2010). The limits of the Oriental and Australian regions are based on Johnson (2001).

Materials from BNHS and ZKJSSC were examined under a Dewinter Zoomstar II stereomicroscope, while materials from FRI were observed under an E. Leitz Wetzlar microscope. As there are very few specimens of *C. assamensis*, *C. eryx*, *C. nodulosus*, and *C. sculptus* representing Indian region, it was not possible to prepare genitalia for the examination. Photographs of the new species and *C. sordidus* were taken using Nikon D3200, Nikon D5300, and Nikon AF105 macro lens with

Kenko extension tubes. Photographs of the type(s) and non-type specimens provided by various museums were also used in the study to confirm descriptions and keys from the original and subsequent publications as well as to correlate with the materials examined from the abovementioned collections.

Body length was measured from the anterior edge of frons to the apices of elytra. Body width was measured near half of its length, usually before the middle of elytra. Pronotum length was measured at midline and width at the half. The elytral length was measured from anterior margin of an elytron to its apex and width at the half. Aedeagus was measured along the midline from the apex of the median lobe to the apical margin of the basal piece. For genitalia preparation, the abdomen was severed from the body and kept overnight in cold 5% KOH for a male and 10% KOH for a female. The male and female genitalia and terminalia were then removed, washed with water followed by a short treatment in 90% alcohol. Terminalia and male genitalia were preserved in alcohol, while female genitalia were stored in glycerol.

Under each species taxon, we provide literature (citing Indian localities) with relevant information on the taxon, type locality, information on type material with its depository, Indian material examined, distribution within India, measurements (given in range), diagnostic characters and remarks, wherever applicable. Under the 'Distribution in India' section, actual localities of the specimens physically examined are provided and the localities given in the literature, for which specimens were not available, are mentioned in parenthesis. The data labels are quoted verbatim with a single slash (/) separating each data label under the specimen. Within the data label section, additional information and current geographic names are provided in square brackets.

Types of the newly designated species were marked with red labels denoting their type status (holotype or paratype), gender, name of the species, and the authors.

The acronyms used for museums with the type specimens are as follows:

NHM—Natural History Museum, London, The United Kingdom

OUMNH—Oxford University Museum of Natural History, Oxford, The United Kingdom

RBINS—Royal Belgian Institute of Natural Sciences, Brussels, Belgium

SDEI—Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany



RESULTS

Genus *Cryptalaus* Ôhira, 1967

Cryptalaus Ôhira, 1967: 97. Type species: *Alaus putridus* Candèze, 1857 sensu Ôhira, 1967 (= *Alaus larvatus* Candèze, 1874; the designated type species was a misidentification and corrected to *Alaus larvatus* by Ôhira, 1976: 32 and amended it in Ôhira, 1990: 21)

Paracalais Neboiss, 1967: 261. Type species: *Alaus suboculatus* Candèze, 1857. (For more details on synonymy with *Cryptalaus* see Ôhira, 1990: 21 and Kundrata et al. 2019: 104)

Diagnosis: Frons carinate over antennal insertions; concave or with shallow triangular depression. Antennae serrate; antennomere I longest; II subglobular, shortest; III triangular with spiniform apex. Pronotum with anterior edge smooth or with two teeth-like projections in dorsal view; disc convex with or without raised longitudinal median region. Prosternal process grooved medially between procoxae. Mesocoxal cavity open to both mesepimeron and mesanepisternum. Sides of mesoventral cavity parallel, horizontal in lateral view; mesometaventral junction straight; metaventral discrimen furrowed near base. Scutellar shield declivous in one slanting plane or folded in two planes: anterior vertical and posterior horizontal. Elytral base with interstria III costate or tuberculate; apices rounded or truncate to emarginate with combinations of sutural and lateroapical spines. Abdominal sternite V posteriorly rounded in male; truncate in female with numerous spatulate setae. Aedeagus with median lobe longer than parameres; parameres articulated with median lobe and fused at base; each paramere with lateral subapical hook, setose apex; basal piece wide. Bursa copulatrix with horseshoe shaped sclerotized toothed structures at entrance of colleterial glands, with two lightly sclerotized spermathecae and single, long tubular sac-like extension.

Distribution: Oriental Region: China, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, South Korea, Sri Lanka, Taiwan, Thailand, and Vietnam. Australian Region: Australia, Fiji, Samoa, and Vanuatu.

Cryptalaus alveolatus sp. nov.

(Images 1–21)

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Type locality: India: Supegaon, Raigad District, Maharashtra.

Type material: Holotype, female, India: “Supegaon, Raigad District, Maharashtra, 16.VIII.2016, leg. A.

Patwardhan”/ “Reg. No. ZKJS 10” (ZKJSSC).

Paratypes: 7 females, **India:** 1 female, “Supegaon, Raigad District, Maharashtra, 07.X.2019, leg. S. Abhyankar”/ “Reg. No. ZKJS 10B” (ZKJSSC); 1 female, “Kanha, Madhya Pradesh”/ “Reg. No. ZKJS 10A” [without further data] (ZKJSSC); 3 females, “Gersoppa, on cut tree, 29.IX.[19]07” [Gersoppa, Karnataka; label data in pencil; without collector data; rewritten on new BNHS label; Reg. No. BNHS 260, BNHS 261, BNHS 263] (BNHS); 1 female, “Gersoppa, on cut tree, 09.XI.[19]06” [Gersoppa, Karnataka; label data in pencil; without collector data; rewritten on new BNHS label; Reg. No. BNHS 262] (BNHS); 1 female, “LOC. Kanger Valley NP, Chhattisgarh, June 17th 2017” [on front side] “coll. Saunak Pal” [on back side; Reg. No. BNHS 264] (BNHS).

Non-type material: 7 females, **India:** 1 female [Acc. No. 13572], “Tithimatti, S Coorg, VIII.1939” [without collector data; now Thithimathi in Kodagu, Karnataka] (FRI); 1 female [Acc. No. 13572], “Tithimatti, S Coorg, B. M. Bhatia, 10.X.1940” [now Thithimathi in Kodagu, Karnataka] (FRI); 1 female [Acc. No. 13572], “Kiwatti, E Kanara, Bombay, B.M. Bhatia, 14.VI.1930”/ “R.R.D. 42, B.C.R. 178, Cage 654” [on front side] “457” [on back side]/ “*Alaus pris eryx* Cand. FLEUTIAUX det.” [Kiwatti, Uttar Kannad District, Karnataka; misidentified] (FRI); 1 female [Acc. No. 9959], “N. Sihawa, R. Raipur, C.P., N.C. Chatterjee, 8.VII.[19]93”/ “R.R.D. 85, B.C.R. 257, Cage 256”/ “ex. *Bombax malabaricum*”/ “*Alaus* near *elaps* Fleutiaux det.” [North Sihawa, Chhattisgarh Plain, Chhattisgarh; misidentified] (FRI); 1 female [with illegible data] (FRI); 1 female [Acc. No. 13572], “Manor R., N. Thana, Bombay, C.F.C. Beeson, 22.vi.1930”/ “R.R.D. 32, B.C.R. 27, Cage 311”/ “ex. Unknown climber”/ “*Alaus pris eryx* Cand., J.C.M. Gardner det.” [Manor, Palghar District, Maharashtra; misidentified] (FRI); 1 female [Acc. No. 13572], “Mandvi, West Thana, Bombay, B.M. Bhatia, 15.VII.1930”/ “R.R.D. 38, B.C.R. 135, Cage 502”/ “ex. *Mangifera indica*”/ “*Alaus pris eryx* J.C.M. Gardner det.” [Mandvi, Maharashtra; misidentified] (FRI).

Distribution in India: Maharashtra, Madhya Pradesh, Karnataka, Chhattisgarh.

Measurements: (Holotype in parenthesis). Body length: 15–27 (26) mm. Body width: 4–8 (6.8) mm. Pronotum length including posterior angles: 5–10 (8.7) mm. Pronotum width including posterior angles: 4–7 (7) mm. Elytral length: 9–17 (15.6) mm. Elytral width: 4–8 (6.8) mm.

Diagnostic characters: *Cryptalaus alveolatus* sp. nov. distinguished from its congeners by the combination of following unique characters: length ratio of antennomeres II–IV is about 1.0 : 2.0 : 3.3, pronotum

with prominent longitudinal median ridge in its posterior 3/4 (Images 5, 7), median basal tubercle of pronotum slightly raised and rounded (Image 5), scutellar shield folded in two planes, anterior 2/3 in vertical plane, while posterior 1/3 in horizontal (Image 10), elytral interstriae flat except interstria III which is raised throughout about 4/5 of elytral length (Image 11) and interstria II more depressed than I and III (Image 12), elytral apices emarginate with both sutural and lateroapical spine (Image 13), bursa copulatrix with darkly sclerotized spots (Images 18, 19) and single, tubular sac-like structure arising apically near base of one spermatheca (Images 18, 19), colleterial gland with tiny spinules-like sclerotized structures (Image 18).

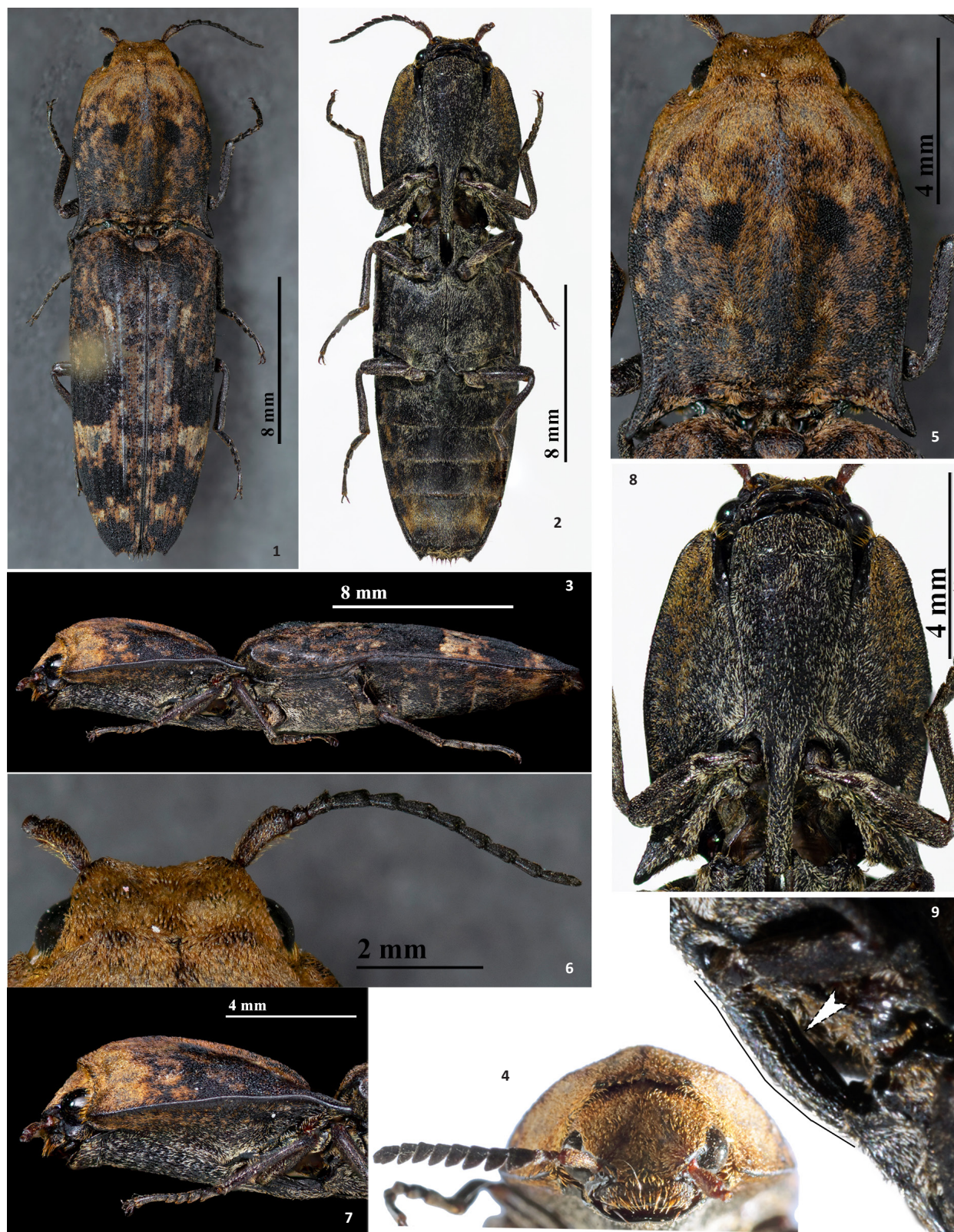
This species resembles *C. lynceus* (Candèze, 1874), which is known only from North India, in general appearance and characters: pronotum longer than wide, anterior edge of pronotum with two teeth-like projections, disc of pronotum with longitudinal median region raised. However, the new species differs from it by the following combination of characters: body pitch-black, anterior 1/3 of pronotum with yellow-brown scales, while posterior 2/3 with brown-black, large elytral patch of black pubescence around eight interstriae wide in its mid-length, sides of pronotum sinuous, pronotum with conspicuous longitudinal median ridge, elytral interstria II more depressed than interstriae I and III, elytral apices emarginate with prominent sutural and lateroapical spines.

Description: Holotype, female (ZKJS 10): Body elongate (Image 1) 26 mm long, 6.8 mm wide, pitch-black, with antennomeres I–III and maxillary palpi red-brown; dorsum densely covered with white, black to several tonalities of brown, decumbent scale-like setae; head, anterior 1/3 of pronotum with yellow-brown scales gradually fading to brown-black scales in posterior 2/3 of pronotum, with two pitch-black discal spots medially; elytral interstria I with alternate black, white to light brown bands, two white to light brown blotches in posterior half of elytra sandwiched between three black blotches covering interstriae around III–X; ventrally (Image 2) with sparse white setae medially, laterally more yellow-brown to black; abdominal ventrite V with transverse band of yellow-brown scales.

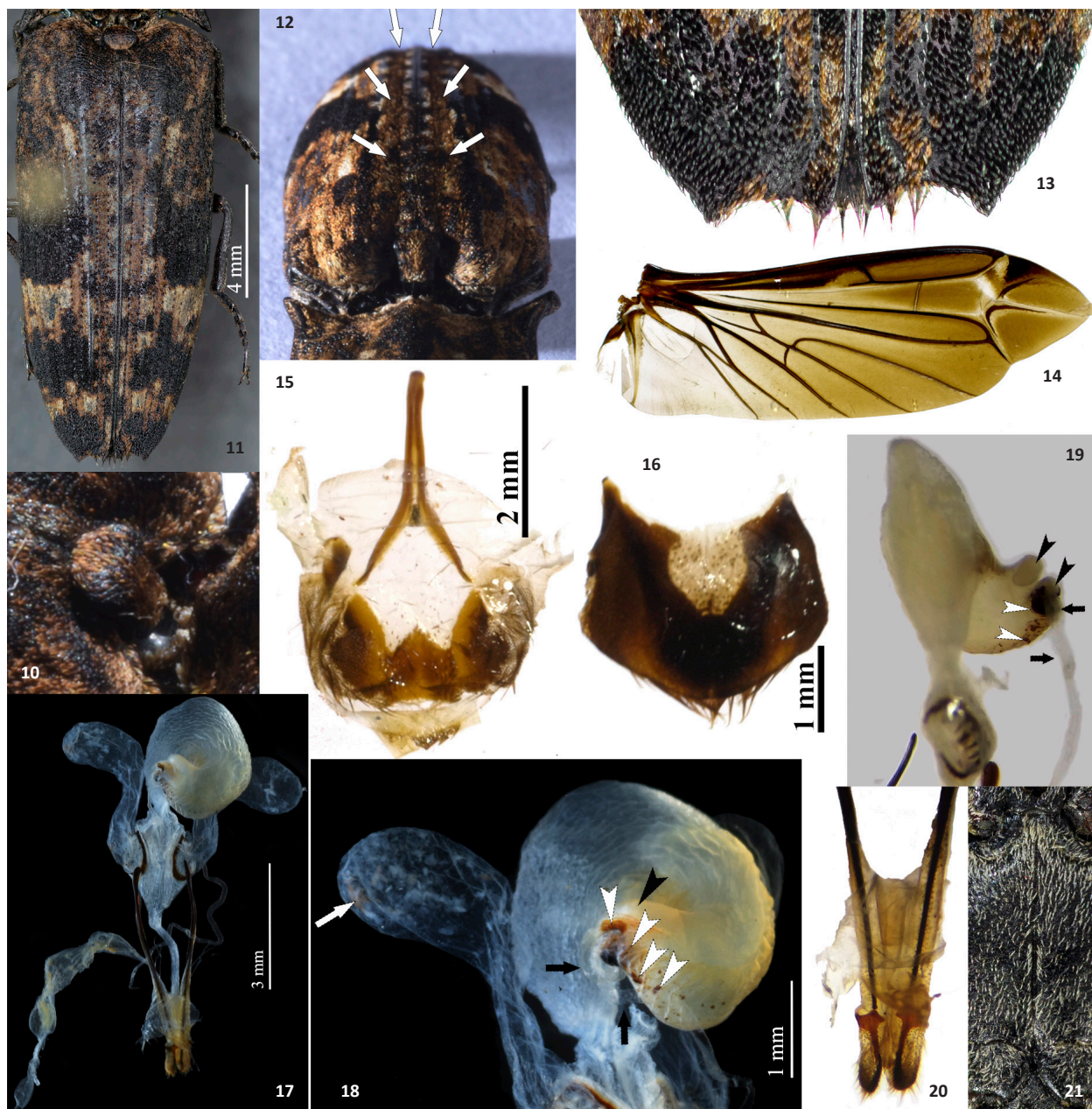
Head: Short (Image 4), slightly wider than long (length/width 0.76), including eyes 0.5 times as wide as pronotum; frons (Image 4) carinate over antennal insertion, with shallow triangular depression medially; punctures dense. Labrum transverse, narrow, around 6.5 times as wide as long, sparsely punctate, covered with yellow, long setae. Maxillary palpi with apical

palpomere securiform. Antennae (Images 1, 4, 6) short, slightly reaching about half of pronotal length in dorsal view, serrate from antennomere IV. Length ratio of antennomeres II–IV is about 1.0 : 2.0 : 3.3. Antennomere II about 1.5 times as wide as long; antennomere III about 1.1 times as wide as long; antennomere IV about 1.1 times as long as wide; antennomere XI as long as antennomere IV, 1.4 times as long as wide.

Thorax: Pronotum (Image 5) 1.17 times longer than wide, and 1.24 times longer than wide including posterior angles. Anterior edge (Image 6) sinuous, raised medioanteriorly forming two teeth-like projections; anterior angles acute, slightly produced anteriorly; sides sinuate, gradually narrowed anteriorly, and smoothly sloping towards posterior angles; posterior angles long, pointed, divergent, with carinae slightly reaching beyond base. Disc of pronotum (Images 5, 7) notably with raised longitudinal median ridge in its posterior 3/4 (visible in both dorsal and lateral view), with median basal tubercle slightly raised and rounded. Punctures dense, round to oval, shallow. Hypomeron (Image 8) with anterior angles acute; punctures dense, intervals between punctures on average smaller than diameter of one puncture. Prosternum (Images 7, 8) in front of procoxae about 4.9 times longer, 2.6 times wider at base of chin piece, 1.6 times wider before procoxae than diameter of procoxa; chin piece around 3.0 times wider than long with anterior edge arcuate, around 20 degrees below prosternal plane in lateral view; surface convex in ventral view, punctures less denser, slightly larger than on hypomeron, each puncture on average separated by about 0.5–1.0 times its diameter; prosternal process (Images 8, 9) about 3.0 times longer than diameter of procoxa, inclined considerably around 10 degrees behind procoxae in lateral view, underside with notable dent in middle. Mesoventrite (Image 2) 1.5 times wider than long. Metaventrite (Image 2) 1.34 times wider than long; metaventral discrimen (Image 21) touching anterior edge of metaventrite, deeply furrowed in about its posterior 1/3, almost touching posterior edge. Metacoxal plate about 5.2 times as wide as narrowest part, anterior edge oblique, posterior edge subparallel to anterior edge. Scutellar shield (Images 10–12) distinctly folded in two planes, anterior 2/3 in vertical plane, posterior 1/3 in horizontal plane; anterior edge slightly emarginate in middle; sides sloping in vertical plane, notably rounded near fold, again sloping in posterior plane; posterior edge with slight notch concealed under pubescence. Elytra (Images 11–13) almost twice as long as pronotum, 2.3 times as long as its combined width, together as wide as pronotum;



Images 1–9. *Cryptalaus alveolatus* sp. nov., female holotype (ZKJS 10): 1—habitus, dorsal view | 2—habitus, ventral view | 3—habitus, lateral view | 4—head, antenna, anterodorsal view | 5—pronotum, dorsal view | 6—pronotal anterior edge, head and antenna, dorsal view | 7—pronotum and prosternum, lateral view | 8—hypomeron and prosternum, ventral view | 9—prosternal spine, lateral view, white arrowhead: dent on underside, black line: inclination of prosternal spine behind procoxae with conspicuous bents. 4, 9—not to scale. © 1–3, 5–8—M. Vankawala | 4, 9—A. Patwardhan.



Images 10–21. *Cryptalaus alveolatus* sp. nov.: 10, 11, 13, 21—female holotype (ZKJS 10) | 12, 15–20—female paratype (ZKJS 10B) | 14—female paratype (BNHS 264) | 10—scutellar shield, dorsolateral view | 11—elytra and scutellar shield, dorsal view | 12—elytra and scutellar shield, anterodorsal view, white arrows: depressed elytral interstria II than interstriae I and III | 13—apex of elytra | 14—right hind wing | 15—abdominal sternite VIII | 16—abdominal tergite VIII | 17—genitalia, ventral view | 18—details of bursa copulatrix, colleterial gland, ventral view, white arrow: tiny spinules-like structures within colleterial gland, black arrows: sac-like single tubular extension from bursa copulatrix, white arrowheads: darkly sclerotized spots on bursa copulatrix, black arrowhead: spermatheca | 19—details of bursa copulatrix, ventrolateral view, black arrows: sac-like single tubular extension from bursa copulatrix, white arrowheads: darkly sclerotized spots on bursa copulatrix, black arrowheads: two spermathecae | 20—apex of ovipositor, ventral view | 21—metaventral discrimen | 12–14, 19–21—not to scale. © 11, 13, 21—M. Vankawala | 10, 12, 14—A. Patwardhan | 15–20—H. Parekar.

sides sub-parallel to posterior half, then slightly tapering to apex, apex of each elytron distinctly emarginate with prominent sutural and lateroapical spine; striae with punctures usually separated by 1.0–3.0 times their diameter and laterally rarely by 5.0 times their diameter,

distinctly larger than punctures on interstriae; interstriae flat except III, and IV raised near base, only interstria III raised throughout about 4/5 of elytron; interstria II (Image 12) more depressed than interstriae I, and III. Hind wing (Image 14: of paratype female, BNHS 264)



2.4 times as long as wide, apex narrowly rounded; radial cell short, about four times as long as wide; r3 extending about 0.2 times as long as radial cell.

Abdomen: Ventricle V (Image 2) anteriorly (measured near anterior edge) 2.19 times as wide as long. Tergite VIII (Image 16) 1.46 times as wide as long; anteriorly concave, sides subparallel, apically arcuate with short setae; sparsely covered with punctures; colorless median area vase shaped. Sternite VIII (Image 15) 1.76 times as wide as long; sclerotized area conspicuously forming letter W anteriorly, posterior margin incurved shallowly in middle; rarely covered with short setae; spiculum ventrale twice as long as sternite VIII, not touching tip of sclerotized area.

Genitalia: Female (Images 17–20: of paratype female, ZKJS 10B): Ovipositor 0.61 times length of abdomen (measured medially); coxites (Image 20) rarely covered with long, darkly sclerotized setae, apically covered with sparse, shorter, less sclerotized setae; paraprocts 5.8 times as long as coxites, 0.85 times length of ovipositor. Colleterial glands (Image 18) thrice as long as wide, with tiny spinules-like sclerotized structures inside (Image 18: shown with white arrow). Bursa copulatrix (Images 18, 19) coiled, two spermathecae on anteriormost section not sclerotized (Image 18, 19: shown with black arrowheads); single extension of long, tubular sac-like structure arising apically near base of one spermatheca (Images 18, 19: shown with black arrows); darkly sclerotized spots (Image 19: shown with white arrowheads) near, and from base of tubular extension.

Male unknown.

Etymology: The Latin word “alveolatus” means hollowed out like a trough. The specific epithet refers to depressed elytral interstria II (than interstriae I and III), which appears to be trough-shaped (see Image 12).

***Cryptalaus assamensis* (Schwarz, 1902) comb. nov.
(Images 22, 23)**

Alaus assamensis Schwarz, 1902: 204 (original description, type locality: Assam); Schenkling, 1925: 45 (catalogue, locality: Assam); Gaedike, 1985: 19 (catalogue of type specimens in SDEI, 1 Syntype).

Type locality: India: Assam.

Type material: Syntype, 1 female, **India:** “Assam”/ “coll. Schwarz”/ “Syntypus” [red label]/ “*assamensis* Schw.” (SDEI).

Indian material examined: 1 female, “Jeypore Res. Lakhimpur, Assam., N.C. Chatterjee, 13.V.1938.” (FRI).

Distribution in India: Assam.

Measurements: Syntype. Length: 28 mm. Width: 8.5 mm.; FRI specimen. Length: 26.5 mm. Width: 8 mm.

Diagnostic characters: Female: Body (Image 22) pitch-black with antennomeres I–III, trochanters red-brown; dorsum densely covered with grey to yellow decumbent scales intermingled with black spots; pronotum with two eye-like spots of black pubescence elongated oval, deviated towards central axis; elytral interstriae VII–VIII with elongate black patch near half of elytral length. Antennae short, slightly reaching half of pronotal length. Length ratio of antennomeres II–IV is about 1.0 : 1.6–2.0 : 3.0–3.6. Pronotum 1.18–1.19 times longer than wide and 1.28–1.30 times longer than wide including posterior angles, anterior edge with two teeth-like projections, anterior angles broad in dorsal view, sides narrowly convex to subparallel, posterior angles long, narrow, pointed and strongly divergent with carinae slightly reaching beyond base, disc with slightly raised median longitudinal surface glabrous, punctures denser laterally than on median longitudinal surface, with weakly developed transverse median carina near base. Scutellar shield almost as long as wide. Elytra 1.88–2.03 times as long as pronotum, 2.21–2.24 times as long as its combined width, apex emarginate with slightly produced sutural and lateroapical spine.

Male unknown.

***Cryptalaus eryx* (Candèze, 1874)
(Images 24, 25)**

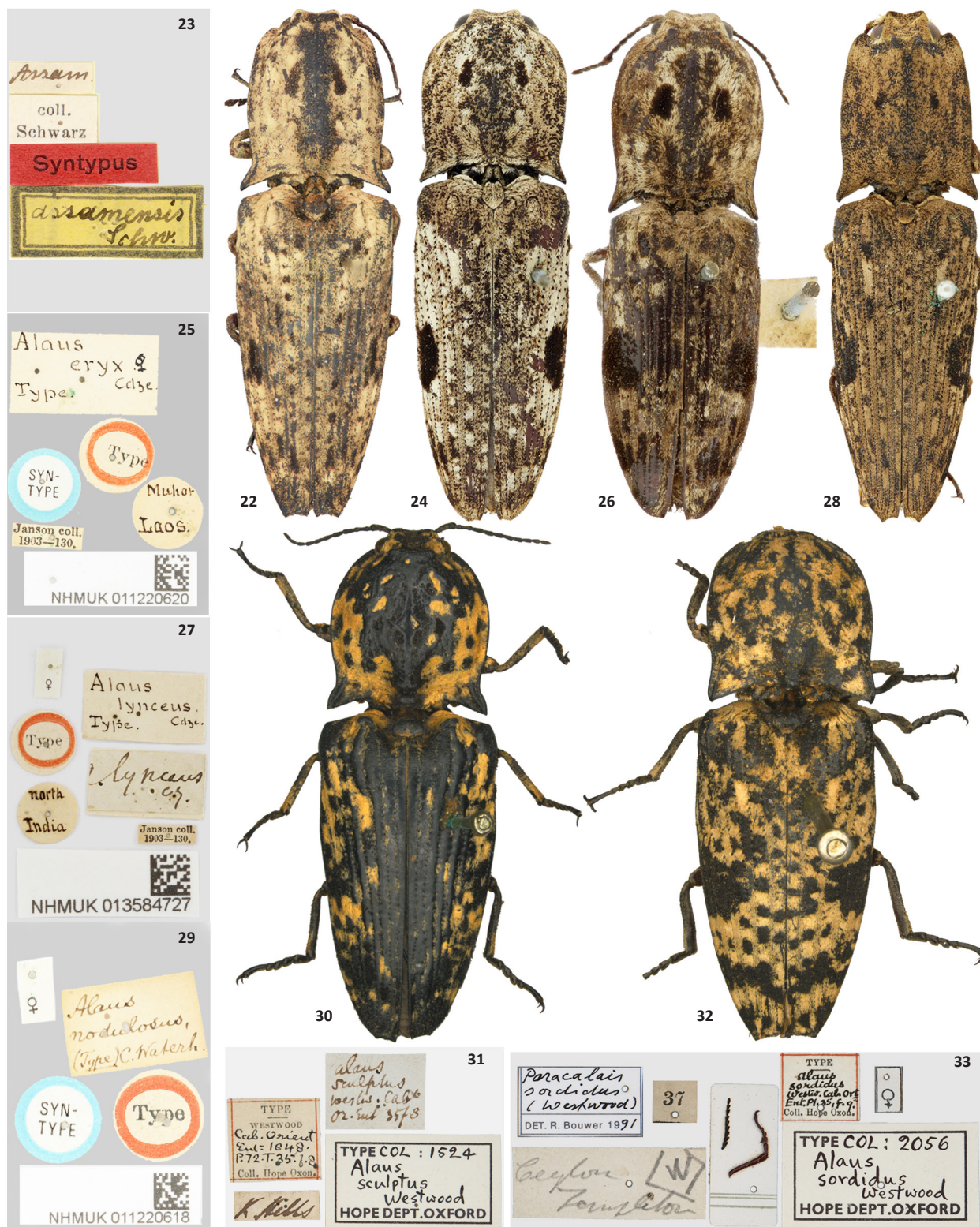
Alaus eryx Candèze, 1874: 140 (original description, type locality: Laos), 119–121 (key to *Alaus* species, Group 2); Fleutiaux, 1927: 102–104 (key to *Alaus* species), 105 (distributional note, locality: Darjeeling).

Cryptalaus eryx (Candèze, 1874); Cate, 2007: 107 (catalogue, locality: Sikkim, Darjeeling); Chandra et al. 2018: 499 (catalogue, locality: West Bengal, Sikkim).

Type locality: Laos: exact location not known.

Type material: Syntypes, 4 females, **Laos:** 1 female, “Muhot, Laos”/ “Janson coll. 1903–130.”/ “*Alaus eryx* [female symbol], Cdze., Type.”/ “SYNTYPE” [within blue circular border]/ “Type” [within orange circular border]/ “NHMUK 011220620” (NHM); 1 female, “Muhot, Laos”/ “Janson coll. 1903–130.”/ “*Alaus eryx* [female symbol], Cdze.”/ “SYNTYPE” [within blue circular border]/ “NHMUK 011220621” (NHM); 1 female, “Muhot, Laos”/ “Janson coll. 1903–130.”/ “*Alaus eryx* [female symbol], Cdze.”/ “SYNTYPE” [2 different labels; within blue circular border]/ “NHMUK 011220622” (NHM); 1 female, “Muhot, Laos”/ “Janson coll. 1903–130.”/ “*Alaus eryx* [female symbol], Cdze.”/ “SYNTYPE” [within blue circular border]/ “NHMUK 011220623” (NHM).

Indian material examined: 3 males. 1 male [Acc. No. 15243], “Samsingh 1800, Kalimpong, Bengal, XI.[19]33,



Images 22–33. *Cryptalaus* spp.: 22, 23—*Cryptalaus assamensis* (Schwarz, 1902) comb. nov., female syntype © S. Blank, SDEI | 22—habitus, dorsal view | 23—data labels | 24, 25—*Cryptalaus eryx* (Candèze, 1874), female syntype © K. Matsumoto, NHM | 24—habitus, dorsal view | 25—data labels | 26, 27—*Cryptalaus lynceus* (Candèze, 1874), female syntype © K. Matsumoto, NHM | 26—habitus, dorsal view | 27—data labels | 28, 29—*Cryptalaus nodulosus* (Waterhouse, 1877) comb. nov., female syntype © K. Matsumoto, NHM | 28—habitus, dorsal view | 29—data labels | 30, 31—*Cryptalaus sculptus* (Westwood, 1848), male syntype © K. Child, OUMNH | 30—habitus, dorsal view | 31—data labels | 32, 33—*Cryptalaus sordidus* (Westwood, 1848), female syntype © K. Child, OUMNH | 32—habitus, dorsal view | 33—data labels | 22–33—not to scale.



Balwant Singh."/ "Ex rotten wood."/ "1130"/ "*Alaus eryx* Cand. FLEUTIAUX det." [Samsing, Kalimpong, West Bengal; specimen with elytra distorted] (FRI); 1 male, "Bagdogra Range, Kurseong, Bengal, N.C. Chatterjee, 8.V.1936"/ "ex unknown wood."/ "R.R.D. 905, B.C.R. 39, Cage 598" [Bagdogra, Kurseong, Darjeeling District, West Bengal] (FRI); 1 male, "Assam, N.C. Chatterjee, 24.IV.1939" (FRI).

Non-Indian material examined: 1 female [Acc. No. 5069], **Myanmar:** "Okkyi, Schwegu, Burma, 2.VI.1919, C.F.C. Beeson" [Shwegu, Kachin District, Myanmar] (FRI).

Distribution in India: West Bengal, Assam, (Sikkim).

Measurements: Length: 23–28 mm. Width: 7–8.5 mm.

Diagnostic characters: Female: Body (Image 24) red-brown with pronotal longitudinal median region, hypomeron and prosternum, maxillary palpi pitch-black; dorsum densely covered with white to light brown decumbent scales intermingled with black spots and patches; pronotum with two eye-like spots of black pubescence oval; two interstriae wide semi-circular ring-like black patch on elytral interstriae VII–IX at near half of elytral length, ring-like patch anteriorly never touching interstriae IX–X, posteriorly touching interstriae X rarely. Antennae short, slightly reaching half of pronotal length. Length ratio of antennomeres II–IV is about 1.0 : 1.6–2.3 : 2.0–2.6. Pronotum 1.12–1.18 times longer than wide and 1.21–1.28 times longer than wide including posterior angles, anterior edge with two teeth-like projections not raised, anterior angles acute in dorsal view, sides evenly convex and narrowly sinuous before posterior angles, posterior angles short, narrow, pointed and divergent with carinae just reaching beyond base, disc with longitudinal median carina obliterating in prominent transverse median carina near base. Scutellar shield 1.2–1.5 times as long as wide, subpentagonal. Elytra 1.90–2.35 times as long as pronotum, 2.10–2.35 times as long as its combined width, interstriae flat, apex narrowly emarginate with slightly produced sutural spine.

Male similar to female in shape, size and appearance. Antennae reaching well beyond half of pronotal length, not reaching base of posterior angles. Length ratio of antennomeres II–IV is about 1.00 : 1.67–1.80 : 2.5–2.8.

***Cryptalaus lynceus* (Candèze, 1874) (Images 26, 27)**

Alaus lynceus Candèze, 1874: 139 (original description, type locality: Inde boréale = North India), 119–121 (key to *Alaus* species, Group 2); Candèze, 1891: 33 (catalogue, locality: Hindoustan sept. = North India);

Schenkling, 1925: 46 (catalogue, locality: N. Hindostan = North India).

Cryptalaus lynceus (Candèze, 1874); Cate, 2007: 107 (catalogue, locality: north India); Chandra et al. 2018: 499 (catalogue, locality: Himalaya: West Bengal, Sikkim, Himachal Pradesh).

Type locality: North India: exact location not known.

Type material: Syntype, 1 female, **north India:** "[female symbol]"/ "Type" [within orange circular border]/ "north India" [sic]/ "Janson coll. 1903–130"/ "*Alaus lynceus* Cdze. Type" [on front side] "*lynceus cz*" [on back side]/ "NHMUK013584727" (NHM).

Distribution in India: North India, (Himalaya: West Bengal, Sikkim, Himachal Pradesh).

Measurements: Length: 17 mm. Width: 5.5 mm. [measurements from original description: Candèze, 1874: 139]

Diagnostic characters: Female: Body (Image 26) dark brown; dorsum densely covered with grey and dark brown decumbent scales mixed with black spots and patches; pronotum with two eye-like spots of dark pubescence large and rounded; elytral large patch of dark pubescence about five interstriae wide. Pronotum longer than wide, anterior edge with two teeth-like projections, sides evenly convex and narrowly sinuous before posterior angles, posterior angles short, narrow, pointed and divergent, disc with longitudinal median region raised. Scutellar shield oblong, uniformly declivous. Elytra less than twice as long as pronotum, apex rounded.

Male unknown.

Remark: There is only one specimen of this species in NHM collection and is marked with label "Type". We have followed recommendation 73F, article 73.2 and 73.2.1 of ICZN for considering the specimen as "Syntype".

***Cryptalaus nodulosus* (Waterhouse, 1877) comb. nov. (Images 28, 29)**

Alaus nodulosus Waterhouse, 1877: 4 (original description, type locality: Andaman Island); Schenkling, 1925: 47 (catalogue, locality: Andamanen = Andaman Island).

Type locality: India: Andaman Island.

Type material: Syntype, 1 female, **India:** "[female symbol]"/ "*Alaus nodulosus* (Type) C. Waterh."/ "SYNTYPE" [within blue circular border]/ "Type" [within orange circular border]/ "NHMUK011220618" (NHM).

Indian material examined: 1 female [Acc. No. 13573], **India:** "Andaman Island, C.F.C. Beeson, 6.IX.193[0]"/ "R.R.D. 88, B.C.R. 38, Cage 715"/ "ex. unknown climber"/ "*Alaus nodulosus* Waterh. FLEUTIAUX det." (FRI).

Distribution in India: Andaman Island.

Measurements: Length: 23–33 mm. Width: 6.8–10 mm. [measurements from original description: Waterhouse, 1877: 4; FRI specimen. Length: 26 mm. Width: 7.5 mm.]

Diagnostic characters: Female: Body (Image 28) pitch-black with antennae red-brown; dorsum densely covered with yellow-brown decumbent scales mixed with black spots forming patterns; pronotum with two eye-like spots of black pubescence small and oval; elytral interstria IV with elongate paler band near base with black spots on either end, elytral interstriae VI–X with black patch near half of elytral length partially encircling brown pubescence. Antennae short, slightly reaching half of pronotal length. Length ratio of antennomeres II–IV is about 1.0 : 1.8–2.0 : 2.8–3.0. Pronotum 1.15 times longer than wide and 1.24 times longer than wide including posterior angles, anterior edge with two teeth-like projections raised, pointed and strongly produced anteriorly, anterior angles conspicuously broad in dorsal view, sides almost subparallel, posterior angles short, pointed and slightly divergent with weak carinae not reaching near base, disc with uniformly and widely raised longitudinal median surface terminating posteriorly with prominent transverse median carina, punctures uniformly dense. Scutellar shield slightly longer than wide, subpentagonal. Elytra 2.19 times as long as pronotum, 2.40 times as long as its combined width, apex emarginate with strongly produced lateroapical spine.

Male unknown.

Remark: The locality label is missing from the syntype specimen. It is determined to be “Andaman Is. [sic]” from the original description. Waterhouse (1877: 4) mentioned both male and female, but did not mention actual number of specimens examined in the description. There is only one female syntype specimen in NHM collection (pers. comm. with Michael Geiser, NHM on 13.ix.2019). In the description, Waterhouse states “Elytris ad apicem emarginatis; abdominis segmento quinto apice truncate” for male and “Elytris ad apicem vix truncatis; abdominis segmento quinto apice rotundato” for female. But it is found that female has the typical dimorphic characteristic of genus *Cryptalaus*: abdominal ventrite V truncate posteriorly with dense spatulate setae.

***Cryptalaus sculptus* (Westwood, 1848)** (Images 30, 31)

Alaus sculptus Westwood, 1848: 72 (original description, type locality: Kasyah Hills = linguistically

mutilated version of former Khasia Hills, Assam; now Khasi Hills in Meghalaya), plate XXXV (fig. 8); Candèze, 1857: 213–215 (key to *Alaus* species), 219 (species description, locality: Indes Orientales = East India); Candèze, 1874: 119–121 (key to *Alaus* species, Group 2), 127 (revision, locality: Hindoustan: Kasyah Hills); Candèze, 1891: 32 (catalogue, locality: Hindoustan sept. = North India; Sikkim); Stebbing, 1914: 225 (descriptive and bionomic note, locality: West Bengal; Assam; Balaghat, Central Province = Madhya Pradesh); Schenkling, 1925: 47 (catalogue, locality: Darjeeling; N. Hindostan = North India); Fleutiaux, 1927: 102–104 (key to *Alaus* species), 107 (distributional note, locality: Assam; Sikkim)

Cryptalaus sculptus (Westwood, 1848); Cate, 2007: 107 (catalogue, locality: Sikkim; Darjeeling; North India); Chandra et al. 2018: 499 (catalogue, locality: West Bengal; Sikkim).

Cryptalaus coomani (Fleutiaux, 1927); Cate, 2007: 107 (synonym).

Type locality: India: Khasi Hills, Meghalaya.

Type material: Syntype, 1 male, **India:** “TYPE, WESTWOOD, Cab. Orient Ent. 1848. P. 72. T.35. f.8., Coll. Hope Oxon.” [within orange border]/ “K Hills”/ “*Alaus sculptus* Westw. Cab. Or. Ent 35 f.8”/ “TYPE COL: 1524, *Alaus sculptus* Westwood, HOPE DEPT.OXFORD” (OUMNH).

Non-type material: 1 female, **India:** “Coll. R. I. Sc. N. B., HINDOUSTAN, ex. coll. E. Candèze”/ “*Alaus sculptus* Westw. dét. E. Candèze”/ “*Sculptus* Hindost. West.” [within square of yellow border]/ “[female symbol]”/ “*Paracalais sculptus* (Westwood), Det. R. Bouwer 1992” (RBINS).

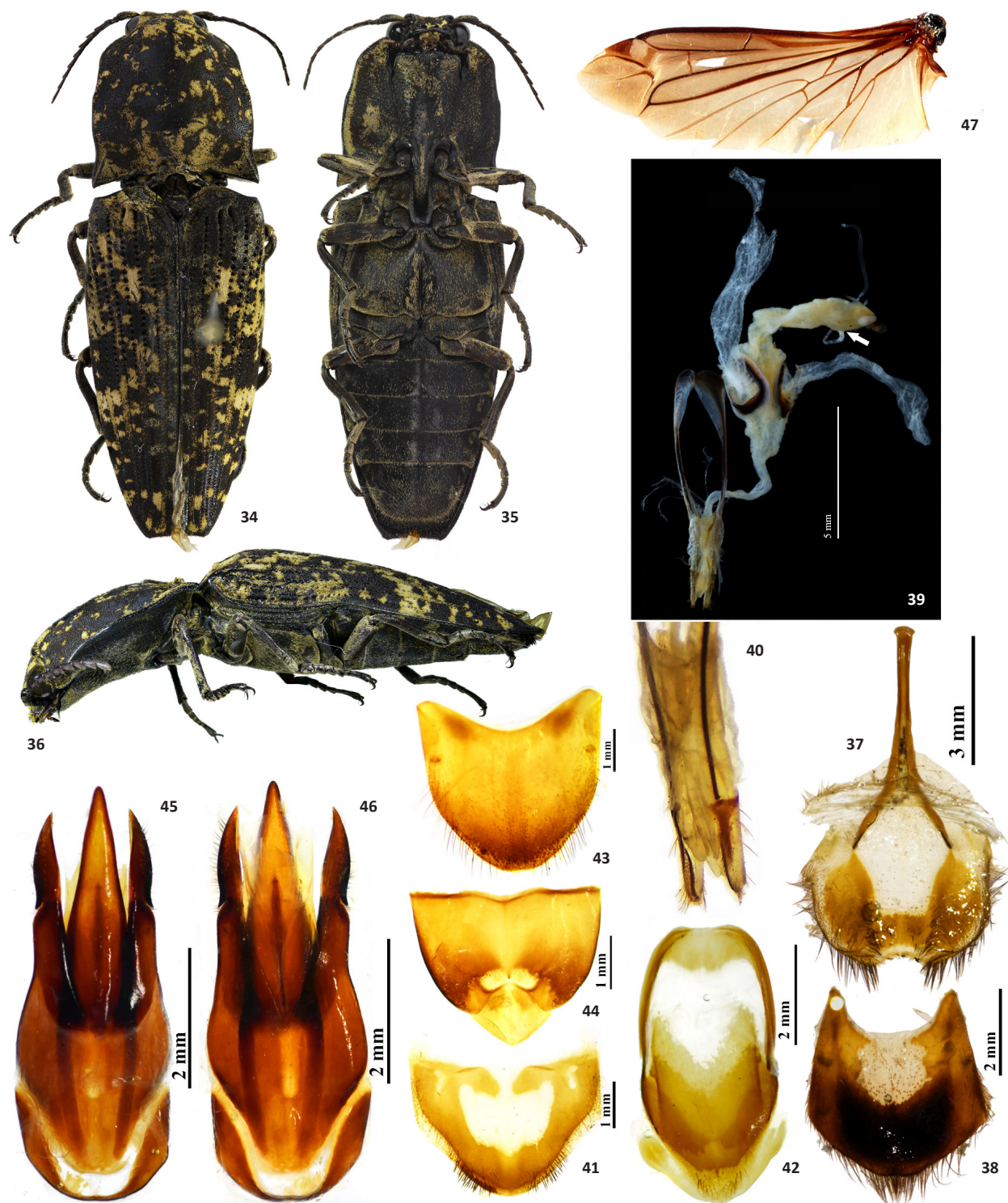
Indian material examined: 1 male [Acc. No. 5068], “Naga Hills 5,500’ [feet]. Assam, O.C. Ollenbach, IV.1924”/ “*Alaus sculptus* Cand [sic], J.C.M. Gardner det.” [Naga Hills are now part of Nagaland] (FRI).

Non-Indian material examined: 2 females [Acc. No. 5068], **China:** 1 female, “Su-Tsang [Ü-Tsang], 2000 m., East Yunnan”/ “*Alaus sculptus* Collection FLEUTIAUX” (FRI); 1 female, “Thibet” [Tibet]/ “*Alaus sculptus* Collection FLEUTIAUX” (FRI).

Distribution in India: Meghalaya, Nagaland, (West Bengal, Sikkim, Madhya Pradesh, Assam).

Measurements: Length: 28–32 mm. Width: 8–12 mm.

Diagnostic characters: Female: Body pitch-black; dorsum densely covered with white to yellow-grey decumbent scales mottled with black spots. Antennae short, slightly reaching half of pronotal length. Length ratio of antennomeres II–IV is about 1.0 : 2.0–2.3 :



Images 34–47. *Cryptalaus sordidus* (Westwood, 1848): 34–40, 47—female (ZKJS 66A) | 41–46—male (ZKJS 67A) | 34—habitus, dorsal view | 35—habitus, ventral view | 36—habitus, lateral view | 37—abdominal sternite VIII | 38—abdominal tergite VIII | 39—genitalia, dorsal view, white arrow: subapical origin of sac-like single tubular extension from bursa copulatrix | 40—apex of ovipositor, ventrolateral view | 41—abdominal sternite VIII | 42—abdominal sternite IX | 43—abdominal tergite VIII | 44—abdominal tergites IX–X | 45—genitalia, dorsal view | 46—genitalia, ventral view | 47—left hind wing. 34–36, 40, 47—not to scale | © 34–36—M. Vankawala | 47—A. Patwardhan | 37–46—H. Parekar.

2.5–2.7. Pronotum 0.98–1.10 times as long as wide and 1.02–1.16 times as long as wide including posterior angles, anterior edge with two teeth-like projections slightly produced, anterior angles conspicuously acute in dorsal view, sides strongly and evenly convex, posterior angles short, broad, pointed and moderately to strongly divergent with carinae just reaching base, disc with irregular wrinkly surface, median basal tubercle raised in transverse ridge and with small transverse tubercular ridge posteriorly near base just before median basal tubercle, punctures irregularly arranged. Prosternum with groove on prosternal process between procoxae extending anteriorly, not reaching half of prosternal length and posteriorly to about half of prosternal process, prosternal process curved distinctly in lateral view. Scutellar shield folded in two planes, anterior half folded in vertical plane and posterior half in horizontal plane. Elytra 1.80–2.07 times as long as pronotum, 1.83–2.02 times as long as its combined width, apex truncate with slightly produced sutural region without spine giving appearance as to be narrowly emarginate.

Male (Image 30) similar to female in shape and appearance. Antennae reaching well beyond half of pronotal length, not reaching base of posterior angles. Length ratio of antennomeres II–IV is about 1.00 : 1.8–2.2 : 2.5–2.8.

Remark: There is only one specimen of this species in OUMNH collection and is marked with label “TYPE”. We have followed recommendation 73F, article 73.2 and 73.2.1 of ICZN for considering the specimen as “Syntype”.

Cryptalaus sordidus (Westwood, 1848) (Images 32–47)

Alaus sordidus Westwood, 1848: 72 (original description, type locality: Ceylon = Sri Lanka), plate XXXV (fig. 9); Candèze, 1857: 213–215 (key to *Alaus* species), 231 (species description, locality: Indes Orientales = East India); Candèze, 1874: 119–121 (key to *Alaus* species, Group 2), 129 (revision, locality: Ceylan [sic] = Sri Lanka); Candèze, 1891: 32 (catalogue, locality: Hindoustan; Assam); Schenkling, 1925: 47 (catalogue, locality: Hindostan; Nilgiri = Nilgiri Hills, Tamil Nadu; Assam); Fleutiaux, 1927: 102–104 (key to *Alaus* species), 106 (distributional note, locality: Hindoustan meridional = South India; Assam; Sikkim)

Cryptalaus sordidus (Westwood, 1848); Cate, 2007: 107 (catalogue, locality: Sikkim; Darjeeling; North India); Chandra et al. 2018: 499 (catalogue, locality: West Bengal; Sikkim).

Type locality: Sri Lanka: exact location not known.

Type material: Syntype, 1 female, **India:** “[female

symbol]”/ “37”/ “Ceylon <W> Templeton” [written in pencil]/ “TYPE *Alaus sordidus* Westw. Cab. Ort. Ent. Pl. 35, f. 9., Coll. Hope Oxon.” [within orange border]/ “TYPE COL: 2056, *Alaus sordidus* Westwood, HOPE DEPT.OXFORD”/ “*Paracalais sordidus* (Westwood), DET. R. Bouwer 1991” [single antenna and tibia-tarsal part of leg mounted on paper card] (OUMNH).

Indian material examined: 7 females [Reg. No. ZKJS 66A–66G] and 7 males [Reg. No. ZKJS 67A–67G], “Kovin, Changlang, Arunachal Pradesh, 21–25.VIII.2006, leg. A. Patwardhan, on light” (ZKJSSC); 1 male, “Nagsidh, Dehra Dun, U.P., C.F.C. Beeson, 25.VII.1931”/ “ex. *Kydia calycina*”/ “R.R.D. 213, B.C.R. 35, Cage 619”/ “*Alaus sordidus* Fleutiaux det.” [Dehradun, Uttarakhand] (FRI); 1 male, “Khasis: 5000 ft., Shillong, 19.VI.1928, Fletcher coll.”/ “*Alaus sordidus* Fleutiaux det.” [Khasi Hills, Shillong, Meghalaya] (FRI); 1 female, “Thano R., Dehra Dun, U.P., C.F.C. Beeson, 15.VIII.[19]23”/ “ex. *Shorea robusta*”/ “R.R.D. 95, B.C.R. 1, Cage I”/ “*Alaus sordidus* S.N. Chatterjee det.” [Dehradun, Uttarakhand] (FRI); 1 female, “Thano R., Dehra Dun, U.P., 22.VII.1921, N.C. Chatterjee”/ “ex. *Shorea robusta*”/ “R.R.D. 849, B.C.R. 197, Cage V”/ “*Alaus sordidus* J.C.M. Gardner det.” [Dehradun, Uttarakhand] (FRI); 1 female, “Bagdogra Range, Kurseong, Bengal, C.F.C. Beeson, 17.VII.1935”/ “*Alaus sordidus* G.D. Pant det.” [Bagdogra, Kurseong, Darjeeling District, West Bengal] (FRI); 1 female, “Palhri, Saharanpur, U.P., C.F.C. Beeson, 30.VIII.1918”/ “Predaceous on *Plocaederus obesus* Gah.”/ “R.R.D. 357a, B.C.R. 195, Cage 121, log 32” [Saharanpur, Uttar Pradesh] (FRI).

Non-Indian material examined: 1 male [Acc. No. 4398], “Mawagankanda, Ratnapura 500 [ft.], Ceylon S.A.B.”/ “F.R.I. coll., Gauri Dutt., 15.III.1936”/ “ex. *Artocarpus nobilis*”/ “R.R.D. 839, B.C.R. 408, Cage 622” [Ratnapura, Sri Lanka] (FRI).

Distribution in India: Arunachal Pradesh, West Bengal, Uttarakhand, Meghalaya, Uttar Pradesh, (Sikkim, Assam, Tamil Nadu).

Measurements: Length: 22–38 mm. Width: 7–13 mm.

Diagnostic characters: Female: Body (Image 32: female syntype; Images 34–36; specimen with distorted scutellar shield, ZKJS 66A) medially pitch-black to red-brown laterally; dorsum densely covered with yellow-brown scales mixed with several dark brown to black spots. Antennae short, slightly reaching half of pronotal length. Length ratio of antennomeres II–IV is about 1.0: 1.7–2.1 : 2.9–3.2. Pronotum 1.05–1.15 times as long as wide and 1.17–1.23 times as long as wide including posterior angles, anterior edge smooth without any

tooth-like projections, anterior angles acute in dorsal view, sides sinuous to evenly convex, posterior angles short, broad, pointed and narrowly divergent with carinae about to reach base, disc uniformly convex with prominent transverse median carina posteriorly near base, median basal tubercle raised, punctures dense. Scutellar shield as long as wide, or slightly longer than wide, subpentagonal. Elytra 2.05–2.24 times as long as pronotum, 2.11–2.25 times as long as its combined width, apex truncate with distinct lateroapical spine.

Male similar to female in shape and appearance. Antennae reaching well beyond half of pronotal length, not reaching base of posterior angles. Length ratio of antennomeres II–IV is about 1.0 : 1.6–2.0 : 3.3–3.6.

Additional description: Hind wing—(Image 47, ZKJS 66A) 2.7 times as long as wide, apex slightly pointed; radial cell long, about five times as long as wide; r3 extending about 0.3 times as long as radial cell. Abdomen—Female (ZKJS 66A): Tergite VIII (Image 38) 1.17 times as wide as long; anterior edge strongly concave, sides anteriorly narrower than posterior end, posterior edge strongly arcuate, medially slightly emarginate; rows of short setae arising from mediolateral region to posterior edge, gradually with row of much longer setae on posterior edge; sparsely covered with punctures; colorless median area distinctly shaped with inner lateral margins wavy and posterior margin arcuate. Sternite VIII (Image 37) 1.34 times as wide as long; sclerotized area horseshoe shaped with anterior margin subtrapezoidal, posterior margin deeply incurved in middle; rows of numerous short to long setae on mediolateral edge; spiculum ventrale almost twice as long as sternite VIII, touching tip of sclerotized area. Male (ZKJS 67A): Tergite VIII (Image 43) U-shaped, about 1.22 times as wide as long, anterior edge concave; medially and apicolaterally punctate with bristle-like setae. Sternite VIII (Image 41) subtriangular, about 1.47 times as wide as long, colorless median area with sparse punctures, posterior margin with dense pubescence of varying length, apex widely rounded without any setae. Tergite IX and X (Image 44) connected with membrane; tergite IX twice as wide as long, anterior margin almost linear, slightly emarginate medially, sides curving towards apex, posterior margin deeply incurved forming wide inverted V; tergite X small, V-shaped. Sternite IX (Image 42) elongate, twice as long as wide, apically rounded with sparse pubescence in middle. Genitalia—Female (Image 39, ZKJS 66A): Ovipositor 0.70 times length of abdomen (measured medially); coxites (Image 40) finely punctured, covered with long, lightly sclerotized setae, apically covered with densely arranged shorter setae

at the tip; paraprocts 6.3 times as long as coxites, 0.86 times length of ovipositor. Colleterial glands five times as long as wide. Bursa copulatrix twisted but not coiled, two spermathecae on anteriormost section lightly sclerotized; single extension of long, tubular sac-like structure arising sub-apically on bursa copulatrix. Male (Images 45, 46, ZKJS 67A): Aedeagus more than twice as long as wide; median lobe gradually narrowed towards apex, apex narrowly rounded; basal struts moderately short, about 0.33 times as long as aedeagus. Parameres abruptly constricted behind subapical hook with small setae near constriction; apical lobe of paramere with pointed apex, outer margin slightly rounded medially with more setae on dorsal side than on ventral, sinuate just before subapical hook; subapical hook sharp.

Remark: There are 25 specimens of *C. sordidus* from India in FRI collection [all with Acc. No. 4398]. Only six specimens spanning different Indian states have been studied and mentioned under 'Indian material examined' section. There is only one specimen of this species in OUMNH collection and is marked with label "TYPE". We have followed recommendation 73F, article 73.2 and 73.2.1 of ICZN for considering the specimen from OUMNH as "Syntype". The female syntype specimen (Image 32) has a remarkable deformity as stated by Westwood (1848: 72): "The specimen figured is a singular monstrosity; the middle leg on the right side having the coxa and trochanter of the normal form, followed by three femora conjoined together at the base, each with its perfect tibia, and with one imperfect and two perfect tarsi".

Ecology of Indian *Cryptalaus* species

Four Indian species are represented only from females: *C. alveolatus*, *C. assamensis*, *C. lynceus*, and *C. nodulosus*. Except for *C. alveolatus* all the above species are known from a limited number of specimens. *Cryptalaus* larvae are predaceous on immature wood-boring longhorn beetles. Stebbing (1914) reports larvae of *C. sculptus* as predaceous on Sal tree, *Shorea robusta*, and cerambycid, *Hoplocerambyx spinicornis* (Newman). According to the data label under a specimen at FRI, (the larva of) *C. sordidus* is predaceous on *Neoplocaederus obesus* (Gahan) (= *Plocaederus obesus*). For brief insights on ecology of some *Cryptalaus* species and bionomics of *C. sordidus* see Beeson (1941: 297, 298). Besides *C. sordidus*, very little knowledge is available about the larval stages and biology of other Indian *Cryptalaus* species.

Key to known Indian species of *Cryptalaus* Ôhira, 1967

1. Pronotum with transverse median carina near base 2
 - Pronotum without transverse median carina near base 5
2. Anterior edge of pronotum smooth without any medioanterior projections *C. sordidus* (Westwood, 1848)
 - Anterior edge of pronotum sinuous with two teeth-like projections medioanteriorly 3
3. Sides of pronotum evenly convex, anterior angles of pronotum acute in dorsal view; elytral interstriae flat *C. eryx* (Cand ze, 1874)
 - Sides of pronotum irregularly convex to subparallel, anterior angles of pronotum broad in dorsal view...4
4. Pronotum 1.18–1.19 times as long as wide, two eye-like spots of black pubescence oval, deviated towards central axis, median longitudinal region glabrous with a carina; elytra 1.88–2.03 times as long as pronotum, apex of elytra emarginate *C. assamensis* (Schwarz, 1902) comb. nov.
 - Pronotum 1.15 times as long as wide, two eye-like spots of black pubescence round, two teeth-like projections on anterior edge raised and pointed; elytra 2.19 times as long as pronotum, apex of elytra emarginate with lateroapical region conspicuously produced with spine *C. nodulosus* (Waterhouse, 1877) comb. nov.
5. Scutellar shield strongly declivous and folded in two planes, anterior vertical and posterior horizontal; elytral apex truncate or emarginate 6
 - Scutellar shield declivous in single slanting plane; elytral apex rounded *C. lynceus* (Cand ze, 1874)
6. Pronotum with sides sinuate to narrowly convex, posterior angles elongate, with conspicuous longitudinal median ridge, median basal tubercle raised and rounded; elytral apex emarginate with sutural and lateroapical spine *C. alveolatus* sp. nov.
 - Pronotum with sides strongly convex, posterior angles broad, disc with irregular surface and without longitudinal median ridge, median basal tubercle raised in transverse ridge; elytra with apex truncate to slightly emarginate due to produced sutural region *C. sculptus* (Westwood, 1848)

DISCUSSION

The species of the genus *Cryptalaus* Ôhira are widespread in the Oriental and Australian regions. In India, however, the presence of the genus was mainly from the northern part. The recent checklists by Cate (2007) and Chandra et al. (2018) were the only source of knowledge for Indian *Cryptalaus*. A few species from these checklists such as *Cryptalaus berus*, *C. cenchris*, *C. eryx*, *C. griseofasciatus*, and *C. sordidus* were described originally from Japan, Oriental India (Eastern India; Laos, Myanmar), Laos, Borneo, and Sri Lanka, respectively. In this study, only the presence of *C. eryx* and *C. sordidus* from the Indian subcontinent is confirmed and a new species, inhabiting the Western Ghats and central India, is discovered. During the examination of *Cryptalaus* species, a single specimen each for species *Alaus assamensis* and *Alaus nodulosus* was discovered from the museum collection and transferred to *Cryptalaus*. This study confirms the following seven *Cryptalaus* species from India: *C. alveolatus* sp. nov., *C. assamensis* comb.

nov., *C. eryx*, *C. lynceus*, *C. nodulosus* comb. nov., *C. sculptus*, *C. sordidus*.

The present study also finds that the characters like the length ratio between antennomeres II–IV, anterior angles of pronotum and hypomeron vary significantly between the species. Thus, these characters, along with others, can be used for distinguishing the congeners. Future studies on *Cryptalaus* species based on ecological, molecular, and additional morphological data are essential to better our understanding of all congeners.

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