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Notes on Clivinini species from Asia with the description of a new genus and a new species from Myanmar and the North of India (Coleoptera, Carabidae, Scaritinae)

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A b s t r a c t : For the Oriental species *Clivina spatulifera* ANDREWES the new genus *Findoclivina* nov.gen. is erected. The new species *Clivina quadrataconvexa* nov.sp. from India is described. Discrepancies in the assignment of the species in the *Clivina helferi* species-group are discussed.

Key words : *Clivina helferi* species-group, Myanmar, Rishikesh, taxonomy.

Introduction

The genus *Clivina* LATREILLE, 1802 (Coleoptera, Carabidae, Scaritinae) is distributed with numerous species over the whole Oriental region. PUTZEYS (1846, 1863, 1867) divided the *Clivina* species into groups and keyed out the species on a world-wide basis including Oriental species. KULT (1951) followed the concept of species-groups and treated the *Clivina* species known to him of the whole Oriental region exclusively, also by sharpening of distinguishing characters. Based on external characters, he subdivided the species into ten species groups. This breakdown is still partly valid and helpful although a key-out to species level was performed by him only for two of the species-groups, and not all groups were known to him. Building up and using the species-group concept is regarded as an instrument while sorting and arranging larger amounts of material upfront of determination to species level. In any case, it is a very useful tool for the daily practice but not suitable for relationship assessments, although there might overlapping occur, partly. There are cases where a species fits formally into a species-group but nevertheless is extraordinary different with the external characters and the morphology of the genitalia.

Working on bulky undetermined Oriental Clivinini material, my attention was focussed on two unusual forms reported in this contribution. Both of them formally fit with the characters of the so called *Clivina helferi* species-group according to KULT (1951). However, one of them exhibits so conspicuously different and new eye-catching characters not seen or reported for the genus *Clivina*. It is regarded as a new form among the Oriental Clivinini and I share the opinion of ANDREWES (1929, p. 370) "Not nearly allied to any other species." He described the species as *Clivina spatulifera* ANDREWES, 1929. Due to its outstanding form, it is fixed in this contribution by erecting a new genus which is one of the goals of this contribution.

The other case is a new *Clivina* species showing a morphology of the female gonocoxites unknown until today. As a second goal, this new species is described including characterisation of the new morphology of the female gonocoxites.

Material and methods

Terms, descriptions and methods were based on BALKENOHL (2021, 2022, 2023). Specimens were examined with a Leica M205-C stereomicroscope and a Reichert–Jung Polyvar compound microscope. Measurements were taken electronically using the integrated and automatically calibrating measurement system of the IMAGIC Client software.

The dissected genitalia were treated and investigated as described in BALKENOHL (2021, 2022) and photographs were taken as described there in detail.

A lectotype has been designated for the first case because there was more than one type specimen ('cotype') available, but no specific indication with the term holotype. This new designation was carried out in order to maintain stability of the nomenclature and this is specifically mentioned in the respective case under 'type material'.

The following acronyms are used: NHMUK: Natural History Museum, London, United Kingdom; OLML: Oberösterreichisches Landesmuseum, Linz, Austria; CMBB: Collection M. Balkenohl, Bonstetten near Zürich, Switzerland.

Results

Taxonomy

Family C a r a b i d a e LATREILLE, 1802

Subfamily S c a r i t i n a e BONELLI, 1810

Tribe C l i v i n i n i RAFINESQUE, 1815

New genus

***Findoclivina* nov.gen. (Figs 1-4)**

Type species: *Clivina spatulifera* ANDREWES, 1929

E t y m o l o g y : The name refers to the base of the pronotum which appears cleft in dorso-frontal view and is derived from the Latin "findere, findo" (= to cleave) and *Clivina*, the lead genus of the tribe.

D i a g n o s i s : Smaller sized Clivinini species, with sub-cylindriform outline of the pronotum and elytra. Labrum seven-setose, clypeus and clypeal wings separated by distinct notches, eyes prominent, mentum with its emargination small. Pronotum with lateral margin running up to the base without posterior angle, median line conspicuously deepened towards base and disrupts the pronotal convexity into two parts, anterior lateral setigerous puncture situated distinctly backwards, proepisternum swollen and distinctly visible in dorsal view. Elytron with striae one to four ending free at base, intervals convex, interval eight carinate at the humerus and apex, sub-costate at middle, interval three with four dorsal setigerous punctures. Abdomen with the two anal setigerous punctures widely separated. Hind wings fully developed. Protibia with digitation extraordinary spatula-like widened including spurs, mesotibia with two rows of robust short setae arising from short tubercles, with one short spur with preapical seta towards apex. Female genitalia with

gonocoxites exhibit a morphology not yet observed in any other Clivinini group (see species description).

There is no other Clivinini species known to me who shares the remarkable characters of the pronotum, front tibia and female gonocoxites.

Description:

Colour: Flavous, shiny; mandibles, clypeus, and front legs darker.

Head: Slightly narrower than pronotum. Clypeus slightly emarginated, clypeal wings rounded, separated from median part of clypeus by distinct notches and from supra-antennal plates by obtuse notches. Clypeus and supraantennal plates blunt reflexed margined. Clypeo-frontal furrow not sharp but distinct, clypeal-field transverse, raised, laterally delimited by prominent fovea at each side which contains the clypeal seta. Frons moderately convex, with two flat elongate impressions, supraorbital carina of medium size, supraorbital sulcus (facial furrow) conspicuously deep and wide, with the two supraorbital setae arising from tubercles, eye moderately prominent, gena indistinct. Antenna with segments five to ten elongate (length/width 1.46), densely pubescent from antennomere three onwards. Labrum moderately bilobed anteriorly, seven setose. Mandible somewhat elongated, slightly hooked at apex. Mentum isodiametrically reticulated, with lobes moderately and regularly convex, tooth at middle acute, with carina, as high as lobes, emargination between lobes and tooth small.

Pronotum (Figs 2, 3): Outline rectangular, slightly longer than wide, distinctly convex in frontal view, in lateral view moderately convex in anterior three quarters, posterior quarter steeply falling to basal constriction. Anterior angle rounded, with distinct notch, anterior lateral setigerous puncture situated distinctly backwards. Lateral margin smooth, running up to the base without posterior angle, position of posterior angle marked by posterior setigerous puncture and slight angle of the margin (visible in lateral view). Lateral margin somewhat contracted before middle. Anterior transverse line not joining margin. Median line surpassing anterior transverse line, conspicuously deepened towards base and disrupts the pronotal convexity into two parts in posterior third. Surface smooth, posterior quarter isodiametrically reticulated. Basal constriction wide, lateral margin not joining carina of flange. Proepisternum swollen, distinctly visible in dorsal view.

Elytron: Flattened in lateral view, subcylindrical in frontal view. Oblong-elongate, nearly two times as long as wide, nearly straight laterally, maximum width behind middle. Humerus square, without tooth. Lateral margin posterior humerus slightly crenulate. Intervals distinctly convex, more convex at base, interval three with tubercle at base, interval three with four setigerous punctures, interval eight carinate at humerus and apex, subcostate at middle. Striae one to four ending free at base, stria one at base with distinct setigerous tubercle, striae opaque, with irregular reticulation and very fine numerous punctures, striae distinct.

Hind wings: Fully developed.

Lower surface: Proepisternum and episternum with isodiametric reticulation, without wrinkles. Abdominal sternites smooth at middle, laterally with distinct isodiametric reticulation, last abdominal sternite completely covered with isodiametric reticulation, with slight marginal sulcus at middle and flattened area (in both of the sexes), with the two marginal setigerous punctures widely separated, with setae elongated.

Legs: Protibia robust (Fig. 4), surface reticulated, with indistinct carina, with digitation extraordinary spatula-like widened including spurs, first tarsomere elongated and widened,

tarsomeres two to four small, as long as wide, tarsomere five short, one and a half longer than wide. Protrochanter elongated, angled apically. Mesotibia with two rows of five robust short setae arising from short tubercles, with one short spur preapically furnished with seta, with three fine setae at the inner side.

External sexual dimorphism: Not observed.

D i s t r i b u t i o n : Myanmar.

***Findoclivina spatulifera* (ANDREWES, 1929) (Figs 1-6)**

Clivina spatulifera ANDREWES (1929): 369; (1930): 117.

Clivina spatulifera ANDREWES 1930, CSIKI (1933): 639; BALKENOHL (2001): 16; LORENZ (2005): 144; (2023): 5ZB73.

T y p e m a t e r i a l : Lectotype by present designation: ♂, with labels and data: white, printed in black "Tavoi, Burma. R.N. Parker. I. XI. 1924" / handwritten in black ink: "286" / black printed with yellow line: "India. B.M. 1927-38. / white, handwritten in black ink and printed: "Clivina spatulifera Andr. Type H.E.Andrewes det." / circle, red framed, black printed: "Type" (NHMUK).

Paralectotype by present designation: 1 ♀, with labels and data: white, printed in black: "Maungmagan, Tavoy Dt. Burma. R.N. Parker. 2. XI. 1924" / white, printed: "At light" / white, black printed: "For. Res. Inst. Dehra Dun" / white, handwritten in black ink: "287" / white, printed: "H.E.Andrewes Coll. B.M.1945-97" / circle, green framed, black printed: "Co-type" / white, handwritten in black ink and printed: "Clivina spatulifera Andr. cotype H.E.Andrewes det." (NHMUK).

N o t e : The species is well characterized in ANDREWES (1929). Therefore, this description provides some missing data and is augmented by figures which are missing in the original description. ANDREWES (1929) does not mention on how many specimens he based the description. Two are available (see type material).

R e m a r k s : In the Lectotype, the tarsomeres are missing in the right hind leg. In the paralectotype, the following parts are missing: Mentum and palpomeres, left antennomeres two to eleven, two terminal tarsomeres of the left front leg, terminal tarsomere of the right front leg, left intermediate leg. The specimen was broken and is glued, the pronotum shows a crack.

D i a g n o s i s : See genus description.

D e s c r i p t i o n :

Measurements. Lectotype: Body length 4.93 mm, width 1.31 mm; ratio length/width of pronotum 1.43; ratio length/width of elytra 1.97. Paralectotype: Body length 5.52 mm, width 1.43 mm; ratio length/width of pronotum 1.02; ratio length/width of elytra 1.97 mm.

Male genitalia (Fig. 5): Median lobe relatively short, convex at middle, apex stick-like elongated. Orofium elongated. Endophallus with some short teeth apically, with an enlarged group of bristles basally. Parameres hyaline, of moderate size, distorted, without setae at apex.

Female genitalia (Fig. 6): Small in comparison to body size, with gonocoxites monomeric, completely fused, flattened and distinctly widened basally, basal orofium wide, gonocoxites attached to each other, preapically with two setae, with two additional setae at margin of orofium, epipleurite without setae.

Variation: In the paralectotype, interval eight is more distinct carinate in its whole length. In the lectotype, interval seven shows a short carina directly at the humerus.

D i s t r i b u t i o n : Known from Maungmagan, Tavoy district, in the South of Myanmar.

Genus *Clivina* LATREILLE, 1802

Clivina quadrataconvexa nov.sp. (Figs 7-9)

Type material: Holotype: ♂, with labels and data: white, handwritten in black ink and black framed, "N-India, UP Rishikesh, 450 m leg. Werner 8/88" (CMBB). Paratypes: 1♂, 2♀♀, same data as holotype (CMBB, OLML); 1♀, same data as holotype but with printed label; 1♂, white, black printed "KISTNA DT. Uppaluru V-51 Biffi" (CMBB).

E t y m o l o g y: The name refers to the square pronotum which is in frontal view distinctly convex, and is expressed by the Latin adjective quadratus (= square) and convexus (= arched) in the feminine genus.

D i a g n o s i s: The new species belongs into the *Clivina helferi* species-group and is externally closer to *C. monticola* ANDREWES, 1931, and *C. mekongensis* LESNE, 1896. From both of the species, it differs mainly by the pronotum which is distinctly wider than long. In addition, *C. mekongensis* differs by the anteriorly sharply advanced anterior angles of the pronotum and the completely dull surface, *C. monticola* by the laterally sharply projecting posterior angles of the pronotum and its much wider lateral marginal channel.

D e s c r i p t i o n: Measurements: Length 6.07-7.67 mm (\bar{x} = 6.35 mm*), width 1.84-1.98 mm (\bar{x} = 1.93 mm*), ratio length/width of pronotum 0.84-0.88 (\bar{x} = 0.86*), ratio length/width of elytra 1.77-1.89 (\bar{x} = 1.83*); (*n = 6).

Colour: Glossy. Piceous. Antenna, palpomeres and legs fuscous.

Head: A quarter narrower than pronotum. Clypeus straight anteriorly, with its lateral teeth slightly projecting; wing of moderate size, not more protruding anteriorly than clypeus, distinctly separated from clypeus by notch; supraantennal plate more or less convex laterally; clypeus, wing, and supraantennal plate finely reflexed margined. Supraantennal plate extended up to mid-eye level, separated from wing by distinct notch, separated from supraorbital carina by an oblique sulcus. Clypeus transverse, with transverse elevation, separated from frons by a rugose furrow (in some specimens indistinct). Frons moderately convex, with central pore at middle, with scattered small punctures. Supraantennal plate separated from clypeus and frons by deep moderately wide furrow continuing posteriorly up to mid-eye level as wide supraorbital furrow. With blunt distinct supraorbital carina at posterior half of eye. With two supraorbital setigerous punctures situated at mid-eye level and at the posterior end of the eye. Neck constriction developed by punctures and distinct step, step pointed posteriorly at middle. Eye hemispherical, projecting laterally. Gena small. Antenna long, reaching over base of pronotum, antennomeres four to ten elongate (ratio length/width around 1.82). Labrum nearly straight, isodiametrically reticulated, seven setose. Mandible of moderate size. Mentum with lateral lobe oval anteriorly, flattened, isodiametrically reticulated, median tooth longer than lateral lobes, hollowed out.

Pronotum: Disk moderately convex in lateral view, distinctly convex in frontal view. Quadrate, wider than long. Anterior margin slightly excised. Reflexed lateral margin subcrenulated (lateral view), slightly convex at middle, slightly attenuating in anterior half, widest in posterior third; anterior angle rounded-off; posterior angle marked by distinct tooth, laterally indistinctly projecting. Lateral channel with irregular reticulation at sides, indistinctly foveolate (lateral view), margin from posterior angle to base flattened-convex, joining with basal carina by indistinct knob, basal channel narrow. Median line narrow, sharp, joining anterior transverse line and base; anterior transverse line slightly wider than

median line, reaching lateral channel. Surface with microscopic punctures, with group of line-like punctures laterally in basal half, with two clouds of punctures anterior to the line-like punctures (arrangement resembles to an indistinct widened letter Y), few transverse wrinkles laterally, more distinct at base.

Elytron: Disk flattened in anterior half in lateral view, distinctly and regularly convex in frontal view. Outline long oval, distinctly less than twice as long as wide, with maximum width behind middle. Humerus rounded, formed by lateral margin which joins interval seven. Reflexed lateral margin smooth. Lateral channel moderately wide. Scutellar striae of moderate length; with distinct setigerous puncture at base of first stria, with distinct tubercle at base of third interval. Striae moderately deep, with indistinct punctures, one to four free at base, five and six joining at humerus, seven shortened behind humerus, striae one and two running up to apex, three and four, and five and six joining apically. Intervals moderately convex, convexity more evident laterally, eight carinate apically. Third interval with four setigerous punctures adjoining third stria. Surface of intervals smooth and glossy on disk, with distinct isodiametric reticulation at base, at apical quarter, and on intervals six, seven and eight.

Hind wings: Fully developed.

Lower surface: Proepisternum covered with distinct isodiametric reticulation, with some fine transverse wrinkles. Sternites of abdomen finely isodiametrically reticulated. Abdominal sternum VII with the two anal setigerous punctures widely separated, at middle slightly projecting posteriorly where it is flattened, with narrow marginal furrow at middle (in both sexes).

Legs: Protibia with three spines of moderate length and a small but distinct one basally, sulcate dorsally, movable spur regularly arcuate, surface with longitudinal reticulation. Mesotibia with distinct and moderately long protuberance preapically with acuminate apex and with its seta inserted laterally, with eight strong setae arranged in two rows, with few fine setae at the inner side.

Male genitalia (Fig. 8): Median lobe regularly curved, with straight apex, apex with flattened and regularly acuminate lamella. Endophallus with group of bristles. Parameres moderately wide, acuminate and distorted in apical third, at apex with one short seta.

Female genitalia (Fig. 9): Gonocoxites of the falciform type, dimer, gonocoxite-2 nearly straight, scapiform-like, with two long apical setae, with four lateral setae, gonocoxite-1 with two nematiform long setae. Coxites not fused, movable to each other. Epipleurite triangle shaped, with two groups of setae.

Variation: The six specimens differ slightly in the development of the clypeal-furrow and rugae on the frons. In two of the paratypes, the furrow is developed laterally and indistinct, on others it appears distinct and doubled. In the specimen from Uppaluru, flat furrows extend to the frons. The supraantennal plates vary slightly in its lateral convexity.

Distribution: Known from two localities in India: Rishikesh (Uttar Pradesh), and Uppaluru (Andhra Pradesh).

Final remarks

The results demonstrate, the *Clivina helferi* species-group according to KULT (1951) comprise three distinctly different groups at a minimum. Beside external characters, this is obvious due to the different ground plans of the female gonocoxites.

The three groups consist of a group with the lead species *Clivina helferi* PUTZEYS, 1867, a group unknown before, and *Findoclivina* nov.gen. In *C. helferi*, the gonocoxites exhibits a falciform morphology with fused and strongly sclerotized gonocoxites one and two, found also in the majority of the Oriental Clivinini (figured and discussed in BALKENOHL 2022). *Clivina quadrataconvexa* nov.sp. shows a morphology of the gonocoxites, different from all other Clivinini of the Oriental region. The morphology of *Findoclivina* nov.gen is unique for Clivinini known from the Oriental and African region. This picture is reflected by the three different types of the male aedeagi.

The findings underline the need for another definition and a revision of the *Clivina helferi* species-group.

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Zusammenfassung

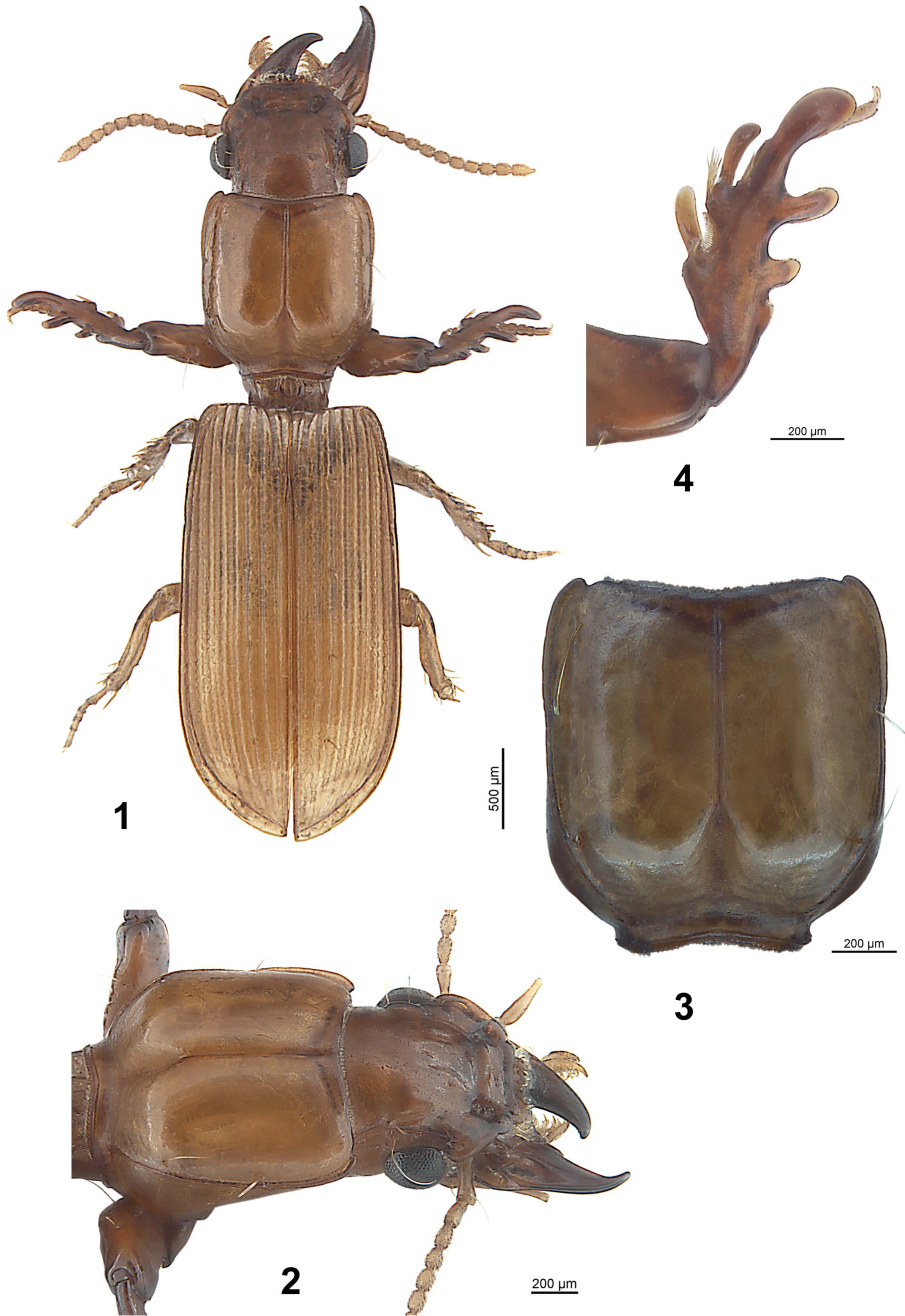
Für die orientalische Art *Clivina spatulifera* ANDREWES wird die neue Gattung *Findoclivina* nov.gen. beschrieben. Die neue Art *Clivina quadrataconvexa* nov.sp. aus Indien wird beschrieben. Unstimmigkeiten in der Zuordnung der Arten der *Clivina helferi* Artengruppe werden diskutiert.

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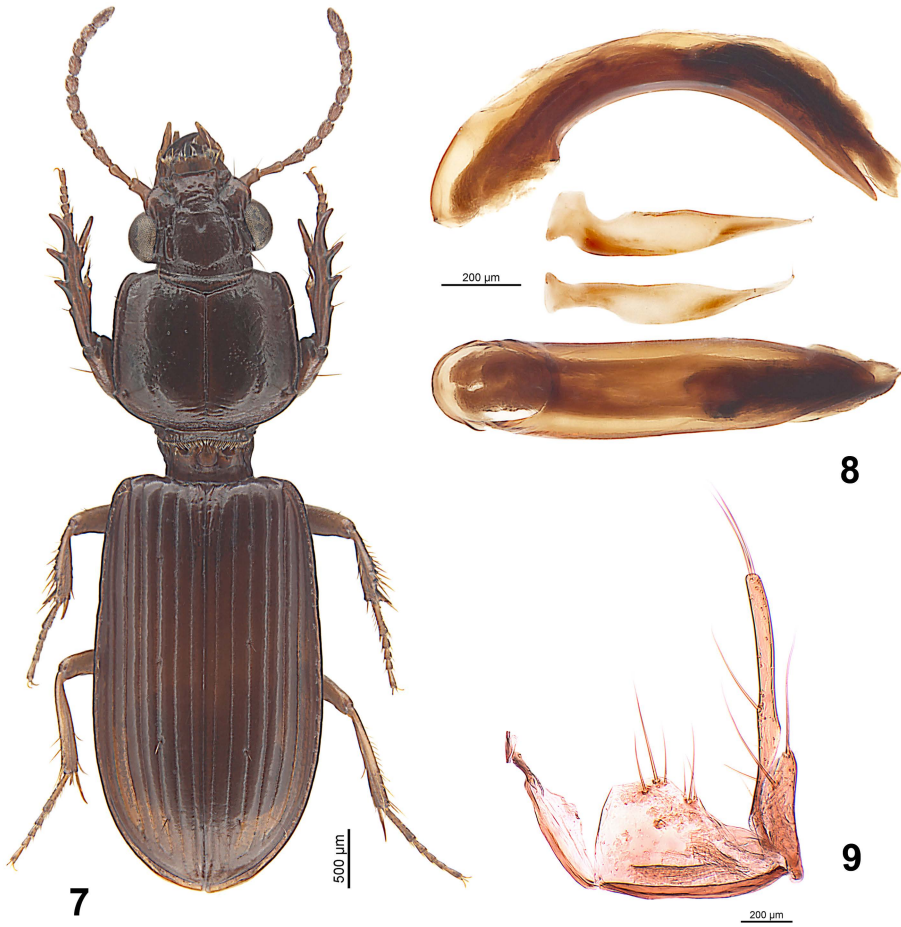
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Figs 1-4: *Findoclivina spatulifera* (ANDREWES), lectotype; (1) habitus, dorsal view; (2) head, pronotum, dorso-lateral view; (3) pronotum, dorsal view; (4) right front tibia, dorsal view.



Figs 5-6: *Findoclivina spatulifera* (ANDREWES); (5) male genitalia, lectotype, ventral and lateral view of median lobe with parameres in between; (6) female external genitalia with gonocoxites and epipleurites, paralectotype.



Figs 7-9: *Clivina quadrataconvexa* nov.sp., holotype; (7) habitus, dorsal view; (8) male genitalia, ventral and lateral view of median lobe with parameres in between; (9) female external genitalia with gonocoxites and epipleurite, paratype.

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