

Supplementary Information for

**An enigmatic beetle with affinity to Lamingtoniidae in mid-Cretaceous amber from northern Myanmar
(Coleoptera: Cucujoidea)**

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List of all Supplementary Information:

Supplementary Data 1. List of characters used in the phylogenetic analyses (adapted from Leschen et al., 2005).

Supplementary Data 2. Morphological dataset used for the analyses.

Supplementary Data 3. R codes for the parsimony analyses.

Supplementary Data 1. List of characters used in the phylogenetic analysis (adapted from Leschen et al., 2005).

Adult characters

- 1 Postocular constriction: (1) absent; (2) present.
- 2 Vertexal line: (1) absent; (2) present.
- 3 Median occipital stridulatory file: (1) absent; (2) present.
- 4 Paired occipital incisions: (1) absent; (2) present.
- 5 Frontoclypeal suture: (1) present; (2) absent.
- 6 Antennal insertions: (1) exposed from above; (2) concealed by frontal ridge.
- 7 Subantennal groove: (1) absent; (2) not extending below or behind eye; (3) extending below or behind eye.
- 8 Genal projection: (1) absent; (2) anterior, truncate or rounded; (3) anterior, acute; (4) anterolateral.
- 9 Anterior cervical sclerites: (1) not contiguous with head capsule or placed in paired emarginations; (2) contiguous with head capsule and usually placed within paired emarginations on ventral edge of occipital foramen; (3) apparently absent.
- 10 Apex of mandible: (1) unidentate; (2) bidentate; (3) tridentate.
- 11 Dorsal surface of mandible: (1) without tubercle fitting into lateral clypeal emargination; (2) with tubercle fitting into lateral clypeal emargination.
- 12 Dorsal surface of mandible: (1) without cavity; (2) with glabrous cavity; (3) with setose cavity.
- 13 Mandibular mola: (1) present; (2) absent.
- 14 Galea: (1) at least 2.5× as wide as lacinia; (2) between 1× and 2.5× as wide as lacinia; (3) distinctly narrower than lacinia; (4) absent.
- 15 Lacinial uncus: (1) absent; (2) present.
- 16 Lateral pronotal carinae: (1) complete; (2) incomplete or absent.
- 17 Sides of pronotum: (1) without 4–6 sharp teeth; (2) with 4–6 sharp teeth.
- 18 Anterior pronotal angles: (1) absent or not produced forwards; (2) produced forwards.
- 19 Anterior portion of prosternum at midline: (1) longer than prosternal process; (2) as long as prosternal process; (3) shorter than prosternal process.
- 20 Anteromesal corner of hypomeron: (1) without tooth; (2) with tooth.
- 21 Apex of prosternal process: (1) without lateral projections; (2) with lateral projections.
- 22 Shortest distance between procoxal cavities: (1) less than half as great as mid length of cavity; (2) more than half as great but less than mid length of cavity; (3) more than mid length of cavity.
- 23 Notosternal suture: (1) complete; (2) incomplete.
- 24 Procoxa: (1) without or with short, concealed lateral extension; (2) with long, concealed lateral extension. An internal coxal extension is said to be long if it is at least 0.75× the length of the exposed portion of the coxa.
- 25 Protrochantin: (1) exposed; (2) concealed.
- 26 Procoxal cavity: (1) strongly transverse; (2) slightly transverse; (3) about as long as wide.
- 27 Procoxal cavities externally: (1) open; (2) closed.
- 28 Procoxal cavity: (1) without lateral notch, only slightly or gradually narrowed laterally; (2) with narrow lateral notch (less than 0.25× as wide as mid length of cavity).
- 29 Procoxal cavity: (1) internally open; (2) internally closed.
- 30 Elytral punctation: (1) not seriate or striate; (2) seriate or striate.
- 31 Scutellary striole: (1) absent; (2) present.
- 32 Elytral sutural flange: (1) not widened apically; (2) widened apically.
- 33 Epipleuron: (1) complete to apex; (2) incomplete or absent.

- 34 Anteromesal corner of mesepisternum: (1) without cuticular pocket; (2) with cuticular pocket.
- 35 Shortest distance between mesocoxal cavities: (1) less than half as great as shortest diameter of cavity; (2) more than half as great but less than shortest diameter of cavity; (3) more than shortest diameter of cavity.
- 36 Meso-metaventral junction: (1) dicondylic; (2) monocondylic; (3) simple.
- 37 Mesocoxal cavities laterally: (1) open (partly closed by mesepimeron); (2) closed (by meeting of mesoventrite and metaventrite).
- 38 Metaventral discrimen: (1) present; (2) absent.
- 39 Metaventral transverse suture (katepisternal suture): (1) present; (2) absent.
- 40 Metacoxae: (1) contiguous or narrowly separated; (2) widely separated.
- 41 Metacoxae: (1) extending laterally to meet elytral epipleura, ventrite one not in contact with metepimeron; (2) not extending laterally to meet elytral epipleura, ventrite one in contact with metepimeron.
- 42 Metacoxal carina: (1) present; (2) absent.
- 43 Metendosternal laminae: (1) well developed; (2) reduced; (3) absent.
- 44 Anterior tendons of metendosternite: (1) narrowly separated; (2) widely separated.
- 45 Radial cell of hind wing: (1) complete (closed basally); (2) incomplete (open basally) or absent.
- 46 Free veins in medial field of hind wing: (1) five; (2) four; (3) three or fewer.
- 47 Tarsi in male: (1) 5–5–5; (2) 5–5–4.
- 48 Mesotarsomere four: (1) not or slightly reduced and not enclosed within lobe on tarsomere three; (2) highly reduced and partly or entirely enclosed within ventral lobe on tarsomere three.
- 49 Apex of terminal tarsomere: (1) without fringe of short setae; (2) with fringe of short setae.
- 50 Empodium: (1) projecting between pretarsal claws; (2) absent or not visible between pretarsal claws.
- 51 Number of basal ventrites connate: (1) none; (2) two.
- 52 Ventrite 1: (1) not much longer than 2; (2) much longer than 2.
- 53 Abdominal intercoxal process: (1) acute or narrowly rounded; (2) broadly rounded; angulate or truncate.
- 54 Abdominal tergite VII: (1) concealed from above; (2) exposed from above.
- 55 Functional spiracles on abdominal segment VII: (1) present; (2) absent.
- 56 Tergite VIII in male: (1) completely dorsal; (2) with sides curved ventrally; (3) with sides and apex curved ventrally to form genital capsule.
- 57 Anterior edge of sternite VIII in male: (1) without median strut; (2) with median strut.
- 58 Apex of sternite IX in male: (1) with mesal lobe; (2) without mesal lobe.
- 59 Anterior edge of sternite IX in male: (1) without spiculum gastrale; (2) with spiculum gastrale.
- 60 Base of tegmen: (1) broadly rounded; (2) narrowly rounded to acute; (3) produced anteriorly forming strut.
- 61 Parameres: (1) free from one another; (2) fused into single piece.
- 62 Parameres: (1) articulated to phallobase; (2) fused to phallobase.
- 63 Penis: (1) not divided into distinct basal and apical sections; (2) divided into distinct basal and apical sections.
- 64 Basal portion of penis: (1) distinctly wider than apical portion; (2) as wide as or narrower than apical portion.
- 65 Base of penis: (1) without median carina; (2) with median carina.
- 66 Anterior edge of penis: (1) without struts; (2) with paired struts; (3) with single strut.

Larval characters

- 67 Posterior edge of head capsule: (1) not, or only slightly, emarginate; (2) distinctly emarginate.
- 68 Bases of frontal arms: (1) contiguous; (2) well separated.
- 69 Median endocarina: (1) absent; (2) present.

- 70 Paired endocarinae: (1) absent; (2) present.
- 71 Stemmata: (1) six; (2) five; (3) four or fewer.
- 72 Antennal length: (1) less than 0.15× head width; (2) 0.15–0.5× head width; (3) more than 0.5× head width.
- 73 Sensorium: (1) shorter than apical antennomere; (2) longer than apical antennomere.
- 74 Labrum: (1) separated from head capsule by complete suture; (2) partly or completely fused to head capsule (suture incomplete or absent).
- 75 Apex of mandible: (1) unidentate; (2) bidentate; (3) tridentate.
- 76 Accessory ventral process of mandible: (1) absent; (2) present.
- 77 Mesal surface of mandibular base: (1) with asperate or tuberculate mola; (2) with 1–3 hyaline processes; (3) simple.
- 78 Ventral mouthparts: (1) strongly retracted (distance between mandibular and maxillary articulations greater than width of stipes); (2) protracted or slightly retracted (distance between mandibular and maxillary articulations less than width of stipes).
- 79 Maxillary articulating area: (1) well developed; (2) highly reduced or absent.
- 80 Inner apical angle of mala or lacinia: (1) rounded or truncate; (2) more or less acute (falciform).
- 81 Number of labial palpomeres: (1) two; (2) one.
- 82 Labial palps: (1) contiguous or separated by less than width of first palpomere; (2) separated by more than width of first palpomere.
- 83 Ligula: (1) absent; (2) present.
- 84 Hypopharyngeal sclerome: (1) absent; (2) present.
- 85 Hypostomal rods: (1) subparallel; (2) diverging.
- 86 Ventral epicranial ridges: (1) absent; (2) present.
- 87 Gula: (1) wider than long; (2) longer than wide.
- 88 Thoracic and most abdominal terga: (1) without long lateral processes; (2) with long lateral processes.
- 89 Mesocoxae separated by: (1) less than two coxal diameters; (2) more than two coxal diameters.
- 90 Number of pretarsal setae: (1) two; (2) one.
- 91 Abdominal tergites: (1) without rows of asperities; (2) with curved rows of asperities.
- 92 Abdominal tergum IX: (1) not forming articulated plate; (2) forming articulated plate.
- 93 Abdominal tergum IX: (1) simple; (2) with paired urogomphi.
- 94 Urogomphi: (1) straight; (2) curved upwards.
- 95 Urogomphi: (1) subparallel; (2) strongly diverging.
- 96 Sternum IX: (1) partly or entirely exposed; (2) completely concealed or apparently absent.
- 97 Segment X and anal opening: (1) posterior or terminal; (2) posteroventral; (3) ventral.
- 98 Spiracles: (1) annular; (2) annular–biforous.
- 99 Abdominal spiracles: (1) not at ends of spiracular tubes; (2) at ends of short spiracular tubes on segments I–VIII; (3) at ends of long spiracular tubes on segments I–VIII; (4) at end of spiracular tubes on segment VIII only.