**Supplementary material 3 - Character list**

**1.** Antenna, antennomeres III-IX, core, shape: (0) serrate; (1) cylindrical; (2) compressed (parallel-sided).

**2.** Antenna, antennomeres III-IX, single lamellae: (0) absent; (1) present (branch longer than core antennomere).

**3.** Clypeus, connection to frons: (0) connected by membrane throughout; (1) completely obliterate; (2) connate by median 1/3.

**4.** Mandible, apex, shape: (0) slender and acute; (1) robust and acute; (2) blunt.

**5.** Mandible, curvature: (0) straight; (1) evenly curved; (2) almost right-angled.

**6.** Labrum, sclerite, anterior margin, shape: (0) straight; (1) emarginate.

**7.** Labium, submentum, anterior margin, shape: (0) straight; (1) notched.

**8.** Labium, submentum, lateral margins, shape: (0) subparallel to slightly convergent posteriorly; (1) abruptly constrained posterly; (2) strongly and evenly convergent posteriorly.

**9.** Labium, palp, palpomere III, lateral margins, shape: (0) obconical; (1) subparallel; (2) divergent apically.

**10.** Pronotum (dorsal view), anterior expansion, anterior margin, shape: (0) acuminate anteriorly; (1) evenly rounded.

**11.** Pronotum (dorsal view), ratio between lateral expansion width to disc width: (0) less than a 1/3; (1) nearly 1/3; (2) at least 1.

**12.** Pronotum (dorsal view), disc, anterior margin, shape: (0) strongly curved; (1) straight to mildly curved.

**13.** Pronotum (dorsal view), posterior margin (by the disc), shape: (0) strongly sinuose; (1) almost straight; (2) slightly emarginate.

**14.** Pronotum (dorsal view), posterior corner, notch, presence: (0) absent; (1) present.

**15.** Hypomeron (posterior view), ratio between hypomeron depth and pronotal lateral expansion width: (0) about as long; (1) at least a 1/5 shorter; (2) at least a 1/5 longer.

**16.** Hypomeron (ventral view), keel countouring the eye: (0) present; (1) absent.

**17.** Hypomeron, core, length/depth ratio: (0) 1x; (1) 1.6x; (2) 2x; (3) 3x.

**18.** Prosternum, anterior margin, shape: (0) medially sinuose; (1) straight.

**19.** Mesoscutellum, posterior margin, shape: (0) rounded; (1) truncate; (2) slightly emarginate.

**20.** Elytron, outer margin, shape: (0) straight; (1) rounded; (2) convergent posteriorly; (3) widest at apical third.

**21.** Wing, position of MP3+4 split relative to CuA1: (0) more basal; (1) more apical.

**22.** Wing, AA3 shape: (0) short (almost as long as wide) and almost perpendicular to AA4; (1) elongate and with an acute angle to AA4.

**23.** Wing, r3: (0) absent; (1) present.

**24.** Proleg, anterior claw, tooth: (0) absent; (1) present.

**25.** Proleg, tibial spurs, count: (0) zero; (1) one; (2) two.

**26.** Mesoleg, anterior claw, tooth: (0) absent; (1) present.

**27.** Mesoleg, tibial spurs, count: (0) zero; (1) one; (2) two.

**28.** Metaleg, tibial spurs, count: (0) zero; (1) one; (2) two.

**29.** Metaendosternite, sides, anterior 1/2, shape: (0) biconvex; (1) convergent posteriorly.

**30.** Tergum I, spiracle, shape: (0) reniform; (1) subcircular.

**31.** Tergum VII, posterior angles, shape: (0) projected, embracing anterior angles of pygidium: (1) rudimentary, slightly projected backwards.

**32.** Sternum VI, lantern: (0) absent; (1) present.

**33.** Sternum VII, lantern: (0) absent; (1) present.

**34.** Sternum VIII, length relative to VII: (0) as long as; (1) slightly longer; (2) at least a 1/5 shorter; (4) 2x as long; (5) at least 3x longer.

**35.** Sternum VIII, lateral margins, shape: (0) rounded; (1) divergent up to basal 1/4, then convergent posteriorly.

**36.** Sternum VIII, posterior margin, shape: (0) almost straight: (1) sinuose; (2) emarginate.

**37.** Sternum VIII, posterior margin, median projection: (0) absent; (1) present.

**38.** Sternum VIII, posterior margin, median projection, shape: (0) tiny; (1) elongate; (2) wide, triangular.

**39.** Pygidium, shape: (0) at least a 1/5 wider than long; (1) as long as wide; (2) at least a 1/5 longer than wide.

**40.** Pygidium, lateral margins, shape: (0) subparallel; (1) rounded; (2) convergent posteriorly.

**41.** Pygidium, posterior margin, central 1/3, shape: (0) almost straight: (1) rounded; (2) emarginate; (3) medially notched.

**42.** Pygidium, posterolateral corners, degree of development: (0) well-developed; (1) barely conspicuous.

**43.** Pygidium, posterolateral corners, length relative to central 3: (0) shorter; (1) as long as; (2) longer.

**44.** Syntergite, shape (proportion): (0) at least a 1/5 longer than wide; (1) at least a 1/5 wider than long.

**45.** Syntergite, lateral margin, shape: (0) convergent posteriorly; (1) subparallel.

**46.** Syntergite, anterior margin, shape: (0) mildly emarginated; (1) strongly indented; (2) almost straight.

**47.** Syntergite, pattern of sclerotization: (0) evenly sclerotized; (1) completely divided by a membranous line.

**48.** Syntergite, length relative to sternum IX: (0) 1/3; (1) 1/2; (2) 2/3; (3) 1/5.

**49.** Syntergite, posterolateral corners, chaetotaxy: (0) glabrous; (1) covered in setae; (2) with dome-shaped sensillae.

**50.** Sternum IX, lateral rods, tips, connection: (0) separated; (1) fused.

**51.** Sternum IX, length relative to aedeagus (including phallobase): (0) slightly shorter; (1) slightly longer; (2) a 1/3 longer.

**52.** Sternum IX, position relative to VIII: (0) completely covered; (1) partially exposed.

**53.** Sternum IX, posterior margin, shape: (0) rounded; (1) deeply clefted (to at least a 1/5 sternum length); (2) truncate to slightly emarginate.

**54.** Phallobase, bilateral symmetry: (0) symmetrical; (1) asymmetrical.

**55.** Phallobase, length relative to phallus: (0) at least a 1/4 shorter; (1) as long as; (2) at least a 1/4 longer.

**56.** Phallobase, sagittal line: (0) absent; (1) present.

**57.** Phallobase, sagittal line, extension: (0) throughout phallobase; (1) not reaching apical margin.

**58.** Phallobase, apical margin, shape: (0) slightly emarginate; (1) deeply emarginate (C-shaped)); (2) medially clefted.

**59.** Phallus, dorsal plate, median connection to parameres: (0) connected by membrane; (1) connate anterior and laterally; (2) fused; (3) connate anteriorly.

**60.** Phallus, dorsal plate, base, pattern of sclerotization: (0) evenly sclerotized; (1) widely membranous.

**61.** Phallus, struts, condition: (0) absent; (1) present (visible through the phallobase).

**62.** Phallus, dorsal plate, basal 1/3, dorsolateral keel: (0) absent; (1) present.

**63.** Phallus, dorsal plate, basal protuberances, presence: (0) absent; (1) present.

**64.** Phallus, dorsal plate, basal protuberances, shape: (0) rudimentary; (1) at least 1/2 as long as dorsal plate.

**65.** Phallus, dorsal plate, basal protuberances, orientation: (0) divergent; (1) close-set; (2) apically convergent.

**66.** Phallus, dorsal plate, basal protuberances, apex, shape: (0) acute; (1) sinuose; (2) serrate; (3) rounded.

**67.** Phallus, dorsal plate, basal protuberances, subapical spike: (0) absent; (1) present.

**68.** Phallus, dorsal plate, subcleft transverse groove: (0) absent; (1) present.

**69.** Phallus, dorsal plate, length relative to parameres: (0) nearly a 1/5 longer; (1) at least a 1/5 shorter; (2) as long as; (3) 2x as long.

**70.** Phallus, dorsal plate, condition: (0) entire; (1) medially split.

**71.** Phallus (dorsal view), dorsal plate, anterior margin, shape: (0) rounded; (1) pointed; (2) truncate; (3) clefted.

**72.** Phallus, dorsal plate, degree of medial indentation: (0) nearly a 1/3 plate length; (1) nearly 2/3 plate length.

**73.** Phallus, dorsal plate, apical arms (of indented Phallus), shape: (0) widely distanced and slightly convergent; (1) contiguous; (2) fused; (3) apically divergent.

**74.** Phallus (lateral view), dorsal plate, overall shape: (0) straight; (1) bent dorsally; (2) slightly curved ventrally; (3) sinuose.

**75.** Phallus, dorsal plate, basal abrupt constriction: (0) absent; (1) present.

**76.** Phallus, dorsal plate, subapical outer teeth: (0) absent; (1) present.

**77.** Phallus, dorsal plate, basal joint: (0) absent; (1) present.

**78.** Phallus, dorsal plate, subapical keel: (0) absent; (1) present.

**79.** Phallus, dorsal plate, basal 1/2, dorsoventral depth relative to to paramere: (0) as deep to slightly shallower; (1) at least a 1/6 deeper.

**80.** Phallus, dorsal plate, lateral keel: (0) absent; (1) present.

**81.** Phallus, dorsal plate, pattern of sclerotization: (0) evenly sclerotized; (1) apically membranous.

**82.** Phallus, ventral plate: (0) absent; (1) present.

**83.** Phallus, ventral plate, length relative to dorsal plate: (0) 1/2 as long as long as or slightly longer; (1) a 1/3 shorter; (2) rudimentary (less than a 1/5).

**84.** Phallus, endossac, extent relative to phallus: (0) as long as; (1) extending at least a 1/5 beyond; (2) slightly shorter than.

**85.** Phallus, endossac, position of endossac relative to dorsal plate: (0) ventral; (1) cross through dorsally.

**86.** Phallus, endossac, opening, shape: (0) cylindrical; (1) cul-de-sac; (2) clefted.

**87.** Bridge between parameres, separation: (0) fused; (1) separated; (2) barely touching each other through a slender bridge; (3) connected via the dorsal plate of phallus.

**88.** Bridge between parameres, shape: (0) rounded; (1) elongate.

**89.** Paramere, subapical ventral spike, presence: (0) absent; (1) present.

**90.** Paramere, subapical ventral spike, shape: (0) pointy; (1) elongate.

**91.** Paramere, base, orientation relative to phallus: (0) dorsal; (1) lateral (coplanar); (2) ventral.

**92.** Paramere, subapical membranous appendage: (0) absent; (1) present.

**93.** Paramere, apex, curvature in lateral view: (0) straight; (1) slightly curved ventrally; (2) evenly curved inwards; (3) curved dorsally; (4) embracing phallus ventrally; (5) sinuose, curved inwards; (6) strongly curved dorsal.

**94.** Paramere, apex, sclerotization relative to core paramere: (0) as sclerotized; (1) distinctly membranous; (2) more sclerotized (darker).

**95.** Paramere, apex (tip), shape: (0) rounded; (1) blunt; (2) pointed; (3) truncated.

**96.** Paramere (lateral view), basal lobe: (0) absent; (1) present.

**97.** Paramere (lateral view), basal lobe, shape: (0) robust, rounded; (1) narrow and acute.