**Supp. file 3**. List of morphological characters. <https://doi.org/10.5852/ejt.2022.819.1773.6723>

1. Antennae, form: (0) non-geniculate; (1) geniculate (fig. 2 in Drugmand et al. 1993).

2. Antennae, base of antennomere 1: (0) concealed to different extent thus not fully visible from above (fig. 1A, B in Bogri et al. 2020); (1) fully exposed and visible from above.

3. Antennae, 'shelf' on head concealing antennal bases: (0) absent; (1) present (fig. 1A, B in Bogri et al. 2020).

4. Antennae, antennomere 3, tomentose pubescence: (0) absent (fig. 1C in Bogri et al. 2020); (1) present (fig. 1D in Bogri et al. 2020).

5. Antennae, antennomere 4, tomentose pubescence: (0) absent (fig. 1C in Bogri et al. 2020); (1) present (fig. 1D in Bogri et al. 2020).

6. Antennae, antennomeres 9 and 10, each of them, shape: (0) elongated, filiform, thin (fig. 1E in Bogri et al. 2020); (1) elongated, egg or funnel shaped (fig. 1F in Bogri et al. 2020); (2) wider than long (fig. 1G in Bogri et al. 2020).

7. Antennae, antennomere 11, shape: (0) symmetrical (fig. 1G in Bogri et al. 2020); (1) asymmetrical (fig. 5A in Brunke & Solodovnikov 2014).

8. Antennae, setation, long setae extending perpendicular to antennal axis: (0) absent; (1) present (fig. 1C–G in Bogri et al. 2020).

9. Antennae, distance between bases: (0) longer than distance from base of antenna to anterior margin of eye (fig. 2A in Żyła et al. 2021); (1) equal to or smaller than distance from base of antenna to anterior margin of eye (fig. 3B in Żyła & Solodovnikov 2020).

10. Eyes, setae between ommatidia: (0) absent; (1) present.

11. Head, longitudinal grooves on dorsal surface between eyes: (0) absent (); (1) present (fig. 3A in Żyła & Solodovnikov 2020).

12. Head, labrum, width vs length: (0) width less than twice the length; (1) width equal to twice the length or wider.

13. Head, labrum, size: (0) not expanded, at least half mandibles visible when closed; (1) expanded, almost or completely covering mandibles when closed.

14. Head, labrum, development: (0) entire; (1) notched to different extent; (2) dentate.

15. Head, labrum, depth of emargination: (0) shallow, basally not reaching membrane connecting labrum with frons (frontoclypeus); (1) deep, basally extended through membrane connecting labrum with frons (frontoclypeus).

16. Head, labrum, apical membrane: (0) absent; (1) present.

17. Head, labrum, attachment to frons (frontoclypeus): (0) with distinct membrane between frons and base of labrum (fig. 1H in Bogri et al. 2020); (1) without distinct membrane between frons and base of labrum (fig. 1I in Bogri et al. 2020).

18. Head, maxillary palpomere 3, shape: (0) elongated, regular; (1) expanded, more fusiform; (2) slightly expanded, vase-like.

19. Head, maxillary palpomere 4, shape: (0) fusiform (fig. 1J in Bogri et al. 2020); (1) conical (fig. 1K in Bogri et al. 2020); (2) nipple-like, elongate (fig. 1L in Bogri et al. 2020); (3) small, acicular (fig. 1M in Bogri et al. 2020); (4) truncate, short (fig. 1N in Bogri et al. 2020); (5) securiform (fig. 1O in Bogri et al*.* 2020).

20. Head, maxillary palpomere 4, width: (0) thinner than palpomere 3; (1) as wide or almost as wide as palpomere 3; (2) wider than palpomere 3.

21. Head, maxillary palpomeres 3 and 4, length: (0) palpomere 3 equal to or shorter than 4; (1) palpomere 3 longer than 4.

22. Head, maxillary palpomere 4, setation: (0) glabrous or at most sparsely setose; (1) densely setose.

23. Head, labial palpomeres 2 and 3, length: (0) palpomere 2 equal to or longer than 3; (1) palpomere 2 shorter than 3.

24. Head, labial palpomere 3, width: (0) as wide as palpomere 2; (1) thinner than palpomere 2; (2) wider than palpomere 2.

25. Head, ligula, development: (0) bilobed; (1) entire; (2) reduced.

26. Head, ligula, dorsal plate, setation: (0) absent; (1) present (fig. 36 in Frania 1986).

27. Head, mandibules, dorso-lateral groove: (0) absent; (1) present.

28. Head, mandibular prostheca: (0) present; (1) absent.

29. Head, mandibles, teeth: (0) present; (1) absent.

30. Head, mandibles, shape: (0) stout (at least twice as wide at base as width at apical portion) (fig. 1H in Bogri et al*.* 2020); (1) thin (as wide at base as apical portion or slightly wider) (fig. 1I in Bogri et al*.* 2020).

31. Head, mandibles, left vs right: (0) mandibles symmetrical (but size of same teeth may slightly differ on left and right mandible); (1) mandibles asymmetrical (when size, shape or sometimes number of teeth clearly differ on left and right mandible).

32. Head, frons (i.e. area of head between eyes), punctation: (0) more sparse than on rest of head; (1) as on rest of head.

33. Head, dorsal surface, pair(s) of trichobothria: (0) absent; (1) present (figs 64, 78 in Herman 1991).

34. Head, integument, presence: (0) smooth; (1) with microsculpture (fig. 2A in Bogri et al*.* 2020).

35. Head, dorsal side, punctation: (0) lack of distinctive punctation or surface smooth; (1) distinctive punctation, surface rugose.

36. Head, ventral basal ridge, development: (0) underdeveloped or absent: (1) fully developed (fig. 1 in Smetana & Davies 2000).

37. Head, infraorbital ridge: (0) absent; (1) present (fig. 1 in Smetana & Davies 2000).

38. Head, postgenal ridge: (0) absent; (1) present (fig. 1 in Smetana & Davies 2000).

39. Head, nuchal ridge: (0) present (fig. 1 in Smetana & Davies 2000); (1) absent.

40. Head, posterior margin, temples, shape: (0) straight; (1) rounded.

41. Head, ventral, gular sutures, development: (0) fully separated, but relatively close; (1) partially fused; (2) fully fused; (3) absent (or at least not visible externally); (4) wide apart (fig. 2B in Żyła et al. 2021).

42. Head, gular sutures, development at base of gula: (0) continue through neck to posterior margin of head (posterior orifice) (fig. 2B in Bogri et al. 2020); (1) become indistinct (fade) not reaching posterior margin of head (fig. 2C in Bogri et al. 2020).

43. Neck, postoccipital suture vs gula: (0) postoccipital suture does not cross gular sutures, not distinct at base of gula; (1) postoccipital suture crosses gular sutures and continues through base of gula.

44. Neck, width: (0) equal to or less than 1/5 of head width; (1) equal to or less than 1/3 of head width; (2) equal to or less than 1/2 of head width; (3) more than 1/2 of head width; (4) as wide as head.

45. Dense hair on head, pronotum and elytra: (0) absent; (1) present.

46. Head vs pronotum, width: (0) head narrower or as wide as pronotum; (1) head wider than pronotum.

47. Head vs pronotum, length: (0) head shorter or as long as pronotum; (1) head longer than pronotum.

48. Pronotum, length: (0) wider than long or quadrate; (1) longer than wide.

49. Pronotum, widest at: (0) base; (1) apex or anterior to its middle; (2) middle; (3) same width everywhere.

50. Pronotum, front angles (in dorsal view): (0) not producing over anterior margin of pronotum (fig. 3A in Bogri et al. 2020); (1) producing over anterior margin of pronotum (fig. 3B in Bogri et al. 2020).

51. Pronotum, front angles, shape: (0) regular (fig. 3B in Bogri et al. 2020); (1) obtuse (apex of pronotum with neck-like projection) (fig. 3C in Bogri et al. 2020).

52. Pronotum, midline, punctation: (0) less punctation than rest of pronotum, often appears impunctate; (1) as punctated as rest of pronotum (or not punctated if no punctation in general)

53. Prothorax, antesternal plates, development: (0) absent; (1) present (fig. 3D–H in Żyła & Solodovnikov 2020).

54. Prothorax, additional sclerotisation on anterior margin of prosternum: (0) absent; (1) present.

55. Pronotum, superior marginal line, development: (0) not deflexed (fig. 9G in Solodovnikov & Newton 2004); (1) deflexed (fig. 3D in Solodovnikov & Newton 2004); (2) absent (fig. 3A in Solodovnikov & Newton 2004).

56. Pronotum, superior marginal line vs inferior line: (0) not meeting each other (fig. 3C in Solodovnikov & Newton 2004); (1) meeting or very close to each other (fig. 3D in Solodovnikov & Newton 2004).

57. Pronotum, postcoxal process of hypomeron, development: (0) well developed and sclerotised; (1) translucent, somewhat flexible, or absent.

58. Prothorax, front angles of pronotum vs prosternum (in ventral view): (0) front angles not produced beyond meeting point of prosternum and pronotum (figs 3E, F, 4A in Bogri et al. 2020); (1) front angles produced beyond meeting point of prosternum and pronotum (fig. 3D in Bogri et al. 2020).

59. Prosternum, pronotosternal suture, development: (0) well developed; (1) weakly developed or absent.

60. Prosternum, basisternum, surface: (0) smooth; (1) with punctation or wrinkled.

61. Prosternum, basisternum, transversal carina: (0) absent; (1) present (figs 3E, 4A in Bogri et al. 2020).

62. Prosternum, basisternum, longitudinal median carina: (0) absent; (1) present.

63. Prosternum, furcasternum, sharp longitudinal carina: (0) present; (1) absent (figs 3E, 4A in Bogri et al. 2020).

64. Prosternum, furcasternum, transversal carina: (0) absent; (1) present (figs 3F, 4A in Bogri et al. 2020).

65. Prosternum, furcasternum, relative extension basad: (0) less extended - its pointy edge does not reach level of tip of postcoxal process; (1) more extended - its pointy edge reaches level of tip of postcoxal process (fig. 3F, I in Bogri et al 2020).

66. Prosternum, furcasternum, lateral extension: (0) not expanded under anterior coxae; (1) expanded under anterior coxae (fig. 3E, F, I in Bogri et al. 2020).

67. Prosternum, furcasternum, length: (0) longer than 1/2 of basisternum length; (1) shorter or equal to 1/2 of basisternum length; (2) longer than basisternum.

68. Prosternum, furcasternum, shape: (0) triangular; (1) rectangular.

69. Prothorax, prosternum, prosternal apophysis as clear invagination: (0) present (fig. 17 in Herman 2010); (1) absent.

70. Mesospiracular peritremes, development: (0) distinct; (1) reduced.

71. Mesothoracic membrane (area under anterior coxae), degree of sclerotisation: (0) soft, without strongly sclerotised areas (fig. 3I in Bogri et al. 2020); (1) with strongly or fully sclerotised areas embedding spiracles (fig. 3D in Bogri et al. 2020); (2) not visible, hidden behind furcasternum (fig. 3E in Bogri et al. 2020).

72. Mesosternum, sterno-pleural sutures, shape: (0) curved, converging towards each other in their basal (closer to prepectus) half (fig. 5A in Bogri et al. 2020); (1) curved, running parallel to each other in their basal (closer to prepectus) half (fig. 5B in Bogri et al. 2020); (2) straight, running transversely along entire extension (fig. 5D in Bogri et al. 2020).

73. Mesosternum, sterno-pleural sutures, basal end: (0) ending at prepectus (fig. 5A in Bogri et al. 2020); (1) ending before (not reaching) prepectus (fig. 5B in Bogri et al. 2020).

74. Mesosternum, basisternum, longitudinal carina: (0) absent; (1) present (fig. 5C in Bogri et al. 2020).

75. Mesosternum, furcasternum, longitudinal intercoxal carina: (0) present (fig. 5C in Bogri et al. 2020); (1) absent.

76. Mesosternum, transversal carina between sterno-pleural sutures: (0) straight or interrupted in middle (fig. 5A in Bogri et al. 2020); (1) pointed apicad (towards abdomen); (2) pointed or curved basad (towards prothorax) (fig. 5B in Bogri et al. 2020); (3) absent (fig. 5E in Bogri et al. 2020).

77. Mesosternum, lateral ridges near (apicad from) prepectus: (0) absent (fig. 5E in Bogri et al. 2020); (1) present, single (fig. 5A in Bogri et al. 2020); (2) present, double (fig. 5B, C in Bogri et al. 2020).

78. Mesosternum, connection to metasternum: (0) mesosternum clearly separated from metasternum by membrane (fig. 5C in Bogri et al. 2020); (1) mesosternum separated from metasternum by suture, no membrane; (2) mesosternum completely fused to metasternum (fig. 5D in Bogri et al. 2020).

79. Metasternum, ridge below coxal rests: (0) present (fig. 5E in Bogri et al. 2020); (1) absent.

80. Mesothorax, scutellum, scutellar ridge(s): (0) absent; (1) only one present; (2) both anterior and posterior present.

81. Mesothorax, elytron, humeral spines or spine-like setae: (0) absent; (1) present.

82. Mesothorax, elytra, epipleuron, marginal ridge: (0) present; (1) absent.

83. Mesothorax, epipleuron, additional ridge (in addition to marginal ridge): (0) absent; (1) present (fig. 5F in Bogri et al. 2020).

84. Mesothorax, elytra, overlap: (0) absent; (1) present.

85. Mesothorax, elytra, elongated elytra bases: (0) absent; (1) present.

86. Mesothorax, elytra, row of setae on edge of posterior margin: (0) absent; (1) present.

87. Protibia, comb-like rows of setae, presence: (0) present (fig. 6D, E in Bogri et al. 2020); (1) absent.

88. Protibia, comb-like rows of setae, position relative to long axis of tibia: (0) transversally (fig. 6E in Bogri et al. 2020); (1) diagonally; (2) longitudinally (fig. 6E in Bogri et al. 2020).

89. Protibia, comb-like rows of setae, number of fully developed rows: (0) two; (1) three; (2) four; (3) five or more.

90. Protibia, comb-like rows of setae, number of setae: (0) three at most; (1) more than three; (2) no setae, spines instead (fig. 3K, L in Żyła & Solodovnikov 2020).

91. Protibia, comb-like rows of setae, position on tibia: (0) closer to tarsus; (1) closer to femur or in mid distance between femur and tarsus.

92. Protibia, expanded area for comb-like rows of setae: (0) absent; (1) present (fig. 6E in Bogri et al. 2020).

93. Protarsus, basal four tarsomeres, compared to those of meso- and metatarsi, width: (0) narrower or equal to meso- and metatarsomeres; (1) wider, at most twice as wide as meso- and metatarsomeres; (2) more than twice as wide as meso- and metatarsomeres.

94. Protarsus, dense pale adhesive setae underneath: (0) present; (1) absent.

95. Protarsus, tarsomere 4, development: (0) bilobed; (1) not bilobed.

96. Mesotibia, outer edge, thorns: (0) present; (1) absent.

97. Mesotibiae, outer side, long bristles: (0) present; (1) absent.

98. Mesotarsomere 1, length: (0) equal to or longer than mesotarsomere 2; (1) shorter than mesotarsomere 2.

99. Meso- and metatarsomere 4, development: (0) similar to proceeding one; (1) modified, either widened or bilobed, with dense pale of adhesive setae underneath.

100. Metacoxa, suture: (0) absent; (1) present; (2) absent, but coxa with two different surfaces.

101. Metatibia, width: (0) same along whole length; (1) apically expanded.

102. Metatibia, apical ctenidium: (0) absent; (1) present.

103. Metatibia, apical ctenidium, position: (0) on both anterior and posterior faces; (1) on one side only.

104. Metatarsomere 1, length: (0) equal to or longer than metatarsomere 2; (1) shorter than metatarsomere 2.

105. Metatarsi, tarsomere 1 vs apical tarsomere, length: (0) tarsomere 1 shorter than apical; (1) tarsomere 1 equal to or longer than apical.

106. Metarsi, tarsomeres 4 vs 5 (or 3 vs 4 if tarsi 4-segmented), length: (0) tarsomere 4 (or 3) equal to or shorter than 5 (or 4); (1) tarsomere 4 (or 3) longer than 5 (or 4).

107. Metatarsi, tarsomere 5 vs 2–4 (or 4 vs 2–3 if tarsi 4-segmented), length: (0) tarsomere 5 (or 4) equal to 2–4 (or 2–3) combined; (1) tarsomere 5 (or 4) shorter than 2–4 (or 2–3) combined.

108. Tarsi, empodial setae, length: (0) longer or equal to claws; (1) half or less shorter than claws.

109. Hind wing, venation, MP3 vein: (0) present (fig. 9A in Brunke 2014); (1) absent.

110. Hind wing, venation, veins MP4 and CuA, development: (0) completely separated (fig. 9A in Brunke 2014); (1) largely or completely fused.

111. Abdomen, tergite I, protergal glands: (0) absent; (1) present (fig. 5D in Żyła & Solodovnikov, 2020).

112. Abdomen, tergites IV–VII, paratergites: (0) present; (1) absent.

113. Abdomen, segment VII, separation: (0) tergite and sclerite separated; (1) tergite and sclerite fused (fig. 33 in Herman 2010).

114. Intersegmental membrane, pattern of sclerites: (0) regular, brick-wall, sclerites hexagonal, rectangular or quadrangular; (1) irregular, angular (mostly triangular) sclerites; (2) irregular, rounded sclerites; (3) no pattern.

115. Intersegmental membrane, sclerites, degree of sclerotisation: (0) weakly sclerotised; (1) strongly sclerotised.

116. Abdomen, sternite III, keel between metacoxae: (0) present; (1) absent.

117. Abdomen, sternite IV, anteromedian gland: (0) absent; (1) present (figs 20–25 in Herman 1981).

118. Abdomen, tergites IX, shape: (0) produced into flat, apically obtuse to sharp, sometimes with spine-like process; (1) produced into inflated, apically sharp process; (2) produced into inflated, apically obtuse or rounded process.

119. Male, aedeagus, paired parameres: (0) present (fig. 62 in Herman 2010); (1) highly reduced or absent (figs 9, 11 in Frania 1986); (2) present but fused into single structure (fig. 2A, E in Brunke et al. 2017).

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