Xyeloblacus gen. nov. (Hymenoptera: Braconidae: Blacinae) parasitoid of Xyelinae (Xyelidae: Hymenoptera)

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Key words: Hymenoptera; Braconidae; Blacinae; *Xyeloblacus*; Palaearctic; Austria; Poland; Japan; key.
The new genus *Xyeloblacus* (type species: *Xyeloblacus leucobasis* spec. nov.) is described and illustrated; it belongs to a new tribe (Xyeloblacini van Achterberg), and two Palaearctic species are included. The type species has been reared from two *Xyela* spp. ("Symphyta"; Xyelidae; Xyelinae) in Austria.

Introduction

Specimens of the family Xyelidae Newman, 1834 ("Symphyta": Xyeloidea) are the earliest known Hymenoptera in the fossil record, known since Trias (about 200 million years ago). In the Triassic period they were the dominant group of Hymenoptera, with much more variation in genera than nowadays (Goulet, 1993). Surprisingly, considering the age of the group, hardly any parasitoids are known. Only three species of parasitoids were reared by the second author from *Xyela* spp. in Austria, one belonging to the Braconidae, the other two belong to its sister-group, the Ichneumonidae. The latter concern members of two koinobiont ectoparasitoid groups: *Idiogramma euryops* Foerster, 1868 (Tryphoninae: Idiogrammatini) and an undescribed *Gelanus* spec. (Tersilochinae; Prof. Dr K. Horstmann, in litt.).

The braconid reared belongs to an undescribed genus and species of the subfamily Blacinae Foerster, 1862. The new genus is similar to the Neotropical genus *Blacozona* van Achterberg, 1988 (tribe Blacozonini), but it differs by the presence of vein 2A of the hind wing, the curved vein 1-1A of the fore wing (fig. 1), the straight ventral margin of the clypeus, and the gradually subbasally narrowed hind tibia (fig. 8). The first two characters are autapomorphies (within the subfamily Blacinae) for the new tribe Xyeloblacini van Achterberg. The small tribe Blacozonini is only known from the Neotropical region and it is similar to the new tribe only in plesiomorphic character states, so there is no reason to suppose that the two tribes are closely related.

The new genus was reared thrice from *Xyela* spp. (Xyeloidea: Xyelidae; Xyelinae) in staminate cones of *Pinus* spp.; this host-relation is unique in the Blacinae and in Braconidae. As far as known other Blacinae are endoparasitoids of larvae of Coleoptera or Mecoptera, but there are some reports of dipterous hosts. The second author has collected larvae of *Xyela* spp. in Austria since 1993. The staminate cones of *Pinus nigra* Arnold, *P. cembra* Linnaeus, *P. mugo* Turra and *P. sylvestris* Linnaeus were examined for larvae; the larvae, after leaving the cones, were put in jars containing a mixture of fine, moist soil material, and peat. The jars were stored under conditions very similar to that of natural soil in a small cellar in the garden; adults of *Xyela* and *Xyeloblacus* emerged from the soil following one or more winters.

The new taxon proved to be elusive, and only a few specimens could be reared. Some larvae emerged from cones of *P. mugo* from Obertauern infested by *Xyela obscura* (Strobl, 1895), and some from cones of *Pinus nigra* from Hernstein/Piesting, about 7 km South of Berndorf, both in Lower Austria on the eastern edge of the Austrian Alps. It is a large area with *Pinus nigra* being the dominant species. Several xerophilous plants are present in the area: *Amelanchier ovalis* Medikus, *Anemone sylvestris* Linnaeus, *Sorbus aria* (Linnaeus), *S. torminalis* Crantz, and *Quercus pubescens* Willdenow. According to the few rearings so far *Xyeloblacus leucobasis* may remain in diapause up to three years, like one of its hosts, *Xyela graeca* Stein, 1876. So far, four species of *Xyela* spp. have been reared, of which two are associated with *Pinus nigra*: *Xyela curva* Benson, 1938 and *X. graeca* Stein (det. Dr W. Schedl, Innsbruck), belonging to two different species groups. Isolated small groups of *P. nigra* in gardens and parks were also infested by both *Xyela* spp., and both may serve as host of the new taxon.

For the recognition of the subfamily Blacinae, see van Achterberg, 1990, 1993; for the identification of its genera, see van Achterberg, 1988, 1995, and for the terminology used in this paper, see van Achterberg, 1988.

Descriptions

Subfamily Blacinae Foerster, 1862

Blacoidae Foerster, 1862: 254.
Blacinae; van Achterberg, 1988: 22-24 (diagnosis).

Note.— The Blacinae are a comparatively small subfamily with about 175 species described in 21 (sub)genera, divided among the following tribes: Dyscoletini van Achterberg, 1984; Chalaropini van Achterberg, 1988; Blacozonini van Achterberg, 1988; Stegnocellini van Achterberg, 1988; Xyeloblacini tribus nov., and Blacini Foerster, 1862.

Tribus Xyeloblacini van Achterberg nov.
(figs 1-16)

Contains only *Xyeloblacus* gen. nov. from the Palaearctic region.

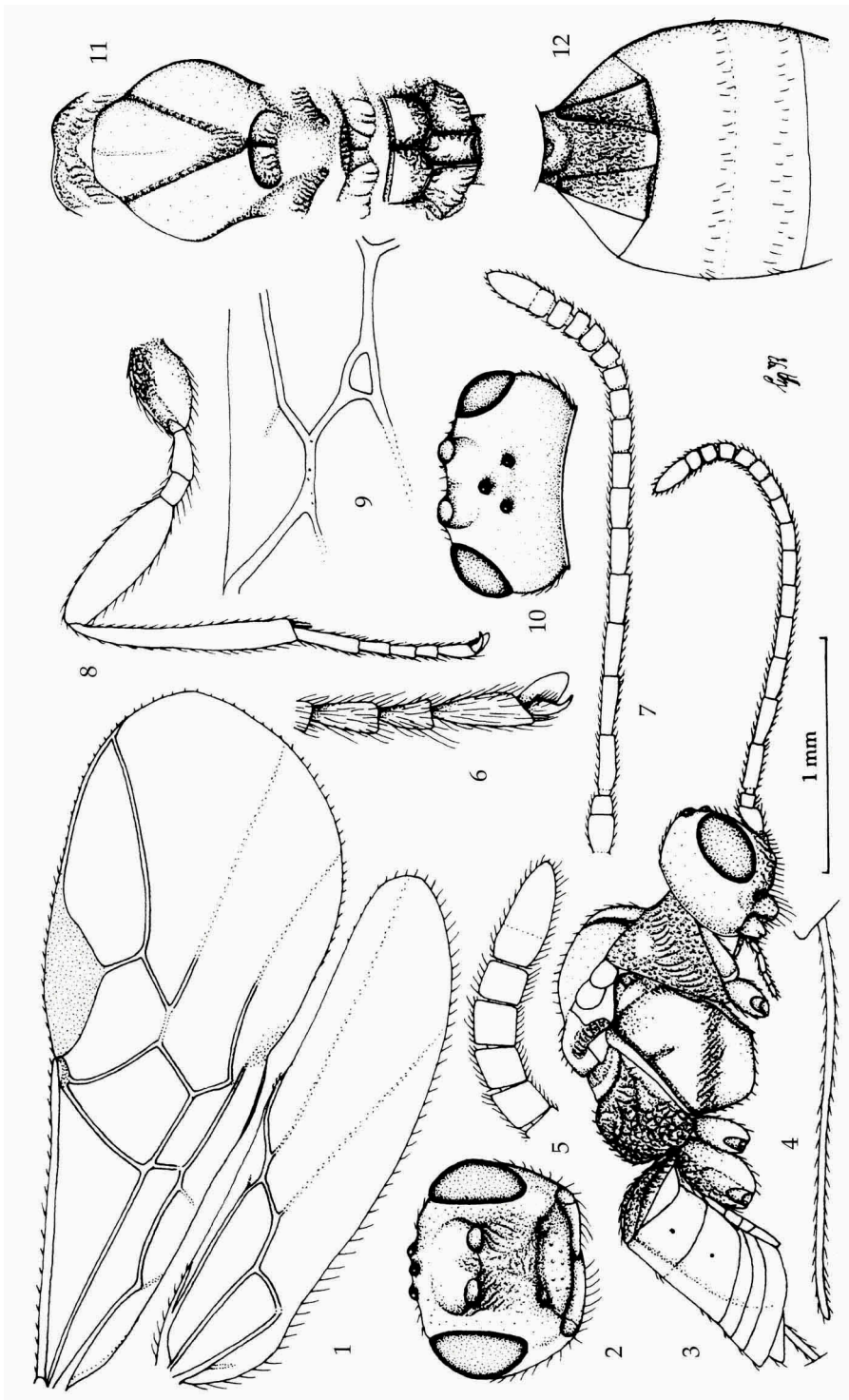
Diagnosis.— See diagnosis of the new genus *Xyeloblacus*. The straight ventral margin of the clypeus, the crenulate anterior subalar depression, the curved vein 1-1A of fore wing, and the presence of vein 2A of hind wing are important characters.

Xyeloblacus van Achterberg, gen. nov.
(figs 1-16)

New subgenus; van Achterberg & Kojima, 1997: 42.

Type species: *Xyeloblacus leucobasis* spec. nov.

Etymology.— Composed of the generic names *Xyela* Dalman, 1819, and *Blacus* Nees, 1818, because it is similar to the genus *Blacus*, and it parasitizes members of the genus *Xyela*. Gender: masculine.



Figs 1-12, *Xyeloblacus leucobasis* gen. nov. & spec. nov., ♀, holotype, but 7 of paratype, ♀, from Austria, Hernstein. 1, wings; 2, head, frontal aspect; 3, habitus, lateral aspect; 4, ovipositor; 5, apex of antenna; ; 6, inner hind claw; 7, antenna; 8, hind leg; 9, subbasal part of hind wing; 10, head, dorsal aspect; 11, mesosoma, dorsal aspect; 12, first-third metasomal tergites, dorsal aspect; 9. 1, 3, 4, 7, 8: 1 × scale-line; 2, 10-12: 1.3 ×; 5, 6, 9: 1.6 ×.

Diagnosis.— Antennal segments of ♀ 15-17, of ♂ 24-25, third antennal segment as long as fourth segment or somewhat longer (figs 3, 7, 16); eyes glabrous; frons smooth or largely so, distinctly depressed anteriorly (fig. 10); ventral margin of clypeus straight, without medio-ventral protuberance (fig. 2); occipital carina complete, nearly straight medio-dorsally; malar suture absent, except for an indistinct depression; occipital flange oblique, hardly protruding (fig. 4); pronope absent (fig. 11); anterior subalar depression crenulate (fig. 3); precoxal sulcus at least partly present (fig. 3); lateral carina of scutellum absent; scutellum moderately convex (fig. 3); propodeum with distinct medial area (fig. 11) and no tubercles (fig. 3); anterior part of propodeum not well differentiated from posterior part (fig. 3), parts subequal; veins CU1b and a of fore wing absent, obsolescent or short (figs 1, 13); veins 2A of fore wing and of hind wing present (figs 1, 13); vein 2-R1 of fore wing present or nearly absent; fore wing not banded (fig. 1); vein 3-CU1 of fore wing weakly oblique; vein r-m of fore wing absent; vein 1-1A of fore wing distinctly curved (fig. 1); vein 3-SR+SR1 of fore wing weakly curved basally (figs 1, 13); hind tibia gradually narrowed subbasally and apically (fig. 8); first metasomal tergite distinctly widened posteriorly and not constricted behind spiracles (fig. 12); laterope absent (fig. 3); second tergite flat and smooth; second metasomal suture absent; length of ovipositor sheath 0.5-0.8 times fore wing; length of fore wing 2-3 mm.

Biology.— Parasitoid of *Xyela* spp. (Xyeloidea: Xyelidae).

Distribution.— Palaearctic (two species).

Note.— The key to the (sub)genera by van Achterberg (1988) has to be changed as follows to accomodate the new genus:

4. Remove ..."frons distinctly concave (figs 56, 87);" .....
- Remove ..."frons flat or slightly concave (figs 104, 399);" .....
5. Remove ..."third antennal segment as long as fourth segment (fig. 71);" .....
- Remove ..."third antennal segment shorter than fourth segment (fig. 60);" ..... and replace last line by " ..... 5a"

5a. Frons flat and densely rugulose (figs 4, 7 in van Achterberg, 1995); precoxal sulcus absent, mesopleural area smooth (fig. 9, l.c.); third antennal segment about as long as fourth segment (fig. 2, l.c.); fore wing banded (fig. 1, l.c.); scutellum strongly protruding (fig. 9, l.c.); laterope large, deep (fig. 5, l.c.) ..... ***Glyptoblacus*** van Achterberg, 1995

- Frons concave and largely smooth (figs 56, 87 in van Achterberg, 1988); precoxal sulcus at least partly sculptured; relative length of third antennal segment variable; fore wing subhyaline or slightly infuscate; scutellum at most moderately convex (fig. 3); laterope medium-sized and comparatively shallow (figs 63, 84 l.c.) or absent 5b

5b. Median carina of propodeum about as long as half length of propodeum or longer (fig. 64 in van Achterberg, 1988); precoxal sulcus coarsely punctate (fig. 63, l.c.); vein 1-1A of fore wing straight or nearly so (fig. 65, l.c.); malar suture deep (fig. 67, l.c.); ventral margin of clypeus somewhat sinuate (fig. 67, l.c.); pronope deep, but rather small; vein 2A of hind wing absent; vein CU1b of fore wing distinct (fig. 65, l.c.); vein 1-SC+R of hind wing nearly straight subapically (fig. 65, l.c.); third antennal segment shorter than fourth segment (fig. 60, l.c.); apical antennal segment small (fig. 70, l.c.); Neotropical ..... ***Blacozona*** van Achterberg, 1976

- Median carina of propodeum distinctly shorter than half length of propodeum (fig. 11); precoxal sulcus more or less rugose (fig. 3), frequently largely smooth; vein 1-1A of fore wing curved (figs 1, 13); malar suture absent, except for an indistinct depression (figs 2, 3); ventral margin of clypeus straight (fig. 2); pronope absent (fig. 11); vein 2A of hind wing present (fig. 1); vein CU1b of fore wing short, obsolescent or absent (figs 1, 13); vein 1-SC+R of hind wing more or less bent subapically (figs 1, 9, 13); third antennal segment as long as fourth segment or slightly longer (figs 3, 7, 14, 16); apical antennal segment enlarged (figs 3, 5, 7, 16); Palaearctic ..... ***Xyeloblacus*** gen. nov.

Key to species of the genus *Xyeloblacus* nov.

1. Area near base of mandible ivory or whitish; first subdiscal cell of fore wing closed apically or nearly so (fig. 1); antennal segments of ♀ 17, rarely 16; third antennal segment of ♀ 1.1 times fourth segment (figs 3, 7); West Palaearctic .... ***X. leucobasis*** spec. nov.
- Area near base of mandible dark brown; first subdiscal cell of fore wing distinctly opened apically (figs 13, 15); antennal segments of ♀ 15; third antennal segment of ♀ as long as fourth segment (fig. 14); East Palaearctic ..... ***X. melanobasis*** spec. nov.

Xyeloblacus leucobasis van Achterberg & Altenhofer, spec. nov.
(figs 1-12)

Material.— Holotype, ♀ (RMNH), "Austria, Salzbg., Obertauern, c[oll]. 5.vii.1995, em. 22.ii.1996, leg. E. Altenhofer", "ex *Xyela obscura* (Strobl) on *Pinus mugo*". Paratypes: 35 ♀♀ + 10 ♂♂ (RMNH; PAN; TMA): 1 ♀ + 1 ♂, topotypic, same data; 1 ♀, "Austria, NÖ. [= Niederösterreich, = Lower Austria], Hernstein(Piesting), c[oll]. 23.v.1994, em. 24.iv.1997, leg. E. Altenhofer", "ex *Xyela ?graeca* [on] *Pinus nigra*"; 1 ♂, Austria, NÖ., Dürnstein [= Duernstein], c[oll]. 18.v.1996, em. 29.iv.1997, leg. E. Altenhofer". "ex *Xyela ?graeca/?curva* [on] *Pinus nigra*"; 7 ♀♀ + 6 ♂♂, "Poland: Bory Tucholskie, 23.v.1987, zm5, III kl. so add. 30a, P. Marczak, RMNH'90"; 14 ♀♀, "Poland: P. Bial/owieska, 8-24.v.1986, 2m3, ML/odn, so 634 cf., P. Marczak, RMNH'90"; 12 ♀♀ + 2 ♂♂, Poland: Puszcza Bial/a, 21.v.1986, III kl. so 469, P. Marczak, RMNH'90".

Holotype, ♀, length of body 2.3 mm, of fore wing 3.0 mm; body normally setose.

Head.— Antennal segments 17, its apical segment large compared to penultimate segment (fig. 5), length of third segment 1.1 times fourth segment, length of third, fourth and penultimate segments 3.4, 3.2 and 0.9 times their width, respectively (figs 2, 3); length of maxillary palp 0.5 times height of head; OOL:diameter of posterior ocellus:POL = 8:3:8; stemmaticum punctate medio-posteriorly; length of eye in dorsal view 1.1 times temple (fig. 10); face rugose medially, and remainder sparsely punctate (fig. 2); clypeus convex, distinctly punctate and its ventral margin thin, narrow; length of malar space 0.9 times basal width of mandible.

Mesosoma.— Length of mesosoma 1.3 times its height; side of pronotum medially punctate-rugose, postero-dorsally and ventrally mainly densely punctate (fig. 3); mesopleuron smooth, except for superficially obliquely rugulose precoxal sulcus (fig. 3); notauli complete, rather deep, crenulate and posteriorly widened and rugose (fig. 11); mesoscutual lobes rather flat and middle lobe slightly impressed medially, with some

punctulation; scutellum smooth; surface of propodeum areolate, its areas rugose but anteriorly and middle of areola smooth (fig. 11), its medial area distinctly parallel-sided, rather slender (fig. 11).

Wings.— Fore wing: first discal cell sessile, but narrowly so (fig. 1); 1-CU1:2-CU1 = 1:8; parastigma medium-sized (fig. 1); 3-SR+SR1 curved basally; r:3-SR+SR1:2-SR = 9:47:12; 2A and a present, unsclerotized. Hind wing: 1-SC+R with short stub and distinctly bent (figs 1, 9); 1r-m of left wing branched posteriorly (fig. 9); 3 hamuli.

Legs.— Hind coxa coarsely rugose dorsally, remainder mainly punctate; length of femur, tibia and basitarsus of hind leg 3.3, 7.9, and 4.5 times their width, respectively; length of hind tibial spurs 0.35 and 0.40 times hind basitarsus.

Metasoma.— Length of first tergite 0.8 times its apical width, its surface rugose-punctate, smooth postero-laterally, its dorsal carinae complete (fig. 12); length of ovipositor sheath 0.59 times fore wing.

Colour.— Black; area of malar space and temple near mandible ivory; clypeus (but basally dark brown), base of fore trochanter, femora (except basally and ventrally), tibiae, and hind tarsus (except telotarsaus) brownish-yellow; coxae blackish or dark brown; remainder of legs, palpi, pterostigma, tegulae, parastigma and veins (dark) brown; wing membrane slightly infuscate, but distinct near apex of vein 2-1A of fore wing.

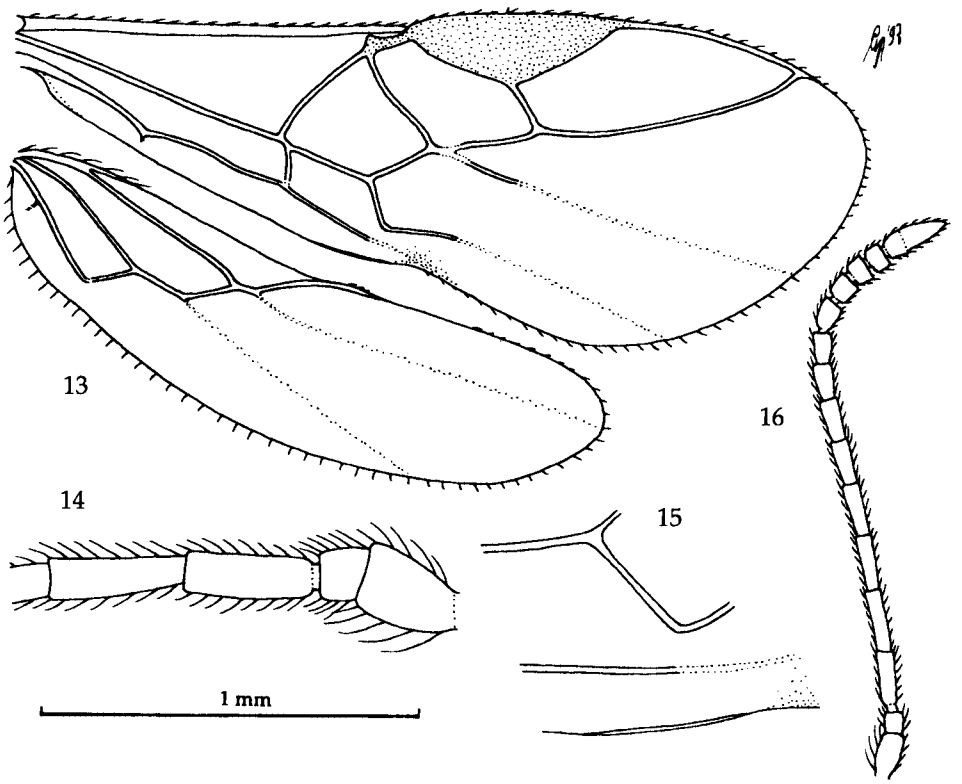
Variation.— Length of fore wing 2.1-3.0 mm, and of body 2.1-2.8 mm; antennal segments of ♀ 16(3) or 17(28), and of ♂ 21(1), 24(3) or 25(4) segments, apex of antenna of ♀ more or less compressed, length of penultimate segment 0.8-0.9 times its width; length of antenna of ♀ 0.6-0.7 times fore wing; length of first metasomal tergite 0.8-1.0 times its apical width; length of ovipositor sheath 0.59-0.77 times fore wing; posterior part of notauli may be hardly widened; vein 1-SC+R of hind wing usually without a stub, and distal part of vein may be only slightly bent; hind coxa often only with an oblique carina dorsally; stemmaticum smooth or punctate; clypeus finely to coarsely punctate; first subdiscal cell of fore wing at most with indistinct opening; vein CU1b absent, obsolescent or shortly developed; tegulae yellowish or dark brown; vein 2-R1 of fore wing short or nearly absent; first discal cell of fore wing sessile to subpetiolate and acute anteriorly; antenna, mesopleuron partly, and metasoma after first tergite black or dark brown; palpi brownish-yellow or brown; first tergite may be largely smooth laterally; ivory or whitish part near base of mandible wide to narrow; apical half of hind tibia may be infuscate; apical half of precoxal sulcus may be largely smooth (except near middle coxa); middle lobe of mesoscutum with or without median depression.

The female reared after three years of diapause is darker, has the antenna more robust and widened apically; with the apical segment is subdivided (fig. 7) and more compressed.

Note.— Dr P. Marczak (Warsaw; in litt.) collected the Polish specimens of this species in yellow pan traps on flowering *Pinus sylvestris* Linnaeus.

Xyeloblacus melanobasis van Achterberg, spec. nov.
(figs 13-16)

Blacus spec. nov.; van Achterberg & Kojima, 1997: 42.



Figs 13-16, *Xyeloblacus melamobasis* gen. nov. & spec. nov., ♀, holotype. 13, wings; 14, base of antenna; 15, apex of subdiscal cell; 16, antenna. 13, 16, : 1 × scale-line; 14, 15: 2.5 ×.

Material.— Holotype, ♀ (RMNH), "Japan: Ibaraki, Namase, Daigo, Mal. trap, 36°48'N, 140°24'E, ground level, 29.iv-6.v.1995, J. Kojima, RMNH'95".

Holotype, ♀, length of body 2.4 mm, of fore wing 2.4 mm; if not mentioned then characters similar to those of type species.

Head.— Antenna with 15 segments, its apical segment partly segmented, distinctly compressed and antenna somewhat widened apically (fig. 16), length of third segment as long as fourth segment, length of third, fourth and penultimate segments 3.0, 3.0 and 0.7 times their width, respectively (figs 14, 16); length of maxillary palp 0.6 times height of head; OOL:diameter of posterior ocellus:POL = 5:2:6; stemmaticum smooth medio-posteriorly; length of eye in dorsal view 1.3 times temple; face sparsely rugose medially, and remainder sparsely punctulate; clypeus sparsely coarsely punctate; length of malar space equal to basal width of mandible.

Mesosoma.— Length of mesosoma 1.4 times its height; side of pronotum medially punctate-crenulate, remainder mainly smooth; mesopleuron smooth, but ventrally sparsely punctulate; precoxal sulcus only anteriorly with a narrow crenulate depression and some additional short depressions; notauli complete, crenulate and posteriorly not widened; mesoscutual lobes setose and middle lobe not impressed medially;

scutellum moderately convex and sparsely finely punctate; surface of propodeum areolate, its areas rugose but anteriorly and middle of areola smooth, its medial area distinctly parallel-sided, rather slender.

Wings.— Fore wing: first discal cell acute anteriorly, subpetiolate (fig. 13); 1-CU1:2-CU1 = 1:6; first subdiscal cell with distinct opening apically; parastigma medium-sized; r:3-SR+SR1:2-SR = 9:47:14; 2A present; a absent. Hind wing: 1-SC+R without stub and weakly bent (fig. 13).

Legs.— Hind coxa with some rugosity dorsally, and an oblique carina; length of femur, tibia and basitarsus of hind leg 3.2, 7.8, and 3.9 times their width, respectively; trasal claws only setose.

Metasoma.— Length of first tergite 0.9 times its apical width, distinctly widened posteriorly, its surface rugose-punctate; length of ovipositor sheath 0.55 times fore wing.

Colour.— Black; antenna, humeral plate, coxa largely, telotarsi, metasoma (except first tergite), pterostigma and veins more or less dark brown; remainder of legs yellowish-brown; tegulum brownish-yellow; palpi pale yellowish; wing membrane slightly infuscate.

Acknowledgements and abbreviations

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