

Revision of the genus *Histeromerus* Wesmael (Hymenoptera: Braconidae)

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The genus *Histeromerus* Wesmael, 1838 (Braconidae: Histeromerinae) is revised and its species are keyed. The type species is redescribed and fully illustrated. The genus *Miithotynia* Hedqvist, 1976, is a new junior synonym of *Histeromerus*, and its type species, *M. aptera* Hedqvist, 1976, a junior synonym of *H. mystacinus* Wesmael, 1838. *Histeromerus canadensis* Ashmead, 1891, is for the first time reported from the Palaearctic region. A lectotype is designated for *H. mystacinus* Wesmael, 1838.

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Introduction

The monotypic subfamily Histeromerinae Fahringer, 1930, has for long been considered to contain two species belonging to one genus, *Histeromerus* Wesmael, 1838. The type species, *H. mystacinus* Wesmael, 1838, has a Palaearctic distribution, and the second species, *H. canadensis* Ashmead, 1894, has been considered to be a Nearctic species (Shenefelt & Marsh, 1976; Shaw & Huddleston, 1991). To my surprise I found specimens of this rarely collected genus from two localities in The Netherlands to belong to the supposed Nearctic species. Because there is no key to the species of *Histeromerus*, it has been necessary to investigate the variability of the characters used in descriptions, before a key to the species could be made.

The systematic position of the subfamily Histeromerinae has been problematic for a long time. It has been included as a tribe in the subfamily Doryctinae (e.g. Shenefelt & Marsh, 1976; Belokobylskij & Tobias, 1986), in the subfamily Braconinae (van Achterberg, 1976; Tobias, 1976), or the tribe has been given subfamily rank (van Achterberg, 1984 & 1988a; Quicke & van Achterberg, 1990; Shaw & Huddleston, 1991). The Histeromerinae is a very aberrant group, difficult to place because of its numerous negative apomorphic character states (van Achterberg, 1988a). It has been placed near the Braconinae (together with Ypsistocerinae, another very aberrant group (van Achterberg, 1984)). An extensive phylogenetic analysis showed that it is one of the oldest groups in the Braconidae, close to the Betylobraconinae Tobias, 1979, *sensu lato* and Rhyssalinae Foerster, 1862 (Quicke & van Achterberg, 1990).

The biology is poorly known; probably (considering its position in the phylogenetic analysis) ectoparasites of concealed living coleopterous larvae belonging to the Cisidae (van Achterberg, 1984), Anobiidae, Cerambycidae, Elateridae, Lucanidae, Lyctidae (Shenefelt & Marsh, 1976), Buprestidae (Belokobylskij & Tobias, 1986) and Ptinidae (this paper). It is a gregarious parasite of larvae of large beetles, but some

beetle species are so small that solitary parasitism might be inferred (Shaw & Huddleston, 1991) Males are rarely collected.

For the identification of the subfamily Histeromerinae, see van Achterberg, 1990, and for the terminology used in this paper, see van Achterberg, 1988b. An asterisk indicates a new record for the species from the country concerned.

Descriptions

Subfamily Histeromerinae Fahringer, 1930

Histeromerini Fahringer, 1930: 21; Shenefelt & Marsh, 1976: 1362; van Achterberg, 1976: 45; Tobias, 1976: 20; Belokobylskij & Tobias, 1986: 25.

Histeromerinae; van Achterberg, 1984: 47, 1988a: 99, 1990: 4-5; Quicke & van Achterberg, 1990: 38-39; Shaw & Huddleston, 1991: 72-73.

Diagnosis.— Head comparatively prognathous (figs 3, 4); 14-21 antennal segments, short setose and moniliform (figs 3, 5, 8, 14); maxillary and labial palpi with 6 and 4 segments, respectively; anterior tentorial pits deep and medium-sized (fig. 4); labrum concave and glabrous; hypoclypeal depression very deep and large (fig. 4); occipital carina laterally and occipital flange present (fig. 3); mandible robust and strongly twisted (fig. 4); pronotum very short anteriorly (fig. 3); anterior subalar depression with only fine crenulae and area below it large and convex (fig. 3); prosternum comparatively large and convex (fig. 9); lateral carina of mesoscutum and posterior flange of propleuron absent; mesosternal suture shallow and smooth; prepectal carina absent; metapleural flange absent; scutellar suture rather shallow and narrow (fig. 10); propodeal spiracle in front of middle of propodeum; propodeum protruding medio-posteriorly (fig. 3); first discal cell of fore wing long petiolate (fig. 1); veins CU1a and 3-M of fore wing largely sclerotized; sometimes a trace of vein 2m-cu of fore wing present; vein cu-a of hind wing inclivous (fig. 1); vein m-cu of hind wing long and slightly curved basad (fig. 1); fore coxa enlarged posteriorly and flattened; fore and middle tibiae with cluster of spines and spiny setae (figs 9, 12); hind femur, tibia, and basitarsus compressed; hind basitarsus about twice as long as remainder of tarsus (figs 7, 15); tibial spurs somewhat widened basally (fig. 7); first metasomal tergite flattened and without sublateral grooves (fig. 2); dorsople absent; second metasomal spiracle situated in epipleuron; metasomal setae mainly in a single row per tergite; ovipositor straight and compressed, with lower valves embraced by upper valve apically (fig. 13), without notch or teeth and with one apical valvillus per valve; length of ovipositor sheath 0.2-0.4 times fore wing.

Distribution.— Contains one genus, *Histeromerus* Wesmael, 1838, with three species. The type species has a Palaearctic distribution, *H. canadensis* Ashmead, 1891, is a Holarctic species, and recently a third species, *H. orientalis* Chou & Chou, 1991, has been described from the Indo-Australian region. The specimen from Papua New Guinea referred to by Quicke & van Achterberg (1990) may be conspecific with the latter species.

Histeromerus Wesmael, 1838

(figs 1-15)

Histeromerus Wesmael, 1838: 63-64; Shenefelt & Marsh, 1976: 1362-1363; Tobias, 1976: 20; Belokobylskij & Tobias, 1986: 49; Shaw & Huddleston, 1991: 72-73; Chou & Chou, 1991: 472-473. Type species (by monotypy): *Histeromerus mystacinus* Wesmael, 1838 [examined].

Mithotynia Hedqvist, 1976: 314-315 [included in the Ichneumonidae]. Syn. nov. Type species (by monotypy): *Mithotynia aptera* Hedqvist, 1976 [examined].

Diagnosis.— Antenna short (figs 3, 14), apically without spine (fig. 5) and with scapus concave apically (figs 3, 8); pedicellus comparatively large and cylindrical (fig. 8); hypostomal carina joining occipital carina about 0.6 times basal width of mandible above mandibular base; occipital carina weak and largely present, but dorsally widely interrupted; eyes glabrous, comparatively small (figs 3, 4) and not emarginate; temples much longer than eye (figs 3, 6); face transverse (fig. 4); clypeus narrow and ventrally depressed (fig. 4); epistomal suture shallow; malar suture absent; dorsal tooth of mandible longer than the rather acute ventral tooth; pronope absent; propleuron strongly oblique dorso-anteriorly (fig. 3); antescutal depression indistinct, nearly absent; precoxal sulcus absent; pleural sulcus largely smooth, except for some indistinct crenulae; episternal scrobe shallow, indistinct (fig. 3); notauli largely absent on disc (fig. 10); metanotum without median carina; vein CU1b of fore wing much shorter than vein 3-CU1 and vein 3-CU1 strongly oblique (fig. 1); parastigma elongate, vein-like (fig. 1); vein m-cu of fore wing distinctly post-furcal to (sub)interstitial and converging to vein 1-M posteriorly (fig. 1); vein 1-1A of fore wing curved; vein SC+R1 of hind wing largely straight; vein R1 of hind wing comparatively long; tarsal claws slender and without lobe (fig. 11); hind tarsus elongate (fig. 7); middle leg less compressed than hind leg and fore leg not compressed (fig. 9); dorsal carinae of first metasomal tergite absent; glymma indistinct; metasoma of ♀ rather compressed posteriorly (fig. 3); hypopygium truncate apically and rather large (fig. 3).

Key to the species of the genus *Histeromerus* Wesmael

1. Vein CU1b of fore wing absent; vein 1A+2A of fore wing distinctly widened distally (Chou & Chou, 1991: fig. 1); hind basitarsus parallel-sided basally; length of ovipositor sheath about 0.32 times fore wing *H. orientalis* Chou & Chou
- Vein CU1b of fore wing present (fig. 1); vein 1A+2A of fore wing less widened distally (fig. 1); hind basitarsus widened basally (fig. 7), if parallel-sided (fig. 15) then length of ovipositor sheath 0.20-0.26 times fore wing 2
2. Hind basitarsus slightly curved, its basal half distinctly widened (fig. 10); length of ovipositor sheath 0.32-0.35 times fore wing; antennal segments of ♀ 18-21 (of ♂ about 17); hind femur similarly coloured to hind tibia; subapical antennal segments of ♀ more robust (figs 3, 5), and antenna hardly or not narrowed apically; face distinctly sculptured (fig. 4); length of fore wing 2.9-4.0 mm; propleuron dark brown *H. mystacinus* Wesmael

- Hind basitarsus nearly straight, its basal half parallel-sided or slightly widened (fig. 15); length of ovipositor sheath 0.20-0.26 times fore wing; antennal segments of ♀ 14-17 (of ♂ unknown); hind femur more or less infuscated, usually darker than hind tibia; subapical antennal segments of ♀ less robust (fig. 14), and antenna slightly narrowed apically; face often largely smooth; length of fore wing 1.8-2.6 mm, exceptionally 3.1 mm; propleuron yellowish *H. canadensis* Ashmead

***Histeromerus canadensis* Ashmead, 1891**
(figs 14-15)

Histeromerus Canadensis Ashmead, 1891: 7.

Histeromerus canadensis; Shenefelt & Marsh, 1976: 1362; Marsh, 1979: 153.

Material.— **Palaeartic:** 1 ♀ (RMNH), "Nederland, Waarder (Z.H.), Oosteinde 33, 29.vi.-1.vii.1973, C. v.Achterberg"; 1 ♀ (RMNH), "Netherlands: Nisse (Z.), 30.v.-2.vi.1985, G.J. Slob, reared from *Crataegus*-stem, ex coleopteron, RMNH'85". **Nearctic:** 1 ♀ (RMNH), "Canada, Al[ber]ta, Lake Wabamun, 53°32'N 114°35'W, Malaise [trap], vii.17-29, 1982, B.G. Jackson"; 7 ♀♀ (RMNH), "Canada, Ontario, 20.vi.1982, L. Huggert, RMNH'84"; 3 ♀♀ (RMNH), "Canada, Quebec, Gatineau P[ark], Fortune Camp, 6.vii.1982, L. Huggert, RMNH'84"; 1 ♀ (USNM), "Ptinid in Beech", "Rockville, Pa., Champlain"; 1 ♀ (USNM), "Guelph, Ont., 15.v.[19]52, ?ex *Anobium punctatum*"; 1 ♀ (USNM), "Reared i.1925", "Tulip tree, dead, dry", "R. St. George Colr"; 1 ♀ (USNM), "La Trappe, Que., 18.viii.[19]48, J. Ouellet"; 1 ♀ (USNM), "New Hope, N.Y., vii.12, 1955, coll. J.B. Simeone"; 1 ♀ (CNC), "Vancouver, B.C., 24.viii.1931, G.R. Hopping, H.B. Leech", "Host— *Nepytia phantasmaria* Stkr. [= Geometridae; most likely incorrect record]", "G.H. 30"; 1 ♀ (CNC), "Alfred, Ont., Alfred bog, 29.vii.1984, M. Sanborne"; 1 ♀ (CNC), "On.: Kemptville, 5-12.vii.1983, W.R.M. Mason, M[alaise] tr[ap]".

This species is very similar to *H. mystacinus*; however, even with an unaided eye nearly all specimens of *H. canadensis* can be separated from *H. mystacinus* by their small size. Other differences are given in the key to the species.

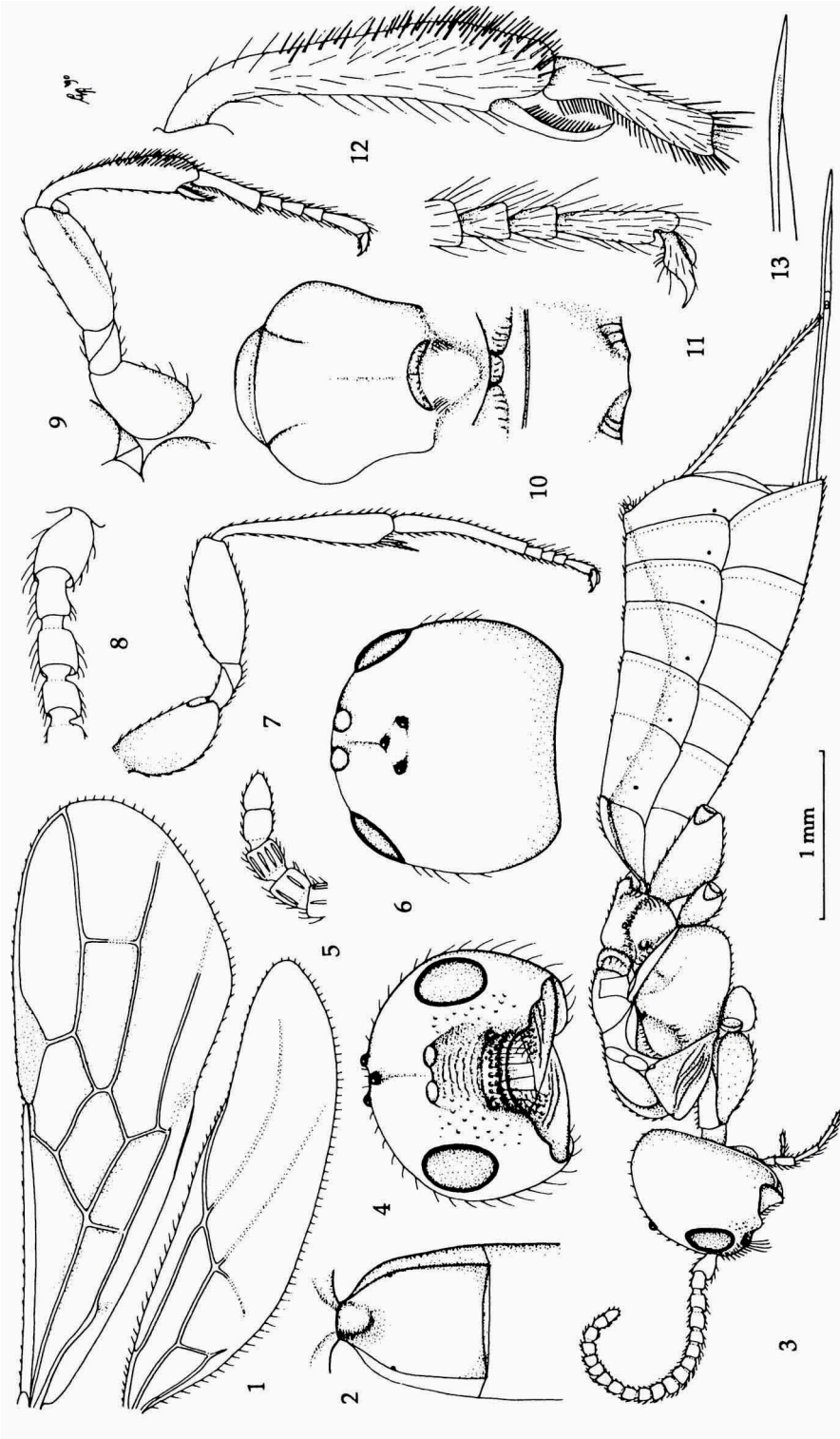
Variation.— Antennal segments of ♀ 14(2), 15(4), 16(12), or 17(1); length of fore wing 1.8-2.6 mm, but one specimen measures 3.1 mm; length of ovipositor sheath 0.20-0.26 times fore wing; clypeus usually largely smooth, except for a row of punctures, but the clypeus may be completely microsculptured.

Distribution.— **Palaeartic:** *Netherlands. **Nearctic:** Canada (Alberta, British Columbia, Ontario, Quebec), and U.S.A. (New York, Pennsylvania; according to Marsh (1979) south to North Carolina, and west to Minnesota).

Notes.— The holotype (♀) of *H. canadensis* (USNM) was temporarily unavailable but the description is unambiguous; the antenna with 15 segments, the largely smooth face, its small size (body 2.8 mm) and the comparatively short ovipositor (about 0.15 times body). The female from Vancouver is extremely large (length of fore wing 3.1 mm), has the clypeus densely microsculptured without distinct punctures, and its left fore wing has part of vein 2m-cu present.

***Histeromerus mystacinus* Wesmael, 1838**
(figs 1-13)

Histeromerus mystacinus Wesmael, 1838: 63-64; Shenefelt & Marsh, 1976: 1362; Tobias, 1976: 42; Belokobylskij & Tobias, 1986: 49; Shaw & Huddleston, 1991: 73.



Figs 1-13, *Histeromerus mystiacinus* Wesm., ♀, Asperen, Netherlands. 1, wings; 2, first metasomal tergite, dorsal aspect; 3, habitus, lateral aspect; 4, head, frontal aspect; 5, apex of antenna; 6, head, dorsal aspect; 7, hind leg; 8, base of antenna; 9, fore leg; 10, mesosoma, dorsal aspect; 11, inner hind claw; 12, fore tibia and basitarsus; 13, apex of ovipositor, lateral aspect. 1, 3, 7: 1 × scale-line; 2, 4, 6, 9, 10: 1.7 ×; 5, 8, 13: 2.5 ×; 11, 12: 3.8 ×.

Histeromerus mystacinus ab. *wesmaeli* Fahringer, 1930: 122; Shenefelt & Marsh, 1976: 1363 [invalid name].

Mithotynia aptera Hedqvist, 1976: 315, figs 1-2. *Syn. nov.*

Material.— Lectotype of *H. mystacinus* here designated (KBIN), only one ♀ of the two original specimens present in the Wesmael collection, without original labels and found in the box with specimens sent to Rev. T.A. Marshall about 100 years ago. The type locality is uncertain, but probably near Brussels and certainly in Belgium (Wesmael, 1838). Holotype of *M. aptera*: ♀, an artificially wingless specimen in the Hedqvist collection. It originates from southern Sweden, Scania, Bökeberg, 26.viii.1973, H. Andersson. Specimen figured and redescribed: (RMNH), "Holland, Asperen, 2.viii.1973, C.J. Zwakhals", "conspecific and compared with ♀ type of *H. mystacinus* Wesm., van Achterberg, 1979". Additional specimens from The Netherlands (all RMNH): 1 ♀, "Nederland, Waarder (Z.H.), Oosteinde 33, 11-13.vi.1973, C. v. Achterberg"; id., but Oosteinde 34 and 2-6.viii.1973; 2 ♀♀, "Holland, e.l. [= ex larva], Asperen, 18.v.1973, C.J. Zwakhals", "from *Salix* stems with 3 specimens of *Campylus linearius* (Elateridae) and 1 *Clytus arietis* (Cerambyc.)"; 2 ♀♀, "Huizen (N.H.), Oud Naarden, S. v. Heynsbergen", "Polyporus m. [= with] *Cis*, 13.ix.1982"; 1 ♀, "Nederland-L., Stein, paal [= reared from pole], 1978, B. V. Lefeber"; 1 ♀, id., but from Termaar; 1 ♀, "Nederland, NBr., Vlijmen, 5.v.1979, A.P.J. Teunissen"; 1 ♀, "Nederland, Wijster (Dr.), opposite Biol. Stat., 26.viii-2.ix.1977, C. v. Achterberg". From Belgium (RMNH): 1 ♀, "La Calamine (B.), ex *Betula* [= reared from *Betula*-pole], 1977, Br. L[efeber]"; 1 ♀, "Belgique-Lg., Mt. St. Pierre, *Salix* [= reared from *Salix*-pole], 1977, Br. Lefeber"; from Germany (RMNH): "Zeller, mitler Odergeg.", and from Denmark (RMNH): 3 ♀♀, "Drews[en], Copenh[agen]". Further 1 ♂ + 4 ♀♀ (RMNH) without locality label but certainly from NW Europe.

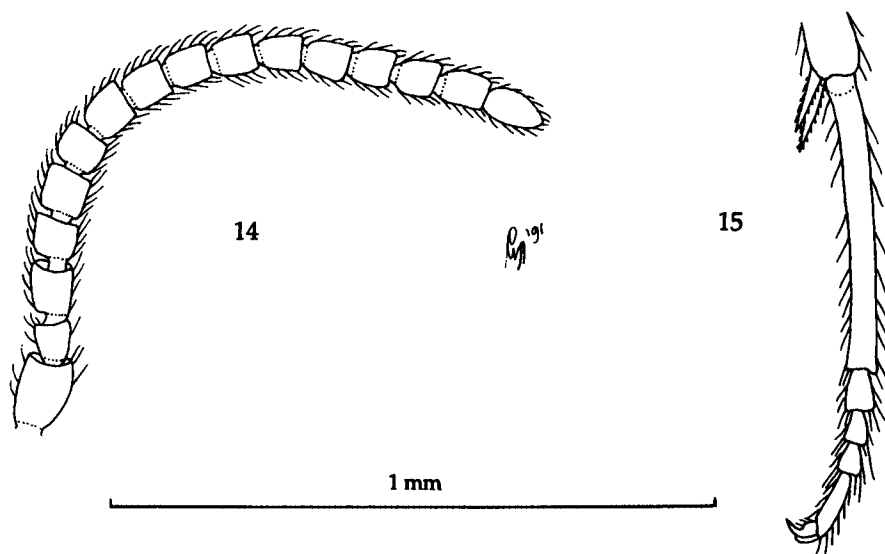
Figured and redescribed specimen from Asperen, ♀, length of body 4.8 mm, of fore wing 3.5 mm.

Head.— Antennal segments 20, robust, length of third segment 1.4 times fourth segment, length of third, fourth and penultimate segments 1.6, 1.1 and 1.1 times their width, respectively (figs 5, 8); length of maxillary palp 0.6 times height of head; length of eye in dorsal view 0.4 times temple (fig. 6); temples subparallel-sided; OOL:diameter of ocellus:POL = 10:3:8; frons flattened medially, with weak median groove, laterally convex and sparsely setose; vertex smooth and sparsely setose; face unevenly convex, irregularly transversely aciculate medially and with some punctures (fig. 4); clypeus coarsely and densely punctate and long setose (figs 3, 4), its ventral margin not differentiated, largely straight, but dorsal margin of depressed part is concave (fig. 4); length of malar space 1.2 times basal width of mandible; mandible with grooves and punctures dorso-basally (fig. 4).

Mesosoma.— Length of mesosoma 1.6 times its height; pronotal sides largely smooth, except for some striae and some pimply, setiferous elevations (fig. 3); mesopleuron smooth; metapleuron smooth except some striae (fig. 3); notauli only anteriorly impressed, smooth and narrow (fig. 3); mesoscutum largely glabrous, medio-posteriorly with shallow and narrow groove (fig. 10); scutellar sulcus with short carina and some rugosity (fig. 10); scutellum smooth except for some aciculae antero-laterally (fig. 10), and flat; surface of propodeum smooth, except for some striae posteriorly, and carinae absent (fig. 10).

Wings.— Fore wing: r:3-SR:SR1 = 6:21:29; 1-SR+M slightly sinuate; SR1 straight; cu-a antefurcal; 2-M+CU1:1+2-CU1 = 1:14; 2-SR:3-SR:r-m = 13:21:12. Hind wing: SR1 largely unsclerotized basally and evenly curved, and marginal cell absent apically (fig. 1).

Legs.— Hind coxa smooth; length of fore spur 0.6 times fore basitarsus; length of femur, tibia and basitarsus of hind leg 2.4, 5.5 and 6.5 times their width, respectively; length of hind tibial spurs 0.3 and 0.2 times length of hind basitarsus; basal half of



Figs 14-15, *Histeromerus canadensis* Ashmead, ♀, Canada, Quebec, Gatineau Park. 14, antenna; 15, hind tarsus. 14-15: 1 × scale-line.

hind basitarsus distinctly widened and (slightly) curved (fig. 7).

Metasoma.— Length of first tergite 0.9 times its apical width, its surface smooth, and dorso-lateral carinae weakly developed; second and following tergites smooth; segments with (sub)membranous posterior margin; length of ovipositor sheath 0.32 times fore wing.

Colour.— Black or blackish-brown; palpi, legs (but coxae and apico-dorsal part of femora dark brown), scapus, and pedicellus yellowish-brown; remainder of antenna, tegulae, propleuron, metasoma and apices of third and following metasomal segments pale (membranous); wing membrane rather infuscated, especially near basal veins (fig. 1).

Variation.— Vein 2m-cu of fore wing may be present; the figured specimens has in one wing a ramellus on vein 1-SR+M of fore wing; vein cu-a of fore wing is often distinctly antefurcal, but sometimes (sub)interstitial or postfurcal; face may be largely smooth dorsally and rugulose ventrally; vein m-cu of fore wing postfurcal to subinterstitial; antenna may be completely brown; antennal segments of ♀ 18(4), 19(3), 20(10), or 21(2), of ♂ 17(1); length of fore wing of ♀ 2.9-4.0 mm, of ♂ 2.0 mm; length of ovipositor 0.20-0.26 times length of fore wing.

Distribution.— Belgium, *Denmark, *Netherlands, and according to Sheneneffel & Marsh (1976) also England, the former USSR, France, Czecho-Slovakia and Germany. According to Belokobylskij & Tobias (1986) in Crimea, Russia and Georgia.

Histeromerus orientalis Chou & Chou, 1991

Histeromerus orientalis Chou & Chou, 1991: 473-474, figs 1-2.

First record from the Oriental region (Taiwan, Meifeng, 2150 m). The specimen from Papua New Guinea noted by Quicke & van Achterberg, 1990, is very similar and may be conspecific.

Acknowledgements and abbreviations

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References

- Achterberg, C. van, 1976. A preliminary key to the subfamilies of the Braconidae (Hym.).— Tijdschr. Ent. 119: 33-78, figs 1-123.
- Achterberg, C. van, 1984. Essay on the phylogeny of Braconidae (Hymenoptera: Ichneumonoidea).— Ent. Tidskr. 105: 41-58, figs 1-17.
- Achterberg, C. van, 1988a. Parallelisms in the Braconidae (Hymenoptera) with special reference to the biology.— Advances Par. Hym. Res., p. 85-115, figs 1-101.
- Achterberg, C. van, 1988b. Revision of the subfamily Blacinae Foerster (Hymenoptera, Braconidae).— Zool. Verh. Leiden 249: 1-324, figs 1-1250.
- Achterberg, C. van, 1990. Illustrated key to the subfamilies of the Holarctic Braconidae (Hymenoptera: Ichneumonoidea).— Zool. Med. Leiden 64: 1-20, figs 1-26.
- Asmead, W.H., 1891. Descriptions of some new Canadian Braconidae.— Can. Ent. 23: 1-7.
- Belokobyl'skij, S.A. & V.I. Tobias, 1986. Doryctinae: p. 21-72. In: Medvedev, G.S. (ed.). Opređelitel' Nasekomykh Evrospeiskoi Tsasti SSSR 3, Peredpiontdatokrylye 4.— Opr. Faune SSSR 145: 1-501, figs 1-263.
- Chou, L. & K. Chou, 1991. The Braconidae (Hymenoptera) of Taiwan. IV. Histeromerinae.— J. Agric. Res. China 40: 472-474, figs 1-2.
- Fahringer, J., 1930. Opuscula braconologica. 3. Palaearktischen Region 1-2: 1-160.
- Hedqvist, K.-J., 1976. *Mithotynia aptera* n. gen n. sp., a wingless ichneumonid from South Sweden (Hymenoptera: Ichneumonidae).— Ent. scand. 7: 314-315, figs 1-2.
- Marsh, P.M., 1979. Braconidae, Aphididae. In: Krombein, K.V. et al. (eds). Catalog of Hymenoptera in America North of Mexico, 1: 144-313.— Washington D.C.
- Quicke, D.L.J. & C. van Achterberg, 1990. Phylogeny of the subfamilies of the family Braconidae (Hymenoptera: Ichneumonoidea).— Zool. Verh. Leiden 258: 1-95, figs 1-180.
- Shaw, M.R. & T. Huddleston, 1991. Classification and biology of braconid wasps (Hymenoptera: Braconidae).— Handbk Ident. Br. Ins. 7 (11): 1-126, figs 1-126.
- Shenefelt, R.D. & P.M. Marsh, 1976. Braconidae, 9.— Hym. Cat. (nov. ed.) 13: 1263-1424.
- Tobias, V.I., 1976. Brakonidy Kavkaza (Hymenoptera, Braconidae).— Opređ. Faune SSSR 110: 1-287, pls 1-67.
- Wesmael, C., 1838. Monographie des Braconides de Belgique, 4.— Nouv. Mém. Acad. sci. R. Bruxelles 11: 1-166.

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