

**Woldstedtius merkli sp. n. from Hungary
(Hymenoptera: Ichneumonidae)**

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Abstract – *Woldstedtius merkli* sp. n. (Hymenoptera: Ichneumonidae: Diplazontinae) is described from Hungary. An affix to the recently published identification key to the Western Palaearctic species of the genus is given. With 7 figures.

Key words – Diplazontinae, Western Palaearctic, Börzsöny, description, new species, identification key

INTRODUCTION

Ichneumon wasps (Hymenoptera: Ichneumonidae) constitute one of the most diverse families of the animal kingdom (TOWNES 1969). The number of described species exceeds 30,000 (YU *et al.* 2012), and the real species richness of the family is estimated at least about 60,000 (TOWNES 1969, WAHL 1993). Ichneumon wasps represent one of the most poorly known groups of Hymenoptera even in Europe; the number of known species in the Hungarian fauna is c. 2000, while the occurrence of further c. 1000 species is reasonably expected (BAJÁRI 1960, VAS 2013).

In 2015–2016 the Hungarian Natural History Museum (HNHM), in cooperation with the Duna–Ipoly National Park Directorate, carried out an assessment of the saproxylic beetles (Coleoptera) in the Börzsöny Mts (the westernmost member of the North Hungarian Mountains). The work was led by Ottó Merkl, head of Coleoptera Collection in HNHM, with the help of several staff members of the Department of Zoology in the fieldwork. Along with the data recording of saproxylic beetles they also collected hymenopterans in the field. Their activity already resulted in an ichneumon wasp species new to the Hungarian fauna (VAS 2015), and an ichneumon wasp species new to science. This paper is devoted to the description of the latter.

MATERIAL AND METHODS

Ichneumonidae taxonomy and nomenclature follow YU & HORSTMANN (1997), YU *et al.* (2012), and KLOPFSTEIN (2014). The morphological terminology follows GAULD (1991), GAULD *et al.* (1997), and KLOPFSTEIN (2014). The description greatly relies on the recent revision of the Western Palaearctic members of the subfamily (KLOPFSTEIN 2014). The original descriptions of the Eastern Palaearctic, Oriental and Nearctic species of the genus were also checked to ensure that this species has not been described previously in another zoogeographical region.

The specimen was examined by using a Nikon SMZ645 stereoscopic microscope. Photos were taken with Nikon D5200 and Nikon AF Micro Nikkor 60mm lens and MitutoyoM Plan Apo 5X microscope lens. Exposures were stacked in ZereneStacker, post image work was done with Photoshop CS5.

TAXONOMY

Woldstedtius merkli sp. n.

(Figs 1–7)

Material examined – Holotype, female: Hungary, Börzsöny Mts, Nógrád County, Diósjenő, Hosszú-bérc, N 47.934053°, E 19.005949°, 12.vi.2015, at light, leg. A. Grabant, O. Merkl, V. Szóke, P. Szöllősi-Tóth. The holotype is deposited in the HNHM Hymenoptera Collection (Id. No. HNHM-HYM 23032). Antennae of the holotype are damaged, the right flagellum and three apical segments of the left flagellum are missing; the number of flagellomeres was counted in sound condition, before the damage. Right wings are mounted on a separate label. Right tarsus is missing. Paratype, female: Hungary, Pest County, Dabas (Gyón), collecting date unknown (the collector was active in the first half of the 20th century), leg. E. Csiki, Id. No. HNHM-HYM 23178. The paratype specimen was labelled by S. Klopstein as "*Woldstedtius cf. flavolineatus* (Grav.)" in 2006. The revision of the *Woldstedtius* material of HNHM due to the description of *Woldstedtius merkli* sp. n. revealed that this specimen is conspecific with the presently described one.

Diagnosis – Within the genus *Woldstedtius* Carlson, 1979 the new species most resembles *W. holarcticus* (Diller, 1969) or *W. flavolineatus* (Gravenhorst, 1829) regarding size and colouration. The sculpture of the first tergite with strong longitudinal striae between the median dorsal carinae is characteristic of *W. merkli* sp. n. The propodeum of *W. merkli* sp. n. is more roughly but less evenly coriaceous than that of the other two species; its petiolar area is somewhat shinier than other parts of the propodeum and is covered with distinct longitu-

dinal and diagonal wrinkles, while *W. holarcticus* and *W. flavolineatus* have evenly coriaceous propodeum with at most weak vestiges of wrinkles in some *W. flavolineatus*. Female of *W. merkli* sp. n., unlike the other two species, lacks the yellow shoulder marks on mesoscutum. The colour patterns of mid and hind coxae of females also differ: *W. holarcticus*: mid coxa black with yellow apical stripe and spot on the outer surface, hind coxa black; *W. flavolineatus*: mid and hind coxae entirely orange; *W. merkli* sp. n.: mid and hind coxae black (or dark brown) and orange. Inner eye orbits are strongly divergent ventrally in *W. merkli* sp. n. while distinctly less divergent in *W. flavolineatus* and almost parallel in *W. holarcticus*.

Description – Female (holotype, Figs 1–6). Body length 8 mm; fore wing length 6.5 mm.

Head: Antenna with 25 flagellomeres; first flagellomere ca 4.5× as long as wide apically; apical flagellomeres longer than wide. Whole head strongly coriaceous with indistinct punctures. Gena short, strongly constricted behind eyes. Occipital carina complete. Face distinctly elevated centrally and with a pair of shallow longitudinal grooves below outer edges of toruli. Clypeus separated from face by a shallow groove, elevated basally, concave in profile, with bilobed apical edge, apical margin thin. Inner eye orbits divergent ventrally. Ocellus diameter 0.7× as long as distance between lateral ocellus and eye. Malar space as long as basal width of mandible.



Fig. 1. *Woldstedtius merkli* sp. n., holotype, lateral view

Mesosoma: Pronotum coriaceous with fine wrinkles along lower front margin. Mesoscutum strongly coriaceous and matt with indistinct punctures, without notaulus. Scutellum coriaceous, slightly more punctate and shinier than mesoscutum, with lateral carinae developed only basally. Mesopleuron coriaceous, with slightly stronger punctures ventrally than dorsally. Speculum smooth and shiny. Sternaulus indistinct. Epicnemial carina complete, reaching above middle of hind edge of pronotum. Posterior transverse carina of mesosternum incomplete. Postscutellum and metapleuron coriaceous. Wing membrane with dense short hairs. Fore wing with vein *cu-a* postfurcal, distinctly inclivous. Vein *2m-cu* postfurcal with a wide bulla. Areolet open. Distal abscissa of *Rs* straight. Hind wing with three basal hamuli. Hind wing vein *cu-a* c. $0.6 \times$ as long as abscissa of *Cu1* between *M* and *cu-a*. Legs long, hind femur $4 \times$ as long as wide at its widest part. Fore and mid coxae coriaceous with weak punctures, hind coxa more finely coriaceous. Tarsal claws simple and thin, distinctly longer than arolium. Propodeum short, convex in profile, strongly coriaceous and matt with indistinct punctures; petiolar area less coriaceous and somewhat shinier with strong longitudinal and diagonal wrinkles. Propodeal spiracle circular, not connected to



Fig. 2. *Woldstedtius merkli* sp. n., holotype, dorsal view



Fig. 3. *Woldstedtius merkli* sp. n., holotype, head, frontal view



Fig. 4. *Woldstedtius merkli* sp. n., holotype, fore and hind wings



Fig. 5. *Woldstedtius merkli* sp. n., holotype, apical part of propodeum, dorsal view



Fig. 6. *Woldstedtius merkli* sp. n., holotype, first and second tergites, dorsal view

weak pleural carina. Longitudinal and transverse carinae of propodeum fully reduced, traces inconspicuous.

Metasoma: Metasoma dorsoventrally depressed, tergites convex, hind margins of tergites straight or weakly convex. First tergite roughly coriaceous and matt with strong longitudinal striae basally between median dorsal carinae. Median dorsal carinae of first tergite strong, reaching middle of tergite, almost as far apart apically as from dorsolateral carinae of tergite. Second tergite roughly coriaceous with strong, short longitudinal striae basally between wide, oval thyridiae. Third tergite coriaceous with strong, very short longitudinal striae at middle of its basal margin. Spiracles of second and third tergites above lateral folds of tergites. Fourth and following tergites finely coriaceous, shinier. Ovipositor sheath straight, short, shorter than apical depth of metasoma, less than $0.3 \times$ as long as hind tibia, with transversely truncate apex.

Colour: Antenna black. Head mainly black; yellow patch on central elevated area of face; mouthparts yellow except brownish base and teeth of mandible; clypeus with very small, almost inconspicuous pale reddish spots around apical notch and around elevated basal ridge. Mesosoma black except following parts: hind corner of pronotum, tegula, subtegular ridge, upper and lower mesepimeron yellow; scutellum and postscutellum with small yellow apical spots. Wings hyaline with brown veins; pterostigma dark brown with a pale yellowish spot basally. Fore



Fig. 7. *Woldstedtius merkli* sp. n., paratype, lateral view

leg: coxa mainly black with yellow patches apically; trochanter and trochantellus yellow; femur, tibia and tarsomeres pale orange except brownish apical tarsomere. Mid leg: coxa with large black and orange patches; trochanter and trochantellus yellow with pale brownish patches basally and apically; femur, tibia and tarsomeres orange (slightly darker than fore leg) except brownish apical tarsomere. Hind leg: coxa with large black and orange patches; trochanter and trochantellus yellow with blackish patches basally and apically; femur orange (darker than mid leg) with thin blackish apex; tibia black with a white base; tarsomeres black. Metasoma black; ovipositor sheath very dark brown with paler base.

Variation: The paratype (Fig. 7) is slightly larger than the holotype (body length 8.5 mm, fore wing length 7 mm) and is rather similar to the holotype in sculpture and colouration except that it is slightly paler; the dark parts of coxae are rather brown than black, and femora are paler orange. Clypeus is a little more extensively reddish as compared to the holotype, and the paratype has inconspicuous dark reddish patch at the apical edge of second tergite. Since some loss of colour intensity in the paratype specimen might be due to time the variation examined here corresponds to KLOPFSTEIN (2014) as females of the Western Palaearctic *Woldstedtius* species show little intraspecific morphological variation.

Male: Unknown.

Distribution – Currently known only from Hungary. Might be a more widespread but rare species.

Ecology – Based on knowledge of life histories of close relatives, presumably a koinobiont endoparasitoid of Syrphidae (Diptera) (WAHL 1993, KLOPFSTEIN 2014); no host is known. The holotype was collected at night at the edge of managed Pannonian-Balcanic *Quercus cerris-Quercus petraea* woodland from a white sheet illuminated with mercury vapour bulb.

Etymology – This species is dedicated to Dr. Ottó Merkl, senior curator of the Coleoptera Collection in HNHM in honour of his long-lasting and remarkable activity in collecting hymenopterans during his expeditions and collecting trips, which enriched the Hymenoptera Collection with thousands of specimens in the last decades.

AFFIX TO THE IDENTIFICATION KEY OF THE WESTERN PALAEARCTIC *WOLDSTEDTIUS* SPECIES

A recent revision of the Western Palaearctic species of subfamily Diplazontinae provides a very useful identification key to the genus (KLOPFSTEIN 2014); by using this key, *W. merkli* sp. n. would key out to *W. holarcticus*. Hence, I provide here an additional couplet to distinguish the females of these species.

- First tergite without strong longitudinal striae between median dorsal carinae; petiolar area evenly coriaceous; inner eye orbits almost parallel, not conspicuously divergent ventrally; mid coxa black with yellow apical stripe and spot on the outer surface, hind coxa black; fore wing length 4.1–5.5 mm *W. holarcticus* (Diller, 1969)
- First tergite with strong longitudinal striae between median dorsal carinae; petiolar area is somewhat shinier than other parts of the propodeum and with longitudinal and diagonal wrinkles; inner eye orbits distinctly divergent ventrally; mid and hind coxae black (or dark brown) and orange coloured; fore wing length 6.5–7 mm **W. merkli** sp. n.

Additionally, a couplet to distinguish the females of *W. flavolineatus* and *W. merkli* sp. n. is also provided here.

- First tergite without strong longitudinal striae between median dorsal carinae; petiolar area evenly coriaceous with at most vestiges of apical wrinkles; inner eye orbits weakly divergent ventrally; mesoscutum usually with yellow shoulder marks; mid and hind coxae entirely orange; fore wing length 4.3–6.3 mm *W. flavolineatus* (Gravenhorst, 1829)
- First tergite with strong longitudinal striae between median dorsal carinae; petiolar area is somewhat shinier than other parts of the propodeum and with distinct longitudinal and diagonal wrinkles; inner eye orbits strongly divergent ventrally; mesoscutum without yellow shoulder marks; mid and hind coxae dark (black or dark brown) and orange coloured; fore wing length 6.5–7 mm **W. merkli** sp. n.

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