Two closely related species of *Cubocephalus* (Hymenoptera: Ichneumonidae: Cryptinae) with asymmetric ovipositors

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Два близкородственных вида рода *Cubocephalus* (Hymenoptera: Ichneumonidae: Cryptinae) с асимметричными яйцекладами

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Abstract. Two species of *Cubocephalus* (Ichneumonidae: Cryptinae) from the Palearctic region with asymmetric ovipositors, *C. crassivalvus* Hinz and *C. kasparyani* sp. n., are discussed. The function of this asymmetry is unknown.

Key words. Ichneumonidae, Cryptinae, *Cubocephalus*, new species, Palearctic region, asymmetric ovipositor.

Резюме. Обсуждаются два палеарктических вида *Cubocephalus* (Ichneumonidae: Cryptinae) с асимметричным яйцекладом: *C. crassivalvus* Hinz и *C. kasparyani* sp. n. Функциональное значение такой асимметрии неизвестно.

Ключевые слова. Ichneumonidae, Cryptinae, *Cubocephalus*, новый вид, Палеарктика, асимметричный яйцеклад.

Introduction

*Cubocephalus* Ratzeburg, 1848 is a large genus distributed widely in the Holarctic region (Townes, 1970; Yu et al., 2005). Townes and Gupta (1962) revised the North American species of this genus and divided them into nine species groups, but there is no modern revision of the European or Asian species. The keys by Schmiedeknecht (1905), Habermehl (1917), Meyer (1933) and Jonaitis (1981) include only a part of the European species and are not up to date. Several undescribed Palearctic species are known to the author. One of them, described below, is exceptional in having an asymmetric ovipositor. It is closely related to the European *Cubocephalus crassivalvus* Hinz having also an ovipositor whose left and right sides are strikingly different, which was overlooked hitherto.

Material and methods

Material in the Biologiezentrum at Linz (Austria) and in the Zoologische Staatssammlung at München (Germany) was investigated. Morphological terminology follows mainly Townes (1969) except for the terms malar space, mesopleuron, metapleuron and trochantellus, which follow Fitton et al. (1988). The images were taken at Biologiezentrum at Linz using a Nikon AZ100M.
Results

Cubocephalus crassivalvus Hinz, 1969
(Figs 10–12)

This species was described by Hinz (1969) after two females from northern Sweden, and hitherto no other material has been listed in the literature. The male is still unknown. Hinz (1969) did not mention the unusual characters of the ovipositor, and therefore the ovipositor is described here.

The ovipositor, which is short, robust and weakly curved upwards, is significantly asymmetric (Figs 10–12) in all three known specimens. The upper valve is conspicuously enlarged and encloses the lower valve, which is therefore hardly seen in lateral view. The dorsal valve has on the right side subapically a large, very deep and slightly elongated depression, which occupies almost the entire ovipositor width and is oblique to the longitudinal body axis. The depression is dorsally narrower than ventrally, and its dorsal end protrudes basally (Fig. 10). On the left side the ovipositor is not pressed at the same level. Basal to this depression on the right side there is on the left a significant depression, which is somewhat smaller than that on the right side (Fig. 11). In dorsal view both depressions are clearly visible. Both upper valves are fused together without a dividing seam (Fig. 12). The lower valve is slender and subapically has fine teeth ventrally.


This species is here recorded from Central Europe for the first time.

Cubocephalus kasparyani sp. n.
(Figs 1–9)


Comparison. This species is very similar to C. crassivalvus Hinz, but differs most obviously by its ovipositor. Cubocephalus kasparyani sp. n. also has an asymmetric ovipositor, but the depressions are not so pronounced, and the ovipositor is curved upwards approximately at a right angle subapically.

Both these species key to the C. brevicornis species group using Townes and Gupta (1962) and agree rather well with the description of this species group, but differ strikingly by their asymmetric ovipositors. Hinz (1969) mentions that Townes has seen C. crassivalvus and also places it in the C. brevicornis group. As the differences from the other known species of the C. brevicornis group are to be found only in the ovipositor, a feature present exclusively in the female.

Description. Female. Body length 7.1 mm. Antenna short and slightly widened in its middle, but broken off apically, third segment (except annellus) 1.1 times as long as wide. Front edge of head in lateral view makes distinct acute angle with imaginary extension of hind margin of eye. Head granulate and with distinct punctation. Face very short and slightly elongated, its lower margin blunt (Fig. 3). Mandibular teeth of about equal length. Malar space 0.6 times as long as basal width of mandible. Temple with scattered punctures. Frons with scattered punctures, but moderately densely punctured medially. Frons at height of antennal scrobe near eye margin with small but distinct bump. Distance between lateral ocellus and eye margin as long as distance between lateral ocelli. Upper edge of vertex distinctly higher than ocelli in lateral view. Head in dorsal view behind eyes long, weakly rounded laterally and hardly narrowed (Fig. 4).

Mesosoma somewhat flattened dorsoventrally. Mesocutum finely granulate and dull, moderately densely punctured (Fig. 5). Notaulus indicated only anteriorly. Scutellum flat, lustrous, very weakly granulate, with scattered and fine punctures. Mesopleuron including most of scutellum granulate and mainly dull, with scattered and distinct punctures. Scutellar ventrally lustrous and densely punctured dorsally. Sternaulus with rough carina, extending only to middle of mesopleuron. Median section of posterior transverse carina of mesoscutum fine and without pair of teeth. Metapleuron granulate and matt, in addition ventrally wrinkled, without distinct punctures. Propodeum (Fig. 6) of moderate length, with rough granulation and with fine rugosity, matt. Apical transverse carina of propodeum present but indistinct medially. Median and lateral longitudinal carinae present only proximally.

Legs stout with hind femur 2.9 times as long as wide. Fore wing with sides of areolet distinctly converging anteriorly. Nervulus opposite basal vein.
Metasoma with tergites distinctly granulate and proximal tergites dull, without distinct punctures. First metasomal segment with ventrolateral carina distinct, dorsolateral carina weak and median dorsal carina absent. Ovipositor sheath short, 0.55 times (without curvature) as long as hind tibia, widened behind its middle and clearly pointed towards tip. Ovipositor very robust, straight basally and strongly bent upwards apically; in lateral view dorsal margin of ovipositor makes right angle (Figs 7, 8). Upper valve unusually enlarged, enclosing lower valve which is only partly visible in lateral view. Lower valve apically with weak teeth ventrally. Upper valve asymmetric, with distinct longitudinal furrow on right side (Fig. 7); caudal margin of furrow just behind curvature of ovipositor. On left side longitudinal furrow weak (Fig. 8). Upper valve

Figures 1–6. Cubocephalus kasparyani sp. n. (holotype, female). 1 – habitus, dorsal view; 2 – habitus, lateral view; 3 – head, frontal view; 4 – head, dorsal view; 5 – mesoscutum; 6 – propodeum, dorsal view. Scale bars: 1, 2 – 1.0 mm; 3–6 – 0.1 mm.
caudal of curvature with indentation laterally; indentation on left side more basal than on right side. Both upper valves fused together without dividing suture (Fig. 9).

**Colouration.** Body black. Seventh tergite of metasoma with hind margin white medially. Antennal flagellum basally, mandible partly, postpetiole apically, second and third tergites mainly, median transverse band on fourth tergite and most of legs orange. Second metasomal tergite basolaterally with black spot and third tergite black basally. Fore and mid coxae partly, and fore and mid trochantelli partly black. Palps brownish. Fore wing with pterostigma brown and yellowish brown in its basal half except margins.

**Male.** Unknown.

**Etymology.** This species is dedicated Dmitri R. Kasparyan, a very productive ichneumonologist, on the occasion of his 75th birthday.

Figures 7–12. Ovipositor of *Cubocephalus kasparyani* sp. n. (holotype) (7–9) and *Cubocephalus crassivalvus* Hinz (10–12). 7, 10 – right side; 8, 11 – left side, 9, 12 – dorsal view. Scale bars – 0.1 mm.
Discussion

Since in all three known specimens of *C. crassivalvus* Hinz the ovipositor is formed asymmetrically in the same way, a deformation can be excluded. It can be assumed that this is also the case in the closely related *C. kasparyani* sp. n., of which only one specimen is known. There are no other Ichneumonidae known to the author with asymmetric ovipositors. The function of this asymmetry and of the deep depressions are unknown. Hosts have so far not become known. Townes (1970) mentions Symphyta as hosts for *Cubocephalus*. Yu *et al.* (2005) and Sawoniewicz (2008) list Hymenoptera (Symphyta, Ichneumonidae, Aculeata), Coleoptera and Lepidoptera, but some of these host records are probably erroneous. The short, robust and upcurved ovipositor with the enlarged dorsal valve resembles roughly *Barycnemis gravipes* (Gravenhorst) (*Ichneumonidae*: Tersilochinae). Unfortunately there is no reliable host record for this species either, but Tersilochinae are mainly assumed to be parasitoids of Coleoptera (e.g. Townes, 1971). *Barycnemis gravipes* (Gravenhorst) is probably searching for hosts on the ground as observations by the author suggest. Therefore it is supposed that these two species of the *C. brevicornis* group with asymmetric ovipositors may oviposit into a similar substrate in which the host is sought. Hosts may be Coleoptera, which are probably searched for on the ground.

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References


