

1961, XXXIV, 596

**A NEW DIRHICNUS — PARASITE OF CONOPIDS IN ADULT
BUMBLE-BEES (HYM., PTEROMALIDAE)**

ZDENĚK BOUČEK

(Department of Entomology, National Museum, Prague)

In 1959 a very interesting *Dirhicnus* species was submitted to me by my colleague M. Chvála for identification, reared from an adult bumble-bee attacked by a Conopid larva as endoparasite. When going through the literature I found several records obviously concerning the same species, but no appropriate name for it.

***Dirhicnus conopidarum*, sp. nova**

Dirhicnus subcoeruleus, Postner, 1951, *Veröff. Mus. Natur-, Völker- u. Handelskunde Bremen*, **A2**: 79 (nec Thomson, 1878).

Description. *Female.* Head and thorax dark bluish-green; abdomen black. Antennae dirty yellow, pedicellus slightly brownish above. Coxae concolorous with the body; legs otherwise fulvous except all femora which are mainly fuscous, sometimes even with a metallic tinge, and the tips of tarsi which are slightly infuscated. Tegulae dark testaceous. Wings hyaline, venation testaceous.

Head broader than the thorax (58:50), in dorsal view 2.1 times as broad as long, with temples roundedly narrowing behind eyes, occiput deeply emarginate, ocelli in a triangle of 130° , POL:OOL as 1.6:1, frons very feebly convex, scrobe shallow; in front view transversely oval, 1.3 times as broad as high, with vertex moderately convex, genae converging strongly towards the mouth, rounded in outline though usually weakly impressed at the mouth corners. Clypeus not well delimited, covered with radiating striae except a small area at its front border which is slightly produced and subtruncate, with a median impression; mouth border sinuate on either side. Both mandibles 3-toothed, basal tooth blunted. Head reticulate, feebly shiny, sculpture turning to radiating striae on face below the ocular line. Relative measurements: height of head 43, compound eye 26, breadth of frons 35, length of gena 12, width of mouth 27, distance between front border of clypeus and antennal sockets 18, between this and eye margin 13, between sockets and front ocellus 19. Antennal scape 20, just reaching the ocellus, flagellum plus pedicellus 50 (relative width of head then 56). Scape equals in length pedicellus plus ring segments

and two basal funicle segments. Pedicellus in profile twice as long as broad; both ring segments subequal, each about $1/4$ as long as wide; funicle stout, cylindrical, first segment subquadrate, sixth very slightly transverse; clava with distinct perpendicular sutures, slightly longer than the fifth and sixth segment of funicle combined; sensillae of funicle and clava very numerous, in two rows upon each segment, about 7 in each row to be seen in profile.

Thorax slightly convex, 1.5 times as long as broad. Pronotum narrow, with collar distinctly but not very sharply margined anteriorly (as in *Habrocytus*, e. g.), finely reticulate except a very narrow smooth strip along its hind margin; pronotal sides diverging in dorsal view, rather deeply emarginate posteriorly just before the spiracle; lateral panels with deep oblique impression. Mesoscutum moderately convex, parapsidal furrows very shallow but traceable more than half way across the mesoscutum. Scutellum rather convex, slightly longer than broad (15:13), about twice as finely reticulate as the mesoscutum; frenal cross-line delicate, straight, situated at $3/4$ of the length of scutellum; hind margin somewhat elevated medially; axillulae distinctly separated. Metascutellum closely attached to the hind margin of scutellum, irregularly reticulate, with some tiny longitudinal carinulae at the hind margin; depressed sides of metanotum also delicately reticulate. Propodeum distinctly reticulate, along median line nearly half as long as scutellum, moderately sloping, usually with distinct and straight median carina ending in about $2/3$ of length on top of an elevated and flat, nearly smooth, triangular nuchal strip; plicae laterales arched, vague anteriorly at a shallow fovea between the median line and the spiracle, sharp and high posteriorly at a deep pit where they join the nuchal strip; fovea apicalis deep but nearly invisible from above as the supracoxal lamina is very narrow; spiracular sulci distinct, narrow; spiracles small, oval, separated by less than their own length from the hind margin of metanotum; callus moderately hairy. Prepectus triangular, reticulate, its upper margin about as long as tegula. Mesepimerum nearly smooth above, reticulate below the arched cross-furrow. Forewing broad, extending beyond apex of gaster; relative lengths of veins sm: m: pm: st as 54: 28: 27: 18; all veins thin, the stigmal slightly curved, its knob narrow, uncus small; upper surface of costal cell bare, on lower surface scattered sparse hairs distally, basally in one row only; speculum large, partly opened below, basal fold hairy, usually also distal part of basal cell with a few hairs; disc of wing not densely hairy; apical ciliae very short. Legs rather slender; hind tarsi not much shorter than hind tibiae (40:45), basitarsus above nearly twice as long as width of hind tibia.

Abdominal petiole small, subconical, smooth, usually retracted. Gaster about as long as and somewhat broader than thorax, oval, depressed dorsally and slightly convex ventrally; ovipositor shortly protruding; hypopygium hardly reaching half the length of gaster, first tergite about one third. Length 2—2.6 mm.

Male. Resembles the female but head and thorax are dorsally more green, often with some brassy reflections, more bluish on sides, antennae

and legs apart from coxae usually pale yellow. Most differently shaped is the mouth opening (fig. 1), with the unusually, circularly emarginate corners, and enlarged, convex bases of mandibles. Margin of mouth corner thin, somewhat elevated. Lower face nearly everywhere reticulate, not distinctly radiately striate. Antennal flagellum more slender than in female, more hairy, sensillae but sparser, mainly in one row on each segment. Length 1.2–2.1 mm.

Hosts: *Physocephala vittata* (Fabr.), *Physocephala* sp., Diptera, Conopidae, developing as endoparasites on adult bumble-bees, e. g. *Bombus lapidarius* L., *B. agrorum* F., etc.

Distribution: Czechoslovakia, Germany, Holland.

Holotype (female): Czechoslovakia, Bohemia, Filipov, 6. VIII. 1959, ex *Physoceph. vittata* in adult *Bombus lapidarius* (Coll. Natl. Mus. Prague, Nr. 2975.). Additional material: Czechoslovakia, Filipov 4 ♂♂ with the holotype. Germany: Erlangen (environments), X. 1950, 11 ♀♀ 20 ♂♂ reared by Postner from *B. lapidarius* attacked by "*Conops vittatus*"; Erlangen (environments), VII. 1942, 1 ♂ (Henze), "aus Hummelnest im Vogelnest", and some further specimens of the same origin in the Deutsches Entomologisches Institut in Berlin-Friedrichshagen.

Obviously the first author to mention (and describe) our species was de Meijere, 1904 (p. 162), who bred Chalcids of the "subtribe Pteromalinae" from adult *Bombus agrorum* parasitized by *Physoc. vittata* in Holland. In one case he received four specimens of the parasite that had bitten their way out through three holes in the puparium and the body wall of the bumble-bee, in another case there were 35 specimens that left the host by one hole only.

In 1947 Ghesquière recorded a "*Dirhcnus* sp. obtenu d'abeilles adultes" in France which perhaps also affects our species.

Most complete data on *Dirhcnus conopidarum* are those of Postner, 1951, who referred it as *Dirhcnus subcoeruleus* Thoms. At first I also suspected it that it might be the Thomson species, but when I received the type of *D. subcoeruleus* kindly lent me by Mr. Andersson from the University Zoological Institute of Lund, Sweden, the parasite of *Physocephala* proved to be specifically quite different, particularly in the male sex. Dr. Postner was kind enough to send me his material and so I could see that it belonged to the same species as the material reared in Bohemia.

According to his observations often more than 40 parasites develop in one Conopid puparium and quit it by one hole. The Conopids must be

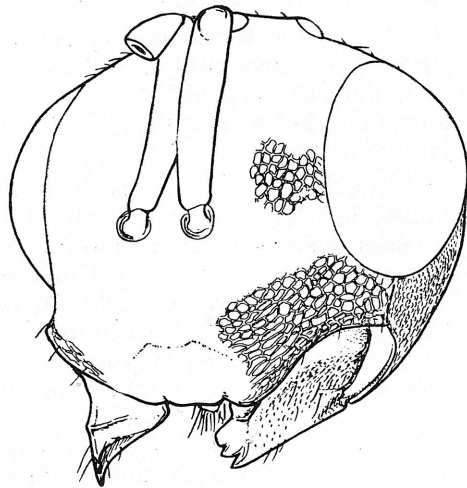


Fig. 1. *Dirhcnus conopidarum*, n. sp., head of male in an oblique dextro-anterior view; sculpture partly indicated.

attacked not long before the pupation as Postner did not find any Pteromalid larvae in the dissected Conopid larvae of the third stadium. As a rule the full-grown Chalcid larvae hibernate within the puparium of the host and emerge in Summer of the next year. Postner obtained the adults of most hyperparasites in Autumn of the same year which he ascribed to the stimulating influence of the room temperature.

Dr. Erdős wrote me several years ago about an interesting case of finding a Pteromalid that had been killed when boring out from the abdomen of a prepared *Bombus* in the collections of the Budapest Museum. Most probably also this specimen belonged to *Dirhichnus conopidarum*.

The species of the hyperparasite seems to be new to science by its name, but its generic classification may rouse some discussion. In the present genera of Pteromalidae it runs to *Dirhichnus*, where from the European species described in the genus probably only the type species, *D. separatus* (= *subcoeruleus*), is to remain. *Dirhichnus* was founded by Thomson in 1878 and originally five species were included: *subcoeruleus* Thoms., *heterotomus* Thoms., *sublaevis* Thoms., *subincrassatus* Thoms. and *magnicornis* Thoms. For a long time they had been little-known until the recent studies of the type material had shed some more light on them. The species *heterotomus* Thoms. belongs now to *Cyclogastrella* Bukowski, 1938, *sublaevis* Thoms. and *subincrassatus* Thoms. to *Tomicobia* Ashmead, 1899, (*n. combb.*) and are probably both the same as *T. rotundiventris* (Ruschka), and *D. magnicornis* Thoms. became the type species of the genus *Hylocomus* Graham, 1959. Kurdjumov, 1913 (p. 16), who according to his own words understood the range of *Dirhichnus* somewhat wider than Thomson, arranged into this genus four more species: *Pteromalus alboannulatus* Ratzeburg, 1852, *P. clandestinus* Förster, 1841, *P. complanatus* Ratzeburg, 1844, and *P. patulus* Walker, 1834. The first of these species became the type of the genus *Erdoesina* Graham, 1957, *P. clandestinus* Först. remains dubious until a reexamination of the type which was in the Vienna Museum several years ago according to a communication of Mr. Novitzky; according to the description its propodeum is "scharf 3kielig, vor der Spitze eingeschnürt" which does not match well our species. *P. complanatus* Ratz. is not identical with *Diglochis* (= *Trichoglenus*) *complanatus* (Thoms.) as stressed already by Kurdjumov, 1913, but is most probably a synonym of *Anogmus vala* (Walk.), and *P. patulus* Walk. is known now as the single European species of *Conomorium* Masi.

Thus from the described species only the type species, *D. separatus* (Först.), which is an earlier name for *D. subcoeruleus* Thoms. according to Delucchi, 1958, is known to belong certainly to the genus *Dirhichnus* now. *D. conopidarum*, n. sp. differs from it mainly by the unusual emargination of the mouth corners in male, shorter antennae with more numerous sensillae in female, vague plicae anteriorly, distinctly delimited nuchal triangle on propodeum, thinner veins of forewing, longer and slenderer tarsi, shortly protruding ovipositor, apart from some minor characters.

It could be suggested that the differences are great enough to allow erection of a new genus. I do not consider it sound, however, at the present level of knowledge when we lack any revision of the Pteromalid genera, or at least, a wider evaluation of the characters traditionally considered as generic

REFERENCES

- Delucchi V., 1958: Sinonimie nei Pteromalidi e descrizione di un nuovo genere (Hymenoptera: Chalcidoidea). — *Boll. Zool. agr. Bachicoltura*. (s. 2) **1**: 51—60.
 Ghesquière J., 1947: (Note on *Dirhicnus* sp.). — *Bull. Ann. Soc. ent. Belg.*, **83**: 235.
 Kurdjumov N., 1913: Notes on Pteromalidae (Hymenoptera, Chalcidoidea). — *Rev. Russe Ent.*, **13**: 1—24.
 Meijere J. C. H. de, 1904: Beiträge zur Kenntnis der Biologie und der systematischen Verwandtschaft der Conopiden. — *Tijdschr. v. Ent.*, **46**: 144—225, pls. 14—17.
 Postner M., 1951: Biologisch-ökologische Untersuchungen an Hummeln und ihren Nestern. — *Veröff. Mus. Natur-, Völker- u. Handelskunde Bremen*, **A2**: 45—86.
 Thomson C. G., 1878: Hymenoptera Scandinaviae, V. Pteromalus (Svederus) Continuatio. — Lundae, 307 pp., 1 pl.

V anglickém textu popisují nový druh rodu *Dirhicnus* z čeledi *Pteromalidae*. Materiál z Čech byl vychován ve Filipově u Čáslavi z dospělých čmeláků *Bombus lapidarius* L., napadených larvami endoparazita mouchy-očnatky z rodu *Physocephala* a předán mi laskavě kolegou M. Chválou. Ukázalo se, že tento druh sice nebyl dosud pojmenován a řádně popsán, ale že o něm již existují dosti podrobné bionomické údaje z Holandska (Meijere, 1904) a z Německa (Postner, 1951). Dr. Postner mi laskavě poskytl svůj materiál z okolí Erlangen vychovaný z *Conops vittatus* Meij. v *Bombus lapidarius* L.

Závěrem rozebírám stav taxonomie v rodu *Dirhicnus* Thoms. a vytyčuji znaky, jimiž se *D. conopidarum* n. sp. liší od již popsaných druhů, z nichž vlastně jen *D. separatus* (Först.) (= *subcoeruleus* Thoms.) do rodu patří.