

## VARIATION IN *OPIUS HIRTUS* FISCHER AND DISCUSSION OF *DESMIOSTOMA* FOERSTER (HYMENOPTERA: BRACONIDAE)

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*Abstract.*—The *bellus* species-group is removed from *Desmiostoma* and replaced in *Opius*. *Opius hirtus* Fischer, a member of the *bellus* group, is redescribed with emphasis on intraspecific variation in relation to different tephritid hosts.

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*Desmiostoma* was erected by Foerster (1862) for *Opius parvulus* Wesmael, but was characterized in key form only. Foerster (1862) separated *Desmiostoma* from what is currently accepted as *Opius* s.s. because of the absence of an occipital carina (Fischer, 1973, 1977).

*Desmiostoma* has usually been treated as a synonym of *Opius*, following Marshall (1891), Szépligeti (1904), and Gahan (1915). Fischer (1971) also treated *Desmiostoma* as a synonym of *Opius*, even though he used the combination *Desmiostoma parvulum* (Wesmael) in three papers appearing the previous year (Fischer, 1970a, b, c). Fischer (1973) formally recognized *Desmiostoma* by presenting a diagnosis and discussion of the genus, and erected the new tribe Desmiostomatini to include those genera and species in which the occipital carina is completely absent. Fischer (1977) presented a key to the 19 *Desmiostoma* species described from the New World, transferring many of these to *Desmiostoma* for the first time. Fischer (1977) also noted that *Desmiostoma* was a heterogeneous assemblage. The genus *Desmiostoma* has not been further discussed, and was not recognized as distinct by Wharton and Marsh (1978) pending more critical analysis of relationships within *Opius* s.l.

The *bellum* species-group of *Desmiostoma* contains several very closely related species characterized by the following apomorphic trends: 1) absence of sternaulus, notaulus, and mesonotal midpit; 2) 3rd discoidal segment reduced to a weakly sclerotized stub; 3) wings heavily infumated; 4) pronope (van Achterberg, 1975) well developed. In the type-species *D. parvulum*, however, the sternaulus is well developed, the notauli are represented by short transverse sulci anteriorly, the wings are nearly hyaline, and the pronope is not discernable. The *bellum* group further differs from the type species of *Desmiostoma* in having the recurrent vein antefurcal, the radiellian vein well developed, the genal sulcus absent or nearly so, the propodeum with a median longitudinal carina, and the mandible tapering only very gradually from base to apex. Additional characters useful for defining the *bellum* group, though shared with many other opiines, are: elongate second cubital cell; long, narrow stigma; clypeus weakly convex below, often with trace of median tooth; little or no opening between clypeus and mandibles; and described species primarily black and orange.



Although the shape of the clypeus and the lack of an occipital carina would seem to unite the *bellum* group with *D. parvulum*, the former is a plesiomorphic character state common to many braconid subfamilies and several opiine genera, and the latter is found in several tropical opiine genera (exhibiting parallelism within the Opiinae). The Neotropical *bellum* species-group is therefore removed from *Desmiostoma*. *Desmiostoma* is here restricted to the group of small leaf-mining parasitoids which lack an occipital carina and generally resemble *D. parvulum* in habitus. There are at least two undescribed species in North America.

There are at least 21 synonyms associated with *Opius* (Fischer, 1971). It is therefore preferable to replace the *bellus* species-group in *Opius* s.l. until the relationships among all Opiinae are better understood, rather than add yet another generic name at this time.

Eleven species are included here in the *bellus* group. Two, *Opius chromaticus* Fischer and *O. fiebrigi* Fischer, known only from males, cannot be adequately diagnosed. The remaining species can be superficially separated into species with short ovipositors (*O. campinaensis* Fischer, *O. cuencaensis* Fischer, *O. cuzcoensis* Fischer) and those with long ovipositors (*O. barrosensis* Fischer, *O. bellus* Gahan, *O. cingulaticornis* Fischer, *O. hirtus* Fischer, *O. johannis* Fischer). Other characters used to separate these species have been limited to coloration and density of pubescence (Fischer, 1977).

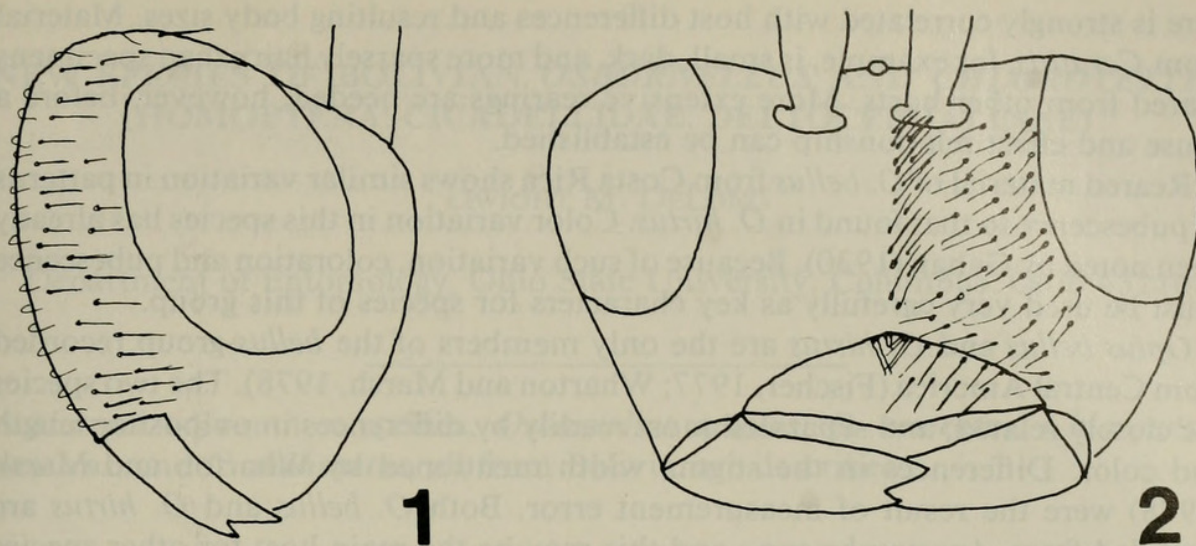
### *Opius hirtus* Fischer

*Opius* (*Opius*) *hirtus* Fischer 1963: 376.

*Opius hirtus* was originally described from the Dominican Republic (Fischer, 1963). Wharton and Marsh (1978) added Costa Rica to its range. Additional specimens from Central America have since been found, and a brief description of *O. hirtus* is presented to illustrate variation in key characters exhibited by this material. A diagnosis is also provided to distinguish *O. hirtus* from other members of the *bellus* species-group.

Description.—Eye bare; frons with longitudinal rows of 4–6 hairs on each side between eyes and ocelli; occiput and temple moderately hairy (Fig. 1); malar space bare; face densely hairy (Fig. 2). Lower border of clypeus medially varying from very weakly convex to more strongly so with toothlike apex (Fig. 2); when more strongly convex medially, entire lower border appears sinuous as in *Doryctobracon*. Mandible gradually tapering from base to apex; lower tooth distinctly shorter than upper, and twisted so as to lie ventral-mesad of upper tooth. Antenna 38–46 segmented, number of segments increasing only very slightly with body length; antenna slightly longer than body; basal flagellomeres nearly twice longer than wide, succeeding segments gradually shorter; hairs short, decumbent, length less than segment width. Maxillary palp a little shorter than head height. Mesonotum somewhat densely hairy anteriorly and along lateral borders, more sparsely hairy along posterior border, central disc variable, from bare or nearly so in some specimens to 2–3 rows outlining each notaular area in other specimens. Scutellum more sparsely hairy medially than around border; density of hairs varying among specimens. Mesopleuron densely hairy above midcoxa, moderately hairy along anterior and dorsal margins, sparsely hairy medially. Metanotum along midline very short, almost vertical; metapleuron densely hairy throughout. Propodeum with lateral carinae distinct, confluent with propodeal spiracle. Stigma of forewing





Figs. 1, 2. *Opius hirtus*. 1, Side view of head showing moderately hairy temples between occiput and eye. 2, Front view of head showing densely hairy face on specimen with clypeus nearly toothlike at apex.

about  $5\times$  longer than wide; 3rd discoidal segment present as a very short pigmented and sclerotized stub, though distinctly longer in one specimen; postnervellus a weakly pigmented crease extending half way to wing margin. Petiole nearly as long as apical width,  $1.7\text{--}2.0\times$  wider at apex than at base, apical width  $2.4\text{--}4.0\times$  maximum height; petiole bicarinate, the carinae weakly to very strongly converging medially, carinae unusually well developed on one specimen; spiracle at or just beyond midlength, situated mesad of weak, dorsal-lateral carina. Total ovipositor length slightly more than twice that of thorax. Color of head varying from uniformly black, to orange with only frons, occiput, and vertex darkened; palps light brown to white; female abdomen orange to yellow, male with terga 4–8 brown to dark brown; coxae yellow in Belize specimens, black with base of forecoxa pale in others; rest of legs varying from yellow on tarsi of foreleg of male (female slightly darker) to black on all tibiae and femora. Length: 3.5–5.5 mm.

Material examined.—DOMINICAN REPUBLIC, Mt. Diego de Ocamp, 3–4000 ft., July '38 (1 ♀, holotype, Museum of Comparative Zoology). BRITISH HONDURAS (= BELIZE), Stann Creek, Oct. '70 (2 ♀, 1 ♂). COSTA RICA, San José, VII-59, from guava (1 ♀); San José (1 ♀); Puntarenas, San Vito, June 6, 1980, from coffee (1 ♀, 1 ♂).

Diagnosis.—*Opius cingulaticornis* differs from *O. hirtus* in the possession of a pale subapical ring on the antenna, a more uniformly hairy mesonotum, and pale rather than dark legs. *Opius johannis* is more densely hairy than *O. hirtus*, has a relatively large basal cell (and shorter recurrent vein), and the thorax is black. *Opius bellus* is more similar to *O. hirtus*, but has a distinctly shorter ovipositor ( $1.6 \pm 0.1\times$  longer than the thorax,  $n = 5$ ). *Opius barrosensis* is also very similar to *O. hirtus*, but the head and legs are not black and the mesonotum is not uniformly pale.

Specimens of *O. hirtus* examined for this study were reared from *Anastrepha* sp., *Toxotrypana curvicauda* Gerstaecker, and *Ceratitis capitata* (Wiedemann) (Tephritidae). The observed variation in coloration, pubescence, and petiole sculp-



ture is strongly correlated with host differences and resulting body sizes. Material from *Ceratitis*, for example, is small, dark, and more sparsely hairy than specimens reared from other hosts. More extensive rearings are needed, however, before a cause and effect relationship can be established.

Reared material of *O. bellus* from Costa Rica shows similar variation in patterns of pubescence to that found in *O. hirtus*. Color variation in this species has already been noted by Gahan (1930). Because of such variation, coloration and pubescence must be used very carefully as key characters for species of this group.

*Opius bellus* and *O. hirtus* are the only members of the *bellus* group recorded from Central America (Fischer, 1977; Wharton and Marsh, 1978). The two species are closely related, and separated most readily by differences in ovipositor length and color. Differences in the stigma width mentioned by Wharton and Marsh (1978) were the result of measurement error. Both *O. bellus* and *O. hirtus* are recorded from *Anastrepha* spp.; and this may be the main host for other species of the *bellus* group.

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