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Taxonomical Studies on Some Species of the Subgenus Glabrobracon Fahr. (Genus Bracon Fabr.) (Hymenoptera, Braconidae)

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Critical Remarks on Rostro- and Cyanopterobracon Taxa

The subgenus *Glabrobracon* was created by Fahringer in 1928, to segregate all species having a smooth abdomen, relegated hitherto to the genus *Bracon* Fabr. Tobias contests (1958, p. 75—77) whether *Glabrobracon* Fahr., as a systematical unit, is also a phylogenetically natural group. In his opinion, the foremost objection against the naturality of the group is that the „subgeneric characters" of the species contained therein are considerably varying. He substantiates his assertion by pointing out that the same species occur in two or eventually three of Fahringer's subgenera. Verily, the same species often occur in the keys of identification of some genera, but it is seldom that we meet the same species in more than one subgenus (e. g. *B. epitriptus* Marsh.).

The subgeneric character of the *Glabrobracon* species, namely the smoothness of the tergites, is rather varying. One might also say that some species have not quite attained their distinctness yet, but will probably gain the acmic phase of specific evolution in the geological present (Haeckel). However, one can establish the fact, on the basis of our information up to date on the state of species and variability, that if any of the abdominal tergites (especially tergites 1—3) be punctate or rugose, it is never of a rate or extension that it recalls any sculptured species, — hence relegable to another subgenus. At the same time, some of the features are often variable to an extent that it is almost impossible to characterize some species unequivocally. Bet it never occurs even in the case of such species that one (or more) features should indicate a relegation to another subgenus.

According to Fahringer, the species reallocated by Tobias (1958) into the new subgenera *Rostrobracon* and *Cyanopterobracon* still belong to the subgenus *Glabrobracon*. *Rostrobracon* contains solely *B. urinator* Fabr., while *Cyanopterobracon* includes the following species occuring also in the Carpathian Basin: *B. fallax* Szépl., *B. falsus* Kok., *B. illyricus* Marsh., and *B. sabulosus* Szépl. Tobias assigned herein also the species *B. armeniacus* Tel., *B. mauritanicus* Schm., *B. oculatus* Tel. and *B. spectabilis* Tel. The genus *Rostrobracon* is distinguished by the beak-shaped (*rostrum*) inferior labium; the ocelli occupy the three corners of an obtuse-angled triangle, the composite eye is projecting, and the median lobe of the mesonotum is hump-like. The genus *Cyanopterobracon* can be characterized by the long, dense, and dark pubescence of the body, the long antennae, the smoky wings and the groove between tergites 2 and 3. I have to remark in general that there is a tendency in Tobias's (1958) whole paper that the subgenera be made

distinct by a network of features which should be useful not only from a practical point of view (identification) but also to designate a group more or less uniform from a phylogenetical standpoint. This endeavour should be valued the more as it is TOBIAS himself who states, summarizing the assertions of several earlier and contemporaneous authors, that „the subtribe *Braconina* is rather poor in structural features..." (p. 76). No matter how well characterized the subgenera *Rostrobracon* and *Cyanopterobracon* seem to be, it is not necessary to distinguish them from the subgenus *Glabrobracon*. The features which segregate the two subgenera from *Glabrobracon* are neither profound nor as early (measured by geological terms) as the smoothness of the abdomen. The complete absence of sculpture as well as the phylogenetically rather forward-pointing trend of (however slight) sculpture — once it does appear — permeate all *Glabrobracon* species to such an extent that if it seems advisable to segregate one or more smaller groups form it, this should be done within the frames of the subgenus proper. Let us therefore designate the subgenera *Rostrobracon* and *Cyanopterobracon* as cohorts (DUDICH. 1952), thereby establishing a systematical classification which expresses adequately their close phylogenetical alliance.

It is not my task to decide whether the systematical separation of the cohorts *Rostrobracon* and *Cyanopterobracon* be justified or not. As I have already mentioned, the cohort *Rostrobracon* is monotypical with *B. urinator* FABR. Its three characteristics: the wide base of the field of ocelli, the shape of the rostrum, and the absence of the furrow between tergites 2 and 3, might be interpreted as specific rather than cohortic ones. Indeed, they cannot be regarded as cohort-features, in special view of the fact that both cohorts are particularly well characterized by the long, dense, and dark pubescence of the body, — this singular phenomenon setting them apart as a separate group within the whole genus *Bracon!* Moreover, their wings are dark smoky, but this feature can be met with also in some other species. The development of the pubescence and the fumosity of the wings are probably connected with their ecological requirements and geographical range. They are decidedly Pontic, Ponto-Mediterranean or Mediterranean species and they adhere strictly to steppe or shrubwood habitats. In general, they live in plain or hilly regions with a high amount of insolation. We are familiar with species, both in the vegetable and animal kingdoms, whose body is covered (in various rates) with hairs, due to the effects of the strong and protracted sunshine. The idea is therefore obvious that the strong pubescence of the species in question had also been brought about by the hot sunshine. I made these suggestions only for the sake of emphasizing the common orismological and ecologic-geographical properties of the *Rostrobracon* and *Cyanopterobracon* species. In my opinion, the common features permeate so far the species of the two cohorts that their distinguishing characters do not meet the requirements of even a thirdrate category, namely those of a cohort. I cannot but question the necessity of upholding the two cohorts; in other words, the *Rostrobracon* species, *B. urinator* FABR., ought to be reallocated to the cohort *Cyanopterobracon*. As a systematical unit, the cohort *Cyanopterobracon* TOBIAS demonstrates as well the phylogenetical unity of the species it contains.

Taxonomical Studies on the Species of the Cohort Cynapoterobracon Tobias Occurring in the Carpathian Basin

As I mentioned in the first chapter, there live the following *Cyanopterobracon* species in the Carpathian Basin: *B. urinator* FABR., *B. fallax* SZÉPL., *B. falsus* KOK., *B. sabulosus* SZÉPL., and *B. illyricus* MARSH. Though they can be distinguished rather well by reason of their coloration, I still consider it meritorious to construct a key of identification, comprising the most characteristical sculptural and other (not color) differences. I submit also a detailed description

of the species subsequently to the key. In my judgement, coloration is never a sure specific feature in this group, and therein I concur with several authors who have also established its very considerable variability.

Identification key of *Cyanopterobracon* species

1 (2) No furrow between tergites 2 and 3; if present, not deep. Second cubital cell of wing elongated, 2.5 times longer than broad (fig. 1). Traces only of parapsidal furrow on mesonotum. Ovipositor almost as long as body. Head, that is, mesonotum and scutellum yellowish-red. Abdomen yellowish-red, in general tergites 1—4 (—5) black-spotted in various extension. Length: 4.5—6 mm. 1. **B. urinator** FABR.

a (f) Third femur and tibia a vivid reddish-yellow, only detally black.

b (e) Head black

c (d) Thorax preponderantly reddish-yellow (only sternum black), abdomen completely reddish-yellow. Only female known **B. urinator** var. **syriacus** FAHR.

d (c) Thorax black, only mesonotum yellowish-red. Tergites 1—5 (—6) with black spots. Only male known **B. urinator** var. **ruficoxa** var. n.

e (b) Head reddish-yellow, with black spot only around scape. Thorax also reddish-yellow, sternum and propodeum black. Only female known **B. urinator** var. **marshalli** FAHR.

f (a) Legs always black, at most femur 3 or tibia 3 smoky red

g (j) Thorax completely black.

h (i) Whole body black, sternites a smoky dark yellow. A small-bodied variety: 3.5—4 mm. Only male known **B. urinator** var. **nigrator** FAHR.

i (h) Abdomen yellow, in general all tergites with black spots. Both sexes known **B. urinator** var. **brevivalvis** FAHR.

j (g) At most mesonotum yellowish-red.

k (l) Generally three (sometimes only one) dark spots on yellowish-red mesonotum. Scutellum in general black. Last segment always black. Only male known **B. urinator** var. **trim aculata** var. n.

l (k) Mesonotum yellowish-red, not spotted with black

m (n) Thorax yellowish-red, sternum and metanotum (eventually only with spots) black. Third femur and tibia smoky rufous. Abdomen wholly yellowish-red. Only female known **B. urinator** var. **flaviventris** FAHR.

n (m) Thorax black, only mesonotum yellowish-red. Proximal half of tibia 3 rufous. Tergites 1—5 (—6) with black spots. Only male known **B. urinator** var. **medius** Fahr.

2 (1) Furrow between tergites 2 and 3 present. Parapsidal furrow generally well visible. Ovipositor generally as long as, or shorter than, half of abdomen.

3 (4) Parapsidal furrow in traces only. Margin of tergite 1 as wide as half length of projecting portion (fig. 5). Posterior margin of tergite 2 straight. Ovipositor shorter than half of abdomen. Length: 5.5 (—6) mm. 2. **B. fallax** SZÉPL.

4 (3) Parapsidal furrow deep.

5 (6) Second cubital cell short (as compared to those of other taxa), 1.6—1.8 times longer than its median width (fig. 2). Posterior margin of tergite 2 twice arched. Antennae with 52—55 (female), that is, with 56—58 (male) joints. Head and thorax black, mesonotum yellowish-red. Abdomen yellowish-red, projection of tergite 1 and last segment black. Length: 5.5—7.5 mm. 3. **B. sabulosus** SZÉPL.

6 (5) Second cubital cell long (as compared to that of preceding species), 2.3—2.6 times longer than its median width. Posterior margin of tergite 2 not arched.

7 (8) Margin of tergite 1 wide, at least as wide as half length of projecting part. Basal vein of first discoidal cell not as long as cubital vein (Cu_1, Riegel). Ovipositor shorter than half length of abdomen. Head black, thorax yellowish-red, sternum and propodeum black. Abdomen yellowish-red, spot of projecting part of tergite 1 and last segment black 4. **B. falsus** KOK.

8 (7) Margin of tergite 1 narrow, at most half as long as quarter length of projecting part (figs. 6—7). Basal vein of first discoidal cell almost as long as cubital vein (Cu_1, Riegel) (fig. 3). Ovipositor almost as long as half length of abdomen. Head and thorax black, abdomen yellow, spot of projecting part of tergite 1 and last segment black 5. **B. illyricus** MARSH.

Bracon urinator FABRICIUS, 1798

Body stout, average ratio of thorax and abdomen 2 : 3. Ratios of thoracic length, hight and width (measured between tegulae) 2 : 2 : 1.1, Antenna 32—43-jointed, generally somewhat longer than head and thorax combined. Characterization of wing venation (fig. 1) : nervulus interstitial, first discoidal cell short, ratio of veins M and Cu_1 (delimiting cell) 10.5 : 11, second cubital cell long, 2.6—2.8 times longer than wide, wing dark smoky brown. Parapsidal furrow absent or in traces only. Tergite 1 somewhat angular at beginning of constriction. No furrow between tergites 2 and 3 (figs. 8—9). Hypopygium always extending beyond end of abdomen, generally broad (in accordance with dorso-abdominal plane). Ovipositor almost as long as body: 4—4.5 mm. Color of body: head,

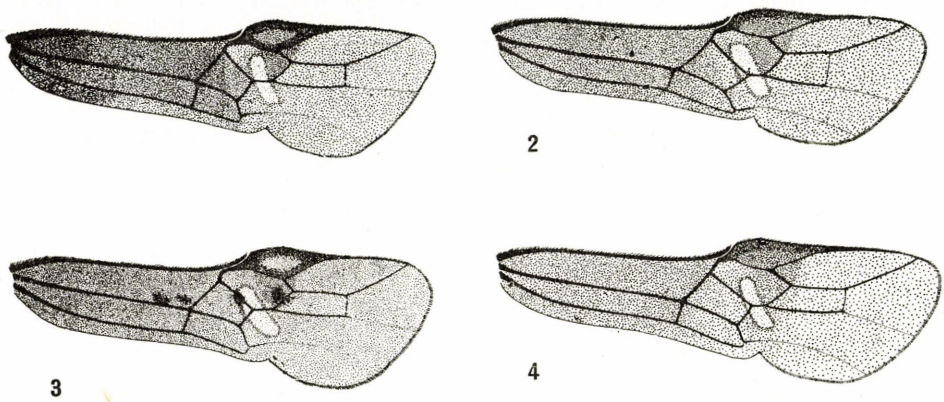

Fig. 1. *Bracon urinator* FABR. Right fore wing. — Fig. 2. *Bracon sabulosus* SZÉPL. Right fore wing. — Fig. 3. *Bracon illyricus* MARSH. Right fore wing. — Fig. 4. *Bracon fallax* SZÉPL. Right fore wing

antennae, palpi, legs (posterior tibia rufous), sternum, metanotum, spots (distally narrowing) of tergites 1—3 or 1—4 black. Mesopleurae of males usually black. Pro-, mesonotum, scutellum, mesopleura (eventually metapleura) yellowish-red.

Length of body: 4.5— 6 mm.

The nominate form, together with all its varieties, inhabits the Palaearctic Region.

Variations:

var. **marshalli** FAHR. (= var. 4. MARSH., = var. 1. SZÉPL.).

Head yellowish-red, with black spots only around scape. Whole mesopleura yellowish-red. Third femur and tibia yellowish-red, distal ends black. Wing light smoky brown. Range: One female specimen known from Croatia. (Zengg = Senj).

var. **syriacus** FAHR. (= var. 3. SZÉPL.)

Whole thoracic side and mesonotum yellowish-red. Abdomen completely yellowish-red. All tibiae and femur 3 blackish-rufous. Range: one female specimen known from the southern Carpathian region (Versec = Vrsac).

var. **flaviventris** FAHR. (= var. 2. SZÉPL.)

Whole thoracic side yellowish-red, metanotum black (spotted). Whole abdomen yellowish-red. All tibiae and femur 3 blackish-rufous. Mandibles, genae and oral parts yellowish-red, sometimes inner (and outer) margins of eyes and occiput lighter. Range: one female known from the southern Carpathians (Boksánbánya = Bocşan).

var. **medius** FAHR. (= var. 5. SZÉPL.)

Only mesonotum of thorax yellowish-red. Tergites 1—5 (—6) of abdomen spotted with black. Range: in the Pannonicum and the Matricum adjacent to the Pannonic district.

Note: Contrarily to SZÉPLIGETI (1901; p. 187), only the male of this variety is known.

var. **ruficoxa** var. n.

Pubescence not black but light. Only mesonotum of thorax yellowish-red. Third femur and tibia yellowish-red, distal ends black (similar to var. marshalli). Range: one male specimen known from Croatia (Zengg = Senj).

var. **trimaculata** var. n.

Thorax black, with three (sometimes only one) black spots on yellowish-red mesonotum. Last abdominal segment black. Range: sporadically in the Pannonian district, and collected in one locality in the Matricum and the Carpathicum each.

var. **brevivalvis** FAHR. (= var. 2. MARSH., = var. 6. SZÉPL.)

Whole thorax black. Shape of first discal cell resembling that of *B. illyricus* MARSH. Generally tergites 1—6 (females), that is, 1—7 (males) spotted with black. Abdomen light yellow instead of yellowish-red. Parapsidal furrow sometimes distinct (again resembling *B. illyricus* MARSH.). Range: in the whole Carpathian Basin with exception of the high mountainous areas.

var. **nigrator** FAHR. (= var. 8. SZÉPL.)

Body completely black, conspicuously short, only 3.5—4 mm. Range: one male specimen known from the Matricum and the adjacent Pannonic district each.

Bracon fallax SZÉPLIGETI, 1901

Body stout, ratio of length of thorax and abdomen 2.5: 3. Ratio of thoracic length, hight, and width (measured between tegulae) 2.5: 1.5: 1.1 Ratio of length and greatest width of abdomen 3: 1.3 Antennae somewhat longer (males) or shorter (females) than body. Number of antennal joints 43—45, single joints shorter than (females) or as long as (males) wide. Parapsidal furrow hardly impressed. Venational characters (fig. 4): nervulus interstitial, first discoidal cell long, ratio of M and Cu_1 (Riegel) veins (delimiting cell) 10: 15.5; wing

smoky brown. Margin of tergite 1 as wide as half length of projecting part. Distal margin of tergite 2 straight (fig. 5). Ovipositor (viewed from above) shorter than half of abdomen (3: 1), 1—1.1 mm long. Color of body: head, antennae, palpi, scutellum, metanotum, lower half of mesopleura, spot of tergite 1, coxae and trochanters black, tarsi smoky; pro- and mesonotum, upper half of mesopleura, legs (excepting smoky tarsi) and whole abdomen yellowish-red.

Length of body: 4.5—6 mm.

Probably an endemic species of the Carpathian Basin: collected only around Budapest and Németboksán (= Bocşan).

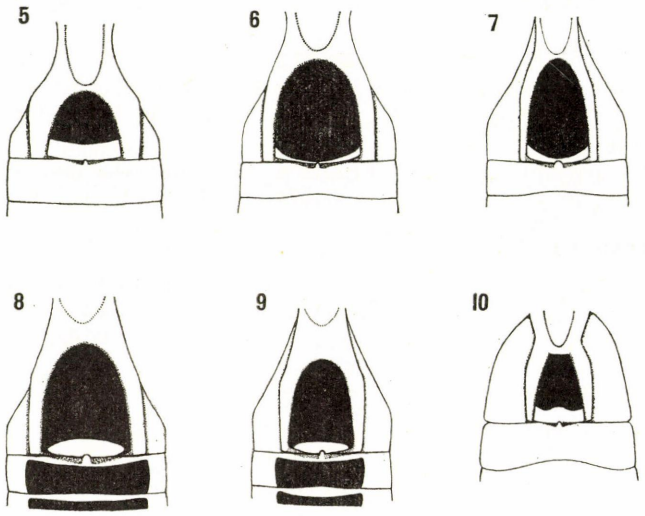

Fig. 5. *Bracon fallax* SZÉPL. Tergites 1—2 (♀ and ♂). — Fig. 6. *Bracon illyricus* MARSH. Tergites 1—2 (♀) — Fig. 7. *Bracon illyricus* MARSH. Tergites 1—2 (♂). — Fig. 8. *Bracon urinator* FABR. Tergites 1—2 (♀). — Fig. 9. *Bracon urinator* FABR. Tergites 1—2 (♂). — Fig. 10. *Bracon sabulosus* SZÉPL. Tergites 1—2 (♀ and ♂)

Bracon falsus KOKUJEV, 1913

Body not stout, ratio of thoracic and abdominal lengths: 2.3: 3. Ratio of thoracic length, height, and width (measured between tegulae) 2.3: 1.5: 1.1 Ratio of length and greatest width of abdomen 3: 1.3—1.4. Number of antennal joints 43—45 (females); no males collected yet within Carpathian Basin (52—jointed, according to TELENGA, 1936: 189). Antenna of females shorter than body (and also than that of *B. fallax* SZÉPL.). Parapsidal furrow conspicuously impressed in almost its total length (contrarily to *B. fallax* SZÉPL.). Venation of wings similar to that of *B. fallax* SZÉPL. Shape of tergite 1 resembling that of *B. fallax* SZÉPL. Distal margin of tergite 2 slightly incised (contrarily to *B. fallax* SZÉPL.). Ovipositor, viewed from above, shorter than half length of abdomen: 1—0.9 mm long. Color of body as in *B. fallax* SZÉPL., except yellowish-red scutellum.

Length of body: 5.5 (—6) mm.

Range: in the European parts of the Soviet Union and in Hungary (Őrszentmiklós, Sződ).

Bracon sabulosus SZÉPLIGETI, 1896

Body slender, ratio of length of thorax and abdomen 2: 2.5. Ratio of thoracic length, height, and width (measured between tegulae) 2: 1.7: 1.1. Ratio of length and greatest width of abdomen 3.5: 1.2. Antennae as long as (females) or slightly longer than (males) body. Number of antennal joints 52—55 (females), that is, 56—58 (males). Parapsidal furrow deeply impressed. Venational characters (fig. 2): nervulus approximately interstitial, first discoidal cell long, ratio of M and Cu_1 veins (Riegel) 11: 13, second cubital cell short, 1.6—1.8 times longer than its width measured at its middle; wing smoky brown. Sternite 1 (viewed from above) joins broadly tergite. Distal margin of tergite 2 with two arches (fig. 10). Ovipositor, viewed from above, shorter than half length of abdomen: 1.5—1.6 mm. Color of body: head, antennae, palpi, thorax (except mesonotum), legs, spots of first and last tergites black; mesonotum, and abdomen (except black spots) yellowish-red.

Length of body: 5.5—7.5 mm.

Range: Hungary, Roumania, Yugoslavia, the Soviet Union (Ukraine, Kasahstan), Iran. It was collected in three localities in the Carpathian Basin.

Bracon illyricus MARSHALL, 1888

Body somewhat stout, ratio of length of thorax and abdomen 2.1: 3. Ratio of thoracic length, height, and width (measured between tegulae) 2.1: 1.5: 1. Ratio of length and greatest width of abdomen 3: 12—1.3. Antennae almost as long as body, 50—55-jointed. Distal section of parapsidal furrow deep, merging proximally almost without transition into surface, — yet three lobes of mesonotum amply projecting. Venational characters (fig. 3): proximal vein of stigma joining first discoidal cell shortly and vertically, two longitudinal veins (R_2 and M, Riegel) of second cubital cell slightly arched, first discoidal cell but slightly longer than in *B. urinator* FABR, ratio of veins M and Cu_1 (delimiting cell) 10.5: 13. Side of tergite 1 curved and rounded off at beginning of constriction (a difference against *B. urinator* FABR). Ratio of length and width of tergite 1 (females) 3:4, that is, (males) 2:4 (figs. 6—7). Furrow present between tergites 2 and 3, and distal margin of tergite 2 slightly arched (contrarily to *B. urinator* FABR.). Ovipositor viewed from above almost as long as half length of abdomen, 1.4—1.5 mm. Color of body: head, antennae, palpi, thorax, legs, spot of first and last tergites black; abdomen (excepting spots mentioned above) yellow (this hue resembling that of B. urinator var. brevivalvis Fahr.).

Length of body: 5.5—6 mm.

Range: the Balkan Peninsula (Dalmatia, Albania), the Crimea, the Armenian SSR (around Tiflis), Hungary. It is known from two localities in the Carpathian Basin (Budapest and Máriagyüd).

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