ANNALES HISTORICO-NATURALES MUSEI NATIONALIS HUNGARICI
Tomus 52. PARS ZOOLOGICA 1960.

A Revision of the Tribe Braconini Ashm. from the Carpathian Basin (Hymenoptera, Braconidae)

By J. PAPP, Veszprém

The first paper on the Braconini was published at the beginning of the last century (Nees 1834). In the second half of it and at the beginning of the present one, however, three authors revised or catalogized this tribe (Förster 1862, Marshall 1888—1897, Szépligeti 1904). The last one to study the Palearctical Braconini species was Fahringer. He compiled identification keys, gave detailed descriptions of every species, their distribution and furnished ethological data. On the other hand, Muesebeck (1951) summarized the species of the Nearcticum in a catalogue.

In Hungary, Szépligeti (1896) was the first to publish contributions; later Mocsáry (1897) enumerated 21 species without *Bracon* F. in the Fauna Regni Hungariae. This catalogue was completed by Szépligeti's further papers (1897, 1899), and by the studies of Győrfi (1941, 1943—44, 1953), L. Móczár (1938, 1941), and Starý (1956, 1957). Each of them increased our knowledge giving new data on localities, hosts and ethology.

In the last four decades, there were several investigators working on Braconidae, incl. Braconini. W. Hellén (Helsinki) recorded the species collected in Finnland and added his critical remarks (1927, 1957). N. A. Telenga (Kiev) published identification keys and detailed characterizations of the species found in the Soviet Union (1936): later he grouped the species from the point of view of zoogeography (1952). Recently Tobias studies taxonomically and phylogenetically (1957) the Braconinae species of the Soviet Union. Finally, Starý deals in Czechoslovakia with this Hymenopteran group (1956, 1957, 1958). — I express my thanks to all who favoured me with their opinion on taxonomically dubious species.

My study is based on the Braconini-collection of the Zoological Department of the Hungarian National Museum, but the Hungarian and foreign contributions and revisions, mentioned previously, were also taken into consideration. Summarizing all these, I prepared the identification keys for the genera and species, and give their distribution in the Palearcticum and within the Carpathian Basin. Under the heading "Critical remarks to some species" I put forth some observations of my own concerning the taxonomical position of certain species. It is here that I must mention that though Szépligeti (1901) and Fahringer (1928) set up identification keys, a new one seems to be necessary. The authors mentioned based their key-system mostly on colour, but considering the available material it is quite clear that colour is greatly variable even within a single species. Therefore I tried to prepare my keys on the ground of sculptural markings. — I did not take into account the genus *Bracon*, for it has an exceedingly high number of species whose taxonomical position needs further and thorough investigations.

Tribus Braconini Ashmead

A round pit between clypeus and mandibles. Margin never in occipital region. 2. cubital cell quadrangular, longer than wide. Submedial vein interstitial.

Key to genera

1 (4) Radius short: radial vein reaches edge of wing approximately in middle between stigma and end of wing. Sculpture of tergites generally lined or granulated. Ground-colour of body reddish-yellow or yellowish-red. Always three black spots on mesonotum.

2 (3) Sculpture of tergites granulated though sometimes smooth. Edge of clypeus with golden yellow hairs but these not „paint-brush"-like. No central field on tergite 2. or hardly visible. Tergites 2. and 3. with lateral fields 1. **Glyptomorpha** Holmgr.

3 (2) Sculpture of tergites radially rugulose or smooth. Golden yellow hairs form two "paint-brushes" on edge of clypeus. Both central and lateral fields visible on tergites 2—3. 2. **Vipio** Latr.

4 (1) Radius long : radial vein almost reaches end of wing. Rugosity of tergites irregular. Thorax generally black, abdomen red, yellow, brownish-yellow or whole body unicoloured.

5 (6) Claws swollen, that is, 5th joint of tarsus 2—3. almost as long as joints 2—4. Head and thorax black, only clypeus, cheek and mandibles yellow. Tergite 1. rugulose. Tergite 2. and proximal half of 3., densely and very finely punctate 3. **Baryproctus** Ashm.

6 (5) Claws neither swollen nor long. Head usually unicoloured.

7 (10) Joints 2. and 3. of antenna of equal length. Body, except legs, black or head and thorax light brown and abdomen yellow.

8 (9) Tergites 1—3. rugulose. Tergite 2. without furrow. Head, thorax, abdomen black, legs yellow 4. **Syntomomelus** Kok.

9 (8) Every segment of abdomen smooth and shiny. Oblique furrow of lateral side of tergite 2. reaches distal border of same. Colour of body light, though head and thorax darker than abdomen 5. **Coeloides** Wesm.

10 (7) Joint 2. of antenna shorter than 3. Head and thorax usually black, abdomen red, reddish-yellow, yellowish red, yellow, eventually black spots.

11 (12) Abdomen wider than thorax. Head and thorax black or thorax spotted with red, abdomen always red. Proximal edge of tergites 3—5. always with wide and crenulated furrow 6. **Iphiaulax** Först.

12 (11) Abdomen as wide as thorax. Abdomen not red.

13 (16) Central field of tergite 2. well separate from its surroundings.

14 (15) Fovea of forehead wide between scapus and ocelli. Tergite 1. one-and-a-half times longer than wide. Abdomen always vivid yellow 7. **Atanycolus** Först.

15 (14) Fovea of forehead narrow between scapus and ocelli. Tergite 1. somewhat longer than wide. Abdomen yellow or brown 8. **Ipobracon** Thoms.

16 (13) At least distal half of central field of tergite 2. indistinct.

17 (18) Proximal half of central field of tergite 2. rather protruding, but distal half indistinct. Inner and outer side of first discoidal cell approximately equal i. e. 0,7—0,8 mm long. Head and thorax black, abdomen vivid yellow. Wing darkly fumose 9. **Cyanopterus** Hal.

18 (17) Central field of tergite 2. in traces only. Inner side of first discoidal cell nearly twice as long as outer side (0,6—0,7 : 0,4—0,45 mm). Colour of head, thorax, and abdomen variable. Wing either fumose or not 10. **Bracon** F.

Genus **Glyptomorpha** Holmgrén, 1868

Key to species

♀♀

1 (6) Ovipositor shorter than abdomen.

2 (3) Tergite finely and dispersely punctate. Whole of tergites 3—7. smooth and shiny. Occiput black, scutellum, metanotum, and mesosternum completely black. Coxa, trochanter, femur, tibia 2—3. and tarsus 3. black, other parts of legs light. Proximal half of plate of tergite 1. black. Ground colour of abdomen reddish-yellow. Ovipositor scarcely longer than half of abdomen. Length 6—7 mm. — Range : Sicily, Italy. In the Carpathian Basin, collected only in Budapest. Rare 1. **sicula** Marshall, 1888

3 (2) Tergites 2—4. always densely punctate. Occiput never black. Yellowish-red might occur on legs. Ground colour of abdomen yellowish-red.

4 (5) Plate of tergite 1. almost smooth. Central field of tergite 2. well observable. Antenna 28—35-jointed. Pro-, mesosternum, scutellum, and metanotum black. Femora 2—3.

black. End of tibia 3. and distal half of tarsal joints black. Other parts of legs yellowish-red, but black and yellowish-red markings without distinct contours. Length 5—6,5 mm. — Range: Central- and South-Europe, South-Ukraine, Caucasus, Turkestan. In the Carpathian Basin, it occurs on the steppes of the Pannonicum and on the wooden steppes of the Matricum; whilst we have but one record from the Illyricum and Carpathicum 2. **umbraculator** Nees, 1834

5 (4) Plate of tergite 1. rugulose (fig. 1.). Central field of tergite 2. scarcely visible. Antenna 42—43-jointed. Pro-, mesosternum, scutellum, and metanotum with black spots. Femora 2—3. yellowish-red, with ends, however, black. End of tibia 3. and distal half of joints of tarsus 3. black. Other parts of legs yellowish-red, black, and yellowish-red, with sharp contours. Length 5,5—7,5 mm. — Range: Caucasus, Ukraine, Central- and South Europe, North-Africa. In the Carpathian Basin, it occurs equally in the Pannonicum and in the Matricum, but it is found sporadically in all other areas. A supposedly euryök-eremophilous species 3. **castrator** Fabricius, 1798

6 (1) Ovipositor longer than body.

7 (10) Base and side towards hind wing of discoidal cell 1. almost equal in length. Border of black spot on mesosternum straight (fig. 4.). All coxae black. Always black spots on sternites. Distal margin of tergite incised.

8 (9) Length of body at least 8 mm, generally 10 mm. Ovipositor twice as long as body: 18—22 mm. Rostrum 1—1,1 mm, sometimes 0,5—0,6 mm. Punctation and rugosity of tergites 1—3. somewhat rough in comparison with those of *Gl. gracilis*. Scutellum and metanotum yellowish-red. Stigma brownish-black, its base vivid yellow. Coxae 1—3. and trochanter black, other parts of legs yellowish-red. Length 8—12 mm, generally 10 mm. — Range: France, Czechoslovakia, South-Europe, Ukraine, Grusia, Azerbeidsan, Turkmenia. It occurs sporadically in the Carpathian Basin. Stenök-eremophilous 4. **desertor** Fabricius, 1775

— Base of femur 2., femur 3. wholly, and end of tibia 3., black or dark. **desertor** var. **intermedia** Szépligeti, 1901

9 (8) Length of body never longer than 8 mm. Length of ovipositor one-and-a-half of body-length: 11—12 mm. Rostrum short: 0,5—0,6 mm. Punctation and rugosity of tergite 1. not rough in comparison with *Gl. desertor*. Scutellum and metanotum black. Stigma unicoloured: brownish-yellow. Coxa 1., trochanter, and base of femur black, other parts yellowish-red. Legs 2—3. black, with exception of somewhat lighter base of tibia. Length 7—8 mm. — Range: Sweden, Ukraine, Turkestan. In the Carpathian Basin, it is known from one locality in the Pannonicum and from two in the Matricum. Rare 5. **gracilis** Szépligeti, 1901

10 (7) Posterior side of discoidal cell 1. longer than its base. Border of black spot of mesosternum not straight. Coxa reddish-yellow, only coxae 2—3. black-spotted. Sternites without black spots. Distal margin of tergite 3. straight.

11 (12) Plate of tergite 1. weakly rugulose (fig. 3.). Tergites 2—7. smooth and shiny. Ovipositor almost twice as long as body: 12 mm. Lateral field of tergite 3. never delimited by oblique furrow. Wing scarcely fumose. Three spots of mesosternum, mesonotum, scutellum, and metanotum spotted with black, other parts of thorax reddish-yellow. Abdomen reddish-yellow, except black, spotted plate of tergite 1. Length 7 mm. — Range: Collected in the Soviet Union (Ukraine, Kazahstan). It is known only from the Pannonicum in the Carpathian Basin. Rare 6. **bírói** Szépligeti, 1896

12 (11) Plate of tergite 1. and tergites 2—3. roughly rugose (fig. 2.). Ovipositor as long as body: 6—9 mm. Lateral field of tergite 3. delimited by a crenulated and oblique furrow. Wing with fumose spots. Colouration of thorax and abdomen similar to former species. Length 7,5—9 mm. — Range: France, South-Europe, Ukraine, Kazahstan. In the Carpathian Basin, it occurs on the steppes of the Pannonicum and the wooden steppes of the Matricum, sporadically in other districts. Euryök mesophilous with an eremophilous inclination. Frequent 7. **inscriptor** Nees, 1834

♂♂

1 (4) Abdomen from tergite 3. on smooth and shiny. Distal half of wings never brownish fumose.

2 (3) Lateral fields of tergites 2—3. and single tergite delimited by deep furrow. Proximal half of wing brown, fumose. Vertex and occiput black. Metanotum and mesosternum black. Every coxa, trochanter, and femora 2—3. black. Abdomen yellow, segments 6—8. black. Length 5 mm 1. **siculus** Marsh.

3 (2) No deep furrows, especially between segments. Whole wing light brown, fumose, translucent. Ocelli situated within black spot, occiput yellow. Metanotum and mesosternum spotted with black. Legs reddish-yellow, only coxa spotted black. End of tibia 3. and tarsi 2—3. black. Abdomen yellow, proximal half of plate of tergite 1. black. Length 6 mm 2. **bírói** Szépl.

4 (1) Tergites at least punctate. Wings brownish fumose in spots.

5 (10) Every coxa and trochanter black. Either femur 3. or tergites 4(—5.) spotted with black.

6 (7) Tergites 1—4. punctate, even weakly ruguloso-punctate. Vertex and occiput black. Scutellum and mesosternum black. Femora 2—3. totally, end of tibia 2—3. black. Tarsus 3. dark. Abdomen yellow. Length 6,5 mm 3. **umbraculator** Nees

7 (6) Tergites 1—3. (—4.) ruguloso-punctate. Ocelli situated in a black spot on vertex, occiput yellowish-red. Border of black spot of mesosternum straight (fig. 4.).

8 (9) A large species. Scutellum yellowish-red. Either femur 3. or tergites 4.(—5.) black. Legs from femur or tibia on yellowish-red. Length 9—10 mm, sometimes 8 mm 4. **desertor** F.

— Base of femur 2., whole of femur 3., end of tibia black **desertor** var. **intermedia** Szépl.

9 (8) A medium-sized species. Scutellum black. Femora 2—3., tibia (except base) and tarsi black. Only femur-tibia-tarsus yellow. Length 7 mm 5. **gracilis** Szépl.

10 (5) At most coxa 3. spotted with black; otherwise yellow. Femur 3. yellow.

11 (12) Lateral field of tergites 2—3. not as densely punctate as in next species. Body, in comparison with next one, somewhat squat. Length 4,5—5,5 mm 6. **castrator** F.

12 (11) Lateral field of tergites 2—3., comparing with preceding species, densely punctate. Body, in comparison with preceding species, not so squat. Length 4—6 mm 7. **inscriptor** Nees

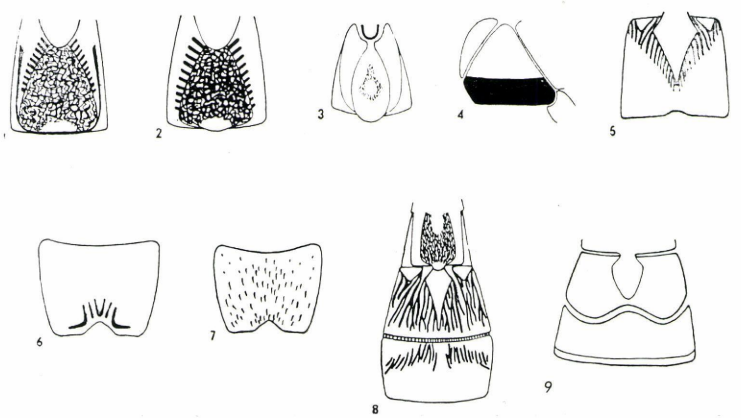

Fig. 1. 1st tergite of *Glyptomorpha castrator* F. — Fig. 2. 1st tergite of *Glyptomorpha inscriptor* Nees — Fig. 3. 1st tergite of *Glyptomorpha birói* Szépl. — Fig. 4. Mesosternum of *Glyptomorpha desertor* F. — Fig. 5. 2nd tergite of *Vipio terrefactor* Vill. — Fig. 6. Metanotum of *Vipio intermedius* Szépl. — Fig. 7. Metanotum of *Vipio tentator* Rossi — Fig. 8. 1—3rd tergites of *Vipio nominator* F. — Fig. 9. 2—3rd tergites of *Ipobracon konovi* Marsh.

Critical remarks to some *Glyptomorpha* species

Gl. umbraculator Nees

The following markings vary on specimens collected in the Carpathian Basin: 1. Tergite 4. of ♀♀ densely and granulately punctate, tergite 5. weakly punctate. 2. A central field on tergite 2., though its distal end indistinct. 3. Length of ♀♀ seldom 3—3,5 mm. 4. A black spot on centre of face. 5. Black spot of ocelli

extends to forehead and occiput. 6. Black spots of thorax either indistinct or wanting. 7. Scutellum partly or wholly yellow. 8. Coxa and trochanter partly or wholly yellow. Ends of femora 2—3. light.

Gl. castrator F.

The following markings vary on specimens collected in the Carpathian Basin : 1. Median edge of metanotum wanting, its surface smooth. 2. Tergite 5. of ♀♀ roughly punctate. 3. Outer half of lateral fields of tergite 3. of ♂♂ punctate. 4. Body conspicously elongate : 9 mm. 5. Scutellum reddish-yellow. 6. Metanotum and lateral sternum of ♀♀ black. 7. Size of black spot on metanotum of ♂♂ varying. 8. Coxa-trochanter-femora 2—3. black. 9. End of femur 3. of ♂♂ only fumose.

Gl. desertor F.

T e l e n g a (1936 : 56) characterizes his *Gl. desertor* var. *intermedia* as follows : „There is a sharp and black spot on the end of the hind femur. Otherwise it agrees with the nominate species." — I examined the type specimens of *Gl. intermedia* Szépligeti and I found that it differs by the following marks from *Gl. desertor* F.: ♀ „Hinterschenkel und Spitze der Hinterschienen schwarz, Tarsen gebräunt", ♂ „Hinterleibsende rot oder 6. Segm. mit einem Basalfleck" (S z é p l i g e t i, 1901 : 155). This difference can taxonomically be only a variety, therefore I regard *Gl. intermedia* Szépl. as a variety of *Gl. desertor* F.: *Gl. desertor* var. *intermedia* Szépl. Accordingly, *Gl. desertor* var. *intermedia* Tel. is also a synonym. As a matter of fact, T e l e n g a expressed the same opinion in his letter (1959) : „I suspect that these two species (namely *Gl. desertor* F. and *Gl. intermedia* Szépl.) are really synonymic."

The following markings vary on specimens collected in the Carpathian Basin : 1. Rostrum short : 0,5 mm, 2. Plate of tergite 1. and centre of tergite 2. spotted with black. 3. Tergite(s) 4 (—5.) black and weakly punctate, in opposite case same tergite wholly smooth.

Gl. inscriptor Nees

The distinction of *Gl. inscriptor* Nees and *Gl. castrator* F. is difficult on the base of the original descriptions, indeed, even by the detailed characterization of the recent authors (F a h r i n g e r 1928 : 92—93, 79—81, T e l e n g a 1936 : 66—67, 52—53). The female of the two species is distinguished by one solid mark : the ovipositor of *Gl. castrator* is 2,5 mm (shorter than the abdomen) on the one hand, while the ovipositor of *Gl. inscriptor* is 8—9 mm (as long as body) on the other. All other features given in the key are not to be regarded as constant since there are many transitional forms among them. The males, lacking ovipositor, are distinguished only by uncertain characters, such as the punctation or smoothness of the lateral field of tergite 3. and the stockiness of the body. S t a r ý made a similar statement in his letter to me (1959) : „But I have a lot of males of both species I am unable to distinguish. The typical males of *castrator* have usually more robust habitus, stronger legs and also the sculpture of abdomen differs a little from that of *inscriptor*." Considering these facts, the two species will probably be synonymized. I cannot do this on my own, since I have not seen the type specimens. Neither does T o b i a s (1957) solve this problem. He grouped several species of *Glyptomorpha*, together with the above two ones, into the new

genus *Pseudoglyptomorpha* Tob., on the basis of the genital organs and other features. On a suggestion in his letter (1959), I examined the male genital organs of the above-mentioned species, but I did not find any difference.

Gl. impeditor Kok.

S t a r ý (1957 : 283) enumerates a single collecting locality (Šturovo-Párkány, 1937, leg. H o f f e r) within the Carpathian Basin, though he designates the species — after T e l e n g a (1936) — as *Euglyptobracon impeditor* Kok. I did not see the specimens, but I examined *Gl. siculus* Marsh., and read the description of *Euglyptomorpha impeditor.* (T e l e n g a, 1936 : 105.) Since the *Gl. siculus* specimens of the Hungarian Natural History Museum agree so much with the description of *E. impeditor*, and as the detailed characterizations (F a h r i n g e r 1928 : 97—98, 202—203 ; T e l e n g a 1936 : 54—55, 105) of *Gl. siculus* and *E. impeditor* are much similar, the latter is presumably synonymus with *Gl. siculus* Marsh. This seems to be supported by the fact that *Gl. siculus* was never collected in the Soviet Union (T e l e n g a, 1936 : 54—55) on the one hand and, — apart from S t a r ý's recent datum, — *E. impeditor* was found only in the Soviet Union on the other.

Genus **Vipio** Latreille, 1805

K e y t o s p e c i e s

♀♀

1 (6) Metanotum flat or its distal central-base radially rugulose. Coxa 2—3. always reddish-yellow. Abdomen totally reddish-yellow.

2 (5) Distal centre of metanotum radially rugulose (fig. 6.), spotted with, or entirely, black.

3 (4) Body longer than 10 mm. Ovipositor generally twice as long as body : 23—33 mm. Rostrum : 1,3—1,4 mm. Rugosity of tergite 2. curves outward, rugulose surface scarcely extends over distal half of tergite (fig. 5.). Distal half of scutellum black. Metanotum wholly black. Base of hair brush of clypeus golden yellow, otherwise black. Palpi yellow. Antenna 60—65-jointed. Length 11—14 mm. Range : Europe except in the North, Asia minor, Iran. In the Carpathian Basin, it was collected mostly in the Matricum. A supposedly stenök eremophilous species, with a mesophilous inclination
1. **terrefactor** Villers, 1779

4 (3) Body shorter than 10 mm. Ovipositor generally as long as body : 8—9 mm. Rostrum short : 0,5—0,6 mm. Longitudinal and somewhat curved rugosity of tergite 2. extends to whole surface. Antenna 45—50-jointed. Distal margin of metanotum reddish-yellow, otherwise black. Scutellum totally reddish-yellow. Hair brush of clypeus golden yellow. Palpi dark. Length 8—9 mm. — Range : North Africa, Central- and Southern-Europe, southern part of East Europe, Central-Asia. In the Carpathian Basin, it was collected mostly in the Pannonicum and the Matricum, but it also occurs in the lower regions of the Carpathicum and in the Illyricum. A stenök eremophilous species
2. **intermedius** Szépligeti, 1896

5 (2) Metanotum smooth, sometimes rugulose along central line, reddish-yellow. Ovipositor one and a half times as long as body : 10—14 mm. Rostrum short : 0,4—0,5 mm, its colour vary from reddish-black to blackish-red. Palpi reddish-yellow. Antenna 50—57-jointed. Longitudinal rugosity of tergite 2. extends to almost entire surface. Length 7—10 mm. — Range : Palearcticum. In the Carpathian Basin, it was collected mostly in the Pannonicum and in the Matricum. A supposedly stenök eremophilous species
3. **appellator** Nees, 1834

a (b) No proximal-central black spot on mesonotum. Black spot of vertex extends only onto triangle formed by ocelli. Plate of tergite 1. roughly rugulose in contrast with nominate species. Range : Collected up to now in the Soviet Union and the Carpathian Basin (Pannonicum). A new variety in the fauna of the Carpathian Basin **appellator** var. **mendax** Kokujev 1898

b (a) Segments 3—6. of abdomen black. — Range : It was collected in the Pannonicum in the Carpathian Basin **appellator** var. **nigricauda** var. nov.

6 (1) Metanotum always rugulose along longitudinal midline, rugosity generally distends on distal half (fig. 7.) Coxa 2—3., except in *V. insectator* always black. Abdomen, except in *V. insectator* always spotted with black.

7 (10) Ovipositor at least twice longer than body, or shorter than abdomen.

8 (9) Rugosity of tergites 1—3. irregular, somewhat discontinuous (well visible under a 25 magnification). Ovipositor shorter than abdomen : 3—3,5 mm. Three spots on mesonotum and proximal three-quarters of metanotum black. Scutellum, and upper margin of mesosternum reddish-yellow. Wing brownish fumose. Stigma brownish-yellow, its base yellow. Femur 3. always spotted with black. Plate of tergite 1., except its distal margin, black ; otherwise abdomen reddish-yellow. Length 5,5—8 mm. — Range : Caucasus, Ukraine, South-Moravia, Italy, North-Africa. In the Carpathian Basin, it occurs mostly in the Matricum. A supposedly euryök eremophilous species
4. **tentator** Rossi, 1790

9 (8) Tergites 1—3. with almost parallel rugosity, this somewhat outwards curved. Ovipositor at least twice longer than body : 20—25 mm. Mesonotum, scutellum, metanotum, side of mesosternum, pro- and mesosternum black. Wing light brownish fumose. Stigma brownish-black. Coxa 3. always reddish-yellow. Proximal half of plate of tergite 1., central field of tergite 2., tergites 4—5., and two spots on every sternite black. Length 9 mm. Male unknown. — Range : Collected up to now in two localities in the Carpathain Basin. A presumably endemical species of the Carpathian Basin
5. **frivaldszkyi** Szépligeti, 1896

10 (7) Ovipositor at most one and half times as long as body, but always longer than abdomen.

11 (14) Tergite 3. smooth and shiny. Soutellum black. Stigma unicolorous.

12 (13) Body longer than 6 mm. Ovipositor somewhat shorter than body : 6 mm. Outline of abdomen, as compared to that of *V. filicaudis*, broadly elliptical. Plate of tergite 1. rugose. Rostrum 0,7 mm, black. Palpi brown or blackish-brown. Abdomen reddish-yellow beyond tergite 3. Length 8 mm. — Range : France, Austria, the Soviet Union. Until now, it was collected only around Budapest (Matricum) in the Carpathian Basin. Rare 6. **contractor** Nees, 1834

13 (12) Body shorter than 5 mm. Ovipositor one and a half times longer than body : 6 mm. Outline of abdomen, as compared to that of *V. contractor*, elongately elliptical. Proximal half of plate of tergite 1. weakly rugose. Rostrum 0,2—0,3 mm, yellowish-red. Two lateral spots of tergite 3. and segments 4—7. black. Length 4 mm. Male unknown. — Range : Until now, it was collected only around Budapest and Trieste (F a h r i n g e r 1928 : 37) 7. **filicaudis** Szépligeti, 1899

14 (11) At least proximal half of tergite 3 rugulose. Scutellum yellowish-red. Stigma bicolorous.

15 (16) Ovipositor as long as body : 9—10 mm. Rugosity of proximal half of tergite 3. generally outwards-curved, its lateral field well separated. Claw-joints of tarsi 1—2., tibia 3., and tarsi 3. black. Metanotum and abdomen yellowish-red. Length 9—10 mm. — Range : Czechoslovakia, the Soviet Union. In the Carpathian Basin, it was collected in the Pannonicum and the Matricum. Rare 8. **insectator** Kokujev, 1898

16 (15) Ovipositor one and half times longer than body : 13—15 mm. Generally, only proximal base of tergite 3. rugulose, its lateral field scarcely separated (fig. 8.) Coxa 2—3., tibia 3. (disregarding its base), and every tarsus black. Metanotum black. Plate of tergite 1., central field, and surroundings of tergite 2., and spots beyond tergite 4. or 5. black. Body yellowish-red, black colouration very variable. Length 8—9 mm. — Range : Palearcticum, excepting the North. In the Carpathian Basin, it was collected mostly in the Pannonicum and the Matricum ; but it occurs in the high mountains. A supposedly euryök mesophilous species with an eremophilous inclination
9. **nominator** Fabricius, 1787

a (b) Entire thorax black. Tergite 1—4. rugulose. No black spot on tergite 2. — Range : In the Carpathian Basin, it was found in one locality each of the Pannonicum, the Matricum, and the Illyricum
nominator var. **nigrothoracalis** var. nov.

b (a) Thorax not entirely black.

c (d) Both scutellum and last segments of abdomen yellowish-red. Central spot of mesonotum small. — Range : Up to now, it was collected only in the Carpathian Basin, where it occurs sporadically in almost every district
nominator var. **szépligetii** Fahringer 1928

d (c) Scutellum black, last segments of abdomen yellowish-red. Black spot of mesonotum not black. — Range : the Soviet Union. It occurs in the Pannonicum and the Matricum in our country.
nominator var. **nigroscutellatus** Fahringer 1928

♂ ♂

1 (6) Metanotum smooth and shiny or its distal central base lineately rugulose. Coxa 2—3. always reddish-yellow.

2 (3) Only proximal half of tergites 3—4. rugulose. Body always longer than 8 mm. Rostrum 0,8—1 mm. Scutellum, metanotum, and mesosternum black. Three black spots of mesonotum large. Length 9—11 mm, seldom 8 mm 1. **terrefactor** Vill.

3 (2) Tergites 3—4. almost entirely rugulose. Body at most 7 mm long. Rostrum 0,3—0,5 mm. Scutellum reddish-yellow.

4 (5) Proximal half or three-quarters of metanotum black. Basic colour of body reddish-yellow. Length 5 mm 2. **intermedius** Szépl.

5 (4) Metanotum wholly yellowish-red. Basic colour of body yellowish-red. Length 5 mm. Varieties of male unknown 3. **appellator** Nees

6 (1) Metanotum rugulose on both sides of longitudinal midline. Coxae 2—3., except in *V. insectator*, black. Abdomen spotted with black.

7 (8) Tergite 4. smooth and shiny. Base of tergite 3. weakly rugulose. Palpi dark. Scutellum, metanotum, and mesosternum black. Length 7 mm 4. **contractor** Nees

8 (7) Tergites 1—4. rugulose. Palpi reddish-yellow.

9 (10) Metanotum weakly rugulose, wholly reddish-yellow. Scutellum reddish-yellow. Every coxa light. Abdomen irregularly spotted with black. Length 5,5—6 mm
5. **insectator** Kok.

10 (9) Metanotum roughly rugose, black. Scutellum black. Coxae 2—3. black at least in spots.

11 (10) Tergites 1—4., as compared with *V. nominator*, somewhat roughly rugose. Occiput reddish-yellow. Femur 3. with black spots. Plate of tergite 1. and lateral fields of tergites 3—4. black, otherwise abdomen reddish-yellow. Length 5—6 mm
6. **tentator** Rossi

12 (11) Tergites 1—4., as compared with *V. tentator*, not roughly rugose. Occiput black. Femur 3. always reddish-yellow. Plate of tergite 1., central field and its vicinity of tergite 2., and segments 5—8. black, otherwise abdomen reddish-yellow. Length 5—7 mm. Varieties see below ♀ ♀ 7. **nominator** F.

Critical remarks on some *Vipio* species

V. terrefactor Vill.

The following markings vary on specimens collected in the Carpathian Basin : 1. Cheek weakly punctate. 2. Proximal centre of metanotum rugulose. 3. Base of tergite 3. with outwards-curving rugosity. 4. Black spots of ocelli and mesonotum indistinct. 5. Black colour of rostrum of varying extense. 6. Proximal spot of mesonotum of varying size. 7. ♀ scutellum not black, yet it may also be wholly black. 8. Tergites 1—4. singly (or all together) with irregular black spots.

V. intermedius Szépl.

The following markings vary on specimens collected in the Carpatian Basin : 1. Tergite 3. wholly smooth. 2. Central spot of mesonotum indistinct. 3. Tergites 3—4. rugose, excepting distal margin, metanotum red. 4. Plate of tergite 1. sometimes weakly rugulose. 5. Metanotum reddish-yellow (var. 2. Szépl.).

V. appellator Nees

The following markings vary on specimens collected in the Carpathian Basin : 1. With distinct edge, and rugulosity along its side, on metanotum of ♂♂. 2. Tergite 1. wholly smooth. 3. Tergite 2. scarcely more rugulose than its halfth, with base of tergite 3. weakly rugulose. 4. Tergite wholly smooth. 5. Distal half of tergite 3. weakly, sometimes extensively and roughly rugose. In latter case, base of tergite 4. also rugulose (var. *striolatus* Fah.?). 6. Ovipositor shorter than body. 7. Black spot of ocelli not extending over ocelli.

V. tentator Rossi

The following markings vary on specimens collected in the Carpathian Basin : 1. Cheek wholly smooth. 2. No furrow on mesonotum. 3. Rugosity on metanotum of ♂♂ restricted only along central line. 4. Only the proximal half of tergite 3. rugulose. 5. Black spot of especially males around ocelli may reach oculi. 6. Scutellum entirely (or spotted-) black or it may be black only on margin. 7. Black colouration variable on tergites, metanotum and legs. 8. Stigma wholly dark brown. 9. Central field and surroundings of tergite dark or black.

V. nominator F.

The following markings vary on specimens collected in the Carpathian Basin : 1. No central edge on metanotum, its rugosity weak. 2. Tergite 3. almost entirely smooth. 3. Tergite 3. almost wholly rugulose. 4. Black spot of ocelli reaches oculi. 5. Proximal spot of mesonotum indistinct. 6. Stigma totally dark. 7. Central spot of tergite 2. indistinct. 8. Black spots wanting on tergites 4—5. 9. Every segment of males yellow. This variety resembles the male of V. *radiatulus* Thoms. According to T e l e n g a (1936 : 312), the male of this species is distinguished from the male of *V. nominator* by the „red" abdominal segments. 10. Abdomen almost entirely black.

Genus **Baryproctus** Ashmead, 1900

K e y t o s p e c i e s ♀♀ and ♂♂

1 (2) Antenna 52-jointed. Margin of clypeus not hairy. Metanotum wholly rugulose. Last two segments of male black. Length 5,5—6 mm. — Range : Up to now collected in the Carpathian Basin and in Ukraine 1. **hungaricus** Szépligeti, 1901

2 (1) Antenna 42-jointed. Margin of clypeus hairy. Length 5 mm. Male unknown. — Range : the single ♀ specimen was collected in our country (Pannonicum) 2. **apti** Győrfi,1953

Genus **Syntomomelus** Kokujev, 1902

Single species :

Almost whole surface of head and thorax densely hairy, entirely smooth and shiny. Antenna scarcely shorter than body. Tergites 1—2. totally, proximal half of tergite 3., rugulose, other tergites smooth and shiny. Body black, only tergites 2—3. may be spotted with red. Legs reddish-yellow, only claw-joints dark. Length 5—9 mm. Male unknown. — Range : Belgium, Finland, Moravia, Eastern-Europe, Cazahstan. In the Carpathian Basin, it was collected in two localities (Matricum and Carpathicum) 1. **rossicus** Kokujev, 1838

Genus **Coeloides** Wesmeal, 1838

Key to species ♀♀ and ♂♂

1 (4) Joint 4. of antenna at most twice longer than 3. Legs light brown.

2 (3) Abdomen of female as long as head and thorax together. Ovipositor almost one and a half times longer than body : 5,5—6 mm. Abdomen of male almost three times longer than head and thorax together. Tergites 3—7. flattened. Head and thorax of female (together with antenna) brown, abdomen yellow, male totally brown. Length 4,5—5,5 mm. — Range : France, Germany, Sweden, Czechoslovakia, European area of the Soviet Union. It occurs also in the Carpathian Basin, but its distribution is unknown. Rare 1. **filiformis** Ratzeburg, 1852

3 (2) Abdomen of both sexes not longer than head and thorax together. Ovipositor longer than abdomen, yet shorter than body : 3 mm. Abdomen of male not flattened. Dorsal side of body dark brown, ventral side yellow. Antenna dark brown. Head yellow, a dark brown spot around ocelli. Length 3,5—4 mm. — Range : England, Belgium, France, Germany, Sweden, Finland, Czechoslovakia, Ukraine. In the Carpathian Basin, it was recorded by Győrfi (1941 : 90) and Starý (1957 : 281). Rare 2. **melanotus** Wesmeal, 1838

4 (1) Joint 4. of antenna as long as joint 3. Legs dark brown.

5 (6) Head wholly dark brown. Antenna as long as body, 37—40-jointed. Thorax also dark brown, abdomen yellow. Length 4,5—5 mm. — Range : England, Sweden, Finland, Czechoslovakia, Austria, South Europe, Ukraine, Bielorussia. Up to now it was collected in four localities in the Carpathian Basin. Rare 3. **abdominalis** Zetterstedt, 1838

6 (5) Head yellow with a dark brown spot around ocelli.

7 (8) Antenna scarcely longer than body, 40—42-jointed. Legs dark brown, end of femur light. Tergite 2. as long as 3. Thorax brown, abdomen light yellow. Length 5—5,5 mm. — Range : England, Sweden, Belgium, Czechoslovakia, European part of the Soviet Union, Cazahstan, around Vladivostok, Sachalin, Japan. In the Carpathian Basin, it was found in four localities. Rare 4. **scolyticida** Wesmeal, 1838

8 (7) Antenna somewhat shorter than body, 31—35-jointed. Tergite 2. twice longer than 3. Legs yellow, at most femora dark. Thorax brown, yet with yellow spots. Abdomen yellow. Length 4 mm. — Range : Sweden, Finland, Germany, Austria, Czechoslovakia, Poland, Ukraine. In the Carpathian Basin, it was recorded by Győrfi (1941 : 90) and Starý (1957 : 280). Rare 5. **bostrychorum** Girauld, 1876

Genus **Iphiaulax** Förster, 1862

Key to species ♀♀ and ♂♂

1 (4) Females.

2 (3) End of ovipositor thickened to a hook. Thorax black, yet some of its parts (pro-, mesonotum, scutellum, metanotum) always more or less spotted with red. Stigma black, eventually brownish-black, on base always with a light spot. Length 7—9 mm. — Range (nominate species and variety) : Germany, Poland, Czechoslovakia, Ukraine, Azerbeidshan, Casahstan, South-Siberia. Both the nominate species and the variety occur in the Carpathian Basin, but the variety is more frequent 1. **mactator** Klug, 1817

— Pronotum, mesonotum (with black spots only on its two sides), scutellum, metanotum and mesosternum spotted with red. Length 8—9 mm **nominator** var. **pictus** Kaw.

3 (2) End of ovipositor not hook-like, though somewhat thickened. Thorax black. Stigma brownish-black or black, no light spot on its base. Length 8—10 mm. — Range : Palearcticum. It occurs sporadically in the Carpathian Basin 2. **impostor** Scop., 1763

4 (1) Males.

5 (6) Tergite 3—5. smooth and shiny, disregarding sulcate proximal margin. Thorax black. Somewhat larger than next species, 8 mm. Male unknown 1. **mactator** Klug

— Tergites 3—5. punctate ; punctation gradually finer distally. Thorax spotted with red **mactator** var. **pictus** Kaw.

6 (5) Tergites 3—5., as compared to *I. mactator* var. *pictus*, more evenly punctate. Thorax black. Somewhat smaller than preceding species. Length 5—6 mm
2. **impostor** Scop.

Critical remarks on the *Iphiaulax* species

I. mactator Klug

The following markings vary on specimens collected in the Carpathian Basin : 1. Pro-, meso-, metanotum, prosternum, and scutellum spotted with red. 2. Mandible black. 3. Broken reddish-yellow margin of oculi can be almost entirely wanting. 4. Abdomen spotted with black. 5. Abdomen with yellow.

According to Fahringer (1928 : 204—205), this species is a variety of *I. impostor* Scop. On the other hand Telenga (1936 : 110) retains it as a „species bona", but he writes in his letter (1959) as follows : „The *Iphiaulax mactator* Klug males are unknown. Therefore some authors are apt to synonymize them with *I. impostor* Scop. It is really an unstudied question." I agree with Starý (1957 : 283), who regards it as a well distinguishable species on the basis of the shape of the ovipositor.

Iphiaulax mactator Klug, ♂ nov.

Face weakly rugulose, cheek densely punctato-rugulose, other surfaces of head smooth and shiny. Rostrum short : 0,1 mm, black. Pit on forehead bears a central groove. Head hairy and black. Antenna larger than body, 70—76-jointed, black. Reddish-yellow margin of oculi broken. Mandible reddish-yellow, only its tip black. Palpi black and hairy.

Thorax hairy ; surface totally smooth and shiny, black. Furow well visible only on proximal half of mesonotum. Legs densely hairy and black. 2—3. coxa-trochanter and trochanter-femur joints red. Wing brown, fumose, venation dark brown. Stigma brown, its base yellow.

Abdomen somewhat longer than head and thorax together, red. Margin of tergite 1. broad and smooth, only proximal two thirds of scutellum rugulose. Lateral fields of tergite 2. projecting, smooth and shiny. Areas between lateral fields roughly and longitudinally rugose, only distal margin smooth and shiny. Proximal margin of tergites 3—5. rugulose, otherwise smooth and shiny together with other tergites.

Length 8—9 mm.

Localities : Gyón, leg. Szépligeti (Allotypus) ; Budapest 1907, leg. Bíró ; Déva, leg. Mallász (Paratypus).

Remark : Differs from the male of *I. impostor* Scop. by the larger body size and sculpture of tergites 1—5.

Genus **Atanycolus** Förster, 1862

Key to species ♀♀ and ♂♂

1 (10) Females.

2 (5) Head and thorax wholly black. Base of central field of tergite 2. generally narrow. Furrow of mesonotum weak.

3 (4) Centre of scutellum of tergite 1. and tergite 2., with exception of small central and lateral areas, rugulose. No longitudinal furrow joining lateral field of tergite 2. Two transverse furrows of tergite 3. somewhat grooved. Transverse furrow somewhat curved and also grooved on proximal half of tergite 4. Ovipositor always shorter than

body, 6 mm. Abdomen yellow. Length 9 mm. — Range: Czechoslovakia, Ukraine. In the Carpathian Basin, it occurs sporadically in the Carpathicum; in the Pannonicum and Matricum it occurs in the neighbouring parts of the Carpathicum. Rare 1. **sculpturatus** Thoms. 1892

4 (3) Tergites 1—7. smooth and shiny. A longitudinal furrow attached to lateral field of tergite 2. Ovipositor longer than body: 10—12 mm. Abdomen yellow. Frequently all tergites or sternites dark-spotted. Length 8—9 mm. — Range: Sweden, Germany, Switzerland, Austria, Czechoslovakia, Ukraine, Asia Minor. In the Carpathian Basin, it was collected mostly in the Pannonicum and the Matricum, but rare in the Carpathicum and the Illyricum. Presumably an euryök mesophilous species with an eremophilous inclination 2. **denignator** var. **neesi** Marshall, 1898

5 (2) Head yellow, with a smaller or larger black spot around ocelli. Furrow of mesonotum deep or eventually shallow.

6 (7) Furrow of mesonotum deep, therefore centre of mesonotum convex. Ovipositor scarcely shorter than body: 7—9 mm. Black spot around ocelli large and of varying shape, frequently band-like, extending to occiput. Other surfaces of head and abdomen yellow. Palpi dark. Legs black. Length 8—10 mm. — Range: Sweden, France, Germany, Poland, Czechoslovakia, Austria, the European part of the Soviet Union, Caucasus, Turkey, Turkmenia, Siberia, Sachalin. In the Carpathian Basin, it occurs in every district, yet sporadically. Rare 3. **initiator** Nees, 1834

7 (6) Furrow of mesonotum not deep, centre of mesonotum flat. Black spot around ocelli extends at most to centre of vertex, never band-like onto occiput. Palpi yellow. Legs black, but end of femur 1. light.

8 (9) Plate of tergite 1. with parallel sides, its proximal end tapering angularly. Central field of tergite 2. quadratic, elongated distally into an edge. Black spot extending around ocelli on occiput, its shape variable. Prosternum brown or yellowish-brown. Length 10 mm, rarely 8 mm. — Range: Czechoslovakia, Ukraine, Azerbeidshan. In the Carpathian Basin, it occurs in every district, except the high mountains. Rare 4. **flaviceps** Ivanov, 1896

9 (8) Side of plate of tergite 1., beginning from distal base, tapering in an arch. Central field of tergite 2. generally of a deltoid shape. Only triangle of ocelli black on occiput. Prosternum yellow. Length 8—11 mm (Male unknown). — Range: Bavaria, the Northern Balkans. In the Carpathian Basin, it is known from three mountainous localities (Matricum, Praenoricum, Illyricum). Rare 5. **fulviceps** Kriechbaumer, 1898

10 (1) Males.

11 (14) Head and thorax wholly black. Furrow of mesonotum always weak. Palpi brown.

12 (13) Some long wrinkles on plate of tergite 1. Sculpture of tergites 2—4. similar to that of female; proximal margin of tergite 5. weakly rugulose. Other tergites smooth. Abdomen yellow. Length 4—6 mm 1. **sculpturatus** Thoms.

13 (12) Only one longitudinal furrow on plate of tergite 1. Other tergites smooth and shiny. A longitudinal furrow attaches to lateral field of tergite 2. Abdomen yellow, darkening beyond segment 4. Length 7—8 mm 2. **deprimator** var. **neesi** Marshall

14 (11) Head yellow, size of black spot around ocelli variable. Furrow of mesonotum not always deep. Palpi yellow

15 (16) Furrow of mesonotum deep; centre of mesonotum never protruding as much as in female. Black spot extends to almost whole occiput. Other surfaces of head and abdomen yellow. Length 8 mm, rarely 11 mm 3. **initiator** Nees

16 (15) Furrow of mesonotum not deep. Black spot of occiput restricted to around ocelli. Length 6—8mm. — There were no males collected yet in the Carpathian Basin 4. **flaviceps** Iv.

Critical remarks on some *Atanycolus* species

A. sculpturatus Thoms.

I have examined the type specimen of *Atanycolus signatus*, described by Szépligeti. I found that there are slight gradual differences between *A. signatus* Szépl. and *A. sculpturatus* Thoms., so there is no „differentia specifica".

Indeed, Telenga (1936 : 90) remarks that he is not acquainted with *A. signatus*, though he must have had a copious material to write his monography. Considering all these, I regard *A. signatus* Szépl. as a synonym of *A. sculpturatus* Thoms.

A. denigrator var. **neesi** Marsh.

The following markings vary on specimens collected in the Carpatian Basin ; 1. Cheek densely punctate. 2. Furrow of mesonotum scarcely visible or wanting. 3. Lateral margin of tergite 1. very wide. 4. Distal half of central field of tergite 2. indistinct. 5. A red spot behind cheek. 6. Centre of mandible reddish-black. 7. Central field of tergite 2. of male brown. 8. Black spot of indistinct shape on tergites 3—4. 9. Furrow attaching lateral field of tergite 2. of female weak.

A. neesi was described by Marshall as a distinct species. Fahringer remarks (1928 : 126, 134) : „Diese Art unterscheidet sich durch das dunkle (schwarze oder schwarzbraune) erste Tergite von dem sehr ähnlichen *Atanycolus Neesi* Marsh. Letzterer könnte daher als Varietät des *denignator* betrachetet werden, wie das schon Schmiedeknecht vermutet." My investigation and the detailed description of Telenga (1936 : 92, 93, 326) convinced me that Fahringer's assumption is correct. Therefore, I regard *A. neesi* as a variety of *A. denignator* L., in the new combination as : *A. denignator* var. *neesi* Marsh. Starý writes (1957 : 278) about *A. denignator* L. as follows : „This is a very common species in Europe, the author however has not seen any representatives from Czechoslovakia." On the other hand, he lists *A. neesi* from several Czechoslovakian localities. It seems that only *A. denignator* var. *neesi* Marsh. lives in Central Europe. In this case, we shall perhaps consider it as a subspecies. Hellén, in his paper (1957 : 36) and letter (1959), does not even regard *A. neesi* as a variety but as a colour aberration only : „The colour variation about these species is at all events very great and I am sure that many of the described species will prove to be only aberrations . . . *Atanycolus neesi* Marsh. is only a colourform of *A. denignator* L."

Győrfi's (1941 : 89) record of *Coelobracon heteropus* Thoms. from Sopron must be relegated to the above species, because, according to Telenga (1936 : 91), *C. heteropus* Thoms. is a synonym of *A. denignator* L.

A. initiator Nees

The following markings vary on specimens collected in the Carpathian Basin : 1. Furrow of mesonotum indistinct. 2. Tergites 2—3. of male finely rugulose. 3. Furrow between tergites 2. and 3. not crenulate. 4. Ovipositor as long as body. 5. Spot of ocelli scarcely extending around ocelli. 6. A light spot on metanotum. 7. Prosternum, mesosternum, and legs light.

Genus **Ipobracon** Thomson, 1892

Key to species ♀♀ and ♀♀

1 (2) One quadrangular central field and two triangular fields on tergite 2., separated by deep and crenulate furrows. Plate of tergite 1. bordered by a narrow furrow, with its entire surface rugulose. Ovipositor scarcely longer than half of abdomen. Margin of oculi yellow. Head and thorax dark brown or black. Abdomen yellow, last two tergites black. Length 5—6 mm. — Range : Finnland, Estonia, Moravia, Ukraine, Grusia. In the Carpathian Basin, it is known from four localities ; new for the fauna of this district. Rare 1. **rector** Thunberg, 1882

2 (1) Only central field on tergite 2., lateral field wanting. Central field separate by crenulated furrow. Tergite 1. usually smooth. Ovipositor at least as long as abdomen.

3 (4) Furrow before scutellum crenulate. Furrow between tergites 2. and 3. twice curved and finely rugulose. Central field of tergite 2. triangular (fig. 9.). Antenna somewhat shorter than body. Ovipositor as long as abdomen. Wing brownish fumose. Abdomen yellow. Length 5—7 mm. — Range: France, Holland. In the Carpathian Basin, it is known from two localities only; new for our fauna 2. **konovi** Marshall, 1897

4 (3) Furrow before scutellum not crenulate. Furrow between tergite 2. and 3. almost straight and smooth.

5 (6) Two indentations on mesonotum. Ovipositor longer than abdomen. Base of wing brown, fumose. Abdomen yellow, last two segments dark. Length 5—7 mm. — Range: Sweden, Lithuania, European part of the Soviet Union, Cazahstan, East Siberia. In the Carpathian Basin, it is known from three localities, as listed by Győrfi (1941 : 90) 3. **nigrator** Zetterstedt, 1838

6 (5) No indentation on mesothorax. Ovipositor scarcely longer than abdomen. Wing entirely brown, fumose. Abdomen yellow. Length 5—7 mm. — Range: Norway, Finland, East Siberia. In the Carpathian Basin, it is known from one locality (Győrfi, 1941 : 90) 4. **obscuripennis** Thomson, 1892

Genus **Cyanopterus** Haliday, 1836

One species:

Entire body shiny. Distal half of central field indistinct on tergite 2. with an oblique hollow on each side. Ovipositor as long as body, black. Head and thorax black, abdomen yellow. Wing brown, fumose. Length 9—10. mm. — Range: Europe, North-Africa, East-Siberia. It occurs only sporadically in the Carpathian Basin. 5. **flavator** Fabricius, 1793

References: 1. Fahringer, J.: Opuscula Braconologica I. (Wien, 1928, p. 1—606). 2. Förster, A.: Synopsis der Familien und Gattungen der Braconen (Verh. Preuss. Rheinl., **19,** (1862), p. 1—225). — 3. Győrfi, J.: Adatok Magyarország gyilkosfürkészdarázsféléinek (fam. Braconidae) ismeretéhez (Folia Ent. Hung., **6,** 1941, p. 89—94). — 4. Győrfi, J.: Ökológiai vizsgálatok a Hymenopterák életéből (Erdészeti Kísérletek, **45,** 1943—44, p. 1—33). — Győrfi, J.: Braconidae (in Bátorliget élővilága, Budapest, 1953, p. 301—303). — 6. Győrfi, J., Móczár, L., Szelényi, G. & Roman, A.: Újabb adatok a Kőszegi-hegység hártyásszárnyú faunájához. I. (Dunántúli Szemle, **7,** 1940, p. 189—195). — 7. Hellén, W.: Zur Kenntnis der Braconiden (Hym.) Finnlands I. Braconinae part., Rhogadinae und Spathiinae (Acta Soc. pro Fauna et Flora Fennica, **56,** 1927, p. 1—59). — 8. Hellén, W.: Zur Kenntnis der Braconidae: Cyclostomi Finnlands (Notulae Entomologicae, **37,** 1957, p. 33—52). — 9. Mocsáry, S.: Hymenoptera: Braconidae (in Magyar Birodalom Állatvilága — Fauna Regni Hungariae, Budapest, 1897, p. 57—65). — 10. Móczár, L.: Adatok a Kőszegi-hegység hártyásszárnyú faunájához (Vasi Szemle, **5,** 1938, p. 72—86). — 11. Móczár, L.: Beiträge zur Kenntnis der Hymenopteren-Fauna der Umgebung von Kassa (Fragm. Faun. Hung., **4,** 1941, p. 107—114). — 12. Móczár, L.: Die Seehöhe und die ökologischen Gesichtspunkte in der Bezeichnung zoogeographischer Gebietseinheiten (Fragm. Faun. Hung., **11,** 1948, p. 85—89). — 13. Muesebeck, C. F. W., Krombein, K. V. & Townes, H. K.: Hymenoptera of America North of Mexico. Synoptic Catalog (Washington, 1951, p. 1—1420). — 14. Starý, P.: Notes on the Genus Vipio (Hym., Braconidae) in Czechoslovakia (Acta Musei Silesiae, **5,** 1956, p. 73—81). — 15. Starý, P.: Notes on the Braconidae (Hym.) of Czechoslovakia IV. part 1 (Acta Soc. Ent. Cech., **54,** 1957, p. 277—292). — 16. Starý, P.: Notes on the Braconidae (Hym.) of Czechoslovakia IV. part 2 (Acta Soc. Ent. Cech., **55,** 1958, p. 20—33). — 17. Szépligeti, Gy.: A palearktikus Braconidák meghatározó táblázatai, I. (Pótfüz. Term. tud. Közl., **59—64,** 1901, p. 174—184). — 18. Szépligeti, Gy.: Braconidae (in Genera Insectorum, Bruxelles, 1904, p. 1—253). — 19. Szépligeti, Gy.: Übersicht der Gattungen und Arten der palearktischen Braconiden (Math. naturw. Ber. Ungarn, **19—20,** 1904—1905, p. 55—64). — 20. Теленга, Н. А.: Braconidae (фауна СССР, 1936, p. 1—403). — 21. Теленга, Н. А.: Происхождение и еволюция паразитизма у насекомых-наездников и формирование их фауны в СССР (Киев, 1952, p. 1—137). — 22. Тобиас, В. И.: К морфологии, систематике и филогении надтрибы Braconina Tel. (Hymenoptera, Braconidae) (Зоологический Журнал, 36, 1957, p. 1338—1354).