

Israel Journal of Entomology Vol. V - 1970

A CONTRIBUTION TO THE BRACONID FAUNA OF ISRAEL

(HYMENOPTERA)

J. Papp

Hungarian Natural History Museum,
Budapest

ABSTRACT

39 species of Braconidae are mentioned, chiefly from the Lake Tiberias region, 28 of them new to the fauna of Israel; one species: Apanteles judaicus is described as new.

It is a pleasant obligation to publish a list of the Braconidae collected by Mr. Y. Palmoni (Deganya A). The material consists of 459 specimens belonging to 39 species (2 of them uncertain). Many species are new to the fauna of Israel, and one species, Apanteles judaicus sp. n., is new to science. The following species, occurring in Israel, are of high zoogeographic interest (reported localities in brackets): Apanteles phaloniae Wilk. (England), Microplitis heterocera Ruthe (sporadically in Europe), Microplitis rufiventris Kok. (USSR: Turkestan and Usbekistan), Rumania, Heterospilus testaceus Tel. (USSR: Ciscaucasia and Turkmenia), Barygrotus zarudniajus Tel. (Iran), Rhogas basalis Costa (Italy, USSR: Transcaucasia, Iran), and Rhogas rossicus Kok. (USSR: Yaroslavsk).

We have meagre knowledge on the Braconidae of Israel. Bodenheimer (1937) gives a list of 23 species and a few more have been added in the meantime by several authors.

The determined material is deposited in the Beth Gordon Agriculture and Nature Study Institute, Deganya A, Israel, some specimens are retained for the Hungarian Natural History Museum, Budapest.

The species indicated with an asterisc (*) are new to the fauna of Israel.

Meteorihae

Meteorus laeviventris Wesm. - Bodenheimer 1937 (Noet.)

A rather variable species concerning its sculpture, measurements, and color. Ratio of r_2 to cu_{q2} as 8:11, and ratio of length to hind width of

petiolus as 32:20 (main differences against M. rubens Nees). Tergite 1 generally with fine longitudinal striation, however, its surface varies from rather extremely striation to a glabrous one. Basic color light brown, propodeum, and petiolus dark to blackish brown, but entire body may also be yellowish brown or dark brown. Length ♀♀: 3.3 - 4.5 mm, generally 4.5 mm, ♂♂: 2.8 - 3.5 mm, generally 3.2 mm.

Ranging and frequent in Europe, Sakhalin, Mongolia.

Localities: Deganya 14.II.-22.XII.1935-69, 32 ♀ 4 ♂; Kinneret 16.II.40 (in light trap) ♀; Afiqim II.69 ♀; Shaar HaGolan 1.VI.42. 2 ♀.

Meteorus ictericus Nees. - Bodenheimer 1937 (Noct.)

Light brownish yellow. Tergite 1 = petiolus, twice longer than wide posteriorly; spiracles before the transverse median line. Tergite 2 with very fine longitudinal striation. Length 5 mm.

Frequent in Europe.

Locality: Deganya ♂, 18.X.1967,

* Meteorus rubens Nees.

Very similar to M. laeviventris Wesm. differing, however, from this species by the following features. Petiolus elongate, its length to hind width as 31:17, ratio of r_2 to cu_{qu_2} as 6:9. Body yellowish brown, propodeum and petiolus (dark) brown, stigma brownish yellow. Length 3.5 - 3.6 mm.

Distributed in the Western Palearctic Region.

Locality: Deganya 12.III. 1940, 9 ♀.

Macrocentrinae

* Macrocentrus collaris (Spin.)

Length 3.5 mm. Cu_2 relatively long, r_2 and cu_{qu_1} of nearly equal length (7:8). Tergite 1 with fine longitudinal rugulosity. Body brown, pronotum and segments 2-3 reddish brown.

Frequent in Europe, reported from Turkey.

Locality: Deganya, 26.IV.1940, caught in a plantation of subtropical fruit-trees, 1 ♂.

* Zele chlorophthalma (Nees). -

Agreeing with the Hungarian forms, but rugosity of tergite 1 somewhat stronger.

Distributed in the Old World.

Localities: Deganya , 30.V - 6.XII 1939 - 44; 5 ♀.

* Zele testaceator Curt. -

Similar to the European forms. Known from several European countries, furthermore from Turkey, Japan and Mongolia.

Locality: Dan (Upper Galilee), 25.VI.1957, 1 ♀.

Diospilinae

* Diospilus capito (Nees).

Antennae 25-jointed. Tergite 1 completely smooth and shiny. Ovipositor somewhat longer than thorax. Length 2.6 mm. Black, clypeus reddish yellow, palpi brownish yellow, legs pale, wings hyaline.

Reported from several European countries.

Locality: Deganya, 3.III.1942, on Cruciferae, 1 ♀.

Cheloninae

* Microchelonus basalis (Curt.)

One of the smallest Microchelonus species, its length 3 mm. The Israeli specimens agree with the European (Hungarian) ones, but they are somewhat stouter. Characteristic for this species is the short radial cell (width of stigma against the metacarpal section of radial cell as 13:8), and first third of carapace vivid yellow.

Known from several European countries, Kazakhstan (USSR), and Iran.

Localities: Deganya 14.III.-23.VII 1947 8 ♀ on mangel.

Agathiinae

* Agathis nigra Nees.

Antennae 29 jointed, almost as long as body. Cu_2 4-sided. Propodeum medially and postero-laterally rugose. Tergite 1 as long as wide posteriorly, almost smooth and shiny.

Ranging in the Palearctic Region.

Locality: Deganya, 25.III.1942, on lower herbs, 1 ♂.

Microgasterinae

* Apanteles emarginatus (Nees).

Reported from several European countries.

Heretofore it was known only as a parasite of caterpillars. It is worthy to note that in Israel it was bred for the first time from the ootheca of Sphodromantis viridis (Mantidae).

Localities: Deganya A, 6.IX.1943, ex ootheca of Sphodromantis viridis Fsk., 1 ♀. - Deganya A, 29.VIII.1968, ex Galleria mellonella L. (new host), 10 ♀ 2 ♂.

* Apanteles cf. firmus Tel. -

One specimen in a very bad condition. Presumably identical with A. firmus. Hitherto reported from the Western USSR and Mongolia.

Locality: Deganya 23.VII.1947, ex larvae of Terellia fuscicornis (Loew) (Trypetidae).

* Apanteles gastropachae (Bché).

Distributed in the entire Palearctic Region. An important Apanteles parasite in some noxious caterpillars.

Localities: Deganya 2.III.1938. ex indetermined Lepidopteran larva and pupa 3 ♀, 9.V.1938.

Apanteles glomeratus (L.) - Bodenheimer 1937 (Pieris).

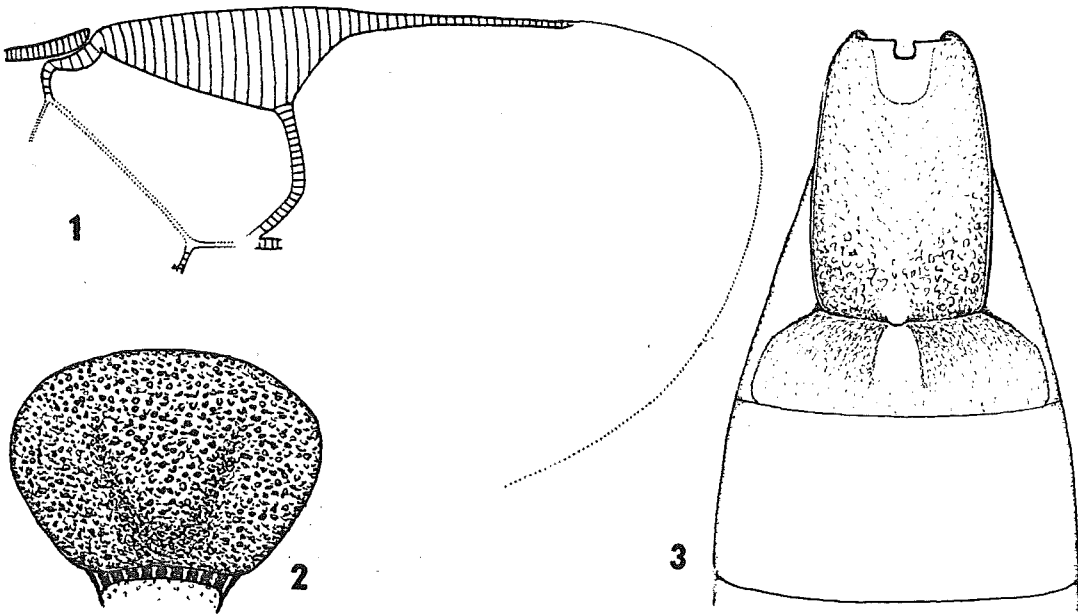
Distributed in Europe, North Africa, Japan, and North America. One of the most important Apanteles species parasitizing several caterpillars.

Localities: Nahalal (Jezreel Plain), 21.I.1927, ex larvae of Pieris brassicae L. 2 ♀ - Deganya 12.IV - 2.XII.1938 - 44 ex larvae of Pieris brassicae L. 49 ♀ & 45 ♂.

* *Apanteles judaicus* sp. n. ♀

(Fig. 1-3)

Head transverse, twice broader than long (28 : 14), rounded and constricted behind eyes. Face hardly twice wider than high (14 - 15: 8), medially almost smooth, laterally finely rugulose, shiny. Eye elliptic, its length to width as 15:11, inner margin convergent. Ocelli on a low triangle; posterior two ocelli of the same distance from each other as ocello-ocular line. Facial dimples at corner of clypeus. Cheek as long as base of mandible, densely rugulose. Tempora narrower than short diameter of eye (6:8). Frons above scapi with two linear impressions. Frons, vertex, occiput, and tempora almost



Explanation of figures.

Fig. 1-3. *Apanteles judaicus* sp. n. ♀ : 1 = part of right fore wing, 2 = Mesonotum, 3. = Tergites.1-3.

smooth, shiny. Entire head, together with eyes pubescent. Maxillar palpi as long as longer diameter of eye. Antennae filiform, 1st flagellar joint 3 times longer than broad, farther ones gradually shortening and attenuating so that last ones 2.5 times longer than broad (see remark 1).

Thorax as wide as head, somewhat stout, ratio of its length, height, and width as 43:32:28. Pronotum almost smooth and shiny, laterally margined with suture. Mesonotum 1.4 times broader than long, with a rather dense and even punctulation, somewhat shiny, along the line of notauli punctulation more even, almost densely rugulose. (Fig. 2).

Prescutellar furrow deep, not wide, with 8 crenulae. Scutellum almost smooth, shiny. Propodeum rugose, with a median longitudinal carina, along its anterior and posterior margin rather smooth, shiny. Mesopleura finely rugulose, its hind upper part glabrous. Sternauli on lower hind part of mesopleura, short. Hind marginal suture of mesopleura with fine crenulae. Metapleura with sculpture similar to that of propodeum.

Fore wing about the length of body, somewhat elongate, almost 3 times longer than its greatest width (70 : 25). Stigma and metacarpal vein almost of equal length (20 : 18), r_1 emerging distally from stigma, r_1 and cu_{q1} of equal length, not distinctly angled at their junction, both veins thick (Fig. 1). Vanal lobe of hind wing evenly convex.

Legs relatively short and somewhat thick. Hind tarsi longer than tibia (30:25), hind spur somewhat longer than half of metatarsus. Hind coxae almost smooth, shiny, as long as abdominal segments 1-2.

Abdomen as long as head and thorax together, widest at 3rd segment. Tergite 1 with evenly but slightly arched sides, almost twice longer than wide at its anterior base (15:8), its posterior base wider than fore one (12:8) (Fig. 3). Tergite 2 transverse, its width to length as 20:6, shagreened (almost smooth), tergite 3 almost 1.7 times longer than 2nd one, together with succeeding tergites smooth and shiny. Ovipositor short, hardly projecting beyond end of abdomen. Hypopygium normal.

Head brownish black, thorax dark brownish black (holotype), or black (paratype), abdomen brown (holotype) or dark brown (paratype). Sternites 1 - 3 yellow, further sternites brown. Coxae brown, trochanters light brown, fore femur-tibia-tarsus yellow, median and hind femora brownish yellow, tibiae and tarsi yellow. Tegulae brown, wings infusate, stigma and vein yellowish brown.

Length: 2.8 - 3 mm, alar expanse 6.4 - 6.8 mm.

Male unknown.

Host: Orgyia dubia judaica Stdr. (Lep.)

Type locality: Deganya (Israel), 23-26. VII. 1939, 2 ♀ (1 ♀ holotype, 1 ♀ paratype), leg. Y. Palmoni.

Holotype (Nr. 9358) in Beth Gordon Agriculture and Nature Study Institute, Deganya, Israel.

Paratype in the Hungarian Natural History Museum, Budapest, (Hym. Type Nr. 1807).

The new species stands nearest to A. specularis Szépl., A. impurus Nees, and A. bignelli Marsh., but it differs by the combination of the following features. Mesonotum with dense and even punctulation, wings infuscate, r_1 issues distally from stigma, r_1 and cu_{1+2} thick, tergite 1 almost rectangular, with evenly and slightly arched sides, tergites 3 1.7 times longer than tergite 2. Head and thorax blackish, abdomen brown, legs yellow to brownish yellow.

Remarks. - 1. Antenna of holotype incomplete, right one without any flagellum, left one with 16 joints.

2. Left antenna of paratype incomplete, with 15 joints.

3. Fore wings of paratype incomplete, distal two thirds of left wing glued separately on a card.

* Apanteles ordinarius (Ratz.)

Reported from several European countries, the USSR, and Japan. An important parasite of Dendrolimus caterpillars.

Locality: Deganya A, 6.V.1943, ex Amata mestrallii palestinae Hmps., 8 ♂ new host.

* Apanteles phaloniae Wilk.

This species has been described as a parasite of Phalonia smeathmanniana F. by Wilkinson, in 1940, from England. Up to now, it was not reported from other countries.

Locality: Kv. Kinneret, 19-26. II. 1960, ex pupae of Zeuzera pyrina L., (new host) 1 ♀ & 1 ♂.

* Apanteles rubripes (Hal.) -

Occurring throughout the Western Palearctic Region. Sculpture of propodeum and tergites 1 - 2 varying from rugose to rugulose.

Locality: Deganya 16.VIII.1939, ex Orgyia dubia judaica Stgr., 27 ♂.

* Apanteles ruficrus (Hal.)

A widely ranging species in the Palearctic, Oriental, and Australian Regions. Mesonotum, scutellum, propodeum, tergites 1-2, and 3rd coxae strongly rugose, tergite 3 always light: brown, reddish brown, reddish, yellowish red etc.

Parasitizing a number of noxious caterpillars.

Localities: Deganya, 17.IV.1940 in a lucerne field, 1 ♀. 6.VII.1942 in a plantation of subtropical fruit-trees 2 ♀ 8.III.1944 ex larvae or pupae of Ocnogyna loewii Z. 5 ♀ & 1 ♂.

* Apanteles stellatarum (Bché).

Its range seems to be limited to Europe, unknown in the USSR. New to the fauna of Israel.

Locality: Deganya, 3.I.1944, ex larvae of Pieris brassicae L., 55 ♀ & 17 ♂.

* Apanteles ultor Reinh. group.

A badly mounted Apanteles specimen, impossible to identify. Characteristic is to the Apanteles ultor Reinh. group that the propodeum bears a clearly marked median areola. This areola is hardly to be seen in our specimen. Mesonotum punctate, scutellum almost smooth, shiny. Wings hyaline, veins opaque. Tergite 1 similar to that of A. lacteicolor Vier., tergite 2 finely rugose, 2.5 times shorter than tergite 3. Ovipositor almost as long as abdomen. Body black, legs reddish yellow. Coxae 1-2 brownish, coxa 3 black. Length 2.8 mm. In view of these features our exemplar represents presumably a new species, however, the state of preservation of the specimen precludes a precise description.

Locality: Deganya, 10.V.1968, light trap, 1 ♀.

* Apanteles vestalis (Hal.)

A common species in the Western Palearctic Region. Very similar to A. congestus Nees, differing, however, from this species by the strongly punctato-rugose scutellum.

Locality: Deganya 8.II.1944, ex larvae or pupae of Ocnogyna loewii Z. (new host!), 1 ♀.

* Microplitis heterocera (Ruthe).

Reported from some European countries. Scutellum laterally rugose, otherwise almost smooth, shiny. Tergite 1 hardly sculptured, rather shagreened laterally, otherwise smooth and shiny with parallel longitudinal margins. The host, Ocnogyna loewii Z., gave our first information on its bionomy.

Localities: Deganya, 28.III-12.IV ex pupae of Ocnogyna loewii Z. 7 ♀ 3 ♂.

Microplitis rufiventris Kok. - Gerling 1969 (Spodoptera littoralis Boisd.)

Only a male specimen at hand. Tergite 1 twice longer than its broadest part medially, with subparallel sides, together with succeeding tergites smooth and shiny (contrarily to Filipescu 1962, but agreeing with Telenga 1955). Abdomen reddish, wings hardly infuscate, stigma brownish with a basal light spot.

Described from Turkestan (USSR), and reported from Uzbekistan (USSR), and Rumania. Presumably a rather widely ranged species in the Mediterranean Subregion.

Locality: Deganya, 6.VII.1942, in a plantation of subtropical fruit-trees, 1 ♂.

Opiinae

Opius concolor Szépl. - Bodenheimer 1937 (Dacus).

A rather variable species. Reddish yellow. Vein d of fore wing not twice longer than n. rec. Median keel of propodeum with longitudinal striae. 1st tergite almost smooth and shiny.

Known from Africa, and Sicily.

Localities: Deganya A, 12.I.1940, ex larvae of Synclera traducalis Z. 1 ♀, 16.I.1940, ex larvae of Carpomyia incompleta Becker, 19.I.1940, 2 ♀, 15.III.1967 Light trap 1 ♀.

* Opius diversus Szépl. -

Antennae 26-jointed. Tergites 2-3 with fine rugulosity. Length 1.8 mm. Head brownish black, mandible yellow, thorax and abdomen black, legs pale. Wings hyaline.

Frequent in the Palearctic Region, also recorded from Ethiopia (Africa).

Locality: Deganya, 1.IV.1965, ex Phytomyza atricornis Mg., 1 ♂.

* Opius sp.

Two males without head; indeterminable. Perhaps a new species. Presumably belonging to subgenus Opius, Sektion A, comatus-Gruppe (Fischer 1958).

Localities: Deganya 14.III.1965, (25.IV.1944, ex pupae of Pegomyia hyosciami betae Curt. 2 ♀.

Doryctinae

* Heterospilus testaceus Tel. - Telenga (1941) described this species from Ciscaucasia and Turkmenia, (USSR) on the base of both sexes. In his re-

vision of the genus Heterospilus Hal., Fischer (1960) states that he had not at hand any specimen of this species, and knew only the original description. The single female from Israel agrees with Telenga's description. However, the antenna is 28-jointed, the scutellum with very fine rugulosity, and the ovipositor longer than half of the abdomen (33:52).

Locality: Deganya 17.IV.1940, in a lucerne field, 1 ♀.

Braconinae

Vipio mlokossewitschi Kok. - Bodenheimer 1937.

Very similar to V. contractor Nees, differing from this species by the reddish palpi and relatively short ovipositor (hardly longer than abdomen).

Reported from the USSR (Georgia, Turkmenia), Iran, Rumania.

Locality: Nahalal, 20.III.1932, 1 ♀.

* Vipio tentator var. rufipes var. n.

The new variety differs from the nominate form by its reddish yellow hind femur; otherwise similar to it. Reported from the USSR (Caucasus, Ukraine), CSR. (South Moravia), Hungary, Rumania, Jugoslavia, Italy and Tunis.

Presumably an euryöc eremophilous species.

Locality: Deganya, 3.VI.1942, on flowering carrots, 1 ♀.

* Glyptomorpha desertor Fabr.

A widely but sporadically distributed species in the Southwestern Palearctic Region. It seems to be a stenöc eremophilous species.

Locality: Deganya 18.V.1942, on lower herbs, 1 ♂.

* Baryproctus zarudnianus Tel.

This species was described by Telenga in 1936 from Iran in the female sex only. The present locality in Israel is the second one.

The female agrees with the original description, but: proximal half of propodeum smooth and shiny, along its median longitudinal carina with very short transverse striae, tergite 2 somewhat shorter than tergite 3 (8:10), with very fine rugulosity, length 5.5 - 6 mm. The male differs from female as follows: carina and posterior sculpture of propodeum, striato-rugosity of 1st tergite stronger. 2nd tergite rugo-striated, 3rd tergite with very fine rugulosity, length 6 mm.

Localities: Deganya 15.III.1965, 23. V., 15.X.1964 - 66 light trap
2 ♀ 1 ♂.

Fischer, M. 1958: Die europäischen Arten der Gattung Opius Wesm. Teil I a. (Hymenoptera, Braconidae). - Ann. Mus. Civ. Stor. Nat. Genova, 70, p. 33-70.

Fischer, M. 1958: Die europäischen Arten der Gattung Opius Wesm. Teil III. Opius s. str., Sektion C (Hymenoptera, Braconidae). - Beitr. Entom., 8, p. 189-212.

* Bracon abscissor var. unicolor Fahr.

A West Palearctic, species.

Locality: Deganya, 17.IV.1940, in a lucerne field, 1 ♀.

* Bracon caudiger Nees.

Known from some European countries (Belgium, Germany, Sweden, Italy, Austria).

Characteristic for this species is the elongated 3rd cubital cell (r_2 : $cuqu_2$ as 15:5).

Locality: Deganya, 17.IV.1940, in a lucerne field, 1 ♂.

* Bracon nigripedator Nees.

A widely distributed species in South, Central, and East Europe.

The single male is reddish yellow, only mesosternum and a median streak of propodeum black.

Locality: Deganya, 1.VI.1942, on flowering carrot, 1 ♂.

* Bracon urinator var. testaceus var. n. - Bodenheimer 1937: B. urinator F.

Ranging in the Western Palearctic Region. The new variety stands nearest to Bracon urinator var. syriacus Fahr., and var. rufithorax Fahr., however, it differs from both varieties by its testaceous femora and tibiae.

Locality: Deganya, 1.VI.1942, on flowering carrot 1 ♀.

Rhogadinae

* Rhogas basalis Costa.

Entire body reddish yellow or mesosternum black, or mesosternum black and anterior half of propodeum blackish. Antenna 35-jointed. Tergite 1 broader posteriorly than its length (22: 20), tergite 2 transverse, width to length as 25:18. Cu_2 hardly quadratic (r_2 : $cuqu_2$ as 12:8).

Reported from South Europe (Italy), Transcaucasia (USSR), and Iran.

Locality: Deganya, 9-22.VII.1939. 3 ♀ 1 ♂ all in light trap.

* Rhogas ductor Thunbg.

Distributed in the entire Palearctic Region. One of the commonest Rhogas species. Tergites 1-3 reddish yellow, further ones black. Legs (from coxae) reddish yellow.

Localities: Deganya, 10.IV.1940, in a Citrus-grove 1 ♀, 17.IV.1940, in a lucerne field 1 ♀. Shaar-Ha'Golan, 1.VI.1947, in a lucerne field, 1 ♂.

* Rhogas rossicus Kok.

♂ new description: Entire body light brownish yellow, without any dark (or black) spot on mesopleura, propodeum, and 1st tergite. Antenna 39-jointed, Cu_2 and brachial cell nearly of equal length ($r_2 : d_2$ upper vein of brachial cell as 20:22). Tergite 1 hardly longer than wide posteriorly (35:33). Tergite 2 transverse, width to length as 42:29. Both tergites longitudinally rugulose.

Hitherto known only from Yaroslavsk (USSR) and Finland (Hellén 1927). New to the Mediterranean region.

Locality: Deganya, 6.VI.1943, light trap, 1 ♂.

Hormiinae

Hormius moniliatus (Nees). - Bodenheimer 1937 (Microlepidoptera)

A widely distributed species in the Palearctic Region. Light forms are at hand; body brownish-red, propodeum and tergite 1 blackish.

Localities: Deganya, 15.II.1965, 14.VII.1943, light trap 2 ♀.

REFERENCES

- Bodenheimer, F.S. 1937: Prodrum Faunae Palaestinae Mem. Inst. Egypte 33. 286 pp. (Braconidae p. 159).
- Eady, R.D. - Clark, J.A.J. 1964: A revision of the genus Macrocentrus Curtis (Hym., Braconidae) in Europe with descriptions of four new species. - Entom.'s Gaz., 15. n. 97-127.
- Fahringer, J. 1922: Hymenopterologische Ergebnisse einer wissenschaftlichen Studienreise nach der Türkei und Kleinasien (mit Ausschluss des Amanusgebirges). - Archiv f. Naturg., 88 A, p. 149-222 (Braconidae: p. 165-167).

- Fahringer, J. 1930: Hymenopteren aus Palästina und Syrien. Systematischer Teil. Ichneumonidae, Braconidae, Evanidae, Cynipidae, Chalcididae, Serphidae, Psammocharidae. - Sitz. ber. Akad. Wiss. Wien, 1, p. 20-22.
- Filipescu, C. 1962: Contributii la studiul genului Microplitis Först. (Hymenoptera, Braconidae) din fauna R.P.R. - Acad. Rep. Pop. Romine. Filiala Iasi, Stud. Cercet. Biol., 13, p. 85-94.
- Fischer, M. 1960: Die europäischen Arten der Gattung Opius Wesm. (Hymenoptera, Braconidae). Teil IVa. - Ann. Zool., Warszawa, 19, p. 33-112.
- Fischer, M. 1960: Revision der paläarktischen Arten der Gattung Heterospilus Haliday (Hymenoptera, Braconidae). - Bull. ent. Pologne, 30, p. 33-64.
- Gerling, D. 1969: The parasites of Spodoptera littoralis Bois. (Lepidoptera, Noctuidae) eggs and larvae in Israel. - Israel J. Entom. 4, p. 73-81.
- Hellén, W. 1927: Zur Kenntnis der Braconiden (Hym.) Finnlands I. Subfam. Braconinae (part.), Rhogadinae und Spathiinae. - Acta Soc. Fauna & Flora Fennica, 56 (12), pp. 59 & 1 map.
- Lacatusu, M. 1967: Ord. Hymenoptera (Fam. Braconidae). In L'entomofaune des forets du sud de la Dobrudja. - Trav. Mus. d'Hist. Nat. Gr. Antipa, 7, p. 165-175.
- Marshall, T.A. 1885 - 1899: Monograph of British Braconidae. Parts I-VIII. - Trans. R. ent. Soc. London.
- Nixon, G.E.J. 1939: Notes on the taxonomy and synonymy of Zele Curtis, and Macrocentrus Curtis (Hym., Braconidae). - Bull. ent. Res., 29, p. 415-424.
- Papp, J. 1960: A Revision of the Tribe Braconini Ashm. from the Carpathian Basin (Hymenoptera, Braconidae). - Ann. Hist. - nat. Mus. Nat. Hung., 52, p. 367-380.
- Papp, J. 1966: A Synopsis of the Bracon F. species of the Carpathian Basin (Hymenoptera, Braconidae). I. Subgenus Glabrobracon Fahr. - Ann. Hist. - nat. Mus. Nat. Hung., 58, p. 373-394.
- Schmiedeknecht, O. 1897: Das Studium der Braconiden nebst einer Revision der europäischen und benachbarten Arten der Gattungen Vipio und Bracon. - Ill. Woch. Ent., 1, p. 496-498, 510-513, 527-530, 540-543, 557-559, 570-573, 589-592.
- Schmiedeknecht, O. 1897: Die Braconiden-Gattung Meteorus Hal. - Ill. Woch. Ent., 2, p. 150-154, 173-175, 184-190, 204-207, 221-223, 298-302.
- Shenefelt, R.D. 1965: A contribution towards knowledge of the world literature regarding Braconidae (Hymenoptera: Braconidae). - Beitr. Ent., 15, p. 201-500.

- Talhok, A.S. 1961: Records of entomophagous insects from Lebanon. - Entomophaga, 6, p. 207-209.
- Telenga, N.A. 1936-1955: Insectes Hyménoptères, Braconidae. - In Faune de l'URSS, V/2-4
- Wilkinson, D.S. 1940: New species of Apanteles (Hym. Brac.) - 1. - Proc. R. ent. Soc. London, B 9, p. 23-29.
- Wilkinson, D.S. 1945: Description of palearctic species of Apanteles (Hymen. Braconidae). - Trans. R. ent. Soc. London, 95, p. 35-226.