

**A survey of the European species of *Apanteles* Först.  
(Hymenoptera, Braconidae: Microgastrinae),  
VII. The carbonarius-, circumscriptus-, fraternus-,  
pallipes-, parasitellae-, vitripennis-, liparidis-, octonarius-  
and thompsoni-group**

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**Abstract** — Key to the *carbonarius*-, *circumscriptus*-, *fraternus*-, *pallipes*-, *parasitellae*-, *vitripennis*-, *liparidis*-, *octonarius*- and *thompsoni*-group comprising all European (50) and a few extra-European (7 East Palaearctic, 7 Nearctic and 2 Oriental) totalling 66 *Apanteles* species, is given. From among the 50 European *Apanteles* species (within the *vitripennis*-group) 5 species are new to science: *A. nivalis* sp. n., *A. ripus* sp. n., *A. salepus* sp. n., *A. sibiricus* sp. n. and *A. urolus* sp. n. Recent type-examination revealed the following new synonymies: *A. aliphera* NIXON, 1973 = *A. sublateralis* TOBIAS, 1976, syn. n., *A. bicolor* (NEES, 1834) = *A. pedias* NIXON, 1973, syn. n.; *A. elpis* NIXON, 1973 = *A. girkanus* TOBIAS, 1976, syn. n.; *A. errans* NIXON, 1973 = *A. arenicola* PAPP, 1973, syn. n.; *A. eugeni* PAPP, 1972 = *A. fausta* NIXON, 1973, syn. n., = *magnicoxis* JAKIMAVIČIUS, 1972, syn. n.; *A. inclusus* (RATZBURG, 1844) = *A. curvulus* THOMSON, 1895 *A. laetus* MARSHALL, 1885 = *A. metallicus* JAKIMAVIČIUS, 1972, syn. n.; *A. nanus* REINHARD, 1880; = *A. szoecsi* PAPP, 1973, syn. n.; *A. pallipes* REINHARD, 1880 = *A. longicornis* PROVANCHER, 1886, syn. n.; *A. rimulosus* NIEZABITOWSKI, 1910 = *A. comes* WILKINSON, 1940, syn. n. All species are enumerated in alphabetical order within their respective species-group. With 139 figures.

**Introduction** — Recently DR. W. R. M. MASON (1981) published his reclassification on the "polyphyletic nature" of the genus *Apanteles* — a problem which has for many decades been an enigmatic question for the specialists engrossed in this complicate phylogenetical process. Disregarding the critics of the theory expounded by Mason, the splitting of the genus *Apanteles* into several new genera seems profounded considering its manifold composition. However, as regards my survey on the European species of *Apanteles*, it is reasonable to continue my elaboration in the future on the basis of the system of species-groups disclosed in the first part of my monograph (PAPP 1976). A "homologization" of my species-groups with Mason's new genera will be issued in the last part of my survey — a task not easy to solve and accomplish.

**The CARBONARIUS-group**

The following features characterize the species of the *carbonarius*-group: 1. Tergites 2-3 enlarged, further tergites about half as long as or shorter than tergites 2-3. 2. Metasoma laterally notched at the joining of tergites 2-3 (Figs 1-2). 3. Hypopygium strongly sclerotized, i.e. laterally without creases. 4. Propodeum polished and with a medio-longitudinal carina, at most medially transversely rugulose along carina. 5. First section of radial vein ( $r_1$ ) directed somewhat inwards (Figs 3, 7).

The species-group comprises 2 European (and 4 Palaearctic) species.

The hosts of the species of the *carbonarius*-group cover the lepidopterous family Bucculatricidae.



KEY TO THE SPECIES OF THE *CARBONARIUS*-GROUP

## Females

- 1 (4) Second tergite less transverse, at most 1.7—1.8 times wider behind than long medially. *d2* twice as long as *d1*. Legs yellow, 3rd tibia and tarsus more or less infusate (Fig. 1)
- 2 (3) Tergites 1–4 (Fig. 1) densely and evenly rugose, 4th tergite slightly less roughly sculptured. Second tergite somewhat longer than third tergite. First tergite broad, 1.3 times longer than wide at hind, with parallel sides. Penultimate joint of antenna subcubic, slightly longer than broad. Legs rather reddish yellow. ♀: 1.7 mm. — So far known only from Mongolia

***A. nixonii* PAPP, 1971 (!!)\***

- 3 (2) Only tergites 1–3 rugose to rugulose-subrugulose, tergite 4th smooth, shiny. 2nd and 3rd tergites equal in length. First tergite less broad, twice longer than wide at hind, distally with converging sides. Penultimate joint of antenna 1.2–1.3 times longer than broad. Legs rather yellow to pale yellow. ♀♂: 1.4–1.7 mm. — USSR (Tadzhikistan)

***A. condarensis* TOBIAS, 1960 (!)**

- 4 (1) Second tergite more transverse, twice wider behind than long medially. *d2* at most 1.5 times longer than *d1*. Legs dark, brown, blackish to black.
- 5 (6) First tergite subrectangular, 1.2–1.3 times as long as wide, parallel- or indistinctly subparallel-sided (Fig. 2). 3rd tergite densely rugulose-subrugulose, dull. Propodeum medially with more or less transverse ruguloses along medio-longitudinal carina, otherwise propodeum polished. Metacarp longer than stigma, latter usually wide, 2.5 times longer than wide (Fig. 3). Second tergite with rugosity almost similar to that of first tergite. Tegula black or brownish black. ♀: 1.8–2.3 mm, ♂: 1.5–2 mm. — Distributed in Europe, Mongolia and Korea. (= *anomalus* LYLE, 1925)

***A. carbonarius* (WESMAEL, 1837) (!)**

— First tergite quadratic, indistinctly longer than wide, with parallel sides. Tegula yellow, legs also yellow. ♀♂: 2–2.2 mm. — Nearctic Region, Ecuador

***A. empretiae* VIERECK, 1913 (!)**

- 6 (5) First tergite distinctly, i. e. 1.6–2 times longer than wide at base. Third tergite chagreened or almost smooth, shiny. Propodeum polished, at most with a few and very short rugulae along hind carina and above lunule.
- 7 (8) First tergite (Fig. 4) posteriorly with weakly to moderately converging sides, its basal width at most one-third greater than its apical width. Stigma less wide, 2.7–2.9(–3) times longer than wide, metacarp as long as or slightly shorter than stigma (Fig. 5). Second tergite somewhat more transverse, 2.1–2.2 times wider behind than long medially. First tergite always entirely black. Tegula brownish black to brownish yellow. Femora 2–3 black(ish). ♀: 1.7–2 mm, ♂ 1.5–2 mm. — Western Palaearctic Region as far eastwards as Kazakhstan and Uzbekistan in the USSR. (= *comes* WILKINSON, 1940, !, syn. n.)

***A. rimulosus* NIEZABITOWSKI, 1910**

- 8 (7) First tergite posteriorly with distinctly converging sides, its basal width about twice greater than its apical width. Stigma wide, 2.3–2.4 times longer than wide, metacarp slightly longer than stigma. Second tergite somewhat less transverse, twice wider behind than long medially. First tergite yellow excepting its blackish apex. Tegula and femora 2–3 yellow. ♀♂: 1.5–1.8 mm. — Moldavia (USSR), Hungary

***A. plugarui* TOBIAS, 1975 (!)**

(!!) = I studied either the holotype or paratype(s).

(!) = I studied authentic specimen(s), i.e. specimen(s) named by Marshall, Nixon, Reinhard, Telenga, Tobias, Wilkinson (Palaearctic species) and Marsh, Mason, Muesebeck, Watanabe (Nearctic or East Palaearctic species).



THE SPECIES OF THE *CARBONARIUS*-GROUP(Synonyms are in *italics*, numbers refer to couplet-numbers)

*anomalus* LYLE 5 (6)  
*carbonarius* WESMAEL 5 (6)  
*comes* WILKINSON 7 (8)  
*condarensis* TOBIAS 3 (2)  
*plugarui* TOBIAS 8 (7)  
*nixonii* PAPP 2 (3)  
*rimulosus* NIEZABITOWSKI 7 (8)

The *CIRCUMSCRIPTUS*-group

The following features characterize the species of the *circumscriptus*-group: 1. Hypopygium sclerotized, i.e. laterally weakly creased to smooth and folded along the medio-longitudinal line. In lateral view hypopygium and ovipositor sheath with a characteristic form and outline (Figs 12, 18). 2. Head and mesonotum-scutellum with satin sheen or pruinose. 3. First tergite more or less narrowing from base to apex (Figs 9–10, 17, 19, 32). 4. Metacarp usually longer than stigma (Fig. 11). 5. Anal vein of hind wing usually of average length, as long as two-fifths of vannal lobe (Fig. 13). 6. Body black coloured; tegula, sternites 1–2 and legs usually yellow.

The species-group comprises 13 species in Europe.

The hosts of the species of the *circumscriptus*-group cover the lepidopterous (leaf-mining species of the) families Elachistidae, Gracilaridae, Lithocolletidae.

KEY TO THE SPECIES OF THE *CIRCUMSCRIPTUS*-GROUP

## Females

- 1 (2) Hypopygium strongly sclerotized, i. e. without lateral creases; distal end of hypopygium more or less pointed, ovipositor sheath distinctly surpassing end of metasoma. Head and mesonotum-scutellum shiny to polished, i.e. without satin sheen. Species of the *vitripennis*-group though with a resemblance to the *circumscriptus*-group

*eugeni* PAPP, 1972 (!)

*lateralis* (HALIDAY, 1834) (!)

- 2 (1) Hypopygium weakly sclerotized corresponding to the group-characters.  
 3 (6) Body reddish yellow with more or less black(ish) pattern. Mesonotum and mesopleuron anteriorly densely coriaceous-rugulose, dull.  
 4 (5) Second tergite wider behind than long medially, first tergite parallel-sided and rounded behind, twice longer than wide at base (Fig. 6). Stigma almost thrice to thrice as long as wide, issuing radial vein clearly distally from its middle, metacarp usually as long as stigma, *r*<sub>1</sub> shorter than *cu*<sub>1</sub> and meeting angularly with each other (Fig. 7). Propodeum rugose, its dorsal surface more or less smooth, shiny. Head in dorsal view twice broader than long, behind eyes rounded. Penultimate joint of antenna 1.3–1.5 times longer than broad. Head black, mesosoma reddish yellow, propodeum and metanotum black, mesonotum sometimes with three black(ish) spots. Metasoma reddish yellow, its hind half to two-thirds dark brown to black. Legs reddish yellow, at most hind coxa infusate. ♀: 2–2.2 mm. — USSR (European part, Kazakhstan, Azerbaidzhan), Turkey, Hungary

*A. rufulus* TOBIAS, 1964 (!)



- 5 (4) Similar to the previous species except the following features: second tergite at most 1.5 times wider behind than long medially (Figs 12–13 in BALEVSKI 1980: 352). *r*1 and *cuq*1 equal in length (Fig. 11, 1. c. ). Ground colour of body black, mesosoma with rich reddish yellow pattern, legs reddish yellow. Supposedly a melanic form of *A. rufulus* TOBIAS. ♀♂: 2 mm. — Bulgaria

**A. intermixtus** BALEVSKI, 1980

- 6 (3) Body black, at most metasoma basally, i. e. 1–2–3 tergites, reddish yellow, legs usually yellow or reddish yellow, sometimes more or less black(ish). Mesonotum with a characteristic satin sheen, with fine to obsolescence punctation.
- 7 (16) Every tergites smooth to polished, at most hind half to third of first tergite and eventually second tergite with weak to hardly distinct aciculation or subrugulosity.
- 8 (9) Hypopygium evenly sclerotized, i. e. neither with latero-longitudinal creases nor with a medio-longitudinal fold. Ovipositor sheath very short, more or less concealed in hypopygium. Represents a separate monotypic species-group, though with several features common with the *circumscriptus*-group. — Sporadic to frequent in the western Palaearctic Region

**[A. fraternus** REINHARD, 1880 (!!)]

- 9 (8) Hypopygium more or less weakly sclerotized, i. e. either with latero-longitudinal creases and/or always with a medio-longitudinal fold. Ovipositor sheath more or less short and never concealed in hypopygium, usually as long as hind basitarsus. Propodeum never entirely polished, usually rugulose(–rugose) around lunule. First tergite other in form.
- 10 (11) Mesosoma in lateral view elongated, nearly twice to twice (1.8–2 times) as long as high. A dark-coloured species. Head-mesosoma-metasoma black, sternites 1–2 yellowish brown. Tegula black. Legs brownish yellow, coxae black, hind femur brown to blackish, apical end of hind tibia blackish, hind tarsus infusate to blackish, femora 1–2 frequently more or less brown to blackish. Ovipositor sheath in lateral view as long as or somewhat shorter than hind basitarsus. Tergites 1–2 similar to that of *A. circumscriptus*. ♀♂: 2.2–2.4 mm. — England, Finland, Austria, Slovakia, Hungary, Azerbaidzhan (USSR), Mongolia. (= *girkanus* TOBIAS, 1976, !, **syn. n.**)

**A. elpis** NIXON, 1973 (!)

- 11 (10) Thorax in lateral view exceptionally elongated, usually normal in size, 1.3–1.5 times longer than high; if more or less elongated then body never dark-coloured, at least legs vivid yellow to yellow, tegula yellow to straw yellow.
- 12 (13) Second tergite transverse, (1.6–)1.8–2 times wider at hind than long medially, first tergite distinctly narrowing posteriorly (Fig. 29); hind half to third of first tergite and second tergite less frequently smooth or polished, rather with fine aciculation or rugosity. Further details see at couplet 29 (30)

**A. arisba** NIXON, 1973 (!)

- 13 (12) Second tergite less transverse, rather subtriangular in form, about 1.5 times wider at hind than long medially (Figs 9–10). Tergites 1–2 smooth to polished, at most with fine to very fine and rather disperse aciculation.
- 14 (15) Metacarp short, usually as long as stigma (Fig. 8), less usually slightly shorter or longer. Stigma relatively wide, 2.6–2.7 times as long as wide, emitting radial vein from its middle and only exceptionally slightly distally; *r*1 usually much shorter than *cuq*1 and meeting each other clearly angularly (Fig. 8). Ocelli, in comparison to the next species, relatively small, distance between fore and a hind ocelli mostly slightly longer than greatest diameter of hind elliptic ocellus. Tergites 1–2(–3) frequently yellow to vivid yellow, otherwise black or blackish. ♀♂: 1.8–2.2 mm.



— Supposedly widely distributed in Europe. (= *ardeaepenellae* BOUCHÉ, 1834, !!; = *pedias* NIXON, 1973, !, **syn. n.**; ? = *schillei* NIEZABITOWSKI, 1910)

**A. bicolor** (NEES, 1834) (!)\*

- 15 (14) Metacarp long, distinctly longer than stigma (Fig. 11). Stigma relatively less wide, 2.8–3 times as long as wide, emitting radial vein distally from its middle; *r*1 more or less shorter than *cuq*u1 and meeting each other less angularly (Fig. 11). Ocelli, in comparison to the previous species, relatively large, distance between fore and a hind ocellus as long as (or minutely shorter than) greatest diameter of hind elliptic ocellus. Tergites 1–2 (–3) black or blackish, less frequently yellow. ♀♂: 1.8–2 mm. — Frequent to common in the Palearctic Region. (= *blancardellae* BOUCHÉ, 1834, !!; = *flavolimbatus* RATZBURG, 1848; = *lautellus* MARSHALL, 1885; = *umbellatarum* HALIDAY, 1834)

**A. circumscriptus** (NEES, 1834) (!)

— Second tergite rather transverse, twice to nearly twice wider behind than long medially, i. e. less subtriangular in form. Ovipositor sheath short, in lateral view distinctly shorter than hind basitarsus. Otherwise quite similar to *A. circumscriptus*. ♀♂: 2–2.2 mm. — Nearctic Region

**A. militaris** (WALSH, 1861) (!)

- 16 (7) Tergites 1–2 rugose-rugulose or weakly rugose, i. e. with distinct sculpture and never polished.  
 17 (20) Two spurs of hind tibia subequal in length, i.e. inner spur at most slightly longer than outer spur (Fig. 16).  
 18 (19) First tergite parallel-subparallel sided, third tergite 1.3–1.2 times longer than second tergite (Fig. 14). Tergites 1–2 with dense and rather strong rugosity, tergite 3 on its fore half rugulose to chagreened. Propodeum with even and similar rugosity to that of first tergite, dull. Ovipositor sheath in lateral view relatively less expanded and rather pointed apically, hypopygium less produced apically (Fig. 15). In dorsal view mesonotum somewhat though distinctly less wide between tegulae than breadth of head. Disc of mesonotum, in comparison to the next species, with rather coarse punctation. Coxae black, femora 2–3 blackish, otherwise legs brownish yellow, tarsi fumous. ♀♂: 2–2.3 (–2.5) mm. — England, Denmark, Hungary

**A. maritimus** WILKINSON, 1941 (!!)

— Tergites 1–2 less strongly rugose and with rather longitudinal striate elements. Rugosity of propodeum restricting to medio-hind surface, otherwise smooth with a weakening few rugulae-subrugulae, shiny. Mesonotum as wide as breadth of head. Colour of legs similar to *A. maritimus*. ♀♂: 1.8–2.1 mm. — Nearctic Region

**A. bedelliae** VIERECK, 1911 (!)

— First tergite slightly though distinctly broadening posteriorly, tergites 1–2 rugose. Rugosity of propodeum similar to that of *A. bedelliae*. In dorsal view mesonotum slightly less wide between tegulae than breadth of head, disc of mesonotum with fine punctato-shrivelling and with satin sheen. Femora 2–3 variable in colour, entirely black to yellow with dark pattern. ♀♂: 1.8–2 mm. — Nearctic Region

**A. rohweri** MUESEBECK, 1921 (!)

- 19 (18) First tergite evenly narrowing posteriorly, third tergite 1.8–1.5 times longer than second tergite (Fig. 17). Hind half of first tergite rugose, roughly rugose, second tergite distinctly with weaker sculpture, i.e. rugulose to chagreened and more or less pruinose. Propodeum medially rugose-rugulose, laterally with weakening sculp-

\*See my remark of this species on p. 267.



ture to smooth, shiny. Ovipositor sheath in lateral view relatively more expanded, and apically rather truncate (Fig. 18). In dorsal view mesonotum between tegulae as wide as breadth of head. Disc of mesonotum, in comparison to previous species, with less coarse punctation. Colour of legs similar to that of previous species. ♀♂: 1.7–2.5 mm, usually 2.1–2.3 mm. — Western Palaearctic Region. (? = *exilis* HALIDAY, 1834; = *fuliginosus* WESMAEL, 1837)

**A. viminetorum** (WESMAEL, 1837) (!!)

- 20 (17) Two spurs of hind tibia distinctly different in length, inner spur longer than outer spur and about as long as half hind basitarsus.
- 21 (24) Third tergite basally more or less rugulose or subrugulose, never entirely smooth. Tergites 1–2 with similar sculpture, usually rugose.
- 22 (23) First tergite parallel-subparallel sided, i.e. not narrowing posteriorly; second tergite less transverse, usually twice, and at most 2.1–2.2 times, wider behind than long medially (Fig. 19). Stigma 2.6–2.7 times as long as wide, issuing radial vein distally from its middle; *D* relatively less wide, only slightly wider than high (Fig. 20). Mesosoma in lateral view less elongate, 1.2 (–1.3) times longer than high. Dark colour of legs somewhat more extended than that of next species. ♀♂: 1.8–2 mm, — England, Nederland, Sweden, Finland, Germany, Switzerland, Austria, Czechoslovakia, Hungary — (?U.S.A.). (? = *ornigis* WEED, 1887, !; = *szoecsi* PAPP, 1973, !, **syn. n.**)

**A. nanus** REINHARD, 1880 (!!)

- 23 (22) Anterior half of first tergite parallel-sided, its posterior half narrowing; second tergite more transverse, 2.5 times wider behind than long medially (Fig. 21). Stigma 2.3–2.4 times as long as wide, issuing radial vein from its middle; *D* relatively more wide, one-third wider than high (Fig. 22). Mesosoma in lateral view elongate, 1.4 times longer than high. Prescutellar furrow shallow and narrow, uncrenulated. Dark colour of legs somewhat less extended than that of previous species. ♀: 1.8 mm. — Mongolia

**A. ambiguus** PAPP, 1977 (!!)

- First tergite rather parallel-sided and narrowing at its hind end. Second tergite twice wider behind than long medially. Prescutellar furrow sharp (or relatively deep), narrow with fine crenulation. ♀♂: 1.8–2 mm. — Canada

**A. salicifoliella** MASON, 1959 (!)

- 24 (21) Third tergite entirely smooth or polished. Second tergite usually with weaker sculpture than first tergite.
- 25 (28) Second tergite rather transverse or subrectangular, i.e. hind width of first tergite about equal to median length of second tergite (Figs 23, 26).
- 26 (27) Head in dorsal view subcubic, 1.6–1.7 times broader than long (Fig. 24). Mesosoma elongate, in lateral view almost twice to twice (1.8–2) as long as high. *r1* much shorter than about half as long as, *cuqul* and two veins meeting each other angularly; *D* distinctly, i.e. 1.3 times wider than high, *d1* slightly shorter than or as long as *d2* (Fig. 25). Mesonotum, in comparison to next species, clearly punctate, dull. Inner spur of hind tibia more or less shorter than half basitarsus. Penultimate joint of antenna 1.2–1.6 times as long as broad. Hind coxa infusate, apically yellow. Scape black or blackish with yellowish tint. ♀: 2.2–2.3 mm — England, Hungary (= *arenicola* PAPP, 1973 !, **syn. n.**)

**A. errans** NIXON, 1973 (!!)

- 27 (26) Head in dorsal view transverse, twice or almost twice broader than long (Fig. 27). Mesosoma in lateral view usual in size, 1.4–1.5 times as long as high. *r1* and *cuqul*



about equal in length and meeting less angularly; *D* indistinctly wider than high, *d1* distinctly shorter than *d2* (Fig. 28). Mesonotum, in comparison to previous species, with fine to obsolescent punctation, with satin sheen, Inner spur of hind tibia half (to almost half) as long as basitarsus. Penultimate joint of antenna 1.8–2 times, usually twice, as long as broad. Hind coxa yellow, basally infusate. Scape yellow. ♀♂: 2.3–2.7 mm. — Europe, Japan. (= *metallicus* JAKIMAČIUS, 1972 !, **syn. n.**)

***A. laetus* MARSHALL, 1885 (!)**

28 (25) Second tergite less transverse, rather subtriangular, i.e. hind width of first tergite distinctly, one-third to two-fourths, shorter than medio-longitudinal length of second tergite (Fig. 29).

29 (30) Second tergite not so distinctly subtriangular than that of subsequent two species, hind width of first tergite one- to two-fourths shorter than medio-longitudinal length of second tergite or second tergite 2.3–3 times wider behind than long medially; first tergite, in comparison to next two species, frequently somewhat more broadening basally (Fig. 29). Ocelli mostly small, distance between fore and a hind ocellus slightly greater than diameter of an ocellus. Ovipositor sheath in lateral view three-fourths as long as hind basitarsus. Body black, tegula and legs yellow, hind coxa black(ish), palpi pale yellow. ♀♂: 2.1–2.4 mm. — England, Norway, Denmark, Nederland, Germany, Austria, Hungary, Yugoslavia, Greece, Egypt

***A. arisba* NIXON, 1973 (!)**

30 (29) Second tergite subtriangular, hind width of first tergite half as wide as medio-longitudinal length of second tergite or second tergite only (1.5–)1.7–2.1 times wider behind than long medially; first tergite usually less broadening basally (Figs 30, 32). Ocelli mostly large, distance between fore and a hind ocelli slightly shorter than or as long as diameter of an ocellus.

31 (32) Head in dorsal view less transverse, 1.7–1.8 times broader than long, temple frequently slightly broadening (Fig. 31). First tergite more narrowing posteriorly, its apical width about half as wide as its basal width (Fig. 30). Hind corner of propodeum somewhat more raised. Colour similar to that of *A. arisba*. ♀♂: 2–2.5 mm. — England, Nederland, Germany, Hungary, Bulgaria, Mongolia

***A. phaetusa* NIXON, 1973 (!)**

32 (31) Head in dorsal view transverse, twice broader than long, temple never broadening. First tergite less narrowing posteriorly, its apical width about one-third as wide as its basal width (Fig. 32). Hind corner of propodeum less raised or usual in form. Colour similar to *A. arisba*. ♀♂: 2.5–3 mm, usually 2.7–2.8 mm. — Great Britain, Norway, Finland, Nederland, North Italy (Tirol), Hungary, Slovakia (ČSSR)

***A. exiguus* (HALIDAY, 1834) (!)**

— Hind coxa yellow. Propodeum with less raised hind corner. Ocelli somewhat greater and forming a slightly higher triangle. ♀: 2.3 mm. — U.S.A.: Oregon

***A. salalicus* MASON, 1959 (!)**

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**Remark** — In 1937 D. S. Wilkinson designated a female specimen as the neotype of *Microgaster bicolor* NEES, 1834 (since 1862 transferred into the genus *Apanteles*) in the Ratzeburg Collection (Eberswalde) now in the Zoologisches Museum, Berlin (WILKINSON 1938). I have also studied this neotype and accept without reservation its taxonomic position. Comparing the neotype to a pair (1 ♀ + 1 ♂) of the paratypes of *A. pedias* NIXON kindly lent to me by Dr. T. Huddleston (London), I was able to establish their identity. From the viewpoint of the Zoological Nomenclature a perplexing prevalence possesses the name *M. bicolor* CURTIS, 1830, i.e. the name *bicolor* by CURTIS is senior by four years over



the name *bicolor* by NEES. However, the namen *M. bicolor* CURTIS is a nomen nudum, *M. bicolor* NEES is a valid name, consequently *M. bicolor* NEES suppresses *M. bicolor* CURTIS. *A. pedias* NIXON, 1973, on the other hand, is simply a junior synonym of *A. bicolor* (NEES, 1834).

#### THE SPECIES OF THE *CIRCUMSCRIPTUS*-GROUP (Synonyms are in italics, numbers refer to couplet-number)

<i>ambiguus</i> PAPP 23 (22)	<i>laetus</i> MARSHALL 27 (26)
<i>ardeaepenellae</i> (BOUCHÉ) 14 (15)	<i>lautellus</i> MARSHALL 15 (14)
<i>arenicola</i> PAPP 26 (27)	<i>maritimus</i> WILKINSON 18 (19)
<i>arisba</i> NIXON 12 (13), 29 (30)	<i>metallicus</i> JAKIMAVIČIUS 27 (26)
<i>bedelliae</i> VIERECK 18 (19)	<i>militaris</i> (WALSH) 15 (14)
<i>bicolor</i> (NEES) 14 (15)	<i>nanus</i> REINHARD 22 (23)
<i>blancardellae</i> (BOUCHÉ) 15 (14)	<i>?ornigis</i> WEED 22 (23)
<i>circumscriptus</i> (NEES) 15 (14)	<i>pedias</i> NIXON 14 (15)
<i>elpis</i> NIXON 10 (11)	<i>phaetusa</i> NIXON 31 (32)
<i>errans</i> NIXON 26 (27)	<i>rohweri</i> MUESEBECK 18 (19)
<i>exiguus</i> (HALIDAY) 32 (31)	<i>rufulus</i> TOBIAS 4 (5)
<i>?exilis</i> (HALIDAY) 19 (18)	<i>salalicus</i> MASON 32 (31)
<i>flavolimbatus</i> (RATZEBURG) 15 (14)	<i>salicifoliella</i> MASON 23 (22)
<i>fuliginosus</i> (WESMAEL) 19 (18)	<i>?schillei</i> NIEZABITOWSKI 14 (15)
<i>girkanus</i> TOBIAS 10 (11)	<i>szoecsi</i> PAPP 22 (23)
<i>intermedius</i> BALEVSKI 5 (4)	<i>umbellatarum</i> (HALIDAY) 15 (14)
	<i>viminetorum</i> (WESMAEL) 19 (18)

#### TRANSITIONAL SPECIES TOWARDS THE *CIRCUMSCRIPTUS*-GROUP (Respective species-groups in parenthesis, numbers referring to couplet-number)

<i>eugeni</i> PAPP 1 (2)
(vitripennis-group)
<i>fraternus</i> REINHARD 8 (9)
(fraternus-group)
<i>lateralis</i> (HALIDAY) 1 (2)
(vitripennis-group)

#### The *FRATERNUS*-group

The following features characterize the species of the *fraternus*-group: 1. Hypopygium strongly sclerotized, i.e. without a medio-longitudinal fold and lateral creases. 2. Head and mesonotum+scutellum pruinose. 3. Every tergite polished. 4. Two spurs of hind tibia subequal, inner spur indistinctly longer than outer spur, and just shorter than half hind basitarsus.

The hosts of the species of the *fraternus*-group cover the lepidopterous family Geometridae.

The *fraternus*-group comprises a single species in Europe:

- In dorsal view head usually distinctly, less usually very slightly, broader than mesosoma between tegulae. Head and mesonotum+scutellum characteristically punctato-shrivelled and pruinose. Propodeum and every tergites polished. First tergite narrowing nearly evenly from base to apex, almost twice to twice as long as wide at base; second tergite one-third (to half) shorter than third tergite (Fig. 33). Metacarp as long as or somewhat longer than stigma, latter issuing radial vein more or less distally from its middle, *r*<sub>1</sub> distinctly shorter than *cu*<sub>1</sub> and meeting each other hardly angu-



larly (Fig. 34). Head in dorsal view behind eyes usually slightly broadening. Ocelli small, distance between fore and a hind ocellus equal with diameter of an ocellus. Ovipositor sheath short, in lateral view at most half as long as hind basitarsus. Black to brown, legs brown, tibiae and tarsi yellow(ish). Wings subhyaline. ♀♂: 1.5–2.5 mm, usually 1.6–1.8 mm. — Sporadic to frequent in the Palearctic Region

**A. fraternus** REINHARD, 1880 (!)

— Head and mesosoma polished, legs yellow with few brownish pattern, otherwise very similar to *A. fraternus*. ♀♂: 1.8–2 mm. — U.S.A.

**A. politus** RILEY, 1881 (!)

### The *PALLIPES*-group

The following features characterize the species of *pallipes*-group: 1. Propodeum densely rugulose, with a distinct medio-longitudinal carina. 2. Dorsal sulcus of pronotum absent. 3. Hypopygium strongly sclerotized, without lateral creases.

The hosts of the species of *pallipes*-group cover the lepidopterous families Noctuidae (mainly) and Pyralidae.

The *pallipes*-group comprises but a single species in Europe (and in the Holarctic Region too):

— Head in dorsal view less transverse, 1.6–1.7 times broader than long, eye only somewhat longer than temple. Face uneven to almost smooth, shiny, otherwise head polished. Antenna more or less longer than body, penultimate joint 1.7–1.8 (–1.9) times as long as broad. Mesonotum glistening, its marked punctation posteriorly reducing. Scutellum polished. Hypopygium densely rugulose, with a medio-longitudinal keel. Metacarp about as long as stigma, latter issuing radial vein distal from its middle. *r*<sub>1</sub> shorter than *cu*<sub>1</sub> and meeting each other distinctly angularly; *D* one-fifth wider than high, *d*<sub>1</sub> shorter than *d*<sub>2</sub> (Fig. 35). First tergite (sub)parallel-sided, its hind half or third attenuating. Second tergite twice wider behind than long medially (Fig. 36). Hind half of first tergite and second tergite medially with similar rugulosity to propodeum, second tergite laterally with longitudinal rugo-rugulosity. Hypopygium small, ovipositor sheath short, in lateral view as long as fourth joint of hind tarsus. Black, palpi and tegula yellow or pale yellow. Legs yellow, hind coxa basally infuscate to blackish. ♀♂: 2.4–2.8 mm. — Holarctic Region. (= *longicornis* PROVANCHER, 1886, **syn. n.** = *radiatus* ASHMEAD, 1898; *reinhardi* WILKINSON, 1936)

**pallipes** REINHARD, 1880 (!)

### THE SPECIES OF THE *PALLIPES*-GROUP

(Synonyms are in italics)

*longicornis* PROVANCHER  
*pallipes* REINHARD  
*radiatus* ASHMEAD  
*reinhardi* WILKINSON

### The *PARASITELLAE*-group

The following features characterize the species of the *parasitellae*-group: 1. First tergite distinctly though in variable sizes narrowing from base to apex; second tergite markedly transverse, third tergite 1.5–1.7 (–2) times longer than second tergite (Fig. 39). 2. *r*<sub>2</sub> present



as a stub-form reduced vein (Fig. 37). 3. Hypopygium weakly sclerotized, laterally creased. 4. Ovipositor sheath long, in lateral view usually as long as hind tibia.

The hosts of the species of the *parasitellae*-group cover the lepidopterous families Gelechiidae, Pterophoridae, Tineidae and Tortricidae.

The *parasitellae*-group comprises 5 European species.

## KEY TO THE SPECIES OF THE *PARASITELLAE*-GROUP

### Females

- 1 (10) *Cu*2 (or areolet of fore wing) always open, i.e. *cuqu*2 usually effaced, at most and exceptionally faintly to very faintly indicated; *r*2 usually present as a stub-like reduced vein (Fig. 37). First tergite always narrowing posteriorly (Figs 39, 40, 41).
- 2 (5) First tergite less narrowing from base to apex, its basal width about and at most one-third greater than its apical width; apical width of first tergite distinctly greater than median length of second tergite (Figs 39, 40).
- 3 (4) Flagellar joints 15–14(–13) cubic or 15(–14th) joint(s) exceptionally slightly transverse, hairs of flagellar joints relatively less erected (Fig. 41). *r*1 and *cuqu*1 equal in length or *cuqu*1 slightly longer than *r*1 (Fig. 37). Hind half of first tergite rugose, less shiny. Prescutellar furrow narrow, finely crenulated. Ovipositor sheath in lateral view as long as hind tibia, at most somewhat longer, gradually widening apically. Propodeum medially rugose to a variable extent and with a weak to indistinct carina, laterally smooth to polished. Inner spur of hind tibia shorter than half basitarsus, body black. Tegula yellow, sternites 1–2 (–3) yellow to yellowish brown. Legs yellow, hind coxa black and only apically yellow(ish), end of hind tibia and entire hind tarsus infusate to blackish. Wings hyaline. Stigma brownish, veins yellowish pigmented. ♀♂: 2.5–3.5 mm, usually 2.6–3 mm. — Frequent to common in the Palearctic Region. (= *flavilabris* RATZBURG, 1844; = *lictorius* REINHARD, 1880; = *polypori* GAUTIER et BONNAMOUR, 1930; = *ruficornis* NEES, 1834; = *rufilabris* RATZBURG, 1844)

#### *A. parasitellae* (BOUCHÉ, 1834) (!!)

- 4 (3) Flagellar joints 15–13 always, usually one-fourth to one-third, longer than broad, hairs of flagellar joints relatively more erected (Fig. 42). *r*1 and *cuqu*1 unequal, *r*1 about one-fourth shorter than *cuqu*1 (Fig. 43). Hind half of first tergite less rugose and more shiny. Prescutellar furrow less narrow, groove-like and crenulated. Otherwise quite identical with the previous species. ♀♂: 2.8–3.5(–4) mm. — England, Germany, Hungary

#### *A. arene* NIXON, 1973 (!!)

— First tergite subparallel-sided, i.e. slightly widening posteriorly. Tergites 1–2 rugose. Flagellar joints 15–14(–13) cubic to slightly transverse. *r*1 and *cuqu*1 about equal in length. Ovipositor sheath distinctly longer than hind tibia. Mesonotum punctate, interspaces shiny. Colour similar to that of *A. parasitellae*. ♀♂: 3–3.3 mm. — Nearctic Region

#### *A. consimilis* VIERECK, 1911 (!)

- 5 (2) First tergite more narrowing from base to apex, its basal width twice to almost twice greater than apical width; apical width of first tergite at most equal with, frequently shorter than, median length of second tergite (Fig. 44).
- 6 (7) Tergites 1–2 almost smooth and shiny, first tergite conspicuously tapering posteriorly, its apical width distinctly shorter than median length of second tergite. Ovipositor



sheath in lateral view half as long as hind tibia. Propodeum smooth and shiny, rugosity restricted to around lunule. Mesonotum distinctly punctate, interspaces shiny. Inner spur of hind tibia half as long as hind basitarsus. Colour of body similar to that of *A. parasitellae*. ♀♂: 2.5 mm. — Ciscaucasus in Russia (USSR)

**A. ciscausicus** TOBIAS, 1971

- 7 (6) Tergites 1–2 usually rugose, less usually subrugose-rugulose, i.e. always with distinct sculpture. First tergite less conspicuously tapering posteriorly, its apical width as wide as, or slightly shorter than, median length of second tergite (Fig. 44).
- 8 (9) Antenna moderately though clearly thickened distally, its penultimate two joints cubic-subcubic to at most and rather exceptionally one-fourth to one-third longer than broad. Propodeum medially rugose, subrugose, with a medio-longitudinal and usually weak carina. *r1* distinctly more or less shorter than *cuqu1*; *D* one-third wider than high (Fig. 45). Flagellum yellow to brownish yellow, apically darkening. Third tergite laterally at least with yellowish suffusion, frequently yellow or brownish yellow to brownish to a variable extent, ♀♂: 2.5–3.2 mm, usually 2.7–2.8 mm. — England, Norway, Holland, Germany, Hungary

**A. hedymeles** NIXON, 1973 (!)

- 9 (8) Antenna indistinctly attenuating distally, its penultimate two joints (1.4–)1.5–1.6 times longer than broad. Propodeum nearly entirely smooth, shiny, (rugose-) rugulose close around lunule, median carina absent. *r1* somewhat to indistinctly shorter than *cuqu1*; *D* at most one-fourth wider than high (Fig. 46). Flagellum black, third tergite laterally at most brown, yellowish brown, ♀♂: 2.5–3.2 mm, usually 3 mm. — England, Sweden, Germany, Switzerland, Austria, Czechoslovakia, Hungary, Romania (Transylvania). (= *epinotiae* FISCHER, 1962; = *epinotica* FISCHER, 1966)

**A. tedellae** NIXON, 1961 (!)

- 10 (1) *Cu2* always closed, i.e. *cuqu2* more or less distinct, usually as somewhat pigmented vein; *r2* not stub-like (Fig. 47). First tergite not always narrowing posteriorly. Few species of *Choeras* MASON, 1981 with transitional features towards *parasitellae*-group as indicated by NIXON too (1965, 1973)

**Choeras dorsalis** (SPINOLA, 1808) (!)

**Choeras tiro** (REINHARD, 1880) (!)

THE SPECIES OF THE *PARASITELLAE*-GROUP

(Synonyms are in italics, numbers refer to couplet-number)

*arene* NIXON 4 (3)  
*ciscausicus* TOBIAS 6 (7)  
*consimilis* VIERECK 4 (3)  
*epinotiae* FISCHER 9 (8)  
*epinotica* FISCHER 9 (8)  
*flavilabris* RATZBURG 3 (4)

*hedymeles* NIXON 8 (9)  
*lictorius* REINHARD 3 (4)  
*parasitellae* BOUCHÉ 3 (4)  
*polyptori* GUATIER et BONNAMOUR 3 (4)  
*ruficornis* NEES 3 (4)  
*rufilabris* RATZBURG 3 (4)  
*tedellae* NIXON 9 (8)

TRANSITIONAL SPECIES TOWARDS THE *PARASITELLAE*-GROUP

(Respective genus in parenthesis, numbers refer to couplet-number)

*dorsalis* SPINOLA 10 (1)  
 (*Choeras* MASON, 1981)  
*tiro* REINHARD 10 (1)[  
 (*Choeras* MASON, 1981)



The *VITRIPENNIS*-group

The following features characterize the species of the *vitripennis*-group: 1. Body rather slenderly built, shiny to polished. 2. *r*<sub>1</sub> and *cu*<sub>1</sub> meeting distinctly angularly (e.g. Figs. 69, 91). 3. Hypopygium strongly sclerotized, i.e. without lateral creases and a medio-longitudinal fold. Ovipositor sheath short, at most as long as, and usually distinctly shorter than, hind basitarsus. 4. First tergite gradually narrowing from base to apex, distinctly longer than wide at base (Figs 73, 89). Tergites 2–3 usually equal in length, or less usually second tergite somewhat shorter. Second tergite trapeziform and longitudinally strio-rugose to strigose. 5. Basella of hind wing strongly incurved (Fig. 92).

The species-group comprises 23 species in Europe.

The hosts of the species of the *vitripennis*-group cover the lepidopterous families Arctidae, Geometridae, Glyphipterygidae, Limntriidae, Noctuidae (mainly!) and Plutellidae.

KEY TO THE SPECIES OF THE *VITRIPENNIS*-GROUP

## Females

- 1 (4) First tergite parallel-sided, exceptionally subparallel-sided, i.e. slightly narrowing posteriorly.
- 2 (3) Tergites 1–2 more or less rugose-rugulose. Fifth joint of fore tarsus with a curved spine on its outer-distal half (cf. Fig. 65, 99) Species of the *popularis*-group with resemblance to the *vitripennis*-group  
[*A. anchisiades* NIXON, 1973 (!)]
- 3 (2) Tergites 1–2 polished. Fifth joint of fore tarsus without spine. Species of the *liparidis*-group, see p.  
[*A. liparidis* (BOUCHÉ, 1834) (!)]
- 4 (1) First tergite narrowing, usually evenly, from base to apex (Figs 67, 73, 89).
- 5 (6) Mesosoma dorso-ventrally more or less, though distinctly, flattened. Antenna short, about as long as head, mesosoma and first tergite, flagellar joints short. Species of the *thompsoni*-group, see p. 274  
[*A. stackelbergi* TELENGA, 1955]  
[*A. thompsoni* LYLE, 1927 (!)]
- 6 (5) Mesosoma never flattened dorso-ventrally, usually normal in form or, in a few species, elongated.
- 7 (8) Head, mesosoma and first tergite reddish yellow, propodeum and tergites brown, sternites yellow to reddish yellow, mesonotum with three blackish spots. Legs yellow, hind coxa, trochanter and tarsus infusate. Head somewhat less than twice as broad as long, behind eyes constricted (Fig. 48). Tergites 1–2 polished. Mesonotum punctate. Propodeum densely rugulose. First tergite twice as long as wide at base. Two spurs of hind tibia unequal, inner spur distinctly longer than half basitarsus. ♂: 3 mm. — Germany (Dresden), European USSR  
*A. rubens* REINHARD, 1880 (!)
- 8 (7) Body black, at most fore tergites with more or less reddish yellow pattern. Legs yellow or reddish yellow, hind coxa usually black.
- 9 (10) Stigma brown with a distinct pale basal spot. Penultimate joint of antenna twice longer than broad. *d*<sub>2</sub> distinctly longer than *d*<sub>1</sub>. Second tergite shorter than third tergite. Body smooth to polished, only propodeum rugulose-subrugulose. Hypopygium in lateral view pointed, ovipositor sheath short. Tegula yellow. Hind margin



of third tergite reddish yellow. Legs also reddish yellow, hind coxa black, hind tarsus infusate. Wings hyaline. ♀: 4 mm. — Turkmenia (USSR)

**A. popovi** TELENGA, 1955

- 10 (9) Stigma evenly brown to blackish, less exceptionally opaque brownish to yellowish.  
 11 (18) Third coxa with rather rough and dense punctation. Mesonotum and anterior half of mesopleuron usually also with rough to strong and dense punctation.  
 12 (13) Mesonotum shiny to glistening, with fine to very fine and shallow punctation. Ovipositor sheath unusually long for the group, in lateral view about as long as hind basitarsus, i.e. surpassing well beyond end of metasoma, hypopygium pointed (Fig. 49). Penultimate joint of antenna 1.3(–1.5) times longer than broad. First tergite twice as long as its basal width, less attenuating posteriorly; second tergite slightly shorter than third tergite (Fig. 51). Stigma issuing radial vein distinctly distally from its middle, *r1* and *cuq1* equal in length; *d1* clearly shorter than *d2* (Fig. 50). Inner spur of hind tibia somewhat longer than half basitarsus. Hind coxa black. Fore sternites yellow. ♀: 3.2–3.5 mm, ♂: 2.8–3.3 mm. See also couplet 20 (21). — England, Holland, Belgium, Sweden, Germany, Slovakia, Hungary. (= *fulcriger* WESMAEL, 1837, ♀, partim)

**A. lateralis** (HALIDAY, 1834) (!)

- 13 (12) Mesonotum less shiny, with distinct to rather strong punctation, interspaces shorter than to at most as long as diameter of punctures. Ovipositor sheath in lateral view short, about as long as fourth joint of hind tarsus (Fig. 52).  
 14 (15) Mesosoma, in comparison to the next species, relatively elongated, in lateral view 1.6–1.65(–1.7) times longer than high. Hypopygium in lateral view pointed, usually more or less surpassing end of metasoma (Fig. 52). Stigma long, 2.9–3.5 times, usually 3–3.2 times, as long as wide, issuing radial vein clearly distal from its middle, *r1* somewhat shorter than, and rather exceptionally as long as, *cuq1*; *D* distinctly one-fourth wider than high (Fig. 53). Ocelli small, distance between fore and a hind ocellus longer or as long as diameter of an ocellus. Head in dorsal view subcubic, 1.8 times broader than high. Penultimate joint of antenna 1.3–1.4(–1.5) times longer than broad. Inner spur of middle tibia two-thirds to three-fourths as long as basitarsus (cf. Fig. 101). Hind coxa either entirely black or with a variable rusty to fulvous tint. Legs usually vivid yellow. ♀♂: 3–3.5 mm. — England, Germany, Austria, Slovakia, Hungary, USSR (European part, Georgia, Armenia). (= *majalis* WESMAEL, 1837)

**A. callidus** (HALIDAY, 1834) (!)

- 15 (14) Mesosoma, in comparison to the previous species, not elongated, usual in form, in lateral view 1.3–4.1(–1.5) times longer than high. Hypopygium in lateral view less pointed, rather truncate, ending before apex of metasoma (Fig. 54). Stigma less long, 2.4–2.6 times as long as wide. Ocelli large, distance between fore and a hind ocelli shorter than diameter of an ocellus.  
 16 (17) Head less transverse to subcubic, in dorsal view 1.7–1.8 times broader than long, behind eyes rounded (cf. Fig. 87). Stigma issuing radial vein less distally from its middle, *r1* and *cuq1* equal in length or former indistinctly shorter; *D* less wide, one-fifth wider than high (Fig. 55). First tergite more attenuating posteriorly, second tergite more transverse (Fig. 56). Inner (or longer) spur of middle tibia two-thirds as long as basitarsus. Distal third to half of hind coxa testaceous to fulvous. Third tergite black, only its hind end and lateral margin reddish yellow or yellow. ♀: 3–3.2 mm. — Nederland

**A. urolus** sp. n.



- 17 (16) Head transverse, in dorsal view twice (to almost twice) broader than long, behind eyes moderately to clearly constricted. Stigma issuing radial vein more distally from its middle, *r*1 slightly to distinctly longer than *cuq*1; *D* wide, distinctly one-fourth wider than high (Fig. 57). First tergite less attenuating posteriorly, second tergite less transverse (Fig. 58). Inner (or longer) spur of middle tibia three-fourths to (almost) equally as long as basitarsus (cf. Fig. 98). Hind coxa black, except its reddish yellow apex. Third tergite reddish yellow to yellow, medio-basally brown to blackish. ♀♂: 3.2–3.6 mm, usually 3.5 mm. — England, Sweden, Nederland, France, Germany, Slovakia, Hungary, Greece, Israel, USSR (Georgia, Armenia, Azerbaidzhan). (= *sublateralis* TOBIAS, 1976, !!, **syn. n.**)

**A. aliphera** NIXON, 1973 (!)

- 18 (11) Third coxa either smooth or with fine to obsolescent punctation. Mesonotum and anterior half of mesopleuron at most finely punctate.
- 19 (22) Ovipositor sheath usually long for the group, in lateral view about length of hind basitarsus and distinctly surpassing beyond end of metasoma (Figs 49, 59).
- 20 (21) Third coxa roughly and densely punctate. Hypopygium conspicuously large and pointed, in lateral view more or less surpassing end of metasoma (Fig. 49). *D* slightly wider than high, *d*2 1.7–1.8 times longer than *d*1 (Fig. 50). First tergite, in comparison to next species, less attenuating posteriorly; second tergite slightly shorter than third tergite (Fig. 51). Penultimate joint of antenna 1.3(–1.5) times longer than broad. Inner margin of eyes parallel-subparallel. Hind coxa black, legs yellow. Tergites black, tergites 3–7 sometimes blackish brown; sternites 1–3(–4) yellow, further sternites blackish or dark. Flagellum black. ♀: 3.2–3.5 mm, ♂: 2.8–3.3 mm. See also couplet 12 (13). — England, Nederland, Belgium, Sweden, Germany, Slovakia, Hungary. (= *fulcriger* WESMAEL, 1837)

**A. lateralis** (HALIDAY, 1834) (!)

- 21 (20) Third coxa either smooth or with very fine and superficial punctation. Hypopygium small and in lateral view truncate, ending before apex of metasoma (Fig. 59). *D* wide, one-fourth to one-third wider than high, *d*2 1.8–2 times longer *d*1 (Fig. 60). First tergite, in comparison to previous species, more attenuating posteriorly; second tergite distinctly shorter than third tergite (Fig. 61). Penultimate joint of antenna 1.8–2 times longer broad. Inner margin of eyes moderately converging towards oral part. Hind coxa together with legs bright yellow. Third tergite more or less yellow, medio-basally darkening to black, otherwise tergites black; exceptionally hind tergites with yellow(ish) pattern. Sternites together with hypopygium yellow to bright yellow. Flagellum brown to light brown. ♀♂: 3–3.6 mm, usually 3.4–3.5 mm. — England, Sweden, Finland, Nederland, Germany, Austria, Hungary, Bulgaria, Lithuania (USSR). (= *fausta* NIXON, 1973, !!, **syn. n.**; = *magnicoxis* JAKIMAVIČIUS, 1972, **syn. n.**)

**A. eugeni** PAPP, 1972 (!)

- 22 (19) Ovipositor sheath short corresponding to the group, in lateral view as long as third or fourth joint of hind tarsus, not or hardly surpassing end of metasoma (Figs 71, 88).
- 23 (26) Sternaulix rugose.
- 24 (25) Hind coxa roughly and densely punctate. Mesosoma somewhat elongated, in lateral view 1.6–1.65(–1.7) times longer than high. Further details see at couplet 14 (15)

**A. callidus** (HALIDAY, 1834) (!)

- 25 (24) Hind coxa smooth to polished. Mesonotum with discrete and dense punctation, before prescutellar furrow punctation reduced. Stigma wide, 2.3 times as long as wide, issuing radial vein slightly distally from middle, *r*1 somewhat shorter than



*cuqul*, *d2* twice longer than *d1*, venation thickened (Fig. 62). Penultimate joint of antenna 1.6–1.7 times as long as broad. Ocelli near to each other, distance between fore and a hind ocellus shorter than diameter of an ocellus. First tergite (Fig. 63) relatively narrow and less attenuating posteriorly, its basal width distinctly one-third greater than apical width; second tergite one-third shorter than third tergite. Inner (or longer) spur of middle tibia three-fourths as long as basitarsus (cf. Fig. 101); inner (or longer) spur of hind tibia half as long as basitarsus. In lateral view hypopygium moderately pointed. Tergites 2–3 brown, anteriorly and laterally yellow. Hind coxa yellow, its basal third blackish. ♀♂: 2.3–2.5 mm. — Austria

**A. antione** NIXON, 1973 (!)

26 (23) *Sternaulix* smooth.

27 (32) Inner third (or along median vein) of basal cell as well as proximal half of subbasal cell almost free from setae or bare (Fig. 64).

28 (31) Outer-distal side of fifth joint of fore tarsus with a curved spine (Figs 65, 70). Head in dorsal view twice broader than long (Fig. 72). Hind coxa black. Stigma issuing radial vein more or less distally from its middle (Figs 66, 69). First tergite relatively less wide and more attenuating posteriorly, second tergite somewhat less transverse (Figs 67, 73). Mesonotum subpubescent.

29 (30) Hypopygium in lateral view pointed and surpassing end of metasoma (Fig. 68). Head in dorsal view behind eyes slightly less rounded. Spine of fore tarsus less conspicuous, opposite to spine tarsal joint not emarginate (Fig. 65). First tergite (Fig. 67), in comparison to next species, somewhat wider. Stigma relatively wide, 2.2–2.4 times longer than wide (Fig. 66). Stigma usually blackish pigmented. ♀♂: 3–3.5 mm. See also couplet 46 (47). — Morocco, Europe as far eastwards as Caucasus Mts. in the USSR

**A. porthetriae** MUESEBECK, 1928 (!)

30 (29) Hypopygium in lateral view blunt and retracted before end of metasoma (Fig. 71). Head in dorsal view slightly more rounded (Fig. 72). Spine of fore tarsus conspicuous, opposite to spine tarsal joint distinctly emarginate (Fig. 70). First tergite (Fig. 73), in comparison to previous species, somewhat less wide or narrow. Stigma relatively less wide, 2.3–2.7 times longer than wide (Fig. 69). Stigma usually brownish pigmented. ♀♂: 2.8–3.5 mm, usually 3–3.2 mm. See also couplet 46 (47). — Sporadic to frequent in the Palearctic Region. (= *fulcriger* WESMAEL, 1837, ♂, partim; = *impavidus* GAUTIER et DRESNAY, 1927)

**A. vitripennis** (CURTIS, 1830) (!)

31 (28) Outer-distal side of fifth joint of fore tarsus without a spine. Head in dorsal view 1.8–1.9 times broader than long (Fig. 76). Hind coxa yellow to reddish yellow, basally (faintly) infusate. Hypopygium in lateral view truncate, ending before apex of metasoma (Fig. 77). Stigma issuing radial vein hardly distally from its middle (Fig. 78). First tergite relatively wide and less attenuating posteriorly, second tergite somewhat more transverse (Fig. 79). Mesonotum hairy as usually. ♀: 3.2–3.3 mm. — Siberia (USSR)

**A. sibiricus** sp. n.

32 (27) Inner third (or along median vein) of basal cell as well as proximal half of subbasal cell evenly setose similarly to other alar cells.

33 (44) Metacarp short, as long as or somewhat shorter than length of stigma; about 2–2.5 times longer than distance between its distal end and apex of radial cell (Figs 91, 134, 137).

34 (37) Head in dorsal view subcubic, 1.5–1.6 times broader than long, Temple and eye about equal in length (Figs 133, 136).



35 (36) Face protuberant if head seen in dorsal view; head behind eyes constricted, i.e. head between eyes distinctly broader than between temples (Fig. 133). Antenna short, distinctly shorter than body, penultimate joint of antenna at most one-third longer than broad. *D* wide, 1.3 times wider than high, metacarp distinctly shorter than stigma, *r*<sub>1</sub> oblique to fore margin of stigma (Fig. 134). First tergite (Fig. 135) parallel-sided, narrowing at its hind end, twice longer than broad at base. Hind femur 4.4 times as long as broad. Legs dark coloured, black to blackish. ♀ : 2.5 mm. — Novaya Zemlya (USSR)

***A. nigerrimus* ROMAN, 1924 (!)**

36 (35) Face not protuberant if head seen in dorsal view; head behind eyes slightly broadening, i. e. head between temples somewhat broader than between eyes (Fig. 136). Antenna long, i. e. usual in length, somewhat longer than body, penultimate joint of antenna twice longer than broad. *D* not wide, 1.1 times wider than high, metacarp (almost) as long as stigma, *r*<sub>1</sub> perpendicular to fore margin of stigma (Fig. 137). First tergite (Fig. 138) slightly to distinctly narrowing posteriorly, distinctly more than twice as long as broad at base. Hind femur unusually long, six times as long as broad (Fig. 139). Legs light coloured as usually. ♀ : 2.8 mm. — Switzerland

***A. nivalis* sp. n.**

37 (34) Head in dorsal view transverse, 1.7—2.2 times broader than long, temple about half as long as eye (Figs 83, 87).

38 (39) Body stout. Fore tarsal joints 2—4 cubic, i. e. hardly longer than broad (Fig. 74). Ocelli forming a high triangle, posterior imaginary tangent to fore ocellus distinctly before hind two ocelli. Antenna bristly and thick, its penultimate joint one-third longer than broad. Spiracle of propodeum conspicuous. First tergite (Fig. 75) wide and subparallel-sided, strongly narrowing at its hind third to half, here together with second tergite rugose, medially rugulose. Legs rusty, hind coxa black, hind femur fumous. ♂♂ : 2.5 mm. — Finland, Scotland

***A. menander* NIXON, 1973**

39 (38) Body average in size and form. Fore tarsal joints 2—4 distinctly longer than broad as usual. Ocelli forming a low triangle, posterior imaginary tangent to fore ocellus before, or at most touching, hind two ocelli. Antenna not thick, filiform, its penultimate joint at least one-half, usually 1.7—2 times, longer than broad.

40 (41) Hypopygium in lateral view (Fig. 80) large and pointed, conspicuously surpassing beyond last tergite. Metasoma compressed laterally. First tergite strongly narrowing posteriorly, less than twice as long as wide at its base (Fig. 81). Penultimate joint of antenna 1.8—2 times as long as broad. Stigma 2.2—2.5 (—3) times longer than wide, *r*<sub>1</sub> either as long as or (somewhat) shorter than *cu*<sub>qu</sub><sub>1</sub> (Fig. 82), *d*<sub>1</sub> distinctly shorter than *d*<sub>2</sub>. Two spurs of hind tibia subequal to equal in length, inner spur more or less shorter than half basitarsus. Hind coxa infusate to blackish, its apical half to third yellow(ish) (European forms); hind coxa entirely black (North American forms). ♂♂ : 3—3.5 mm. — Sporadic to common in the Holarctic Region

***A. compressiventris* MUESEBECK, 1921 (!)**

41 (40) Hypopygium (Fig. 88) in lateral view moderate to small in size, ending at or before last tergite. Metasoma not compressed laterally. First tergite usually not strongly narrowing posteriorly, and usually twice longer than wide at its base (Figs 89, 93, 97).

42 (43) First tergite (Fig. 89) not gradually attenuating from base to apex, its side feebly converging, clearly to strongly narrowing at its hind third to fourth. Stigma emitting radial vein distinctly distal from its middle (Fig. 91). Basella of hind wing incurved (Fig. 92). Propodeum usually more or less evenly rugulose, dull. First tergite on its hind "horizontal" half with similar rugulosity to that of propodeum, dull. Hind



coxa fully black. ♀♂: 2.5—4 mm, usually 3—3.5 mm. See also couplet 57 (58). — Frequent to common in the Palearctic Region, ?Nearctic Region. (? = *alticola* ASHMEAD, 1902)\*

**A. fulvipes** (HALIDAY, 1834) (!)

- 43 (42) First tergite (Fig. 93) gradually attenuating from base to apex, its sides evenly and clearly converging. Stigma emitting radial vein hardly distal from its middle (Fig. 94). Basella of hind wing indistinctly sigmoid-like (Fig. 95). Propodeum uneven to almost smooth, medially at most subrugulose(-rugulose), shiny. First tergite on its hind "horizontal" half unvarnished to smooth or almost entirely smooth, shiny. Hind coxa yellow, basally infuscate. ♀♂: 2.9—3.3 mm, usually 3—3.1 mm. — Slovakia (ČSSR), Poland, Russia: Kalinin district (USSR)

**A. ripus** sp. n.

- 44 (33) Metacarp long, distinctly longer than length of stigma; at least thrice, usually 3.5—4 times, longer than distance between its distal end and apex of radial cell (Figs 69, 86, 107).  
45 (52) Outer-distal side of fifth joint of fore tarsus with a curved spine, opposite to spine tarsal joint either emarginate (Figs 70, 96) or not emarginate (Figs 65, 99).  
46 (47) Inner third (or along median vein) of basal cell as well as proximal half of subbasal cell almost free from hairs to bare (Fig. 64). Further details see at couplets 27 (32) — 30 (29)

**A. porthetriae** MUESEBECK, 1928 (!!)

**A. vitripennis** (CURTIS, 1830) (!)

- 47 (46) Basal and subbasal cells evenly haired similar to other cells.  
48 (49) First tergite parallel-sided, at most and exceptionally subparallel-sided, i. e. slightly to indistinctly narrowing posteriorly. Tergites 1—2 more or less rugose-rugulose. Further details see at couplet 2 (3)

**[A. anchisiades** NIXON, 1973 (!!)]

- 49 (48) First tergite attenuating, usually evenly, from base to apex (Figs 97, 103, 108) or less evenly (Fig. 100).  
50 (51) Body, in comparison to next species, strong. Inner (or longer) spur of middle tibia longer than (Fig. 98) to as long as basitarsus; two spurs of hind tibia unequal in length, inner (or longer) spur longer than half basitarsus. First tergite twice longer than wide at base, its sides straight (Fig. 97). Ocelli relatively large, distance between fore and a hind ocellus usually shorter than diameter of hind ocellus; posterior imaginary tangent to fore ocellus transecting hind two ocelli. Penultimate joint of antenna 1.8—2 times longer than broad. Hind coxa apically frequently yellow. ♀♂: 3—3.3 mm, usually 3.3—3.5 mm. — Ireland, England, Germany, Slovakia, North Italy, Bulgaria

**A. mygdonia** NIXON, 1973 (!)

- 51 (50) Body, in comparison to previous species, less strong or usual in form. Inner (or longer) spur of middle tibia two-thirds to three-fourths (Fig. 101) as long as basitarsus; two spurs of hind tibia subequal to equal in length, inner spur at most as long as half basitarsus. First tergite less than twice as long as wide at base, its sides rather arched (Fig. 100). Ocelli relatively less large, distance between fore and a hind ocelli about as long as diameter of hind ocellus; posterior imaginary tangent to fore ocellus before or touching hind two ocelli. Penultimate joint of antenna 1.5—1.6 times

\*From the locality "nr. Estes Pk, Colo." (U.S.A.) I have two females of *A. alticola* ASHMEAD named by Dr. P. Marsh (Washington). Between these two specimens and my series of *A. fulvipes* (HALIDAY) from several parts of the Palearctic Region I could not establish any specific differences; supposedly the two names refer to the same species.



longer than broad. Hind coxa black. ♀♂: 3 mm. — England, Germany, Hungary, Bulgaria, Greece

*A. acasta* NIXON, 1973 (!)

52 (45) Fifth joint of fore tarsus without spine as usually.

53 (54) Flagellum pubescent, length of hairs equal to half breadth of flagellar joints (Fig. 102). First tergite moderately narrowing posteriorly (Fig. 103). Head behind eyes rather constricted (Fig. 104). Inner spur of hind tibia distinctly longer than outer spur. *d1* only somewhat shorter than *d2*. Hypopygium in lateral view truncate. Hind coxa black, its apical third yellow. ♀: 3.5 mm. — Finland, Slovakia (ČSSR)

*A. aletta* NIXON, 1973 (!)

54 (53) Flagellum with short hairs as usually, their length about one-third to one-fifth of breadth of flagellar joints. First tergite distinctly narrowing posteriorly (Figs 89, 108). Head behind eyes rounded.

55 (58) Head in dorsal view less transverse, only 1.7—1.8 times broader than long (Figs 83, 87). First tergite not evenly attenuating posteriorly (Figs 84, 89). Propodeum densely rugulose, dull.

56 (57) Temple in lateral view (Fig. 85) broadening below, its greatest width behind eye somewhat longer than greatest width of eye. Cheek long, distinctly one-third longer than basal breadth of mandible. Penultimate joint of antenna 1.3—1.5 times as long as broad. Metacarp longer than stigma (Fig. 86); stigma issuing radial vein hardly distally from its middle, *r1* oblique to fore margin of stigma. First tergite (Fig. 84) relatively strongly attenuating posteriorly, its narrowing side slightly concave. Flagellum proximally yellow to yellowish. Apical third of hind coxa yellow(ish) to rusty. ♀♂: 2.8—3 mm. — Nederland

*A. salepus* sp. n.

57 (56) Temple in lateral view (Fig. 90) not broadening below, evenly wide behind eye as usually, greatest width of temple shorter than greatest width of eye. Cheek less long, only somewhat longer than basal breadth of mandible. Penultimate joint of antenna 1.7—2(—2.2) times longer than broad. Metacarp usually shorter than stigma (Fig. 91), exceptionally as long as or rarely slightly longer than stigma; latter issuing radial vein distinctly distally from its middle, *r1* perpendicular to fore margin of stigma. First tergite (Fig. 89) less strongly attenuating posteriorly, its narrowing side rather convex. Flagellum fully black(ish), rather exceptionally faintly yellowish proximally. Hind coxa black, sometimes with more or less yellow(ish) pattern apically. ♀♂: (2.5—)3—3.5 mm. An extremely variable species as indicated by NIXON (1973) too. See also couplet 42 (43). Frequent to common in the Palaearctic Region; ?Nearctic Region. (? = *alticola* ASHMEAD, 1902, !)\*

*A. fulvipes* (HALIDAY, 1834) (!)

58 (57) Head in dorsal view transverse, (1.9—)2—2.2 times broader than long (Fig. 106). Metacarp distinctly longer than stigma (Fig. 107). First tergite (almost) evenly attenuating posteriorly (Fig. 108). Propodeum subrugulose to almost smooth, shiny.

59 (60) Before anterior or median ocellus a somewhat pointed hunch prolonged in a blunt and low keel towards antennal base. *r1* perpendicular to fore margin of stigma (Fig. 105); *d1* usually somewhat shorter than *d2*. Body relatively strong, similar to *A. viripennis*. Inner spur of hind tibia longer than outer spur. Hind femur apically usually faintly infusate to blackish. ♀♂: (3—)3.7—4 mm. — England, North Italy, Slovakia (ČSSR), Transylvania (Romania)

*A. pinicola* LYLE, 1917 (!)\*

\*See footnote on p. 263.



- 60 (59) Before anterior or median ocellus neither hunch nor prolonged keel towards antennal base. *r1* more or less oblique to fore margin of stigma (Fig. 107); *d1* usually distinctly shorter than *d2*. Body relatively less strong; very similar to *A. fulvipes*. Inner spur of hind tibia slightly longer than or subequal to outer spur. Hind femur apically usually distinctly blackish. ♀♂: 3—3.5 mm. — Sporadic to frequent in Europe as far eastwards as Armenia in the USSR

*A. luciana* NIXON, 1973 (!)\*

#### THE SPECIES OF THE *VITRIPENNIS*-GROUP

(Synonyms are in italics, numbers refer to couplet-numbers)

<i>acasta</i> NIXON 51 (50)	<i>majalis</i> (WESMAEL) 14 (15)
<i>aletta</i> NIXON 53 (54)	<i>menander</i> NIXON 38 (39)
<i>aliphera</i> NIXON 17 (16)	<i>mygdonia</i> NIXON 50 (51)
? <i>alticola</i> (ASHMEAD) 42 (43), 57 (56)	<i>nigerrimus</i> ROMAN 35 (36)
<i>antioe</i> NIXON 25 (24)	<i>nivalis</i> sp. n. 36 (35)
<i>callidus</i> (HALIDAY) 14 (15), 24 (25)	<i>pinicola</i> LYLE 59 (60)
<i>compressiventris</i> MUESEBECK 40 (41)	<i>popovi</i> TELENGA 9 (10)
<i>eugeni</i> PAPP 21 (20)	<i>porthetriae</i> MUESEBECK 29 (30), 46 (47)
<i>fausta</i> NIXON 21 (20)	<i>ripus</i> sp. n. 43 (42)
<i>fulcriger</i> (WESMAEL) 12 (13), 20 (21)	<i>rubens</i> REINHARD 7 (8)
<i>fulvipes</i> (HALIDAY) 42 (43), 57 (56)	<i>salepus</i> sp. n. 56 (57)
<i>impavidus</i> GAUTIER et DRESNAY 30 (29)	<i>sibiricus</i> sp. n. 31 (28)
<i>lateralis</i> (HALIDAY) 12 (13), 20 (21)	<i>sublateralis</i> TOBIAS 17 (16)
<i>luciana</i> NIXON 60 (59)	<i>urolus</i> sp. n. 16 (17)
<i>magnicoxis</i> JAKIMAVIČIUS 21 (20)	<i>vitripennis</i> (CURTIS) 30 (29), 46 (47)

#### TRANSITIONAL SPECIES TOWARDS THE *VITRIPENNIS*-GROUP

(Respective species-groups in parenthesis, numbers refer to couplet-numbers)

<i>anchisiades</i> NIXON 2 (3), 48 (49)
(popularis-group)
<i>liparidis</i> (BOUCHÉ) 3 (2)
(liparidis-group)
<i>stackelbergi</i> TELENGA 5 (6)
(thompsoni-group)
<i>thompsoni</i> LYLE 5 (6)
(thompsoni-group)

\* \* \*

**Remark** — Type-designations of *Microgaster fulvipes* HALIDAY, 1834 (= *Apanteles fulvipes* [HALIDAY]):

1. Female lectotype: „141” (handscript, first card with insect) — „fulvipes” (second card, handscript) — „Box 25 AWS.” (A. W. Stelfox's handscript, above on card) — „British Haliday 20. 2. 82.” (third card, printed below on card).

2. Two male paralectotypes: with the same cards and data as the lectotype.

Lectotype and 2 paralectotypes are deposited in the Haliday's Collection, National Museum of Ireland, Dublin.

Herewith I express my sincere thank to Dr. J. P. O'Connor (National Museum of Ireland, Dublin) for his kind assistance to arrange the loan of Haliday's types.

\*The two species, *A. luciana* NIXON and *A. pinicola* LYLE, are very similar to each other, their distinction is not always unambiguous. *A. luciana* extremely similar to *A. fulvipes*



## DESCRIPTION OF THE NEW SPECIES

*Apanteles nivalis* sp. n. ♀

(Figs 136–139)

♀. Body 2.8 mm long. Head in dorsal view (Fig. 136) subcubic, 1.57 times broader than long, temple slightly shorter than eye and faintly broadening, i.e. head between temples slightly broader than between eyes, temple rounded, occiput weakly excavated. Ocelli small, distance between fore and a hind ocelli as long as diameter of an ocellus, hind imaginary tangent to fore ocellus touching hind pair of ocellus. Eye in lateral view twice higher than wide, temple feebly broadening below, though greatest width of temple equal to that of eye. Cheek about as long as basal width of mandible. Clypeus somewhat protruding, labrum somewhat retracted. Face above somewhat wider than, below as wide as high, inner margin of eyes converging towards oral part. Head smooth to polished. Antenna somewhat longer than body. First flagellar joint four times and penultimate joint twice as long as broad.

Mesosoma in lateral view 1.4 times longer than high. Mesonotum wider between tegulae than long medially, its disc with very fine and disperse punctation, shiny. Prescutellar furrow very narrow, uncrenulated. Scutellum with similar punctation to that of mesonotum. Polished field of postaxille hardly reaching up half to base of scutellum. Propodeum rugulose, anteriorly sculpture somewhat weakening, dull. — Legs long unusually to species of the *vitripennis*-group. Hind femur six times as long as broad (Fig. 139). Hind tibia and tarsus equal in length. Two spurs of hind tibia equalling, inner spur shorter than half basitarsus.

Fore wing about as long as body. Stigma (Fig. 137) 2.7 times as long as wide, emitting radial vein distal from its middle, metacarp (almost) as long as stigma; *r*<sub>1</sub> perpendicular to fore margin of stigma, shorter than *cu*<sub>1</sub> and meeting each other angularly; *D* not wide, 1.1 times wider than high, *d*<sub>1</sub> somewhat shorter than *d*<sub>2</sub>. *R* approaching tip of wing. Nervellus of hind wing incurved (cf. Fig. 92), *Cu* not conspicuously long, *cu*<sub>1</sub> 1.5 times longer than *n. bas*.

Metasoma in lateral view longer than mesosoma though shorter than head + mesosoma together. First tergite (Fig. 138) unusually narrow, 2.7 times longer than broad at base, slightly to distinctly attenuating from base to apex; second tergite somewhat wider behind than long medially. Hind horizontal half of first tergite and second tergite densely rugulose, dull, further tergites polished. Hypopygium in lateral view truncate, ovipositor short.

Body black. Palpi dirty pale, mandible and galea brownish yellow. Antenna black, flagellum proximally and below brownish. Tegula yellow. Legs yellow, hind coxa black. Sternites 1–3 brown. Wings hyaline, stigma and vein yellowish pigmented.

♂ and host unknown.

Locality — Holotype ♀: Switzerland, "Engadin, Pontresina, 1964. VIII. 19., dr. Erdős" (first label) — "coll. Dr. J. Erdős" (second label).

Holotype is deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5344.

The new species, *A. nivalis* sp. n., is closely related to *A. nigerrimus* ROMAN, the two species represent a subgroup within the *vitripennis*-group by their subcubic head. Their specific differences are included in the key to the species of the *vitripennis*-group, see couplets 34 (37) — 36 (35).

*Apanteles ripus* sp. n. ♀ ♂

(Figs 93–95)

♀. Body 2.9–3.3 mm, usually 3–3.1 mm long. Head in dorsal view (cf. Fig. 87), eye distinctly longer than temple, latter evenly rounded, occiput weakly excavated. Ocelli small, imaginary posterior tangent to fore ocellus at most touching hind two ocelli, distance between fore and a hind ocelli more or less shorter than diameter of an ocellus. Eye in lateral view about one-third wider than greatest width of temple behind eye. Face quadrate, its median height (almost) as long as its width, inner margin of eyes (sub)parallel. Head smooth and shiny, face subpunctate. Antenna somewhat longer than body. First flagellar joint four times and penultimate joint twice as long as broad.

Mesosoma in lateral view one-and-a-half times longer than high. Mesonotum somewhat wider between tegulae than long medially, its disc faintly punctate, shiny. Prescutellar furrow narrow, finely crenulated. Scutellum superficially and very finely punctate, shiny. Polished field of postaxille reaching up to half base of scutellum. Propodeum uneven to almost smooth, at most medially sub-



rugulose (to rugulose), shiny to glistening. — Hind femur in lateral view 4.5 times longer than broad. Hind tarsus minutely longer than hind tibia. Two spurs of hind tibia subequal to equal in length, inner spur somewhat shorter than half basitarsus.

Fore wing about as long as body. Stigma 2.8(–3) times longer than wide, issuing radial vein hardly distal from its middle,  $r_1$  distinctly shorter than *cu*<sub>1</sub> and meeting each other angularly (Fig. 94). Metacarp either and usually as long as stigma or slightly shorter (cf. Fig. 91). *D* one-fifth to one-sixth wider than high, *d*<sub>2</sub> one-fourth to one-fifth longer than *d*<sub>1</sub>. *R* approaching tip of wing. Nervellus of hind wing faintly sigmoid-like (Fig. 95).

Mesosoma in lateral view about as long as mesosoma. First tergite (Fig. 93) twice to almost twice as long as its basal width, its sides evenly and clearly converging posteriorly; second tergite quadrate, its hind breadth as long as or somewhat longer than median length. Hind horizontal half of first tergite rugose-rugulose, shiny; second tergite uneven to subrugulose and basally with longitudinal short elements, shiny. Further tergites polished. Hypopygium in lateral view truncate, ovipositor sheath short (cf. Fig. 88).

Body black. Antenna black(ish), pedicel yellow. Palpi yellow, mandible brownish yellow. Tegula yellow. Legs yellow, hind coxa black, apically yellowish. Tergites 2–3 laterally more or less brownish. Sternites 1–2 brown to dark brown. Wings hyaline, stigma yellowish opaque, veins light yellowish.

♂. Similar to female. Antenna distinctly longer than body, its penultimate joint 2.3–2.5 times as long as broad.

Host — 1 ♀ and 3 ♂ were bred from *Clostera anastomosis* L. (Lep., Notodontidae), however, without locality data; specimens in the Zoologisches Museum, Berlin.

Localities — 16 ♀ + 4 ♂ (1 ♀ holotype, 15 ♀ + 4 ♂ paratypes): “Ungarn, Treneczin, 7. 1896” (since 1920 Treneczin = Trenčín = Trenčín belongs to Czechoslovakia), leg. ? — 1 ♂ (allotype): “Berlin, Grunew. (ald), 17. 7. (19)01., Dr. G. Enderlein S.” — 2 ♀ (paratypes): “Berlin, Tegel, 16. 7. (19)02., Dr. G. Enderlein S.” — 1 ♀ (paratype): “Berlin, Savron, 6. 7. (19)02., Dr. G. Enderlein S.” — 1 ♀ (paratype): “Berlin, (?)Tangschleure, 20. 7. (19)02., Dr. G. Enderlein S.” — 1 ♀ (paratype): “Kurland, Jelowka, 19. 7. 1917, Bischoff S. G.” — 1 ♂ (paratype): “Kurland, Jelowka, 1. 8. 1917, Bischoff S. G.” — 1 ♂ (paratype): “Kurland, Jelowka-Lepel, 13. 8. 1917, Bischoff S. G.” — 1 ♂ (paratype): “Kurland, Neugut, 10. 9. 1917, Bischoff S. G.” — 1 ♀ (paratype): “Niederlehme, b. Kgsusterh., 21. 5. (19)22, Bischoff S. G.” — 2 ♀ (paratypes): “Voges, Fischbödle 790 m bis Hoheneck 1350 m, 11. VII. 1901, H. Kolbe S. G.” — 1 ♀ (paratype): “(?) Finkenkrug, IX. (19)24, Bischoff S. G.” — 2 ♀ + 1 ♂ (paratypes): “Leipzig, Lindenau, 26. 7. (18)90., Dr. R. Krieger S.” — 1 ♀ (paratype): “Deutschland”. — 1 ♂ (paratype): “Karlsruhe, 20. 8. (19)27., Hohndorf”. — 1 ♀ (paratype): “Polen, Lenkovo, bei Ossowicz, 20.–30. VII. (19)15, Bischoff S. G.” — 1 ♀ + 3 ♂ (paratypes): without locality data, ex *Clostera anastomosis* L.

Holotype, allotype and 30 paratypes (21 ♀ + 9 ♂) are deposited in the Zoologisches Museum, Berlin; 11 paratypes (8 ♀ + 3 ♂) are in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5345–5355. — Total number of type-specimens 43 (30 ♀ + 13 ♂).

The new species, *A. ripus* sp. n., is closely related to *A. fulvipes* (HALIDAY, 1834), their specific distinction is given in the key for the species of the *vitripennis*-group, see couplets 41 (40) — 43 (42).

#### *Apanteles salepus* sp. n. ♀♂

(Figs 83–86)

♀. Body 2.8–3 mm long. Head in dorsal view (Fig. 83) less transverse, 1.75–1.85 times broader than long, eye longer than temple, latter slightly broadening and evenly rounding behind eyes, i.e. head between temples slightly broader than between eyes, occiput weakly excavated. Ocelli average in size, distance between fore and a hind ocelli shorter than greatest diameter of a hind ocellus; hind imaginary tangent to fore ocellus almost touching to touching hind pair of ocellus. Eye in lateral view (Fig. 85) 1.8 times higher than wide, temple broadening below so that its greatest width somewhat longer than greatest width of eye. Cheek long, distinctly one-third as long as basal breadth of mandible. Face distinctly a quarter wider than high, inner margin of eyes subparallel-parallel. Head smooth to polished, face with superficial to indistinct and rather disperse punctation. Antenna as long as body. First flagellar joint 3.1–3.3 times, penultimate joint 1.3–1.5 times as long as broad.

Mesosoma in lateral view 1.4 times longer than high. Mesonotum one-fifth wider between tegulae than long medially, its disc finely-superficially punctate, shiny. Prescutellar furrow narrow, finely crenulated. Scutellum with a few and very fine punctures, shiny. Polished field of postaxille hardly



eaching up half to base of scutellum. Propodeum dull, densely rugulose, laterally somewhat roughened, latero-anterior corner uneven to almost smooth, subshiny; its medio-longitudinal keel feebly distinct and usually restricted to fore part of propodeum. — Hind femur in lateral view four times longer than broad. Hind tarsus slightly longer than hind tibia. Two spurs of hind tibia subequal, inner spur minutely longer than outer spur and just shorter than half basitarsus. Two spurs of middle tibia distinctly unequal, inner spur as long as two-thirds of basitarsus.

Fore wing about length of body. Stigma 2.7–2.9 times as long as wide, issuing radial vein hardly distally from its middle, metacarp longer than stigma; *r*1 more or less oblique to fore margin of stigma and shorter than *cu*<sub>1</sub>, *r*1 and *cu*<sub>1</sub> meeting angularly (Fig. 86). *D* rather wide, 1.2–1.3 times wider than high, *d*2 one-third longer than *d*1. *R* approaching tip of wing (Fig. 86). Nervellus of hind wing incurved (cf. Fig. 92), *Cu* relatively long, *cu*<sub>1</sub> twice as long as *n. bas*.

Metasoma in lateral view somewhat longer than mesosoma and shorter than head + mesosoma together. First tergite (Fig. 84) at its anterior third parallel-sided, relatively strongly narrowing behind, its basal width 1.8 times greater than its apical width, its narrowing side slightly concave. Second tergite (Fig. 84) transverse, its hind width 2.3 times longer than its median length; third tergite 1.3 times longer than second tergite. Hind horizontal half of first tergite and second tergite densely rugulose and dull, similar to rugulosity of propodeum. Further tergites polished. Hypopygium in lateral view truncate, ovipositor sheath short, about length of third joint of hind tarsus (cf. Fig. 77).

Body black. Scape black; pedicel and proximal half of flagellum yellow to yellowish, distally darkening. Palpi pale yellow to yellow, oral parts (clypeus, mandible, galea) dark yellow to brownish, yellow. Tegula yellow. Legs yellow, hind coxa infuscate to black (ish), apically rusty to yellowish. Hind femur dorso-apically with black spot. Sternites 1–3 (–4) yellow to brownish yellow. Wings hyaline or subhyaline. Stigma opaque brownish or eventually yellowish-brownish, venation yellowish pigmented.

♂. Similar to female. Antenna distinctly longer than body, its yellow colour less distinct. Hind tibia and tarsus distally gradually infuscate. Body 2.8–3 mm long.

Host unknown.

Locality — 21 type-specimens (9 ♀ + 12 ♂): "Nederland, Waarder (Z. H.), Oosteinde 33, C. v. Achterberg"; with different collecting-time data within the year 1973: Holotype ♀, allotype ♂, 2 ♀ + 6 ♂ paratypes 6–8 VII; 1 ♂ paratype 29.VI–1 VII; 1 ♀ + 4 ♂ paratypes 2–5 VII; 1 ♀ paratype 9–11 VII; 3 ♀ paratypes 12–14 VII; — and 1 ♀ paratype 2–28 VII 1974 caught in ground-trap.

Holotype, allotype and 14 paratypes (6 ♀ + 8 ♂) are deposited in Rijksmuseum van Natuurlijke Historie, Leiden; 5 paratypes (2 ♀ + 3 ♂) are in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5356–5360.

The new species, *A. salepus* sp. n., stands nearest to *A. fulvipes* (HALIDAY, 1834), probably it is a specialized form of *A. fulvipes* widely distributed and frequent in the Palaearctic Region. The distinction of the two species is given in the key-couplets 55 (58) — 57 (56) within the *vitripennis*-group.

*A. salepus* sp. n. is related to *A. acasta* NIXON (sporadically in Europe) too, their specific differences are tabulated below:

*A. salepus* sp. n.

1. Fifth joint of fore tarsus on its outer side without spine as usually.
2. Temple (Fig. 85) in lateral view widening below so that its greatest width behind eye somewhat longer than width of eye.
3. Head in dorsal view (Fig. 83) behind eyes broadening, i.e. breadth of head between temples somewhat greater than between eyes.
4. *r*1 more or less distinctly oblique to fore margin of stigma (Fig. 86).
5. First tergite (Fig. 84) distinctly attenuating behind, its narrowing side slightly concave.
6. Proximal half of flagellum yellow to yellowish.

*A. acasta* NIXON

1. Fifth joint of fore tarsus on its outer side with a curved spine (Fig. 99).
2. Temple in lateral view evenly wide behind eye and somewhat shorter than greatest width of eye.
3. Head in dorsal view behind eyes rounded, i.e. head broadest between eyes.
4. *r*1 (almost) perpendicular to fore margin of stigma (cf. Fig. 105).
5. First tergite (Fig. 100) less distinctly attenuating behind, its narrowing side rather convex.
6. Flagellum fully black(ish).



*Apanteles sibiricus* sp. n. ♀  
(Figs 76–79)

♀. Body 3.2–3.3 mm long. Head in dorsal view transverse (Fig. 76), 1.8–1.9 (–2) times broader than long, eye distinctly longer than temple, latter rounded, occiput excavated. Ocelli relatively large, distance between fore and a hind ocelli shorter than diameter of an ocellus, hind imaginary tangent to fore ocellus transecting hind pair of ocellus. Eye in lateral view higher than wide, temple evenly broad behind eye and half as wide as width of eye. Cheek about as long as basal width of mandible. Face distinctly one-sixth wider than high, inner margin of eyes slightly converging towards oral part. Head polished to smooth; face with superficial to indistinct punctation, shiny. Antenna somewhat longer than body. First flagellar joint 3.3–3.5 times, penultimate joint 1.5–1.6 times as long as broad.

Mesosoma in lateral view 1.35 times longer than high. Mesonotum somewhat to minutely wider between tegulae than long medially, its disc glistening and finely punctate, interspaces and diameter of punctures about equalling. Prescutellar furrow narrow and finely crenulated. Scutellum polished, at most with a few and rather indistinct punctures. Polished field of postaxille just reaching up half to base of scutellum. Propodeum smooth and shiny to polished, postero-laterally uneven.

Hind femur 3.5–3.6 times as long as broad. Hind tarsus longer than hind tibia. Two spurs of hind tibia distinctly unequal in length; inner spur clearly longer, outer spur just longer than half basitarsus. Inner spur of middle tibia as long as basitarsus, outer spur distinctly shorter.

Fore wing as long as body. Stigma (Fig. 78) 2.1–2.2 times longer than wide, issuing radial vein hardly (to indistinctly) distally from its middle, metacarp longer than stigma;  $r_1$  perpendicular to fore margin of stigma and longer than  $cu_{1+2}$ ,  $r_1$  and  $cu_{1+2}$  meeting each other angularly (Fig. 78).  $D$  feebly wider than high,  $d_2$  (1.8–) 2 times as long as  $d_1$ .  $R$  approaching to almost reaching tip of wing. Inner third or along median vein of basal cell as well as proximal half of subbasal cell almost free from setae (cf. Fig. 64), basal cell somewhat more setose than that on Fig. 64. Nervellus of hind wing incurved at its lower half.  $Cu$  short,  $n. bas.$  and  $cu_1$  equal in length.

Metasoma in lateral view somewhat longer than mesosoma but shorter than head + mesosoma together. First tergite (Fig. 79) relatively wide, 1.8 times longer than wide at base, narrowing posteriorly, its side feebly convex; second tergite moderately transverse, 1.8 times wider behind than long medially; third tergite one-quarter longer than second tergite. Hind horizontal third of first tergite rugulose-punctate, otherwise smooth and shiny; second tergite laterally along furrow weakly and rather longitudinally (sub)rugulose, otherwise smooth and shiny. Further tergites polished. Hypopygium in lateral view (Fig. 77) truncate and ending before or at apex of metasoma, ovipositor short, its projecting part equal in length with second joint of hind tarsus.

Body black. Oral organs together with palpi yellow to pale yellow. Antenna below yellowish to rusty, above black(ish). Tegula pale yellow. Legs yellow, ground colour of hind coxa yellow to reddish yellow with a variable infuscation from base to apex. Sternites fully and tergites 1–3 laterally yellow; hypopygium also yellow, below and apically brownish to brown. Wings: hyaline. Stigma, metacarp,  $r_1 + cu_{1+2} + cu_3$  brownish, further vein yellowish pigmented.

♂ and host unknown. Cocoon white.

Locality — Holotype ♀ and 6 ♀ paratypes: "USSR, Siberien, VII 1962, leg. Kulik".

Holotype and 4 paratypes are deposited in the Zoologisches Museum, Berlin; 2 paratypes in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5361–5362.

The new species, *A. sibiricus* sp. n., seems to be related to *A. vitripennis* (CURTIS) and *A. portheiriae* MUESEBECK owing to the setoseless surface of proximal part of fore wing, their specific separation is included in the key for the species of the *vitripennis*-group, see couplets 28 (31) — 31 (28).

In a few respects the new species resembles *A. compressiventris* MUESEBECK, however, they are easily distinguished by the following features:



*A. sibiricus* sp. n.

1. Metacarp longer than stigma, *r*1 distinctly longer than *cuq*1 (Fig. 78).
2. First tergite (Fig. 79) less wide at base, 1.8 times as long as its basal width.
3. Hypopygium in lateral view (Fig. 77) usual in size, truncate and ending at last tergite.
4. Basal cell at median vein and subbasal cell proximally nearly free from or with disperse setae.

*A. compressiventris* MUES.

1. Metacarp usually somewhat shorter than stigma, *r*1 at most as long as *cuq*1 (Fig. 82).
2. First tergite (Fig. 81) wide at base, 1.6–1.7 times as long as its basal width.
3. Hypopygium in lateral view (Fig. 80) conspicuously large, surpassing far beyond last tergite.
4. Basal and subbasal cells evenly (or almost evenly) setose.

*Apanteles urolus* sp. n. ♀

(Figs 54–56)

♀. Body 3–3.2 mm long. Head in dorsal view (cf. Fig. 87) less transverse to subcubic, 1.7–1.8 times broader than long, eye somewhat longer than temple, latter rounded, occiput excavated. Ocelli relatively large, distance between fore and a hind ocelli shorter than diameter of an ocellus, hind imaginary tangent to fore ocellus touching to just transecting hind pair of ocellus (cf. Fig. 76). Eye in lateral view 1.7–1.8 times higher than wide, behind eye temple very slightly broadening below though at its widest point distinctly less broad than eye. Cheek 1.3–1.4 times longer than basal width of mandible. Face subquadrate, inner margin of eyes converging towards oral part, face above, i.e. close below toruli, somewhat wider than, and below, i.e. close above tentorial pits, just as wide as median height of face. Head smooth and shiny, face with extremely fine punctation. Antenna somewhat longer than body. First flagellar joint distinctly thrice and penultimate joint 1.5(–1.6) times as long as broad.

Mesosoma in lateral view 1.3 (–1.4) times longer than high. Mesonotum slightly wider between tegulae than long medially; its disc densely punctate, interspaces much shorter than diameter of punctures, punctation somewhat weakening posteriorly, dull to subshiny-shiny. Prescutellar furrow crenulated. Scutellum smooth with scattered, few and fine punctures, shiny. Anterior half of mesopleuron with similar punctation to that of mesonotal disc, its posterior half polished. Propodeum evenly and densely rugulose.

Hind coxa distinctly punctate, interspaces more or less shorter than diameter of punctures, subshiny to shiny. Hind femur 4–4.2 times longer than broad; hind tarsus somewhat longer than hind tibia. Two spurs of hind tibia subequal, inner spur just shorter than half basitarsus. Two spurs of middle tibia unequal, inner spur as long as two-thirds of basitarsus.

Fore wing as long as body. Stigma (Fig. 55) 2.35–2.5 times as long as wide, issuing radial vein less distally from its middle, *r*1 and *cuq*1 equal in length or former minutely shorter and meeting each other angularly, *r*1 more or less oblique to fore margin of stigma, metacarp longer than stigma. *D* moderately wide, one-fifth wider than high, *d*2 one-third longer than *d*1. R approaching to nearly reaching tip of wing. Nervellus of hind wing incurved (cf. Fig. 92), *Cu* average in size, *n. bas.* shorter than *cu*1.

Metasoma in lateral view about as long as mesosoma, and clearly shorter than head + mesosoma together. First tergite (Fig. 56) 1.7–1.8 times longer than wide at base, (almost) evenly attenuating from base to apex. Second tergite transverse, twice wider behind than long medially, third tergite distinctly one-fifth longer than second tergite. Tergites 1–2 densely rugulose, similar to that of propodeum, dull. Further tergites polished. Hypopygium in lateral view rather feebly pointed, ovipositor sheath short, its projecting part as long as third joint of hind tarsus (Fig. 54).

Body black. Antenna black(ish), tip of pedicel yellow(ish). Palpi pale yellow, oral organs brownish yellow to yellow. Tegula yellow. Legs yellow; hind coxa black, its distal third to half testaceous to fulvous. Distal half of hind tibia and entire hind tarsus blackish fumous. Tergites 1–3 laterally yellow, hind margin of third tergite reddish yellow or yellow; sternites 1–3(–4) yellow or pale yellow, further sternites blackish brown. Wings hyaline, stigma blackish brown, venation opaque brownish yellow to brownish pigmented.

♂ and host unknown.

Localities — Holotype ♀: "Nederland (Z. H.), Waarder: at. O. 33, in Malaise trap, 1–10. X. 1975, C. van Achterberg". — 1 ♀ paratype: "Nederland, Waarder (Z. H.), Oosteinde 34, 20–26. X. 1971, C. van Achterberg" (first label); "Alnus-Salix-forest, on peat in cult. area, Townes-trap" (second label). — 2 ♀ paratypes: "Nederland, Waarder (Z. H.), Oosteinde 33, 1–8. X. 1973, C. van Achterberg".



Holotype and 2 ♀ paratypes in the Rijksmuseum van Natuurlijke Historie, Leiden; 1 ♀ paratype in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5363.

The new species, *A. urolus* sp. n., is closely allied with *A. aliphera* NIXON, their specific differentiation is included within the key for the species of the *vitripennis*-group, see couplets 15 (14) — 17 (16).

**Remark** — 1 ♀ paratype was named as *A. aff. callidus* (HAL.) det.?, and by Nixon in 1975 as *Apanteles* sp. (*vitripennis*-gr.). — Another 1 ♀ paratype was named by Achterberg in 1974 as *A. aliphera* NIXON?, and by Nixon in 1980 as *A. cf. aliphera* NIXON.

### The *LIPARIDIS*-group

The following features characterize the species of the *liparidis*-group: 1. First tergite parallel- to subparallel-sided, rounded behind (Figs 109, 112—113). Tergites 1—2 smooth, shiny, at most distal end of first tergite with weak and (nearly) confluent punctures. 2. Ovipositor sheath markedly projecting (Figs 115, 116). 3. *r*1 and *cuq*1 usually meeting clearly angularly (Figs 114, 117); *d*1 half as long as *d*2. 4. Basella strongly incurved.

The species-group comprises 1 European species and further 2 extra-European species. are included into the key.

The hosts of the species of *liparidis*-group cover the lepidopterous families Lymantriidae and Notodontidae.

### KEY TO THE SPECIES OF THE *LIPARIDIS*-GROUP

#### Females

- 1 (2) Disc of mesonotum with fine, dense and even punctation, dull. First tergite relatively short and wide, 1.5—1.7 times as long as broad at base, subparallel-sided, pair of sulci of second tergite almost straight (Fig. 109). Head in dorsal view distinctly twice broader than long, behind eyes constricted (Fig. 110). *r*1 and *cuq*1 meeting rather feebly angularly (Fig. 111). Hypopygium in lateral view large and acute (cf. Fig. 115). Hind femur infumate to blackish. Tegula blackish. ♀♂: 3 mm. — India

***A. euproctisiphagae*** MUZAFFER AHMAD, 1946 (!)

- 2 (1) Disc of mesonotum at most with superficial fine punctation, shiny to polished. First tergite relatively long, twice (Fig. 112) to nearly twice (Fig. 113) as long as broad at base, parallel-sided and narrowing at its posterior end. Head in dorsal view twice to slightly less than twice broader than long, behind eyes rounded (cf. Fig. 106). *r*1 and *cuq*1 meeting angularly (Figs 114, 117).

- 3 (4) Hypopygium in lateral view large and truncate to pointed, more or less surpassing last tergite, ovipositor sheath projecting (Fig. 115). Stigma 2.5—2.8 times longer than wide, *r*1 and *cuq*1 mostly equal in length (Fig. 114). Disc of mesonotum with very fine to indistinct punctation, shiny. Penultimate joint of antenna 1.8—2 times longer than broad. Hind coxa black or brownish black. ♀♂: 2.5—3.5 mm, usually 3—3.3 mm. — Palearctic and Oriental Regions. (= *japonicus* ASHMEAD, 1906; = *liparidis* RATZEBURG, 1844 nec BOUCHÉ, 1834; = *nemorum* HARTIG, 1838; = *posticae* SONAN, 1927)

***A. liparidis*** (BOUCHÉ, 1834) (!)

- 4 (3) Hypopygium in lateral view small, truncate and apically blunt, ending before last tergite (Fig. 116). Stigma 2.2—2.3 times longer than wide, *r*1 more or less longer than *cuq*1 (Fig. 117). Disc of mesonotum with discrete and shallow punctation, glistening.



Penultimate joint of antenna subcubic, 1.1—1.2 times longer than broad. Hind coxa brown to yellowish brown. ♀♂: 2.2—2.3 mm. — Japan, Taiwan (= Formosa)

**A. minor** (ASHMEAD, 1906) (!)

#### THE SPECIES OF THE *LIPARIDIS*-GROUP

(Synonyms in italics, numbers refer to couplet-numbers)

*euproctisiphagae* MUZAFFER AHMAD 1 (2)

*japonicus* ASHMEAD 3 (4)

*liparidis* (BOUCHÉ) 3 (4)

*liparidis* (RATZBURG) nec (BOUCHÉ) 3 (4)

*minor* (ASHMEAD) 4 (3)

*nemorum* (HARTIG) 3 (4)

*posticae* SONAN 3 (4)

#### The *OCTONARIUS*-group

The following features characterize the species of the *octonarius*-group: 1. *r1* and *cuq1* forming an arched vein, i. e. not meeting each other in an angle (Fig. 122). 2. Propodeum and tergites 1—2 polished. 3. Hypopygium strongly sclerotized. 4. First tergite parallel-subparallel-sided, rounded at hind (Fig. 121).

The species comprises 2 European (and 3 Palearctic) species.

The hosts of the species of the *octonarius*-group cover the lepidopterous families Arctiidae, Lymantriidae.

#### KEY TO THE SPECIES OF THE *OCTONARIUS*-GROUP

##### Females

- 1 (4) First tergite distinctly widening posteriorly, at most somewhat longer than greatest width before its hind end. Propodum rugose. Second tergite without a pair of lateral sulci. Two species of the *glomeratus*-group with arched *r1*+*cuq1* reminiscent of the *octonarius*-group.

- 2 (3) Tergites 1—2 uneven to smooth. Penultimate joint of antenna 1.5—1.7 times longer than broad. Tergites black or blackish. ♀: 2.3 mm. — Uzbekistan (USSR)

[**A. bactrianus** TELENGA, 1955 (!)]

- 3 (2) Tergites 1—2 rugose-rugulose. Penultimate joint of antenna cubic-subcubic, at most 1.1—1.2 times longer than broad. Tergites reddish yellow or rusty. ♀♂: 2.5 mm. — Uzbekistan (USSR)

[**A. turkestanicus** TELENGA, 1955]

- 4 (1) First tergite parallel-subparallel-sided, at least 1.3 times, usually 1.5—2 times, longer than its greatest width (Fig. 118). Propodeum smooth, at most with a medio-longitudinal (weak) carina. Second tergite with a pair of lateral sulcus (Figs 121, 127).

- 5 (6) First tergite short, 1.5 times longer than its greatest width; second tergite transverse, its hind margin arched (Fig. 118). Stigma wide, 2.1—2.3 times longer than wide, issuing radial vein from its middle (Fig. 119); *d2* twice longer than *d1*. Mesonotum rugulo-punctate. Hypopygium in lateral view small and truncate (Fig. 120). Stigma opaque yellow. Legs yellow, coxae brown to blackish. ♀♂: 1.5—1.8 mm. — Wladivostok (USSR)

**A. arcuatus** TELENGA, 1955 (!)



- 6 (5) First tergite long, 1.5—2 times longer than its greatest width; second tergite less transverse, its hind margin straight (Fig. 121). Stigma less wide, 2.3—2.7 times longer than wide, issuing radial vein more or less distal from its middle (Figs 122, 124);  $d_2$  1.5 times longer than  $d_1$ . Stigma brown to blackish. Body at least 2.5 mm long.
- 7 (10) First tergite 1.5—1.7(—1.8) times longer than its greatest width, subparallel-sided (Fig. 121). Propodeum smooth and shiny to polished. Mesonotum coriaceous-pruinose.
- 8 (9) Hypopygium in lateral view (Fig. 123) acute and clearly surpassing last tergite, ovipositor sheath projecting. Fifth joint of fore tarsus without spine. Hind half of first tergite smooth and shiny. Stigma wide, 2.3—2.4 times longer than wide, issuing radial vein less distally from its middle (Fig. 122). Hind femur infusate to blackish. ♀♂: 2.5—2.7 mm. — Sporadic in the Palaearctic Region. (= *curvulus* THOMSON, 1895, !! **syn. n.**; = *rectinervis* TELENGA, 1955)
- A. inclusus** (RATZBURG, 1844) (!)
- 9 (8) Hypopygium in lateral view (Fig. 125) truncate and ending clearly before apex of metasoma, ovipositor sheath short. Outer-distal side of fifth joint of fore tarsus with a curved spine (Fig. 126). Hind half of first tergite coriaceous-pruinose or dull. Stigma less wide, 2.6—2.7 times longer than wide, issuing radial vein more distally from its middle (Fig. 124). Hind femur yellow or reddish yellow. ♀♂: 2.5—3 mm. — Sporadic in Europe
- A. octonarius** (RATZBURG, 1852) (!)
- 10 (7) First tergite twice longer than its greatest width, parallel-sided (Fig. 127). Propodeum smooth and shiny with a medio-longitudinal weak carina. Disc of mesonotum smooth and shiny. Hypopygium in lateral view pointed and ovipositor sheath projecting similarly to that of *A. inclusus*. Legs yellow, hind coxa basally, hind tibia distally and hind tarsus entirely infusate. ♀♂: 2.3—2.6 mm. — Ethiopian Region (Nigeria, Uganda, Zaire) and East Palaearctic Region (China, Mongolia)
- A. eucosmae** WILKINSON, 1929 (!!)

\* \* \*

**Remark** — Below I expound the synonymization of *A. curvulus* THOMSON:

***Apanteles inclusus* (RATZBURG)**

*Microgaster inclusus* RATZBURG, 1844, Ichn. Forstins., 1: 70, ♀, locus typicus: ?Eberswalde (German Democratic Republic).

*Microgaster (Apanteles) curvulus* THOMSON, 1895, Opusc. ent., 20: 2262, ♀♂, locus typicus: Sonderburg (Denmark), **syn. n.**

The junior name *curvulus* THOMSON is an evident synonym of the senior name *inclusus* (RATZBURG); the synonymization is based on my original examination of the type of *curvulus* and authentic specimens of *inclusus* identified by Wilkinson who had seen the type-series (WILKINSON 1945).

**THE SPECIES OF THE *OCTONARIUS*-GROUP**  
(Synonyms in italics, numbers refer to couplet-numbers)

*arcuatus* TELENGA 5 (6)  
*curvulus* THOMSON 8 (9)  
*eucosmae* WILKINSON 10 (7)  
*inclusus* (RATZBURG) 8 (9)  
*octonarius* (RATZBURG) 9 (8)  
*rectinervis* TELENGA 8 (9)

<sup>6</sup>See remark below.



TRANSITIONAL SPECIES TOWARDS THE *OCTONARIUS*-GROUP  
(Respective species-group in parenthesis, numbers refer to couplet-numbers)

- bactrianus TELENGA 2 (3)  
(glomeratus-group)  
turkestanicus TELENGA 3 (2)  
(glomeratus-group)

The *THOMPSONI*-group

The following features characterize the species of the *thompsoni*-group: 1. Mesosoma dorso-ventrally flattened or compressed, mesonotum-scutellum-metanotum and (anterior half of) propodeum in lateral view on the same level. 2. Antenna short, shorter than body. 3. Body usually polished, at most with (weak) sculpture of propodeum and tergites 1-2. 4. Hypopygium strongly sclerotized, without lateral creases.

The species-group comprises 1 European and further 3 (+1) extra-European species are included into the key.

The hosts of the species of the *thompsoni*-group cover the lepidopterous family Pyraustidae.

KEY TO THE SPECIES OF THE *THOMPSONI*-GROUP

Females

- 1 (2) Head in dorsal view cubic, 1.6 times broader than long, eye small and nearly half as long as temple, head behind eyes broadening (Fig. 128). Antenna somewhat shorter than body, its penultimate 2-3 joints almost cubic. Propodeum smooth and glistening. First tergite weakly narrowing posteriorly, together with second tergite uneven to smooth, shiny. Second tergite shorter than third tergite. Hypopygium in lateral view truncate, ovipositor sheath very short. Metasoma somewhat compressed laterally, as long as mesosoma. Legs black, tibiae and tarsi brownish. ♀: 2.5 mm. — Uzbekistan (USSR)

*A. stackelbergi* TELENGA, 1955

- 2 (1) Head in dorsal view transverse, 1.8-2 times broader than long, eye large and distinctly longer than temple, head behind eyes rounded (Fig. 129).
- 3 (6) Antenna bristly and short, at most as long as head, mesosoma and first tergite together; flagellar joints 5-6 to 10-11 subcubic-cubic, i.e. at most somewhat longer than broad.
- 4 (5) First tergite evenly narrowing from base to apex (Fig. 130), together with second tergite polished. Propodeum also polished. Mesosoma strongly compressed dorso-ventrally, in lateral view mesotum-scutellum-metanotum and propodeum on the same level. Hind femur laterally flattened, 2.5 times longer than wide (Fig. 131). Fore and middle legs short, femora somewhat thickened, fore tarsal joints 2-4 subcubic. Stigma 2-2.2 times longer than wide, metacarp distinctly longer than stigma; *r*<sub>1</sub> longer than *cu*<sub>1</sub> and meeting less angularly, *r*<sub>2</sub> indicated by weak swelling; *d*<sub>2</sub> about one-fourth to one-fifth longer than *d*<sub>1</sub> (Fig. 132). Hind coxa black (European form) or yellow (East Asian form). Legs yellow, antenna basally brownish to brownish yellow. ♀: 2-2.5 mm. — Palearctic Region, Japan and Taiwan (= Formosa)

*A. thompsoni* LYLE, 1927 (!)



- 5 (4) First tergite widening from base to apex, together with second tergite rugose-rugulose. Propodeum rugose(rugulose) (Fig. 87 A-F, in MASON 1981: 111). Mesosoma moderately compressed dorso-ventrally, propodeum more or less declivous, i.e. in lateral view not on the same plane with mesonotum-scutellum-metanotum. Hind femur not flattened, at least thrice longer than wide. Legs normal. Stigma 2.3-2.5 times longer than wide, *r1* shorter than *cuqu1*, *d2* twice as long as *d1*. Hind coxa yellow, colour of body similar to that of *A. thompsoni*. ♀♂: (1.8-) 2-2.2 mm. Member of the *glomeratus*-group, its compressed mesosoma and short antenna are transitional features towards the *thompsoni*-group. — Indo-Australian Region, China, Mauritius, Malgasy (= Madagascar)

[*A. flavipes* (CAMERON, 1891) (!)]

- 6 (3) Antenna filiform and long, about as long body; flagellar joint 5-6 to 10-11 distinctly longer than broad.
- 7 (8) Propodeum and tergites 1-2 rugose-rugulose to a variable extent and size, otherwise body polished. Mesonotum with fine and rather disperse punctulation. *r1* and *cuqu1* equal in length, or *r1* somewhat longer than *cuqu1*. Mesosoma moderately flattened dorso-ventrally ♀♂: 2-2.3 mm. — Nearctic Region (USA, Canada)
- 8 (7) Body entirely polished. *r1* distinctly shorter than *cuqu1*. Mesosoma flattened dorso-ventrally. ♀♂: 2-2.2 mm. — Nearctic Region (USA)

*A. sarrothripae* WEED, 1887 (!)

*A. politus* RILEY, 1881 (!)

#### THE SPECIES OF THE *THOMPSONI*-GROUP

(Numbers refer to couplet-numbers)

*politus* RILEY 8 (7)  
*sarrothripae* WEED 7 (8)  
*stackelbergi* TELENGA 1 (2)  
*thompsoni* LYLE 4 (5)

#### TRANSITIONAL SPECIES TOWARDS THE *THOMPSONI*-GROUP

(Respective species-group in parenthesis, number refers to couplet-number)

*flavipes* CAMERON 5 (4)  
 (*glomeratus*-group)

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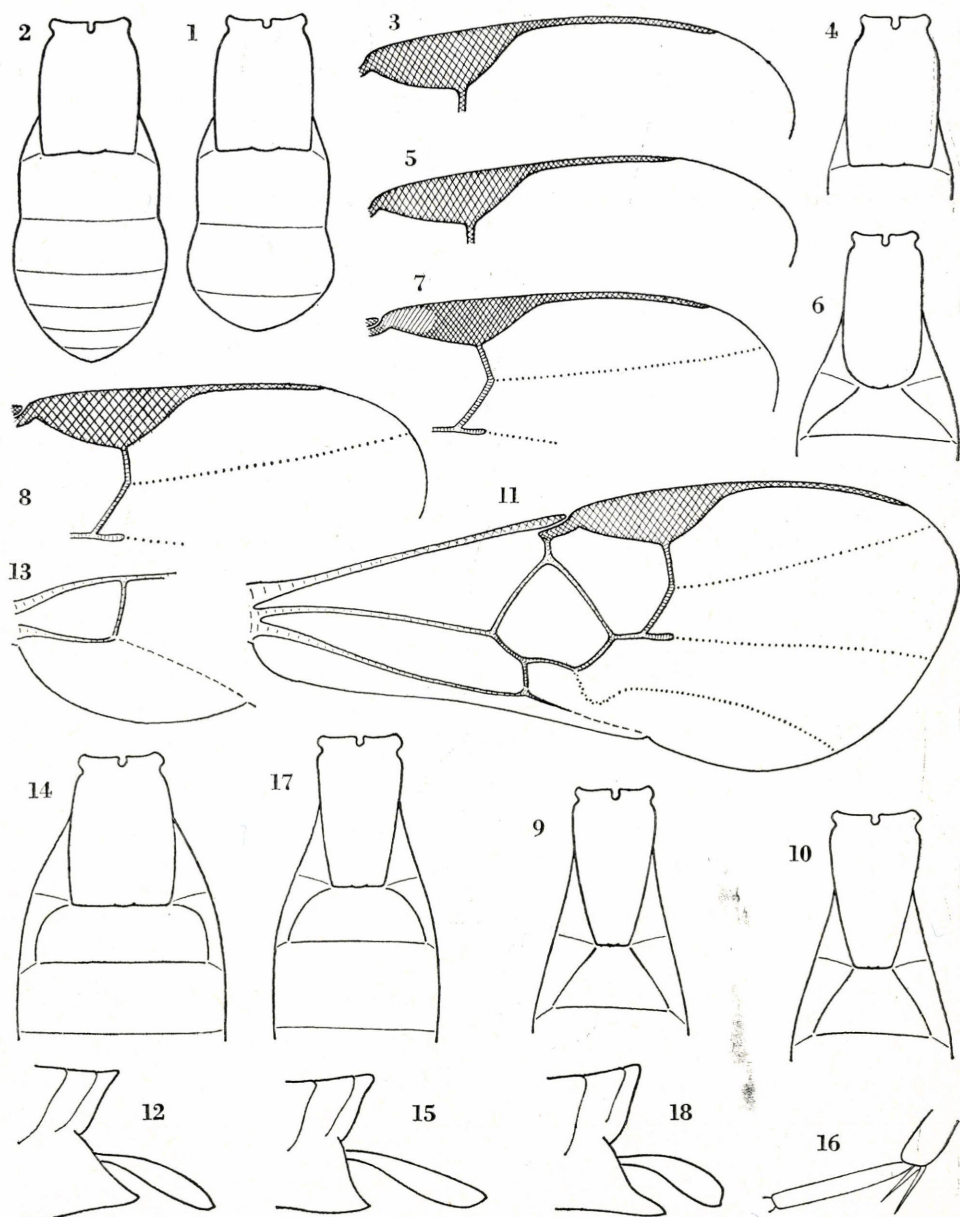
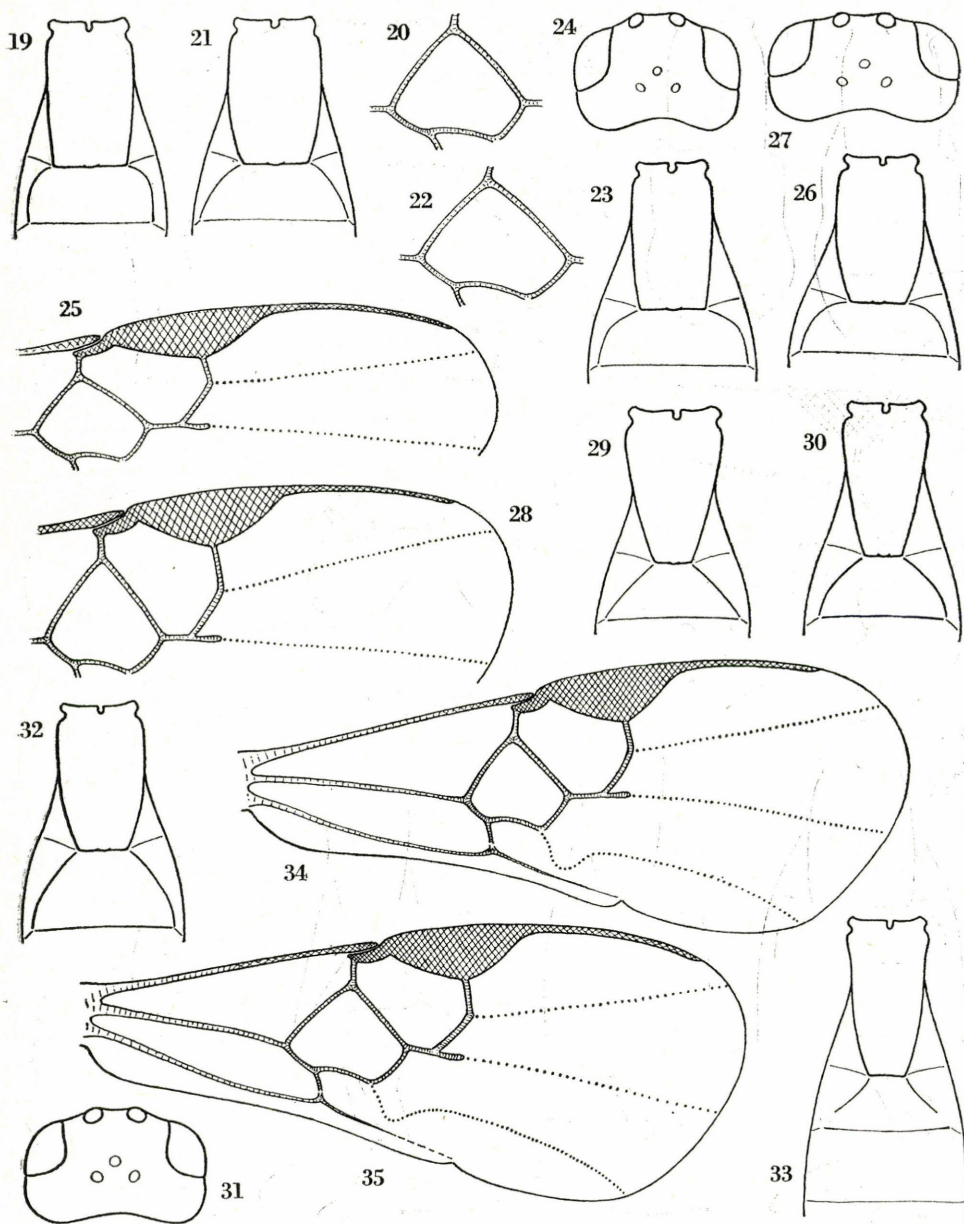


Fig. 1. *Apanteles nixonii* PAPP: metasoma or tergites in dorsal view. — Figs 2–3. *A. carbonarius* (WESMAEL): 2 = metasoma or tergites in dorsal view, 3 = stigma + metacarp of right fore wing. — Figs 4–5. *A. rimulosus* NIEZABITOWSKI: 4 = tergite 1, 5 = stigma + metacarp of right fore wing. — Figs 6–7. *A. rufulus* TOBIAS: 6 = tergites 1–2, 7 = distal part of right fore wing. — Fig. 8. *A. bicolor* (NEES): distal part of right fore wing. — Figs 9–13. *A. circumscriptus* (NEES): 9–10 = tergites 1–2, 11 = right fore wing, 12 = posterior end of metasoma with hypopygium + ovipositor sheath, 13 = nervellus and vannal lobe. — Figs 14–15. *A. maritimus* WILKINSON: 14 = tergites 1–2, 15 = posterior end of metasoma with hypopygium + ovipositor sheath. — Figs 16–18. *A. viminetorum* (WESMAEL): 16 = two spurs of hind tibia, 17 = tergites 1–3, 18 = posterior end of metasoma with hypopygium + ovipositor sheath





Figs 19–20. *Apanteles nanus* REINHARD: 19 = tergites 1–2, 20 = discoidal cell (D) of right fore wing. — Figs 21–22. *A. ambiguus* PAPP: 21 = tergites 1–2, 22 = discoidal cell (D) of right fore wing. — Figs 23–25. *A. errans* NIXON: 23 = tergites 1–2, 24 = head in dorsal view, 25 = distal part of right fore wing. — Figs 26–28. *A. laetus* MARSHALL: 26 = tergites 1–2, 27 = head in dorsal view, 28 = distal part of right fore wing. — Fig. 29. *A. arisba* NIXON: tergites 1–2. — Figs 30–31. *A. phaetusa*, NIXON: 30 = tergites 1–2, 31 = head in dorsal view. — Fig. 32. *A. exiguus* (HALIDAY): tergites 1–2. — Figs 33–34. *A. fraternus* REINHARD: 33 = tergites 1–3, 34 = right fore wing. — Fig. 35. *A. pallipes* REINHARD: right fore wing



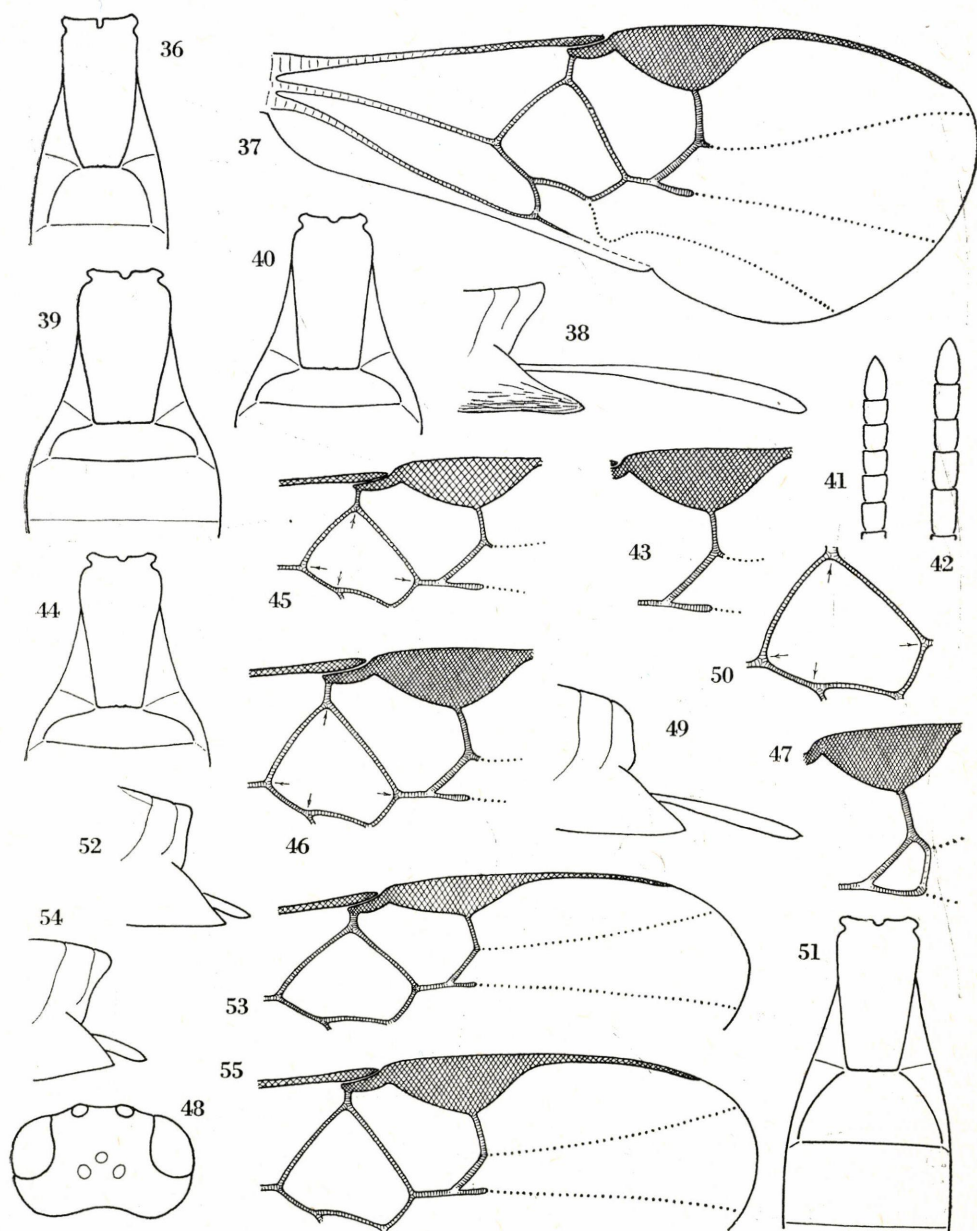


Fig. 36. *Apanteles pallipes* REINHARD: tergites 1-2. — Figs 37-41. *A. parasitellae* (BOUCHÉ): 37 = right fore wing, 38 = posterior end of metasoma with hypopygium + ovipositor sheath, 39 = tergites 1-3, 40 = tergites 1-2, 41 = flagellar joints 11-16. — Figs 42-43. *A. arene* NIXON: 42 = flagellar joints 12-16, 43 = stigma and  $r_1 + cu_{cu1}$  of right fore wing. — Figs 44-45. *A. hedyemeles* NIXON: 44 = tergites 1-2, 45 = middle part of right fore wing. — Fig. 46. *A. tedellae* NIXON: middle part of right fore wing. — Fig. 47. *Choerast dorsalis* (SPINOLA): stigma,  $r_1$  and  $Cu_2$  of right fore wing. — Fig. 48. *A. rubens* REINHARD: head in dorsal view. — Figs 49-51. *A. lateralis* (HALIDAY): 49 = posterior end of metasoma with hypopygium + ovipositor sheath, 50 = discoidal cell ( $D$ ) of right fore wing, 51 = tergites 1-3. — Figs 52-53. *A. callidus* (HALIDAY): 52 = posterior end of metasoma with hypopygium and ovipositor sheath, 53 = distal part of right fore wing. — Figs 54-55. *A. urolus* sp. n.: 54 = posterior end of metasoma with hypopygium + ovipositor sheath, 55 = distal part of right fore wing



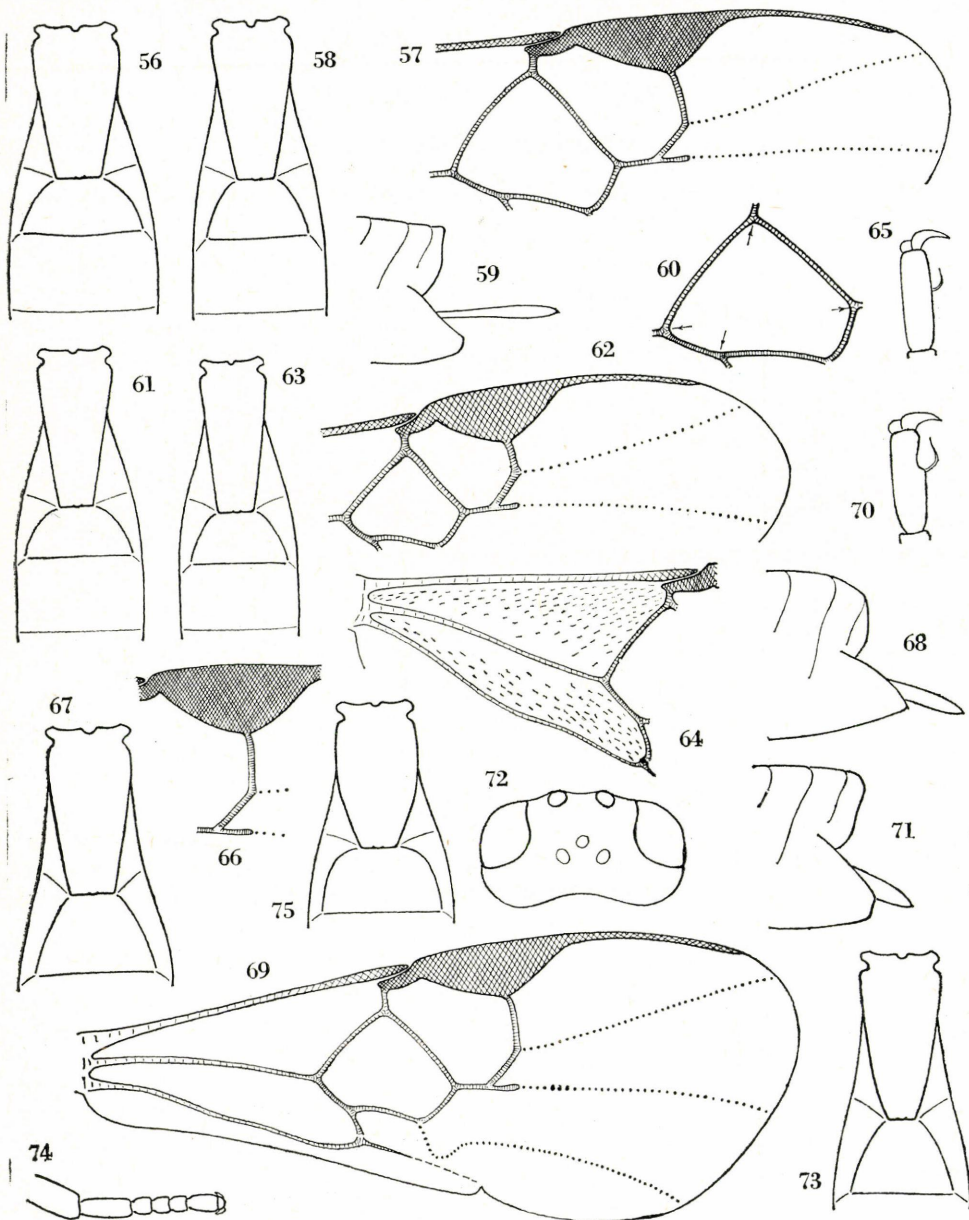
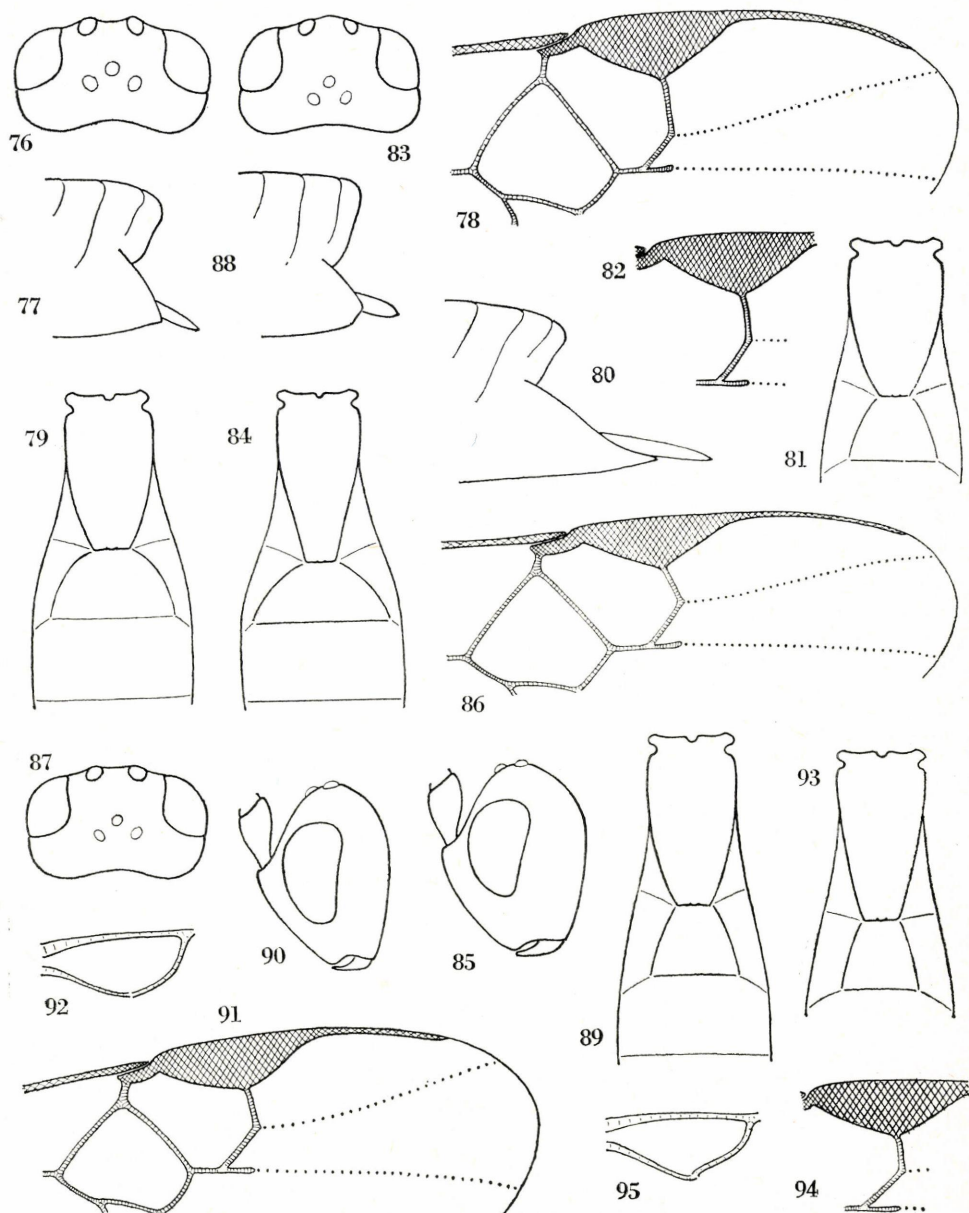


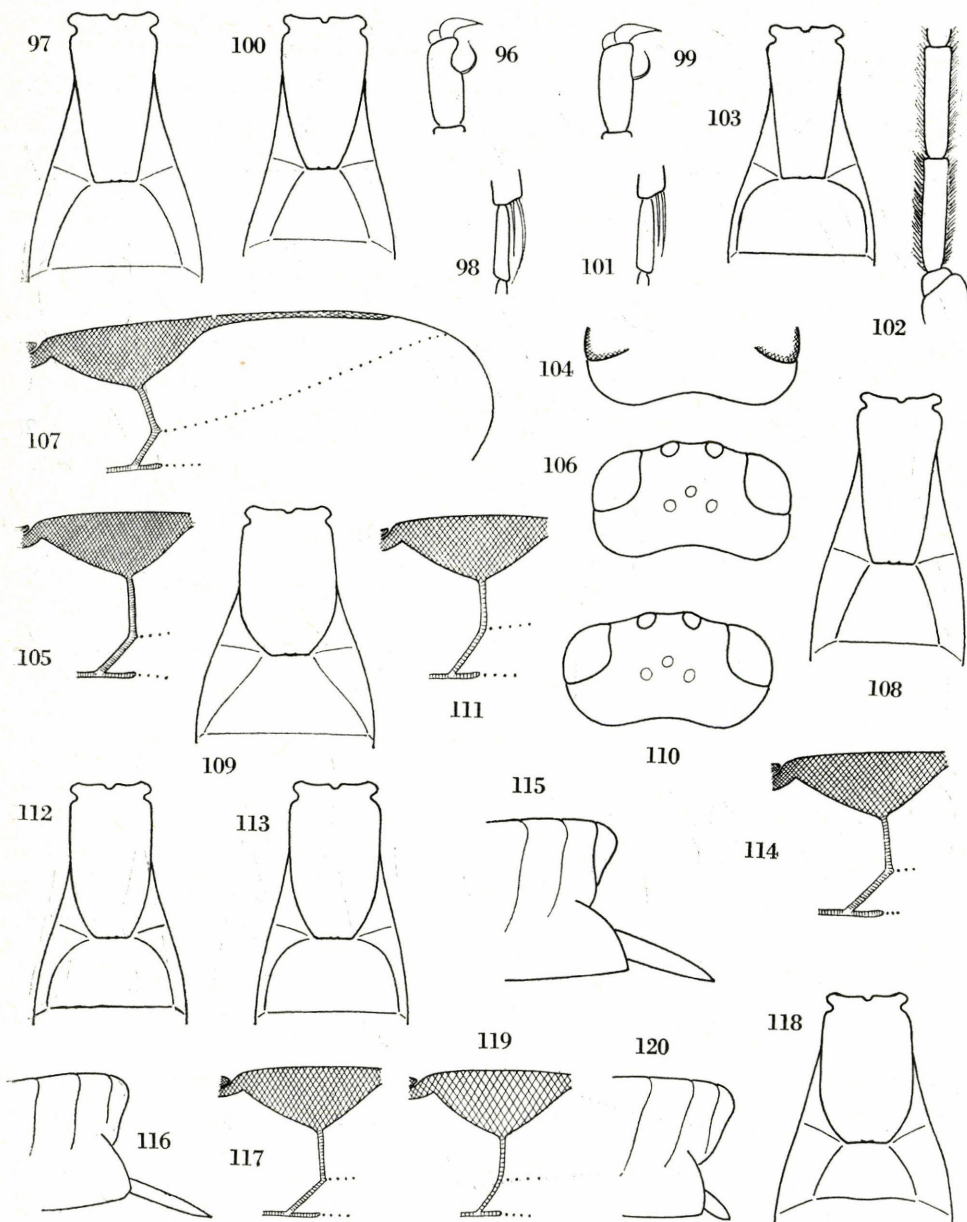
Fig. 56. *Apanteles urolus* sp. n.: tergites 1-3. — Figs 57-58. *A. aliphera* NIXON: 57 = distal part of right fore wing, 58 = tergites 1-3. — Figs 59-61. *A. eugeni* PAPP: 59 = posterior end of metasoma with hypopygium + ovipositor sheath, 60 = discoidal cell (D) of right fore wing, 61 = tergites 1-3. — Figs 62-63. *A. antinoe* NIXON: 62 = distal part of right fore wing, 63 = tergites 1-3. — Figs 64-68. *A. portheiriae* MUESEBECK: 64 = proximal part of right fore wing, 65 = spine of fifth joint of fore tarsus, 66 = stigma,  $r_1 + cu_{1+2}$  of right fore wing, 67 = tergites 1-2, 68 = posterior end of metasoma with hypopygium + ovipositor sheath. — Figs 69-73. *A. vitripennis* (CURTIS): 69 = right fore wing, 70 = spine of fifth joint of fore tarsus, 71 = posterior end of metasoma with hypopygium + ovipositor sheath, 72 = head in dorsal view, 73 = tergites 1-2. — Figs 74-75. *A. menander* NIXON: 74 = fore tarsus in dorsal view, 75 = tergites 1-2.



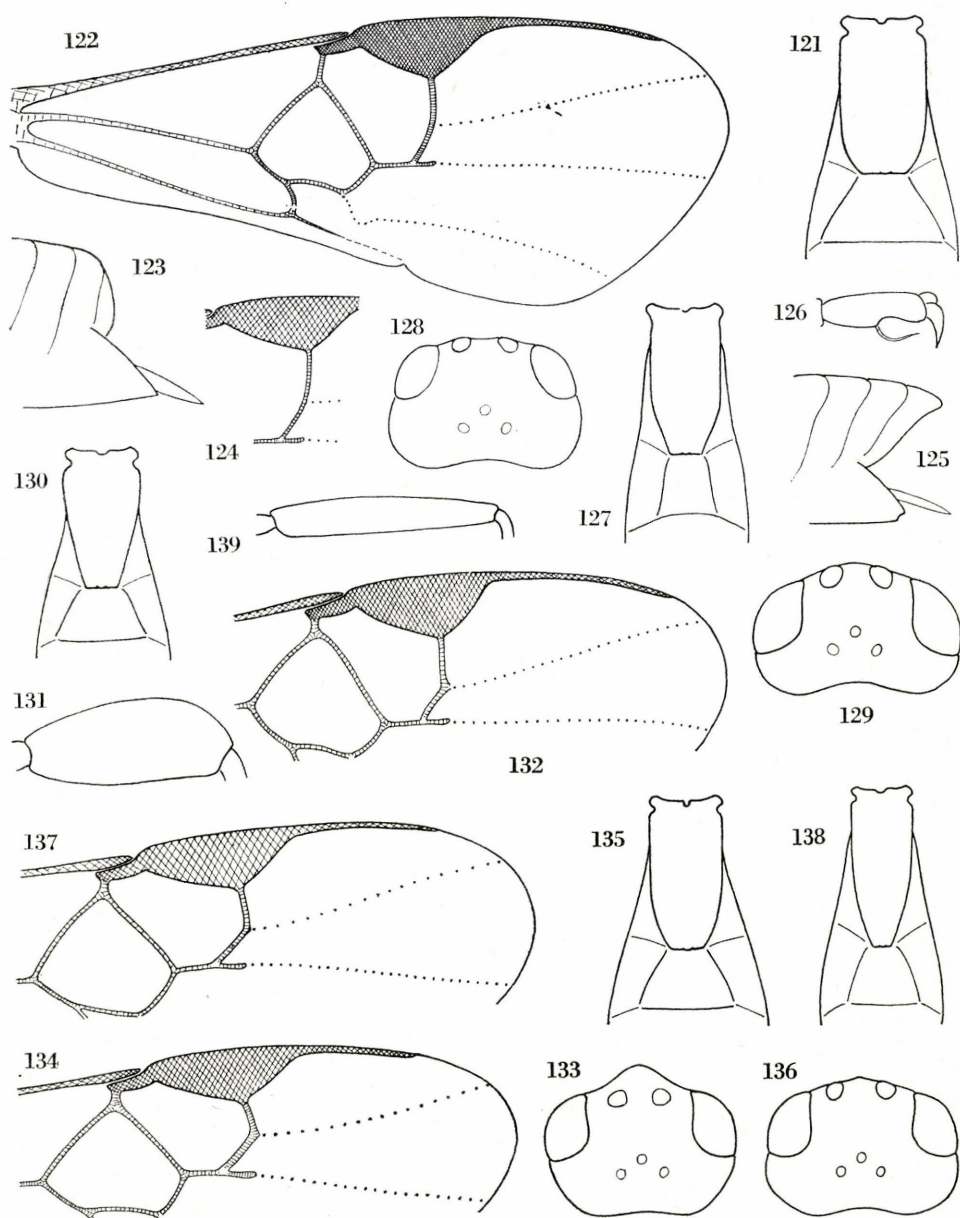


Figs 76-79. *Apanteles sibiricus* sp. n.: 76 = head in dorsal view, 77 = posterior end of metasoma with hypopygium + ovipositor sheath, 78 = distal part of right fore wing, 79 = tergites 1-2. — Figs 80-82. *A. compressiventris* MUESEBECK: 80 = posterior end of metasoma with hypopygium + ovipositor sheath, 81 = tergites 1-2, 82 = stigma,  $r1+cuq1$ ,  $cu3$  of right fore wing. — Figs 83-86. *A. salepus* sp. n.: 83 = head in dorsal view, 84 = tergites 1-3, 85 = head in lateral view, 86 = distal part of right fore wing. — Figs 87-92. *A. fulvipes* (HALIDAY): 87 = head in dorsal view, 88 = posterior end of metasoma with hypopygium + ovipositor sheath, 89 = tergites 1-3, 90 = head in lateral view, 91 = distal part of right fore wing, 92 = nervellus of right hind wing. — Figs 93-95. *A. ripus* sp. n.: 93 = tergites 1-2, 94 = stigma,  $r1+cuq1$ ,  $cu3$  of right fore wing, 95 = nervellus of right hind wing





Figs 96-98. *Apanteles mygdonia* NIXON: 96 = spine of fifth joint of fore tarsus, 97 = tergites 1-2, 98 = two spurs of middle tarsus. — Figs 99-101. *A. acasta* NIXON: 99 = spine of fifth joint of fore tarsus, 100 = tergites 1-2, 101 = two spurs of middle tarsus. — Figs 102-104. *A. aletta* NIXON: 102 = flagellar joints 1-2 with pubescence, 103 = tergites 1-2, 104 = head behind eyes in dorsal view. — Fig. 105. *A. pinicola* LYLE: stigma,  $r1 + cu_{q1}$ ,  $cu3$  of right fore wing. — Figs 106-108. *A. luciana* NIXON: 106 = head in dorsal view, 107 = distal part of right fore wing, 108 = tergites 1-2. — Figs 109-111. *A. euproctisiphagae* MUZAFFER AHMAD: 109 = tergites 1-2, 110 = head in dorsal view, 111 = stigma,  $r1 + cu_{q1}$ ,  $cu3$  of right fore wing. — Figs 112-115. *A. liparidis* (BOUCHÉ): 112-113 = tergites 1-2, 114 = stigma,  $r1 + cu_{q1}$ ,  $cu3$  of right fore wing, 115 = posterior end of metasoma with hypopygium + ovipositor sheath. — Figs 116-117. *A. minor* (ASHMEAD): 116 = posterior end of metasoma with hypopygium + ovipositor sheath, 117 = stigma,  $r1 + cu_{q1}$ ,  $cu3$  of right fore wing. — Figs 118-120. *A. arcuatus* TELENGA: 118 = tergites 1-2, 119 = stigma,  $r1 + cu_{q1}$ ,  $cu3$  of right fore wing, 120 = posterior end of metasoma with hypopygium + ovipositor sheath



Figs 121-123. *Apanteles inclusus* (RATZBURG): 121 = tergites 1-2, 122 = right fore wing, 123 = posterior end of metasoma with hypopygium + ovipositor sheath. — Figs 124-126. *A. octonarius* (RATZBURG): 124 = stigma,  $r1 + cuq1$ ,  $cu3$  of right fore wing, 125 = posterior end of metasoma with hypopygium + ovipositor sheath, 126 = spine of fifth joint of fore tarsus. — Fig. 127. *A. eucosmae* WILKINSON: tergites 1-2. — Fig. 128. *A. stackelbergi* TELENGA: head in dorsal view. — Figs 129-132. *A. thompsoni* LYLE: 129 = head in dorsal view, 130 = tergites 1-2, 131 = hind femur in lateral view, 132 = distal part of right fore wing. — Figs 133-135. *A. nigerrimus* ROMAN: 133 = head in dorsal view, 134 = distal part of right fore wing, 135 = tergites 1-2. — Figs 136-139. *A. nivalis* sp. n.: 136 = head in dorsal view, 137 = distal part of right fore wing, 138 = tergites 1-2, 139 = hind femur in lateral view



