

**A Survey of the European Species of *Apanteles* Först.  
 (Hymenoptera, Braconidae: Microgasterinae)  
 IV. The *lineipes*-, *obscurus*- and *ater*-group**

by J. PAPP, Budapest

**Abstract** — Key to the *lineipes*-, *obscurus*- and *ater*-group comprising all European (31) and some non-European (4 East Palearctic and 13 Nearctic), a total of 48 *Apanteles* species is given. Recent type-examination revealed the following five new synonyms: 1. *A. brunnistigma* ABDINBEKOVA, 1969 = *A. sotades* NIXON, 1976; 2. *A. corvinus* REINHARD, 1880 = *A. aptus* PAPP, 1977; 3. *A. evanidus* PAPP, 1975 = *A. calpurnia* NIXON, 1976; 4. *A. petrovae* WALLEY, 1937 = *A. dioryctriae* WILKINSON, 1938, = *A. magnus* TELENGA, 1955, = *A. murinanae* ČAPEK & ZWÖLFER, 1957; 5. *A. punctiger* WESMAEL, 1837 = *A. itae* NIXON, 1972; 6. *A. trachalus* NIXON, 1965 = *A. sevocatus* PAPP, 1975. All species are enumerated in an alphabetic order within their respective species-group. With 233 figures.

The *LINEIPES*-group

The following features characterize the species of the *lineipes*-group: 1. First tergite narrowing posteriorly, either from its base or only its hind half to third. 2. Second tergite less distinctly shorter than third one in comparison with that of the *laevigatus*-group. 3. Hypopygium weakly sclerotized, with more or less longitudinal creases. 4. Vannal lobe convex. 5. Mesonotum usually with a weak to obsolete punctation.

The hosts of the species of the *lineipes*-group cover the following lepidopterous families: Coleophoridae, Gelechiidae, Gracillariidae, Pterophoridae, Tortricidae.

KEY TO THE SPECIES OF THE *LINEIPES*-GROUP

Females

- 1 (4) Stigma evenly bright yellow or yellow to brownish yellow.
- 2 (3) Head in frontal view a little elongated (cf. Fig. 93 in PAPP 1978). Distance between fore and a hind ocelli at most as long as, usually somewhat longer than, greatest diameter of a hind ocellus. First tergite evenly narrowing posteriorly, its surface polished but apically with dense rugo-rugulosity (Figs. 3, 104). Spines of outer side of hind tibia numerous to dense (cf. Fig. 155 in PAPP 1978). Ovipositor sheath long, arched, as long as hind tibia and tarsal joints 1–3 (see Figs. 5–6 in WILKINSON 1941). Stigma 2.3–3 times as long as wide, issuing radial vein distally from its middle, *r*<sub>1</sub> slightly longer than *cuq*<sub>1</sub>; stigma bright yellow, its margin brownish (Figs. 1, 103). Alar venation milky white, *r*<sub>1</sub>+*cuq*<sub>1</sub> rather yellowish white. Mesonotum shiny, with fine and dense punctation (Fig. 2). Middle and hind tibiae black except their reddish yellow base, tarsi blackish to black. Tegula black. ♀♂: (2.5–)2.8–3 mm.  
 — England, Hungary (new record) ***A. britannicus* WILKINSON, 1941 (!)**



Figs. 1-3. *Apanteles britannicus* WILK.: 1 = distal part of right fore wing, 2 = mesonotum, 3 = tergites 1-2. — Figs. 4-7. *A. punctiger* (WESM.) 4 = distal part of right fore wing, 5 = mesonotum, 6 = propodeum, 7 = tergites 1-2. — Figs. 8-10. *A. erdoesi* PAPP: 8 = mesonotum, 9 = propodeum, 10 = tergites 1-2. — Fig. 11. *A. annularis* (HAL.): mesonotum. — Figs. 12-15. *A. flavostriatus* PAPP: 12 = head in dorsal view, 13 = tergites 1-2, 14 = distal part of left fore wing, 15 = propodeum

- 3 (2) Head in frontal view not elongated, usual in its outline (cf. Fig. 74 in PAPP 1979). Distance between fore and a hind ocelli shorter than greatest diameter of hind ocellus. First tergite distinctly narrowing on its hind third (Fig. 231), its surface shiny except its uneven and dull turned-over (or horizontal) hind third. Spines of outer side of hind tibia few and disperse. Ovipositor sheath short, at most as long as hind basitarsus, in lateral view subfusiform (Fig. 232). Stigma at most 2.2 times as long as wide, issuing radial vein almost from its middle, *r1* and *cuqu1* about equal in length; stigma pellucid yellow to brownish yellow (Fig. 233). Alar venation pellucid yellowish, *r1+cuqu1* similar to pigmentation of stigma. Mesonotum dull with satin-like sheen, superficially punctato-alutaceous (similar to that of *A. circumscriptus* NEES). Middle and hind tibiae yellow to vivid yellow, tarsi also yellow. Tegula yellow to pale yellow. ♀♂: 2.2–2.8 mm. — West Palaearctic Region as far eastwards as Azerbaidzhan and Tadzhikistan in the USSR

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

- 4 (1) Stigma not evenly yellow. Alar venation at least distally with more or less brownish yellow to brownish pigmentation. First tergite usually with sculpture of very different size, only exceptionally polished.
- 5 (20) Stigma dark brown to pellucid light brown with a basal yellow to dark yellow spot.
- 6 (7) Stigma pellucid brownish yellow to yellow and at most indistinctly lightening basally. Penultimate two joints of antenna one-and-one-half as long as broad. Tegula together with every tibia and tarsus yellow to vivid yellow. Further details see at couplet 3 (2)

**A. coniferae** (HAL.)

- 7 (6) Stigma dark brown to pellucid light brown with a distinct yellow spot.
- 8 (11) Hind femur reddish yellow to yellow. Penultimate two or three joints of antenna subcubic to cubic.
- 9 (10) Mesonotum quite heavily punctate (Fig. 5). Propodeum medially rugose, with a median and more or less foveola-like depression, sculpture laterally weakening (Fig. 6). Head behind eyes rounded (Fig. 105). First tergite subparallel on its anterior two-thirds, faintly narrowing behind (Fig. 106), its hind surface mixed with rugose and puncture-like elements (Fig. 7). Distance between hind two ocelli twice as long as diameter of an ocellus (Fig. 105). Inner spur of hind tibia slightly but distinctly longer than half basitarsus. Ovipositor sheath at most as long as two-thirds of hind tibia. Legs including coxae fully yellow. Antenna predominantly reddish yellow. ♀♂: 3 mm. — Europe as far eastwards as European part of USSR, North Africa. (= *itea* NIXON, 1972, !!, **syn. n.**)

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

- 10 (9) Mesonotum finely punctate (Fig. 8). Propodeum smooth, shiny, without foveola-like depression medially (Fig. 9). Head behind eyes strongly constricted (Fig. 108). First tergite evenly narrowing posteriorly (Fig. 109), smooth, shiny, its hind two third or quarter chagreened, dull (Fig. 10). Distance between hind two ocelli only somewhat greater than diameter of an ocellus (Fig. 108). Inner spur of hind tibia distinctly shorter than half basitarsus. Ovipositor sheath long, as long as hind tibia and basitarsus. Legs not fully yellow, hind coxa black. Antenna black. ♀: 2.8 mm. — Hungary

**A. erdoesi** PAPP 1973 (!!)

- 11 (8) Hind femur black, at most apically more or less light. Penultimate joint(s) of antenna rather distinctly longer than broad.
- 12 (13) Antennal joints (13–)14–18 usually almost smooth to smooth, faintly dull; antenna itself not conspicuously tapering distally; penultimate joint of antenna one-and-

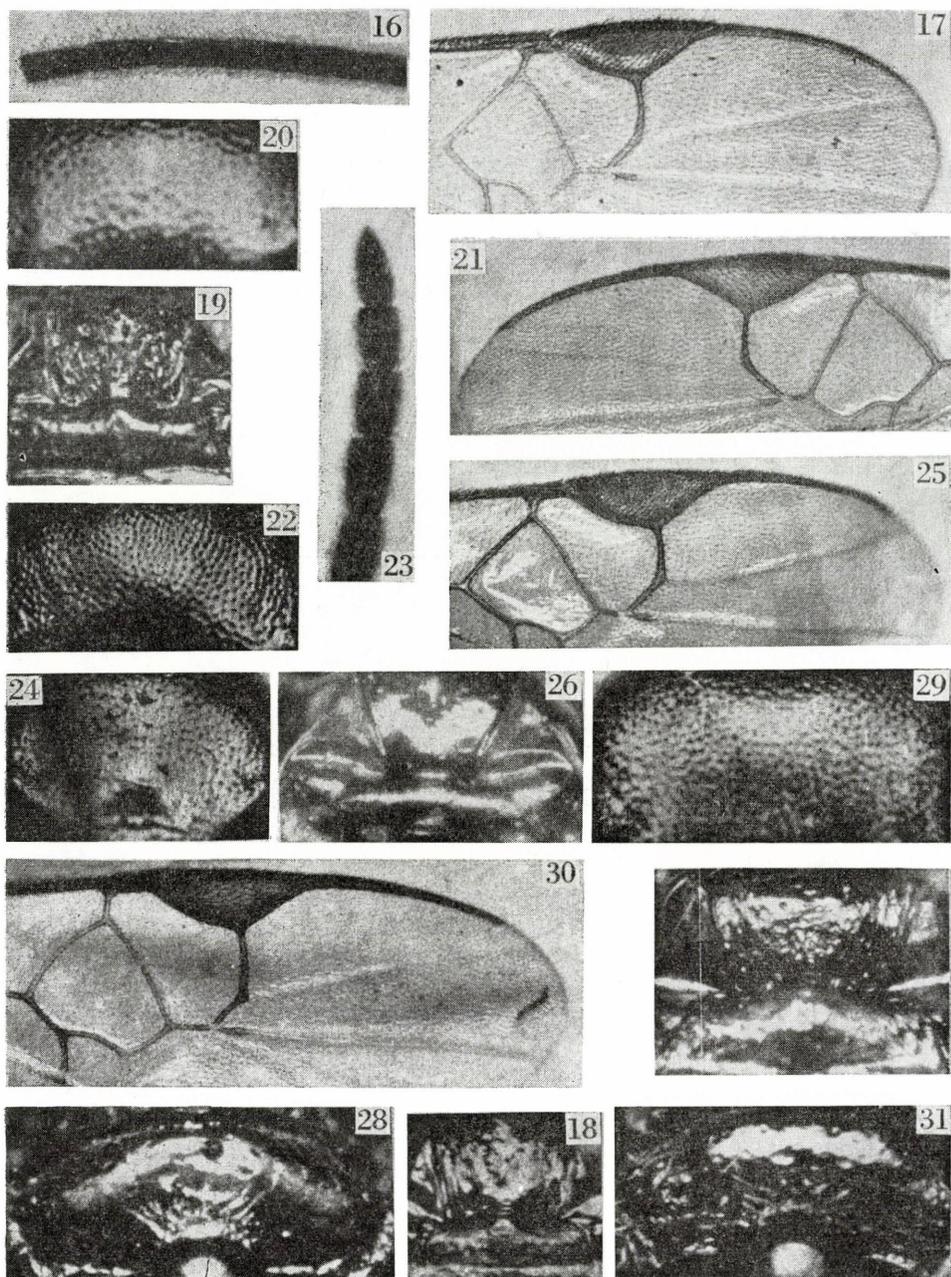


Fig. 16. *Apanteles sisenna* NIXON: antenna. — Figs. 17-18. *A. szalayii* PAPP: 17 = distal part of right fore wing, 18 = tergites 1-2. — Figs. 19-21. *A. lemariei* NIXON: 19 = tergites 1-2, 20 = mesonotum, 21 = distal part of left fore wing. — Fig. 22. *A. conopiae* WAT.: mesonotum. — Figs. 23-25. *A. lineipes* (WESM.): 23 = antennal joints 14-18, 24 = mesonotum, 25 = distal part of right fore wing. — Fig. 26. *A. tersus* PAPP: tergites 1-2. — Figs. 27-28. *A. piraticus* PAPP: 27 = tergites 1-2, 28 = propodeum. — Figs. 29-31. *A. petrovae* WALLEY: 29 = mesonotum, 30 = distal part of right fore wing, 31 = propodeum

one-half to twice as long as broad. First tergite subparallel-sided, its distal third to quarter narrowing (Fig. 110), its horizontal half rugose. Mesonotum with dense and shallow punctation, subshiny to faintly dull (Fig. 11). Stigma wide, 2.1–2.2 times as long as wide, issuing radial vein less distally (Fig. 111). Inner spur of hind tibia almost as long as half basitarsus. Ovipositor sheath in lateral view slightly arched and thickening apically, as long as hind tibia and basitarsus. Light colour of legs rather pale yellow. Tegula pale yellow. ♀♂: 2.8–3 mm. — West Europe, USSR (European part, Transbaikalia)

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

- 13 (12) Antennal joints 13–18 with longitudinal sculpture as usual, antenna usually not tapering apically.
- 14 (17) Propodeum rugose-rugulose, laterally rugosity weakening, dull (Fig. 15). Spines on outer side of hind tibia few, disperse.
- 15 (16) Head behind eyes strongly rounded (Figs. 12, 112). First tergite evenly narrowing distally (Fig. 113), its horizontal half rugulose-uneven, second tergite uneven (Fig. 13). *r1* and *cuqu1* meeting in a faint though distinct angle (Fig. 14, 114). Nervellus of hind wing strongly incurved (Fig. 115). Distance between hind two ocelli and that between an ocellus and an eye equal (Fig. 12). Inner spur of hind tibia somewhat shorter than half basitarsus. Sternum black, laterally with a vivid yellow longitudinal streak. Metacarp proximally rather yellowish. ♀: 3 mm. — Hungary

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

- 16 (15) Head behind eyes evenly rounded (Fig. 116). First tergite subparallel-sided and narrowing only at its distal third (Fig. 117). *r1* and *cuqu1* forming a rather arched vein, i.e. not angularly meeting each other (Fig. 118). Nervellus of hind wing weakly incurved, nearly straight (Fig. 119). Distance between hind two ocelli 1.4–1.5 times greater than that between an ocellus and eye. Inner spur of hind tibia slightly longer than half basitarsus. Sternum evenly black. Metacarp evenly brown. ♀: 2.6–2.8 mm. Hungary (new record), USSR: Azerbaidzhan

**A. submarginatus** ABDINBEKOVA, 1969 (!)

- 17 (14) Propodeum smooth, shiny, at most with weak and rather disperse punctation (*A. szalayi* PAPP). Spines of outer side of hind tibia numerous to dense (Fig. 104 in PAPP 1978).
- 18 (19) Pubescence of antenna unusually long (Fig. 16). Stigma short and wide, twice as long as wide, *r1* distinctly longer than *cuqu1* (Fig. 120). Mesonotum shiny and with very fine punctation. Horizontal half of first tergite densely rugose. Ovipositor sheath straight, unusually wide (Fig. 121), as long as hind tibia (or hardly shorter). Inner spur of hind tibia clearly shorter than half basitarsus. Hind tibia dull yellowish throughout except its faintly infusate end. ♀♂: 3.3–3.4 mm. — England

**A. sisenna** NIXON, 1972 (!)

- 19 (18) Pubescence of antenna short as usual (Fig. 28 in PAPP 1979). Stigma 2.4–2.7 times as long as wide, *r1* only somewhat longer than *cuqu1* (Figs. 17, 122). Mesonotum subshiny to dull with dense and distinct punctation (Fig. 30 in PAPP 1979). Horizontal half of first tergite shiny, with rather longitudinal and weak aciculo-wrinkles (Fig. 18). Ovipositor sheath almost straight, less wide (Fig. 79 in PAPP 1979), as long as two-thirds of hind tibia. Inner spur of hind tibia almost as long as half basitarsus. Proximal half of hind tibia yellow, its distal half black. ♀♂: 2.4–2.5 mm. A member of the *laevigatus*-group (Papp 1979, p. 214) with few transitional features towards the *lineipes*-group (e. g. subparallel sides of first tergite). — Hungary

**[A. szalayi** PAPP, 1977 (!)]

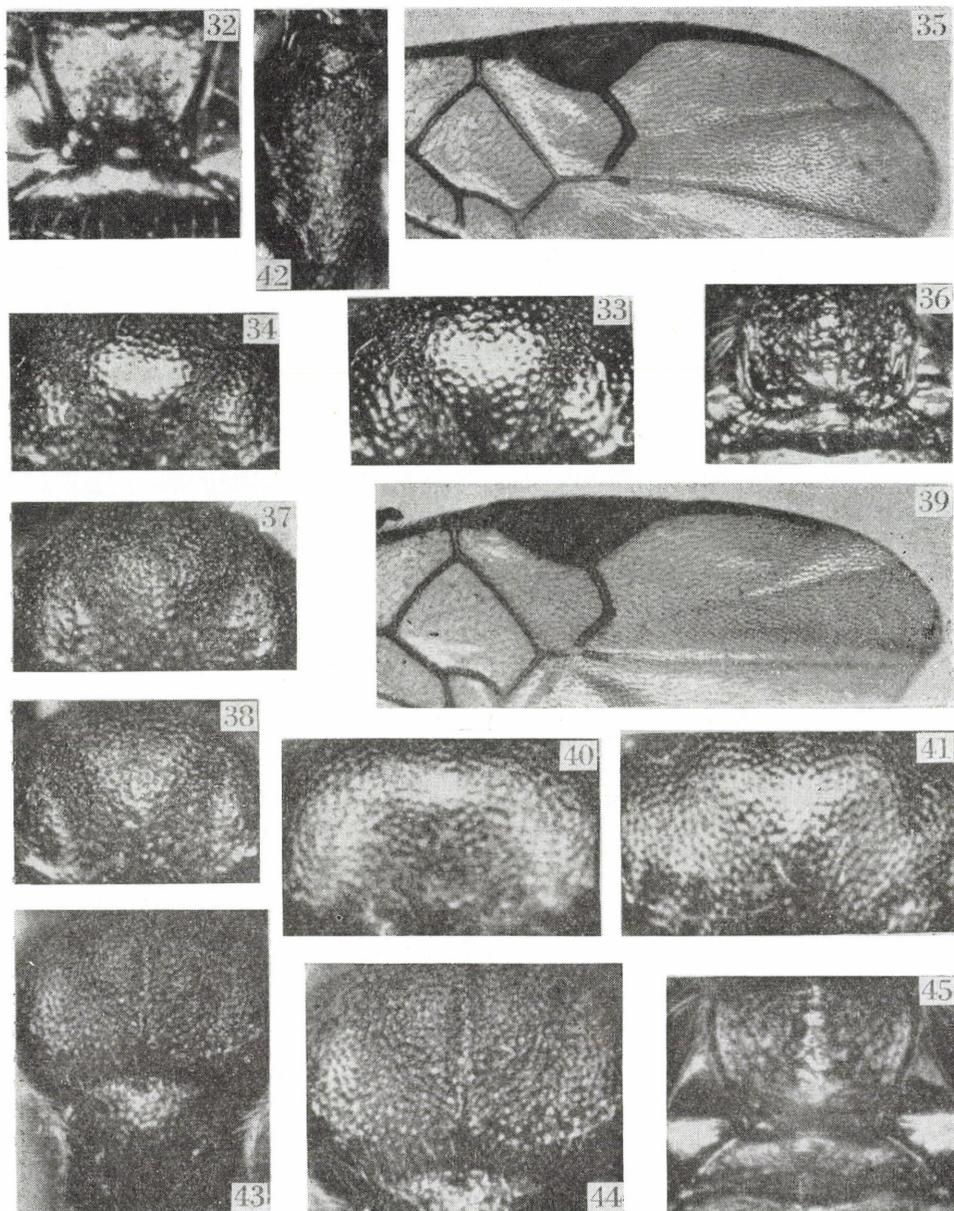
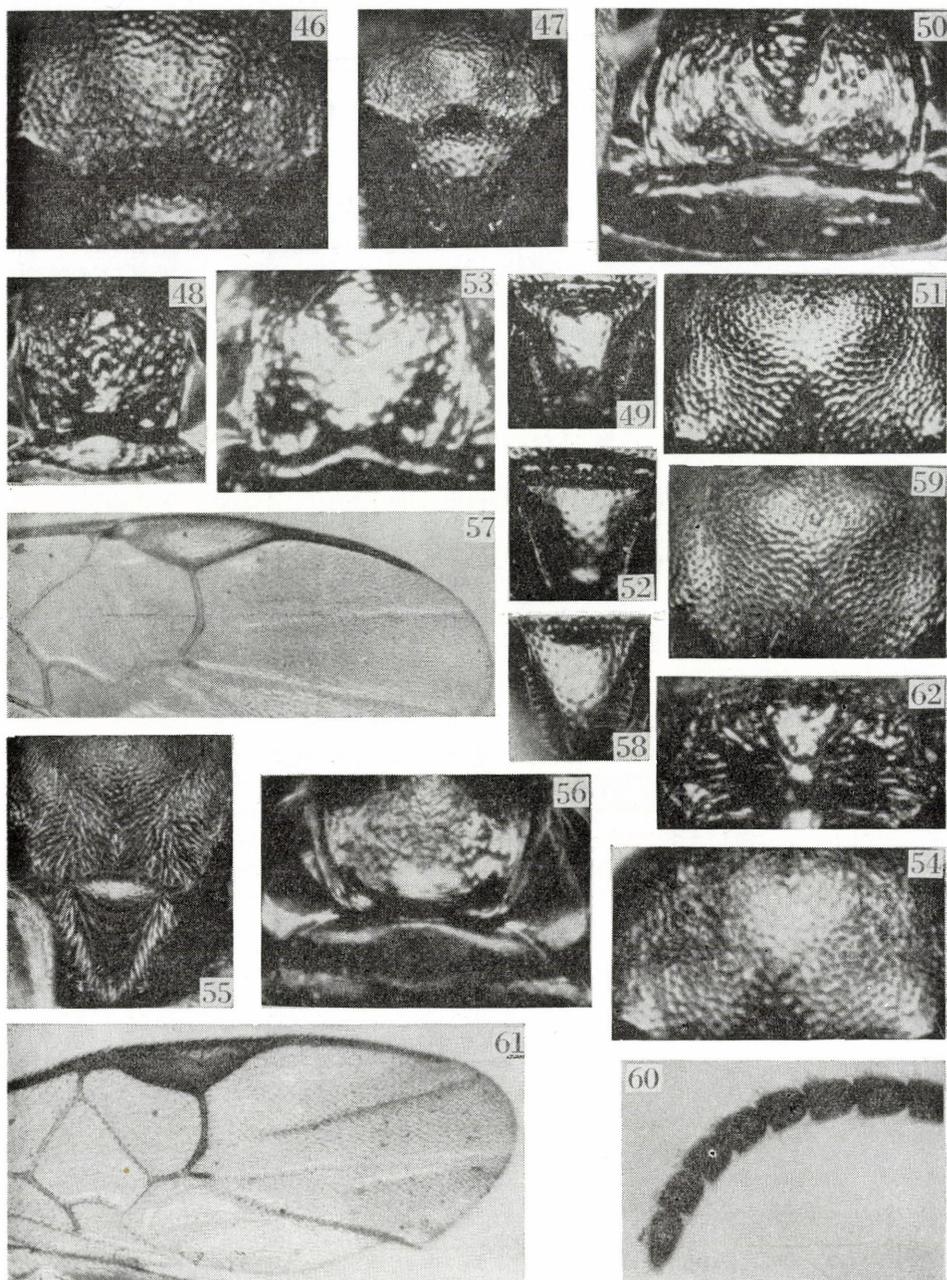


Fig. 32. *Apanteles petrovae* WALLEY: tergites 1-2. — Figs 33-36. *A. obscurus* ((NEES): 33 = mesonotum of female, 34 = mesonotum of male, 35 = distal part of right fore wing, 36 = tergites 1-2. — Figs. 37-39. *A. lenea* NIXON: 37 = mesonotum of female, 38 = mesonotum of male, 39 = distal part of right fore wing. — Fig. 40. *A. polychrosidis* VIER.: mesonotum. — Fig. 41. *A. aristoteliae* VIER.: mesonotum. — Figs. 42-45. *A. evanidus* PAPP: 42 = left mesopleuron, 43 = mesonotum and scutellum 44 = mesonotum, 45 = tergites 1-2.

- 20 (5) Stigma evenly brown or pellucid brown without pale basal spot (Figs. 21, 25, 30, 130, 133, 154).
- 21 (22) Basal light spot of stigma hardly discernible to almost indistinct. Further details see at couplets 3(2), and 12 (11) — 16 (14)  
**A. coniferae** (HAL.)  
**A. sisenna** NIXON  
**A. submarginatus** ABDINB.  
**A. szalayi** PAPP
- 22 (21) Stigma evenly brownish pigmented, stigma without basal light spot.
- 23 (24) Propodeum with a median and rather ill-defined foveola-like depression bordered with rugae (Figs. 15–16 in MASON 1974). Hind half of first tergite with a median trough (Figs. 3–4 1. e.). Members of the *ater*-group, though transitional towards the *lineipes*-group considering their convex vannal lobe  
**[A. milleri** MASON]  
**[A. nephopteris** PACK]  
**[A. trachalus** NIXON]
- 24 (23) Propodeum without foveola-like depression at middle, usually smooth, shiny or polished (Figs. 28, 31).
- 25 (36) Hind femur reddish yellow, sometimes with more or less fuscous to blackish suffusion.
- 26 (27) Hind femur brown, or with varying blackish suffusion. Further details see at couplets *A. hemerobiellidica*: 39 (38) and *A. lineipes*: 35 (34), 38 (39).  
**A. hemerobiellidica** FI.  
**A. lineipes** (WESM.)
- 27 (26) Hind femur reddish yellow or yellow.
- 28 (32) Propodeum medially rugose, laterally either smooth (*A. adjunctus* NEES) or rugulose (*A. papaipemae* MUES.). Mesonotum shiny, subpunctate. Legs reddish yellow, basal half of hind coxa black (*A. adjunctus* NEES). Sternites 1–3(–4) reddish yellow to yellow. tegula reddish yellow.
- 29 (30) Hind half of first tergite narrowing (Fig. 123), here its surface rugo-rugulose. Stigma less long, only 2.3 times as long as wide (Fig. 124); *d1* only somewhat shorter than *d2*. Penultimate two joints of antenna cubic to subcubic. Inner spur of hind tibia half as long as basitarsus. Body relatively robust. ♀: 4 mm. — Germany, further records (SHENEFELT (1972) needed confirmation  
**A. adjunctus** (NEES, 1834) (!!)\*
- 30 (29) First tergite evenly and faintly narrowing posteriorly, on its hind two-thirds rugulostriate. Stigma longer, 2.5 times as long as wide; *d1* half as long as *d2*. Penultimate two joints of antenna 1.3 times longer than broad. Inner spur of hind tibia shorter than half basitarsus. Body relatively less robust. ♀: 2.8 mm. — Nearctic Region.  
**A. papaipemae** MUESEBECK, 1961 (!)
- 31 (28) Propodeum smooth, shiny to glistening, at most around lunule with short rugae-rugulae. Legs usually black with a more or less reddish yellow pattern. Sternites black or brown except *A. conopiae* WAT.
- 32 (33) Ovipositor sheath short, about half as long as hind tibia (Fig. 125) or somewhat longer and never equal in length with hind tibia. First tergite subparallel-sided, less narrowing apically (Figs. 19, 126). Ocelli rather large, distance between fore and a

\* My knowledge of *A. adjunctus* (NEES) is based on a female specimen named by H. REINHARD himself and seen by D. S. WILKINSON in 1936, deposited in the Zoologisches Museum, Berlin, in Reinhard's Collection. It seems necessary to designate this authentic female specimen as the neotype, because the type (?-series) of *A. adjunctus* (NEES) has been destroyed (SHENEFELT 1972) and because two species *A. lemarei* NIXON, *A. lineipes* WESM. are very closely related with it (cf. Art. 75, International Code of Zoological Nomenclature, 1961). Data of the neotype of *A. adjunctus* are as follows: "Coll. H. Rhd." (printed, first label), "seen (handwriting) D. S. WILKINSON 193 (printed) 6 (handwriting), (second label)" "26941" (printed, third label); "adjunctus Ns." (Reinhard's handwriting, fourth label).



Figs. 46-48. *Apanteles mimoristae* MUES: 46 = mesonotum 47 = mesonotum and scutellum, 48 = tergites 1-2. — Figs. 49-51. *A. paranthrenidis* MUES.: 49 = scutellum, 50 = tergites 1-2, 51 = mesonotum. — Figs. 52-54. *A. megathymni* RILEY 52 = scutellum, 53 = tergite 1, 54 = mesonotum. — Figs. 55-57. *A. articas* NIXON: 55 = mesonotum and scutellum, 56 = tergites 1-2, 57 = distal part of right fore wing. — Figs. 58-59. *A. thurbiae* MUES: 58 = scutellum, 59 = mesonotum. — Figs. 60-62. *A. ater* (RATZ.): 60 = antennal joints 11-18, 61 = distal part of right fore wing, 62 = propodeum

hind ocelli somewhat smaller than diameter of hind ocellus. Mesonotum with superficial punctation (Fig. 20), and with weak satine sheen. Inner spur of hind tibia longer than outer one, and somewhat longer than half basitarsus. Stigma issuing radial vein somewhat distally from its middle, *r*1 and *cuq*1 meeting angularly (Figs. 21, 127). Stigma brown to pellucid yellowish brown. ♀♂: 2.6–3 mm. — England, Czechoslovakia, Hungary (new record)

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

33 (32) Ovipositor sheath long, distinctly longer than hind tibia (Figs. 129, 132). First tergite more or less subparallel-sided and always narrowing apically (Figs. 128, 131).

34 (35) First tergite distinctly narrowing from base to apex, its basal width twice as wide as its apical width (Fig. 128). Vannal lobe of hind wing beyond its widest point with straight to nearly straight margin (Fig. 22 in PAPP 1976). Penultimate joint of antenna 1.7–2 times as long as broad. Ocelli small, distance between fore and a hind ocelli greater than diameter of an ocellus. Mesonotum with discrete and dense punctation, interspaces shorter than diameter of punctures (Fig. 22). Ovipositor sheath as long as hind tibia (Fig. 129), *r*1 slightly longer than width of stigma, faintly arched outward, and longer than *cuq*1 (Fig. 130). Body rather strong. Hind femur always reddish yellow to yellow, at most with darkening apex. ♂♂: 3.5 mm, ♂♂: 3 mm. A member of the *grandiculus*-group (NIXON 1965) owing to its nearly straight margin of vannal lobe, however, with some transitional features towards the *lineipes*-group.  
— Japan, Malaya

[**A. conopiae** WATANABE, 1934 (!)]

35 (34) First tergite less distinctly narrowing from base to apex, its basal width 1.1–1.3 times as wide as its apical width (Fig. 131). Vannal lobe of hind wing distinctly convex (Fig. 24 in PAPP 1976). Penultimate joint of antenna at most 1.5 times, usually 1.3–1.4 times, as long as broad (Fig. 23). Ocelli large, distance between fore and a hind ocelli shorter than diameter of an ocellus. Mesonotum with shallow to indistinct punctation (Fig. 24). Ovipositor sheath 1.3–1.4 times as long as hind tibia (Fig. 132). *r*1 slightly shorter than width of stigma, straight and about as long as *cuq*1 (Figs. 25, 133). Body less strong. Hind femur usually reddish yellow, but varying to almost black with more or less intensive flush along each side. ♀♂: 2.5–3 mm. — Northern half of Europe

**A. lineipes** (WESMAEL, 1837) (!)\*

36 (25) Hind femur black, or brown, or black with more or less flush on each side.

37 (40) Hind femur brown or not entirely black.

38 (39) Hind femur usually reddish yellow, frequently varying to almost black with more or less intensive flush along each side. Further details see at 35 (34)

**A. lineipes** WESM.

39 (38) Hind femur evenly brown, that of male frequently more or less blackish. First tergite twice as long as wide at base, and distinctly thrice as long as wide at hind; its horizontal half rugose, second tergite rugo-rugulose with a distal row of punctures

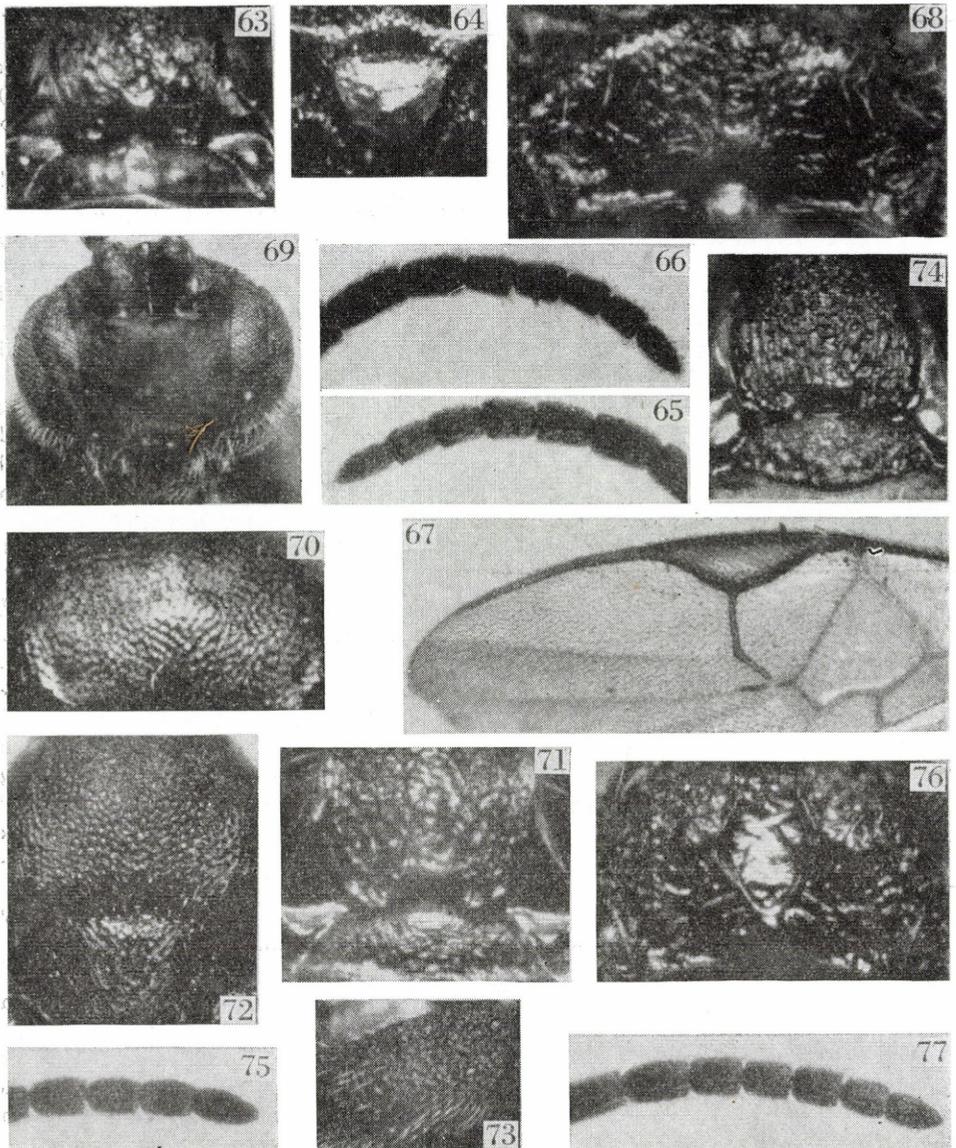
\* *Apanteles absonus* MUESEBECK, 1965, Nearctic Region, is especially similar to *A. lineipes* WESM. Both NIXON (1972) and MASON (1974) pointed out the difficulties in the separation of the two species; besides the few morphological differences the biological distinction is also important:

*A. absonus* MUES.

1. Mesonotum with slightly more expressed punctation, its satine sheen stronger.
2. First tergite somewhat more elongated, its horizontal half rugulo-uneven.
3. Host spectrum restricted, it covers Tortricids attacking spruce and fir foliage.

*A. lineipes* WESM.

1. Mesonotum with less expressed to obsolete punctation, its satine sheen weaker.
2. First tergite less elongated, its horizontal half smooth to almost smooth.
3. Host spectrum wide, it covers Tortricids, Gracillarids, Hyponomeutids and Eucosmids attacking deciduous and coniferous trees and shrubs.



Figs. 63-64. *Apanteles ater* (RATZ.): 63 = tergites 1-2, 64 = scutellum. — Figs. 65-71. *A. xanthostigma* (HAL.): 65-66 = antennal joints 12-18, 67 = distal part of left fore wing, 68 = propodeum, 69 = head in frontal view, 70 = mesonotum, 71 = tergites 1-2. — Figs. 72-76. *A. hemara* NIXON: 72 = mesonotum and scutellum, 73 = outer side of right hind coxa, 74 = tergites 1-2, 75 = antennal joints 15-18, 76 = propodeum. — Fig. 77. *A. salutifer* WILK.: antennal joints 12-18.

(Fig. 134). Head in dorsal view behind eyes rounded, constricted, occiput less excavated (Fig. 135). Ocelli average in size, distance between fore and a hind ocelli equal with diameter of an ocellus (Fig. 135). Penultimate joint of antenna twice longer than broad. Propodeum strongly punctate, behind rugo-punctate. Mesonotum

punctate. Inner spur of hind tibia almost as long as half basitarsus. Ovipositor sheath as long as two-thirds of hind tibia (Fig. 136). Stigma pellucid brown. Legs brown, coxae black. ♀♂: 2.7 mm. — Austria

**A. hemerobiellcida** FISCHER, 1966 (!!)

40 (37) Hind femur entirely black.

41 (42) Spines on outer side of hind tibia, especially on its upper half, dense and scale-like (Fig. 137). *r1* and *cuqu1* about equal in length, sometimes *r1* shorter than *cuqu1* (Fig. 2, in PAPP 1977). Ocelli relatively large, distance between fore and a hind ocelli equal with diameter of an ocellus. Penultimate joint of antenna 1.5 times as long as broad. First tergite 1.6–1.7 times as long as wide at its base, with subparallel sides and its hind horizontal part with narrowing sides (Fig. 138), smooth and shiny, apically with rather shallow punctation. Ovipositor sheath at most as long as three-fifths of hind tibia. Inner spur of hind tibia as long as half basitarsus, or slightly longer. Palps pale, first joint fumous to blackish. Hind tibia yellow with variable infuscation. ♀: 2–2.2 mm. A member of *metacarpalis*-group with some transitional features towards *lineipes*-group. — Europe as far as eastwards in USSR as Gruzia (= *aptus* PAPP, 1977, !!, syn. n.)

[**A. corvinus** REINHARD, 1881 (!!)]

42 (41) Spines on outer side of hind tibia few and disperse, spiculiform (Fig. 139). *r1* usually somewhat longer than *cuqu1* (Figs. 30, 154).

43 (48) Ovipositor sheath in lateral view shorter than hind tibia (Fig. 142). First tergite usually less long (Figs. 141, 144, 147).

44 (45) Inner spur of hind tibia distinctly longer than half basitarsus (Fig. 139). Penultimate joint of antenna twice longer than broad. First tergite subparallel-sided, about 1.5 times longer than wide at its base, its distal third to half narrowing (Fig. 141), its horizontal part punctate and interspaces with rather longitudinal rugose elements. *r1* as long as width of stigma and longer than *cuqu1* (Fig. 140). Ovipositor sheath as long as hind basitarsus or half hind tibia; hypopygium produced behind (Fig. 142). Mesonotum dull, with superficial and almost confluent punctation, interspaces with microsculpture. Middle tibia yellow or yellowish, at most with faint infuscation. ♀: 2.5–3 mm. — England, Sweden, Hungary, Korea

**A. longicalcar** THOMSON, 1895 (!!)

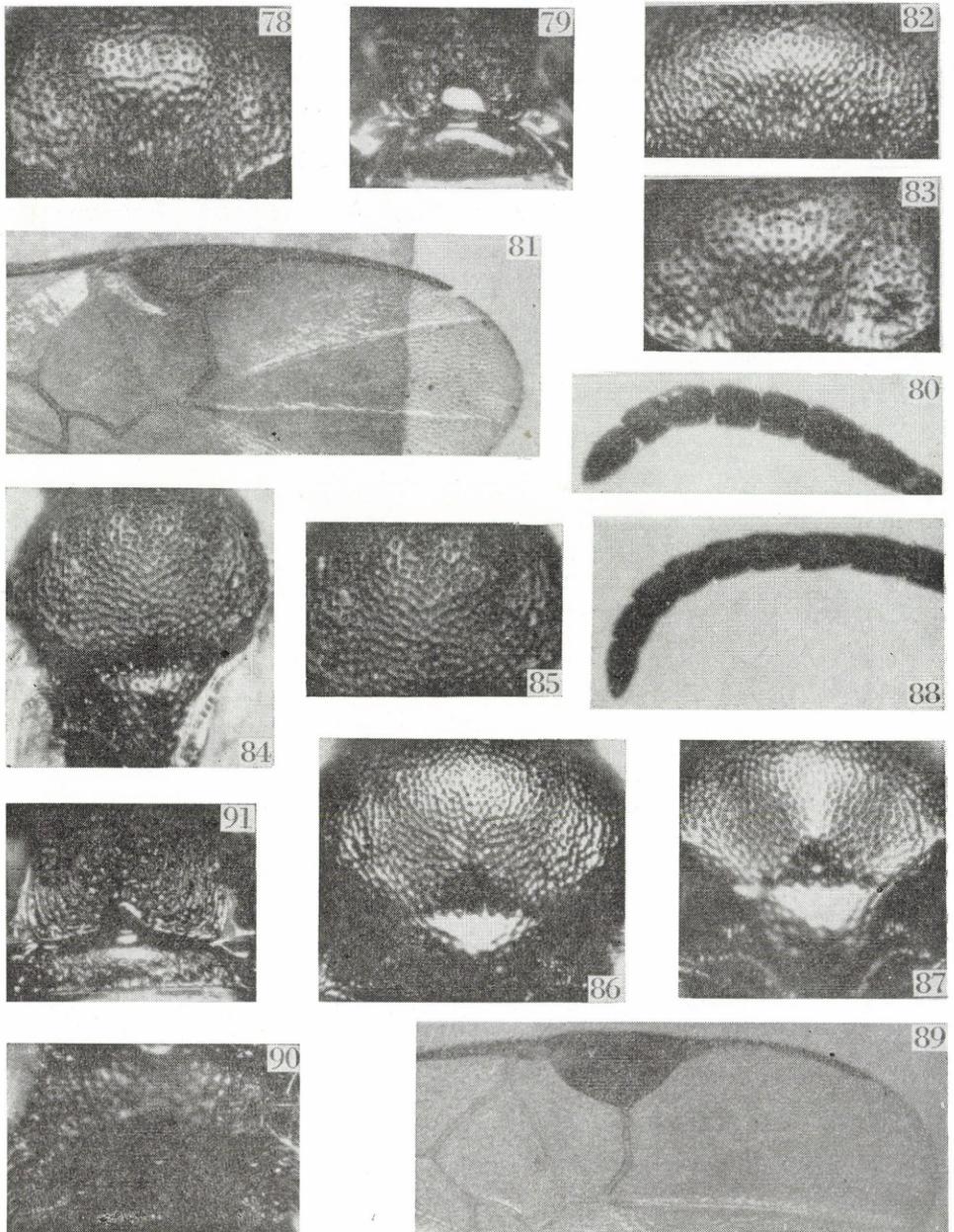
45 (44) Inner spur of hind tibia at most as long as half basitarsus (Fig. 143). Penultimate joint of antenna at most 1.5 times as long as broad.

46 (47) First tergite 1.6–1.7 times longer than wide at its base, almost evenly narrowing distally (Fig. 144); its hind half highly polished (Fig. 26). Postaxille reaching base of scutellum (Fig. 145†). Nervellus of hind wing straight (Fig. 146). Ovipositor sheath relatively narrow, as long as half hind tibia. Inner margin of eyes somewhat convergent towards oral part. Ocelli forming a low triangle, hind imaginary tangent to fore ocellus transecting hind two ocelli. Light colour of legs and palps pale yellow. ♀♂: 2.2–2.8 mm. — Hungary

**A. tersus** PAPP 1973 (!!)

47 (46) First tergite at most 1.3 times longer than wide at its base, its fore half parallel-sided and strongly narrowing posteriorly (Fig. 147); its hind third rugo-rugulose, second tergite uneven (Fig. 27). Postaxille reaching well before base of scutellum (Fig. 148†). Nervellus of hind wing incurved (Fig. 149). Ovipositor sheath relatively wide, as long as two-thirds of hind tibia. Inner margin of eyes parallel. Ocelli forming a high triangle, hind imaginary tangent to fore ocellus distinctly before hind two ocelli. Light colour of legs and palps yellow to brownish yellow. ♀: 3 mm. — Hungary

**A. piraticus** PAPP 1977 (!!)



Figs. 78-79. *Apanteles salutifer* WILK.: 78 = mesonotum, 79 = tergites 1-2. — Figs. 80-82. *A. galleriae* WILK.: 80 = antennal joints 12-18, 81 = distal part of right fore wing, 82 = mesonotum. — Figs. 83. *A. ater* (RATZ.): mesonotum. — Figs. 84-85. *A. ensiger* (SAY): 84 = mesonotum and scutellum, 85 = mesonotum. — Figs. 86-91. *A. carpatus* (SAY): 86-87 = mesonotum and scutellum, 88 = antennal joints 11-18, 89 = distal part of right fore wing, 90 = propodeum with projecting hind corner, 91 = tergites 1-2

48 (43) Ovipositor sheath in lateral view at least as long as hind tibia (Fig. 150), usually longer, i.e. as long as hind tibia and basitarsus. First tergite longer, usually 1.6 times longer than wide at its base, with nearly evenly narrowing sides, apically with faintly produced angle (Figs. 32, 151). Penultimate joint of female antenna subcubic to one-third longer than broad (Figs. 152, 153). Ocelli usual in size; hind imaginary tangent to fore ocellus touching or at most just transecting hind two ocelli. Mesonotum with shallow and contiguous punctation, interspaces with microsculpture variable in strength, consequently mesonotum subshiny to dull (Fig. 29). *r*1 longer than *cu*<sub>1</sub> and emitting from stigma distal to its middle (Figs. 30, 154). Propodeum smooth to polished, around lunule rugose, and along hind margin rugulo-uneven (Fig. 31). Inner spur of hind tibia longer than outer spur, and, usually, slightly longer than half basitarsus. Fore tibia yellow to reddish yellow, middle and hind tibia either dark with few light colour pattern or also more or less yellow to reddish yellow. Wings subhyaline, stigma and venation with dark brown to pellucid brown pigmentation (Fig. 30). ♀♂: (2.5–)3–4 mm. — Holarctic Region (= *dioryctriae* WILKINSON, 1938, !, **syn. n.**; = *magnus* TELENGA, 1955, !, **syn. n.** = *murinanae* ČAPEK & ZWÖLFER, 1957, !, **syn. n.**)\*

**A. petrovae** WALLEY, 1937 (!)\*

#### THE SPECIES OF THE *LINEIPES*-GROUP

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

absonus MUESEBECK 35 (34) (in footnote)	<i>lineipes</i> (WESMAEL) 26 (27), 35 (34), 38 (39)
adjunctus (NEES) 29 (30)	longicalcar (THOMSON) 44 (45)
annularis (HALIDAY) 12 (13)	<i>magnus</i> TELENGA 48 (43)
britannicus WILKINSON 2 (3)	<i>murinanae</i> ČAPEK & ZWÖLFER 48 (43)
coniferae (HALIDAY) 3 (2), 6 (7), 21 (22)	papaipemae MUESBECK 30 (29)
<i>dioryctriae</i> WILKINSON 48 (43)	petrovae WALLEY 48 (43)
erdoesi PAPP 10 (9)	piraticus PAPP 47 (46)
flavostriatus PAPP 15 (16)	punctiger (WESMAEL) 9 (10)
hemerobiellida FISCHER 26 (27), 39 (38)	sisenna NIXON 18 (19), 21 (22)
<i>itea</i> NIXON 9 (10)	submarginatus ABDINBEKOVA 16 (15), 21 (22)
lemariei NIXON 32 (33)	tersus PAPP 46 (47)

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

(Respective species-group in parenthesis, synonym in italics, numbers referring to couplet-number)

<i>aptus</i> PAPP 41 (42)	neophopteris (PACKARD) 23 (24) (ater-group)
conopiae WATANABE 34 (35)	szalayi PAPP 19 (18), 21 (22)
(grandiculus-group)	(laevigatus-group)
corvinus REINHARD 41 (42)	trachalus NIXON 23 (24)
(metacarpalis-group)	(ater-group)
milleri MASON 23 (24)	
(ater-group)	

\* NIXON (1973) in his revision pointed out that (1) *A. magnus* TEL. represents an intermediate form between *A. dioryctriae* WILK. and *A. murinanae* ČAP. & Zwö., and (2) the specimens of *A. dioryctriae* and *A. murinanae* may be separated only by the hair-density of the median cell and the length of ovipositor sheath. In examining these features I found that they are not of specific value and the three names indicated above fall in synonymy with *A. petrovae* described from the Nearctic Region. My knowledge of *A. petrovae* is based on the authentic female and male specimens named by W. R. M. MASON, (Ottawa) and housed in the Hungarian Natural History Museum, Budapest.

The *OBSCURUS*-group

The following features characterize the species of the *obscurus*-group: 1. Propodeum scrobiculate with U-shaped median foveola. 2. Tergites 1–2 scrobiculate to rugose, first tergite on its hind (or horizontal) half with a medio-longitudinal trough of variable size (Fig. 36). 3. Metacarp short, usually about twice as long as its distance from tip of radial cell. 4. Mesonotum with dense, strong to coarse and contiguous punctation, notaulus distinct by roughened sculpture. 5. *r*<sub>1</sub> slightly directed towards distal end of wing. 6. Edge of vannal lobe of hind wing straight. 7. Hypopygium weakly sclerotized, creased laterally.

The hosts of the species of the *obscurus*-group cover the following lepidopterous families: Pyralidae, Tortricidae.

KEY TO THE SPECIES OF THE *OBSCURUS*-GROUP

- 1 (2) Metacarp long, thrice as long as its distance from tip of wing. Notaulus hardly distinct, mesonotum less strongly punctate. Stigma pellucid brownish yellow to yellow. Member of the *ater*-group, though transitional towards the *obscurus*-group by its convex vannal lobe.

[*A. contaminatus* (HALIDAY, 1837) (!)]

- 2 (1) Above features not adequate, see also the characterization of the *obscurus*-group.  
3 (4) Mesonotum with strong and sharp punctation, interspaces polished particularly on hind part of its median lobe where punctures becoming shallow to absent (Figs. 33, 34). Stigma usually twice as long as wide (Figs. 35, 155). Face usually shiny. Body rather strong to stout, proportional length to height of thorax in lateral view usually as 1:1.5. Fore wing below stigma brownish fumous, otherwise rather subhyaline. Light colour of legs reddish yellow. ♀: 3–4.5 mm, usually 4–4.5 mm; ♂: 3–4 mm, usually 3.5 mm. — Distributed in the Palearctic Region as far as Mongolia and Middle Siberia. (= *arenarius* HALIDAY, 1834)

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

- 4 (3) Mesonotum with weak and rather confluent punctation, interspaces dull to faintly dull (i.e. never polished, Figs. 37, 38). Stigma 2.1–2.2 times as long as wide (Figs. 39, 156). Face usually more or less dull. Body less strong, proportional length to height of thorax in lateral view, as 1:1.8–2. Fore wing hyaline to subhyaline, and exceptionally brownish fumous below stigma. Light colour of legs rather yellow. ♀♂: 3–3.5 mm. — England, Sweden, France, Germany, Austria, Hungary, Czechoslovakia, Yugoslavia, Bulgaria

*A. lenea* NIXON, 1976 (!!)

THE SPECIES OF THE *OBSCURUS*-GROUP

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

*arenarius* (HALIDAY) 3 (4)

*lenea* NIXON 4 (3)

*obscurus* (NEES) 3 (4)

TRANSITIONAL SPECIES TOWARDS THE *OBSCURUS*-GROUP

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

*contaminatus* (HALIDAY) 1 (2)

(*ater*-group)

The *ATER*-group

The following features characterize the species of the *ater*-group: 1. Edge of vannal lobe of the hind wing either straight or distinctly concave. 2. First tergite usually parallel- or subparallel-sided and narrowing at its posterior third, its hind horizontal surface with a longitudinal trough. 3. Second tergite usually distinctly shorter than third tergite. 4. Propodeum rugose, with a median U-shape areola. 5. Preapical 2-4 joints of antenna frequently cubic or subcubic. 6. Hypopygium weakly sclerotized, with more or less longitudinal creases. 7. *r1* usually longer than *cuqul* and meeting each other in a characteristic obtuse angle.

The hosts of the species of the *ater*-group cover the following lepidopterous families: mainly Tortricidae, but also Galleridae, Gracillariidae, Lithocolletidae, Nolidae, Pterophoridae and Tineidae.

KEY TO THE SPECIES OF THE *ATER*-GROUP

## Females

- 1 (34) Stigma pellucid or opaque yellowish with dark border (Figs. 162, 171, 176, 183, 193).  
 2 (9) Edge of vannal lobe of hind wing beyond its widest point either weakly convex (Fig. 157), or rather straight (Fig. 158), and here with a distinct though sparse and usually short fringe of hairs.  
 3 (4) First tergite (Fig. 159) distinctly widening distally and its surface rugose, second tergite less rugose. Propodeum evenly rugose to coarsely rugose. Mesonotum with discrete and dense punctation. Notaulus indicated by crowded and rather confluent punctation. Penultimate joint of antenna one-and-one-half times as long as broad. Inner spur of hind tibia distinctly, though not much, longer than half of basitarsus. Ovipositor sheath about half as long as hind tibia, markedly widening (Fig. 160). Tegula yellow to dark yellow and sometimes with blackish suffusion. Hind femur with reddish yellow apex. Hind tibia reddish yellow, with pale yellow base. Stigma usually pellucid yellow with dark border, sometimes opaque brownish yellow. ♂♀ : 3-3.3 mm. Ireland, England, Netherland

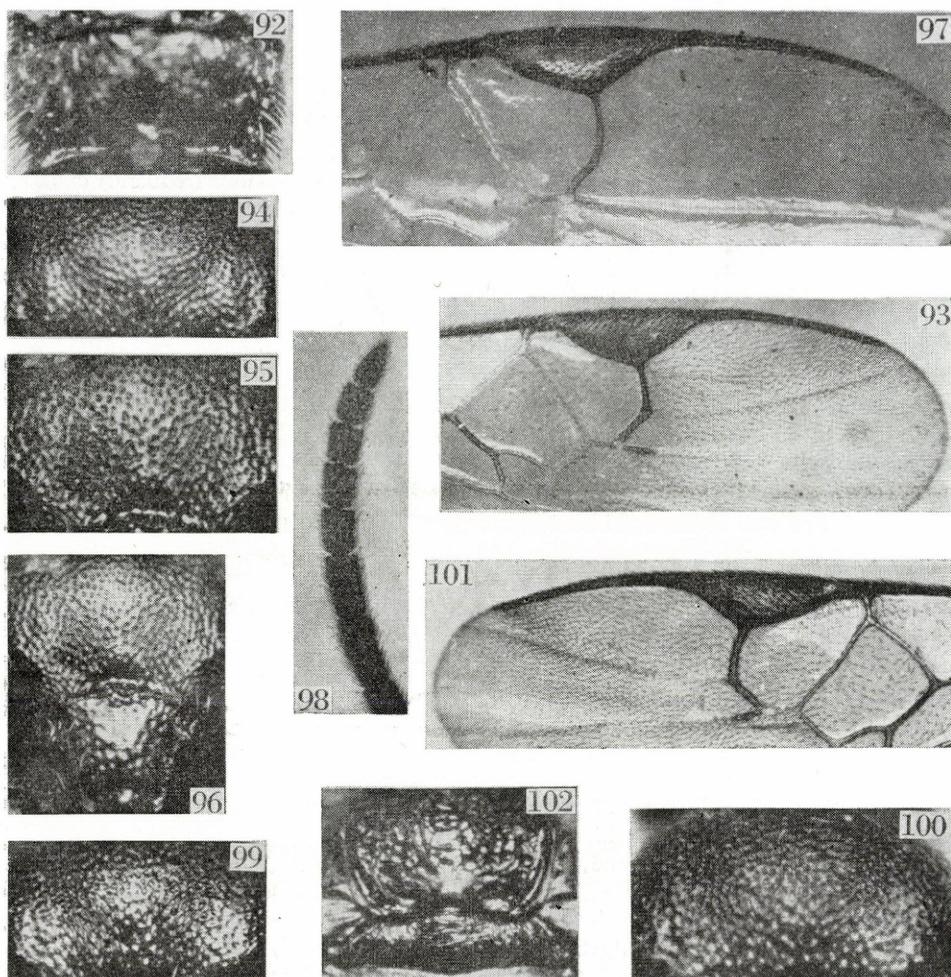
***A. contaminatus*** (HALIDAY, 1834) (!)

- 4 (3) First tergite either parallel- to subparallel-sided (Figs. 5-6 in MASON 1974), or less distinctly widening distally (Fig. 161). Propodeum laterally smooth to nearly smooth, medially more or less rugose to rugulose. Mesonotum with weak to obsolete and rather confluent punctation (Figs. 40, 41). Ovipositor sheath at least as long as hind tibia.  
 5 (6) First tergite parallel- to subparallel-sided and narrowing at its hind third, distally with strengthening rugosity, second tergite rather rugulose (Figs. 5-6 in MASON 1974). Body less strong. Mesonotum dull and with obsolete punctation. Ovipositor sheath as long as hind tibia. Tegula yellow or brownish yellow. ♀ : 2.8-2.9 mm, 2.5-2.8 mm. Canada

***A. morrisoni*** MASON, 1974 (!)

- 6 (5) First tergite in comparison with *A. contaminatus* less distinctly widening distally, and narrowing at its hind third to quarter (Fig. 161). Body strong. Mesonotum less dull to subshiny, with weak to very weak and rather confluent punctation (Figs. 40, 41)  
 7 (8) Penultimate joint of antenna 1.7-1.5 times as long as broad (♀). Ovipositor sheath as long as hind tibia. Tegula yellow. Middle femur usually yellow. ♀♂ : 2.5-2.8 mm. — Nearctic Region.

***A. polychrosidis*** VIERECK, 1912 (!)



Figs. 92-93. *Apanteles fumiferanae* VIER.: 92 = propodeum with usual hind corner, 93 = distal part of right fore wing. — Fig. 94. *A. contactus* PAPP: mesonotum. — Figs. 95-97. *A. lectus* TOBIAS: 95 = mesonotum, 96 = mesonotum and scutellum, 97 = distal part of right fore wing. — Figs. 98-102. *A. brunnistigma* ABDINB.: 98 = antennal joints 12-18, 99-100 = mesonotum, 101 = distal part of left fore wing, 102 = tergites 1-2. — (All photographs were taken with a Tessovar Opton C-35 apparatus in the Zoological Institute of the József Attila University at Szeged, Head Prof. DR. L. MÓCZÁR)

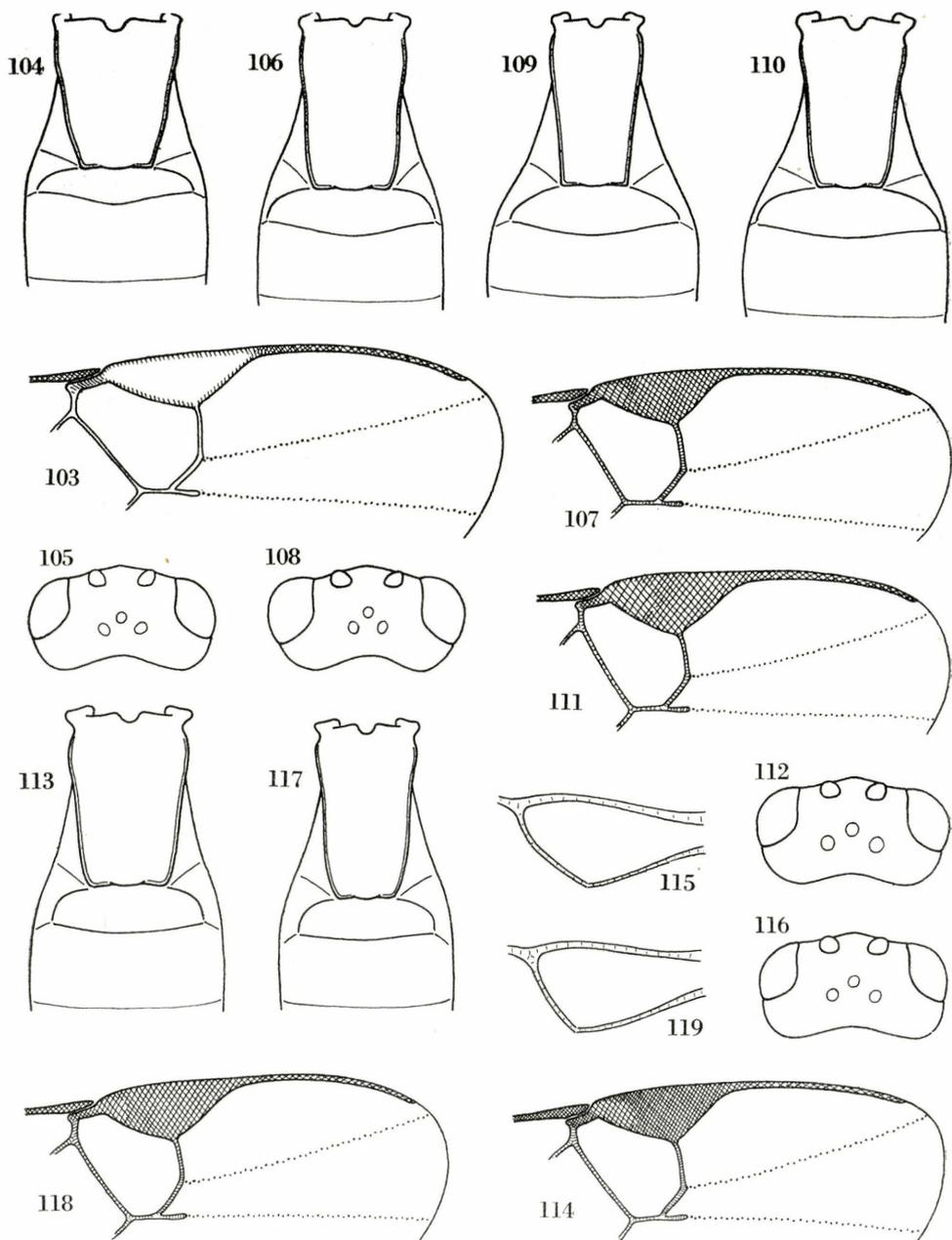
- 8 (7) Penultimate joint of antenna cubic to subcubic (♀). Ovipositor sheath slightly longer than hind tibia. Tegula black to brownish black. Middle femur usually yellow with black pattern proximally. ♀♂: 2.7-2.3 mm. — Nearctic Region. (= *A. gelechia* VIERECK, 1912)

***A. aristoteliae* VIERECK, 1912 (!)\***

\* The two species are very difficult to separate by morphological features. My authentic specimens (det. P. M. MARSH Washington) do not show strong distinguishing features. Supposedly the two names refer to the same species, of, they deviate on specific level by their microhabitat- and host-selection. — See also foot-note to couplet 31 (28).

- 9 (2) Edge of vannal lobe of hind wing beyond its widest point more or less concave (Fig. 181), or, less usually, distinctly straight (Fig. 191), and here in all cases without fringe of hairs.
- 10 (11) Metacarp very short, at most as long as, usually shorter than, stigma or hardly longer than distance from its distal end to tip of *R*. Two species of *butalidis*-group, however, with some transitional features towards *ater*-group. See also couplet 20 (23)  
 [A. *brevimetacarpus* HEDQUIST, 1965 (!)]\*  
 [A. *lindbergi* HEDQUIST, 1965 (!)]\*
- 11 (10) Metacarp long, distinctly longer than stigma, and distinctly longer than distance from its distal end to tip of *R* (Figs. 57, 61, 67, 162, 182, 193).
- 12 (15) Scutellum dull, with even and rather large punctures and without polished surface, interspaces short to very short and microsculptured (Figs. 43, 47). Inner spur of hind tibia longer than half basitarsus.
- 13 (14) Anterior two-thirds of mesopleuron rugo-rugulose (Fig. 42). *d1* as long as *d2*, *D* very slightly and comparing to next species relatively higher (Fig. 162). Mesonotum rugose, punctate elements indistinct (Figs. 43, 44). Ovipositor short, as long as half tibia, widening apically (Fig. 163). Hind half of first tergite densely rugulose to subrugulose, second tergite less transverse (Fig. 45). Hind tibia on its proximal half reddish yellow to yellow, its distal half blackish to black. Tegula yellow. ♀: 2.8–3 mm. — Sweden, Hungary. (= *calpurnia* NIXON, 1976, !, *syn. n.*)  
 A. *evanidus* PAPP, 1975 (!)
- 14 (13) Anterior half of mesopleuron punctate to rugulo-punctate. *d1* distinctly shorter than *d2*, *D* comparing to previous species relatively less high (Fig. 165). Mesonotum densely punctate, interspaces usually shorter than punctures, microsculptured (Figs. 46, 47). Ovipositor sheath long, as long as hind tibia. Hind half of first tergite rugose, second tergite more transverse (Fig. 48). Hind tibia reddish yellow or yellow, apically more or less fumous to infusate. Tegula dark yellow to brown. ♀♂: 2.5–2.8 mm. — USA (Texas, Florida)  
 A. *mimoristae* MUESEBECK, 1922 (!)
- 15 (12) Scutellum polished with a few small and rather superficial punctures, at most along its lateral margin uneven to alutaceous, dull (Figs. 49, 52, 55, 58, 64). Inner spur of hind tibia not always longer than basitarsus.
- 16 (19) Hind femur bright reddish testaceous in female, more or less blackish in male. Postaxille reaching or almost reaching base of scutellum (Figs. 49, 52, 166†, 167†).
- 17 (18) Scutellum, unusually, with less converging sides, its hind width nearly two-thirds of its fore width (Figs. 49, 166). First tergite slightly though distinctly widening posteriorly, only somewhat longer than wide at hind, its horizontal half shiny and with more and rather longitudinal rugulose elements (Fig. 50). Mesonotum with discrete and dense punctation, interspaces polished (Fig. 51). Propodeum rugose, on its hind or declivous part with strigose-strigillose elements. Nervellus of hind wing less incurved (cf. Fig. 68 in PAPP 1979). Ovipositor sheath one-fifth longer than hind tibia. ♀♂: 3.8–4 mm. — USA, Mexico  
 A. *paranthrenidis* MUESEBECK, 1921 (!)
- 18 (17) Scutellum, as usual, with more converging sides, its hind width about half of its fore width (Figs. 52, 167). First tergite parallel-sided, distinctly longer than wide at hind, its horizontal half shiny or subshiny and with more punctate elements (Fig. 53). Mesonotum with discrete but not dense punctation, interspaces shiny (Fig. 54).

\* On the basis of an examination of the holotypes described from Cape Verde Islands, they are extremely similar to each other. Supposedly, one of the two names will become synonym following thorough revision of the European species ranged in the *butalidis*-group. Their separation in my previous paper (PAPP 1978) should be considered as a tentative one.



Figs. 103-104. *Apanteles britannicus* WILK.: 103 = distal part of right fore wing, 104 = tergites 1-3. — Figs. 105-107. *A. punctiger* (WESM.): 105 = head in dorsal view, 106 = tergites 1-3. 107 = distal part of right fore wing. — Figs. 108-109. *A. erdoesi* PAPP: 108 = head in dorsal view, 109 = tergites 1-3. — Figs. 110-111. *A. annularis* (HAL.): 110 = tergites 1-3. 111 = distal part of right fore wing. — Figs. 112-115. *A. flavostriatus* PAPP: 112 = head in dorsal view, 113 = tergites 1-2, 114 = distal part of right fore wing, 115 = nervellus of left hind wing. — Figs. 116-119. *A. submarginatus* ABDINB.: 116 = head in dorsal view, 117 = tergites 1-3, 118 = distal part of right fore wing, 119 = nervellus of left hind wing

Propodeum rugo-rugulose without strigose elements. Nervellus of hind wing more incurved (cf. Fig. 57 in PAPP 1978). Ovipositor sheath as long as hind tibia. ♀♂: 3–3.5 mm. — USA

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

- 19 (16) Hind femur black or at most brownish black with rufous suffusion in both sexes. Postaxille not reaching base of scutellum (Figs. 64, 172↑, 177↑, 186) except in *A. articas* NIXON and *A. epinotiae* VIER.
- 20 (23) Metacarp relatively short, usually one-and-one-half, at most twice, as long as distance between its distal end and tip of *R* (Figs. 57, 168).
- 21 (22) Mesonotum with pubescence posteriorly becoming gradually longer and silky; scutellum laterally with long silky pubescence (Fig. 55). Propodeum densely alutaceous to uneven, dull to subshiny, its median foveola shallow and not bordered with U-shaped rugae. First tergite narrowing behind, its horizontal half coriaceous tending rugulose in the middle (Fig. 56). *d2* almost twice as long as *d1*, *D* distinctly wider than high; *r1* emitting from middle of stigma (Figs. 57, 168). Ovipositor sheath as long as, or somewhat longer than, hind tibia. Carpal vein, stigma and *r1+cuqu1* pellucid light to whitish yellow, metacarp brown, further veins colourless. Hind tibia blackish brown throughout. ♀♂: 2.5–3 mm. — Senegal, Turkey (new record)

**A. articas** NIXON, 1965 (!!)

- 22 (21) Mesonotum with usual hairs; scutellum laterally without pubescence. Propodeum rugose, anteriorly rather rugulose, border of its median foveola faintly carinated. First tergite subparallel-sided, i.e. very slightly widening posteriorly, its horizontal half evenly rugo-rugulose. *d2* at most 1.5 times as long as *d1*, *D* less distinctly wider than high (Fig. 169); *r1* emitting distally from middle of stigma. Ovipositor sheath somewhat longer than hind tibia. Carpal vein, stigma and *r1+cuqu1* pellucid yellow, border of stigma together with metacarp brown, further veins coloured with light yellow pigmentation. Hind tibia blackish except its yellow base. ♀♂: 2–2.5 mm. — USA

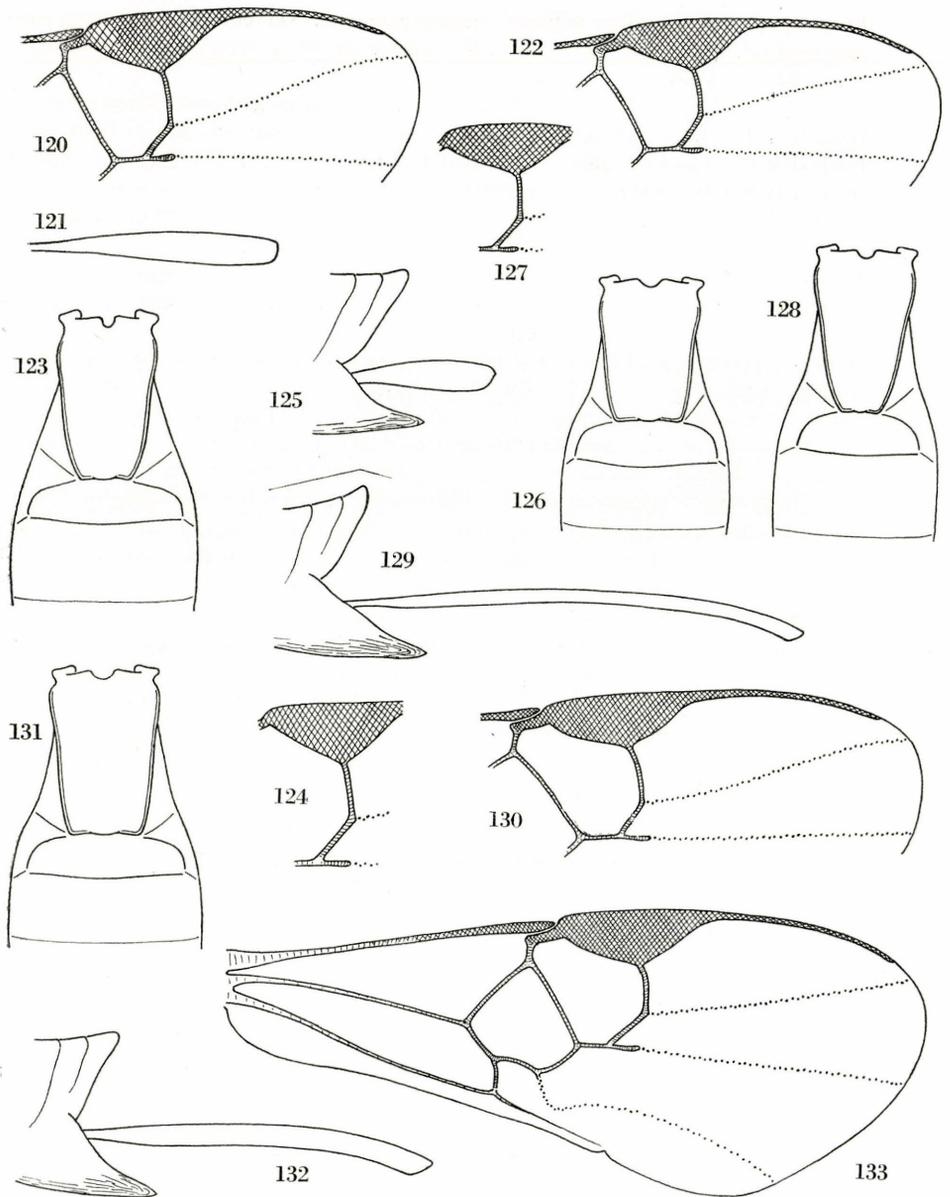
**A. epinotiae** VIERECK, 1912 (!)

- 23 (20) Metacarp long, distinctly thrice as long as distance between its distal end and tip of *R* (Figs. 61, 67, 182, 193)
- 24 (25) Edge of vannal lobe of hind wing convex to faintly convex and here without fringe of hairs (Fig. 158). Body less strong. Further details see at couplet 5 (6)

**A. morrisoni** MASON

- 25 (24) Edge of vannal lobe of hind wing distinctly concave (Figs. 181, 187) or straight (Fig. 191), and here without fringe of hairs. Body more strong.
- 26 (29) Disc of mesonotum shiny with distinct, not confluent and relatively strong punctation, latter more or less crowded along notaulic course (Fig. 59). Scutellum polished with scattered and few punctures (Fig. 58). Ovipositor sheath about one-and-one-third as long as hind tibia. First tergite subrectangular, about one-fourth longer than wide at its base (Figs. 170, 175). Inner spur of hind tibia almost half as long as basitarsus.
- 27 (28) First tergite slightly but distinctly narrowing posteriorly (Fig. 170), its horizontal half rather rugulose. *r1* only somewhat longer than *cuqu1* (Fig. 171). Scutellum rather wide, its basal width equal with its median length (Fig. 172). Head in facial view slightly elongated (in comparison to that of *A. xanthostigma* HAL. too, Fig. 173). Ovipositor sheath almost straight (Fig. 174). Tibiae 2–3 blackish to black, except dark reddish base. ♀: 3.2–3.3 mm. — England

**A. miramis** NIXON, 1976 (!!)\*



Figs. 120-121. *Apanteles sisenna* NIXON: 120 = distal part of right fore wing, 121 = ovipositor sheath. — Fig. 122. *A. szalayii* PAPP: distal part of right fore wing. — Figs. 123-124. *A. adjunctus* (NEES): 123 = tergites 1-3, 124 = stigma,  $r1+cuq1$ . — Figs. 125-127. *A. lemarieti* NIXON: 125 = end of abdomen with hypopygium and ovipositor sheath, 126 = tergites 1-2, 127 = stigma,  $r1+cuq1$ . — Figs. 128-130. *A. conopiae* WAT.: 128 = tergites 1-3, 129 = end of abdomen with hypopygium and ovipositor sheath, 130 = distal part of right fore wing. — Figs. 131-133. *A. lineipes* (WESM.): 131 = tergites 1-3, 132 = end of abdomen with hypopygium and ovipositor sheath, 133 = right fore wing

28 (27) First tergite with parallel sides (Fig. 175), its horizontal half rather with longitudinal rugo-rugulosity. *r1* distinctly longer than *cuqu1* (Fig. 176). Scutellum less wide, its basal width shorter than its median length (Figs. 58, 177). Head in facial view round as usually. Ovipositor sheath distally down-curved (Fig. 178). Tibiae 2-3 reddish yellow, tibia 3 apically dark. ♀: 4 mm. — Neotropic Region: Trinidad, Colombia. Nearctic Region: USA (Arizona, Texas)

**A. thurbiae** MUESEBECK, 1921 (!)\*

29 (26) Disc of mesonotum dull, with indistinct, more or less confluent to obsolete punctation, notaulic course less indicated by crowded sculpture (Figs. 70, 83). Scutellum usually shiny to subshiny or faintly dull (Fig. 64). Ovipositor sheath usually as long as hind tibia, or somewhat longer. First tergite at least 1.6-1.8 times longer than wide at its base (Figs. 184, 188, 192). Inner spur of hind tibia usually distinctly half as long as basitarsus.

30 (33) Flagellar joints 13-15 subcubic to cubic (Fig. 60). First tergite 1.7-1.8 times longer than wide at base (Figs. 184, 188). Stigma emitting *r1* distinctly distally from its middle, *r1* always longer than *cuqu1*, veins meeting less angularly (Figs. 61, 182, 183). Median foveola of propodeum smooth, shiny (Fig. 62).

31 (32) Body less strong, usual in size, thorax in lateral view 1.3-1.4 times longer than high. First tergite 2.4-2.6 times as long as wide apically (Fig. 184). Distance between fore and a hind ocelli equal with, or somewhat longer than, diameter of fore ocellus. *d1* more or less shorter than *d2*, *D* slightly higher (Figs. 61, 182). Nervellus of hind wing straight to almost straight (Fig. 181). Basitarsus of middle leg almost twice as long as its second joint (Fig. 185). Fifth joint of fore tarsus below with a fine spine (Fig. 52 in NIXON 1976)\*\*. Ovipositor sheath as long as hind tibia, relatively less wide in comparison to that of *A. xanthostigma* HAL. (Fig. 22 in PAPP 1975). Stigma usually opaque brownish yellow (Fig. 182) though frequently pellucid yellow (Fig. 183). ♀♂: 2-2.7 mm, usually 2.5 mm. See also couplet 51 (50). — Europe as far eastwards as Azerbaidzhan and Armenia in USSR. (= *carbonarius* RATZBURG, 1848, non WESMAEL, 1837; ? = *sodalis* HALIDAY, 1834)

**A. ater** (RATZBURG, 1852) (!)\*\*

32 (31) Body strong, thorax in lateral view 1.6-1.65 times longer than high. First tergite thrice as long as wide apically (Fig. 188). Distance between fore and a hind ocelli shorter than diameter of fore ocellus. *d1* almost as long as *d2*, *D* slightly less high (Fig. 189). Nervellus of hind wing moderately incurved (Fig. 187). Basitarsus of middle leg slightly more than twice as long as second joint (Fig. 190). Fifth joint of fore tarsus below without fine spine. Ovipositor sheath one-fifth longer than hind tibia. Stigma always pellucid yellow. ♀♂: 2.5-3 mm, usually 3 mm. — USSR: Azerbaidzhan, Hungary (new record)

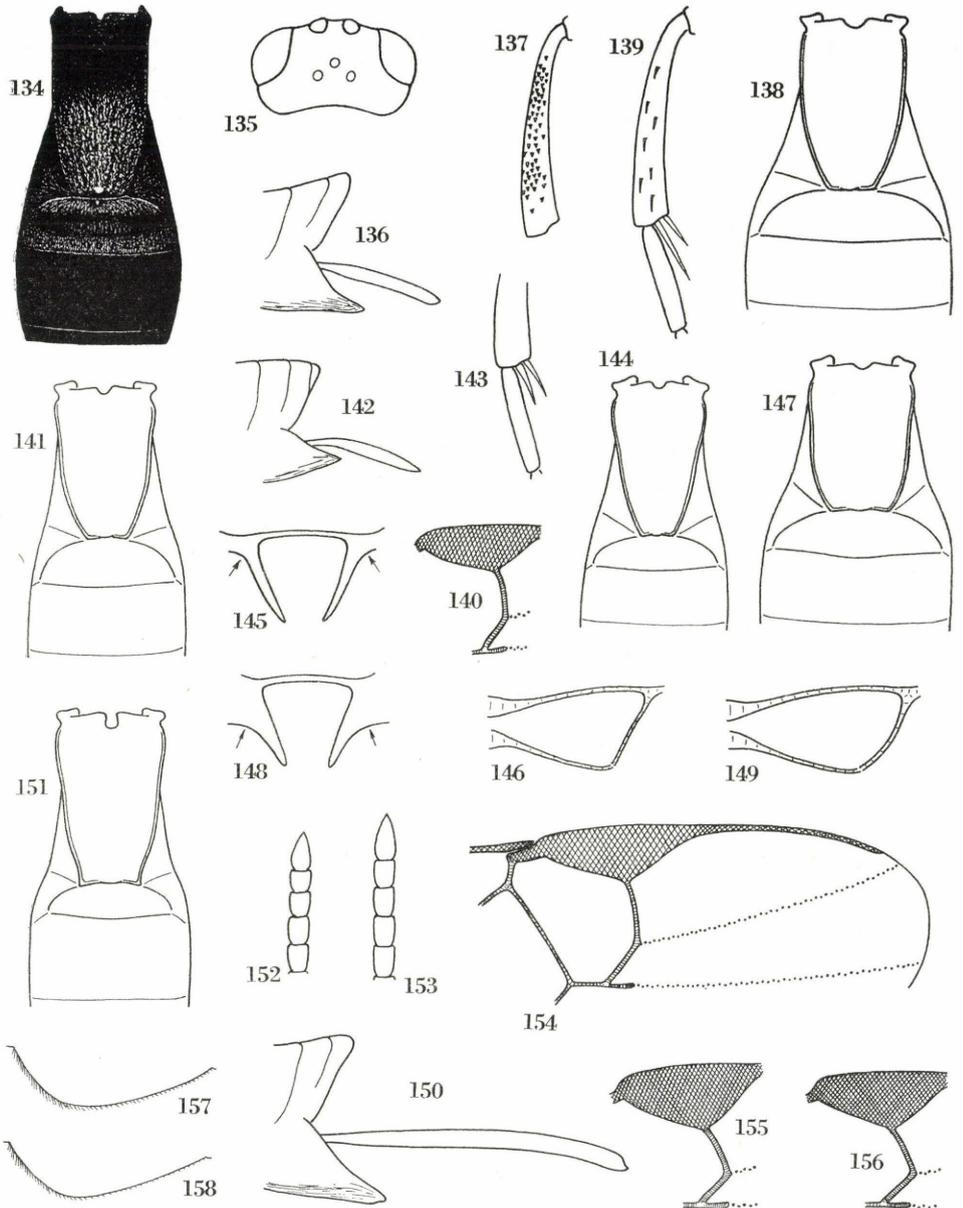
**A. kubensis** ABDINBEKOVA, 1969 (!)\*\*

33 (30) Flagellar joints 13-15 one-third to one-fourth, i. e. distinctly, longer than broad (Fig. 65-66). First tergite 1.5(-1.4) times longer than wide at base (Fig. 192). Stigma emitting *r1* from its middle or close distally from its middle, *r1* of female longer than or (of male) as long as *cuqu1*, veins meeting distinctly angularly (Figs. 67, 193). Median foveola of propodeum rugo-rugulose (Fig. 68). Nervellus of hind wing distinctly incurved (Fig. 191). Inner spur of hind tibia as long as or, usually, hardly longer than half basitarsus. Ovipositor sheath as long as hind tibia, relatively wide

\* The two species, *A. miramis* NIXON and *A. thurbiae* MUES., are very near to each other. Their identification requires a meticulous examination of the features expounded in the key.

\*\* This feature is seen on properly mounted specimen only.

\*\*\* For lectotype designation see the foot-note to couplet 51(50) on p. 267.



Figs. 134-136. *Apanteles hemerobiellidica* Fl.: 134 = tergites 1-3, 135 = head in dorsal view, 136 = end of abdomen with hypopygium and ovipositor sheath. — Figs. 137-138. *A. corvinus* REINH.: 137 = spines of outer side of hind tibia, 138 = tergites 1-3. — Figs. 139-142. *A. longicalcar* THOMS: 139 = hind tibia with spines, spurs and basitarsus, 140 = stigma,  $r1+cuq1$ , 141 = tergites 1-3, 142 = end of abdomen with hypopygium and ovipositor sheath. — Figs. 143-146. *A. tersus* PAPP: 143 = distal half of hind tibia with spurs and basitarsus, 144 = tergites 1-3, 145 = scutellum with postaxille, 146 = nervellus of right hind wing. — Figs. 147-149. *A. piraticus* PAPP: 147 = tergites 1-3, 148 = scutellum with postaxille, 149 = nervellus of right hind wing. — Figs. 150-154. *A. petrovae* WALLEY: 150 = end of abdomen with hypopygium and ovipositor sheath, 151 = tergites 1-3, 152-153 = antennal joints 14-18, 154 = distal part of right fore wing. — Fig. 155. *A. obscurus* (NEES): stigma,  $r1+cuq1$ . — Fig. 156. *A. lenea* NIXON: stigma,  $r1+cuq1$ . — Fig. 157. *A. contaminatus* (HAL.): edge of vannal lobe. — Fig. 158. *A. morrissi* MASON: edge of vannal lobe

in comparison to that of *A. ater* (cf. Fig. 174). Hind tibia variable in colour: in spring to summer generation testaceous to testaceous yellow with more or less infuscation distally, in late summer and autumn generation blackish to black with pale base. ♀: 2.9–3 mm, ♂: 2.3–2.6 mm. — In Palaearctic Region frequent to common, Ethiopian Region: Uganda. (= *ochrostigma* WESMAEL, 1837; ? = *polychrosidis* VIERECK, 1912\*; = *xanthocarpus* SZÉPLIGETI, 1901\*\*)

**A. xanthostigma** (HALIDAY, 1834) (!)\*\*\*

- 34 (1) Stigma brown, opaque brown, or, less usually, opaque brownish yellow to yellow, never pellucid (Figs. 81, 89, 93, 97, 101, 182, 201, 205, 208, 217, 224, 228).  
 35 (44) Edge of vannal lobe beyond its widest point either hardly convex (Figs. 157, 194) or rather straight (Fig. 197) and here with distinct though sparse and short fringe of hairs.  
 36 (39) First tergite widening posteriorly (Figs. 29 and 53: *A. sophiae* PAPP, 1978; Figs. 159, 161, 207).  
 37 (38) Stigma brown or dark brown with a vivid yellow basal spot (Fig. 55, PAPP 1978). Further details see at couplet 56 (57) (*A. carpatus* SAY), and in PAPP 1978, couplet 25 (42). A member of the *laevigatus*-group (*A. sophiae* PAPP)

**A. carpatus** (SAY)

[*A. sophiae* PAPP]

- 38 (37) Stigma evenly opaque brownish yellow, without yellow spot at its base. Further details see at couplets 3 (4)—8 (7)

**A. aristoteliae** VIER.

**A. contaminatus** (HAL.)

- 39 (36) First tergite parallel- to subparallel-sided and usually narrowing apically (Figs. 196, 199).  
 40 (41) Metacarp short, as long as length of stigma and twice as long as distance between its distal end and tip of *R*. First tergite narrowing on its hind third, its hind two-thirds rugose; second tergite rather longitudinally rugulose, shiny. Mesonotum with dense and discrete punctation, along notaulus punctation crowded-confluent. Tegula yellow. Legs dark, black with brown pattern. ♀: 2.8—3 mm. — Nearctic Region (USA)

**A. nephopteris** (PACKARD, 1864) (!)

- 41 (40) Metacarp long, distinctly longer than stigma and at least thrice as long as distance between its distal end and tip of *R*.  
 42 (43) Eye in lateral view unusually narrow, temple below somewhat wider than width of eye (Fig. 195). Three preapical joints of antenna cubic. Ocelli small, distance be-

\* A comparative examination of *A. polychrosidis* VIER. (1 ♀ and 1 ♂ det. P. M. MARSH, Washington) and *A. xanthostigma* (HAL.) revealed that the two forms are but extremely near to each other, the morphological differences between them are few and I rather hesitate to warrant their specific value:

*A. polychrosidis* VIER.

1. Tegula yellow or bright yellow.
2. Stigma emitting radial vein distinctly distally from its middle.

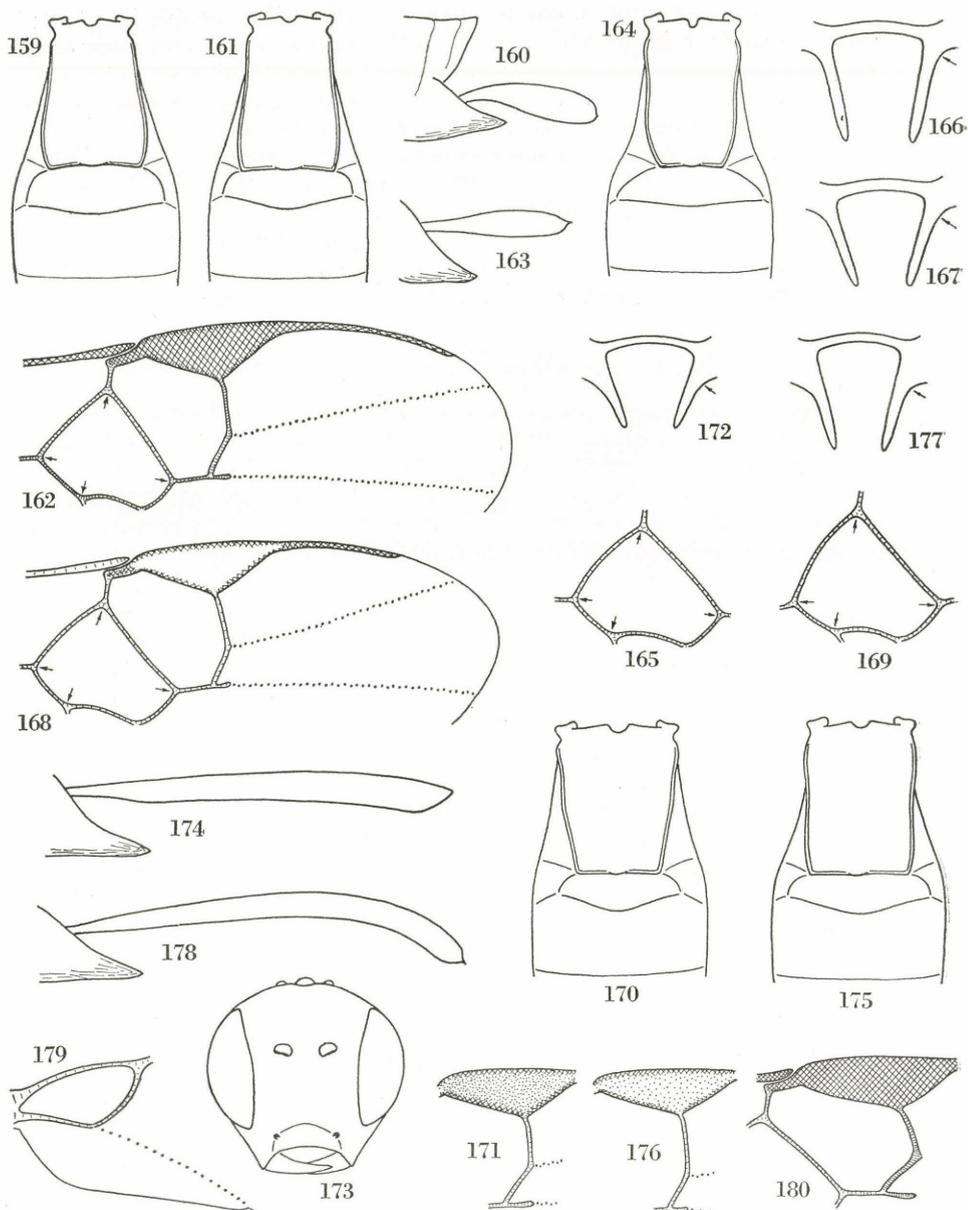
*A. xanthostigma* (HAL.)

1. Tegula black to dark brown.
2. Stigma emitting radial vein from its middle or close distally from its middle (Fig. 193).

A thorough study of their microhabitat and host-selection will disclose whether they represent two distinct species or not.

\*\* Designation of types of *A. xanthocarpus* SZÉPLIGETI: 1. Lectotype ♂: Transbaikalia, Burdukova, 24 VIII 1898, Exp. ZICHY, leg. CSIKI, Hym. Typ. No. 1014. — 2. Paralectotypes (5 ♂): Transbaikalia, Kibalina, 26 VIII 1898, Exp. ZICHY, leg. CSIKI, 1 ♂, Hym. Typ. No. 1015; Transbaikalia, Burdukova, 24 VIII 1898, Exp. ZICHY, leg. CSIKI, 4 ♂, Hym. Typ. No. 1016-1018, 2826. Type-series is deposited in the Hungarian Natural History Museum, Budapest.

\*\*\* WILKINSON (1931) designated the neotype of *A. xanthostigma* (HAL.) regarding the statement that HALIDAY's types had been lost. The ♀ neotype was selected from Marshall's Collection housed in the British Museum (Nat. Hist.), London. It is an astonishing fact that among the specimens of *A. xanthostigma* (HAL.) in Reinhard's Collection of the Zoologisches Museum, Berlin, another ♀ neotype was fixed by WILKINSON himself. However, this neotype should be considered invalid owing to WILKINSON's designation indicated above. — Herewith I express my sincere thank to DR. E. KÖNIGSMANN (Berlin) for lending me material from Reinhard's Collection.



Figs. 159-160. *Apanteles contaminatus* (HAL.): 159 = tergites 1-3, 160 = end of abdomen with hypopygium and ovipositor sheath. — Fig. 161. *A. aristotelice* VIER.: tergites 1-3. — Figs. 162-164. *A. evanidus* PAPP: 162 = distal part of right fore wing, 163 = hypopygium and ovipositor sheath, 164 = tergites 1-3. — Fig. 165. *A. mimoristae* MUES.: discoidal cell (*D*) of fore right wing. — Fig. 166. *A. parenthrenidis* MUES.: scutellum with postaxille. — Fig. 167. *A. megathymus* RILEY: scutellum with postaxille. — Fig. 168. *A. articus* NIXON: distal part of right fore wing. — Fig. 169. *A. epinotiae* VIER.: discoidal cell (*D*) of fore right wing. — Figs. 170-174. *A. mircomis* NIXON: 170 = tergites 1-3, 171 = stigma, *r1+cuq1*, 172 = scutellum with postaxille, 173 = head in frontal view, 174 = hypopygium and ovipositor sheath. — Figs. 175-178. *A. thurbiae* MUES.: 175 = tergites 1-3, 176 = stigma, *r1+cuq1*, 177 = scutellum with postaxille, 178 = hypopygium and ovipositor sheath. — Fig. 179. *A. fumiferanae* VIER.: nervellus and vannal lobe. — Fig. 180. *A. ensiger* (SAY): stigma, *r1+cuq1*, Cul.

tween fore and a hind ocelli as long as diameter of an ocellus; hind imaginary tangent to fore ocellus at most touching hind two ocelli. Nervellus of hind wing rather oblique (Fig. 194). First tergite subparallel-sided, i.e. rather indistinctly widening posteriorly (Fig. 196). Sternaulus oblong-oval impressed and crenulo-rugose. Two spurs of hind tibia almost of equal length, inner spur as long as, or nearly as long as, half basitarsus. Hind tibia and tarsus black to blackish. ♀: 2.8–3 mm. A member of *ultor*-group with few features towards *ater*-group. — Great Britain, Hungary. (= *sevocatus* PAPP, 1975, !!, **syn. n.**)

[**A. trachalus** NIXON, 1965 (!!)]

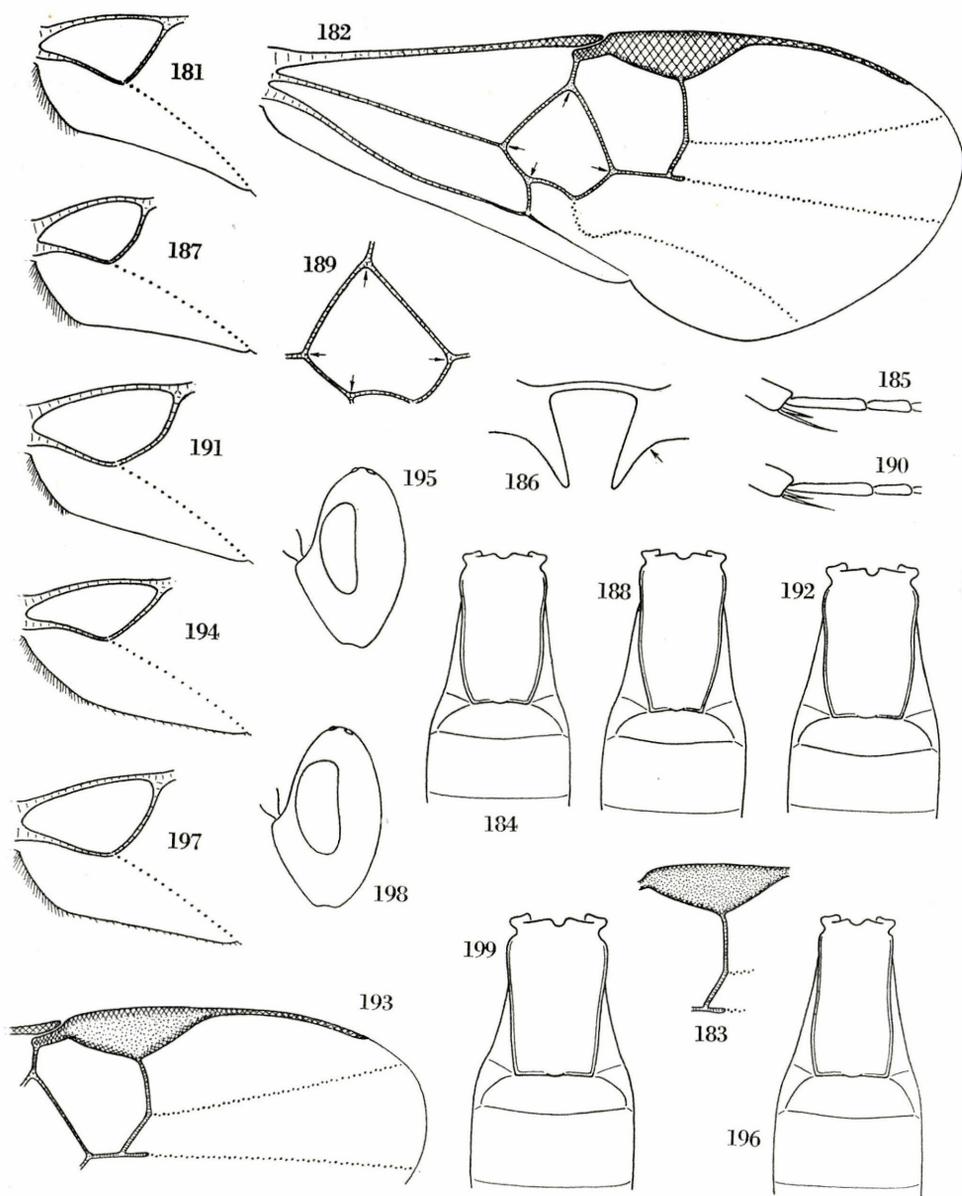
- 43 (42) Eye in lateral view of usual size, temple and eye equal in width (Fig. 198). Three preapical joints of antenna twice longer than broad. Ocelli large, distance between fore and a hind ocelli distinctly shorter than diameter of an ocellus; hind imaginary tangent to fore ocellus transecting hind two ocelli. Nervellus of hind wing rather incurved (Fig. 197). First tergite feebly narrowing posteriorly, its sides straight (Fig. 199). Sternaulus indistinct. Two spurs of hind tibia clearly different in length, inner spur slightly longer than half basitarsus, outer spur one-third of basitarsus. Hind tibia and tarsus testaceous. ♀: 3.7 mm. — Hungary

**A. peridoneus** PAPP, 1974 (!)

- 44 (35) Edge of vannal lobe beyond its widest point either concave (Figs. 181, 203), or distinctly straight (Figs. 211, 213, 226), and here without fringe of hairs.
- 45 (52) First tergite at least twice as long as wide at hind, parallel- or subparallel-sided with narrowing hind third (Figs. 200, 202).
- 46 (47) Scutellum rugose to rugulose, mesonotum densely rugose (Fig. 72). Outer(-upper) side of hind coxa rugose or, less usually, rugulose (Fig. 73). Second tergite densely rugulose (Fig. 74). Ocelli small, distance between fore and a hind ocelli equal with diameter of hind ocellus, hind imaginary tangent to fore ocellus at most touching hind two ocelli. Penultimate joint of antenna one-and-one-half times as long as broad (Fig. 75). Median foveola of propodeum smooth, shiny, otherwise propodeum rugose and carinated (Fig. 76). Stigma emitting radial vein distally from its middle, *r*1 1.8–2 times longer than *cuq*1 (Fig. 201), *d*1 and *d*2 about equal in length. Ovipositor sheath almost as long as hind tibia. Middle and hind trochanters reddish yellow. Proximal half of hind tibia yellow or pale yellow. Stigma brown to blackish brown. ♀: 3.3–3.5 mm, ♂: 3–3.2 mm. — Old World: Australia, India, Africa, Cyprus, Italy, Bulgaria (new record)

**A. hemara** NIXON, 1965 (!)

- 47 (46) Scutellum smooth to polished, at most with some small and scattered punctures. Mesonotum distinctly punctated, never rugose (Figs. 78, 82, 83). Outer side of hind coxa smooth, at most with some weak punctures. Second tergite smooth, at most uneven to subrugulose (Figs. 63, 79)
- 48 (49) Preapical three-four joints of antenna one-and-one-half as long as broad (Fig. 77). First tergite thrice or almost thrice as long as wide at hind (Fig. 202). Body usually about 3 mm long. Ocelli near to each other, distance between fore and a hind ocelli at most as long as, frequently shorter than, diameter of hind ocellus, distance between hind two ocelli twice as long as diameter of hind ocellus. *r*1 1.7–2 times longer than *cuq*1. Mesonotum with sharp punctation (Fig. 78). Two spurs of hind tibia distinctly different in length, inner spur somewhat longer than half basitarsus, outer spur as long as one-third of basitarsus. Nervellus of hind wing faintly incurved (Fig. 203). Legs, except black coxa, reddish yellow, tibiae-tarsi 1–2 rather yellow, proximal half of hind tibia more or less and that of hind basitarsus usually pale yellow. Tegula



Figs. 181-186. *Apanteles ater* (RATZ.): 181 = nervellus and vannal lobe, 182 = fore right wing, 183 = stigma, *r1*+*cuqul*, 184 = tergites 1-3, 185 = middle tarsal joints 1-2, 186 = scutellum with postaxille. — Figs. 187-190. *A. kubensis* ABDINB.: 187 = nervellus and vannal lobe, 188 = tergites 1-3, 189 = discoidal cell (*D*), 190 = middle tarsal joints 1-2. — Figs. 191-193. *A. xanthostigma* (HAL.): 191 = nervellus and vannal lobe, 192 = tergites 1-3, 193 = distal part of right fore wing. — Figs. 194-196. *A. trachalus* NIXON: 194 = nervellus and vannal lobe, 195 = head in lateral view, 196 = tergites 1-3. — Figs. 197-199. *A. peridoneus* PAPP: 197 = nervellus and vannal lobe, 198 = head in lateral view, 199 = tergites 1-3.

brown, brownish yellow. ♀: 3–3.2 mm, ♂: 2.5–3 mm. — India, Burma, Thailand (= Siam), China, Korea

**A. salutifer** WILKINSON, 1931 (!)

- Mesonotum with faint punctation. Distance between hind two ocelli four times greater than diameter of an ocellus. Nervellus of hind wing distinctly incurved. ♀: 2.8–3 mm. ♂: 2.3 mm. — USSR: Azerbaidzhan. (= *lencoranus* ABDINBEKOVA, 1969)

**A. samedovi** ABDINBEKOVA, 1969\*

- 49 (48) Preapical three-four joints of antenna usually cubic, less usually subcubic, i.e. at most one-fifth to one-fourth longer than broad (Figs. 60, 80). First tergite 2.4–3 times as long as wide at hind (Figs. 184, 204). Body less long, usually 2.3–2.5 mm long.
- 50 (51) Stigma wide, 2–2.2 times as long as wide; *r*1 directed somewhat outwards (Figs. 81, 205). Outer side of hind tibia with thicker spines, overlapping to almost overlapping each other (Fig. 206). Ocelli near to each other, posterior imaginary tangent to fore ocellus distinctly transecting hind two ocelli. Inner spur of hind tibia more or less longer than half basitarsus. Mesonotum with more discrete punctation (Fig. 82). Fifth joint of fore tarsus below without a spinule. Legs including coxae reddish brown to brown, tibiae and tarsi more or less lighter. Stigma evenly brown or dark brown. ♀♂: 2.5–3 mm. — Reported from several parts of the world: Argentina, USA, India, Mauritius, France (Montpellier), Hungary (new record); supposedly a cosmopolitan species

**A. galleriae** WILKINSON, 1932 (!!)

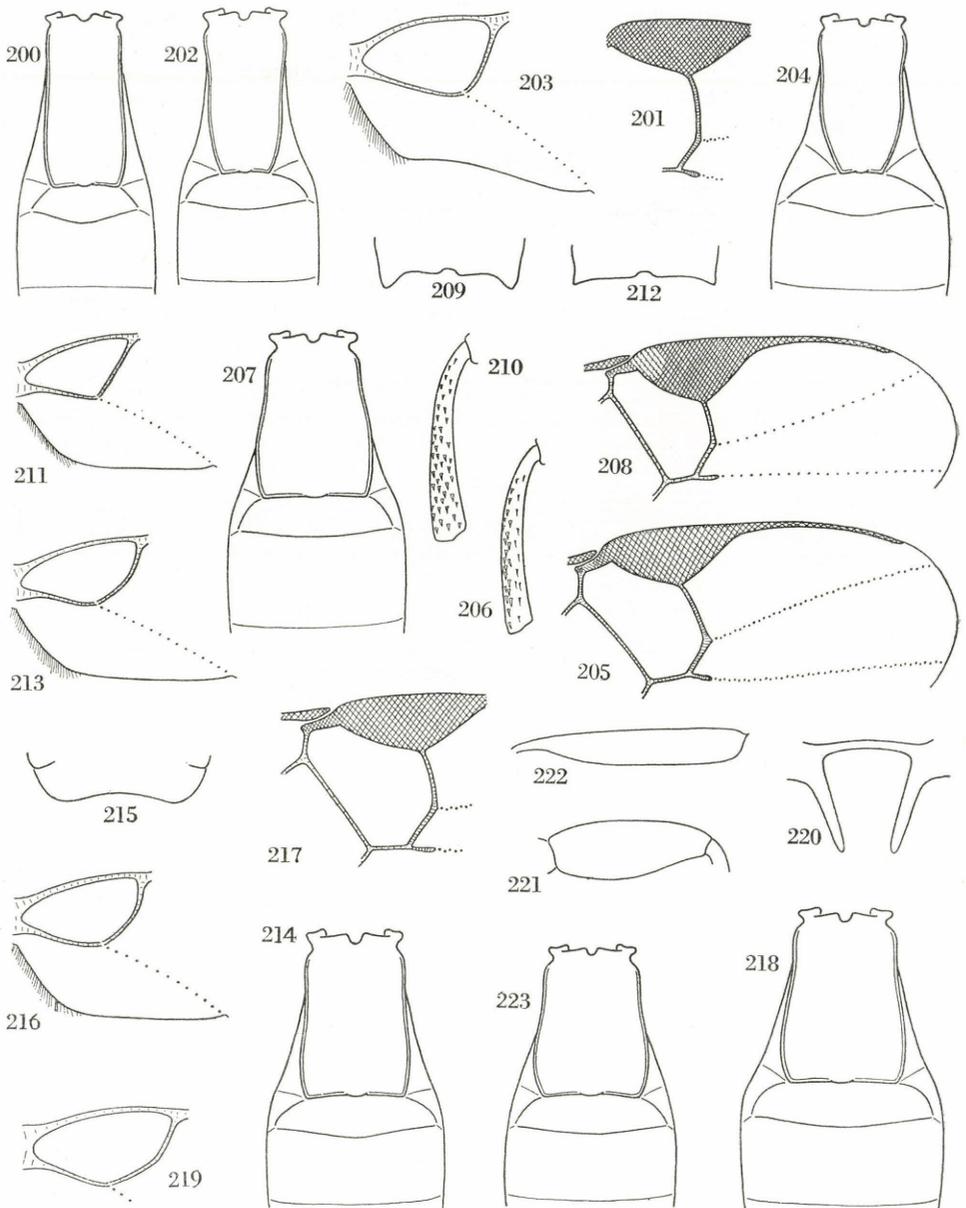
- 51 (50) Stigma less wide, thrice or almost thrice as long as wide; *r*1 perpendicular to stigma (Fig. 61). Outer side of hind tibia only with disperse spicular spines. Ocelli less near to each other, posterior imaginary tangent to fore ocellus at most touching hind two ocelli. Inner spur of hind tibia at most as long as half basitarsus. Mesonotum with less discrete punctation (Fig. 83). Fifth joint of fore tarsus below with a spinule (Fig. 52 in NIXON 1976). Legs black, fore tibia and tarsus yellow or dark yellow. Stigma usually opaque brownish yellow (Fig. 182) though frequently pellucid yellow (Fig. 183). ♀♂: 2–2.7 mm. See also couplet 31 (32). — Europe as far as eastwards as Azerbaidzhan and Armenia in USSR. (= *carbonarius* RATZBURG, 1848, non WESMAEL, 1837; ? = *sodalis* HALIDAY, 1834)

**A. ater** (RATZBURG 1852) (!)\*\*

- 52 (45) First tergite at most 1.4–1.5 times, usually 1.1–1.2 times, as long as its hind width, its two sides more or less widening posteriorly (Figs. 207, 218, 223), or subparallel-sided and one-third longer than wide at hind (Fig. 214).
- 53 (54) Scutellum evenly or almost evenly punctato-rugulose, dull (Fig. 84). Legs of female entirely reddish yellow, apex of hind femur blackish. First tergite widening behind less distinctly. Second tergite distinctly rugo-rugulose, this sculpture only somewhat weaker than that of first tergite. Mesonotum (Figs. 84, 85) and anterior half of mesopleuron with dense and rather strong to coarse punctation. Penultimate joint of antenna 1.4 times longer than broad. Stigma thrice or almost thrice as long as wide and emitting *r*1 distally from its middle, *r*1 and *cuq*1 of equal length (Fig. 180).

\* *A. samedovi* ABDINBEKOVA unknown to me in nature. On the basis of its re-description (ABDINBEKOVA 1975) it seems quite near to *A. salutifer* WILKINSON, and the two species may be separated by three distinctive features. A more detailed re-description of *A. samedovi* ABDINBEKOVA is needed with special regard to features not disclosed in the original description.

\*\* Lectotype designation of *Apanteles ater* (RATZ.) — A female lectotype was selected from Ratzburg's Collection (Deutsches Entomologisches Institut, Eberswalde) which had served to the original description (KÖNIGSMANN 1964, p. 650). Its data on four labels: "brumat: . . . ?" (second word illegible) — "Lectotypus (printed red), Microgaster ater Ratz. 1852, ♀, Papp 1980" (my manuscript on white label with printed red frame; text above), "= Microgaster carbonarius Ratz. 1848" (my manuscript; text below) — "Apanteles" (printed) "ater Ratz." (my manuscript "det. J. Papp 19" (printed) "80" (my manuscript) — "Apanteles ater (Rtz.)" (Königsmann's manuscript)



Figs. 200–201. *Apanteles hemara* NIXON: 200 = tergites 1–3, 201 = stigma,  $r1+cuq1$ . — Figs. 202–203. *A. salutifer* WILK.: 202 = tergites 1–3, 203 = nervellus and vannal lobe. — Figs. 204–206. *A. galleriae* WILK.: 204 = tergites 1–3, 205 = distal part of right fore wing, 206 = outer side of right hind tibia with spines. — Figs. 207–211. *A. carpatus* (SAY): 207 = tergites 1–3, 208 = distal part of right fore wing, 209 = hind margin of propodeum with projecting corner, 210 = outer side of right hind tibia with spines, 211 = nervellus and vannal lobe. — Figs. 212–213. *A. fumiferanae* VIER.: 212 = hind margin of propodeum with less projecting corner, 213 = nervellus and vannal lobe. — Figs. 214–217. *A. contactus* PAPP: 214 = tergites 1–3, 215 = head behind eyes, 216 = nervellus and vannal lobe, 217 = stigma,  $r1+cuq1$  and  $Cu1$ . — Figs. 218–222. *A. lectus* TOB.: 218 = tergites 1–3, 219 = nervellus, 220 = scutellum with postaxille, 221 = third femur, 222 = ovipositor sheath. — Fig. 223. *A. brunnistigma* ABDINB.: tergites 1–3.

Ovipositor sheath as long as hind tibia, hypopygium obviously surpassing end of abdomen. Tegula black to dark brown, parategula yellow. First three(-four) flagellar joints yellowish with blackish tip. Wings brownish fumous. Male with black to blackish legs. ♀: 4-4.5 mm, ♂: 3.5-4 mm. — Nearctic Region (USA)

**A. ensiger** (SAY, 1836) (!)

54 (53) Scutellum smooth to polished, at most laterally uneven to densely alutaceous (Figs. 86-87, 96). At least hind coxa black. First tergite more distinctly widening behind (Figs. 207, 218, 223). Second tergite uneven to rugulose, this sculpture weaker than that of first tergite (Figs. 91, 102).

55 (58) Preapical three joints of antenna cubic (Fig. 88). Hind femur reddish yellow.

56 (57) Stigma wide, 2-2.1 times longer than wide, with a distinct pale basal spot (Fig. 89, 208). Hind corner of propodeum projecting (Fig. 90, 209). Outer side of hind tibia with dense thick spines (Fig. 210). Nervellus of hind wing straight to almost straight (Fig. 211). Ocelli small, distance between fore and a hind ocelli equal with diameter of hind ocellus. *r1* more or less longer than *cuqu1* (Fig. 208). Tegula yellow to reddish yellow. Hind femur and tibia usually reddish yellow, sometimes rather faintly infuscate. ♀: 2.4-2.6 mm. — Cosmopolitan. (= *fusciornis* CAMERON, 1910; = *hawaiensis* ASHMEAD, 1901; = *igae* WATANABE, 1932; = *sarcitorius* TELENGA, 1955; = *ultericus* TELENGA, 1955)

**A. carpatus** (SAY, 1836) (!)

57 (56) Stigma less wide, 2.6 times longer than wide, without basal pale spot, i.e. evenly opaque brown to yellowish brown (Fig. 93). Hind corner of propodeum not projecting (Fig. 92, 212). Outer side of hind tibia only with sparse and spicular spines as usual. Nervellus of hind wing distinctly incurved (Fig. 213). Ocelli not small, distance between fore and a hind ocelli somewhat greater than diameter of hind ocellus. *r1* and *cuqu1* equal or almost equal in length. Tegula black. Apex of hind tibia and entire hind tarsus infuscate to blackish. ♀♂: 2.6-2.7 mm. — Nearctic Region

**A. fumiferanae** VIERECK, 1912 (!)

58 (55) Preapical three joints of antenna 1.2-1.3 times longer than broad (Fig. 98). Hind femur black.

59 (60) First tergite subparallel-sided, one-third longer than wide at hind (Fig. 214), its hind half rugulose to weakly rugulose. Head behind eyes more constricted (Fig. 215). Mesonotum dull, with more or less confluent and fine punctation (Fig. 94). Propodeum rugose-rugulose, on its hind or declivous part laterally with some more or less uneven to smooth fields. Nervellus of hind wing incurved (Fig. 216). Ocelli relatively small; hind imaginary tangent to fore ocellus touching or almost touching hind two ocelli, distance between fore and a hind ocelli equal or hardly longer than diameter of hind ocellus. *r1* issuing near distally to middle of stigma, *r1* and *cuqu1* about of equal length (Fig. 217). Hind tibia black, basally yellowish. Tegula black. ♀: 3-3.2 mm. — Mongolia

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

60 (59) First tergite widening posteriorly and rounded-narrowing at hind (Figs. 218, 223), its hind half strongly rugose to rugose (Fig. 102). Head behind eyes rounded, not constricted (Fig. 225). Mesonotum either strongly punctate (*A. lectus* TOBIAS, Fig. 95) or wrinkled (*A. brunnistigma* ABDINBEKOVA, Figs. 99-100). Propodeum scrobiculate rugose, without uneven or smooth fields. Nervellus of hind wing either moderately arched (Fig. 226, *A. brunnistigma*) or incurved (Fig. 219, *A. lectus*).

61 (62) Mesonotum shiny to subshiny, with strong and discrete punctation; scutellum smooth, shiny, with some disperse and discrete punctures (Fig. 95, 96). Scutellum slightly though distinctly longer medially than wide basally (Fig. 220). *r1* distinct-

ly longer than *cuqu1*, meeting each other less angularly (Fig. 97, 224). Hind femur relatively thick, 2.6–2.7 times as long as wide (Fig. 221). Inner spur of hind tibia at most as long as half basitarsus. Ovipositor sheath somewhat shorter than hind tibia, in lateral view rather wide (Fig. 222). Nervellus of hind wing distinctly incurved (Fig. 219). Proximal half to two-thirds of hind tibia reddish yellow. Wings hyaline. ♀: 3–4 mm; ♂: 2.5–3.5 mm. — USSR (European part, Kazakhstan), Mongolia

**A. lectus** TOBIAS, 1964 (!)

- 62 (61) Mesonotum dull, usually strongly wrinkled, or, less usually, with confluent punctation lending the surface a less rough sculpture (Fig. 99, 100); scutellum polished. Scutellum as long medially as wide basally (Fig. 227). *r1* at most slightly longer than *cuqu1*, meeting each other more angularly (Fig. 101, 228). Hind femur relatively less thick, thrice as long as wide (Fig. 229). Inner spur of hind tibia slightly longer than half basitarsus. Ovipositor sheath as long as or somewhat longer than hind tibia, in lateral view rather narrow (Fig. 230). Nervellus of hind wing moderately arched (Fig. 226) or, sometimes, almost straight. Hind tibia variable in colour from entire blackish to reddish yellow with blackish distal tip. Wings subhyaline to faintly brownish fumous. ♂: 2.6–3 mm. — England, Hungary, Italy, Azerbaidzhan in USSR (= *sotades* NIXON, 1976, !! **syn. n.**)

**A. brunnistigma** ABDINBEKOVA, 1969 (!)

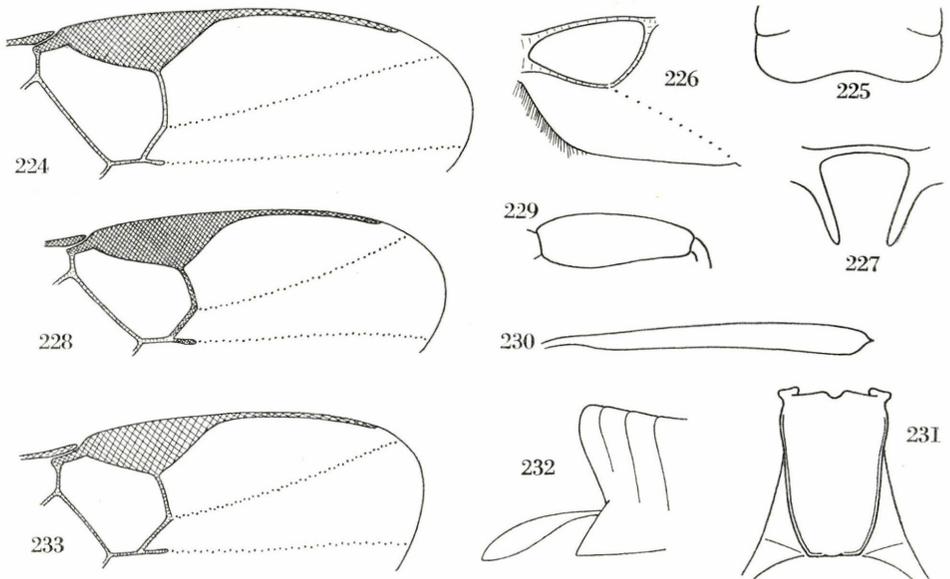


Fig. 224. *Apanteles lectus* TOB.: distal part of right fore wing. — Figs. 225–230. *A. brunnistigma* ABDINB.: 225 = head behind eyes, 226 = nervellus and vannal lobe, 227 = scutellum with post-axille, 228 = distal part of right fore wing, 229 = hind femur, 230 = ovipositor sheath. — Figs. 231–233. *A. coniferae* (HAL.): 231 = first tergite, 232 = distal half of abdomen with hypopygium and ovipositor sheath, 233 = distal part of right fore wing

## THE SPECIES OF THE ATER-GROUP

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

- aristoteliae* VIERECK 8 (7), 38 (37)  
*articas* NIXON 21 (22)  
*ater* (RATZBURG) 31 (32), 51 (50)  
*brunnistigma* ABDINBEKOVA 62 (61)  
*calpurnia* NIXON 13 (14)  
*carbonarius* (RATZBURG) 31 (32), 51 (50)  
*carpatus* (SAY) 37 (38), 56 (57)  
*contactus* PAPP 59 (60)  
*contaminatus* (HALIDAY) 3 (4), 38 (37)  
*ensiger* (SAY) 53 (54)  
*epinotiae* VIERECK 22 (21)  
*evanidus* PAPP 13 (14)  
*fumiferanae* VIERECK 57 (56)  
*fuscicornis* CAMERON 56 (57)  
*galleriae* WILKINSON 50 (51)  
*gelechiae* VIERECK 8 (7)  
*hawaiiensis* ASHMEAD 56 (57)  
*hemara* NIXON 46 (47)  
*igae* WATANABE 56 (57)  
*kubensis* ABDINBEKOVA 32 (31)  
*lectus* TOBIAS 61 (62)
- lencoranus* ABDINBEKOVA 48 (49)  
*megathymni* RILEY 18 (17)  
*mimoristae* MUESEBECK 14 (13)  
*miramis* NIXON 27 (28)  
*morrisi* MASON 5 (6), 24 (25)  
*neophopteris* (PACKARD) 40 (41)  
*ochrostigma* (WESMAEL) 33 (30)  
*paranthrenidis* MUESEBECK 17 (18)  
*peridoneus* PAPP 43 (42)  
*polychrosidis* VIERECK 7 (8)  
*?polychrosidis* VIERECK 33 (30)  
*salutifer* WILKINSON 48 (49)  
*samedovi* ABDINBEKOVA 48 (49)  
*sarcitorius* TELENGA 56 (57)  
*sevocatus* PAPP 42 (43)  
*?sodalis* (HALIDAY) 31 (32), 51 (50)  
*sotades* NIXON 62 (61)  
*thurbiae* MUESEBECK 28 (27)  
*ultericus* TELENGA 56 (57)  
*xanthocarpus* SZÉPLIGETI 33 (30)  
*xanthostigma* (HALIDAY) 33 (30)

## TRANSITIONAL SPECIES TOWARDS ATER-GROUP

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

- brevimetacarpus* HEDQVIST 10 (11)  
 (butalidis-group)  
*lindbergi* HEDQVIST 10 (11)  
 (butalidis-group)  
*sophiae* PAPP 37 (38)  
 (laevigatus-group)  
*trachalus* NIXON 42 (43)  
 (ultor-group)

## References

- Абдинбекова, А. А. (1975): Бракониды (Hymenoptera, Braconidae) Азербайджана. — *Изд. „ЭЛМ“*, Баку, стр. 1—333.  
 FISCHER, M. (1966): Gezüchtete Braconiden aus Niederösterreich und aus dem Burgenland (Hymenoptera). — *Zschr. angew. Zool.*, **53**: 385–402.  
 KÖNIGSMANN, E. (1964): Braconidae aus den Resten der Ratzeburg-Sammlung (Hymenoptera). — *Beitr. Ent.*, **14**: 631—661.  
 MASON, W. R. M. (1974): The Apanteles species (Hymenoptera: Braconidae) attacking Lepidoptera in the micro-habitat of the spruce budworm (Lepidoptera: Tortricidae). — *Can. Ent.*, **106**: 1087–1102.  
 NIXON, G. E. J. (1961): Two new European species of Apanteles (Hymenoptera: Braconidae). — *Proc. R. Ent. Soc. London*, (B) **30**: 50–52.  
 NIXON, G. E. J. (1965): A reclassification of the tribe Microgasterini (Hymenoptera: Braconidae). — *Bull. Brit. Mus. (Nat. Hist.)*, *Entom.*, Suppl., **2**: 1–284.  
 NIXON, G. E. J. (1972): A revision of the north-western European species of the laevigatus-group of Apanteles Förster (Hymenoptera, Braconidae). — *Bull. ent. Res.*, **61**: 701–743.  
 NIXON, G. E. J. (1973): A revision of the north-western European species of the vitripennis, pallipes, octonarius, triangulator, fraternus, formosus, parasitellae, metacarpalis and circumscriptus-groups of Apanteles Förster (Hymenoptera, Braconidae). — *Bull. ent. Res.*, **63**: 169–230.  
 NIXON, G. E. J. (1976): A revision of the north-western European species of the merula, lacteus,

- vipio, ultor, ater, butalidis, popularis, carbonarius and validus-groups of *Apanteles* Förster (Hymenoptera, Braconidae). — *Bull. ent. Res.*, **65**: 687–735.
- PAPP, J. (1975): New *Apanteles* Förster species from Hungary (Hymenoptera, Braconidae: Microgasterinae), IV. — *Ann. Hist.-nat. Mus. Nat. Hung.*, **67**: 237–255
- PAPP, J. (1976): A survey of the European species of *Apanteles* Förster. (Hymenoptera, Braconidae: Microgasterinae), I. The species-groups. — *Ann. Hist.-nat. Mus. Nat. Hung.*, **68**: 251–274.
- PAPP, J. (1978): A survey of the European species of *Apanteles* Förster. (Hymenoptera, Braconidae: Microgasterinae), II. The laevigatus-group, 1. — *Ann. Hist.-nat. Mus. Nat. Hung.*, **70**: 265–301.
- PAPP, J. (1979): A survey of the European species of *Apanteles* Förster. (Hymenoptera, Braconidae: Microgasterinae), III. The laevigatus-group, 2. — *Ann. Hist.-nat. Mus. Nat. Hung.*, **71**: 235–250.
- SHENEFELT, R. D. (1972): Hymenopterorum Catalogus (nova editio), pars 7, Braconidae 4, Microgasterinae: *Apanteles*. — 's-Gravenhage, Uit. W. Junk, p. 429–668.
- Тобиас, В. И. (1976): Бракониды Кавказа (Hymenoptera, Braconidae). — Ленинград, изд. „Наука“, стр. 1–269.
- WATANABE, C. (1934): Notes on Braconidae of Japan, IV. *Apanteles* (First supplement). — *Ins. Mats.*, **8**: 132–143.
- WILKINSON, D. S. (1931): Braconidae: notes and new species. — *Bull. ent. Res.*, **22**: 75–82.
- WILKINSON D. S. (1938): On a further two new Palaearctic species of *Apanteles* (Hym. Bracon.) — *Proc. R. Ent. Soc. London*, (B) **7**: 222–227.
- WILKINSON, D. S. (1941): On the identity of *Apanteles albipennis* Haliday non Nees and of *Apanteles albipennis* Haliday of Marshall (Hym. Bracon.) — *Proc. R. Ent. Soc. London*, (B) **10**: 71–81.

Author's address: DR. JENŐ PAPP

Zoological Department  
Hungarian Natural History Museum  
H-1088 Budapest, Baross utca 13  
Hungary