

A Survey of the European Species of *Apanteles* Först. (Hymenoptera, Braconidae: Microgasterinae) III. The *laevigatus*-group, 2.

by J. PAPP, Budapest

Abstract — A key to the *laevigatus*-group (second part) comprising all (23) Palaearctic and a few (5) Nearctic, totalling 28, *Apanteles* species is given. Recent type examination revealed one new synonym: *A. decorus* HALIDAY, 1834 = *A. lineatus* REINHARD, 1880. The *laevigatus*-group composing of 78, i.e. 63 European and 15 non-European, species are enumerated in alphabetic order. With 110 figures.

(Continuation of *laevigatus*-group 1, PAPP 1978a)

210 (79) Stigma entirely dark, i.e. opaque brown to blackish brown, without pale basal spot (Figs. 6, 8, 10, 11, 62, 94).

211 (216) First and second tergites rugose (Fig. 2).

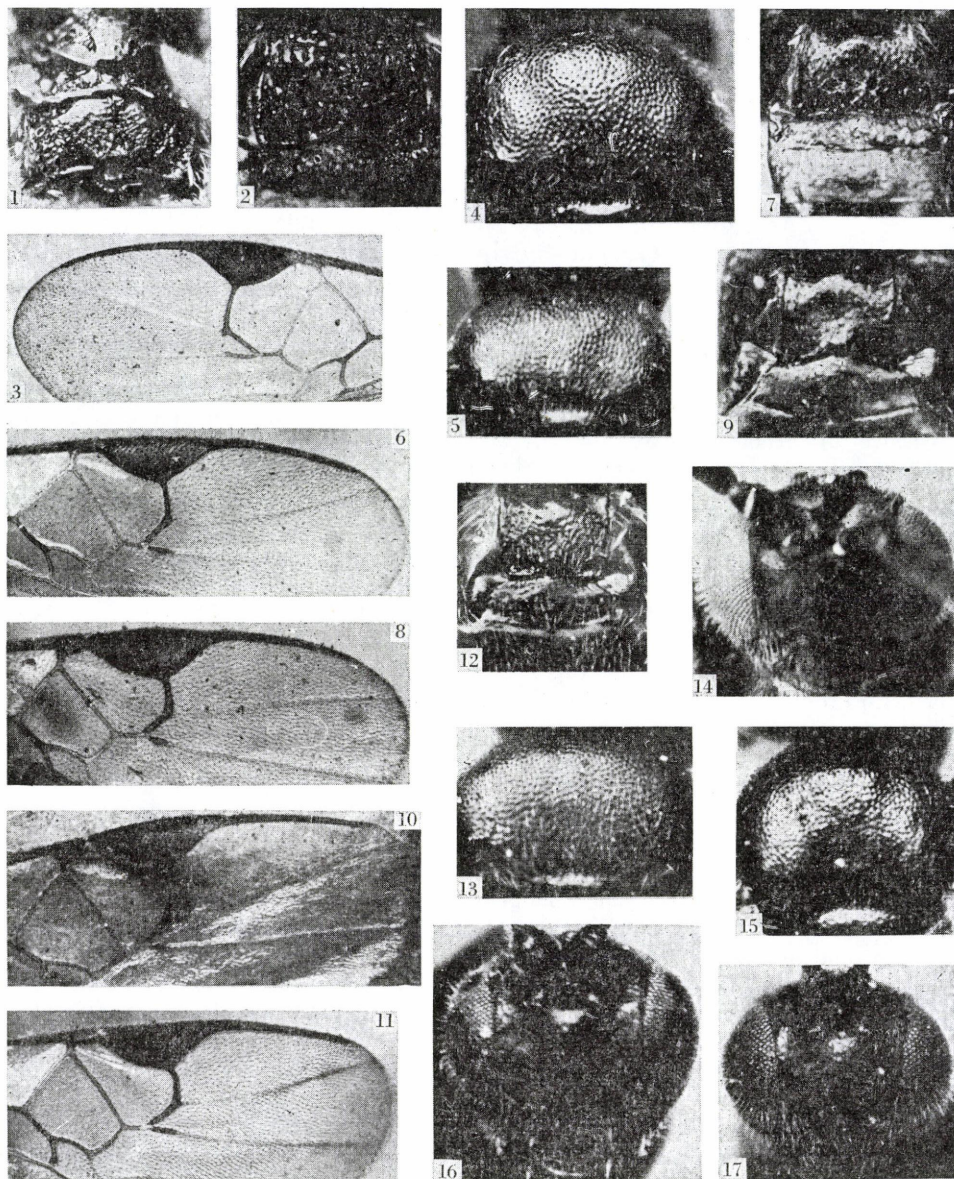
212 (213) Propodeum without foveola-like depression above lunule in middle; rugose elements on declivous (hind) part of propodeum crowded in middle and here with a feeble medio-longitudinal keel (Fig. 1). *r*2 as a stub-like vein present at meeting point of *r*1 and *cuq*1 (similar to representatives of *parasitellae*-group); stigma relatively wide, twice longer than wide (Fig. 3). Ovipositor sheath as long as abdomen and widening apically. Antennal joint 15 cubic, joints 16–17 subcubic, i.e. slightly shotrer than broad. Black. Legs almost entirely reddish yellow. Tegulae also reddish yellow. Palpi whitish. Sternites 1–3 and hypopygium reddish yellow. Stigma usually entirely brown, only exceptionally with a rather small and indistinct pale basal spot. Further details see at couplet 81 (82) (PAPP 1978a). ♀♂: 3 mm. — Nearctic Region

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

213 (212) Propodeum with a foveola-like depression above lunule in middle bordered with more or less strong rugae. Propodeum evenly rugose. (*A. fumiferanae*) or rugose (*A. laspeyresiae*). *r*2 absent. Two species of *ater*-group, however, having a rather indistinctly concave vannal lobe.

214 (215) Head behind eyes (in dorsal view) strongly constricted (Fig. 56). Penultimate three joints of antenna twice longer than broad. Mesonotum with rather deep and distinct punctation, interspaces smooth and shiny (Fig. 4). *r*1 one-and-a-half times as long as *cuq*1. First tergite somewhat narrowing behind, widest before its middle. Hind femur black or blackish brown. ♀♂: 3.5–4 mm. — Nearctic Region
[*A. laspeyresiae* VIERECK, 1913 (!)]

215 (214) Head behind eyes (in dorsal view) rounded as normal (Fig. 57). Penultimate three joints of antenna cubic, i.e. as long as broad. Mesonotum with shallow and rather confluent punctation, interspaces with dense alutaceous microsculpture, entire mesonotum pruinose (Fig. 5). *r*1 and *cuq*1 equal in length (Fig. 6). First tergite



Figs. 1-17. — Figs. 1-3. *Apanteles consimilis* VIER.: 1 = propodeum, 2 = tergites 1-2, 3 = distal part of left fore wing. — Fig. 4. *A. laspeyresiae* VIER.: mesonotum. — Figs. 5-6. *A. fumiferanae* VIER.: 5 = mesonotum, 6 = distal part of right fore wing. — Figs. 7-8. *A. mimi* PAPP: 7 = tergites 1-3, 8 = distal part of right fore wing. — Figs. 9-10. *A. decorus* (HAL.): 9 = tergites 1-2, 10 = distal part of right fore wing. — Figs. 11-14. *A. phaola* NIXON: 11 = distal part of right fore wing, 12 = tergites 1-3, 13 = mesonotum, 14 = head in frontal view. — Figs. 15-16. *A. luctificus* PAPP: 15 = mesonotum, 16 = head in frontal view. — Fig. 17. *A. mirus* PAPP: head in frontal view.

moderately widening posteriorly, widest before its hind end (Figs. 1–2 in MASON 1974, p. 1089). Hind femur reddish yellow, apically fuscous. ♀♂: 2.5–2.7 mm. — Nearctic Region

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

216 (211) Second tergite usually smooth, shiny to polished (Figs. 9, 35); at most uneven to subrugulose, this sculpture always much and distinctly weaker than that of first tergite (Fig. 7).

217 (222) Legs 1–3, except black coxae and trochanters, reddish yellow, at most femora 2–3 with infusate pattern.

218 (219) Propodeum with a foveola-like depression. Hind half of first tergite with a median trough. Penultimate three joints of antenna cubic. Further details see at couplet 215 (214). A species of *ater*-group

[**A. fumiferanae** VIER. (!)]

219 (218) Propodeum without any depression. Hind half of first tergite without a trough (i.e. Figs. 7, 9).

220 (221) First tergite gradually widening posteriorly and as long as wide at hind (Figs. 7; Fig. 47 in PAPP 1978a, p. 272). Stigma relatively small, two-and-a-half times longer than wide, metacarp somewhat longer than stigma (Fig. 8). Ocelli relatively small, distance between fore and a hind ocelli equal with diameter of an ocellus; posterior imaginary tangent to fore ocellus virtually at most touching hind two ocelli (Fig. 58). Hind or declivous half (or third) of propodeum rugose. Ovipositor sheath short, as long as hind tarsal joints 1–3, markedly expanded towards apex (Fig. 46 in PAPP 1978a, p. 272). Tegulae reddish yellow to yellow. ♀: 2.8–3 mm. See also couplet 19 (20) in PAPP 1978a. — Hungary

A. mimi PAPP, 1974 (!!)

221 (220) First tergite parallel-sided or faintly narrowing posteriorly, one-and-a-half times longer than wide at hind (38: 25–26, $\times 100$, Figs. 9, 59). Stigma relatively large, twice longer than wide, metacarp distinctly longer than stigma (Fig. 10). Ocelli relatively large, distance between fore and a hind ocelli shorter than diameter of an ocellus; posterior imaginary tangent to fore ocellus virtually transecting hind two ocelli (Fig. 60). Propodeum entirely smooth, shiny. Ovipositor sheath long, as long as hind tarsus, hardly expanded towards apex (Fig. 61). Tegulae black. ♀♂: 3–3.2 mm. — Europe (Ireland, England, Sweden, Finland, Germany, Hungary: new record, Rumania), USSR: Estonia, Kazakhstan, Siberia (Irkutsk). (= *lineatus* REINHARD, 1880, **syn. n.**)

A. decorus (HALIDAY, 1834) (!)

222 (221) Legs dark, at least hind femur, usually middle and hind femora, black or brownish black.

223 (230) First tergite distinctly, but never strongly, constricted before its hind end (Figs. 18 and 97 in PAPP 1978a; Fig. 12).

224 (227) D1 wide, usually one-third, wider than high (Figs. 31, 87).

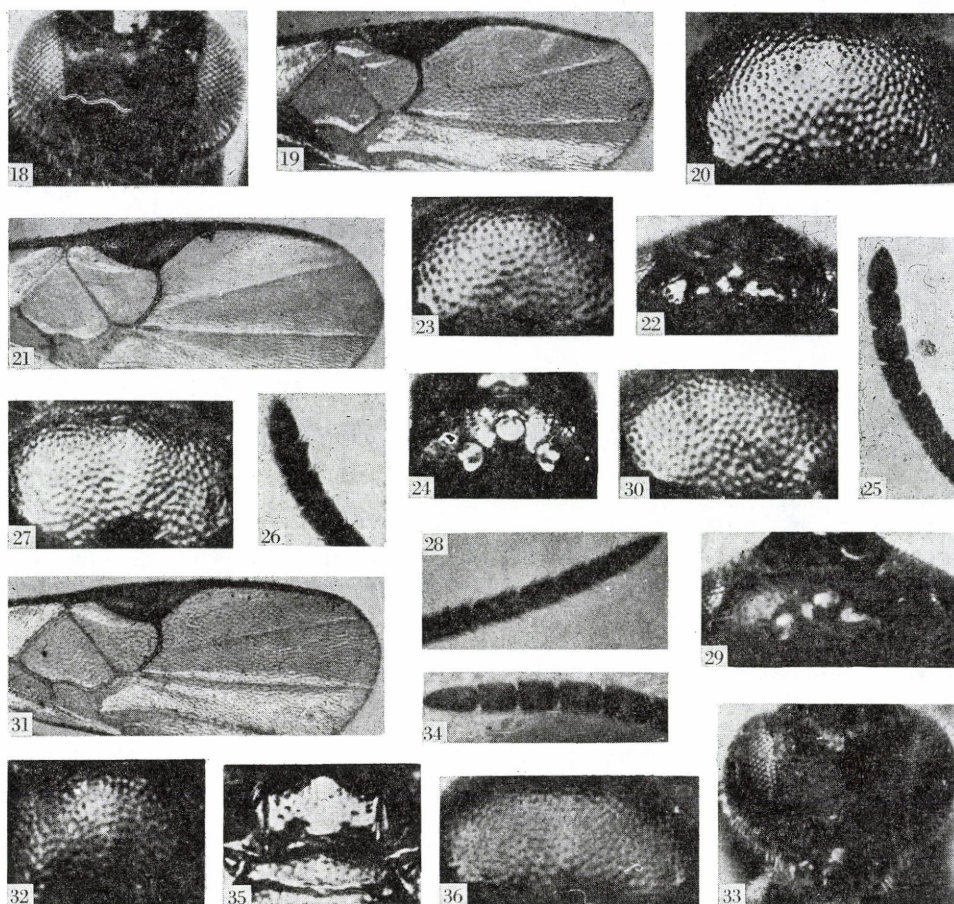
225 (226) Spines of outer (upper) side of hind tibia conspicuously numerous and close-set (Fig. 83). Thorax (in lateral view) lengthened, 1.6 times longer than high. Further details see at couplet 257 (258). A member of *metacarpalis*-group

[**A. coniferoides** PAPP (!!)]

226 (225) Spines of outer side of hind tibia less numerous or sparse. Thorax not lengthened, normal in form, 1.3–1.4 times longer than high. Further details see at couplet 260 (261)

A. mycale NIX. (!!)

227 (224) D1 less wide, usually a quarter wider, than high.



Figs. 18-36. — Figs. 18-19. *Apanteles purdus* PAPP: 18 = head in frontal view, 19 = distal part of right fore wing. — Figs. 20-22. *A. princeps* WILK.: 20 = mesonotum, 21 = distal part of right fore wing, 22 = ocelli. — Figs. 23-25. *A. erasmi* NIXON: 23 = mesonotum, 24 = ocelli, 25 = flagellar joints 13-18. — Figs. 26-27. *A. soikai* NIXON: 26 = flagellar joints 14-18, 27 = mesonotum. — Figs. 28-30. *A. szalayi* PAPP: 28 = flagellar joints 13-18, 29 = ocelli, 30 = mesonotum. — Figs. 31-32. *A. coniferoides* PAPP: 31 = distal part of right fore wing, 32 = mesonotum. — Fig. 33. *A. mycale* NIXON: head in frontal view. — Figs. 34-36. *A. celsus* PAPP: 34 = flagellar joints 13-18, 35 = tergites 1-2, 36 = mesonotum.

228 (229) Metacarp six to seven times longer than its distance from apex of radial cell, metacarp distinctly, i.e. 1.3 times longer than stigma (Fig. 11). Second tergite smooth, shiny, at most pruinose (Fig. 12). Mesonotum (in dorsal view) relatively wide, one-third wider between tegulae than long medially (Fig. 13). Head (in frontal view) a fifth wider than high (Fig. 14). Spines of outer(-hind) side of third tibia sparse. Ovipositor sheath always longer than half hind tibia, usually as long as three-fifths to three-fourth of hind tibia. ♀♂: 2.5-2.8 mm. — England, Sweden, Hungary: new record

A. phaola NIXON, 1972 (!)

- 229 (228) Metacarp twice longer than its distance from apex of radial cell, metacarp at most slightly longer than, usually as long as, stigma (Fig. 62). Second tergite rugulose to uneven, dull (Fig. 18 in PAPP 1978a). Mesonotum (in dorsal view) relatively long, only one-sixth (to one-fifth) wider between tegulae than long medially (Fig. 15). Head (in frontal view) as wide as high, somewhat lengthened in its outline (Fig. 16). Spines of outer side of third tibia disperse. Ovipositor sheath always shorter than half hind tibia, usually as long as third basitarsus. Further details see in *laevigatus*-group 1, couplet 65 (64). ♀: 2.5–2.9 mm, ♂: 2.8–2.9 mm. — Mongolia, Hungary, Yugoslavia, Finland. (= *anfition* NIXON, 1972, !!)

A. luctificus PAPP, 1971 (!!)

- 230 (223) First tergite not constricted before its hind end (i.e. Fig. 35).
 231 (244) Spines of outer side of hind tibia extremely numerous and close-set (Figs. 104, 151 and 155, in PAPP 1978a — Figs. 67, 72, 83).
 232 (233) First tergite either constricted before its hind end (*A. luctificus*, Figs. 18 and 97 in PAPP 1978a) or narrowing apically (*A. coniferoides*, Fig. 84). Spines of hind tibia not always close-set (*A. luctificus*). Further details see at couplets 229 (228): *A. luctificus* and 257 (258): *A. coniferoides*

[A. coniferoides PAPP (!!)]

A. luctificus PAPP (!!)

- 233 (232) First tergite not constricted before its hind end (Figs. 63, 65, 70, 78).
 234 (237) *D1* distinctly, usually one-third, wider than high (Fig. 19). First tergite parallel-sided (Figs. 63, 65).
 235 (236) First tergite twice longer than wide at hind (Fig. 63). Ovipositor sheath short, two-thirds as long as hind tibia. Face (with clypeus) one-fifth wider than high medially, inner margin of eyes subparallel (Fig. 17). Nervellus of hind wing less incurved (Fig. 64). Two penultimate joints of antenna twice longer than broad. Propodeum on its median two-thirds rugo-rugulose, laterally tending to be smooth. Light colour pattern of legs yellow. ♀: 2.3 mm. — Hungary

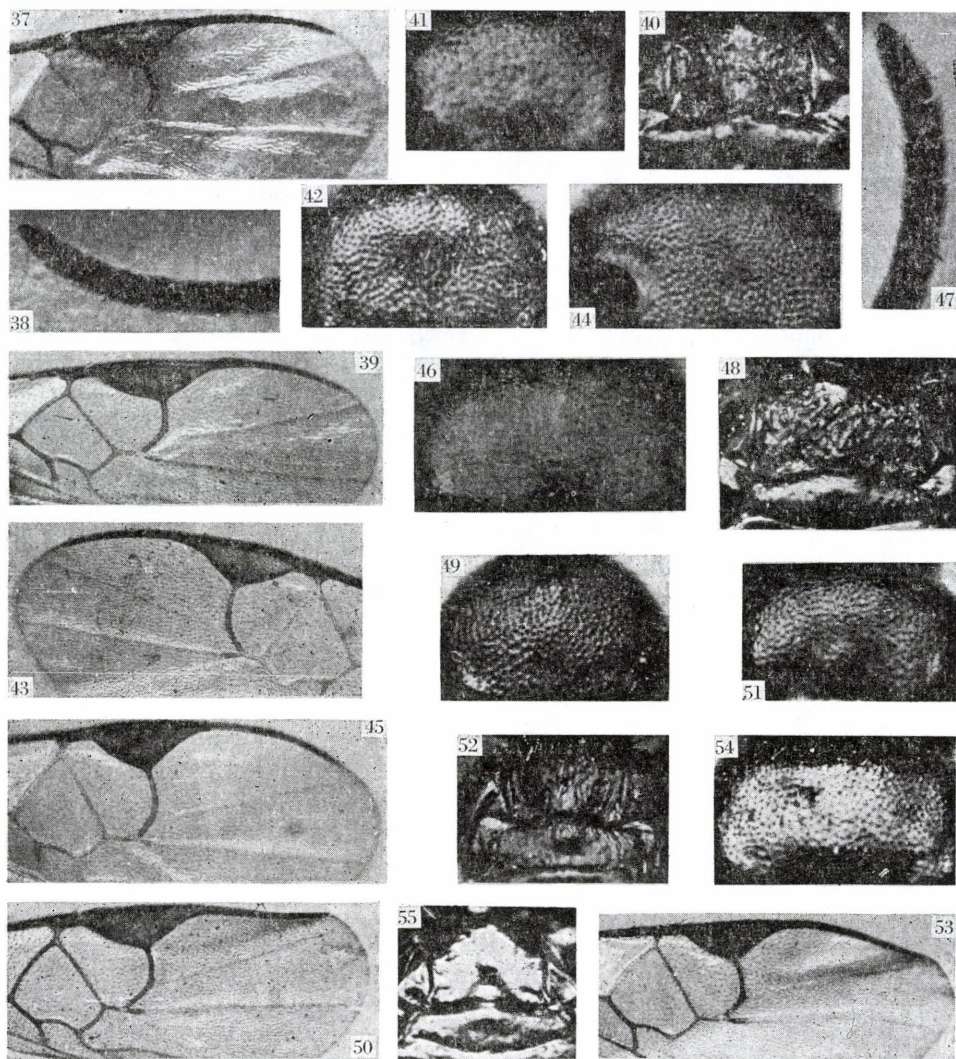
A. mirus PAPP, 1977 (!!)

- 236 (235) First tergite 1.5 times longer than wide at hind (Fig. 65). Ovipositor sheath long, as long as hind tibia and basitarsus combined. Face (with clypeus) almost quadrate, only minutely wider below than high medially; inner margin of eyes distinctly, but not strongly, converging towards oral part (Fig. 18). Nervellus of hind wing more incurved (Fig. 66). Two penultimate joints either cubic or subcubic, i.e. slightly longer than broad. Propodeum smooth with disperse and fine punctures, around lunule rugulose. Light colour pattern of legs rusty or brownish red. ♀: 2–2.3 mm. — Hungary

A. purdus PAPP, 1977 (!!)

- 237 (234) *D1* indistinctly, usually one-fifth to one-sixth, wider than high (Figs. 21, 73).
 238 (241) Head (in frontal view) almost round, i.e. indistinctly broader than high, inner margin of eyes converging towards oral part (Fig. 8 in NIXON 1972 — Fig. 74). Penultimate joint of antenna cubic or subcubic, i.e. slightly longer than broad (Fig. 25).
 239 (240) Mesonotum with strong and deep punctation (Fig. 20). Nervellus of hind wing incurved (Fig. 68). First tergite subquadrate, its sides converging posteriorly, 1.4 times longer than wide at hind (Fig. 152 in PAPP 1978a). Ovipositor sheath feebly curved to almost straight. Ocelli relatively small, distance between fore and a hind ocelli as long as diameter of hind ocellus (Fig. 22). Further details see at couplet 127 (128) (l.c.)

A. princeps WILK. (!!)



Figs. 37-55. — Fig. 37. *Apanteles celsus* PAPP: distal part of right fore wing. — Figs. 38-41. *A. infimus* (HAL.): 38 = flagellar joints 12-18, 39 = distal part of right fore wing, 40 = tergites 1-2, 41 = mesonotum. — Fig. 42. *A. halidayi* MARSH.: mesonotum. — Figs. 43-44. *A. benevolens* PAPP: 43 = distal part of right fore wing, 44 = mesonotum. — Figs. 45-46. *A. gracilariae* WILK.: 45 = distal part of right fore wing, 46 = mesonotum. — Figs. 47-48. *A. gagates* (NEES): 47 = flagellar joints 12-18, 48 = tergites 1-2. — Fig. 49. *A. paralechia* MUES.: mesonotum. — Figs. 50-52. *A. ensiformis* (RATZ.): 50 = distal part of right fore wing, 51 = mesonotum, 52 = tergites 1-2. — Figs. 53-55. *A. longicauda* (WESM.): 53 = distal part of right fore wing, 54 = mesonotum, 55 = 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)

- 240 (239) Mesonotum with rather weak and shallow, though discernible, punctation (Fig. 23). Nervellus of hind wing straight and usually oblique towards base of wing (Fig. 69). First tergite long subparallel-sided (i.e. its sides faintly converging posteriorly), 1.7 times longer than wide at hind (Fig. 70). Ovipositor sheath conspicuously and characteristically falcate (Fig. 71). Ocelli relatively large, distance between fore and a hind ocelli slightly shorter than diameter of hind ocellus (Fig. 24). Penultimate joint of antenna usually subcubic, or, exceptionally, at most a third longer than broad (Fig. 25). Palpi and legs dark, i.e. brown to blackish brown. ♀♂: 2.3–2.5 mm. — Germany, North Italy, Slovakia (ČSSR: new record)

A. erasmi NIXON, 1972 (!!)

- 241 (238) Head (in frontal view) distinctly, usually one-fifth, broader than high, inner margin of eyes subparallel (Fig. 77).

- 242 (243) Penultimate joint of antenna subcubic, i.e. slightly longer than broad (6 : 5, ×100, Fig. 26). First tergite 1.3–1.4 times longer than wide at hind, slightly converging posteriorly (Fig. 153 in PAPP 1978a). Ovipositor sheath long, as long as hind tibia and (half) hind basitarsus (Fig. 75). Ocelli relatively small, distance between fore and a hind ocelli as long as diameter of hind ocellus (Fig. 156 l.c.). Nervellus of hind wing hardly incurved (Fig. 76). Mesonotum with rather sharp and distinct punctation, rather shiny (Fig. 27). Light colour pattern of legs rusty or brownish red. ♀♂: 2.5–2.7 mm. — North Italy, Hungary, Bulgaria

A. soikai NIXON, 1972 (!!)

- 243 (242) Penultimate joint of antenna 1.5 times as long as broad (Fig. 28). First tergite 1.8 times longer than wide at hind, slightly narrowing posteriorly (Fig. 78). Ovipositor sheath short, as long as two-thirds of hind tibia (Fig. 79). Ocelli relatively large, distance between fore and a hind ocelli shorter than diameter of hind ocellus (Fig. 29). Nervellus of hind wing strongly incurved (Fig. 80). Mesonotum with less sharp, rather confluent punctation, dull (Fig. 30). Light colour pattern of legs yellow. ♀♂: 2.4–2.5 mm. — Hungary

A. szalayi PAPP, 1977 (!!)

- 244 (231) Spines of outer side of hind tibia less numerous or sparse, disperse to rather disperse (Figs. 81, 82).

- 245 (248) First tergite widening posteriorly (Figs. 47, 60 in PAPP 1978a — Fig. 7). Stigma usually entirely dark, rather exceptionally with a more or less distinct pale basal spot.

- 246 (247) Legs 1–3, except black coxae and trochanters, reddish yellow, at most femora 2–3 with an infuscate pattern. Further details see at couplets 19 (20) (in PAPP 1978a) and 220 (221)

A. mimi PAPP (!!)

- 247 (246) Legs black with yellow or brownish yellow pattern. Further details see at couplets 20 (19): *A. cinerosus*, 30 (31) and 91 (92): *A. sicarius*, 31 (30): *A. seriphia* (in PAPP 1978a)

A. cinerosus PAPP (!!)

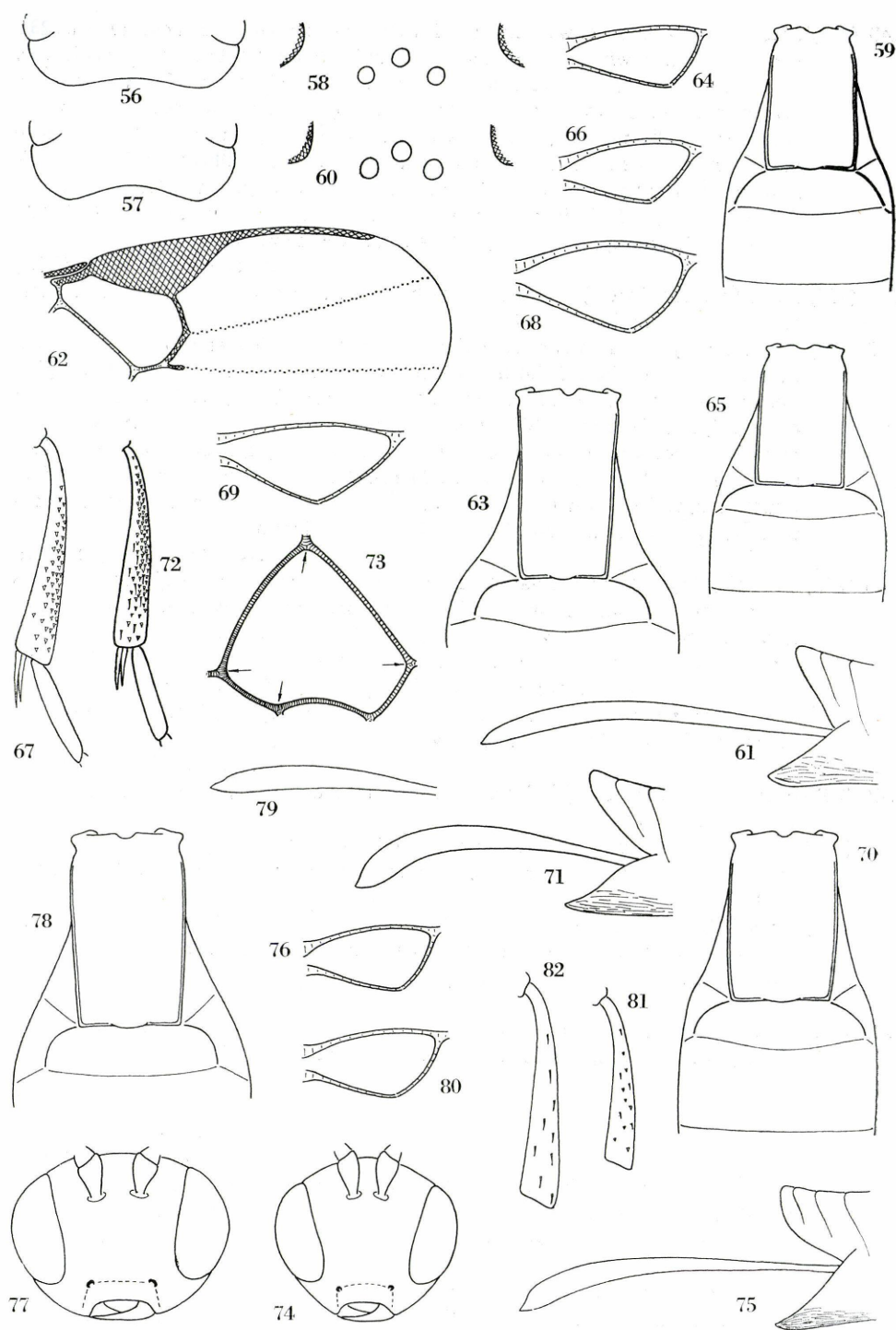
A. seriphia NIX. (!!)

A. sicarius MARSH.

- 248 (245) First tergite not widening posteriorly, usually parallel-subparallel-sided (Figs. 90, 92, 95, 100, 104, 105, 109), or narrowing behind (Figs. 84, 88), or, exceptionally, with weakly arched sides [*A. starki*, couplets 11 (10) in PAPP 1978a, and 279 (280)].

- 249 (266) D1 wide, usually one-third wider than high (Figs. 19, 31, 37, 39, 87, 94).

- 250 (251) D1 lacking any stalk, i.e. D1 directly joins parastigma (Fig. 181 in PAPP 1978a). Thorax and abdomen elongated, thorax (in lateral view) twice or nearly twice



longer than high brow of propodeum placed posteriorly to middle and, therefore, propodeum having a long dorsal surface (Fig. 180 l.c.). Further details see at couplet 189 (190) (l.c.)

A. victor WILK. (!)

251 (250) *D1* with a distinct, even short, stalk (Figs. 19, 31, 37, 39, 87, 94). Thorax and abdomen at most less elongated, thorax usually stout or rather stout.

252 (253) Propodeum usually with a distinct median and postero-lateral areolae bordered with keels, however, sometimes areolation faint to indistinct. Stigma opaque pale. Hairs of median cell of fore wing evenly dense. Mesonotum with less sharp punctation. ♀♂: 1.75–2.3 mm — A member of the *ultor*-group in the Oriental Region to as far as China and Japan (= *parnae* WATANABE, 1935; = *paranae* WATANABE, 1967, misspelling)

[A. baoris WILKINSON, 1930 (!)]

253 (252) Propodeum without any areolae, at most with a median depression above lunule.

254 (255) First tergite widening posteriorly (Figs. 47 and 49 in PAPP 1978a). Legs black with yellow pattern (*A. cinerosus*) or legs reddish yellow except coxae and trochanters. Further details see at couplets 18–21 (l.c.) and 245–247.

255 (254) First tergite not widening posteriorly, usually parallel-subparallel-sided, or narrowing behind.

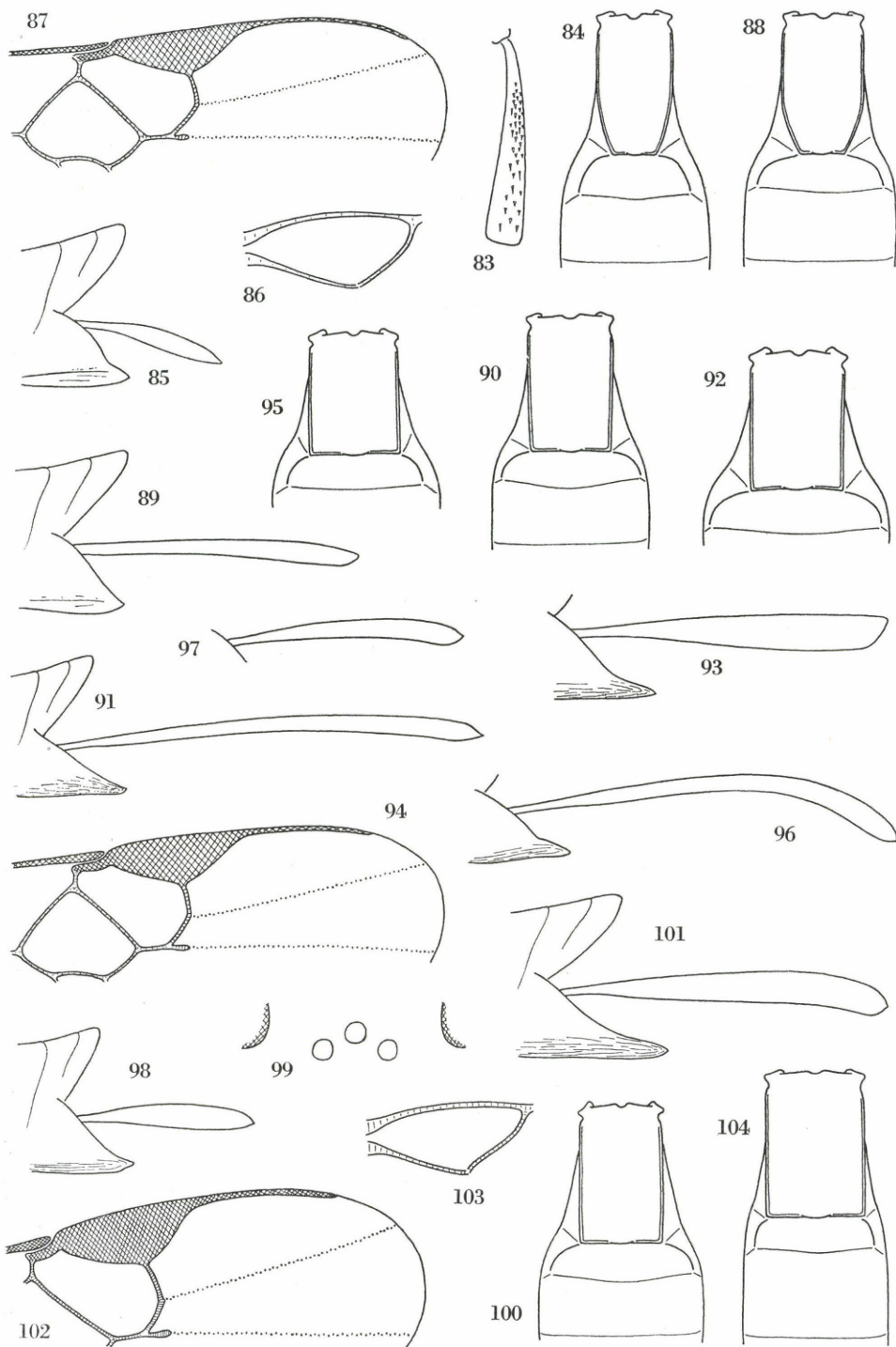
256 (259) Spines of outer side of hind tibia (on its upper half) conspicuously numerous and close-set (Figs. 67, 72, 83).

257 (258) Hind third of first tergite gradually narrowing apically (Fig. 84). Thorax (in lateral view) somewhat lengthened, 1.6 times longer than high. Mesonotum slightly, usually one-sixth to one-seventh, wider between tegulae than long medially (Fig. 32). Hypopygium somewhat pointed, ovipositor sheath short, at most as long as hind basitarsus (Fig. 85). *D1* wide, 1.4–1.5 times wider than high (Fig. 31). Nervellus conspicuously oblique (Fig. 86). Mesonotum with dense and shallow punctation, interspaces shorter than punctures, pruinose to weakly pruinose (Fig. 32). Penultimate joint of antenna one-and-a-half times longer than broad. Light colour of legs variable yellow to rusty, third femur entirely black, second femur apically yellowish. ♀♂: 2.3–2.5 mm. A member of *metacarpalis*-group, a transitional form towards *laevigatus*-group. See also couplets 84 (85) in PAPP 1978a and 225 (226), 232 (233). — Hungary

[A. coniferoides PAPP, 1972 (!)]

258 (257) First tergite parallel- or subparallel-sided, never narrowing apically (Figs. 63, 65, 70). Thorax not lengthened, 1.4–1.2 times longer than high (in lateral view). Mesonotum distinctly, usually one-fourth, wider than long medially (Fig. 23).

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Figs. 56–82. — Fig. 56. *Apanteles laspeyresiae* VIER: head behind eyes. — Fig. 57. *A. fumiferanae* VIER.: head behind eyes. — Fig. 58. *A. mimi* PAPP: ocelli. — Figs. 59–61. *A. decorus* (HAL.): 59 = tergites 1–3, 60 = ocelli, 61 = end of abdomen with hypopygium and ovipositor sheath. — Fig. 62. *A. luctificus* PAPP: distal part of right fore wing. — Figs. 63–64. *A. mirus* PAPP: 63 = tergites 1–2, 64 = nervellus of right hind wing. — Figs. 65–67. *A. purdus* PAPP: 65 = tergites 1–3, 66 = nervellus of right hind wing, 67 = third tibia with many spines. — Fig. 68. *A. princeps* WILK.: nervellus of right hind wing. — Figs. 69–74. *A. erasmi* NIXON: 69 = nervellus of right hind wing, 70 = tergites 1–3, 71 = end of abdomen with hypopygium and ovipositor sheath, 72 = third tibia with many spines, 73 = first discoidal cell (*D1*) of fore left wing, 74 = head in front. — Figs. 75–76. *A. soikai* NIXON: 75 = end of abdomen with hypopygium and ovipositor sheath, 76 = nervellus of right hind wing. — Figs. 77–80. *A. szalayi* PAPP: 77 = head in front, 78 = tergites 1–2, 79 = ovipositor sheath, 80 = nervellus of right hind wing. — Fig. 81. *A. infimus* (HAL.): third tibia with few spines. — Fig. 82. *A. longicauda* (WESM.): third tibia with few spines



Ovipositor sheath always longer than hind basitarsus. D1 less wide, 1.3(–1.4) times wider than high (Figs. 19, 73). The distinction of the three species see at couplets 234 (237)–240 (239)

A. erasmi NIX. (!!)

A. mirus PAPP (!!)

A. purdus PAPP (!!)

259 (256) Spines of outer side of hind tibia less numerous or sparse, disperse to rather disperse (Figs. 81, 82).

260 (261) First tergite markedly narrowed behind (Fig. 88). Ovipositor sheath as long as three-fourths of hind tibia, relatively thin and almost straight (Fig. 89). Penultimate joint of antenna 1.3–1.5 times longer than broad. Inner spur of hind tibia slightly longer than half basitarsus, outer one slightly shorter. Hypopygium relatively less produced (Fig. 89). Face quadrate to subquadrate, i.e. scarcely wider below than high medially, inner margin of eyes moderately converging towards oral part (Fig. 33). ♀♂: 2–2.5 mm. — Sweden, Hungary (new record), Bulgaria (new record)

A. mycale NIXON, 1972 (!!)

261 (260) First tergite parallel- or subparallel-sided (Figs. 90, 92, 95). Ovipositor sheath at least as long as hind tibia (*A. infimus*: Fig. 93) or distinctly longer (*A. celsus*: Fig. 91, *A. halidayi*: Fig. 96).

262 (263) Penultimate joint distinctly, usually 1.5 times, longer than broad (Fig. 34). r1 issuing distally from stigma, directed outward, i.e. not perpendicular to stigma, angle of *n. med.* and *n. bas.* about 90–100 degrees (Fig. 37). First tergite 1.4–1.6 times longer than wide at hind, its hind horizontal surface tending to be smooth (Figs. 35, 90). Ocelli of average size, distance between fore and a hind ocelli slightly greater than diameter of an ocellus (2.5 : 2, ×100). Mesonotum with even and rather dense, hardly perceptible punctation, shiny to feebly dull (Fig. 36). Ovipositor sheath long, as long as hind tibia and basitarsus combined, somewhat arched and feebly widening apically (Fig. 91). Distal half of fore femur and entire tibia yellow. Tegulae brown. ♀: 2.5–2.7 mm, ♂: 2.3–2.6 mm. — Hungary

A. celsus PAPP 1975 (!!)

263 (262) Penultimate joint cubic (Fig. 38) or slightly transverse, i.e. slightly shorter than broad. r1 issuing from stigma either distally or less so, perpendicular to stigma, angle of *n. med.* and *n. bas.* distinctly larger than 100, i.e. about 120–140, degrees (Figs. 39, 94). Ovipositor sheath wide (Fig. 93) or downcurved (Fig. 96). Legs black, mostly with a brown or brownish pattern. Tegulae black.

264 (265) Metacarp always longer than stigma, latter usually thrice longer than wide and emitting radial vein clearly distally (Fig. 39). First tergite 1.4–1.5 times longer than wide at hind (Fig. 92), its hind horizontal surface either punctate-rugose, or

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Figs. 83–104. — Fig. 83–86. *Apanteles coniferoides* PAPP: 83 = third tibia with dense spines, 84 = tergites 1–3, 85 = end of abdomen with hypopygium and ovipositor sheath, 86 = nervellus of right hind wing. — Figs. 87–89. *A. mycale* NIXON: 87 = distal part of right fore wing, 88 = tergites 1–3, 89 = end of abdomen with hypopygium and ovipositor sheath. — Figs. 90–91. *A. celsus* PAPP: 90 = tergites 1–3, 91 = end of abdomen with hypopygium and ovipositor sheath. — Figs. 92–93. *A. infimus* (HAL.): 92 = tergites 1–2, 93 = hypopygium and ovipositor sheath. — Figs. 94–96. *A. halidayi* MARSH.: 94 = distal part of right fore wing, 95 = tergites 1–2, 96 = hypopygium and ovipositor sheath. — Fig. 97. *A. benevolens* PAPP: ovipositor sheath. — Figs. 98–100. *A. graciliariae* WILK.: 98 = end of abdomen with hypopygium and ovipositor sheath, 99 = ocelli, 100 = tergites 1–3. — Figs. 101–104. *A. gagates* (NEES): 101 = end of abdomen with hypopygium and ovipositor sheath, 102 = distal part of right fore wing, 103 = nervellus of right hind wing, 104 = tergites 1–3.

rugose (Fig. 40). Ovipositor sheath (almost) as long as hind tibia, wide and almost straight (Fig. 93). Mesonotum shiny and with only extremely fine, obsolescent punctation (Fig. 41). Inner spur of hind tibia as long as or, less usually, slightly shorter than half basitarsus. ♀♂: 2–2.5 mm. — Europe eastward as far as to Lithuania and Azerbaïdzhan

A. infimus (HALIDAY, 1834) (!)

- 265 (264) Metacarp never longer than, usually as long as, stigma, latter at most 2.7–2.8, usually 2.5, times longer than wide and emitting radial vein less clearly distally (Fig. 94). First tergite subquadrate, at most 1.3 times longer than wide at hind (Fig. 95), its hind horizontal surface smooth with scattered, small and fine punctures. Ovipositor sheath long, as long as hind tibia and basitarsus combined, downcurving and widening distally (Fig. 96). Mesonotum faintly dull (to dull), with extremely fine and rather dense punctation (Fig. 42). Inner spur of hind tibia distinctly shorter than half basitarsus. ♀♂: 2.3–2.8 mm. — England, Sweden, Hungary (new record); further records (SHENEFELT 1972) needing confirmation

A. halidayi MARSHALL, 1885 (!)

- 266 (249) D1 less wide, at most a quarter wider than high (Figs. 43, 45, 50, 53).
 267 (270) Ovipositor sheath short, at most as long as two-thirds of hind tibia (Figs. 97, 98). D1 relatively high, usually as wide as high and at most slightly wider than high (Figs. 43, 45).
 268 (269) Propodeum faintly areolated: with a median and a pair of postero-lateral areolae bordered with more or less emergent keels and along keels rugulose. Mesonotum dull, with dense and antero-posteriorly gradually with more and more discrete punctation (Fig. 44). Inner spur of hind tibia somewhat, though distinctly, shorter than half basitarsus (7 : 16, ×63). Ocelli relatively small, hind imaginary tangent to anterior ocellus just before posterior pair. First tergite before its hind end slightly rounded-constricted. Stigma opaque brownish yellow with a rather indistinct pale basal spot (?fading)*. A member of *ulior*-group, somewhat transitional to the *laevigatus*-group. ♀♂: 2.8–3 mm. — Italy

[A. benevolens PAPP, 1973 (!!)]

- 269 (268) Propodeum without any areolae, smooth and shiny, only around lunule and at postero-lateral corner with rugulae. Mesonotum shiny to weakly pruinose, with very fine, obsolescent and rather disperse punctation (Fig. 46). Inner spur of hind tibia as long as half basitarsus. Ocelli relatively large, hind imaginary tangent to anterior ocellus transecting posterior pair (Fig. 99). First tergite (Fig. 100) at its hind end angled. Stigma brownish black, never with any pale basal spot. ♀♂: 2.5–3 mm. — England, Germany, Austria, Switzerland and Hungary (new record)

A. graciliariae WILKINSON, 1940 (!)

- 270 (267) Ovipositor sheath long, at least as long as, usually longer than, hind tibia (Figs. 101, 107). D1 relatively less high, usually somewhat wider than high (Figs. 10, 50, 53).
 271 (272) Wings strongly and evenly brownish fumous. Metacarp short, as long as stigma and ending well before apex of R, i.e. its distance from apex twice shorter than its own length (Fig. 102). Penultimate two (or three) antennal joints cubic (Fig. 47). Nervellus of hind wing with a characteristic sigmoid course (Fig. 103). Ocelli avarage in size, hind imaginary tangent to anterior ocellus at most touching

* In my original description (PAPP 1973) the pale basal spot was characterized indirectly to be distinct: "Stigma opaque brownish yellow, with a pale basal spot." However, in order to rectify myself, this basal spot is rather indistinct and supposedly originates from faded pigmentation; the type-specimens (1 ♀, 1 ♂) seem very old.

posterior two ocelli; distance between fore and a hind ocelli equal or indistinctly greater than diameter of hind ocellus. Face, mesonotum and scutellum smooth, shiny to polished, with extremely fine, small and disperse punctures. First tergite 1.3–1.5 times longer than wide at hind, parallel-sided (Fig. 104), its hind horizontal surface rugulose (Fig. 48). Ovipositor sheath almost as long as hind tibia and basitarsus combined, wide (Fig. 101). Middle and hind legs black to blackish. ♀♂: 2.8–3.5 mm. — England, Belgium, Germany, Sweden, Finland, Austria, Hungary, USSR (European part, Georgia)

A. gagates (NEES, 1834)

272 (271) Wings hyaline, subhyaline or, at most, faintly fumous. Metacarp more or less, usually distinctly, longer than stigma (Figs. 10, 50, 53). Penultimate joint of antenna usually not cubic. Nervellus of hind wing strongly incurved (Figs. 108) or hardly incurved (Fig. 76). Legs with an extensive light-coloured pattern.

273 (276) Legs, except coxae and trochanters, reddish yellow, at most middle and hind femora with fuscous or brownish pattern.

274 (275) Mesonotum shiny and almost smooth, i.e. with extremely fine, small and rather disperse punctation. Stigma relatively large, twice longer than wide (Fig. 10). Tegulae black. Further details see at couplet 221 (220)

A. decorus (HAL.) (!)

275 (274) Mesonotum dull, with well-defined punctures varying from contiguous to almost contiguous (Fig. 49). Stigma not large, 2.7–3 times longer than wide. Tegulae yellow to bright yellow. Further details see at couplets 93 (94) and 94 (93) in PAPP 1978a

A. paralechia MUES. (!)

A. renaulti MASON (!!)

276 (273) Legs black with more or less yellow, brownish yellow or rusty pattern; femora always black, except fore femur of *A. eleagnellae*.

277 (278) Spines of outer side of hind tibia extremely numerous and close-set (Fig. 155 in PAPP 1978a). First tergite 1.3–1.4 times longer than wide at hind (Fig. 153, l.c.). Further details see at couplets 242 (243) and 128 (127) in PAPP 1978a

A. soikai NIX. (!!)

278 (277) Spines of outer side of hind tibia much less numerous, rather disperse (Fig. 82).

279 (280) First tergite with weakly, though distinctly arched sides. Penultimate 2–3 joints of antenna 1.6 times longer than broad. Further details see at couplet 11 (10) in PAPP 1978a

A. starki MASON (!!)

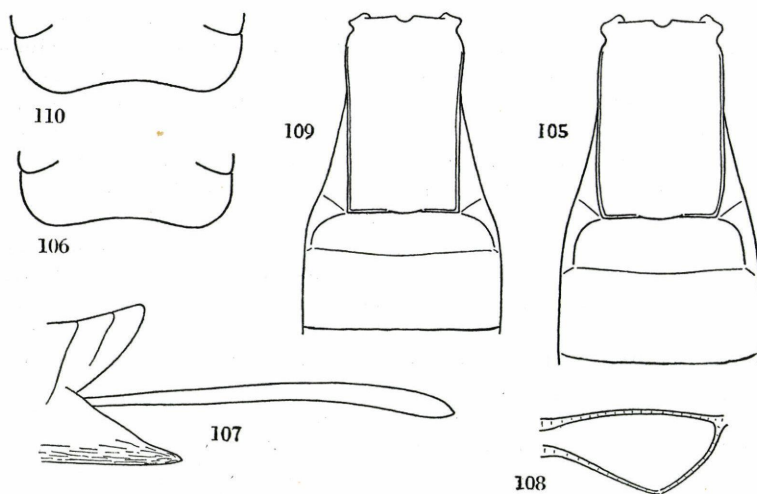
280 (279) First tergite parallel- or subparallel-sided (Figs. 105, 109).

281 (282) Tegulae yellow. Fore femur fully brownish yellow, middle femur black and only apically brownish yellow, hind femur entirely black. Prescutellar furrow wide and deep, with ten crenulae. *r1* and *cuqul* arched, i.e. not angularly meeting with each other. Ovipositor sheath hardly longer than hind tibia. ♀♂: 2.2–2.4 mm. — USSR: Armenia

A. eleagnellae TOBIAS, 1976*

282 (281) Tegulae black. Fore femur also more or less, at least its proximal half, black. Prescutellar furrow narrow, shallow to very shallow, finely crenulated. *r1* and *cuqul* angularly meeting with each other (Figs. 50, 53). Ovipositor sheath distinctly longer than hind tibia, usually as long as hind tibia and basitarsus or tarsal joints 1–2 combined (Fig. 107).

* I know this species only on the basis of its description (TOBIAS 1976a). It may well be, of course, that not the most characteristic specific features are included in the present key.



Figs. 105–110. — Figs. 105–106. *Apanteles ensiformis* (RATZ.): 105 = tergites 1–3, 106 = head behind eyes. — Figs. 107–110. *A. longicauda* (WESM.): 107 = end of abdomen with hypopygium and ovipositor sheath, 108 = nervellus of right hind wing, 109 = tergites 1–3, 110 = head behind eyes.

283 (284) Mesonotum dull to subshiny, with rather confluent and hardly discernible punctation (Fig. 51). Hind horizontal half of first tergite and entire second tergite densely alutaceous to subrugulose, dull to subshiny (Fig. 52). Head behind eyes somewhat less rounded (Fig. 106). *r*₁ as long as *cuq*₁ (Fig. 50; Fig. 3 in PAPP 1978b, p. 81). First tergite 1.6–1.7 times longer than wide at hind (before its end), parallel-sided (Fig. 105). Fore tibia and tarsus blackish brown to brown. Third femur brownish black. ♀: 3 mm. — Germany, Slovakia (ČSSR); further records (SHENEFELT 1972) needing confirmation

***A. ensiformis* (RATZEBURG, 1844) (!)**

284 (283) Mesonotum shiny, almost polished, with scattered, extremely small and superficial punctures (Fig. 54). Hind horizontal half of first tergite also shiny (Fig. 55). Head behind eyes somewhat more rounded (Fig. 110). *r*₁ usually more or less longer than *cuq*₁ (Fig. 53; Fig. 15 in PAPP 1975, p. 242). First tergite 1.7–1.8 times longer than wide at hind, either parallel-sided (Fig. 109), or slightly converging posteriorly (Fig. 121 in WILKINSON 1945). Fore tibia and tarsus yellow, at most tarsus faintly fumous. Hind femur black. ♀: 3–3.6 mm, ♂: 2–3.3 mm. — Palearctic Region

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

THE SPECIES OF THE *LAEVIGATUS*-GROUP

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

abila NIXON 17 (18)
agilla NIXON 8 (9)
albipennis (NEES) 204 (203)
anfitrión NIXON 65 (64)
appellator TELENGA 48 (47)
artissimus PAPP 17 (18)
assabensis SHENEFELT 72 (73)

basiflavus PAPP 111 (112)
bersus PAPP 206 (207)
breviventris (RATZEBURG) 109 (108)
cacoeciae RILEY 209 (208)
californicus MUESEBECK 122 (121)
celsus PAPP 262 (263)
cheles NIXON 125 (126)

- cinerosus PAPP 20 (19)
 clavatus (PROVANCHER) 197 (198)
 colchicus TOBIAS 76 (77)
 consimilis VIERECK 81 (82), 211 (216)
crudelis PAPP 30 (31)
 cytherea NIXON 121 (122)
 decorus (HALIDAY) 221 (220)
 dilectus (HALIDAY) 108 (109)
 drusilla NIXON 153 (154), 203 (204)
 eleagnellae TOBIAS 281 (282)
 emarginatus (NEES) 134 (133)
 ensiformis (RATZBURG) 283 (284)
 erasmi NIXON 240 (239)
 evonymellae (BOUCHÉ) 113 (114)
 faucula NIXON 102 (103)
femoralis (BOUCHÉ) 108 (109)
 furtim PAPP 133 (134), 167 (168)
 gagates (NEES) 271 (272)
 gallicolus (GIRAUD) 59 (60)
 graciliariae WILKINSON 269 (268)
 halidayi MARSHALL 265 (264)
 helleni NIXON 141 (142)
 homoeosomae MUESEBECK 199 (200)
hoplites RATZBURG 115 (116)
iarbas NIXON 113 (114)
 immissus PAPP 119 (120)
 imperator WILKINSON 28 (29)
 impurus (NEES) 10 (11)
 infimus (HALIDAY) 264 (265)
 interpolatus PAPP 200 (199)
 iranicus TELENGA 60 (59)
 lacteipennis CURTIS 72 (73)
lacteipennis SZÉPLIGETI 72 (73)
 laevigatoides NIXON 158 (157)
 laevigatus (RATZBURG) 115 (116)
 latistigma PAPP 51 (52)
lineatus REINHARD 221 (220)
lissonotus TOBIAS 72 (73)
 litae NIXON 57 (58)
litae var. *operculellae* NIXON 48 (47)
 longicauda (WESMAEL) 284 (283)
 luctificus PAPP 65 (64), 229 (228)
 marica NIXON 192 (193)
mesoxanthus RUSCHKA 109 (108)
 midas NIXON 68 (69)
 mimi PAPP 19 (20), 220 (221)
 mirus PAPP 235 (236)
 mycale NIXON 260 (261)
nilae TELENGA 109 (108)
 nixosiris PAPP 73 (72)
 obstans PAPP 70 (71)
osiris NIXON 73 (72)
 palpator TOBIAS 43 (42)
 paralechia MUESEBECK 94 (93)
 phaloniae WILKINSON 208 (209)
 phaola NIXON 228 (229)
 praetor MARSHALL 142 (141)
praetorius TOBIAS 157 (158)
 princeps WILKINSON 127 (128)
 probatus PAPP 53 (54)
 propinquus PAPP 157 (158)
 pulcher TELENGA 42 (43)
 purdus PAPP 236 (235)
 reicharti PAPP 155 (156)
 renaulti MASON 93 (94)
salverdensis HEDQVIST 48 (47)
 scaber TOBIAS 14 (15)
 seriphia NIXON 31 (30)
 sicarius MARSHALL 30 (31)
 simulatus PAPP 116 (115)
 soikai NIXON 128 (127), 242 (243)
 sophiae PAPP 25 (24)
 starki MASON 11 (10)
 szalayai PAPP 243 (242)
 thujae MUESEBECK 165 (166)
 turionellae NIXON 194 (195)
turcmenicus TOBIAS 45 (46)
 turkmenus TELENGA 45 (46)
 varifemur ABDINBEKOVA 147 (148)
 victor WILKINSON 189 (190)

TRANSITIONAL FORMS TOWARDS *LAEVIGATUS*-GROUP

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

- annularis (HAL.) 131 (132)
 (lineipes-group)
 aristoteliae VIERECK 6 (7)
 (ater-group)
 baoris WILKINSON 252 (253)
 (ultor-group)
 benevolens PAPP 268 (269)
 (ultor-group)
 brevimetacarpus HEDQVIST 38 (39)
 (butalidis-group)
 coniferoides PAPP 257 (258)
 (metacarpalis-group)
 fumiferanae VIERECK 215 (214)
 (ater-group)
 kazak TELENGA 1 (2)
 (glomeratus-group)
 laspeyresiae VIERECK 214 (215)
 (ater-group)
 lindbergi HEDQVIST 39 (38)
 (butalidis-group)
 nephopteris (PACKARD) 64 (65)
 (ater-group)
paranae (Watanabe 252 (253)
parnae WATANABE 252 (253)
 polychrosidis VIERECK 77 (76)
 (ater-group)
 subemarginatus ABDINBEKOVA 163 (164)
 (lineipes-group)
 turkestanicus TELENGA 47 (48)
 (glomeratus-group)

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(Further references see in PAPP 1978a)

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