ACTA ENTOMOLOGICA MUSEI NATIONALIS PRAGAE

VOL. 36 1965

STUDIES OF EUROPEAN EULOPHIDAE, IV: PEDIOBIUS WALK. AND TWO ALLIED GENERA (HYMENOPTERA)

by ZDENĚK BOUČEK
(Department of Entomology, National Museum, Prague)

In this paper I present a further part of my studies of the European Eulophidae. It contains an attempt to revise the European species of the Entedontine genera *Kratoysma,* n. g., *Pediobius* Walker and *Horismenus* Walker. *Kratoysma* is established for one species, *Derostenus usticrus* Erdös, in *Pediobius* 35 species (2 of them of uncertain validity) are treated, with 10 described as new and about 20 names sunk in synonymy; *Horismenus* has only one species in Europe.

The bulk of the paper deals with *Pediobius.* Apart from the most valuable key to British species by Graham, 1959, there has been so far no other key to identification of species. And also in other faunas the genus has not yet been revised, although in North America a short key to some species was published by Crawford in 1912, and the African species, several of which were excellently described and figured by Waterston, 1915, were reviewed in form of a key by Masi, 1940, and by Risbec, 1951.

Genus **Kratoysma**, gen. novum

Derivation of name: partly from *Kratochviliana,* partly from *Enaysma.*

Description of the genus.

Head not or hardly collapsing after death. Occiput not excised; sharply margined above, but temples immargined. Frontal fork replaced by straight raised cross-line; scrobes without linear grooves on bottom; inner orbits straight; eyes distinctly pubescent; malar space distinct, not very small; mouth small, but mandibles not stunted. Antennae inserted just above lower ocular line; funicle in female 3-segmented and clava bisegmented, bearing a narrow terminal spine; in male clava not differentiated, flagellum then 5-segmented; last segment also with terminal spine.

Thorax coarsely but shallowly reticulate. Pronotum short, collar distinct, although only vaguely margined. Notauli incomplete, posteriorly indicated by broad depressions; the latter smooth on bottom; lateral lobes of mesoscutum obtuse-angularly incised for reception of axillae; mid lobe with two pairs of bristles. Scutellum without any grooves, reticulate, with only one pair of bristles, these in distal third. Metascutellum short, sculptured. Propodeum not small, mainly weakly sculptured, but with distinct plicae; submedian areas margined posteriorly by distinct ridge; otherwise

sculpture strongly variable, sometimes two diverging submedian carinae distinct as in *Pediobius,* sometimes a median carina developed; lateral fimbriae poor. Forewing: submarginal vein distinctly broken at prestigma, with two bristles; marginal vein much longer than costal cell which is bare; stigmal vein extremely short, subequal in length to the postmarginal; wing pubescence rich, marginal ciliation developed. Legs weak, tarsi tetramerous.

Abdominal petiole distinct, quadrangular, dorsally sculptured. Gaster short, partly collapsing after death; first tergite the longest but not exceeding anterior one-third, its hind margin straight; ovipositor not protruding.

Type-species: *Derostenus usticrus* Erdös.

This genus belongs to Entedontinae and seems to combine various characters of *Kratochviliana* Maláč, 1943 [= *Epilampsis* Delucchi, 1954, now considered a subgenus of *Chrysocharis* Förster, 1856], *Enaysma* Delucchi, 1954, and *Pediobius* Walker, 1846. The general aspect of the body is like in some *Kratochviliana,* but the wing venation is more like *Pediobius.* Like the latter genus also *Kratoysma* possesses lateral plicae on the propodeum, by which character it differs not only from the whole *Chrysocharis*-complex, but also from *Entedon.* In most points it agrees with *Pediobius,* but the face has no scrobal grooves and on frons a raised crossline replaces the fork. In other words *Kratoysma* combines the characters of head and gaster of the *Chrysocharis*-complex with the characters of thorax of *Pediobius.* Within the latter genus *P. coxalis,* n. sp., seems to be nearest to *K. usticrus.*

Kratoysma usticrus (Erdös), comb. nova

Derostenus usticrus Erdös, 1954, Ann. hist. nat. Mus. Nat. Hung. (s. n.), 5: 346—347; ♀.
Pediobius diluticrus Erdös, 1958, Bull. Soc. ent. France, 62: 284; ♀. **N. syn.**

Through the courtesy of Mr. Ch. Granger of Paris I was enabled to examine the holotype of *Pediobius diluticrus* Erd. I knew then this species as *diluticrus* until recently when I could examine a male of *Derostenus usticrus* Erd. identified as such by the author of the species. A careful comparison in the specimens at my disposal with the original description of *usticrus* confirmed the correctness of the synonymy.

For description of the only species of the genus see both papers by Dr. Erdös. Some further characters are stressed in the description of the genus above.

Host: (LEP.) *Phyllocnistis suffusella* Zell., a leaf-miner in *Populus.* — The host of *K. usticrus* was ascertained independently by Prof. E. Schimitschek (in Western Germany) and by Miss K. Rohde (in Eastern Germany).

Distribution: France, Germany, Czechoslovakia, Hungary.

Material examined: France: Esbarres, the type of *diluticrus.* — Germany: (DBR) Weiden am See, Nordheim, Heppenheim and Lorsch (Schimitschek, Niemann); (DDR) Sachsen, Graupe, VIII. 1962 (K. Rohde). — Czechoslovakia: S. Slovakia, Kamenica nad Hron. near Štúrovo, 5. V. 1948 (A. Hoffer). — The type of *usticrus* came from Hungary.

Genus **Pediobius** Walker

Microterus Spinola, 1811, Ann. Mus. Hist. nat. (Paris), **17**: 151—152. **N. syn.**
Type (by monotypy): *Diplolepis petiolata* Spinola.
Pediobius Walker, 1846, Ann. Mag. nat. Hist., **17**: 184.
Type (design. by Ashmead, 1904): *Entedon (Pediobius) imbreus* Walker.
Pleurotropis Förster, 1856, Hym. Studien, **2**: 78, 82.
Type (first sp. incl. by Förster, 1861): *Pleurotropis isomerus* Förster.
Rhopalotus Förster, 1856, Hym. Studien, **2**: 78, 80.
Type (design. by Ashmead, 1904): *Elachestus cothurnatus* Nees.
Cluthaira Cameron, 1912, Proc. Linn. Soc. N. S. Wales, **37**: 211. **N. syn.**
Type (by monotypy): *Cluthaira agaristae* Cameron.
Pseudacrias Girault, 1913, Arch. f. Naturg., **79 A**, H. 6: 104.
Type (by orig desig.): *Pseudacrias micans* Girault.
Eupleurotropis Girault, 1917, Speciosissima Genera Novae Eulophidorum, p. 3.
Type (by orig. design.): *Pleurotropis testaceipes* Crawford.
Pseudacriasoides Girault, 1917, Descriptiones Stellarum Novarum, p. 9.
Type (by orig. design.): *Pleurotropis utahensis* Crawford.
Epipleurotropis Girault, 1917, Descriptiones Hymenopterorum Chalcidoidicarum Variorum cum Observationibus, III, p. 7.
Type (by orig. design.): *Epipleurotropis longfellowi* Girault.

According to the principle of priority, strictly applied, this genus should be named *Microterus* Spinola. This name is however an example of a forgotten name considered since Nees, 1834, a synonym of another name created by Spinola, of *Elachertus. Microterus* was originally established only with one included valid species, its present type-species *Diplolepis petiolata* Spinola, 1808, the only other included species being a nomen nudum *(Microterus capreolus).* I could not see the type-species, but from its description it is clear to me that it must be a *Pediobius.* In support of this opinion I wish to mention that also Förster knew the present *Pediobius acantha* (Walker) under "*Microterus petiolaris* Ns." (sic!).

As *Pediobius* is today already a well-established and a well-known name, it is taken here as the valid name for the genus and, consequently, *Microterus,* although older than the former name, is dropped into synonymy.

I saw the type-species of *Pediobius, P. imbreus* (Walker) described from India, in the British Museum.*) It belongs to the *eubius*-group, as mentioned already by its author in the original description (Walker, 1846, *Ann. Mag. nat. Hist.,* 17: 185). *Pseudacriasoides* Grlt. and *Epipleurotropis* Grlt. (the type-species of the latter, *longfellowi,* must be very similar to the European *P. alcaeus*) were synonymized with *Pleurotropis* Först. by Gahan, 1921, *Pseudacrias* Grlt. by Gahan, 1932, and *Eupleurotropis* Grtl. with *Pediobius* by Peck, 1963. Ferrière, 1953, showed that *Pleurotropis* has a senior subjective synonym in *Pediobius* Walk. and since the time the latter has become the valid name for the present genus.

As for *Rhopalotus* Först., for some time there has existed a disagreement in its interpretation, mainly because of poor knowledge its type-

*) Also at this opportunity I wish to express my thanks to the Trustees of the British Museum (Natural History) for the kind permission to examine the types in their care.

species, *Elachestus cothurnatus* Nees, and its relation to the other species of the genus. The latter species is however, evidently synonymous with *Entedon argon* Walk., classified with *Pediobius* e. g. by Graham, 1959. The enlarged clava of the female is considered now a character only of specific level. The synonymy of *Rhopalotus* and *Pediobius* was mentioned by Askew, 1962.

Also *Cluthaira* Cameron is identical with *Pediobius* Walk. I saw recently the type of *Cluthaira agaristae* Cam., the type-species, in the collections of the British Museum. *C. agaristae* was described from New South Wales and is very similar to the European *Pediobius crassicornis* (Thoms.).

The taxonomic range of *Pediobius* as understood here is a little different from the concept of some authors in the past. It agrees with the interpretation proposed many years ago by A. B. Gahan and accepted in Europe e. g. by Graham, 1959. Its correctness has been confirmed by my study of the European species, as well as of some non-European ones.

Pediobius Walk. is one of the few Eulophid genera in which most authors have come to an agreement as to the number of the funicle segments, which is not taken here a generic character. The females of some species possess two, the majority of species three, and one European species has four clearly separated funicle segments, while the males of the same species have the same number, or have more of free funicle segments. The number of these segments depends on the degree to which the distal segments of the antenna are separated from, or fused to, each other. It seems probable that the reduction in number of free segments has occurred independently in various species-groups, although some natural groups show rather constant antennal formula. There may exist however also some intra-specific variation, as shown e. g. by Gahan, 1921, in *Pediobius utahensis* (Crawford).

The task of a subgeneric division is mentioned elsewhere.

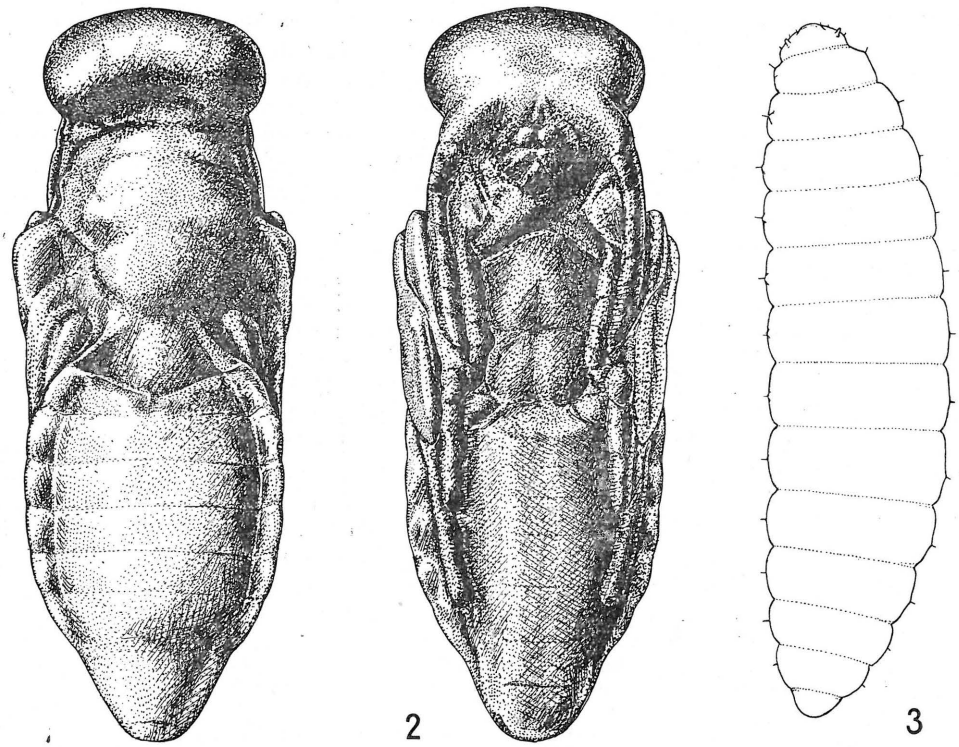
Characters of the genus.

Body strongly sclerotized, usually neither head nor abdomen collapsing after death, only in some species the convex gaster may become depressed or concave after exsiccation, in particular if the material has been preserved in alcohol.

Occiput more or less distinctly margined, broadly excavated. Face with two converging impressed lines on bottom of scrobes (called scrobal grooves) ending at the more or less angulate, deeply groove-like frontal fork.

Pronotum with collar always differentiated, more or less smooth, rather long, usually set off by a ridge from the reticulate declivous anterior part of the sclerite. Mesoscutum with notauli anteriorly obliterate, or linear and then abruptly curved out; posteriorly never linear: mostly replaced by shallow and broad (or rarely: deep) notaular depressions. Mid lobe of mesoscutum always only with two pairs of bristles; posterior bristles usually placed in notaular depressions. Trans-scutal suture between mesoscutum and scutellum distinctly sinuate. Scutellum without

clearly-cut longitudinal grooves, but sublateral grooves may be indicated by striation or even depression *(P. alcaeus)*. Propodeum with two submedian carinae separated at least posteriorly by an intercarinal stripe which is mostly groove-like, but may be convexly raised anteriorly; or the two carinae are fused into one in anterior half; submedian carinae diverge posteriorly and are connected by marginal cross-carina with dis-



Figs. 1—3. *Pediobius saulius* (Walker). — 1. and 2. Pupa (obtect) in dorsal and ventral view. — 3. Larva.

tinct plica on either side, thus delimiting large submedian areas; spiracles small, elevated; spiracular grooves outside of spiracles mostly deep; hind margin of propodeum forming usually on either side a distinct supracoxal angulation which usually projects between end of spiracular groove and the postero-lateral corner of submedian area. Forewing has very long marginal vein and very short stigmal and postmarginal veins (the last one sometimes stunted); submarginal vein bears two bristles; costal cell bare or (rarely) with a hair-line on lower surface; basal cell always open below, speculum developed, open (rarely) or closed by a hair-line (usually).

Abdominal petiole always distinct, more or less quadrangular, its dorsal surface sculptured, reticulate to striate. Gaster in female convex,

with first (basal) segment large; hind margins of tergites straight or nearly so. Ovipositor hardly protruding (hidden, but even in species with short gaster fairly long — cf. Fig. 55).

The usual type of larva is shown in Fig. 3. The pupa is obtect as in most Entedontinae (Figs. 1, 2).

The genus is known in numerous species from nearly all parts of the world. They are parasites attacking insects of various orders, mainly of Lepidoptera, Diptera, Hymenoptera and Coleoptera. Some of them develop as secondary parasites (endoparasites) laying eggs in the Ichneumonids, Braconids, Tachinids or Chalcids. Evidently also one and the same species may develop as a primary parasite in one case and as a secondary parasite in another case. Although some species seem to be exclusively primary parasites, it is necessary to keep in mind the trend to hyperparasitism of various *Pediobius* species when evaluating their role in the control of various pests, as reminded already by Salt, 1931 (p. 534). This author seemed to doubt the corectness of the taxonomic definition of a genus which included both primary and secondary parasites. I think that this question has already been answered in subsequent years (e. g. in the genus *Mesopolobus* Westw.). The morphological characters reflect at least in part the physiological, ecological and other characters of species and no wonder if we cannot find any reason for a taxonomic subdivision of the genus, if the diversity, as far as the primary and secondary parasitism are concerned, is both intra-specific and interspecific.

Key to the European species of Pediobius

1 Antennal scapus and all femora and tibiae, pale testaceous (males not known so far) 2
— Scapus, femora and tibiae metallic (except sometimes narrow tips of tibiae) . 4
2 Abdominal petiole in female subquadrate; third funicle segment hardly longer than broad; notaular depressions on mesoscutum reticulate, not delimited; intercarinal stripe of propodeum groove-like; stigmal vein of forewing subsessile (Fig. 28) . . . . . **P. moldavicus**, n. sp.
— Abdominal petiole at least 1.5 times as long as broad; funicle segments very long and slender, the third at least twice as long as broad 3
3 Coxae metallic; frons above the fork and vertex shiny, almost smooth; notaular depressions reticulate, not delimited; meshes of reticulation on scutellum polygonal; median carinae of propodeum diverging backwards, the stripe between them groove-like; petiole (in female) about 1.5 times as long as broad; first tergite covering $^2/_3$ of gaster (or more) . . . . . **P. flaviscapus** (Thomson)
— Coxae whitish; vertex and frons above the fork dull, densely reticulate as well as the face; notaular depressions delimited, triangular, smooth and shiny; scutellum longitudinally striate; median carinae of propodeum anteriorly indistinct, replaced by a raised stripe projecting like a tooth against the metascutellum; petiole (in female) about twice as long as broad; first tergite hardly reaching the middle of gaster . . . . . **P. coxalis**, n. sp.
4 Notauli deeply groove-like in posterior two-thirds (Fig. 16), their narrow bottom dull; scutellum with coarse longitudinal striae slightly diverging, radiating from anterior angles of the sclerite, this nearly smooth in a short triangle at base; propodeum with bottom of intercarinal stripe distinctly, highly elevated anteriorly; antennae slender, in female funicle 3-segmented, second segment about twice as long as broad, in male 4-segmented and each segment about three times as long as broad . . . . . **P. termerus** (Walker)

— Notauli shallow (at least posteriorly), their flat bottom reticulate, striate, aluta-ceous or smooth, their inner margin sometimes step-like 5

5 Scutellum elongate and with two shallow sublateral longitudinal grooves, the part between them more or less smooth and shiny, convex; the part outside of them longitudinally striate (Fig. 14); intercarinal stripe of propodeum distinctly raised anteriorly; notaular depressions smooth, triangular, their margin with mid lobe of mesoscutum step-like; abdominal petiole in female swollen, not longer than broad; antenna slender, the funicle in female 3-segmented, in male 4-segmented . . . . . **P. alcaeus** (Walker)

— Scutellum different; intercarinal stripe of propodeum not raised anteriorly, but usually groove-like, or carinae fused into one anteriorly; notaular depressions also mostly different 6

6 Hind margin of mid lobe of mesoscutum distinctly emarginate, separated by a distinct hole from the base of scutellum (Fig. 32); inner corners of axillae deeply impressed, notauli (rather deep) as well as coarse striae of scutellum radiating from this place; scutellum only as long as broad, smooth anteriorly and with wide polygonal meshes of reticulation posteriorly; postmarginal vein longer than the stigmal; antenna of female short, broad, funicle 3-segmented, in male funicle 4-segmented, but fourth segment only narrowly separated from the clava segment . . . . . **P. crassicornis** (Thomson)

— No unusual hole between the mid lobe of mesoscutum and scutellum; inner corner of axilla not distinctly impressed; sculpture of scutellum different . . 7

7 Lateral corners of pronotum, seen from above, strikingly prominent, rectangular or even acutely angled (Figs. 24, 26); forewing with cubital hair-line absent, speculum open; scutellum striate, not reticulate; in female funicle 3-segmented and abdominal petiole transverse 8

— Lateral corners of pronotum obtuse, less prominent; speculum in the forewing mostly closed 9

8 Body squat (Fig. 26); mesoscutum all over reticulate; scutellum coarsely striate and only 1.5 times as long as broad at its base; female gaster short-ovate, shorter than thorax, first gastral tergite exceeding the middle, sixth tergite at least five times as broad as long . . . . . **P. italicus,** n. sp.

— Body rather slender (Fig. 24); notaular impressions smooth, mesoscutum anteriorly transversely striate; scutellum finely longitudinally striate, longer; female gaster ovate-acuminate, at least twice as long as broad and longer than the thorax, with first tergite not or hardly reaching the middle, and sixth tergite not much more than twice as broad as long . . . . . **P. saulius** (Walker)

9 Spur of hind tibia at least twice as long as width of tibia, almost as long as, or much longer than, the basitarsus, slightly curved, infuscate at apex; scutellum broader than long, longitudinally striate or smooth; female funicle 3-segmented, third funicle segment always transverse 10

— Spur of hind tibia much shorter, straight 12

10 Body strongly depressed, short; scutellum quite flat and shiny, smooth except on sides; occiput not sharply margined; female gaster oval, about 1.6 times as long as broad . . . . . **P. phragmitis,** n. sp.

— Body not strongly depressed; scutellum longitudinally striate except sometimes a narrow median stripe; female gaster about twice as long as broad, acuminate 11

11 Occiput sharply margined, even in the middle; spur of hind tibia only slightly longer than first segment of hind tarsus which is usually infuscate (Fig. 36) . . . . . **P. pyrgo** (Walker)

— Occipital ridge blunted in the middle and on sides, only behind either lateral ocellus shortly ridged; spur of hind tibia much longer than first tarsal segment, nearly half as long as the whole tarsus; mid and hind tarsi whitish with abruptly dark claw segment (see Figs. 33—35) . . . . . **P. obtusiceps,** n. sp.

12 Propodeum: plicae very highly step-like and posterior outer angle of submedian area unusually protruding above hind coxa; antenna in female very stout, short and strongly clavate, preclava transverse, clava with a large area of micropilosity beneath; male antenna (as far as known) not stout, with three-segmented funicle 13

— Plicae never steeply step-like; female antenna never strongly clavate, never with distinct area of micropilosity; male funicle with two to four segments . . . 14

13 Female gaster short-oval, its sides converging apically at an obtuse angle (Fig. 19); head much broader than thorax; clava about as long as two preceding segments combined; male antenna with last funicle segment subquadrate . . . . . **P. cothurnatus** (Nees)

— Female gaster about twice as long as broad, its sides converging apically at an acute angle (Fig. 21); head only slightly broader than thorax; clava still broader than in the preceding species and distinctly longer than two distal funicle segments combined (Fig. 20); male unknown . . . . . **P. claviger** (Thomson)

14 Postmarginal vein absent, stigmal vein extremely short; apex of scutellum polished; abdominal petiole elongate, its surface dull, substrigose; first gastral tergite unusually large, its posterior margin straight; funicle in female three-segmented, but clava not distinctly differentiated 15

— Postmarginal vein developed, although often not longer than the stigmal; apex of scutellum not broadly polished; the other characters at least partly different 17

15 Thorax strongly depressed, with scutellum flat and smooth in median broad stripe (Fig. 13); frons and vertex almost completely polished; first gastral tergite smooth; body 1.2 mm. . . . . **P. deplanatus,** n. sp.

— Body not depressed, scutellum distinctly convex; vertex mostly distinctly sculptured, as well as the first gastral tergite; body mostly larger 16

16 Antennae shorter, in female first funicle segment 1.5 times as long as, and the second only just longer than, broad (Fig. 12); following two segments subquadrate; smooth area on apex of scutellum more or less expanded forward along median line . . . . . **P. ulmi** (Erdös)

— Antennae longer, slender, in female first funicle segment twice as long as broad, the following segments usually only slightly shorter (Fig. 8); scutellum often smooth only in apical one-quarter or less . . . . . **P. epeus** (Walker)

17 Female flagellum long and stout, with four square funicle segments separated from each other by narrow petioles (Fig. 22); malar space almost as long as width of mouth; notaular depressions smooth on bottom; obdominal petiole elongate; male not known . . . . . **P. tetratomus** (Thomson)

— Female flagellum different, funicle never distinctly four-segmented; if notaular depressions smooth then abdominal petiole subquadrate 18

18 Notaular depressions smooth, well-defined and rather deep, or the whole of thorax finely alutaceous, not reticulate; body squat, small; forewing often with speculum open; female antenna mostly only with two funicle segments 19

— Mesoscutum all over reticulate, even on bottom of the notaular depressions which are not more feebly sculptured 22

19 Head and thorax shiny, everywhere very feebly sculptured, on back half of mid lobe of mesoscutum and on scutellum delicately alutaceous; interantennal callus weak, seen from above subrectangularly protruding . . **P. sublaevis** (Erdös)

— Head and thorax distinctly reticulate, often dull; scutellum strigose; interantennal callus more protruding 20

20 Speculum of forewing closed by cubital hair-line (Fig. 54); malar space rather large, as in *lysis* . . . . . **P. chilaspidis,** n. sp.

— Speculum broadly open below (Fig. 52) 21

21 Level of lower extremities of eyes much nearer to the straight mouth margin than to the antennal sockets, malar space very short (Figs. 58, 59); inner orbits deeply emarginate, distance between them below only two-thirds as long as above; face densely reticulate; interscrobal crest high but narrow and only gradually raising below; speculum of forewing broadly open below; tarsi pale at base . . . . . **P. clita** (Walker)

— Lower ocular line not nearer to mouth margin than to the antennal sockets (Figs. 56, 57); malar space larger, in female longer than maximum width of flagellum; inner orbits less emarginate, distance between eyes above only by the width of ocellus larger than below; face usually broadly reticulate; interscrobal crest below abruptly elevated, often tooth-like . . . . . **P. lysis** (Walker)

22 Body squat, with gaster in female almost round (Figs. 39, 49), petiole subquadrate or transverse, basal tergite of gaster long, reaching or exceeding the middle;

antennae very short, funicle always three-segmented, its distal segments in female usually transverse; scrobal grooves separately reaching the fork; malar space large (Figs. 41, 48); scutellum short, its reticulations elongate anteriorly . . 23

— Body less squat to rather slender, gaster in female not round, antennae not extremely short; in doubtful cases females with scrobal grooves meeting below the fork, antennae different, first gastral segment mostly not reaching the middle of gaster (or abdominal petiole longer than broad), etc. 25

23 Flagellum in female with sparse long bristles, not densely hairy, funicle segments more or less rounded, the third hardly transverse (Figs. 44, 45); body almost black in both sexes; scutellum at base with longitudinal reticulations, not densely strigose; mandibles bidentate . . . . . **P. grunini** (Nikolskaya)

— Flagellum in female more or less densely hairy, distal funicle segments usually considerably transverse, in male however sometimes elongate *(facialis)*; body at least in male distinctly metallic; scutellum at base mostly strigose; mandibles with several smaller teeth above the usual two main teeth 24

24 Mesoscutum about twice as broad as long, pronotum slightly arched, but its lateral corners distinct (Fig. 39), their edge separated from the smooth dorsal part by a furrow; scutellum only feebly convex, short, anteriorly broad, often almost as broad as mesoscutum long; face coppery, in female funicle not unusually stout and not very densely pubescent; in male femora not thickened; mainly hyperparasitic in lepidopterous pupae . . . . . **P. facialis** (Giraud)

— Mesoscutum much less transverse, convex, with distinct notaular depressions; pronotum strongly arched, lateral corners rounded and not set off by a groove; length of mesoscutum at least 1.5 times as great as width of scutellum at base; scutellum distinctly convex; face not or hardly different in colour from vertex and thoracic dorsum; female funicle unusually stout and very densely pubescent; in male femora distinctly thickened; hyperparasitic in egg-cocoons of spiders . . . . . **P. brachycerus** (Thomson)

25 Scutellum broadly reticulate, convex, shiny, meshes at least in anterior half distinctly elongate; female gaster ovate-acuminate, with basal tergite smooth and large; antenna in both sexes with distinctly separated three funicle segments and a bisegmented clava; scrobal grooves not meeting below the fork . . . . . **P. cassidae** (Erdös)

— Scutellum at least anteriorly densely longitudinally reticulate, meshes often indistinctly elongate; abdomen often different; antenna never with a three-segmented funicle clearly separated from clava; scrobal grooves in female always meeting before reaching the fork 26

26 Antenna with funicle bi-segmented and clava three-segmented; body squat, with gaster in female almost round, but basal tergite not exceeding the middle; scrobal grooves in both sexes meeting just below the fork; malar space very short, mouth hardly as broad as distance between eyes below; occiput distinctly margined only in median one-third; associated with oak in S. Europe . **P. plagiotrochi** (Erdös)

— Antennal clava in female bi-segmented, but not sharply separated from the three-segmented funicle (Figs. 70, 72, 73, 76), in male flagellum without differentiated clava (Fig. 62); body rarely squat; gaster in female elongate or first segment clearly exceeding the middle *(glabratus)* 27

27 Female: abdominal petiole quadrate to slightly elongate; gaster shorter, at most 1.9 times as long as broad, with basal tergite occupying one-third or more of the gaster (Figs. 61, 68, 69, 75); scutellum hardly longer than broad; first funicle segment sometimes shorter than pedicellus. Male: gaster ventrally with epipleurae very broad, not inflexed; marginal vein of forewing usually considerably arched 28

— Female: petiole slightly to obviously transverse; gaster longer, at least 1.8 times as long as broad, with basal tergite covering one-third or less of dorsal surface (Figs. 64—66, 71, 77); scutellum always longer than broad; first funicle segment nearly always longer than pedicellus. Male: gaster ventrally with epipleura forming a narrow inflexed ridge on each side (Fig. 67); marginal vein of forewing almost straight 31

28 Gaster in female shorter and broader than thorax, almost round, completely smooth, with basal tergite covering most of the surface (Fig. 61); propodeum reticulate, but vertex and frons shiny, almost smooth; occipital margin obtuse

obliterate; in male scapus very long, exceeding the vertex level (Fig. 62) . . . . . **P. glabratus**, n. sp.

— Gaster ovate, at least some of the tergites partly alutaceous; propodeum not distinctly reticulate; vertex distinctly reticulate, occipital margin sharp; in male scapus not reaching the vertex level 29

29 Female: antenna very slender (Fig. 76), with flagellar segments strongly decreasing in length, the first fully three times as long as broad and about twice as long as the third segment; gaster broadly ovate, distinctly alutaceous; 2.2—2.4 mm.; male not known . . . . . **P. oviventris**, n. sp.

— Flagellar segments in female only slightly decreasing in length, the first rarely longer than twice its width; body size smaller 30

30 Female: face green, mostly vividly green to almost brassy; flagellum hardly stouter than the pedicellus, with last segment, bearing long terminal spine, abruptly narrower than the preceding first clava segment. Male: funicle segments at least twice as long as broad, usually even longer . . . . **P. epigonus** (Walker)

— Female: face bluish-black, only rarely slightly greenish; funicle stouter, its first segment mostly obviously stouter than pedicel; last segment of flagellum at base almost as broad as the preceding segment and terminal spine usually shorter. Male: funicle segments shorter, subquadrate to about 1.8 times as long as broad, well separated from each other . . . . . **P. acantha** (Walker), **P. helianthemellae** (Erdös) and **P. dorycniellae** (Erdös)

31 Female antenna clavate, its flagellar segments strongly decreasing in length, the first segment very slender and about as long as the third plus clava, the third segment subquadrate or slightly transverse (Fig. 70); frons and face mainly bronzy to violet black, dull; propodeum with submedian carinae fused to one in anterior half; tip of abdomen in female obtuse; mid and hind tarsi always fuscous; in male flagellum very densely pubescent, rather broad, scrobal grooves broadly separated; length 3—3.4 mm.; parasitic mainly on Cephidae . . . . . **P. nigritarsis** (Thomson)

— Female antenna slenderer, its segments less decreasing in length; the other characters at least partly different; face and frons mainly green to blue, often vividly green; male antenna slenderer, less densely pubescent and scrobal grooves meeting above or only narrowly separated; as far as known mainly parasites of *Tetramesa* spp. in grass stems 32

32 Female gaster conically pointed (Fig. 77), with last tergite at least as long as broad at base and smooth except for insertions of hairs; antenna slender, third funicle segment twice as long as broad; male not known . **P. polanensis**, n. sp.

— Female gaster posteriorly more depress and more obtusely pointed, its last tergite much broader and always distinctly sculptured (*eubius*-complex; males indistinguishable) 33

33 Antennal funicle in female subfiliform, its third segment 1.5—1.9 times as long as broad; clava hardly broader than funicle, its first segment subquadrate to transverse (according to Graham, 1959); body small . . . . . **P. eubius** f. **planiventris** (Thomson)

— Funicle in female generally shorter and often slightly clavate 34

34 Female gaster 2.2—3 times as long as broad, nearly always slightly longer than head plus thorax, sixth gastral tergite generally half as long as broad at base (at spiracles) . . . . . **P. eubius** (Walker), s. str.

— Female gaster 1.7—2.2 times as long as broad, at least sligthly shorter than head plus thorax; sixth tergite about one-third as long as broad at base, all over densely reticulate, dull, tip of gaster more obtuse . . **P. eubius** f. **alaspharus** (Walker)

A subdivision of the genus on subgeneric level seems premature and unnecessary. But it is quite natural that certain species show closer affinity to each other than to the rest. Taking into consideration their similarity, the assumed grade of relationship, including the available host-selection data, the following incomplete grouping of species is proposed (see the Review). In the same order the species are arranged farther below.

Review of the European species of Pediobius

species	group	funicle segments in ♀	grade of parasitism	host-group ecologically etc.
coxalis		3	?	?
flaviscapus		3	?	?
epeus	*epeus*	3—4	?	? (in grasses?)
ulmi	*epeus*	3—4	?	?
deplanatus	*epeus*	3—4	?	?
alcaeus		3	primary parasite	of lepidopterous leaf-miners
termerus		3	?	?
tetratomus		4	?	?
cothurnatus	*cothurnatus*	3	mainly hyperparasitic	on *Eulophus* spp. in caterpillars, etc.
claviger	*cothurnatus*	3	?	?
saulius	*saulius*	3	mainly hyperparasitic, solitary	on lepidopterous miners and smaller caterpillars and, mainly, their hymenopterous parasites
italicus	*saulius*	3	primary gregarious parasite	ex *Spulerina simploniella*
moldavicus		3	?	?
crassicornis		3	mainly (?) hyperparasitic	on caterpillars and their hymenopterous parasites
cassidae		3	primary parasitic to hyperparasitic	in lepidopterous and some coleopterous pupae and their parasites
pyrgo	*pyrgo*	3	mainly hyperparasitic	mainly smaller Lepidoptera and their parasites
obtusiceps	*pyrgo*	3	(?) mainly hyperparasitic	smaler Lepidoptera and their parasites
phragmitis	*pyrgo*	3	?	(assoc. with *Phragmites*)
grunini	*brachycerus*	3	hyperparasitic	on Diptera in spiders mainly
facialis	*brachycerus*	3	mainy hyperparasitic	on Lepidoptera through their hymenopterous parasites
brachycerus	*brachycerus*	3	hyperparasitic	on hymenopterous predators of spider eggs
lysis	*lysis*	2	primary parasite	of Cynipids in galls on oak leaves

species	group	funicle segments in ♀	grade of parasitism	host-group ecologically etc.
chilaspidis	*lysis*	2—3	primary parasite	of Cynipids, in oak galls
sublaevis	*lysis*	2	?	?
clita	*lysis*	2	primary parasite	on Cynipids on oak leaves
plagiotrochi	*lysis*	2	primary parasite	of Cynipids in small oak galls; allegedly in eggs of *T. viridana* (?!)
epigonus	*epigonus*	3 (—4)	primary parasite	on small Diptera in grass stems
acantha-complex	*epigonus*	3	primary parasite	of dipterous and lepidopterous leaf-miners
glabratus	*epigonus*	3 (—4)	?	?
oviventris	*epigonus*	3	?	?
nigritarsis	*epigonus*	3 (—4)	primary parasite	mainly of Cephidae in grass stems
eubius-complex	*epigonus*	3 (—4)	mainly primary parasites	*of Tetramesa* and *Eurytoma* spp. in grass stems
polanensis	*epigonus*	3	?	?

I find it interesting that species with distinctly three-segmented funicle (from *crassicornis* to *brachycerus*) are mainly hyperparasites and species with a bi-segmented funicle (*lysis*-group) develop as primary parasites of Cynipids.

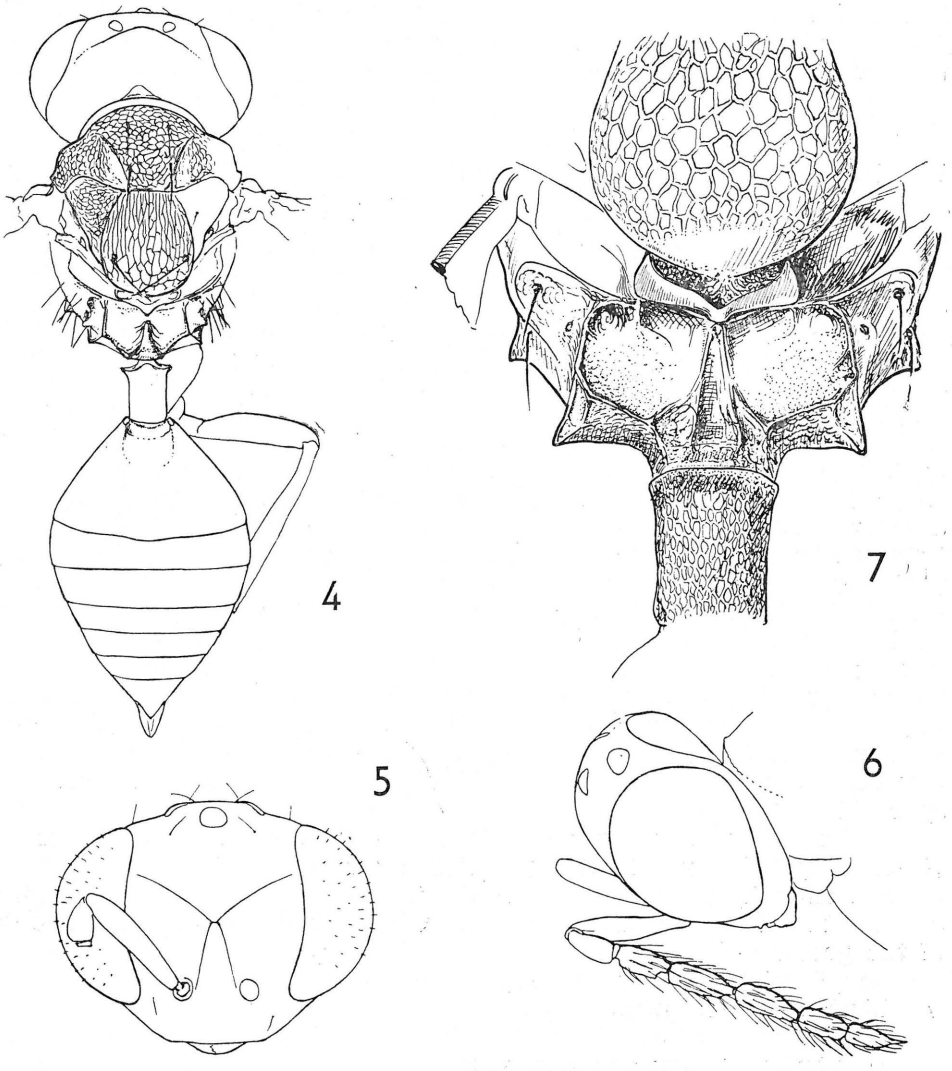
Pediobius coxalis, sp. nova

This species differs from all other species of the genus in Europe by pale coxae and a distinct hair-line on the costal cell of the forewing (otherwise it reminds one much of *Kratoysma usticrus* treated above). Only in two other European species are the tibiae of all legs pale as in *coxalis,* viz. in *flaviscapus* (Thoms.) and *moldavicus,* n. sp. By the form of the propodeum *P. coxalis* is similar to *termerus* (Walk.) and *alcaeus* (Walk.), i. e. to a species-group considered by Girault a good genus, the *Eupleurotropis* Grlt., with the American *P. testaceipes* (Crawf.) as type-species. Apart from the latter North-American species also in other faunas there are known species with pale tibiae (at least), e. g. *P. orientalis* (Crawford, 1910) and *mitsukurii* (Ashmead, 1904) in Japan, *P. ptychomyiae* (Ferrière, 1940) in South East Asia, etc., but everywhere as rare exceptions.

F e m a l e. — Body black, with slight greenish tint on head and thorax and brassy reflections on face and mesopleurae; antennal flagellum fuscous; scapes and legs including coxae pale, dirty yellowish,

femora and hind tibiae slightly infuscate. Wings subhyaline, veins pale brown.

Head seen from above distinctly broader than mesoscutum (21.5:17.5), transverse as 21.5:10.5, with occiput deeply emarginate, head in the middle then relatively thin (7); occiput distinctly margined between eyes, but at eyes the rigde blunted. Vertex fully twice as broad as eye



Figs. 4—6. *Pediobius coxalis,* n. sp., female. — 4. Body with sculpture on the thorax partly indicated. — 5. Head in anterior view. — 6. Head with antenna in side view. — Fig. 7. *Pediobius flaviscapus* (Thomson), female; hind half of the thorax with abdominal petiole.

from above (11.5:5.5), distinctly reticulate even in depressions laterad from paired ocelli. Eyes finely pubescent, large, in facial view with inner orbit slightly emarginate; eye height subequal to distance between eyes at fork level; whole face reticulate, meshes very fine below ocular line; angle of the fork about 120°; interscrobal space distinctly convex, but not protruding; malar space distinct, though genae strongly converging in facial view, about 3.5 times shorter than the vertical eye diameter. Antenna slender; scapus not nearly reaching the ocellus, about three times as long as the pedicel, which is about twice as long as broad and nearly as long as the first funicle segment; the latter fully twice as long as broad, slightly shorter than the second, which is almost as long as the third; the second and the third segment slightly tapering apically, the third nearly three times as long as broad; clava with first segment taking up the proximal half, distinctly separated from the rest which is composed of a tapering, shorter second segment and the terminal spine.

Thorax convex, not very short. Pronotum with collar sharply margined, laterally rounded, without angles seen from above. Mesoscutum reticulate, with notaular depressions distinct, smooth, triangular, about twice as long as broad, without bristle; hind margin of median lobe straight. Scutellum convex, elongate (11:9), anteriorly longitudinally striate, posteriorly more reticulate, apex nearly smooth. Metascutellum with a pit on either side, convex in the middle and angularly protruding against the tooth of the propodeum. Propodeum shiny; submedian carinae straightly diverging backwards, intercarinal space raised anteriorly into a tooth against the metanotum (in side view!); space between plicae twice as broad as long, lateral margin of submedian area (plica) only posteriorly step-like and raised, anteriorly low, carinaceous, in total as long as the highly carinaceous posterior margin of the submedian area, angle between both margins about 120°. Forewing with speculum small, closed; costal cell on lower surface with complete row of hairs; marginal vein distinctly arched and when combined with prestigma and postmarginal vein only as long as maximum width of wing; postmarginal vein subequal to the stigmal in length, the latter relatively long, about three times as long as maximum width of costal cell. Legs very slender, spur of hind tibia shorter than width of tibia.

Abdominal petiole parallel-sided, almost twice as long as broad (body of petiole only 1.6:1), anterior angles spine-like. Gaster ovate, convex, smooth, about as long as thorax, its sides apically converging almost at right angle; first gastral tergite slightly exceeding the middle of the gaster.

Length of body 1.5 mm. (Figs. 4—6).

M a l e. — Unknown.

H o s t not yet known.

D i s t r i b u t i o n: Czechoslovakia.

Holotype (female): Bohemia, Černá Studnice near Jablonec nad Nisou, 17. VI. 1961 (Vl. Martinek lgt.); deposited in the Prague Nat. Mus. (Entomology), Cat. No. 25 625. Another female, paratype: Bohemia, Nové Město nad Met., VII. 1956 (J. Macek lgt.).

Pediobius flaviscapus (Thomson), comb. nova

Pleurotropis flaviscapus Thomson, 1878, Hym. Scand., **5**: 255; ♀.

So far this species has been known only from the type collected in Sweden. It differs from all other European species of the genus mainly by the characters given in the key above. Very characteristic also is the form of the propodeum, with acute, protruding supracoxal angulations shown in Fig. 7, depicted from the type.

This species is probably closely related to the *epeus*-group, mainly by its slender antennae, elongate petiole, very large gastral tergite and feebly developed postmarginal vein, but differs then strikingly from its allies by the pale scapes and legs. In the specimen at my disposal (from the Moldavian SSR) the posterior bristles of the mid lobe of mesoscutum are broken off, but their traces seem to be in depressions just at the margin of the mid lobe.

In addition to the characters already mentioned in the key the following ones may be stressed.

F e m a l e. — Head from above strongly transverse (29:12), with vertex almost smooth; occiput sharply margined, rather deeply excavated; ocellar triangle almost equilateral; frons smooth above the fork, the latter of about 100°; face reticulate except below insertion of antennae where it is smooth; eye orbits distinctly emarginate; clypeal margin reflexed; malar space about one-quarter of longer eye diameter; temples strongly reduced.

Thorax arched, only 1.5 times as long as broad. Pronotum with lateral corners not protruding, rounded. Mesoscutum reticulate, notaular depressions shallow, their inner margins however well-defined; lateral margin of mesoscutum deeply excavated between tegula and the strong lateral bristle, which is situated, seen from above, on a massive tubercle. Scutellum as long as broad, arched, reticulate except for the smooth apex. For propodeum see Fig. 7. Mesopleura with distinct usual depressions but otherwise smooth. Forewing with costal cell bare and speculum closed; marginal vein plus prestigma as long as width of wing.

Gaster distinctly shorter but a little broader than the thorax. Basal tergite almost smooth, very large, its hind margin slightly sinuate sublaterally.

Length 1.9—2 mm.

M a l e. — Unknown.

H o s t s: so far unknown, as those mentioned by Otten, 1940 and 1941, and repeated by Fulmek, 1962, do not concern this species, but a *Chrysocharis*.

D i s t r i b u t i o n: Sweden, Moldavian SSR.

Material examined. — S w e d e n: Småland, type female in coll. Thomson in Lund. — M o l d a v i a n S S R: Vadului-Vody, 16. VII. 1961 (Bouček). —

Pediobius epeus (Walker)

Entedon Epeus Walker, 1839, Monogr. Chalc., **1**: 117—118; ♂.
Pleurotropis longicornis Erdös, 1954, Ann. hist.-nat. Mus. Natl. Hung., s. n. **5**: 351; ♀. **N. syn.**
Pediobius epeus; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 189.

In 1959 Dr. Graham kindly sent me one female compared with the Walker type of *epeus,* which I myself saw later on, in 1962 in London. There is no doubt that my specimens are conspecific with *epeus,* as well as with *longicornis* Erdös. Of the latter I was enabled to examine the syntype collected at Tompa, kindly submitted to me by Dr. Erdös in 1958. The mentioned British specimen compared with the type (it came from the J. C. and C. W. Dale collection) had the antennae a little shorter than most specimens from Czechoslovakia, but we agree with Dr. Graham that the differences are within the range of the individual variation of one species. It seems to suggest, however, that some specimens of *Pediobius ulmi* (Erd.), although being strongly aberrant in having still much shorter antennae, may prove difficult to be separated. For the time being I think it better to consider *ulmi* as a different valid species, at least until further material that may confirm or reject the synonymy, is at hand.

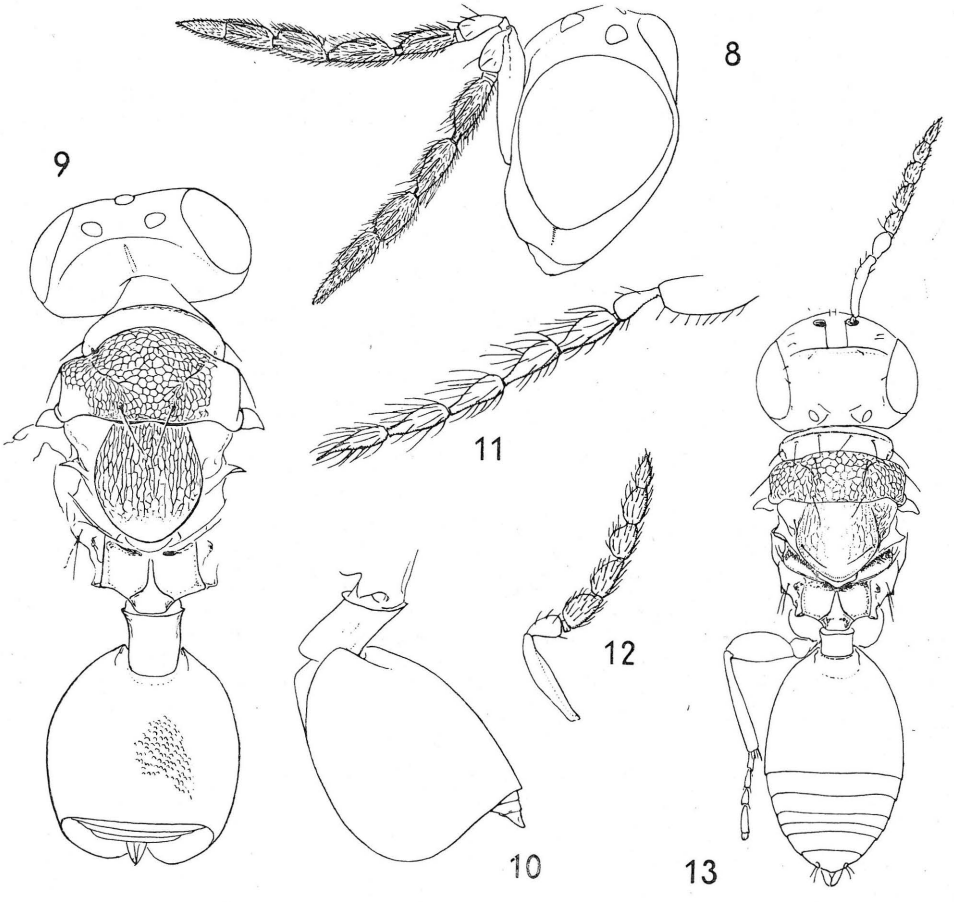
P. epeus (Walk.) is certainly closely allied to *ulmi* (Erd.) and *deplanatus,* n. sp., and forms with them a group of its own, suggesting some relation to the *epigonus*-group. Probably also *P. flaviscapus* (Thoms.) is near to this group.

In the following I describe some more characters of *epeus,* in addition to those given in the key above.

F e m a l e. — Body black, but at least thorax with a slight metallic, mostly bluish, tint; tarsi pale at base, infuscate in distal half.

Head distinctly broader than mesoscutum; occiput sharply margined and shallowly emarginate, the ridge close to hind orbit and obliterate on temple; vertex usually distinctly reticulate, in larger specimens also the face; frons nearly smooth above the fork; the latter very wide, angle between its branches at least 140°. Interscrobal space narrow, slightly convex below. Malar space 2.5 times as short as vertical eye diameter, smooth, sulcus vaguely indicated. Antenna with four postpedicellar segments (ring segment hardly distinct) often each twice as long as broad, in the type of *epeus,* however, only the first of this length, the following segments shorter: the second about 8: 5, the third segment 7: 5 (Fig. 8).

Thorax 1.1 times as long as broad, convex. Pronotum arched, with collar ridge blunted, lateral corners rounded, not prominent. Mesoscutum not quite twice as broad as long, scapulae often prominent, shoulder-like in larger specimens, seen from above; surface all over distinctly reticulate, notaular depressions broad, not sharply delimited, each with the bristle posteriorly near inner margin. Scutellum as long as broad or hardly elongate, moderately convex, striate-reticulate, but with polished apex. Metascutellum with granulate band along base, slightly acute-angular laterally, in the middle slightly obtuse-angular, produced. Propodeum with very narrow intercarinal stripe, submedian carinae meeting



Figs. 8—11. *Pediobius epeus* (Walker). — 8. Head of female in side view, with antennae. — 9. Body of female with sculpture partly indicated. — 10. Abdomen of female in side view (the same specimen as Fig. 9). — 11. Male antenna (depicted at the same power as Fig. 8). — Fig. 12. *Pediobius ulmi* (Erdös), antenna of female. — Fig. 13. *Pediobius deplanatus,* n. sp., holotype: body of female with sculpture on thorax partly indicated.

at base; each submedian area slightly longer than broad, posteriorly often granulate, its outer posterior angle sharp to rightangled, but posterior margin obliquely descending to the short subglobose nucha, shorter than the often blunted plica; supracoxal angulation low, not protruding backwards; metapleural convexity prominent, right-angular. Forewing with costal cell bare, speculum small and closed, stigmal vein very short and postmarginal vein absent; marginal vein with prestigma longer than width of mesoscutum as 7:5. Spur of hind tibia about as long as width of the latter, half the length of the slender basitarsus which is slightly longer than the second tarsal segment.

Abdominal petiole distinctly elongate, subcylindrical, its anterior

margin highly arched and overlapping nucha; surface dull, very finely striate-reticulate. First gastral tergite always convex, longer than broad, covering most part of gaster (the following tergites often more or less retracted), narrowed posteriorly, finely strigose-alutaceous dorsally and on sides. See Figs. 9 and 10.

Length of body 1.2—2 mm.

Male. — Similar to female, but distal tergites more retracted under the large first gastral tergite (which is not longer than broad); abdominal petiole fully twice as long as broad; antenna longer. Scapus distinctly expanded, about 2.7 times as long as broad, compressed, with sharp ventral edge and abruptly petiole-like, narrowed at apex; pedicellus much shorter than the basal funicle segment, this and the following segments distinctly petiolate, tapering apically, covered with rather long hairs (Fig. 11). Length 1.6 mm.

Hosts not known.

Distribution: Britain, Germany, Czechoslovakia, Hungary, Moldavian S.S.R.

Material examined. — Britain: type of *epeus* and another female specimen. — Germany: Aachen, with manuscript name *"cumatis"*, another identified as *"lucens* Nees" (Förster); Bavaria, München, 27. VII. 1959 (Bachmaier). — Czechoslovakia: Bohemia, Jedlová near Rumburk, 29. VI. 1957 (Bouček); Deblík Hill near Ústí nad Lab., 26. VII. 1956 (Bouček); Řevničov, 14. VIII. 1955 (Bouček); Řevnice near Praha, 12. IX. 1955 (L. Masner); Kunratice near Praha, 26. VII. 1962 (Bouček); Velký Vřešťov, 12. VIII. 1956 (Bouček); Týniště nad Orl., 12. VIII. 1959 (Bouček); Moravia, Dolní Věstonice, 4. VII. 1952 (Hoffer); Bzenec, 21. VII. 1942 (Šustera). — Hungary: the mentioned syntype of *longicornis* from Tompa. — Moldavian SSR: Kishinev, V. 1958 (Talitzki). —

Pediobius ulmi (Erdös), comb. nova

Pleurotropis ulmi Erdös, 1954, Ann. hist.-nat. Mus. Nat. Hung., s. n. **5**: 352; ♀.

As already mentioned this *Pediobius* is very near to *epeus* (Walk.). It differs from all *epeus* known to me mainly by the shorter antennae (Fig. 12). I had the type of *ulmi* for examination and comparison with my specimens in 1959, kindly sent to me by Dr. Erdös.

Hosts unknown. The type collected on leaves of *Ulmus glabra.*

Distribution: Czechoslovakia, Hungary.

Material examined. — Czechoslovakia: Bohemia, Nová Oleška near Děčín, IX. 1962 (Mikula); Pokratice, 25. VI. 1959 (Strejček); Sedlo Hill near Litoměřice, 6. VIII. 1964 (Bouček); Veltrusy, 26. V. 1964 (Mikula). — Hungary: Tompa, the type female of *ulmi.*

Pediobius deplanatus, sp. nova

Although dissimilar at first glance this species is certainly closely allied to *P. epeus* (Walk.). Like the latter it possesses the characteristic very short stigmal vein, with postmarginal vein absent, the dull, elongate abdominal petiole, the large first gastral segment, the submedian carinae on propodeum close to each other, etc. Superficially, however, the new species reminds one by its unusually depressed body, of *P. phragmitis,* n. sp. and differs by this character from all other European species. It

may be easily distinguished from *phragmitis* not only by the characters it has in common with *epeus* and *ulmi,* but also by the very short spur of hind tibia.

F e m a l e. — Body black, here and there with a very faint bluish tint; mid and hind tarsi pale at base, infuscate at apex. Wings hyaline, venation brown.

Head broader than mesoscutum as 16.7:13, seen from above moderately transverse, subcrescentic, with occiput very deeply excavated and sharply margined, even in upper third of the distinct temples, the ridge very high in the middle, vertex rather strongly sloping forward, nearly smooth, even in its narrowest part anteriorly more than half as wide as head (9:17); frons between the fork and ocelli polished, with only two bristles (one on either side sublaterally), apart from several orbital hairs; the fork nearly straightened (angle about 170°). Head in facial view transverse-oval, with inner orbits nearly straightly diverging downwards; interscrobal area very broad, almost parallel-sided, smooth, flat, only between antennae hardly convex. Eyes relatively small, finely pubescent, oval (about 5.7:8); malar space smooth with distinct sulcus, about three times as short as the longest diameter of eye. Antenna slender, subfiliform; scapus not nearly reaching the ocellus, almost as long as pedicel plus two basal funicle segments; funicle bisegmented but clava with its three segments very clearly separated so that there is no sharp difference between the two parts; pedicellus and following three segments subequal in length, each about 1.6 times as long as broad, none of them petiolate; clava slightly tapering to apex, its third segment pointed, with rather stout terminal spine.

Thorax strongly depressed, 1.5 times as long as mesoscutum broad. Pronotum with collar relatively very broad, its anterior margin broadly arched, lateral corners rounded. Mesoscutum very short, almost three times as broad as long, all over reticulate, meshes on posterior half of mid lobe slightly elongate; notaular depressions very shallow, not delimited, with the bristle posteriorly, behind middle of depression. Scutoscutellar suture slightly sinuate. Scutellum as long as broad, flat, polished in posterior third and along median line, with sides distinctly longitudinally alutaceous. Metascutellum linear. Propodeum deeply and narowly impressed along base, with submedian carinae meeting anteriorly and archedly diverging backward; nucha distinct, separated by arched cross-furrow; submedian area as broad as long, its outer corner slightly obtuse-angular, the posterior carinaceous margin as long as 2/3 the plica; supracoxal angulation not unusually prominent. Forewing with costal cell bare, speculum small and completely closed; marginal vein with prestigma hardly longer than width of mesoscutum, postmarginal vein absent, stigmal vein scarcely twice as long as broad, hardly longer than width of costal cell. Hind tibia with spur shorter than width of tibia, basitarsus not shorter than the second tarsal segment.

Abdominal petiole subcylindrical (Fig. 13), slightly longer than broad, its surface dull, extremely finely strigose-granulate; its anterior

margin arched and overlapping nucha, but corners not protruding. Gaster about 1.7 times as long as broad (22: 13), subequal in length to thorax, dorsally sunken in the type (a dry specimen), the sides converging at apex at about 80°. First gastral tergite smooth, distinctly surpassing middle of gaster, with hind margin straight.

Length of body (Fig. 13) 1.2 mm.

Male. — Unknown.

Host unknown.

Distribution: Czechoslovakia.

Holotype (female): Bohemia, Lužany near Plzeň, 25. VII. 1954 (Skuhravý lgt.); deposited in the Prague National Museum (Entomology), Cat. No. 25.630.

Pediobius alcaeus (Walker)

Entedon Alcaeus Walker, 1839, Monogr. Chalc., **1**: 94—95; ♂♀.
Elachestus politus Ratzeburg, 1848, Ichneum. d. Forstins., **2**: 174; ♂♀. **N. syn.**
Pleurotropis polita; Thomson, 1878, Hym. Scand., **5**: 254.
Asecodes politus; Schmiedeknecht, 1909, Genera Ins., **97**: 436.
Pleurotropis politus; Bukowski, 1938, Rev. Ent. URSS, **27**: 167.
Pediobius alcoeus; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 189.

Last year (1962) I had the opportunity of comparing my specimens with the Walker type of *alcaeus.* The collection of the Berlin Zoological Museum contains this species as *politus* Ratz. and recently I examined also material presumably forming a remnant of the Ratzeburg collection of Eberswalde, containing also *E. politus* Ratz. In a paper printed in Germany (Bouček, 1964, *Beitr. z. Ent.*) I synonymize the latter name with *alcaeus,* in full agreement with the opinion of Dr. de V. Graham of Oxford.

This species is very characteristic (Fig. 14) and most records in literature are most probably correct. *P. alcaeus* seems to belong to a species-group called *Eupleurotropis* by Girault, in Europe together with two other, also very distinctive species, viz. *termerus* (Walk.) and *coxalis,* n. sp. Also North-American *P. longfellowi* (Grlt.), type-species of *Epipleurotropis* Grlt., must be very near to *alcaeus.* The chief characters are given in the key above, but the following additional ones seem also important.

Female. — Body metallic green and bluish, only segments 1 to 3 of mid and hind tarsi white.

Occiput sharply margined only in median third; head distinctly reticulate, sculpture weak between branches of the fork and especially on face below antennae; malar space and space between ventral extremity of eye and antennal socket smooth. Frontal fork diverging at about 90°; interscrobal stripe raised into high, sharp vertical crest; malar space three times as short as vertical eye diameter.

For thorax see Fig. 14. Mid lobe of mesoscutum with both paires of bristles very long, the posterior ones situated near the step-like inner margins of the smooth notaular depressions. Forewing with bare costal cell and rather large speculum which is completely closed below and basally; postmarginal vein subequal in length to the stigmal which

is about twice as long as width of costal cell. Apex of hind tibia broader than length of the spur, the latter distinctly shorter than basitarsus, which is again shorter than the second segment of hind tarsus.

Abdominal petiole stout, with sides slightly carinate (in side view) and, seen from above, with sides distinctly converging backwards and dorsal surface coarsely rugose anteriorly, granulate and depressed posteriorly. Gaster in female as long as thorax, dorsally sunken after death. First tergite smooth, not surpassing the basal third of gaster; its hind margin arched. Sides of gaster apically converging at angle of about 70°, sixth tergite semicircular, about 2.3 times broader than long.

Male similar except for antennae (Fig. 15) and gaster, which is mostly circular.

Length (in both sexes) 1.8 —2.7 mm.

Hosts: (LEP.) *Lithocolletis blancardella* F. in Germany; *L. cavella* Zell. in France and Germany; *L. coryli* Nic. in Sweden, Germany and France; *L. kleemannella* F. in Germany: *L. maestingella* Zell. (= *faginella* Zell.) in Germany and the Crimea; *L. malifoliella* Zell. in Germany and Italy; *L. nicellii* Stt. in Austria; *L. populifoliella* Tr. in Czechoslovakia; *L. quercifoliella* Zell. in Sweden and Germany; *L. rajella* Zell. (= *alniella* Zell.) in Denmark, France and Czechoslovakia; *L. salicicolella* Sirc. in Czechoslovakia; *L. salictella* Zell. in Czechoslovakia; *L. schreberela* F. in Sweden and Germany; *L. spinolella* Dup. in Sweden, Czechoslovakia and Germany; *L. strigulatella* Haw. in Czechoslovakia and Germany; *L. ulmifoliella* Hb. in Czechoslovakia, Germany and Italy; *Lithocolletis* sp. in Austria; *L.* sp. in *Alnus* in Czechoslovakia; *L.* sp. in *Quercus* in Germany and Czechoslovakia; *L.* sp. in *Salix* in Italy. — References to the host-records: Bukowski, 1938; Fulmek, 1962; Heyden, 1894; Ratzeburg, 1848, 1852.

Pediobius alcaeus is probably essentially a primary parasite, so far known only from lepidopterous leaf-miners. In Czechoslovakia it prefers shady damp places.

Distribution: throughout Europe: Britain, Sweden, Denmark, Germany, France, Italy, Austria, Czechoslovakia, Hungary, European USSR.

Material examined. — Britain: Berks., Bagley Wood, 3. VI. 1962 (Bouček); and further material collected by several English colleagues. — Sweden: specimens in C. G. Thomson's and Dr. Hedqvist's collections; then: Blekinge, Högatofta, 19. VI. 1962 (Bouček); Skåne, Lomma, 16. VI. 1962 (Bouček). — Denmark: Lemrig, ex *L. alniella,* VII. 1944 (Sönderup). — Germany: (DBR) Gahrenberg near Hann. Münden, ex *Lithocolletis* sp. on *Quercus* and ex *L. faginella* (lg. E. Priesner); Schleswig-Holstein, ex *L. faginella* in *Fagus, L. strigulatella* in *Alnus* and *L. ulmifoliella* in *Betula,* 1963 (E. Führer); (DDR) Thüringen (Schmiedeknecht); Ins. Rügen, Baabe, VII. 1960 (Bouček). — Czechoslovakia: Bohemia, Fláje, Krušné hory (= Erzgebirge), 16. VIII. 1956 and 5. VII. 1959 (Bouček); Šumná near Litvínov, 3. VI. 1956 (Bouček); Bělá near Děčín, 20. VIII. 1956 (Bouček); Maxičky near Děčín, 8. VII. 1956 (Bouček); Jedlová near Rumburk, 29. VI. 1959 (Bouček); Deblík Hill near Ústí nad Lab., 15. VI. 1957 (Bouček); Břehyně near Doksy, 12. VII. 1959 (Bouček); Peřimov near Semily, 14. X. 1962 (Dlabola); Nový Hradec Králové, 18. VIII. 1959 (Bouček); Hradec Král.—Věkoše, 8. VIII. 1956 (Bouček); Týniště nad Orl., 20. VIII. 1959 (Bouček); Černošice near Praha, 29. VI. 1933 (Šustera); Praha-Grébovka, 16. IX. 1925 (Novický); Praha, ex *L. populifoliella,* 1958 (Bouček); Kytín in Brdy-Hills, VII. 1959 (Macek); Prachatice, 29. VIII. 1884 (Hand-

lirsch); Moravia, Radostín near Velké Meziříčí, ex L. *salicicolella* in *Salix aurita,* V. 1958 (Gregor); Křtiny near Brno, ex *L. alniella,* III. 1959 (Gregor); Slovakia, Cígel' near Prievidza, 17. VII. 1959 (Bouček); Rakúsy, ex *L. ulmifoliella, L. spinolella,* and *L. strigulatella,* 1958 (Gregor); V. Fatra, Gäderská dolina, ex *L. salictella* and *L. spinolella,* 1957 (Gregor); Pribylina, ex *L. salictella* in *Salix purpurea,* 1954 (Gregor); Kežmarské Žleby, *ex L. spinolella,* 1954 (Gregor); Pata Forest near Vráble, ex *Lithocoll.* sp. in *Alnus* and *Lithocoll.* sp. in *Quercus,* Spring 1956 (Čapek); Banská Štiavnica-Kysihýbel, ex *Lithocoll.* sp. in *Alnus,* Spring 1956 (Čapek). — Austria: Linz, ex *Lithocoll.* sp., 9. IV. 1911 (Hauder); Böhlerwerk a. d. Ybbs, ex *L. nicellii,* 1950 (Novitzky); Piesting near Wien, 1869 (Tschek). — Italy: M. di Campliglio, 1550 m., ex *Lithocoll.* sp. in *Salix caprea,* 2. V. 1938 (Hartig). — U. S. S. R.: Pavlovsk near Leningrad, 17. IX. 1963 (Bouček). —

Pediobius termerus (Walker)

Entedon Termerus Walker, 1839, Monogr. Chalc., **1**: 96; ♀.
Entedon Nephthe Walker, 1839, Monogr. Chalc., **1**: 107—108; ♀. **N. syn.**
Horismenus Clinus Walker, 1844, Ann. Mag. nat. Hist., **14**: 408; ♂ **N. syn.**
Entedon Clinus: Walker, 1848, List Spec. Hym. Ins. Coll. Brit. Mus., 2, Chalc., addit. Spec., p. 140.
Pediobius termerus; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 190.

During my stay in London and Oxford in 1962 I had the opportunity of comparing my Czechoslovak specimens with the type of *termerus,* as well as with further British material in the collection of my esteemed friend Dr. de V. Graham. I saw then also the types of *E. nephte* (this without abdomen) and of *Horismenus clinus,* which in my opinion belong to *termerus.*

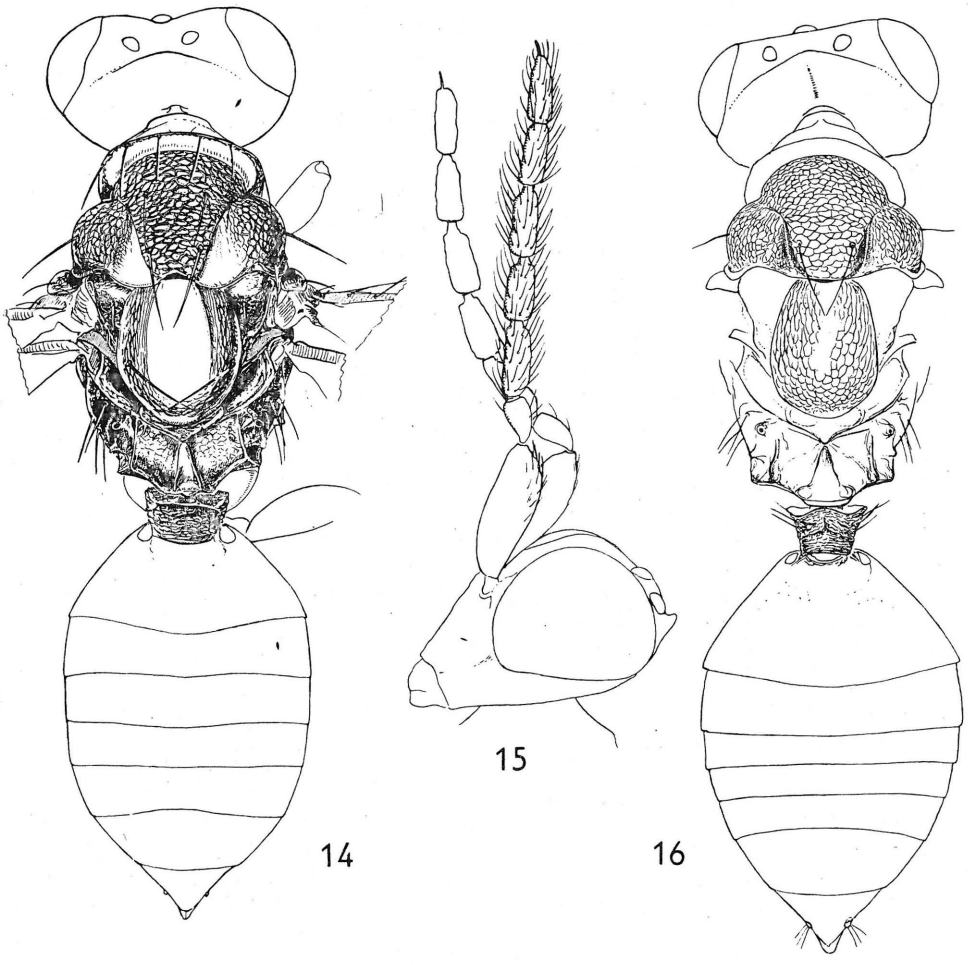
P. termerus seems to belong together with *P. alcaeus* and *coxalis* to the same species-group, distinctive by the form of the propodeum, which is raised medially into a tooth against the metanotum, and by the rather deep notauli which bear no bristles (these are situated on the mid lobe of the mesoscutum). Apart from the characters mentioned in the key above the following ones may be emphasized.

Body metallic, only basal segments of mid and hind tarsi more or less pale. Occiput sharply margined in more than half of the width of head, which is distinctly reticulate except for a smooth triangle above the fork; sculpture obliterate in a stripe between eye and antennal socket and on malar space, the latter about 3.3 times as short as the vertical eye diameter (4:13). Frontal fork diverging at an angle of about 120°; interscrobal stripe raised, crest-like, high and sharp in upper half.

Thorax convex, slender. Pronotum long, especially the collum (part anterior to the sharp collar cross-ridge). Mid lobe of mesoscutum with posterior pair of long bristles distinctly situated on this sclerite, not in notaular depressions, which are deep, furrow-like, minutely reticulate-rugulose on bottom. Forewings and legs nearly as in *P. alcaeus,* also abdominal petiole and gaster, but all these parts a little more slender, as are the antennae, in both sexes.

Length of body (Fig. 16) in female 1.7—2.4 mm., in male 1.2—2.4 mm.

Hosts are not yet known. *P. termerus* is in Czechoslovakia a forest element, with preference for shady, damp places. In the High Tatra Mountains it was found abundantly at an altitude of 1350 m.



Figs. 14—15. *Pediobius alcaeus* (Walker). — 14. Body of female with sculpture on thorax and petiole indicated. 15. Male head with antennae in side view. — Fig. 16. *Pediobius termerus* (Walker). Body of female with sculpture partly indicated.

Distribution: Britain, Sweden, Czechoslovakia (probably all over Northern and Central Europe).

Material examined. — Britain: several specimens from England including the types of *termerus, nephthe* and *clinus*. — Sweden: Skåne, Lomma, 16. VI. 1962 (Bouček). — Czechoslovakia: Bohemia, Fláje, Krušné hory, 16. VIII. 1956 (Bouček); Bělá near Děčín, 20. VIII. 1956 (Bouček and Boučková); Černošice near Praha, 29. VI. 1933 (Šustera); Chabry near Praha, 3. VII. 1934 (Šustera); Praha-Podhoř, 13. VI. 1954 (Bouček); Radotín near Praha, 2. IX. 1942 (Šustera); Neratovice, VI. (Ogloblin); Malá Skála near Turnov (Obenberger); Velký Vřešťov, 4. VIII. 1956 (Bouček); Dobrošov near Náchod, VII. 1956 (Macek); Broumov, VII. 1917 (J. Sekera); Slovakia: Vysoké Tatry, Smokovec, 1350 m., 21. VIII. 1958 (Bouček); Zádiel, VI. 1956 (L. Masner).

Pediobius tetratomus (Thomson)

Pleurotropis tetratomus Thomson, 1878, Hym. Scand., **5**: 257; ♀.
Rhopalotus tetratomus; Dalla Torre, 1898, Cat. Hym., **5**: 31.
Pediobius tetratomus; Graham, 1963, Trans. Soc. Brit. Ent. **15**: 200.

This is so far the only known European species of the genus having four distinctly separated funicle segments in the female antenna. Otherwise *P. tetratomus* seems to be allied to *alcoeus, termerus* and *coxalis,* especially by the form of the propodeum, which is (in side view) distinctly elevated anteriorly in the middle and tooth-like.

The following description may complete the characters used in the key above.

F e m a l e. — Metallic green; tarsi except claw segment whitish, but front tarsi more or less infuscate. Wings hyaline.

Head sligthly broader than mesoscutum (25.5:23), fully twice as broad as long (25.5:12; minimum thickness in the middle, 9); occiput shallowly excavated, sharply margined, also temples above distinctly ridged; vertex and upper face densely reticulate; frons between branches of the fork which diverge at an angle of about 130°, as well as malar space and a broad band between ventral extremity of eye and antennal socket, smooth; lower face sublaterally finely reticulate. Interscrobal space dull, elevated as a blunted vertical crest which is, however, lower than in *P. alcaeus.* Eye relatively small and malar space large (Fig. 23), almost half as long as vertical eye diameter (6:13). Antenna rather long and stout, with clearly four-segmented funicle; scapus not nearly reaching the ocellus, not quite as long as pedicellus plus first funicle segment; pedicel plus flagellum less clava hardly shorter than width of head; pedicellus subglobose, hardly elongate, distinctly narower and shorter than the first funicle segment; the latter about 1.5 times as long as broad, the second segment hardly longer than broad, the third and fourth subquadrate; funicle segments and clava about the same width, all denselly hairy, hairs about half the width of each segment; clava with distinct terminal spine, otherwise subconical, unisegmented, as long as first funicle segment (Fig. 22).

Thorax only about 1.6 times as long as broad (37:23), not depressed. Pronotum relatively short, its lateral angles rounded, not protruding. Mesoscutum short, coarsely reticulate, with smooth triangular notaular depressions; posterior bristles of median lobe situated in depressions at inner margin (as far as I can see in the only specimen at my disposal). Scutellum convex anteriorly, flattened posteriorly, coarsely reticulate, very sligthly longer than broad; inner angle of axilla in one plane with scutellum and scapula. Propodeum not punctured, subhorizontal; submedian carinae parallel in anterior 3/5, broadly diverging posteriorly, stripe between them groove-like, though raised anteriorly when seen from the side, then tooth-like, projecting against the short metascutellum; nucha not segregated; plicae slightly diverging, low anteriorly, high posteriorly; submedian area impressed at hind margin which is only 2/3 as long as plica, and angle between them about 105°; postero-lateral cor-

ner hardly visible from above, situated very low. Metapleura with high, conically projecting corner seen from above. Forewing with small, closed speculum, bare costal cell, and stigmal vein hardly as long as the postmarginal and only 1.5 times as long as width of costal cell. Spur of hind tibia short; first segment of hind tarsi about as long as the second.

Abdominal petiole longer than broad, its surface densely minutely reticulate, its anterior margin archedly overlapping apex of propodeum, anterior corners tooth-like, protruding sidewards. Gaster hardly longer than thorax less propodeum, oval, sides apically converning at about 80°; first tergite smooth, its hind margin arched medially and surpassing middle of gaster; sixth tergite about twice as long as the fifth and about 3.5 times as broad as long, extremely finely alutaceous.

Length of body 1.9—2.6 mm.

Male. — Unknown.

Host not known.

Distribution: Britain, Sweden, Germany, Czechoslovakia, Hungary, South of European USSR (Crimea).

Material examined. — Sweden: the type of *P. tetratomus* in the C. G. Thomson collection in Lund. — Germany: Thüringen, one female (Schmiedeknecht lg.). — Czechoslovakia: Bohemia, Starkoč near Náchod, forest undergrowth, VII. 1961 Macek). — U. S. S. R. Crimea: Savlyk-Su, Krymskii zapovednik, 28. VIII. 1929, one female in the Zool. Inst. A. N. in Leningrad, det. as *Pleurotropis tetratoma* by Bukovski. — I have seen also the specimen announced from Hungary by Erdös, 1956 (p. 42).

Pediobius cothurnatus (Nees), comb. nova

Cynips foliorum Geoffroy in Fourcroy, 1785, Entom. Paris., **2**: 388. **N. syn.**
Cynips foliorum; Olivier, 1790, Encycl, méthod. Ins., **5**: 789.
Elachestus cothurnatus Nees, 1834, Hym. Ichneum. affin. Monogr., **2**: 141; "♀♂".
Elachestus gradualis Nees, 1834, ibidem, **2**: 142; ♂.
Entedon Argon Walker, 1839, Monogr. Chalc., **1**: 101—102; ♀. **N. syn.**
Entedon cothurnatus; Walker, 1848, List Spec. hym. Ins. Coll. Brit. Mus., 2-Chalc., addit. Spec., p. 136.
Rhopalotus cothurnatus; Förster, 1856, Hym. Studien, **2**: 80.
Rhopalotus gradualis; Förster, 1856, Hym. Studien, **2**: 80.
Rhopalotus foliorum Olivier: Giraud et Laboulbène, 1877, Ann. Soc. ent. France s. 5, **7**: 431.
Pleurotropis (Rhopalotus) cothurnata; Thomson, 1878, Hym. Scand., **5**: 255—256.
Chrysocharis kraussei Wolff, 1916, Ent. Mitt., **5**: 278—280; ♀♂. **N. syn.**
Pleurotropis gradualis; Erdös, 1956, Folia ent. hung., s. n., **9**: 41.
Pediobius argon; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 190.

I do not know whether the original material of *foliorum* is still somewhere in existence or not. Unfortunately also the description of Geoffroy is quite inadequate: "*C. foliorum* sine gallà, totus nigro-viridis nitens. Loc. Larva vel chrysalis foliis adhaeret" (I owe it to my friend Dr. J. R. Steffan of Paris). The first subsequent author, Olivier, 1790, added, however, some very valuable data which enabled Giraud, 1877, to recognize in *foliorum,* I hope correctly, the present *Pediobius cothurnatus.* The correctness seems to be confirmed by what we know today about the peculiar habit of the species described in detail and figured by Wolff, 1916. Namely, within the whole subfamily this is the only

known species the pupae of which are found (as refered to) gregariously and freely exposed upon leaves, similarly to the species of the genus *Eulophus* Oliv. and to *Sympiesis capeki* Bčk. of the Eulophinae. My reason why I do not use the name *foliorum* for the species is that *cothurnatus* has become a rather well established name in the literature in the last 100 years, and *foliorum* a nomen oblitum.

The types of *cothurnatus* Nees, 1834, and of *gradualis* Nees, 1834, seem to be lost, but the original description is rather well done and most authors agree as to the interpretation of these species. Already Walker, 1848, synonymized his *argon,* the type of which was studied recently by Dr. Graham, with *cothurnatus.* And after him this species has been mentioned, or identified as *cothurnatus* by Förster, Thomson, Schmiedeknecht, Ruschka, Ferrière, Novitzky, Szelényi, etc. Also Dr. Graham now agrees with the acceptance of this name for the species he published as *argon* in 1959. Dr. Erdös' *Rhopalotus cothurnatus* of 1956 (p. 42) is *Pediobius brachycerus* (Thoms.), but in the same paper he mentioned the present *cothurnatus* under *Pleurotropis gradualis* (Nees) (1956, p. 41).

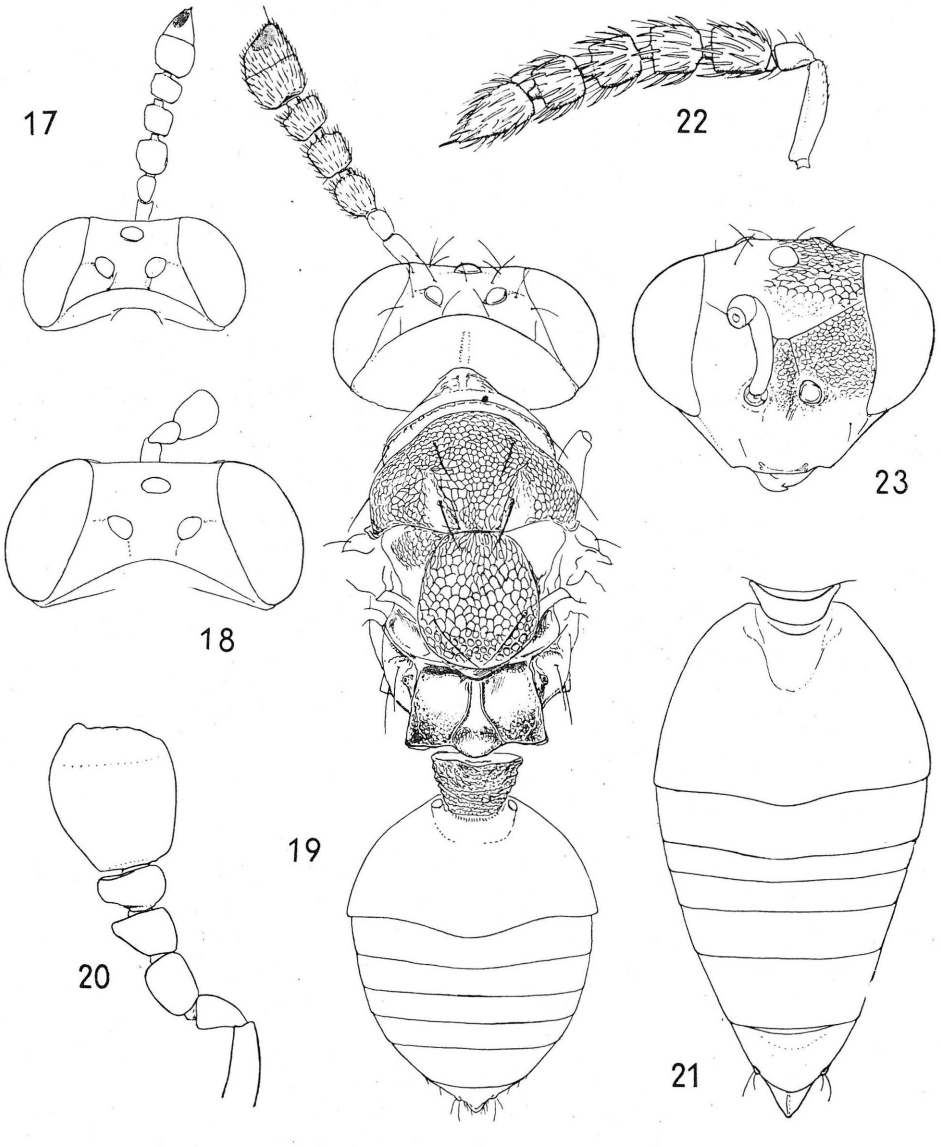
As already mentioned the type of *Entedon argon* Walk. is preserved in the British Museum (Natural History) in London, where it was studied by Dr. Graham. I saw it also, in 1962.

The types of *Chrysocharis kraussei* Wolff consisting of one male and one female are deposited in the Deutsches Entomologisches Institut in Berlin-Friedrichshagen. They are conspecific with *cothurnatus.* The male is labelled "*Chrysocharis kraussei* Wolff Eberswalde 1915 ♂♀", probably in Wolff's handwriting and both bear another label "Eberswalde Wolff ded. 1915", apart from the red Typus label and the designation of the sex (cf. Wolff, 1916, p. 280).

Pediobius cothurnatus (Nees), probably together with the still little known *P. claviger* (Thomson), seem to form a rather distinct species-group. The first of them is the type-species of *Rhopalotus* Förster, 1856, a genus then erected and based upon the combination of the clavate antennae in female and the high, step-like plicae of the propodeum, the submedian areas of which form a striking, horizontal shelf. However aberrant these body parts are, in the general shape they do not differ considerably from those in other species of the genus, and the male antenna is of a quite common type. The inflated clava in female of *cothurnatus* bears an area of micropilosity not observed in the other species and the terminal spine is hair-like, long, less conspicuous. I do not think that owing to these features the species-group should deserve a generic status and take *Rhopalotus* as a mere synonym to *Pediobius.*

The following characters of the species may complete those mentioned in the key.

F e m a l e. — Head distinctly broader than mesoscutum, as 31.5:25, with very large pubescent eyes; vertex reticulate except a narrow stripe along posterior orbits, narrower than half the width of head (14:31); occiput deeply emarginate and sharply margined above as well as on temples; frontal fork diverging at about 100°, reticulation above the fork obliterate; inner orbits distinctly emarginate; interscrobal space re-



Figs. 17—19. *Pediobius cothurnatus* (Nees), female. — 17. Head in dorsal view, of a specimen from eastern Canada. — 18. Dtto, of a Czechoslovak specimen (antenna not depicted). — 19. Body of female with sculpture partly indicated; on the antenna, as well as in Fig. 17, the area of micropilosity indicated. — Figs. 20—21. *Pediobius claviger* (Thomson), female, holotype. — 20. Antenna. — 21. Abdomen in dorsal view. Figs. 22—23. *Pediobius tetratomus* (Thomson), female. — 22. Antenna. 23. Head in facial view, with sculpture partly indicated.

ticulate, hardly convex above but distinctly raised between antennae; lower face nearly smooth; malar space 3.5 times shorter than vertical eye diameter, with a small subtriangular granulate area at lower eye extremity. Scapus not nearly reaching to the ocellus, hardly longer than first two funicle segments together; pedicellus slightly longer than broad, much narrower and shorter than first funicle segment; ring segment distinct, double; funicle three-segmented, densely pubescent, all segments subequal in width, but strongly decreasing in length, the first slightly elongate, the third about 1.5 times as broad as long, transverse; clava bisegmented, slightly to considerably broader than funicle, terminal spine transformed into a thin hair (Fig. 19).

Pronotum strongly arched, broadly rounded at sides. Mesoscutum reticulate, notaular depressions nearly smooth, with the bristle situated in the middle of the depression at inner margin; hind margin of mid lobe straight but narrow. Scutellum oval, slightly longer than broad, posteriorly rather flat, all over reticulate, meshes anteriorly elongate; apex slightly raised, very slightly subangularly protruding. Metascutellum narrow, smooth, impressed sublaterally. Propodeum very large, horizontal between the parallel plicae, smooth except for hind part of submedian areas which is usually coarsely reticulate to rugose; submedian carinae subparallel anteriorly, space between them shallowly groove-like, often subdivided by a weak median carina; nucha not developed, but hind margin at petiole narrowly emarginate; supracoxal angulation hidden deep under the protruding corner of submedian area which is subrectangular to distinctly acute; spiracle deeply under level of plica, but nearer to the later than to margin of metanotum; spiracular sulcus deep; metapleural convexity high from above, right-angular to acute-angular. Forewing with basal cell bare, speculum closed, small; postmarginal vein usually slightly longer than stigmal vein, which is hardly 1.5 times as long as width of costal cell. Spur of hind tibia not longer than width of the latter.

Abdominal petiole subhexagonal, transverse, its short base submarginate, the surface dull, finelly and deeply granulate, uneven, with shallow median depression posteriorly. Gaster hardly longer than thorax less propodeum. First gastral segment not reaching middle of gaster, smooth, its posterior margin distinctly produced medially, the following tergites alutaceous.

Length of body 1.8—2.3 mm.

Male. — Similar to female except for antennae and abdomen; colouring of body usually more vividly green to brassy or golden (often much duller in female). Clava of the slender antenna bisegmented, without any patch of micropilosity, its first segment slightly longer than broad, the second narrower, bearing the usual terminal spine which is hardly as long as the narrow petiole between third funicle segment and clava. Length 1.5—2.2 mm.

The Canadian female specimen mentioned below differs from the European *cothurnatus* only in having relatively larger eyes (Fig. 17), with minimum width of vertex in relation to width of head as 10.5:27.

In spite of this discrepancy I consider the specimen conspecific with *cothurnatus.* Probably a name was made available in North America for this species, but then it is unknown to me.

Hosts: The mentioned references Giraud et Laboulbène, 1877, and Wolff, 1916, report that the specimens in question came from dark pupae found on leaves of *Quercus* and *Platanus,* respectively. The recent host records from Czechoslovakia suggest that the species is essentially (or, exclusively?) a hyperparasite, attacking mainly the *Eulophus* species, primary parasites of various catepillars. Therefore the photographed pupae in Wolff's paper (pl. 4, fig. 6) probably did not belong to his *Chrysocharis kraussei* (= *cothurnatus*), but to its host species, a *Eulophus,* as well as the pupae mentioned by Olivier, 1790, and by Giraud et Laboulbène, 1877. The only reliable hosts known to me are: *Eulophus larvarum* (L.) *in Tortix viridana* (L.) and *Eulophus* sp. in *Lymantria dispar* (L.) (from another caterpillar there was reared *Eulophus slovacus* Bčk.). Another host record is *Archips crataegana* (Hbn.) in Czechoslovakia.

Distribution: Britain, France, Sweden, Germany, Czechoslovakia, Austria, Hungary, Moldavian S. S. R.; eastern Canada (Ontario).

Examined material. — Britain: type of *argon* in the Brit. Mus. (Nat. Hist.). — Sweden: C. G. Thomson's material of *Pleurotropis cothurnata.* — Germany: Aachen, coll. Förster (in Vienna), det. *Rh. cothurnatus* Nees (♀♀) and *Rh. gradualis* Nees (♂♂) by Förster; Thüringen (Schmiedeknecht). — Czechoslovakia: Bohemia, Šumná near Litvínov, 3. VII. 1956 (Bouček); Děčínský Sněžník, 27. VII. 1956 (Bouček); Maxičky near Děčín, 8. VII. 1956 (Bouček); Jedlová near Rumburk, 29. VI. 1957 (Bouček); Deblík Hill near Ústí nad Lab., 26. VII. 1956; Lovoš Hill near Litoměřice, 7. VII. 1956 (Bouček); Obříství near Mělník, 6. IX. 1959 Hoffer); Praha-Ruzyně, 12. VIII. 1953 and 23. IX. 1954 (Bouček); Kunratice near Praha, 9. X. 1962 (Bouček); Jevany-Habr, 14. VI. 1953 (Bouček); Prachatice-Fefry, 23. VIII. 1957 (Hoffer), Choustník near Tábor, 17. VIII. 1954 (Hoffer); Čelákovice nad Lab., 1927 (Novitzky); Chlumec nad Cidl., ex *Archips crataegana,* VI. 1960 (Hochmuth); Velký Vřešťov, 12. and 15. VIII. 1956 and 1961 (Bouček); Věkoše near Hradec Králové, 13. VII. 1955 (Bouček); Týniště nad Orl., 23. VII. 1955 (Bouček); Nové Město nad Met., VII. 1956 (Macek); Horní Lipka—Kralický Sněžník, 14. VIII. 1962 (Bouček); Moravia, Brno-Veselka, ex *Eulophus larvarum* in *Tortrix viridana,* 11. VI. (Gregor); Hodonín, 20. V. 1941 (Hoffer); Slovakia, Nová Vieska near Štúrovo, 30. VII. 1955 (Bouček); Dobrá Niva near Zvolen, ex *Eulophus* sp. in *Lymantria dispar,* 7. VII. 1953 (Jamnický); Hrhov near Rožňava, VI. 1956 (Čapek). — Austria: Wien-Mauer, 15. VII. 1952 (Fulmek); Sophien-Alpe, 17. VIII. 1960 (Šedivý). — Hungary: several specimens collected by Dr. Erdös and: Györ, V. 1918 (J. Sekera). — Moldavian SSR: Strasheny, 21. VII. 1961 (Bouček); Kopatsheny, 18. VII. 1961 (Bouček); Kishinev, 5. VII. 1963 (Talitzki); Bendery, 18. VII. 1963 (Talitzki). — Canada: Ontario, Montreal, Mont Royal, VIII. 1956 (Obenberger).

Pediobius claviger (Thomson)

Pleurotropis (Rhopalotus) clavigera Thomson, 1878, Hym. Scand., **5**: 256; ♀.
Rhopalotus claviger; Dalla Torre, Cat. Hym., **5**: 31.
Pediobius claviger; Graham, 1963, Trans. Soc. Brit. Ent., **15**: 199.

This rare and distinctive species has not been mentioned in literature since its description until Graham, 1963, except for catalogue works. It is certainly closely allied to *P. cothurnatus* (Nees) and may be easily recognized by the characters given in the key. I now publish several

more notes made from the type (kindly submitted to me for examination in 1958 from the Lund Zoological Institute):

Head semiglobose, only indistinctly broader than mesoscutum (20:18). Antenal clava (in female; Fig. 20) very broad and almost as long as all three funicle segments taken together. Axillar furrows more strongly converging forward than in *cothurnatus,* directed towards inner hind angle of the narrowly triangular notaular depressions. Propodeum with hind outer corner of submedian area slightly obtuse and hind margin of intercarinal space at abdominal petiole subtruncate. Abdominal petiole almost longer than broad, less narrowed posteriorly than in *cothurnatus,* its anterior margin highly arched, anterolateral corners sharp, the outline behind them (from above) emarginate. Gaster nearly twice as long as broad (31:16), its first tergite slightly surpassing the basal third (relative length to whole gaster as 12:31), hind margin distinctly produced medially (Fig. 21). Length of body 1.6 mm. Male unknown.

Hosts not known.

Distribution: Sweden, Britain.

Material examined. — Northern Sweden: the type female in the C. G. Thomson collection in Lund, and another female in coll. Dr. K. J. Hedqvist in Stockholm.

Pediobius saulius (Walker)

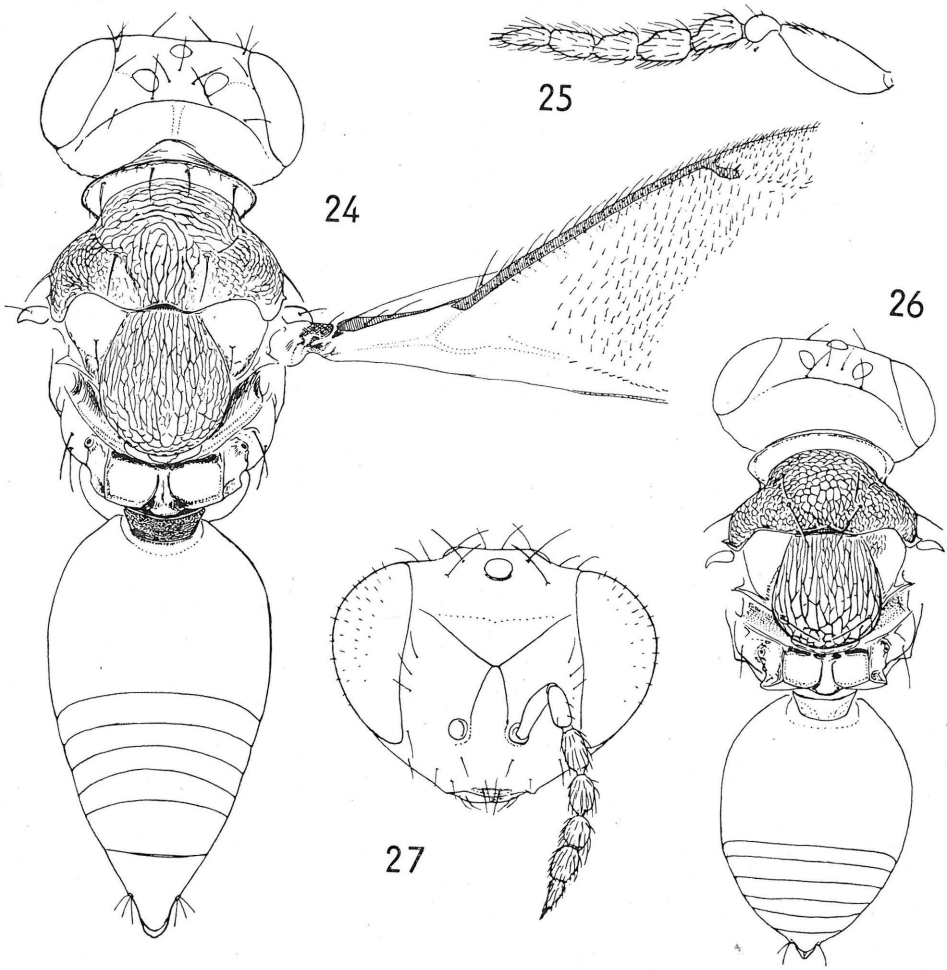
Entedon Saulius Walker, 1839, Monogr. Chalc., **1**: 115; ♀.
Entedon Linus Walker, 1839, Monogr. Chalc., **1**: 119—120; ♀. **N. syn.**
Eulophus obscuripes Ratzeburg, 1844, Ichneum. d. Forstins., **1**: 165; ♀.
Elachestus obscuripes; Ratzeburg, 1848, ibidem, **2**: 173.
Pleurotropis strigiscuta Thomson, 1878, Hym. Scand., **5**: 254; ♀♂. **N. syn.**
Pleurotropis obscuripes; Bukowski, 1938, Rev. Ent. URSS, **27**: 165—166.
Pediobius grandii Ferrière, 1953, Boll. Ist. Ent. Univ. Bologna, **19**: 401—402; ♀♂.
Pleurotropis obscuripes var. *laeta* Erdös, 1956, Folia ent. hung. (s. n.), **9**: 40—41; ♀.
Pediobius linus; Delucchi, 1958, Entomophaga, **3**: 260—261.
Pediobius saulius; Graham, 1959, Trans. Soc. Brit. Ent.,**13**: 189.
Pediobius saulius; Bouček, 1961, Trudy Mold. n.-issl. Inst. Sadov. Vinogr. Vinod., **7**: 24.

During my stay at the British Museum in 1962 I examined the types of *saulius* and *linus* and concur with the unpublished opinion of Dr. Graham that they represent the same species.

The original material of *Eulophus obscuripes* Ratz. seems to be lost but the original description together with the host record made it possible for Bukowski to recognize correctly, as I hope, this species. His excellent figures accompanied by a description (in Russian) clearly show *P. saulius,* with which I synonymized *obscuripes* in 1961 (p. 24).

Another subjective junior synonym of *saulius* is *Pleurotropis strigiscuta* Thomson. I have seen the lectotype of the latter in Lund and can confirn Dr. Erdös' opinion that it is the same species as *obscuripes* sensu Bukowski (Erdös, 1956, p. 3). Erdös' var. *laeta* does not differ morphologically from the typical *saulius,* but has its thorax of a splendid vivid green, almost brassy colour.

Pediobius grandii Ferrière was synonymized with *P. linus* by Delucchi, 1958, who examined the type material of *grandii.* The species was



Figs. 24—25. *Pediobius saulius* (Walker). — 24. Body of female with sculpture partly indicated (not on axillae, e. g.) and a part of forewing with the broadly open large speculum. — 25. Antenna of male. — Figs. 26—27. *Pediobius italicus,* n. sp., female. — 26. Body with sculpture on the thorax partly indicated. — 27. Head with antenna, in facial view.

cited as *linus* on the authority of Dr. Kerrich of London, but Graham subsequently used *saulius* as the valid name for the species, obviously owing to the good condition of its lectotype and the page precedence in the original publication (the latter is no mandatory provision according to the new Code).

Pediobius saulius is a very distinctive species, mainly by the form of the pronotum which has protruding lateral angles, and by the characteristic sculpture of the mesoscutum and scutellum. In these respects *saulius* is very near, however, to a new species from Italy, described here as *italicus.* From the latter it may be easily separated by the char-

acters given in the key, primarily by the much longer abdomen in the female sex (Fig. 24).

The following few characters may complete the descriptions published by Ferrière, 1953 *(grandii)* and by Bukowski, 1938 *(obscuripes)*.

Body usually bluish to black, except for var. *laeta* Erd., which has head and thorax vividly green. In males this colour occurs more often, at least on the head; it may turn to brassy or golden.

Occiput sharply margined, also temples in upper part; vertex distinctly depressed between eye, lateral ocellus and hind margin. Frontal fork with branches diverging at angle of 100—120°. Interscrobal space nearly flat above, but distinctly raised into a short high crest between antennal sockets. Inner orbit emarginate. Malar space fully four times as short as vertical eye diameter (4:17). Funicle segments usually distinctly broader than pedicellus, first funicle segment mostly 1.5 times to twice as long as broad.

Thorax seen from above deeply contracted between pronotum and mesoscutum, lateral corners of collar then strikingly protruding at right angle, because the pit at hind margin of pronotum just in front of notaular groove is here connected with a deep furrow-like depression below the corner (seen from the side); the depression radiately striate on bottom. Hind pair of bristles of mid lobe of mesoscutum situated in notaular depressions but shifted forward to middle of the sclerite. Propodeum with intercarinal stripe everywhere concave: submedian area slightly longer than broad, deeply depressed along anterior margin, its posterior carinaceous margin (straight part) 1.5 times as short as the plica, angle between both of them about 100°; supracoxal angulation not projecting backward beyond the mentioned angle. Metapleural convexity slight. Forewing with speculum large and completely open; basal cell bare, about 1.5 times to twice as narrow as length of the short stigmal vein, which is distinctly longer than the rudimental postmarginal vein. Spur of hind tibia about as long as width of tibia, distinctly shorter than basitarsus, this subequal in length to the second tarsal segment.

Gaster in female as long as thorax, its sides posteriorly converging at about 50—70°; sixth gastral tergite about three times as broad as long. See Fig. 24.

Length of body in female 1.5—2.2 mm., in male 1.0—1.6 mm.

H o s t s: (LEP.) *Ancylis upupana* Tr. in Czechoslovakia; *Bucculatrix ulmella* Zell. in Czechoslovakia; *Lithocolletis agilela* Zell. in Italy; *L. blancardela* F. in Italy; *L. corpinicolella* Stt. *(carpinifoliella)* in Switzerland; *L. comparella* Zell. in Switzerland, Hungary and western Kazakhstan (USSR); *L. coryli* Nic. in Hungary and Switzerland; *L. corylifoliella* Hbn. in the Moldavian SSR; *L. delitella* Zell. in Czechoslovakia; *L. distentella* Zell. in southern Europe; *L. lautella* Zell. in Austria; *L. manni* Zell. in Czechoslovakia; *L. messaniella* Zell. in southern Europe; *L. millierella* Stgr. in Italy; *L. platani* Stgr. in Czechoslovakia, Hungary and Italy; *L. populifoliella* Tr. in western Kazakhstan (USSR); *L. pyrifoliella* Grsm. in the Moldavian SSR; *L. quercifoliella* Zell. in Czechoslovakia, Austria and southern Europe; *L. roboris* Zell. in southern Europe and Ger-

many; *L. salicicolella* Sorh. in Hungary; *L. schreberella* F. in Hungary; *L. stettinensis* Nic. in Czechoslovakia; *L. tremulae* Zell. in Hungary; *Lithocolletis* spp. on *Alnus, Quercus,* etc. in Germany, Czechoslovakia, Switzerland; *Phyllocnistis saligna* Zell. in Czechoslovakia; *Ph. xenia* Her. in Hungary *(Pediobius saulius* var. *laeta!)*; *Recurvaria leucatella* Cl. in Germany; *Tortrix viridana* L. in Germany; *Yponomeuta malinella* Zell. in the Ukrainian SSR. — (COL.) *Orchestes fagi* (L.) in the Crimea; *O. quercus* (L.) in Germany and the Crimea; *O. testaceus* Müll. in the Crimea. — (HYM.) *Ageniaspis testaceipes* (Ratz.) in Czechoslovakia; *Apanteles circumstriptus* (Nees) in southern Europe; *A. fulvipes* Hal. in Russia; *Apanteles* spp. in Moldavia and Kazakhstan (USSR); *Calyptus minutus* (Ratz.) in the Crimea; *Chrysocharis orchestidis* Buk. in the Crimea; *Enaysma albiscapus* Del. and *E. splendens* Del. in southern Europe; Eulophid spp. in Moldavia; *Tetrastichus ecus* (Walk.) (= *xanthops, cyclogaster*) in Moldavia; *Triaspis pallidipes* (Nees) (= *fagi* Ratz.) in the Crimea.

Pediobius saulius develops as a solitary endoparasite, mostly as a hyperparasite of the named Lepidoptera, though some of them may be also primary hosts of the parasite. During the investigations in the Mediterranean area *saulius* (= *linus*) was found essentially as a hyperparasite (see Delucchi, 1958, p. 260, and Viggiani, 1962). —

References to host records: Bukowski, 1938; Delucchi, 1958; Erdös, 1956; Ferrière, 1953; Györfi, 1941; Nikolskaya, 1934; Nikolskaya et Kyao, 1954; Ratzeburg, 1844 and 1848; Szelényi 1941 and 1957; Szöcs, 1961; Talitzki, 1961.

Distribution: throughout Europe, from Sweden to Italy, from Britain down to Central Asia (Kazakhstan).

Material examined. — Britain: type material of *saulius* and *linus*. — Sweden: type material of *Pleurotropis strigiscuta* Th. — Germany: Aachen, coll. Förster, under three different manuscript names, one of them "aus Miniergängen in überwinterten Erlenblättern"; Thüringen (Schmiedeknecht). — Czechoslovakia: Bohemia, Břehyně near Doksy, VI. 1959 (Hoffer); Praha-Ruzyně, 17. IX. 1952 and 18. IX. 1953 (Bouček); Praha-Šárka, ex *Lithocolletis* on *Quercus,* II. 1946 (Bouček); Černošice near Praha, 9. VII. 1933 (Šustera); Koda near Beroun, 25. V. 1956 (Bouček); Luka pod Medníkem, 4. VII. 1954 (Bouček); Hnanice pod Troskami, VI. 1957 (Bouček); Velký Vřešťov, VIII. 1953 (Bouček); Vrchoviny near Náchod, 9. VIII. 1936 (Macek); Moravia, Pouzdřany, ex *Lithoc. delitella,* 1. III. 1947 (Gregor); Lednice, ex *Lithoc. platani,* XI. 1953 (Bouček); Charvátská Nová Ves, Boří les, *ex Ageniaspis testaceipes* in *Lithocolletis* sp. on *Quercus cerris,* IV. 1954 (Gregor); Poštorná, ex *L. quercifoliella,* 1954 (Gregor); Slovakia, Neded nad Váhom, 9. IX. 1953 (Bouček); Pata Wood near Vráble, ex *Lithocolletis* sp., 3. XII. 1955 (Čapek); Gabčíkovo, ex *Phyllocnistis saligna,* 1953, ex *Ancylis upupana,* IX. 1957 (Čapek); Kamenica nad Hronom, 19. V. 1960 (Bouček); Vinica, ex *Bucculatrix ulmella,* VII. 1958 (Čapek); Beluja Wood near Plášťovce, 20. V. 1960 (Bouček); Zádiel, ex *L. stettinensis,* 1954 (Gregor); Košice, 14. V. 1952 (Kocourek), ex unidentified miner, 1954 (Gregor). — Austria: Gugging, ex *Lithoc. quercifoliella,* Ruschka leg., det. as *obscuripes* Ratz. by Ruschka; Böheimkirchen, 1910 (Fahringer), det. as *strigiscuta* Th. by Ruschka; Wien district, ex *Lithoc. lautella,* VIII. 1910 (Fahringer), det. as *strigiscuta* by Ruschka. — Switzerland: Bern, ex *Lithocolletis* sp., 1962 (Schmidlin). — Italy: Valsarca inf., Oro, ex *Lithoc. agilella* on *Ulmus campestris,* 17. X. 1936 (Hartig); Portici, ex *Lithoc. millierella,* 1961 (Viggiani). — Hungary, many specimens. — Moldavian S.S.R.: Kotovskoe, 12. VII. 1961 (Bouček); Slobodzeya, ex *Cacoecia rosana,* 5. VII. 1958 (Talitzki); Kishinev, 17. VIII. 1958 and 15. VII. 1962, ex *L. pyrifoliella* (Talitzki); Vadului-Vody, 16. VII. 1961 (Bouček). — U.S.S.R.: Belaya near Kursk, VI. 1958 (Belizin); Southern Ural, Yanvartsevo, ex Braconid cocoon, 13. VII. 1950 (Grunin).

Pediobius italicus, sp. nova

This species is apparently new to science, although closely allied to *P. saulius* (Walk.), as may be seen from the key. Like *saulius* also the new species possesses the very prominent lateral angles of the pronotum and the open speculum on forewings, the body is however squat, as in the *lysis*-group. *P. italicus* seems to form a link between this group and *saulius.*

Female. — Body black, with dark greenish tint dorsally, and more bluish to distinctly blue on sides of thorax, legs, scapes and genae; segments 1—3 of all tarsi whitish. Wings hyaline, venation brown.

Head distinctly broader than mesoscutum (24:20.5), strongly transverse seen from above (24: 10.5, in the middle 24: 9), widest just behind paired ocelli, with vertex fully half as broad as width of head (12.5:24), distinctly impressed laterally as in *P. saulius.* Occiput sharply margined but ridge on temples indistinct, temples reduced; hind orbit bordered above by a smooth impressed line starting in lateral depression of vertex. Vertex, frons and face finely reticulate, only lower face, interscrobal space and frons above the fork, almost smooth. Frontal fork forming angle of about 110°; interscrobal space flat, only between antennae slightly convex; inner orbit slightly sinuate; eye very large, but also malar space rather long, longer than width of mouth, this apparently stunted, hardly 2.5 times shorter than the vertical eye diameter (6:14), which is longer than minimum width of frons (14:12). Antenna short, but not stout. Scapus not nearly reaching the ocellus, as long as part of flagellum from base of pedicellus to middle of second funicle segment; pedicellus about twice as long as broad, about as long as the second funicle segment; funicle three-segmented, but the third segment only narrowly separated from the clava, hardly longer than broad; the first funicle segment about twice, the second 1.5 times, as long as broad, both of them distinctly narrowed apically; clava with first segment subequal to its preceding segment, and with second segment narrow, conical, as long as the slender terminal spine (Fig. 27).

Thorax (Fig. 26) squat, its length in relation to width of mesoscutum only as 29: 20.5. Pronotum and mesoscutum nearly as in *saulius,* in particular the deep oblique furrow-like depression cutting off the protruding lateral corner of pronotum, but mesoscutum more distinctly reticulate, meshes coarser on disc, only slightly transversely elongate in anterior third, and longitudinaly so before scutellum; bottom of notaular depressions finely reticulate, the bristle shifted forward as in *saulius*; hind margin of mid lobe slightly arched. Scutellum especially in back half highly convex, hardly as long as broad, longitudinally striate anteriorly, reticulate in posterior third. Metascutellum very narrow. Propodeum with submedian carinae subparallel in anterior half, widely diverging posteriorly, space between them groove-like; submedian area broader than long, with a slightly oblique impressed line at anterior margin, this groove ending laterally in a deep pit; plica only slightly longer than the straight part of the carinaceous hind margin, angle between both of

them almost 90°; posterolateral corner sharp, but protruding only sidewards, over the hind coxa; metapleural convexity prominent, almost right-angled from above. Forewing with large, open speculum, bare costal cell; two hair lines vaguely indicated, radiating from the subsessile stigmal vein, which is very short, scarcely as long as width of costal cell; postmarginal vein rudimentary. Spur of hind tibia longer than the latter wide, almost as long as basitarsus and rather stout.

Abdominal petiole about twice as broad as long, with several vague longitudinal rugae; anterior angles prominent, anterior margin archedly raised. Gaster short-oval (26:20), about as long as thorax less propodeum, convex, its apex roundedly obtuse-angular; first tergite distinctly surpassing the middle, smooth or nearly so, with straight hind margin; sixth tergite very short, about five times as broad as long.

Length of body 1.1 (holotype) — 1.4 mm.

Male. — Very similar to female, except for antennae and abdomen. Occipital margin blunted (in correlation with the smaller body size?). Antennal flagellum with pedicellus scarcely shorter than width of head, funicle distinctly three-segmented; pedicellus only slightly longer than broad, clava as long as two preceding segments together, with terminal spine as long as width of preceding segment which is almost as broad as the elongate first clava segment. Spur of hind tibia distinctly longer than width of the latter at apex. Abdominal petiole only slightly transverse, transversely impressed subbasally, without any rugae. Length of body 1.0—1.3 mm.

Host: *Spulerina (= Dialectica) simploniella* (F.) in Italy.

Distribution: Italy.

Holotype (female): Italy, Torino, ex *?Dialectica simploniella* on *Castanea vesca,* ex larva 9. VII. 1960, Venturi lgt. (submitted to me for identification through the C. I. L. B.). Deposited in the Muséum d'Histoire Naturelle in Geneva, Switzerland.

Further material (paratypes and allotype). — Two females and two males with the holotype; one paratype labelled also "Pecetto torinese, 9. 7. 1960"; Torino, three females ex *Spulerina simploniella,* VI. 1959 (G. Viggiani). The latter material was sent to me additionally from Dr. Viggiani, according to whose observation this species develops as a gregarious endoparasite, being thus also in this respect different from *Pediobius saulius.*

Pediobius moldavicus, sp. nova

This is another species with pale legs, a character occurring in Europe only in *P. flaviscapus* (Thoms.) and *P. coxalis,* n. sp. The main differences between the three species are stressed in the key above.

Female. — Body black, with a very faint metallic green tint dorsally on head and thorax and more bluish on face and sides of thorax; scapes and legs apart from coxae (which are concolorous with the body), pale testaceous. Wings hyaline, veins pale brown.

Head in dorsal view distinctly broader than mesoscutum (21:15), transverse as 21:11, with occiput moderately excavated, relative thickness of head in the middle 8; occiput distinctly sharply margined between eyes, temples immargined. Vertex exactly half as broad as width

of head, very shallowly, sparsely reticulate; frons above the fork smooth, the sides below the fork reticulate, with meshes twice as small as those of vertex; interscrobal space hardly convex. Face below antennae and eyes smoth, malar space with fine sulcus, about 3.5 times as short as the vertical eye diameter; eye large, hairy, inner orbit hardly emarginate. Antenna not very slender; scapus not quite reaching the ocellus, about as long as pedicel plus one and a half of basal funicle segments; ring segments indistinct; first funicle segment about 1.5 times as long as broad, as well as the second segment, the third subquadrate; clava acuminate, three segmented, only as long as pedicellus plus first funicle segment, last segment in form of terminal spine. See Fig. 28.

Thorax convex, longer than broad as 5:3. Pronotum with lateral angles obtuse, about 120°, as well as lateral angles of scapulae. Mesoscutum very coarsely, on disc broadly, reticulate, also bottom of notaular depressions with irregular, rather fine reticulation and one bristle; hind margin of mid lobe slightly arched. Scutellum coarsely reticulate, convex, subpentagonal, slightly longer than broad (10:9). Metascutellum narrow, not protruding in the middle. Propodeum with submedian carinae archedly diverging backwards, intercarinal space also anteriorly groove-like; a short nucha set off by transverse groove; plica carinaceous, almost 1.5 times as long as the posterior carina delimiting submedian area; outer branch of plica moderately sloping obliquely backward to the sharply angular supracoxal angulation. Forewing with speculum closed, rather small, costal cell bare, and stigmal vein extremely short, subequal to the postmarginal vein, and hardly longer than maximum width of costal cell. Legs rather slender, spur of hind tibia scarcely longer than width of tibia.

Abdominal petiole quadrangular, slightly transverse, not depressed, its front margin straight, corners rectangular. Gaster slightly shorter than thorax plus head combined, oval-acuminate, sides apically converging at angle of about 60°. First tergite smooth, not reaching the middle; each of the following tergites finely alutaceous at base, sixth gastral tergite not fully three times as broad as long.

Length of body 1.4 mm.

Male. — Unknown.

Host not yet known.

Distribution: Moldavian S.S.R. (formerly Bessarabia; USSR).

Holotype (female): Moldav. SSR, Strasheny (Страшены), 21. VII. 1961 (Bouček a. Talitzki lgt.); deposited in the Prague Nat. Museum (Entomology), Cat. No. 25.626.

Pediobius crassicornis (Thomson)

Pleurotropis crassicornis Thomson, 1878, Hym. Scand., **5**: 255; ♀.
Asecodes crassicornis; Schmiedeknecht, 1909, Genera Ins., **97**: 436.
Pleurotropis crassicornis; Bukowski, 1938, Rev. Ent. URSS, **27**: 167—168; ♀♂.

In the European fauna this *Pediobius* is quite singular in having a distinct, narrowly semicircular, hole between the mid lobe of meso-

scutum and the scutellum, but it is certainly closely allied e. g. to *P. foveolatus* (Crawford) and *P. detrimentosus* (Gahan) from South Asia. The mentioned slit-like hole is much narrower in the latter two species however and the first of these two *(foveolatus)* has a more coarsely sculptured scutellum with striae parallel in anterior half, and *detrimentosus* possesses coarse, longitudinal, radiating carinae on mesoscutum. The characters of *crassicornis* given in the key may be completed by the following ones (see also Fig. 32).

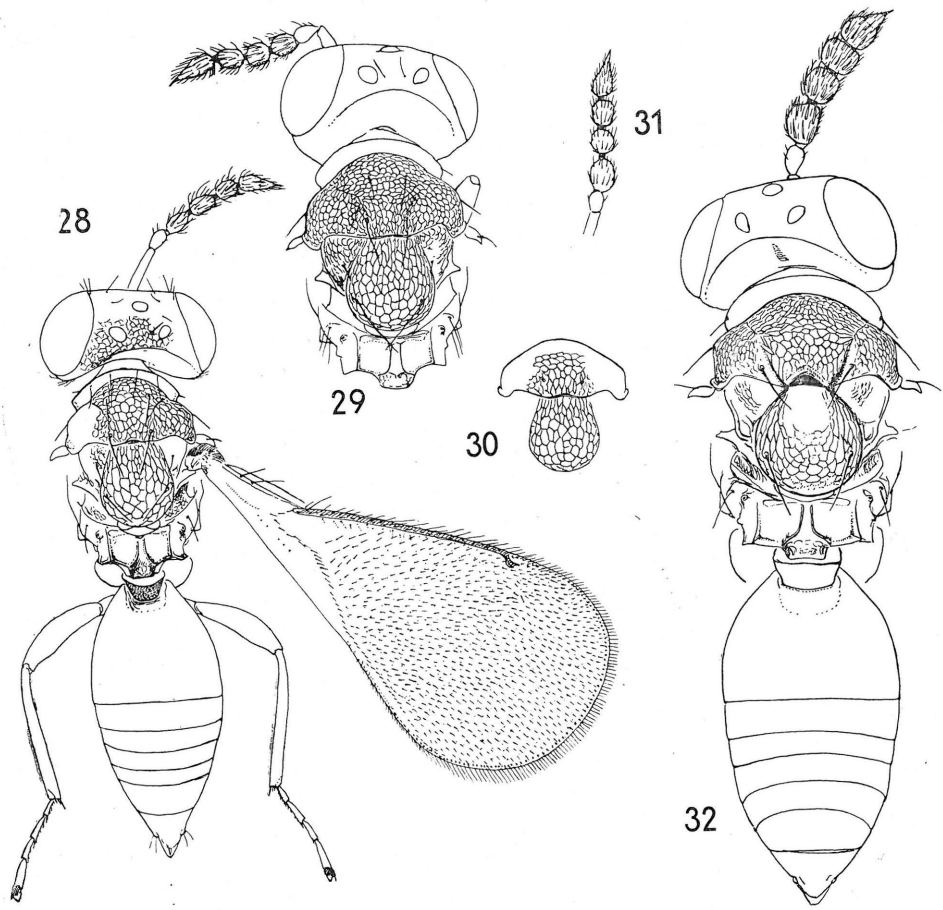


Fig. 28. *Pediobius moldavicus,* n. sp., female, body with antenna and forewing. Sculpture on head and thorax partly indicated. — Figs. 29—31. *Pediobius cassidae* Erdös. — 29. Head and thorax in female, with reticulations on mesonotum indicated. — 30. Sculpture on mesoscutum and scutellum in another female of smaller size (at same power as Fig. 29). — 31. Antenna of female of a form with the first funicle segment stouter than the following one. — Fig. 32. *Pediobius crassicornis* (Thomson), female. Body with antenna, with sculpture on the thorax partly indicated (incomplete e. g. on axillae).

Occiput and temples sharply margined. Vertex deeply reticulate; frons nearly smooth above the fork, this wide, obtuse-angular, about 150°; interscrobal space slightly elevated, obtusely keel-like, smooth; lower face almost smooth; malar space three times as short as vertical eye diameter; inner orbits scarcely sinuate; eye densely hairy. Funicle segments in female subquadrate, stout, the first often longer; in male all four funicle segments elongate, the last narrowly separated from clava which is conical, narrower than, but as long as, the fourth funicle segment, with distinct terminal spine.

Pronotum with collar ridge in dorsal view strongly arched, but lateral corners indistinct, rounded. Mesoscutum reticulate, except for notaular depressions which are almost smooth, with only vague longitudinal striae on bottom, but each bearing one long bristle (hind pair of mid lobe) in the middle. Mid lobe posteriorly raised and excised before base of scutellum; the latter almost circular, moderately convex anteriorly, flat and broadly reticulate posteriorly, with meshes obliterate anteriorly, elongate on sides between the striae radiating from the inner, deeply impressed corners of axillae. Metascutellum narrow, very short. Propodeum with broadly separated submedian carinae archedly diverging backwards; space between them depressed, a short nucha distinctly separated; posterior carinaceous margin of submedian area $^2/_3$ as long as plica, angle between them about 90°; supracoxal angulation acute, laterad from the named angle, not much protruding; elevation on metapleura (seen from above) low, obtuse-angular. Forewing with costal cell bare, speculum closed but large, expanded to middle of marginal vein; stigmal vein only 1.5 times as long as width of costal cell, hardly as long as postmarginal vein. Spur of hind tibia stout, slightly longer than width of tibia, as long as the basitarsus, this hardly as long as the second segment; colour of tarsi as in *alcaeus*.

Abdominal petiole transverse, its sides converging backward, anterior margin almost straight, anterior angles right or nearly so. Gaster in female as long as thorax, alutaceous, convex, its sides converging apically at about 70°; first tergite covering basal $^2/_5$.

Length of female 1.4—2 mm., of male 0.9—1.5 mm.

Hosts: *Pediobius crassicornis* was ascertained as a hyperparasite of *Tortrix viridana* (L.), through the Pteromalid *Cyclogastrella deplanata* (Nees) in the Crimea (Bukowski, 1938), of *Lymatria dispar* (L.) and of *Ancylis mitterbachiana* Schiff. in Czechoslovakia, and as a primary parasite of *Cacoecia rosana* (L.) in the Moldavian SSR, and of the sawfly *Trichiocampus ulmi* (L.) in Germany.

Distribution: Britain, Sweden, Germany, Czechoslovakia, Hungary, South of Europ. USSR (Moldav. SSR, Crimea).

Material examined. — Sweden: type of *crassicornis* in C. G. Thomson's collection in Lund. — Germany: two specimens among the alleged remnants of the Ratzeburg collection (see Bouček, 1964, *Beitr. z. Ent.*); Berlin district, ex *Trichiocampus ulmi,* 1959 (D. E. I). — Czechoslovakia: Bohemia, Řevničov, 14. VIII. 1955 (Bouček); Obříství near Mělník, 6. IX. 1959 (Hoffer); Praha-Ruzyně, 23. IX. 1954 (Bouček); Praha-Krč, 30. IV. 1959 (Bouček); Čelákovice, IX. 1922 (Novický); Kutná Hora, ex *Ancylis mitterbachiana,* hyperparasitic, 8. IX. 1954 (Čapek); Choťovice near Chlumec

nad Cidl., 19. VIII. 1959 (Bouček); Velký Vřešťov, VIII. 1953, 1954, 1959 and 1961 (Bouček); Černilov near Hradec Král., 17. IX. 1944 (Bouček); Týniště nad Orl., 8. VIII. 1959 (Bouček); Slovakia, Smolenice, ex *Lymantria dispar,* 1954 (Patočka); Hrhov near Rožňava, ex Microlepidoptera sp. VI., 1956 (Čapek). — Moldavian SSR: Kishinev, 28. VII. 1961 (Bouček); Strasheny, 21. VII. 1961 (Bouček a. Talitzki).

Pediobius cassidae Erdös

Pediobius cassidae Erdös, 1958, Bull. Soc. ent. France, **62**: 282—284; ♀.

This species was described originally from a single female reared "ex ootheca *Cassida viridis* L.". The type is preserved in the collection of Dr. Granger in Paris who in 1959 kindly submitted it to me for examination. I found it agreeing fully with my specimens from *Tortrix viridana* that I intended to describe as new. Soon after that I had the opportunity of examining further material of this species, including specimens reared from *Cassida viridis* in Germany and some more reared specimens from the Moldavian SSR the data of which were published subsequently by Bouček, 1961, and by Talitzki, 1961.

Pediobius cassidae seems to belong in the vicinity of the *pyrgo*-group, although the spurs of hind tibiae are not prolonged. The characters suggesting this relationship are as follows: structure of antennae in both sexes, the form of head, the thoracal sculpture, especially that of the scutellum, mesoscutum and propodeum, the short abdominal petiole, elongate gaster in females, etc. On the other hand, also *P. facialis* (Gir.), *brachycerus* (Thoms.) and *grunini* (Nik.) seem to be allied to *cassidae,* although their body is more squat and the thoracic sculpture reminds one more of the *eubius*-group, the species of which have, however, a different antennal formula.

The following description is intended to provide some more characters in addition to those mentioned by Erdös, 1958. See also Figs. 29, 30 and 31.

Female. — Metallic colour of body often green instead of bluish. Tibiae sometimes not wholly metallic, but mainly fuscous, with the apex pale.

Head distinctly broader than thorax (24:19), in dorsal view only twice as broad as long, with occiput rather deeply emarginate; vertex slightly broader than long in the middle (12:10); ocelli large, the lateral as broad as its distance from the eye margin; depression outside lateral ocellus distinct but very shallow; temple very short, in upper part shorter than ocellus diameter. Frontal fork diverging at about 120°; interscrobal crest low, blunted, the scrobal grooves not widely separated above; malar space one third as long as vertical eye diameter, about 1.3 times as long as mouth width; eye large, short-oval, inner orbits subparallel, hardly emarginate. Antenna with flagellum plus pedicel shorter than width of head as 20: 24; pedicellus slightly shorter and narrower than first funicle segment; ring segment very short, indistinct; all three funicle segments subequal in width but very slightly decreasing in length, all distinctly elongate or, sometimes, the third quadrate, each apically with narrow

petiole which is almost as long as broad; terminal spine of clava distinct, often almost half as long as width of clava.

Pronotum strongly arched, lateral angles prominent, mostly slightly obtuse-angular, the corner above distinctly impressed at margin of smooth part. Mesoscutum only twice as broad as long in the middle, in dorsal view sides behind lateral bristle very slightly diverging backwards. Bristle of notaular depression situated in posterior third, at inner margin. Hind margin of mesoscutum slightly sinuate. Scutellum convex, as long as broad, reticulations in anterior half distinctly elongate. Propodeum with submedian carinae almost parallel in anterior half, space between them groove-like; nucha very short but indicated; submedian area very slightly longer than broad, its anterior margin narrowly impressed, the outer hind corner right-angular, supracoxal angulation sidewards from the latter, not prominent; spiracle at same level as submedian area; metapleural convexity obtuse-angular in outline from above. Forewing with costal cell bare, speculum closed, stigmal and postmarginal veins short, subequal in length; marginal vein with prestigma (less the postmarginal) as long as width of wing. Spur of hind tibia thin, hardly longer than width of tibia.

Abdominal petiole slightly transverse and with sides converging backward, anterior margin slightly arched. Gaster as long as, or slightly shorter than, the thorax. First gastral tergite mostly not reaching the middle, its hind margin straight or nearly so (sometimes slightly arched; ?due to the position of tergites).

Length of body 1.3—1.9 mm.

M a l e. — Similar to female, but abdomen shorter, the petiole quadrate, and antennal flagellum slenderer, distinctly longer than width of head; all funicle segments very distinctly petiolate, elongate, the first at least 1.5 times as long as pedicellus; first clava segment about 1.6 times as long as broad.

Length 1.0—1.4 mm.

V a r i a t i o n of this species concerns not only the relative length of the antennal segments, size of body, and relative length of abdomen in female, certainly due to different condition before and after egg-laying, but also the sculpture of thorax and the relative length of the stigmal vein. In smaller specimens reticulations on scutellum are mostly wide, although distinctly lengthened longitudinally, the stigmal vein is relatively longer. In larger specimens the scutellum is more densely longitudinally reticulate to striate, although never so densely as in *P. facialis*. In such specimens also the stigmal vein is extremely short, reminding one of the shape of this vein in the *epeus*-group. The specimens with longer stigmal vein have the marginal vein shorter than the width of wing.

H o s t s. *P. cassidae* develops essentially as a hyperparasite, but may be also a primary parasite like the other similarly living species of the genus. The following host records are known to me: (COL.:) *Cassida viridis* L. in France (Erdös, 1958, and also one new record) and *C. nebulosa* L. in Germany (Otten 1940, p. 178, as "*Entedon* sp.:"); (LEP.:) *Cacoecia rosana* (L.) in the Moldavian SSR; *Tortrix viridana* (L.) in Czechoslovakia; *Zygaena* sp. in Czechoslovakia; (HYM.:) *Apanteles* sp. in *Zygaena* sp.

in Czechoslovakia; *Apechthis rufata* (Gmel.) and *Microgaster tibialis* Nees and *Phytodietus polyzonias* Först. in the Moldavian SSR (Talitzki, 1961), all the three species as primary parasites of *Cacoecia rosana* (L.).

Distribution: France, Germany, Czechoslovakia, Austria, Hungary, Moldavian SSR.

Material examined. — France: Esbarres, the type of *cassidae*; Saint-Genough, ex *Cassida viridis,* VI. 1963 (Labeyrie). — Germany: (DDR) Brandenburg, Cablow, ex *Cassida nebulosa,* VIII.—IX. 1939 (E. Otten). — Czechoslovakia: Bohemia, Pohořany near Litoměřice, 11. V. 1954 (Bouček); Praha-Jarov,, 23. V. 1954 (Bouček); Wood between Jevany and Habr near Prague, 14. VI. 1953 (Bouček); Veselí nad Luž., 11. VII. 1945 (Bouček); Moravia, Mutěnice, 28. VII. 1941 (Hoffer); Tvrdonice near Břeclav, ex *Tortrix viridana,* 12. VI. 1953 (Gregor); Charvátská Nová Ves near Břeclav, ex *T. viridana,* VIII. 1955 (Gregor); Slovakia, Neded nad Váhom, 9. IX. 1953 (Bouček); Tesáre nad Žitavou, 19. V. 1956 (Čapek); Beluja Wood near Plášťovce, ex *Zygaena,* sp. via *Apanteles* sp., 25. VII. 1955 (Čapek). — Austria: without data (Coll. Mayr. Mus. Wien); Wien-Purkersdorf, 22. V. 1884 (Handlisch). — Hungary: Kalocsa, 6. V. 1943 (Erdös); Hegyalja, 13. VII. 1954 (Erdös). — Moldavian SSR: Bakhmut near Kalarash, 27. VI. 1961 (Plugar); Kotovskoe, 12. VII. 1961 (Bouček); Kishinev, VIII. 1958 (Talitzki); Slobodzeya, ex *Cacoecia rosana,* 23. VI. 1958 (Talitzki); Tiraspol, ex *C. rosana,* VI. 1959 (Talitzki).

Pediobius pyrgo (Walker)

Entedon Pyrgo Walker, 1839, Monogr. Chalc., **1**: 118—119; ♀♂.
?Eulophus pyralidum Audouin, 1842, Hist. d. Ins. nuis. à la vigne et part. de la Pyrale, p. 1871—88, pl. 19, fig. 3; ♀♂.
Elachestus complaniusculus Ratzeburg, 1852, Ichneum. d. Forstins., **3**: 218; ♀♂. **N. syn.**
Pleurotropis (Rhopalotus) substrigosa Thomson, 1878, Hym. Scand., **5**: 256—257; ♀. **N. syn.**
Rhopalotus substrigosus: Dalla Torre, 1898, Cat. Hym., **5**: 31.
Derostenus nawai Ashmead, 1904, Journ. N. York ent. Soc., **12**: 160—161; ♀♂. **N. syn.**
Pleurotropis nawaii; Muesebeck et Dohanian, 1927, US Dept. Agr., Dept. Bull., 1487: 31.
Pleurotropis complaniusculus; Bukowski, 1938, Rev. Ent. URSS, **27**: 166.
Rhopalotus chalcidiphagus Szelényi, 1957, Ann. Inst. Prot. Plant. Hung., **7**: 308—310; ♀♂. **N. syn.**
Pediobius nawai; Burks, 1958, US Dept. Agr., Agr. Monogr., 2, Suppl. **1**: 68.
Pediobius pyrgo; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 189.

I have seen the type of *pyrgo* as well as material compared with it by Dr. de V. Graham. This species had been known for some time as *Pleurotropis complaniuscula* (Ratz.), chiefly owing to Bukowski's excellent figures of some its characteristic features.

According to our colleague Dr. Domenichini (of Milano) also *Eulophus pyralidum* Audouin, described as a parasite of *Sparganothis pilleriana* (Pyrale de la Vigne) in France, belongs to this species. He reared this species from the same host in Italy and determined so specimens for Dr. Hedqvist, Stockholm.

The original material of *Elachestus complaniusculus* Ratzeburg seems to be lost in Germany except one male specimen now at the Vienna Naturhistorisches Museum. It is labelled "*complani-usculus* R.", probably in Ratzeburg's handwriting, apart from: "Collectio Ratzeburg" and "*complaniusculus* R. det. Ratzeburg", the last two labels apparently of a later origin. I think that this specimen could be taken as lectotype of *complaniusculus,* but I do not designate it so. It fully agrees with *Pediobius pyrgo,* as well as with the interpretation of *complaniusculus* of Bukowski,

1938. Therefore I mentioned the latter name and *substrigosus* Thomson as synonyms of *pyrgo* in a recent paper published in the USSR (Bouček 1961, p. 24).

I had also the opportunity to study the type material of *Pleurotropis substrigosa* Thomson and *Rhopalotus chalcidiphagus* Szelényi, both of which belong to the same species as *pyrgo.* I owe several paratypes of *chalcidiphagus* to the kindness of Dr. Szelényi, who considered it new instead of *obtusiceps* (described here below as new), hoping to have recognized *substrigosa* correctly from the description. Unfortunately, the reverse proved to be true after a study of the type material of *substrigosa.*

I have not seen the type material of *Derostenus nawai* Ashm., but several years ago I received through exchange a specimen of this species from the U. S. National Museum in Washington identified so by Dr. Muesebeck. It proved to be the same as *pyrgo,* too. At this opportunity it may be worth calling to mind that already Muesebeck and Dohanian, 1927 (p. 31) wrote about *nawai:* "This Japanese and European species of *Pleurotropis* . . .". Evidently this species was known to them from the named two countries, although under a name not familiar to the European students.

Pediobius pyrgo (Walk.) is very near to *P. obtusiceps* described as new in this paper and differs from it only in the characters mentioned in the key. *P. obtusiceps* may be called a twin-species of *pyrgo.* The two, together with *phragmitis,* n. sp., form a small species-group, characterized by the prolonged spur of the hind tibia and similarly sculptured body, although the last-named species differs considerably from the other two by its depressed body. *P. pyrgo* was redescribed in detail recently by Szelényi, 1957, under *Rhopalotus chalcidiphagus,* therefore its description is not given here. For antenna and hind leg see Figs. 36 and 37.

H o s t s. This species is well known as essentially hyperparasitic (cf. Muesebeck a. Dohanian, 1927), so all the following records of Lepidoptera should be taken with some reservation as probably not concerning the primary host. LEP.: *Aporia crataegi* (L.) in the Moldavian SSR; *Cacoecia murinana* Hbn. in Poland; *C. rosana* (L.) in the Moldavian SSR; *C. sorbiana* Hbn. in the Crimea; *Cerostoma coriacellum* HS. in Czechoslovakia; *Euproctis phaeorrhoea Don.* (= *chrysorrhoea* auct.) in Europe and U.S.A.; *Fumea casta* Pall. in Czechoslovakia; *Grapholita molesta* (Busck) in the U.S.A.; *Hyphantria cunea* Drury in Czechoslovakia and Hungary; *Leucoptera scitella* Zell. in Italy; *Lithocolletis corylifoliella* Hbn. in the Moldavian SSR; *Pandemis ribeana* Hbn. in Czechoslovakia and the Moldavian SSR; *Recurvaria leucatella* Cl. in Germany; *Solenobia* sp. in Czechoslovakia; *Sparganothis pilleriana* Dup. in France and Italy; *Tortrix viridana* (L.) in the Crimea; *Yponomeuta evonymella* (L). in Czechoslovakia. — The following Hymenoptera are certainly primary hosts: *Apanteles albipennis* (Nees) in the Crimea; *A. melanoscelus* (Ratz.) in Europe and the U.S.A.; *A. rectinervis* Telenga in southern Siberia; *A. solitarius* (Ratz.) in Europe and the U.S.A.; *Bracon* sp. in *Ceutorrhynchus maculaalba* Hrbst. in Hungary; *Bracon variegator* Spin. in the Crimea; *Cyclogastrella deplanata* (Nees) in the Crimea; *Dibrachys cavus* (Walk.) in Poland (Mo-

krzecki, 1933) and the U.S.A.; *Eupteromalus nidulans* (Thoms.) in Europe and the U.S.A.; *Psychophagus omnivorus* (Walk.) in Czechoslovakia and Hungary. — Diptera: *Nemorilla floralis* (Fall.) in *Pandemis ribeana* in the Moldavian SSR. — References to the host records: Audouin, 1840; Bukowski, 1938; Dlabola, 1962; Mokrzecki, 1933; Muesebeck et Dohanian, 1927; Peck, 1951; Ratzeburg, 1852; Szelényi, 1941 and 1957; Talitzki, 1961. Erdös, 1956 (p. 41) records also *Biorrhiza pallida* Ol. as host, which concerns probably a moth within the galls of the named Cynipid. For some more host-records see Peck, 1963.

Distribution: throughout Europe, from Britain to the U.S.S.R. and from Sweden to Italy; southern Siberia; Japan. Introduced into North America.

Material examined. — Britain: specimens in the Brit. Mus. (Nat. Hist.) and in Oxford. — Sweden: specimens in C. G. Thomson's and Dr. Hedqvist's collections, in Lund and Stockholm, resp. — Germany: one syntype of *complaniusculus* ex coll. Ratzeburg (Naturhistorisches Museum Wien). — Poland: N. Suchedniów, l. Michniów, ex *Cacoecia murinana,* 10. VII. 1961 (Gadek). — Czechoslovakia: Bohemia, Budyně nad Ohří, ex *Yponomeuta evonymella,* VII. 1954; Břehyně near Doksy, 18. VI. 1958 (Hoffer); Hlavenec near Brandýs nad Labem, 6. VI. 1962 (Martinek); Praha-Ruzyně, ex *Euproctis phaeorrhoea,* V.—VI. 1956 (Dlabola); Praha-Krč, ex *Fumea casta* and *Solenobia* sp., IV. 1943 (Zouhar); Choťovice nad Cidl., 19. VIII. 1959 (Bouček); Havlíčkův Brod, ex Microlepidoptera, VII. 1954 (Hoffer); Vlčice near Trutnov, ex *Yponomueta* sp., VIII. 1955 (Hostounský); Nový Hradec Králové, 12. VIII. 1957 and 27. VIII. 1958 (Bouček); Týniště nad Orl., 8. VIII. 1959 (Bouček); Moravia, Sobůlky, 20. VIII. 1942 (Šustera); Slovakia, Biskupice pri Dunaji, ex *Euproctis phaeorrhoea,* 1952 (Bouček); Králová nad Váhom, hyperparas. in *Hyphantria cunea,* 14. IX. 1954 (Arbatskaja); Tarnovica, hyperparas. in *Cerostoma coriacellum,* V. 1961 (Čapek); Vyhne, IV. 1956 (Čapek); Banská Štiavnica, ex *Pandemis ribeana,* VII. 1956 (Čapek). — Hungary: Nikla, ex *Hyphantria cunea,* 4. VIII. 1952 (Reichart), paratypes of *Rh. chalcidiphagus.* — Roumania: Bucureşti, ex *E. phaeorrhoea,* 14. IX. 1957. — Italy: Caserta, ex *Leucoptera scitella,* IV. 1962 (Viggiani). — Moldavian SSR: Plot', ex *Pandemis ribeana,* 24. VIII. 1958 (Talitzki); Kishinev, VII.—IX. 1957 and 1958, V. 1958 and 1959, ex winter nests of *Aporia crataegi* and *Euproctis phaeorrhoea* (lgt. Talitzki); Rybnitza, ex *E. phaeorrhoea,* III.—V. 1958 and 1959 (Talitzki); Slobodzeya, ex *Cacoecia rosana,* 5. VII. 1958 (Talitzki). Ukrain. SSR: Kiev, ex *E. phaeorrhoea,* 1948 (Fedotova); Taganrog, 9. VII. 1921 (Kokuyev). — U. S. S. R. in Asia: S. Siberia, Tuva, Turan, ex *Apanteles rectinervis,* 1960 (Kolomyetz). — U. S. A.: Mass., Melrose Hills, ex *Apanteles melanoscelus,* 6. IX. 1924, Gipsy Moth Lab., det. as *Pleurotropis nawaii* (Ashm.) by Muesebeck.

Pediobius obtusiceps, sp. nova

This is a twin species of *Pediobius pyrgo* (Walk.), to which *obtusiceps* is extremely similar. Although the differences are small and there is some variation, I have had no difficulty in separating *pyrgo* from *obtusiceps* on combination of the characters of the occiput and hind legs.

Female. — Body black, with faint greenish or (in places) coppery tint, antennae and legs usually bluish; fore tarsi fuscous, the segments 1—3 of mid and hind tarsi whitish, spur of mid and hind tibia whitish, that of hind tibia usually fuscous at apex; claw segment fuscous. Wings hyaline.

In morphological characters very near to *P. pyrgo.* Mandibles with two teeth, upper margin near the upper tooth minutely indented. Frons

above the fork almost completely smooth, inner orbits of eyes in facial view hardly sinuate. Occipital margin reduced to a short carina behind each lateral ocellus, but blunted in the middle and at sides, angle between vertex and occiput clearly obtuse (right or nearly so in *pyrgo*), occiput not distinctly excavated, its sloping line slightly convex at least outside median line. For a general view of the body see Fig. 33, for head and hind leg Figs. 34 and 35.

Length of hind tibia in relation to tarsus, tibial spur and basitarsus (below, maximum length) as 16: 17: 7.5: 6 (whereas in female of *pyrgo* of the same size these measurements are 16:15.5:5:5). Length of body 1.1—1.9 mm. (holotype 1.8 mm.).

Male. — Also very similar to *pyrgo* and distinguishable only by the characters of head and hind leg already mentioned. Length of body 0.9—1.5 mm.

Hosts. Like *P. pyrgo* also *P. obtusiceps* probably develops as both primary and secondary parasite although the records at hand concern only the following Lepidoptera: *Euproctis phaeorrhoea* Don. (= *chrysorrhoea* auct.) in Czechoslovakia, *Lymantria dispar* (L.) in Italy and *Yponomeuta malinella* Zell., *Y. padella* (L.) and *Y. rorella* (Hbn.) in the Moldavian SSR.

Distribution: Czechoslovakia, Hungary, Italy, Moldavian SSR, Ukrainian SSR; Tadzhikistan in Central Asia. Probably common throughout central, southern and eastern Europe.

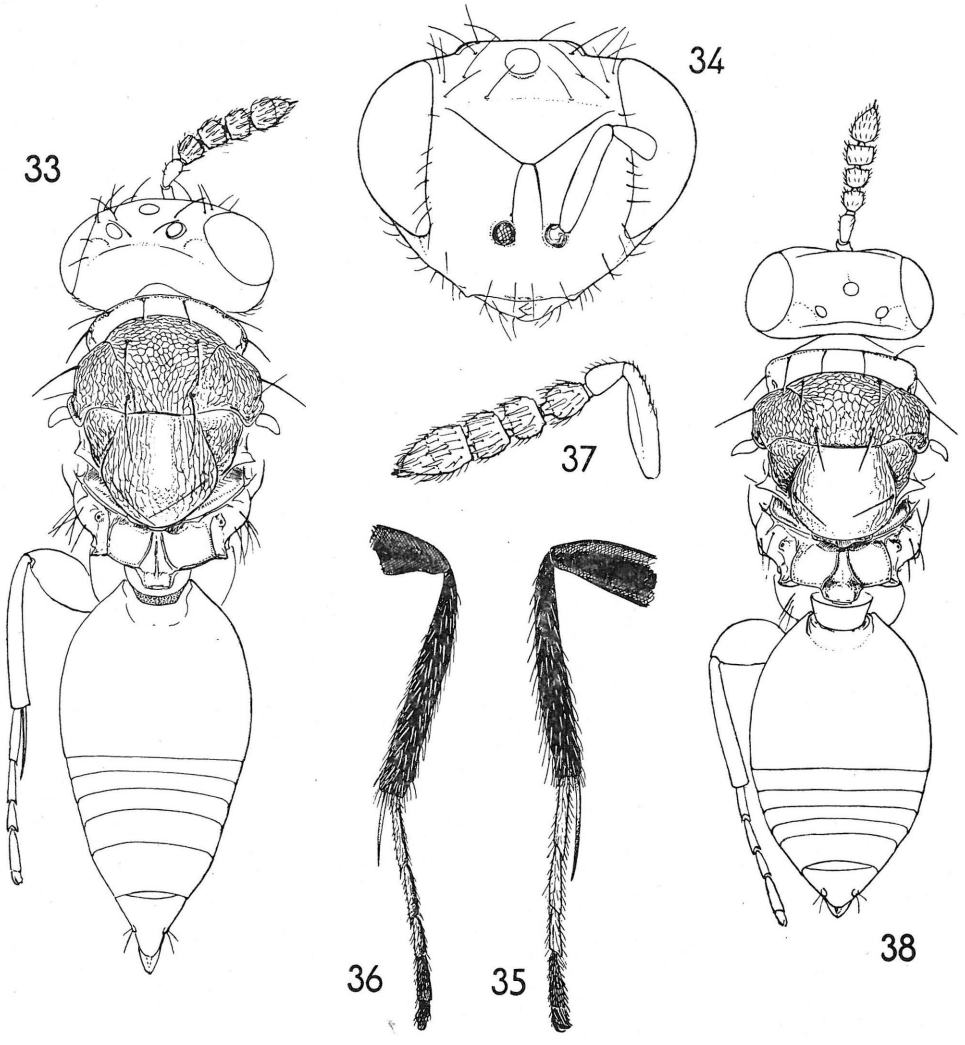
Holotype (female): Bohemia, Praha-Ruzyně, reared from a nest of *Euproctis phaeorrhoea,* 1956 by Dr. J. Dlabola. Deposited in the National Museum (Entomology), Prague, Cat. No. 25.627.

Further material (paratypes and allotype). — Czechoslovakia: Bohemia, Praha-Ruzyně, allotype and many paratypes of both sexes with the holotype, V.—VI. 1956 (Dlabola); Plaňany near Český Brod, nest of *E. phaeorrhoea,* 1956 (Dlabola); Moravia, Vlasatice, nest of *E. phaeorrhoea,* V.—VI. 1956 (Dlabola); Slovakia, Biskupice pri Dunaji, nest of *E. phaeorrhoea,* 1951 (Bouček); Bajč near Nitra, nest of *E. phaeorrhoea,* 1959 (Hostounský). — Hungary: Budapest, 8. and 10. VIII. 1935 (Szelényi). — Italy: Portici, ex *Lymantria dispar,* 1962 (Viggiani). — Moldavian SSR: Rybnitza; Kishinev, ex *Yponom. malinella,* 1. VII. 1957, and, not reared, VII. and 17. VIII. 1958 (all data Talitzki); Dubossary, ex *Yponom. padella,* 9. VII. 1959 (Talitzki); Tiraspol, ex *Yponom. rorella,* 7. VII. 1962 (Talitzki); Karmanovo, 2. VII. 1961 (Bouček). — Ukrain. SSR: Kiev, ex *E. phaeorrhoea,* 17. V. 1948 (Fedotova); Crimea (Bukowski); Rostov on the Don, ex *E. phaeorrhoea,* 15. III. 1956 (Kholyavko). — U. S. S. R. in Asia: Tadzhikistan, Kvak, ex *Yponomeuta* sp., 28. VII. 1955 (V. Degtareva).

Pediobius phragmitis, sp. nova

Pleurotropis facialis; Erdös, 1956, Folia ent. hung. (s. n.), **9**: 3, 41. (Nec Giraud, 1863.)

This species is allied to *P. pyrgo* and *P. obtusiceps,* but differs from both of them by its depressed and only weakly sculptured, shiny body with flat and almost wholly polished scutellum. Another very similar species, especially as regards the thorax and abdomen, is *P. furvum* Gahan from Africa. The antennae in the latter species are, however, much slenderer, with all three funicle segments elongate in female, the scutellum is less flattened, the spur of hind tibia shorter, etc.



Figs. 33—35. *Pediobius obtusiceps,* n. sp. — 33. Body of female (holotype) with reticulations on thorax indicated. — 34. Head of female in facial view. — 35. Hind leg, with the long spur. — Figs. 36—37. *Pediobius* pyrgo (Walker). — 36. Hind leg (part), with colour indicated, as in Fig. 35. Mind the length of the spur. — 37. Antenna of the female. — Fig. 38. *Pediobius phragmitis,* n. sp., female; body with one antenna and hind leg; reticulations on the thorax indicated.

Pediobius phragmitis was mentioned by Erdös, 1956, from Hungary as *facialis* Giraud, which is a quite different species (see below).

F e m a l e. — Body with distinct metallic green tinge on head and thorax; segments 1—3 of mid and hind tarsi whitish. Wings hyaline, venation brown.

Head from above hardly broader than mesoscutum (20:19), transverse-oval, fully twice as broad as thick, with occiput hardly excavated and indistinctly, bluntedly margined. Vertex broad, fully half as broad as head (11.5:20), shiny, finely minutely alutaceous, except in a space anterior to median ocellus and between lateral ocellus and eye where it is nearly smooth. Frons above the fork polished, angle between the branches about 140°. Interscrobal space broad, hardly convex, almost smooth; lateral parts of frons feebly reticulate; inner orbit hardly sinuate. Eye not large, oval (11:7.5), as high as shortest width of frons, almost three times as high as length of malar space; the latter smooth as well as lower face, malar sulcus fine but distinct. Antenna short and broad, with distinctly three-segmented funicle. Scapus not nearly reaching the ocellus, nearly as long as pedicellus with basal two funicle segments combined; pedicellus about 1.6 times as long as broad; ring segment distinct, but very transverse; funicle segments increasing in width toward clava, the first slightly, the second and the third more distinctly, transverse; clava short, with distinct terminal spine, without this as long as last two funicle segments combined but broader, its first segment large, hardly longer than the preceding segment, the second clava segment short, conical.

Thorax (Fig. 38) depressed, very short, hardly 1.5 times as long as broad. Pronotum broad, its lateral corners obtuse, rounded, sides of pronotum seen from above moderately converging backward; anterior margin of collar feebly arched. Mesoscutum all over alutaceous, meshes anteriorly at sides radiating backward from the indicated notauli, in posterior half more longitudinally arranged; notaular depressions very faint, with distinct bristle posteriorly. Scutellum subpentagonal, distinctly broader than long, flat, polished except for the sides which are longitudinally alutaceous. Metanotum very narrow. Propodeum subhorizontal, with fine submedian carinae archedly diverging backwards, intercarinal space concave anteriorly, convex posteriorly and distinctly separated by a transverse groove from the short nucha. Plicae finely carinaceous, even posteriorly, at base bent towards median line; submedian area nearly square, but its hind corner rounded; supracoxal angulations short but distinct. Forewing with speculum closed, but hairs proximally very sparse; costal cell bare; postmarginal vein rudimentary, shorter than the very short stigmal vein, the latter hardly longer than width of costal cell. Legs rather strong; spur of hind tibia about twice as long as width of the latter, exceeding the basitarsus, pale, with infuscate tip.

Abdominal petiole subcylindrical but transverse, its anterior angles about 90°, anterior margin feebly arched, overlapping the propodeal nucha; sides sligthly converging backward; dorsal surface dull, etremely finely reticulate. Gaster slightly shorter than thorax, oval, its sides converging apically at angle of about 70°. First gastral tergite surpassing the middle, smooth, the following tergites finely alutaceous at base, the sixth about five times as broad as long.

Length of body 1.4—1.7 mm. (holotype 1.6 mm.).

Male. — Unknown.

Hosts unknown, but certainly associated with *Phragmites communis* Trin.

Distribution: Czechoslovakia, Hungary, Moldavian S.S.R.

Holotype (female): Slovakia, Gbelce (formerly Köbölkút), swept from *Phragmites communis,* 29. VII. 1955 (Bouček); deposited in the Prague National Museum (Entomology), Cat. No. 25.628.

Further material (17 females, paratypes). — Czechoslovakia: Slovakia, Gbelce, with the holotype; Kamenín near Štúrovo, 27. VII. 1955 (Bouček). — Moldavian SSR: Kotovskoe, on *Phragmites,* 12. VII. 1961 (Bouček); Synzhereya (Сынжерея) near Kopatsheny, in *Phragmites,* 18. VII. 1961 (Bouček and Talitzki); Vadului-Vody, 16. VII. 1961 (Bouček and Talitzki). — I have seen also specimens from Hungary collected by Dr. Erdös.

Pediobius grunini (Nikolskaya), comb. nova

Pleurotropis grunini Nikolskaya, in Nikolskaya et Kyao, 1954, Trudy zool. Inst. Akad. N. SSSR, **16**: 414, 415; ♀♂.

Also this species belongs to the European fauna. During my stay in Leningrad in 1961 I was enabled to examine the type material and received (through the kindness of Dr. Nikolskaya) several paratypes for our collections. It was evident from the beginning that *P. grunini* was near to *brachycerus* (Thoms.), with which it has in common not only the small squat body with short antennae and rather characteristic sculpture, but also the biology. The main differences between the two species seem to lie in the antennae (see the key and the figures), these being less stout and only sparsely covered with long bristles instead of dense hairs of *P. brachycerus.*

Female. — Body nearly black, with tibiae fuscous, sometimes narrowly pale at tips; mid and hind tarsi whitish, but infuscate at apex, fore tarsi all infuscate; antennae fuscous. Wings hyaline, veins brown.

Head broader than thorax as 20:16, in dorsal view strongly transverse (9:20, in the middle 6:20), with occiput rather deeply excavated and sharply margined, the ridge blunted on temples which are above, in their narrowest place, at least as broad as the short diameter of lateral ocellus. Interocular distance above greater than half the width of head (12:21); vertex distinctly depressed externally to lateral ocelli, the latter large and prominent. Head in facial view almost smooth, subtriangular, with genae strongly converging; malar space almost half as long as vertical eye diameter (4.5:10); inner orbits distinctly diverging downwards, hardly sinuate; frontal fork diverging at angle of about 150°, frons above it smooth; interscrobal space hardly convex, scrobal grooves converging, only narrowly separated above; mouth margin in the middle slightly produced, broadly arched, mouth very small. Antenna short, but longer than in *brachycerus,* flagellum with pedicellus only slightly longer than width of vertex plus one eye from above, moderately broad; funicle three-segmented. Scapus slender, as long as pedicel plus one and a half of basal funicle segments; pedicellus short-oval, slightly longer than broad, narrower than and hardly as long as, the following segment; ring segment indistinct; first funicle segment as long as or very slightly longer than

broad; the second and third funicle segments subequal, slightly transverse to subquadrate; all three funicle segments irregularly rounded and covered with obliquely distant long whitish sparse bristles, arranged roughly in one irregular whorl, more or less reaching the middle of the following segment; each funicle segment apically with an extremely short petiole; clava bisegmented, subconical, as long as preceding two segments together, with distinct and slender terminal spine and hairs subequal to those of the funicle (Figs. 44, 45).

Thorax almost as in *P. brachycerus.* Pronotum rather strongly arched, distinctly ridged, rounded at sides, but the lateral edge set off by a short longitudinal groove. Mesothorax convex, mesoscutum all over reticulate, not quite twice as broad as long (16:9), about 1.5 times as long as width of scutellum at base, all over reticulate, with distinct broad notaular depressions, their inner margins strongly converging backward; notaular bristle situated at inner margin. Scutellum convex, reticulations distinctly lengthened in anterior half, not very dense (sparser than in *facialis* or *brachycerus*). Propodeum as in *brachycerus.*

Gaster subcircular to shortly oval; first tergite smooth, much broader than long, reaching with its straight margin the middle.

Length 1.0—1.5 mm.

Male. — Very similar to female, also in shape of antennae which are however slightly longer, with first two funicle segments hardly to slightly longer than broad, and the third almost quadrate; pubescence of flagellum shorter. Abdominal petiole quadrate. Length 0.9—1.2 mm.

Host: (DIPT.:) *Oncodes fumatus* Erd. within (the metasoma of) spider of the genus *Clubion,* in western Kazakhstan.

Distribution: Czechoslovakia, W. Kazakhstan (USSR).

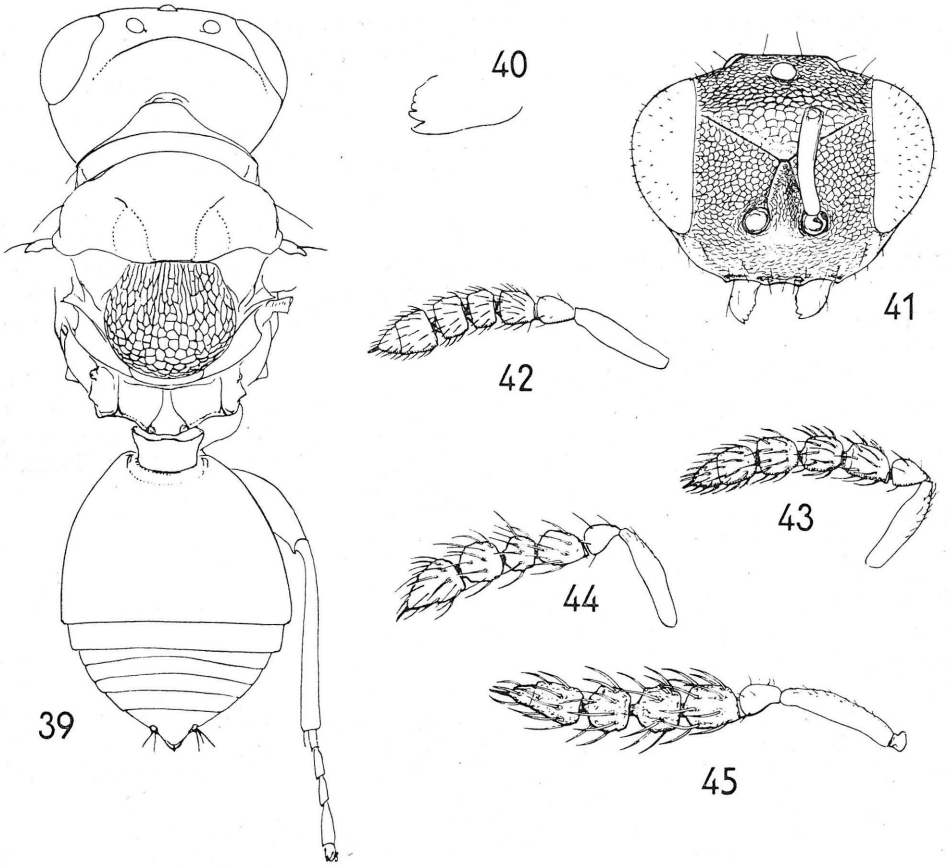
Material examined. — W. Kazakhstan, USSR: Yanvartsevo, ex puparium of *Oncodes fumatus* in *Clubion* sp. on a leaf of *Ulmus glabra,* 2. VII. 1950 (Grunin), holotype and paratypes of *grunini.* — Czechoslovakia: Bohemia, Nový Hradec Králové, 22. VII. and 21. VIII. 1955 (Bouček).

Pediobius facialis (Giraud)

Pleurotropis facialis Giraud, 1863, Verh. zool.-bot. Ges. Wien, **13**: 1272—1273; ♀♂.
Pediobius facialis; Bouček, 1961, Trudy Mold. n.-issl. Inst. Sadov. Vinogr. Vinod., **7**: 24.
Pediobius albae Erdös, 1961, Ann. hist.-nat. Mus. Natl. Hung., Zool., **53**: 485—486; ♀♂. — **N. syn.**

Through the kindness of my friend Dr. Steffan of the Paris Muséum National d'Histoire Naturelle I was enabled to examine, in 1959, four females and one male from the syntypes of *P. facialis.* I recognized this species in my material as well as in the material submitted to me for examination from the Moldavian SSR. On the latter I published a note in my recent paper on the Moldavian Chalcid flies (Bouček, 1961).

In 1963 Dr. Graham of Oxford kindly let me see his English specimens of *albae* compared with a paratype of this species. They proved to be conspecific with *facialis,* as well as the holotype of *albae* which I was enabled to examine soon afterwards thanks to the kindness of Dr. Erdös. This holotype is dark-coloured and does not differ in anything important



Figs. 39—42. *Pediobius facialis* (Giraud), female. — 39. Body with sculpture on the scutellum indicated. — 40. Right mandible seen from inner side. — 41. Head in facial view; sculpture and pubescence indicated. — 42. Antenna of the female. — Figs. 43—45. *Pediobius grunini* (Nikolskaja). — 43. Antenna of a male paratype. — 44—45. Antenna of two female specimens collected in Bohemia.

from my specimens of *facialis,* while the English specimens are more similar to a part of my Moldavian material, being mainly vividly green-coloured on head and thorax. Obviously this variation is of no taxonomic value.

As far as I known *P. facialis* was not mentioned in literature (except for catalogues) between the date of the original description (1863) and 1961. The specimens announced under *facialis* from Hungary by Erdös, 1956, concern in fact *P. phragmitis* described as a new species in the present paper.

Pediobius facialis is closely allied to *brachycerus* (Thoms.) and *grunini* (Nik.) on one hand, and on the other probably to the *pyrgo*-group and to *P. cassidae* Erd. The evidence at hand of the host records seems to confirm the opinion based on the morphological similarity. The species

seems to belong to the nearest vicinity of *brachycerus* mainly by its broad five-toothed mandibles, squat body with short antennae with three funicle segments and the shortly oval abdomen in female. The antenna of the male is more similar, and suggest a near relation, to *grunini, cassidae* and the *pyrgo*-group.

I hope *P. facialis* may be recognized easily by the characters mentioned in the key above.

Female. — Head and thorax with a slight, sometimes rather vivid, greenish or bluish tint, in specimens with protruding clypeal margin often almost brassy; face usually distinctly coppery to brassy; tibiae often vaguely pale at apex; tarsi pale, the claw segments and front tarsi all in all, infuscate. Wings hyaline.

Head (Fig. 41) very broad but only slightly broader than mesoscutum (26:23), twice as broad as long in dorsal view, with vertex much broader than long in the middle (14:9), as well as face (this finer) and frons densely reticulate; depressed area outside of lateral ocellus indistinct; occiput very shallowly excavated, sharply margined, temple rather broad, broader than length of lateral ocellus. Frontal fork diverging at about 140°; interscrobal space slightly convex, grooves converging, narrowly separated above. Eyes not very large, inner orbits strongly diverging downwards, straight. Anterior mouth margin generally straight, clypeus not or slightly protruding, then its anterior margin subtruncate and usually more or less reflexed; mouth margin at corners bordered by a narow but distinct malar depression. Both mandibles broad (Figs. 40, 41), about five-toothed, but inner teeth very small. Longest eye diameter almost 2.5 times as long as malar space, the latter nearly smooth. Antennae (Fig. 42) inserted just above the lower ocular line, short, funicle three-segmented, with flagellum plus pedicel only hardly longer than width of frons. Scapus slender, slightly longer than pedicel plus two basal funicle segments, not nearly reaching the ocellus; pedicellus elongate, subequal in length to, but a little narrower than, the first funicle segment, which is hardly longer than broad; the following segment slightly transverse, the third about 1.4 times as broad as long; clava bisegmented, as long as two preceding segments together, strongly pointed, with distinct terminal spine.

Thorax broad (Fig. 39), dorsally slightly flattened, only 1.4 times as long as broad. Pronotum only weakly arched, side corners distinct, although obtuse, the reticulate lateral edge prominent, separated from the smooth part by a longitudinal depression. Mesoscutum strongly transverse, twice to 2.2 times as broad as long, only slightly longer than width of scutellum at base (11:9.5), all over reticulate, meshes very dense on the very shallow notaular depressions; the notaular bristle situated in posterior third near inner margin; sides of mesoscutum when seen from above parallel behind lateral bristle. Scutellum only feebly convex, hardly as long as broad, longitudinally strigose in anterior half, reticulations posteriorly more or less isodiametric. Metascutellum very short. Propodeum not large, posteriorly often distinctly reticulate and then the carinae more or less obliterate; intercarinal space groove-like and sometimes

broad, posteriorly widened, but nucha not dostinct; submedian area subquadrate, at basal margin deeply narrowly impressed; plica hardly longer than posterior margin and feebly carinaceous, angle between them right or nearly so; supracoxal angulation distinctly produced obliquely sidewards, not low; metapleural convexity sharp-angular in outline, blunted at apex. Forewing with speculum completely closed, basal cell bare and almost as broad as length of stigmal vein, the latter subclavate, at least as long as the postmarginal vein; marginal vein with prestigma and postmarginal vein as long as width of wing. Legs not strong, spur of hind tibia hardly longer than width of tibia, much shorter than the first tarsal segment which is slightly shorter than the second.

Abdominal petiole transverse, densely reticulate, subcylindrical or dilated anteriorly, anterior margin raised, arched, slightly emarginate sublaterally. Gaster (Fig. 39) shortly oval, shorter than thorax, convex, sides converging at apex at a slightly obtuse angle; first tergite exceeding the middle (of gaster), its disc sometimes slightly alutaceous, its hind margin straight.

Length 1.3—1.8 mm.

Male. — Very similar to female, but usually more vividly green (to brassy), tarsi fuscous, abdomen often shorter, with petiole quadrate, very high, seen from side, and antennae different: scapus not broad, only as long as pedicel plus one and a half of basal funicle segments, all three funicle segments subquadrate to slihtly elongate, separated from each other by distinct though short petioles; flagellum with pedicel often nearly as long as width of head. Legs in male not stronger than in female.

Length of body 1.0—1.3 mm.

Hosts. In Austria *P. facialis* was reared by Giraud as a hyperparasite of (DIPT.) *Lipara tomentosa* (Macq.) via *"Pimpla arundinis"*. Also in the Moldavian SSR this parasite was bred several times from some hymenopterous primary parasites (Talitzki, 1961), viz. from *Apechthis rufata* (Gmel.), *Microgaster tibialis* Nees and *Phytodietus polyzonias* Först., all in *Cacoecia rosana* (L.). Further host records are (LEP.): *Cacoecia rosana* (L.) in Moldavia; *Choristoneura diversana* Hb. in Czechoslovakia (det. Dr. Patočka); *Depressaria nervosa* Haw. in England; *Mompha fulvescens* Haw. in Czechoslovakia; *Simaethis nemorana* Haw. in Sardinia. Giraud and Laboulbène, 1877, record also *"Cecidomyia rosaria"* as host. *Pediobius facialis* seems to be an essential hyperparasite attacking, at random, also some unparasitized lepidopterous pupae.

Distribution: Britain, Germany, Czechoslovakia, Austria, Hungary, Moldavian SSR, Italy; southern Siberia (USSR).

Material examined. — Germany (DBR): ?Aachen (Förster). — Czechoslovakia: Bohemia, Milá Hill in Středohoří, 30. IV. 1961 (Bouček and Strejček); Obříství near Mělník, 6. IX. 1959 (Hoffer); Zlonín N. of Praha, ex pupa of *Choristoneura diversana,* 30. VIII. 1954 (Samšiňák): Břve near Praha, 6. VI. 1952 (Bouček); Praha, 20. VII. 1958 (Bouček); Praha-Podhoř, 1. V. 1946 (Bouček), 24. V. 1953 (Hoffer); Praha-Chuchle, 11. VII. 1955 (Bouček); Praha-Slivenec, 7. VI. 1954 (Bouček); Košov near Lomnice nad Pop., 1957 (Bouček); Velký Vřešťov, ex *Mompha fulvescens* in *Epilobium,* VIII. 1954 (Bouček); Hradec Králové-Věkoše, 28. VIII. 1958 (Bouček); Týniště nad Orl., 10. VIII. 1953

and 1959 (Bouček); Moravia, Branišovice, 29. V. 1956 (Bouček); Klausen Hill in Pavlovské kopce, 27. VII. 1946 (Hoffer); Bzenec, 22. VII. 1942 (Šustera); Slovakia, Senec, at Černý Dunaj, 8. IX. 1953 (Bouček); Oslany near Nitra, 15. VII. 1959 (Bouček); Slanec, Izra Lake, 6. VIII. 1954 (Bouček); Baba near Ladmovce, 23. VI. 1952 (Kocourek). — Austria: Marchfeld, Oberweiden, 14. VIII. 1960 (Bachmaier); Siegenfeld, 4. VIII. 1922 (Ruschka); Weyer, 15. VIII. 1918 (Ruschka). — Moldavian SSR: Nisporeny, 17. VII. 1958 (Talitzki); Slobodzeya, ex *Cacoecia rosana,* 5. VII. 1958 (Talitzki); Tiraspol, ex *C. rosana,* 5. VII. 1958 (Talitzki); Kishinev, VII. 1958 (Talitzki); Vadului-Vody, 16. VII. 1961 (Bouček a. Talitzki); Karmanovo, 2. VII. 1961 (Bouček). — Italy: Sardinia, ex *Simaethis nemorana,* 28. VIII. 1960 (Prota). — Southern Siberia (USSR): Irkutsk, 18. VII. 1951 (Plugar).

Pediobius brachycerus (Thomson)

Pleurotropis (Rhopalotus) brachycerus Thomson, 1878, Hym. Scand., **5**: 257; ♀♂.
Rhopalotus brachycerus; Dalla Torre, 1898, Cat. Hym., **5**: 31.
Pleurotropis aquatica Erdös, 1954, Ann. hist.-nat. Mus. Nat. Hung., s. n. **5**: 350; ♂. **N. syn.**
Rhopalotus cothurnatus; Erdös, 1956, Folia ent. Hung., s. n., **9**: 42.
Pediobius brachycerus; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 189.

I have seen the type of *brachycerus* as well as some specimens identified by Dr. Erdös as *aquaticus,* which is the male to *brachycerus.*

P. brachycerus is very near to *facialis,* from which it differs mainly by thicker and densely pubescent antennae in female, a more convex thorax, with distinct, though shallow, notaular depressions, the hind margin of pronotum more deeply emarginate, the mesoscutum less transverse, about 1.8 times as long as width of scutellum at base; the scutellum is also more convex and its sides more strongly narrowing forwards, the propodeal submedian carinae mostly closer to each other, etc. The body in the two species is in both sexes squat, antennae are very short, with the second and third funicle segment, at least in female, transverse or subquadrate.

Similar to *brachycerus* (and *grunini*), at least in host-relationship, must be the North-American *P. wilderi* (Howard).

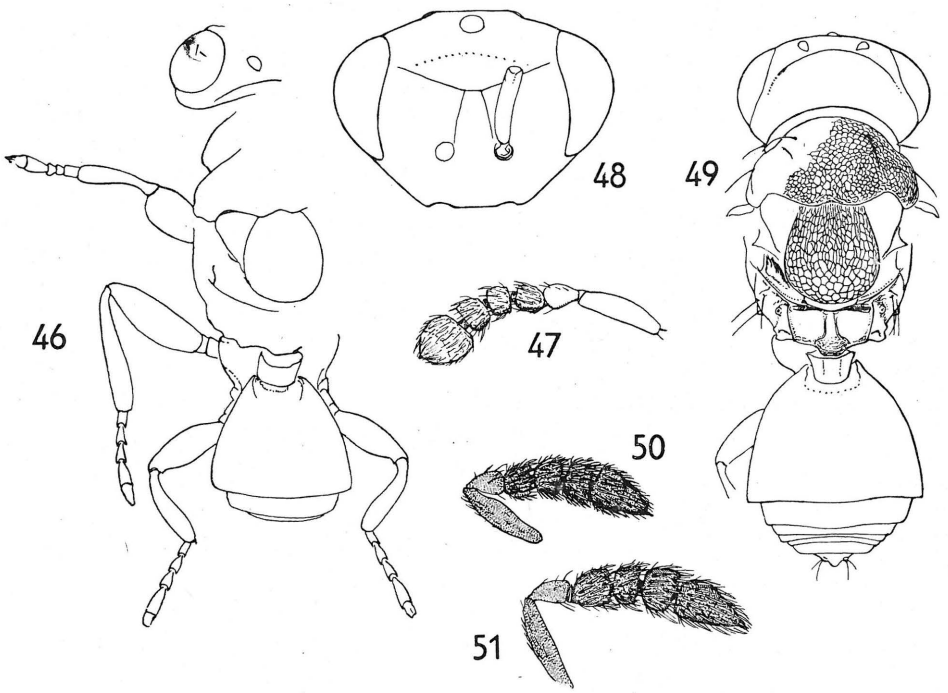
In the following only those characters that are different from *facialis* are mentioned.

Female. — Face mostly not differently coloured from the dorsum of head and thorax.

Head with occiput rather deeply excavated; vertex twice as broad as long in the middle, or nearly so, high posteriorly, with distinct though shallow impressed area outside of lateral ocellus; frons and face finely reticulate; vertical eye diameter twice as long as malar space; depression along mouth margin at sides almost indistinct. Head in facial view (Fig. 48) much more converging to mouth than in *facialis,* genae longer. Antenna (Figs. 50, 51) very short with very stout and very densely pubescent flagellum; scapus rather short, only slightly longer than pedicel plus first funicle segment (ring segment indistinct); pedicellus as broad as scapus and hardly shorter than the first funicle segment, but much narrower than the latter, which is subquadrate; the second and third funicle segments transverse, often at least 1.5 times broader than long, very narrowly separated from each other, only in smaller specimens with less developed pubescence incisures more distinct; clava often longer

than two preceding segments together, strongly tapering to apex, the terminal spine hidden in the dense pubescence, but present.

Thorax (Fig. 49) distinctly convex, fully 1.5 times as long as broad. Pronotum strongly arched, at sides mostly rounded, without prominent corners, the side edge completely obliterate, not set off by a short groove as in *facialis*. Mesoscutum at least 1.5 times as long as width of the



Figs. 46—51. *Pediobius brachycerus* (Thomson). — 46. Body (partly) of a male with unusually stout legs. — 47. Antenna of the same aberrant male. — 48. Head of female in facial view; very characteristic are the long and strongly converging genae. — 49. Body of female, with sculpture partly indicated. — 50 and 51. Antenna of two females, one from Austria (Fig. 50) and one from the Moldavian SSR.

narrow base of scutellum, convex, with notaular depressions rather distinct though not deep; sides of mesoscutum (seen from above) diverging backward behind lateral bristle. Scutellum hardly longer than broad, convex, its sides rather strongly converging forwards. Propodeum with carinae often obliterate, intercarinal stripe mostly very narrow, at least anteriorly; submedian area often much broader than long. Forewing in correlation with the relatively small body with postmarginal and stigmal veins extremely short.

Abdominal petiole only slightly transverse. Gaster narrow, shorter than thorax, first tergite smooth, covering most of gastral surface; its sides subparallel in posterior half.

Length of body 1.1—1.6 mm.

Male. — Head and thorax usually brassy-green (see description of *aquaticus*). Antenna with scapus distinctly thickened in distal two-thirds; flagellum less broad and less densely pubescent than in female; second and third funicle segments only slightly transverse. Front femora often (probably not always!?) thickened, mid and hind ones less so (Fig. 46). Abdominal petiole quadrate. Gaster usually (in both sexes) less convex than in *facialis*. Length of body 0.9—1.3 mm.

This species is also rather variable, as already mentioned in various characters. In the female most characteristic are the antennae, but in some specimens a comparison with individuals of *facialis* is necessary to get accuracy in identification. It is also difficult to explain the variation of the thickeness of the femora in males (Fig. 46) which does not seem to be in correlation with the body size. In one male specimen that I leave unidentified for the time being the femora are very stout, but the antennal scapus is more slender and flagellum strongly clavate, with clava circular (Fig. 47), twice as broad as the second funicle segment, and without distinct terminal spine. Another new species?

Hosts. *Pediobius brachycerus* is obviously essentially a hyperparasite attacking mainly predators of spider eggs. In Austria it was reared from a pupa of the Ichneumonid *Polysphincta* sp., a parasite in the cocoon of *Argiope bruennichi* (Scop.), in southern Ukraine from a cocoon of the "karakurt" *Latrodectus tredecimguttatus* (Rossi), then from a "spider nest" in England and from "spider eggs" in Germany (Otten, 1940). I have seen the specimens in question.

Distribution: Britain, Sweden, Germany, Czechoslovakia, Hungary, Moldavian SSR, Ukrainian SSR in Europe, and S. Ontario in Canada.

Material examined. — Britain: England, ex "spider eggs" (Bignell, coll. Mayr, Mus. Vienna). — Sweden: the type of *brachycerus*. — Germany: specimens mentioned by Otten, 1940. — Czechoslovakia: Bohemia, Bělá near Děčín, 14. VI. 1957 (Bouček); Břehyně near Doksy, 9. VIII. 1957 and 12. VII. 1959 (Bouček), 18. VI. and 30. VIII. 1958 (Hoffer); Vrchoviny near Náchod, 9. and 12. VIII. 1936 (Macek); Velký Vřešťov, VIII. 1961 (Bouček); Týniště nad Orl., 10. VIII. 1959 (Bouček); Choťovice near Chlumec nad Cidl., 19. VIII. 1959 (Bouček); Praha-Ruzyně, 17. VII. 1952 (Bouček); Hromice in S. Bohemia, 30. VIII. 1946 (Hoffer); Rožmberk Lake near Třeboň, 16. VI. 1946 (Bouček); Prachatice, 30. VIII. 1950 (Hoffer); Černá in Šumava Mountains, 25. VII. 1954 (Hoffer); Slovakia, Kamenica nad Hronom, *Salix* at Danube, 5. V. 1948 (Hoffer). — Austria: Eichkogel near Mödling, Vienna district, ex *Polysphincta* in egg-cocoon of *Argiope bruennichi*, 1956 (Schremmer). — Hungary: several specimens of *aquaticus*. — Moldavian SSR: Kopatsheny near Synzhereya, 18. VII. 1961 (Bouček and Talitzki). — Ukrain. SSR: Shabo (Bugaz) at Dniestr Liman, in reeds, 9. VII. 1961 (Bouček); Odessa, ex egg-cocoon of the karakurt, V. 1954 (E. Volyanskaya). — Canada: Ontario, Lake Erie, Turkey Point, VIII. 1956 (Obenberger).

Pediobius lysis (Walker)

?Cynips rotundata Fonscolombe, 1832, Ann. Sci. nat., **26**: 294—295; ♂ (?).
Entedon Lysis Walker, 1839, Monogr. Chalc., **1**: 114—115; ♀.
Entedon Sosarmus Walker, 1839, Monogr. Chalc., **1**: 116—117; ♀. **N. syn.**
Elachestus Cyniphidum Ratzeburg, 1848, Ichneum. d. Forstins., **2**: 174—175; "♂".
Pleurotropis cribrifrons Thomson, 1878, Hym. Scand., **5**: 253—254; ♀♂. **N. syn.**
Pleurotropis naso Erdös, 1951, Acta biol. Acad. Sci. Hung., **2**: 227—229; ♀.

Pleurotropis cyniphidum; Erdös, 1951, ibidem, **2**: 229.
?Pediobius rotundatus; Domenichini, 1953, Boll. Zool. agrar. Bachicolt., **19**: 84, 94—95.
Pleurotropis cyniphidum; Erdös, 1954, Ann. hist.-nat. Mus. Hung., s. n., **5**: 351—352.
Pediobius lysis; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 191. — Askew, 1961, ididem, **14**: 259, 261. — Askew, 1962, Entomophaga, **7**: 337—340.

It was probably this species that was studied by Domenichini, 1953, as "*Pediobius rotundatus* Fonscolombe". The location of the type of *Cynips rotundata* Fonsc. is not known to me. But I think anyway that the name

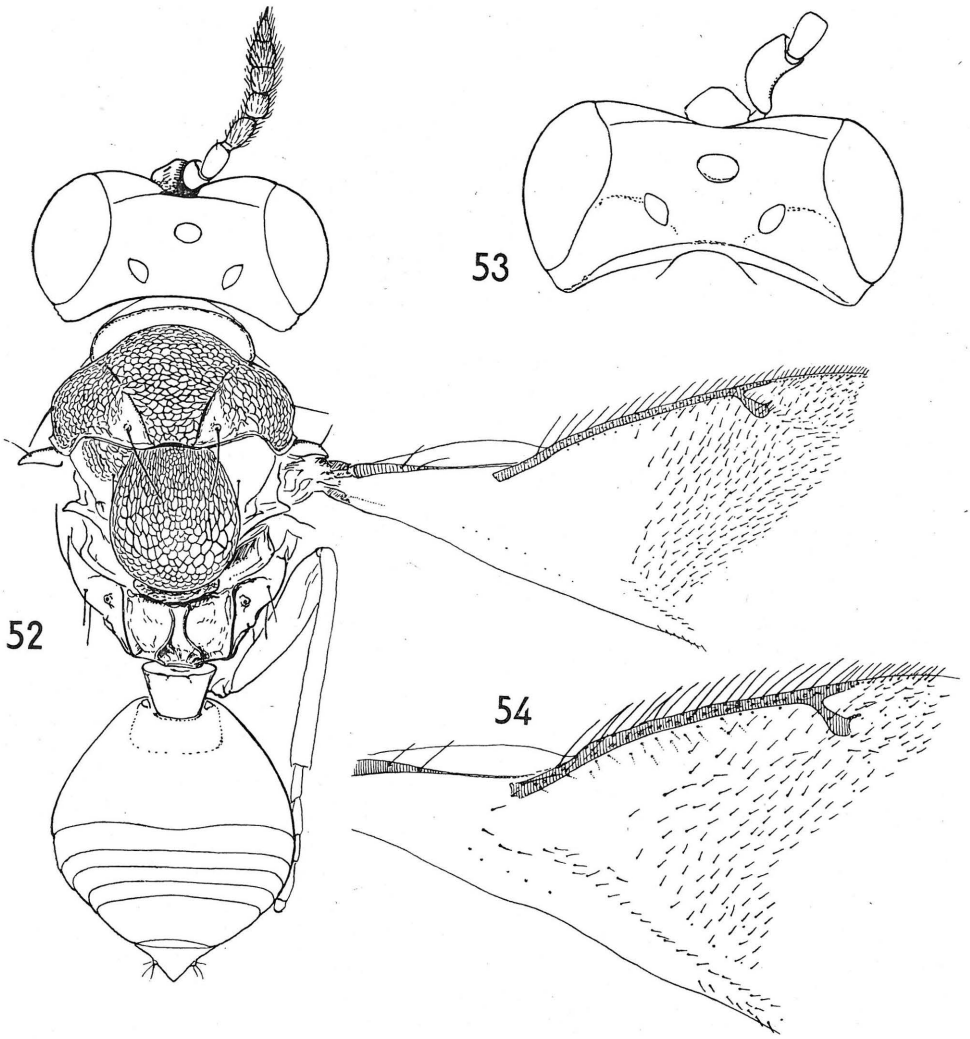


Fig. 52. *Pediobius lysis* (Walker), female, with sculpture on thorax partly indicated; forewing showing the large open speculum. — Fig. 53. *Pediobius clita* (Walker), head of male from above. — Fig. 54. *Pediobius chilaspidis,* n. sp. Forewing with closed speculum.

rotundatus should not be accepted as a valid name and should be rejected as a nomen oblitum, even if the type material is discovered.

During my recent stay at London and Oxford I saw the types of *lysis* and *sosarmus*. They are conspecific, as found previously also by Dr. Graham, with *Pleurotropis cribrifrons* Thomson, the type of which I was enabled to examine in 1959. The name *lysis* was resuscitated and established by Dr. Graham in 1959, after 120 years of oblivion, together with many other Walker names. The synonymy of the three mentioned names was published by Askew, 1962. The latter author examined also *Pleurotropis naso Erd.* (which was synonymized in 1954 by its own author with *Elachestus cyniphidum* Ratzeburg) and found it to be the same as *lysis*.

This species belongs to one group with *P. clita* (Walk.), *chilaspidis, n. sp., plagiotrochi* (Erd.) and *sublaevis* (Erd.). Nearly all these species are known as endoparasites of Cynipids in oak galls. The *lysis-group* as a whole shows some similarity, on the other hand, to *P. crassicornis* (Thoms.), but the latter species differs considerably not only by the different antennae and abdomen, but also by the different host selection.

P. lysis (Fig. 52) is characterized in the key above and was redescribed by Erdös, 1951 (as *naso*). The following additional characters may be also of importance.

F e m a l e. — Temple above sharply margined, broad, much broader than distance between eye and lateral ocellus. Head in facial view (Fig. 56) strikingly trapezoidal, with eyes very large, very distinctly prominent above. Interscrobal space broad, distinctly narrowed above, highly raised below as stated in the key; scrobal grooves broadly separated at the fork. Ring segment even in the antenna exsiccated distinct. Notaular depression of mesoscutum ending posteriorly in a deep pit at base of scutellum, with the notaular bristle situated in the middle of bottom, which is smooth or nearly so; hind margin of mid lobe narrow, raised and slightly emarginate (reminding one of *Pediobius crassicornis*). Metascutellum depressed at sides. Propodeum with submedian area highly margined, particularly in posterior half, the straight part of posterior margin less than half as long as plica; nucha not distinctly separated. Forewing with costal cell broad and bare, speculum large and broadly open (Fig. 52); stigmal vein distinctly clavate and longer than the postmarginal vein, the space between the two veins bare. Tarsi very slender, in mid tarsus third segment the shortest, but twice as long as broad. Spur of hind tibia slender and only as long as width of tibia at apex. Abdominal petiole not longer than broad, its sides sharply carinaceous, its dorsal surface nearly flat, with two vague submedian longitudinal keels indicated, with shallow median groove between them; anterior margin arcuate. Gaster circular, alutaceous, but first tergite smooth, hardly reaching the middle (in female, Fig. 52), its hind margin distinctly emarginate at sides in dorsal view; seventh gastral tergite (epipygium) in the middle between pygostyli triangularly impressed.

M a l e similar to female, but more brightly coloured, in places brassy or slightly golden-red, especially on dorsum of thorax and on vertex. For

head in facial view, with strikingly truncate lower margin, see Fig. 57. Level of lower extremities of eyes almost three times nearer to lower margin of antennal sockets than to the truncate, nearly straight (very slightly archedly produced) mouth margin. Face very broadly depressed below either antennal socket.

Hosts: (HYM.) *Neuroterus albipes* (Schenck) f. *laeviusculus* Schenck in Britain (occasionally), *N. lanuginosus* (Giraud) in Hungary, *N. numismalis* (Geoffr.) in Britain and Germany (commonly), and *N. quercusbaccarum* (L.) f. *lenticularis* (Ol.) in France and Czechoslovakia (frequently). According to Kieffer, 1899, *Illustr. Zeischr. f. Ent.*, 4:196, also *Trigonaspis megaptera* (Panz.) was mentioned as host of "*Elachestus cyniphidum* Rtz." in Prussia by Brischke, 1882 (not available to me). Probably also Hadersold's record of *Pleurotropis cribrifrons* ex *Neuroterus laeviusculus* or *N. lenticularis* in Germany (1939, p. 8) concerns *Ped. lysis.* Further host records, viz. *Cynips longiventris Hart.* in Germany (Ratzeburg, 1848) and *Lithocolletis platani* Stgr. in Hungary (Györfi, 1941, under "*cribrifrons*") are probably not reliable; the latter seems to concern rather *Pediobius acantha* (Walk.).

P. lysis is a primary endophagous parasite (Askew, 1962) and in Britain the flight period of the adults reaches its peak in June whereas the allied *P. clita* appear later, mainly in July. In Czechoslovakia we cannot confirm this sequence as regular.

Distribution: Britain, Sweden, France, Germany, Czechoslovakia, Hungary, Moldavian SSR.

Material examined. — Britain: the types of *lysis* and *sosarmus,* apart from some recent materials. — Sweden: the type of *cribrifrons* in the C. G. Thomson collection. — Germany: Is. Rügen, Baabe, VII. 1960 (Bouček); Brandenburg, Zehlendorf, ex *Neurot. numismalis,* 20. IX. 1922 (Bollow). — Czechoslovakia: Bohemia, Děčínský Sněžník, 27. VII. 1956 (Bouček); Deblík Hill near Ústí nad Lab., 26. VII. 1956 (Bouček); Praha-Ruzyně, 17. VII. 1952 (Bouček); Praha-Bohdalec, ex *Neurot. lenticularis,* 1925 (Novitzky); Luka pod Medníkem, 7. VII. 1954 (Bouček); Cikar, Nežárka, VII. 1923 (Syrovátka); Hradec Králové, VI. 1916 (Sekera); Piletice near Hradec Král., 19. VII. 1955 (Bouček); Týniště nad Orl., 5. VII. 1959 (Bouček); Velký Vřešťov, VIII. 1961 (Bouček); Moravia, Čejč, 16. VI. 1956 (Kocourek). — Hungary: Mecsek Hills, ex *Neurot. lanuginosus,* 1. V. 1952 (Erdös). — Moldavian SSR: Kishinev, 25. VI. 1960 (Talitzki).

Pediobius chilaspidis, sp. nova

This is a twin species of *P. lysis* and at first, before I found further differences in males, apart from the closed speculum, I considered it a mere subspecies of *lysis. P. chilaspidis* is so similar to *lysis* that I refrain from a detailed description and mention only the following differences.

Interantennal callus generally lower than in *lysis,* in female less steep below and here mostly smooth; frontal fork more openly diverging in most specimens. In male head in anterior view more transverse, 3:2 (or 27:18, while in male of *lysis* 24:19; see Fig. 57), and more trapezoidal, with interantennal callus less prominent, the subantennal depressions shallower, genae slightly shorter and mouth margin less strikingly trun-

cate than in *lysis*. Forewing with speculum basally and below always closed by a hair-line (Fig. 54). Female 1.6—1.9 mm., male 1.5—1.7 mm.

Host: (HYM.:) *Chilaspis nitida* (Giraud) in *Quercus cerris* L. in Austria and Hungary. The flight period of *chilaspidis* is much earlier than that of *lysis*.

Distribution: Czechoslovakia, Austria, Hungary.

Holotype (female): Czechoslovakia, southern Slovakia, Kamenica nad Hronom, in *Quercus cerris*, 19. V. 1960 (Bouček); deposited in the Prague Nat. Mus. (Entomology), Cat. No. 25631.

Further material (paratypes and allotype, 15 ♀♀, 5 ♂♂). — Czechoslovakia: Kamenica nad Hron., 4 ♀♀ with the holotype (Bouček); Beluja Forest near Plášťovce, 1 ♂, allotype, 20. V. 1960 (Bouček). — Austria: Wien, Türkenschantze, ex *Chilaspis nitida*, 13. and 16. IV. 1912 (Wachtl); Schönbrunn, „ex Gallen v. Andricus nitidus G."; Gugging, VI. 1904 (Naturh. Mus. Wien). — Hungary: Bakony, 3. VI. 1953 (Erdös); Tompa, ex *Chilaspis nitida*, 25. III.—14. IV. 1960, 1 ♂ and 7 ♀♀ (Erdös).

Pediobius sublaevis (Erdös)

Rhopalotus sublaevis Erdös, 1958, Bull. Soc. ent. France, **62**: 286; ♀.
Pediobius sublaevis; Askew, 1962, Entomophaga, **7**: 342.

This species is known so far only from one female. It is deposited in Dr. Granger's collection in Paris, who kindly submitted in 1959 the holotype to me for examination. *P. sublaevis* belongs to a close vicinity of *lysis* and *clita*. In 1962 Dr. Askew transferred it to *Pediobius*.

The characters of this species by which it differs from its allies, as well as from all other species of the genus, are given in the key above. Most characteristic is the extremely feeble, mostly alutaceous sculpture of the thorax. The interantennal crest is as in *clita*, lower than in most *lysis*, but the malar space is longer, as in the latter species. The similarity to *lysis* is so great that it suggests a doubt as to whether *sublaevis* is not only an aberrant specimen of that species.

Host unknown. — The species is said to have been swept from *Phragmites*, but it is surely associated with some oak galls.

Distribution: France.

Material examined. — France: the type female from Toulon (coll. Ch. Granger, Paris).

Pediobius clita (Walker)

Entedon Clita Walker, 1839, Monogr. Chalc., **1**: 117; ♂.
Pediobius clita; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 191. — Askew, 1961, ibidem, 14: 257. — Askew, 1962, Entomophaga, **7**: 337—340.

This species was recently recognized from the type and from some fresh additional material from England by Dr. Graham (1959) and segregated from the closely allied *P. lysis*. Soon afterwards *P. clita* was studied ecologically and taxonomically by Dr. Askew (1961, 1962), also in England. I have also examined the type.

The species may be distinguished from its allies by the characters given in the key above. It is very near to *lysis*, but has much shorter genae

(Figs. 58, 59) and also the funicle segments are shorter, only quadrate or hardly longer than broad in female.

Hosts: (HYM.:) *Neuroterus albipes* (Schenck) f. *laeviusculus* Schenck in Britain and certainly in other countries, but further records are not yet available. Several years ago I obtained through the kindness of Dr. Erdös one female reared by him together with *P. lysis* from *Neuroterus lanuginosus* (Giraud) in Hungary. According to Askew, 1962, *P. clita* develops as an endophagous parasite and appears in nature later than *P. lysis,* mainly in July, which coincides with the later appearance of its host in Britain. In Czechoslovakia the flight periods of the two species do not differ distinctly.

Distribution: Britain, Germany, Czechoslovakia, Hungary, Yugoslavia.

Material examined. — Britain: the type of *clita.* — Germany: ?Aachen (coll. Förster); (DDR) Ins. Rügen, Baabe, VII. 1960 (Bouček). — Czechoslovakia: Bohemia, Deblík Hill near Ústí nad Lab., 26. VII. 1956 (Bouček); Čelákovice, 1927 (Novický); Piletice near Hradec Králové, 19. VII. 1955 (Bouček). — Hungary: Mecsek Hills, ex *Neuroterus lanuginosus,* 1. V. 1952 (Erdös). — Yugoslavia: Crna Gora (Montenegro), Budva, 9. VII. 1958 (Bouček).

Pediobius plagiotrochi (Erdös)

Rhopalotus plagiotrochi Erdös, 1958, Bull. Soc. ent. France, **62**: 284—285; ♀.
Pediobius plagiotrochi; Askew, 1962, Entomophaga, **7**: 339—341.

Through the courtesy of Mr. Granger of Paris I was enabled to examine the type of this species and later on he donated me even one paratype for our collections.

P. plagiotrochi is another species of the *lysis*-group and belongs here not only by the morphological characters, but also by the host selection. From all species of this group it may be easily distinguished by the characters given in the key, in particular by the deep reticulation of the mesonotum and the scrobal grooves connected below the frontal fork. The sculpture of the thorax reminds one much of some species of the *eubius*-group. From all of them *P. plagiotrochi* differs by its squater body, broad wings, short antennae with bisegmented funicle only, etc.

A redescription of *P. plagiotrochi* was made by Askew, 1962, and the few following characters may complete it.

Interscrobal space triangular, raised below into an obtuse narrow crest, the scrobal grooves meeting distinctly before reaching the fork, which diverge at an angle of about 130°. Vertex not very sharply margined and distinctly so only in the median third. Bristle of notaular depression situated in posterior quarter at inner margin. First gastral tergite with hind margin slightly produced backward in the middle.

Pediobius plagiotrochi, as far as known from the poor material and evidence at hand, shows a very interesting variation. Most specimens are dark-coloured, mainly bluish, with some parts of body green or violet, as redescribed by Askew, 1962, and have the speculum in the forewing closed by several sparse hairs on the cubital food. According to Dr. Askew, who reared several specimens, these hairs may even be missing. In most of

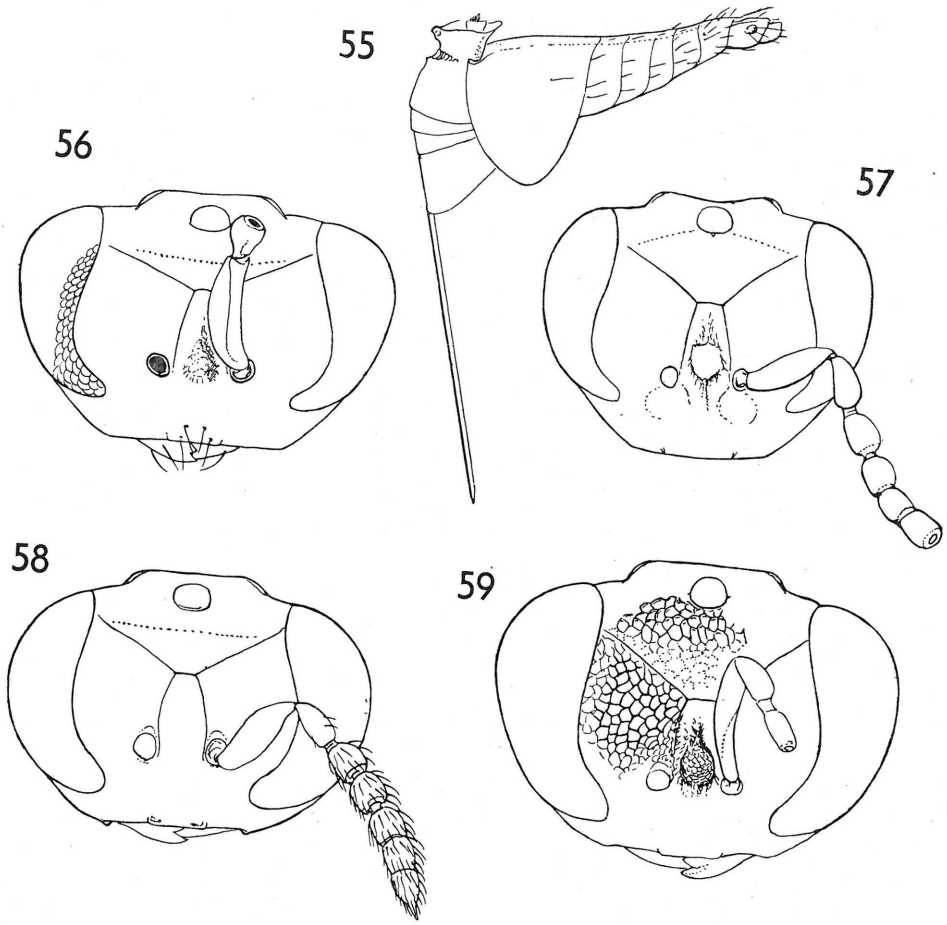


Fig. 55. *Pediobius plagiotrochi* (Erdös). Abdomen of female showing the position of the ovipositor and the abdominal segments at the act of egg-laying. – Figs. 56—57. *Pediobius lysis* (Walker). – 56. Head of female in facial view. – 57. Head of male in facial view. Figs. 58—59. *Pediobius clita* (Walker). — 58. Head of male in facial view. — 59. Head in female in facial view. Mind the short malar space in this species in comparison with *lysis* (Fig. 56).

the Portugese specimens mentioned below, however, the body is dorsally vividly green to brassy (on vertex and mesoscutum), with hind coxae violet, and the speculum of the forewing is completely closed by dense cubital hair-line. Head in dorsal view is not narrowed behind eyes, the temples are on the contrary more distinctly developed, in one specimen (seen from above) even broader than head at centres of the eyes. Unfortunately no exact host records are available yet to throw more light onto the problem. The Portugese specimens were observed with eggs of *Tortrix viridana* (L.) on oak leaves, but they probably did not parasitize them. Further evidence is much needed. For the time being I classify

these specimens with *plagiotrochi,* as suggested already by Dr. Askew, who also knew this form (swept from oaks) and who thinks that they may belong to the alternate generation of the typical *plagiotrochi.*

Hosts: (HYM.:) *Andricus burgundus* Mayr in *Quercus suber* L. in Spain and *Plagiotrochus fusifex* Mayr in *Quercus coccifera* L. in southern France. *P. fusifex* is the original host of *Cynips rotundata* Fonsc. (Ruschka, 1924, Deut. ent. Zeitschr., p. 95); thus, *Ped. plagiotrochi* may be *rotundatus* (see sub *lysis*).

Distribution: France, Spain, Portugal.

Material examined. — France: Var, Ollioules, the type and one paratype of *plagiotrochi.* — Spain: Gerona, Tossa de Mar, ex *Andricus burgundus* from male catkins of *Quercus suber* (reared and kindly donated to me by Dr. Askew). — Portugal: Carrasqueira, eggs (?!) of *T. viridana,* 1961 (Orrico); several further not specified spots, with eggs of *T. viridana,* III. 1962 (Silva).

Pediobius epigonus (Walker)

Entedon Epigonus Walker, 1839, Monogr. Chalc., **1**: 112—113; ♂♀.
Entedon metallicus; Walker, 1848, List Spec. hym. Ins. Coll. Brit. Mus.,**2**: 136.
?Pleurotropis isomerus Förster, 1861, Progr. Realschule Aachen, p. XXXVII; ♂.
Semiotellus (?) nigripes Lindeman, 1887, Bull. Soc. Imp. Natur. Moscou (2), **1**: 179, 185, 192.
Pleurotropis epigonus; MacConnell, 1916, Journ. econ. Ent., **9**: 145—147.
Pediobius metallicus; Ferrière, 1953, Boll. Ist. Ent. Univ. Bologna, **19**: 400.
Pediobius epigonus; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 191. — Rosen, 1959, Ent. Tidskr., **80**: 163—165.

I saw the lectotype of *epigonus* in the British Museum, as well as further material from England compared with the type by Dr. Graham.

Eulophus metallicus Nees, 1834, has been used in more than one paper to designate the species presently called *P. epigonus.* Unfortunately, its type material is no more in existence and the original description fits equally well *epigonus* as *acantha.* However, as far as our evidence goes, *P. epigonus* in closely bound to a grassy habitat, being essentially (or exclusively?) parasitic on small dipterous insects dwelling in grass-stems. And it is the near *acantha* which attacks, on the other hand, various leaf-miners. Therefore *E. metallicus* referred by its author as collected from oaks, may be rather *acantha* than *epigonus.* Probably on this reason the synonymy *epigonus-metallicus,* accepted by Gahan, 1933 (and by several subsequent authors), was not approved by Graham, 1959. I concur with this reason, and use consequently *epigonus* as the valid name for the species, and consider *E. metallicus* a nomen dubium.

As to *Pleurotropis isomerus* Förster, I could not examine its type mentioned by Ferrière, 1953 (p. 400), who received it then through Mr. Novicky from the Vienna Museum. It is missing now in the Förster collection in Vienna. Notwithstanding I propose to consider it, in absence of evidence to the contrary, a synonym to *epigonus,* basing on Ferrière's statement after his comparison of the type of *isomerus* with *Pediobius "metallicus* Nees" (sensu Gahan, 1933, = *epigonus* Walk.) that it is "probablement synonyme de cette espèce".

Another synonym of *P. epigonus* is *Semiotellus nigripes* Lindeman, 1877, as explained by Gahan, 1933 (p. 137).

Pediobius epigonus belongs to a difficult species-group, but should be readily identified by the characters used in the key. Here some more characters to stress or in addition to the very good description of this species, accompanied by excellent figures, by Gahan, 1933 (under *metallicus,* pp. 133—138):

Frons and face in female with a more or less vivid green cast, often almost brassy. Hind tarsi in female mainly infuscate, only rarely segments 1—3 pale (as in *acantha*). Scrobal grooves in female meeting just below the fork (Fig. 74), in male distinctly separated. Tip of antenna in female often pale, last two segments strongly tapering to apex (Figs. 72—73), the last segment at base much narrower than the last but one; terminal spine curved, half as long as the preceding segment or (often) still longer. Forewing with speculum closed, costal cell bare.

The variation of *P. epigonus* is fairly wide. It seems to suggest that the species may be formed by a complex of lower units, probably in accordance with the different hosts or different conditions of development. But very little is known yet in this respect.

The antennae in female are sometimes considerably stout and short, with the third funicle segment slightly transverse (cf. also Blunck, 1931, p. 589), sometimes fairly slender, with the third funicle segment clearly elongate, up to 1.5 times as long as broad (with all intergrades). But always the antenna is filiform, not distinctly clavate, the funicle not abruptly stouter than the pedicellus, and, especially, it is its clava which is characteristic (Figs. 72—73): ist first segment subequal to third funicle segment, the second clava segment is however much narrower at base than the first and is distally conically tapering into the long and bent terminal spine. Another form of female has an unusually stout head (antero-posteriorly) with antennae mostly rather short and the occipital margin less sharp. In still another form there is a rather coarse sculpture on head, the orbits are more deeply emarginate and malar space is very short (Fig. 74). There are always, however, intergrades. Probably some of the forms may prove different host races one day.

Hosts: (DIPT.:) *Hydrellia griseola* (Fall.) in Sweden; *Mayetiola destructor* (Say) in Europe and North America; *Mayetiola phalaris* Barnes in Germany; *Mayetiola poae* (Bosc) in Czechoslovakia; *Mayetiola* sp. in Finland, *Melanagromyza simplex* (Lw.) in Britain; *Oscinella frit* (L.) in Britain and the Europ. USSR; *Oscinella pusilla* Meig. in the Europ. USSR.

All data before 1933 are discussed and summarized by Gahan, 1933. More recent references are those by Nikolskaya, 1934, Barnes & Walton, 1934 (I doubt whether the identification of *P. epigonus* here was correct), Rosen, 1959, and Hårdh, 1950.

Distribution: all over Europe eastwards to Central Russia (but probably also throughout temperate Asia!); North America. *P. epigonus* was introduced several times from Europe to North America, but may have existed there before, as a species of a holarctic distribution. This species was discussed also as a factor in the control of the hessian fly *(Mayetiola destructor)* in New Zealand (by Miller, 1910, *N. Zealand Journ. Agr.,* 19: 205; cf. *Rev. appl. Ent.,* A, 8: 63).

Material examined. — Britain: material from various spots in England. — Sweden: specimens of the C. G. Thomson and K. J. Hedqvist collections; Skåne, Lomma, VI. 1962; Skåne, Åkarp, VI. 1962; Blekinge, Drögsperyd, VI. 1962 (all Bouček lgt.). — Germany: (DBR) Aachen (Förster); (DDR): Insel Rügen, Baabe, VI. 1960 (Bouček). — Czechoslovakia: Bohemia, Nové Hamry near Nejdek; Kamenná near Sokolov; Dvory and Tašovice near Karlovy Vary; Fláje; Děčínský Sněžník; Bělá near Děčín; Krásný Studenec; Varvažov near Ústí nad Lab.; Most; Jedlová near Rumburk; Deblík near Ústí nad Lab.; Vinné near Litoměřice; Hazmburk near Libochovice; Markvarec near Louny; Peruc; Libušín near Kladno; Noutonice; Praha-Ruzyně; Praha-Chuchle; Koda near Beroun; Jevany; Bělčice near Blatná, ex *Mayetiola poae,* VI. 1958 (M. Skuhravá); Holovousy; Velký Vřešťov; Broumov; Piletice near Hradec Kr.; Nový Hradec Králové; Týniště nad Orl.; Černilov; Moravia, Karlova Studánka; Pouzdřany; Ratiškovice; Bzenec; Hodonín; Slovakia, Čenkov near Štúrovo; Banská Štiavnica; Hodrúša near Ban. Štiavnica; Smokovec in the High Tatra Mts. — Hungary: Foktö. — Austria: Weyer (Ruschka).

Pediobius acantha (Walker)

?Diplolepis petiolata Spinola, 1808, Insectorum Liguriae species novae aut rariores, p. 229; ♂.
Elachestus petiolatus; Nees, 1834, Hym. Ichneum. affin. Monogr., **2**: 140—141.
?Eulophus metallicus Nees, 1834, Hym. Ichneum. affin. Monogr., **2**: 176—177; ♀♂.
Entedon Acantha Walker, 1839, Monogr. Chalc., **1**: 107; ♀.
Pleurotropis brevicornis Thomson, 1878, Hym. Scand., **5**: 253; ♀♂. **N. syn.**
?Pleurotropis petiolaris Nees: Heyden, 1894, Ber. Senckenberg. naturf. Ges. Frankfurt a. M., p. 181.
Pediobius acantha; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 191.
?Pediobius helianthemellae Erdös, 1961, Ann. hist.-nat. Mus. Nat. Hung., **53**: 486—487; ♀♂.
?Pediobius dorycniellae Erdös, 1961, ibidem, **53**: 487—488; ♀♂.

Förster in the latter period of his days called this genus *Microterus* Spin. In his collection in Vienna there are several specimens of *acantha* identified by himself as "*M. petiolaris* Ns.", i. e. obviously *petiolatus* (Spinola) Nees. And indeed, among the European chalcids the description of Spinola's *petiolatus* fits best this species. I am sure that this synonymy is correct, it needs however confirmation from a study of the type if this be still in existence.

As already said under *epigonus, Eulophus metallicus* Nees previously often mentioned in literature to designate the present *Pediobius epigonus,* may be probably rather this species. It was described by Nees in *Eulophus,* i. e. among species with "sessile abdomen" and this is another reason to doubt its identity. The type material is no more in existence and so *E. metallicus* Nees will remain, probably for ever, a *nomen dubium.*

When in England in 1962 I saw the type of *Entedon acantha* Walker, as well as further English material compared with it. I was also enabled to examine the type material of *Pleurotropis brevicornis* Thomson (in Lund; two syntypes also in the Mayr collection in Vienna), which is the same species.

For *P. helianthemellae* and *dorycniellae* see also farther below. I think they are more likely only forms of *acantha* than independent species.

My interpretation of the species may be considered too wide and what I understand one species may be considered a species-complex by others. In most female specimens available to me, e. g., the gaster is

ovate, 1.6—1.9 times as long as broad, with first tergite reaching the middle. In some other female specimens the gaster is only 1.5 times as long as broad, with sculpture of the surface weak, and the first tergite reaching or even surpassing slightly the middle (Fig. 68). The latter form is *helianthemellae* Erdös. In another form the gaster is similarly short and broad, but the basal tergite covers distinctly less than one-half of the surface which is on a broad caudal belt of the first tergite and the whole of the following tergites, distinctly and densely reticulate-alutaceous, dull. This form is *P. dorycniellae* Erd., but the holotype itself, although very similar to the form mentioned, has the first gastral tergite clearly reaching the middle of the gaster (Fig. 69).

Pediobius acantha is very near to *P. epigonus* (Walk.) and very similar to it. There has been much confusion in literature and not many data are reliable. In comparison with other species *P. acantha* was characterized only quite recently by Graham, 1959, in his concise key to the British species. My interpretation of the species concurs largely with his, but the material available to me obviously shows a much wider range of variation, as the Central European material in many species does.

In contradistinction to *P. epigonus* the following characters of *P. acantha* may be stressed.

Face in female bluish-black, violet-black or black, only rarely with a slight greenish tint. Inner orbits more shallowly emarginate than in *epigonus,* malar space longer; antennal flagellum broad, often distinctly broader than the pedicellus, its distal segments only very slightly decreasing in length, last segment (bearing terminal spine which is usually relatively shorter than in *epigonus*) at base almost as broad as the preceding segment, or at least not strikingly narrower than it. Hind tarsi often (but not always) with segments 1—3 pale. Length of female usually 1.4—1.8 mm., exceptionally 1.2—2.2 mm.

In male abdomen like in *epigonus,* but antennae quite different, having flagellar segments shorter and broader, as quoted in the key above.

Hosts: (DIPT.) *Dizygomyza verbasci* (Bouché) in *Bussleya* in Italy; *Pegomyia hyoscyami* (Panz.) in *Spinacia oleracea* in Italy; *Phytomyza atricornis* Meig. in Sweden (Jansson, 1952) and in Austria; *Phytomyza phillyreae* Her. in Italy; *Phytomyza populi* Kaltb. in Germany; *Syringophila chomnei* Her. in *Phillyrea* in Italy; probably also the record of "*Pleurotropis amyntas* Walk." from *Phytomyza* ilicis Curt. in England (see Fulmek, 1962, p. 56) belongs also to *P. acasta;* (LEP.) *Argyroploce oblongana* (Haw.) in *Dipsacus* in Italy (a large specimen of 2 mm.); *Lithocolletis pastorella* Zell. in Hungary (Szöcs, 1959); *L. salictella* Zell. and *L. scitulella* Zell. in Czechoslovakia; *Lithocolletis* sp. in *Salix* in Czechoslovakia; *Parectopa kollariella* (Zell.) in *Dorycnium pentaphyllum* in Italy; *Stigmella helianthemella* H.-Sch. in Czechoslovakia and in Hungary (the latter record Erdös, 1961, as *Pediobius helianthemellae*); *S. dorycniella* Suire (in *Dorycnium*) and *S. gozmanyi* Szöcs (in *Tetragonolobus siliquosus*) in Hungary (*P. dorycniellae,* in Erdös, 1961). Where no reference is mentioned the data are new.

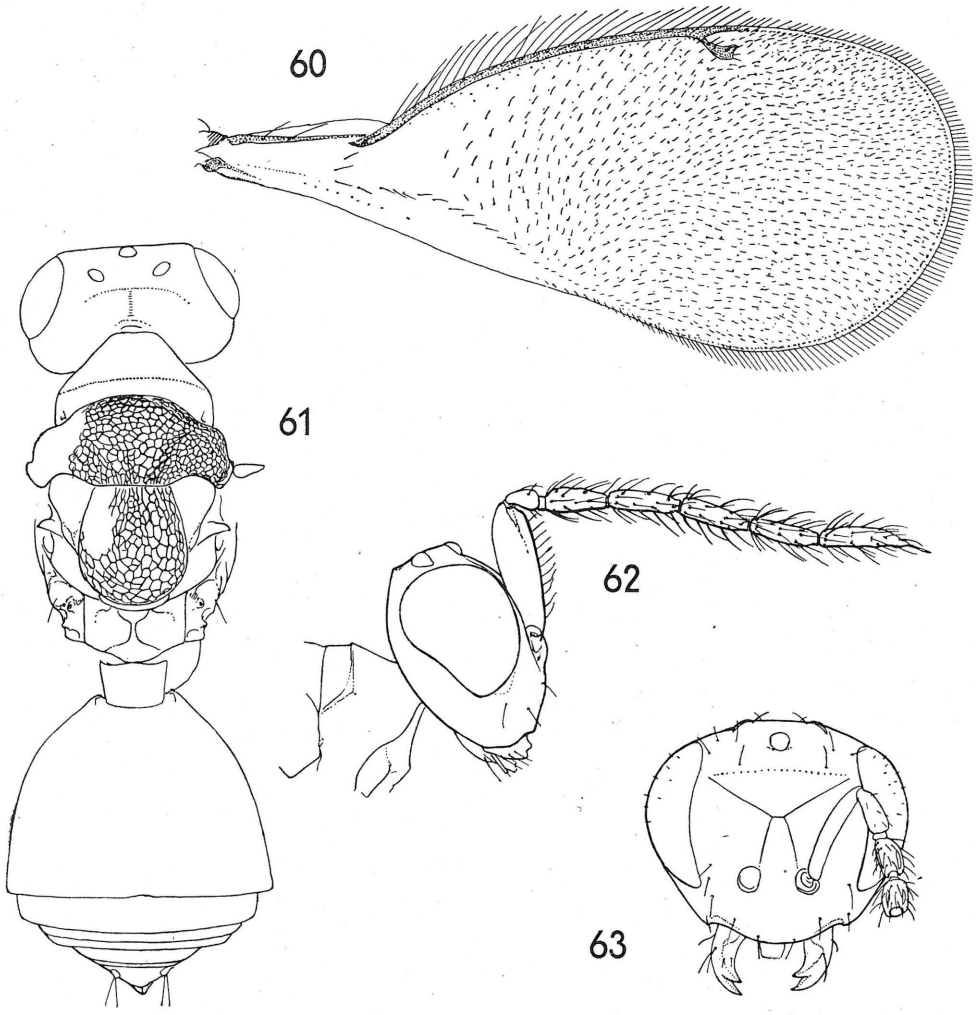
Distribution: throughout Europe, from Sweden to Italy, from Britain to Russia. In Czechoslovakia the commonest species of the genus.

Material examined. — Britain: the type of *acantha* and some fresh material from England. — Sweden: the type of *brevicornis* and more recent specimens in Dr. Hedqvist's collection; Skåne, Lomma, VI. 1962 (Bouček). — Germany: (DBR) Lorsch, ex *Phytomyza populi*, VIII. 1961 (Prof. Schimitschek's Institute). — Czechoslovakia: Bohemia, from the following 57 spots: Soos near Frant. Lázně; Chaloupky near Kraslice; Horní Blatná; Kamenná near Sokolov; Dvory near Karlovy Vary; Moldava; Chomutov; Bělá near Děčín; Krásný Studenec; Janov near Děčín, Deblík near Ústí nad Lab.; Milá; Raná; Měrunice; Lovoš; Lovosice; Pohořany near Litoměřice; Vinná; Líšťany near Louny; Markvarec; Peruc; Řevničov; Obříství near Mělník; Jestřebí near Doksy; Břehyně; Veltrusy; Unčín; Noutonice; Přední Kopanina; Ruzyně; Břve; Suchdol; Slivenec; Radotín; Jarov S. of Praha; Koda near Beroun, ex *L. scitulella,* 1954 (Gregor); Rožmitál pod Třemšín.; Lužany near Plzeň; Blatná; Třeboň; Rožmberk near Třeboň; Stříbrné Hutě near Tábor; Český Brod; Čelákovice; Lysá nad Lab.; Kolín; Choťovice; Holovousy; Velký Vřešťov; Vrchoviny near Náchod; Hradec Králové; Nový Hradec Kr.; Piletice; Černilov; Týniště nad Orl.; Mokré near Opočno; Opatovice nad Lab.; Moravia, Hodice near Jihlava; Brno, ex *Lithocolletis* sp.; Terezín near Čejč; Sobůlky; Hovorany; Kyjov; Bzenec; Tvrdonice, ex *L. salictella,* 1954 (Gregor); Lednice; Slovakia, Nové Mesto nad Váhom, ex a miner of a leaf, VIII. 1947 (Zouhar); Karlova Ves near Bratislava; Vieska nad Žitavou; Štúrovo; Zádiel, ex *Stigmella helianthemella,* X. 1953 (Gregor); Košice; Slanec; Lake Izra; Helmec valley; Svätá Mária-Rad. — Austria: Weyer; Vienna district, ex *Phytomyza atricornis,* X. 1922 (Fahringer); Siegenfeld; Wien-Mauer. — Hungary: Budaörs, types of *helianthemellae*; Budapest, types of *dorycniellae*; Berhida. — Moldavian SSR: Britchany; Kotovskoe; Strasheny; Karmanovo. — France: Agay, Var. — Italy: Lago di Garda, San Vigilio, ex *Parectopa kollariella,* 17. VII. 1942 (Hartig), ex *Phytomyza phillyreae,* 24. VI. 1949 (Hartig); Lazio, Riano Rom.; ex *Argyroploce oblongana* in *Dipsacus,* 21. II. 1939 (Hartig); Lazio, Guidonia, ex *Dizygomyza verbasci* in *Bussleya,* 25. V. 1943 (Montelucchi), ex *Pegomyia hyoscyami* in *Spinacia oleracea,* 20. V. 1940 (Montelucchi); Lazio, Mte. Sonate, ex *Phytomyza phillyreae* in *Phillyrea,* 11. II. 1939 (Hartig); Roma, Acqua Traversa, ex *Phytomyza phillyreae* in *Phillyrea,* 14. IV. 1941 (Hartig); Roma district, Valle Inferno, ex *Phytomyza phillyreae,* 9. III. 1940 (Hartig); Sardinia, Cagliari, ex *Syringophila chomnei* in *Phillyrea,* 6. II. 1935 (Ricchello).

Pediobius helianthemellae Erdös

Pediobius helianthemellae Erdös, 1961, Ann. hist.-nat. Mus. Nat. Hung., Zool., **53**: 486—487; ♀♂.

Through the kindness of Dr. Erdös I was enabled recently to examine the holotype and allotype of *helianthemellae,* apart from one paratype I saw earlier. The syntypes of *helianthemellae,* as well as further specimens at my disposal (reared from the same host in Czechoslovakia) are smaller than the average *acantha,* females only 1.1—1.3 mm. in length, with sculpture generally weaker, body therefore more shiny, especially the gaster which is even smaller than the thorax less propodeum, in the holotype only as long as with of head. The relative shortness of the female gaster, with the basal tergite surpassing the middle (Fig. 68), forms the main difference of *helianthemellae* from *acantha,* as mentioned above under the latter name and also in Erdös' paper of 1961 (*metallicus* of that paper = *acantha*). Otherwise I cannot find any more reliable differences and consider the mentioned ones of no specific value. A shorter gaster in this case may well be connected with its condition after egg-laying, but in some other specimens, e. g. those reared from *Phillyrea* leaf-miners in Italy, various intergrades occur between this form, *dorycniellae* and



Figs. 60—63. *Pediobius glabratus,* n. sp. — 60. Forewing of male. — 61. Body of female, with sculpture on thorax partly indicated. — 62. Head with one antenna in male, in lateral view, showing the long scapus. — 63. Head of female, in facial view.

the "typical" *acantha.* I find similar intergrades among the swept material.

I think that what we need first, in general, is a firm ground for our taxonomic work. Therefore I consider as one species all such specimens, or populations, which can be separated by a distinct morphological gap from all other populations (belonging then to different species). Some other students obviously consider the morphological concept something

obsolet, old-fashioned, and describe freely "sibling species" or other hardly distinguishable forms. I do not wish to and cannot deny existence of such taxa, but believe that at least at our stage of knowledge, when first keys and revisions are elaborated, a subspecific level for such taxa would be more appropriate, more useful and fully satisfactory as well. Different host-records are often put in support of the assumed validity of such forms. Unfortunately this field is not yet very well-covered by investigations. And possibly we may have here an analogous case with the much better known geographical variation. A known fact that some geographically remote populations of one species will not cross or do not produce fertile progeny, may have its counterpart in some populations of a parasitic species coming from different hosts. Such populations often differ from other in structure, or colour, or both, and are sometimes considered "species in statu nascendi" (developing species) or very close different species, sibling species. But as long as intergrades exist, similar to gradual intergrades in geographical variation, we should not split such forms into different species. We should await further information which is badly needed in so many groups of parasitic Hymenoptera, and should not quit firm ground.

For other data on *helianthemellae* see under *acantha* above.

Pediobius dorycniellae Erdös

Pediobius dorycniellae Erdös, 1961, Ann. hist.-nat. Mus. Nat. Hung., Zool., **53**: 487—488; ♀♂.

Dr. Erdös sent me recently kindly also the holotype and allotype of this form, also differing mainly only by a shorter female abdomen (Fig. 69) from *acantha.* Although I synonymize it only with a query with *acantha,* I have not found any reliable differences. See more above, mainly under *acantha.*

Pediobius glabratus, sp. nova

This species belongs to the vicinity of *acantha-epigonus,* by the shape of its body and, in particular, by the very similar sculpture of the thorax, the elongate abdominal petiole and the broad, non-inflexed epipleurae of the gaster in male. It clearly differs however from all the species of that group by its feeble sculpture of head, differently shaped antennae (with unusually long scape in male), distinctly produced mouth margin when observed from in front, then by somewhat longer genae and the almost polished gaster, with the first tergite very large, as stressed also partly in the key above.

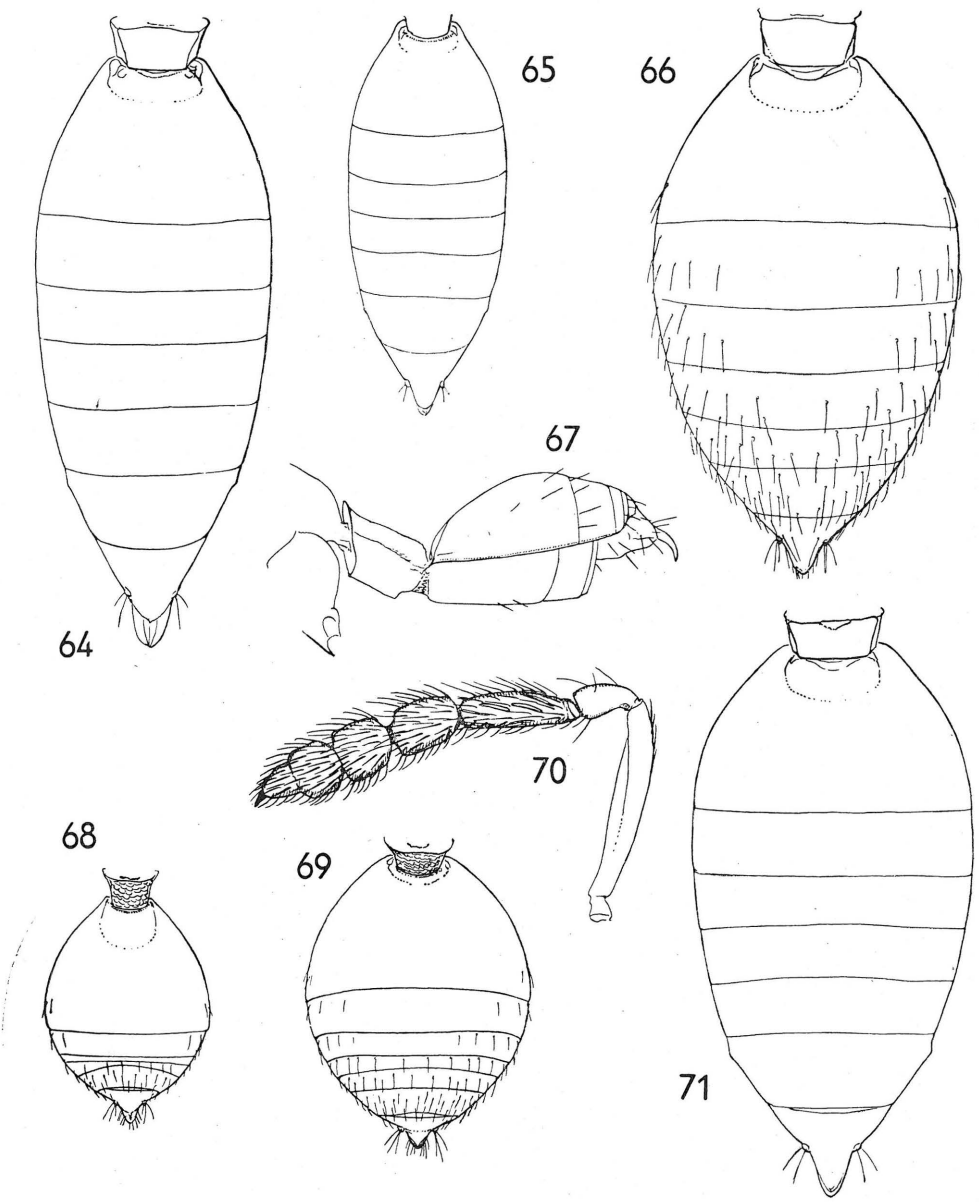
F e m a l e. — Head and thorax metalic greenish, here and there more bluish, but mostly dark green, also on sides and on legs; tarsi dark or mid and hind ones partly pale at base beneath. Wings hyaline, veins fuscous.

Head only slightly broader than mesoscutum (24:21.5), in dorsal view twice as broad as long, with occiput rather shallowly excavated (Fig.61), margined above only in the median one-third and from there less

steeply sloping than in most European species of the genus; vertex finely reticulate between ocelli, but almost smooth between lateral ocellus and eye as well as in front of lateral ocelli. Frontal fork diverging in angle of about 140°, frons above it polished; face nearly smooth; interscrobal space moderately convex, smooth, scrobal grooves broadly separated above. Mouth margin in facial view broadly-archedly produced as the corners are rather deeply emarginate (Fig. 63); malar space only one-quarter as long as vertical eye diameter, genal groove indistinct, but the mouth margin in the corner bordered by a distinct groove-like depression. Eye oval, about 1.4 times as high as broad, almost bare. Temples well developed, broad and hardly receding below. Antenna not clavate, slender, but not long, with flagellum plus pedicel almost as long as width of head. Scapus slender, not quite reaching the ocellus, fully as long as pedicel plus 1.5 basal funicle segments; pedicellus fully twice as long as broad, subequal in length to the first funicle segment which is about 1.5 times as long as broad; funicle segments decreasing in length, the third still slightly oblong, narrowly but distinctly separated from the clava, which is very distinctly bisegmented, with a rather stout, long, conical terminal spine; clava as long as two preceding segments together. Pubescence of flagellum rather dense, obliquely distant.

Thorax convex, deeply reticulate, almost as in *epigonus*. Pronotum strongly arched, rounded on sides, collar not sharply margined. Mesonotum all over reticulate; notaular depressions shallow, with the bristle situated in posterior third at inner margin (in one specimen two bristles in each depression, one behind the other!); meshes on mesoscutum lengthened at the scutellum margin, more or less radiating from its middle. Scutellum slightly longer than broad, convex, broadly rounded posteriorly, its sides slightly converging forward; its reticulations lengthened anteriorly, but almost regularly polygonal posteriorly (Fig. 61). Metascutellum rather broad, reticulate, as well as sides of the metanotum. Also propodeum mainly reticulate, except sometimes at base; submedian carinae broadly diverging behind, much approached anteriorly, often united; nucha not distinct; submedian area slightly broader than long, deeply depressed along base, its outer posterior angle right or slightly obtuse. Metapleural convexity obtuse-angular when seen from above. Forewing with costal cell bare, speculum large but completely closed, stigmal vein short and distinctly clavate, subsessile, only about 1.5 times as long as width of costal cell. Legs not stout, spur of hind tibia short.

Abdominal petiole slightly longer than broad (on Fig. 61 in an oblique position), dorsally without distinct depressions or keels, with anterior margin produced above in the middle to overlap the nuchal part of propodeum (much as in *acantha*). Gaster (Fig. 61) fairly broader and shorter than the thorax, convex, subpentagonal, its sides at apex converging at an obtuse angle. First tergite covering almost two-thirds of gaster, its hind margin straight, its basal fovea very short; the following tergites retracted, very short and as well as the basal tergite polished above or nearly so.



Figs. 64—67. *Pediobius eubius* (Walker), s. l. — 64. Abdomen of female of typical *eubius*. — 65. Abdomen of female of f. *planiventris* (Thomson). — 66. Female abdomen of f. *alaspharus* (Walker). Figs. 64—66 depicted at the same scale. — 67. *P. eubius* f. *planiventris*. Male abdomen in side view. — Fig. 68. *Pediobius helianthemellae* Erdös. Abdomen of female (from the holotype). — Fig. 69. *Pediobius dorycniellae* Erdös. Abdomen of female (from the holotype). — Figs. 70—71. *Pediobius nigritarsis* (Thomson). — 70. Antenna of the female. — 71. Abdomen of the female.

Length 1.7—1.8 mm.

Male. — Very similar to female, but sculpture of head generally more distinct, abdomen with petiole longer and caudal segments of gaster still more retracted than in the female. Antenna different: scapus distinctly enlarged and clearly exceeding the ocellus level (Fig. 62), by its distal two-thirds exceeding lowest part of frontal fork; flagellum very slender, the second to fourth funicle segments nearly four times as long as broad each. Marginal vein of forewing (Fig. 60) strongly arched, with bristles as long as the stigmal vein. Length of body 1.6—1.8 mm.

Hosts: unknown.

Distribution: Britain, Germany, Czechoslovakia.

Holotype (female): Bohemia, Hradec Králové, 11. VII. 1960 (Bouček); deposited in the Prague National Museum (Entomology), Cat. No. 25.632.

Further material (paratypes and allotype). — Britain: Berkshire, Wytham Wood, one female, 11. VI. 1953 (Dr. Graham). — Germany: Aachen, one female (Förster, Mus. Vienna). — Czechoslovakia: Bohemia, Hradec Králové-Věkoše, one female, 1. VI. 1945 (Bouček); Týniště nad Orl., one male, 28. V. 1944 and one male (allotype), 1. X. 1944 (Bouček); Moravia, Suchdol nad Odrou, two females, VI. 1918 (J. Sekera).

Pediobius oviventris, sp. nova

This species also (Fig. 75) belongs to the *epigonus*-subgroup, together with *epigonus, acantha (helianthemellae, dorycniellae)* and *glabratus,* but shows at the same time also some features of the *eubius*-subgroup. From the former species *dorycniellae* and *helianthemellae* are very similar to *acantha* and probably only forms of this species. *P. glabratus* differs from *oviventris* greatly by its fine sculpture, very long basal tergite of the gaster, etc. *P. oviventris* is most closely allied to *epigonus* and *acantha,* but differs from the two mainly by the quite different antennae in the female, with a very long first funicle segment, and by its size. It is the form of the antenna and the slightly elongate, posteriorly sloping scutellum which reminds one more of some species of the *eubius*-subgroup, but the abdominal petiole is not transverse.

Female. — Black, with distinct metallic greenish cast on thorax, its sides however more or less bluish to violet; face almost black, with a vague greenish tint; abdomen black; mid and hind tarsi with segments 1—3 abruptly whitish. Wings hyaline.

Morphologicaly near to *epigonus.* Occiput sharply margined, moderately excavated. Lateral ocellus only very slightly nearer to hind margin than to the eye; vertex dull, deeply densely reticulate, as well as face except shallow sculpture below antennae and above the fork. Scrobal grooves meeting below the fork which diverges at about 100° (Fig. 76); interscrobal space convex, high. Mouth margin seen from in front hardly arched; malar space fully 3.5 times shorter than the largest eye diameter. Antenna very slender (Fig. 76); scapus almost reaching the ocellus, distinctly longer than pedicellus plus first funicle segment (12:10); pedicellus about 2.5 times as long as broad, distinctly shorter than the long first funicle segment (4:6), subequal in length to the second funicle segment

which is three times as long as broad; the third a little shorter than the second, subequal to the first clava segment; last segment narrower than the preceding, narrowly conical, the terminal spine short; flagellar pubescence obliquely distant, not long; flagellum plus pedicellus shorter than width of head as 25:29.

Thorax almost as in *epigonus.* Pronotal collar not sharply set off. Scutellum longer than broad as 16:13, its meshes even anteriorly not distinctly elongate. Propodeum with submedian carinae very near to each other in anterior half, or partly fused; lateral fimbriae two in number: one on callus, one laterad of spiracle. Forewing with speculum closed, but at the holotype shortly open at base (hairs worn off?).

Abdominal petiole slightly longer than broad, its sides distinctly converging backwards, anterior margin archedly produced in the middle; dorsal surface with two indicated longitudinal ridges on either side. Gaster ovate (Fig. 75), distinctly alutaceous, even on the basal tergite which occupies one-third of gaster.

Length 2.2 (holotype) — 2.4 mm.

Only with hesitation I attribute to this species two m a l e s, both of which have antennal pubescence damaged from Psocids. In one male the colouring is alike as described for the female, in the other male the whole body bluish-violet (except for mid and hind tarsi, of course). Flagellar segments 1—4 twice as long as broad, broadly separated from each other, rather stout; otherwise as in *acantha.* Abdominal petiole very broad (as in *nigritarsis,* e. g., with anterior corners protruding and anterior margin lobe-likely produced in the middle; sides distinctly converging backwards; anteriorly only slightly narrower than long. Epipleurae of gastral tergites broad, not inflexed. Length of body 1.5—1.9 mm.

H o s t: unknown.

D i s t r i b u t i o n: Czechoslovakia.

Holotype (female): Slovakia, Devínska Kobyla, 20. VI. 1951 (Hoffer); deposited in the Prague National Museum (Entomology), Cat. No. 25.633. Paratype (female): Slovakia, Kováčov, 16. V. 1953 (Hoffer).

The mentioned two males come from Bohemia, Jestřebí near Doksy, ex *Lithocolletis* sp. on *Salix,* X. 1956 (Gregor), and Praha-Sedlec, 2. IX. 1935 (Šustera).

Pediobius nigritarsis (Thomson)

?Elachestus facialis Förster, 1841, Beitr. Monogr. Pterom., p. 40; ♀.
Pleurotropis nigritarsis Thomson, 1878, Hym. Scand., **5**: 251—252; ♀♂.
Pleurotropis benefica Gahan, 1921, Proc. ent. Soc. Wash., **23**: 117—120; ♀♂. — Salt, 1931, Bull. ent. Res., **22**: 534—541. — Gahan, 1932, Ann. ent. Soc. Amer., **25**: 751—752.
Pediobius nigritarsis; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 190. — Rosen, 1959, Ent. Tidskr., **80**: 163.

The Förster collection in the Vienna Museum contains one female of this species labelled "Bopp." (= Boppard), "Collect. G. Mayr" and "*M. facialis* Förster Type". The specimen should belong to *Elachestus facialis* described by Förster in 1841. I am however not sure enough whether the specimen realy is the type which should have the abdominal petiole, according to the original description, as long as the basal gastral tergite.

Therefore I keep the name of *Pleurotropis nigritarsis* Thomson and leave *Elachestus facialis* Förster aside as a *nomen dubium.* An acception of the Förster species as a *Pediobius* would make necessary to rename *Pediobius facialis* (Giraud), a different species.

I examined the lectotype of *P. nigritarsis* Thomson, compared my Central European material with it, as well as with some English specimens in London (Brit. Mus.) and Oxford (Dr. Graham's collection), and consider them conspecific. *Pleurotropis benefica* Gahan was dropped into synonymy with *nigritarsis* by Graham, 1959.

Pediobius nigritarsis belongs to the *eubius*-subgroup and is most closely allied to *P. eubis* f. *alaspharus* (Walk.), at least in the form of abdomen (in both sexes; female abdomens see in Figs. 66 and 71). From this species, as well as from all the other of the group, *nigritarsis* differs mainly by its subclavate antennae with the flagellar segments strongly decreasing in length in female (Fig. 70) and by the usually fused submedian carinae of propodeum.

Detailed redescriptions accompanied by excellent figures were published by Salt, 1931, and by Gahan, 1933. These references review also all then known data on the biology, host-relations and distribution of the species.

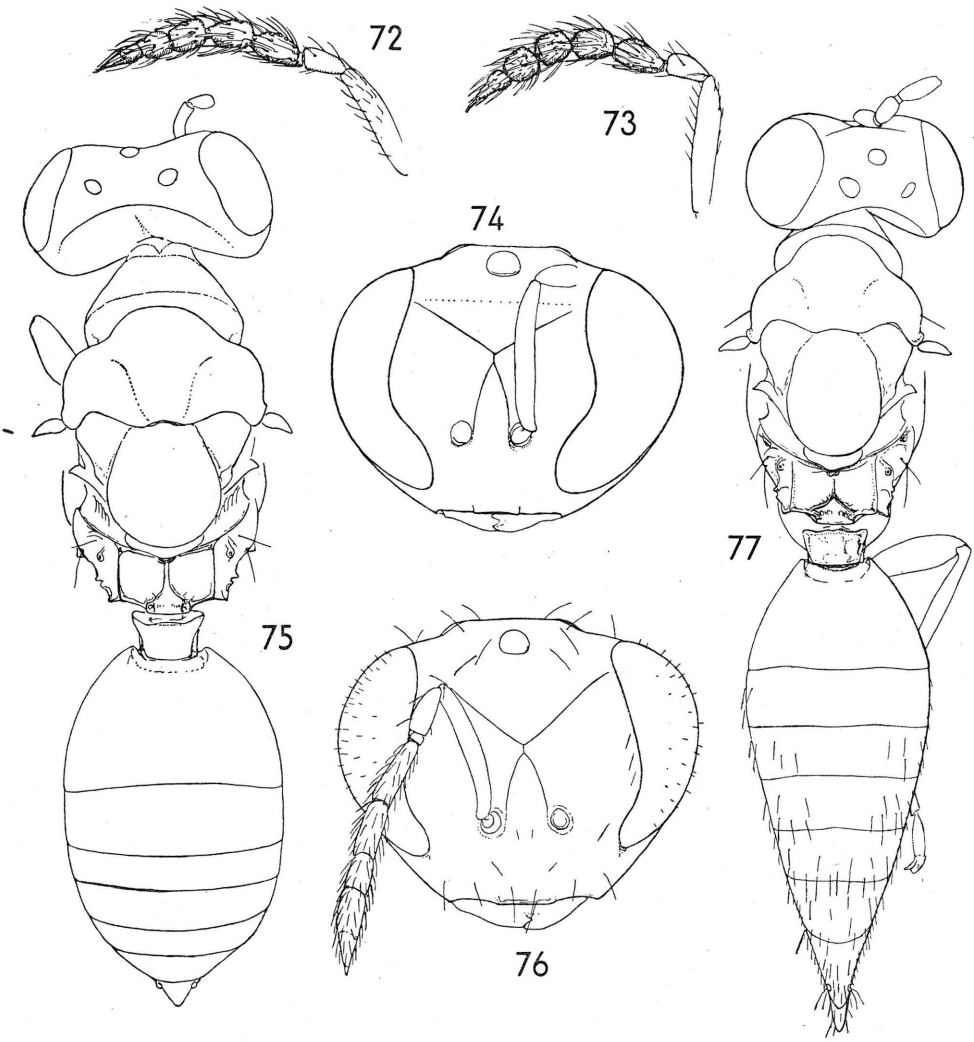
Hosts: (HYM.:) *Cephus cinctus* Nort. in Canada, *C. pygmaeus* (L.) in Britain, Sweden and USA, *Trachelus tabidus* (F.) in USA (all these hosts belong to Cephidae); (DIPT.:) *Mayetiola destructor* (Say) in Britain, European USSR and USA. *P. nigritarsis* is a primary parasite. For references to most of these data see Gahan, 1933, and to *C. cinctus* see Baid, 1938, *Canad. Insect Pest Rev.,* 16: 116—117, 138, 140, 148 (according to Peck, 1963, p. 229). *M. destructor* seems to be only an occasional, unusual host and at least some of the host-records of *Pediobius nigritarsis* (Thoms.) (= *Pleurotr. benefica* Gahan) may have been based upon misidentication, as certainly is the record of the Noctuid moth *Euplexia lucipara* (L.) from Finland (Forsius, 1915, p. 138) mentioned also in Gahan, 1932, p. 751, and queried by von Rosen, 1959.

Distribution: Britain, Sweden, Germany, Czechoslovakia and European USSR in Europe; Canada and U. S. A. in North America. A species of holarctic distribution, probably primarily.

Material examined. — Britain: several specimens in Dr. Graham's collection. — Sweden: the type of *nigritarsis* Thomson in Lund. — Germany: (DBR) Boppard, the Förster specimen mentioned above; Aachen (Förster); (DDR) Blankenburg in Thüringen (Schmiedeknecht). — Czechoslovakia: Bohemia, Nové Hamry near Nejdek, 6. VI. 1957 (Bouček); Bořeň Hill near Bílina, 7. VI. 1953 (Bouček); Slatina near Libochovice, 14. VI. 1934 (Šustera); Noutonice NW. of Prague, 6. VI. 1953 (Bouček); Praha-Děvín, 30. V. 1946 (Dlabola); Česká Lípa, VI. 1917 (J. Sekera); Holovousy near Hořice, 22. V. 1953 (Hostounský); Velký Vřešťov, VI. 1955 (Bouček).

Pediobius eubius aggregate

The forms known as *P. eubius* (Walker), *P. alaspharus* (Walker) and *P. planiventris* (Thomson), together with some further names belonging here mainly as synonyms, viz. *isomerus* Förster, *angularis* Förster and *nitifrons* Thomson, belong to one species-complex. At the present state of



Figs. 72—74. *Pediobius epigonus* (Walker). — 72 and 73. Antenna in two female specimens. — 74. Head of female of a form with shorter malar space and strongly emarginate eye orbits. Figs. 75—76. *Pediobius oviventris,* n. sp. — 75. Body of female. — 76. Head of female, in facial view. — Fig. 77. *Pediobius polanensis,* n. sp.; body of the female. Although belonging to the difficult *eubius*-group this species may be easily recognized by its conically pointed abdomen in the female.

knowledge of this group I feel unable to judge definitely whether they represent several independent species, or sibling species, or host-races, or perhaps only varieties of one species (I incline to the last but one, after all). All the forms belonging here, as far as our modest evidence

goes of course, are parasites of various *Tetramesa* species or also of certain *Eurytoma* species developing similarly in grass stems.

As a whole the forms belonging to the *eubius*-complex should be readily recognized from other species by characters mentioned in the key above, such as the short transverse petiole bearing an elongate gaster in females which have also more slender antennae than e. g. the similar *P. nigritarsis,* then the elongate petiole and inflexed pleurae of the gastral tergites in males, reticulate notaular depressions, undifferentiated clava in the male antenna, etc. Both sexes possess an elongate scutellum which is rather narrow anteriorly and has the reticulations on its disc mainly polygonal, but anteriorly very dense, minute, clearly elongate. The form of the scutellum combined with the antennal formula (clava bisegmented in female, one-segmented in male) may be helpful also in separating some aberrant individuals from various other species, e. g. *Pediobius cassidae,* the *brachycerus*-group, etc. The males of this complex compared with the *epigonus*-group have the marginal vein of the forewing more straight and the flagellar segments showing often a tendency to decrease in length, while in *epigonus* the marginal vein is mostly distinctly arched and the flagellar segments tend to get longer towards apex.

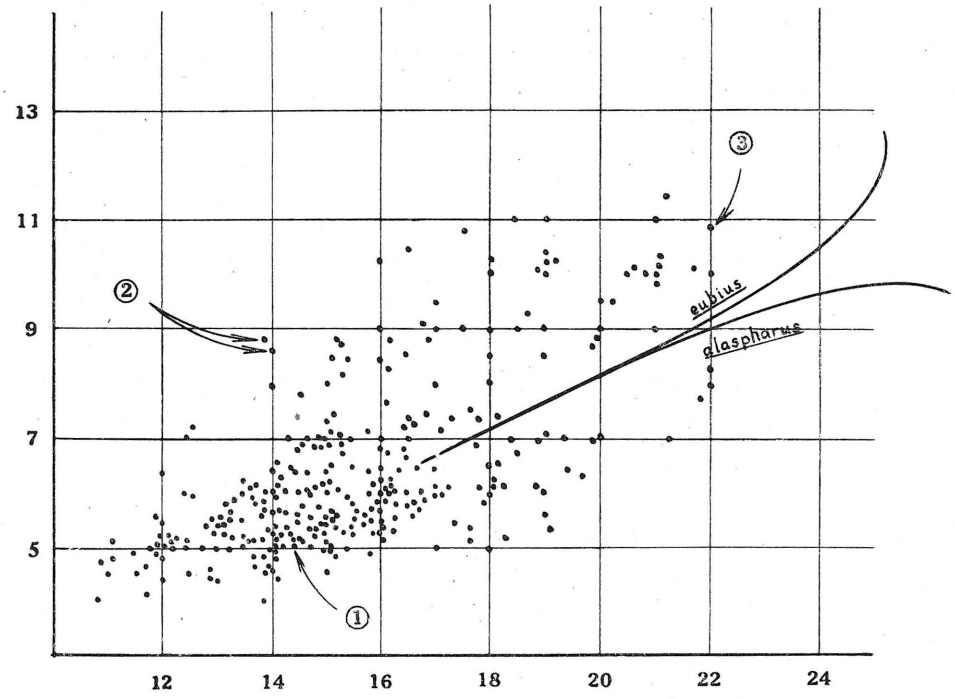
Within the *eubius*-complex itself the individual specimens may differ considerably from each other, as reflected already in the characters used for their dividing into species by Graham, 1959.

In f e m a l e s the antennae vary from nearly filiform to subclavate, with the first and second funicle segments subequal or little different in length and shape, usually 2—2.5 times as long as broad each; the third funicle segment is mostly about 1.3 times as long as broad, but may be also considerably short, almost subquadrate [the North American *Pediobius utahensis* (Crawf.) may be identical with this form!] or again, on the other hand, fairly slender, up to twice as long as broad, as should be the form mentioned as *planiventris* by Graham, 1959. There is also considerable variation in sculpture of head and thorax (also the apical tergites may be wholly dull, reticulate-alutaceous, or broadly smooth at apical margins), in shape of the scutellum, of the sculpture of propodeum, but particularly in shape of the female gaster. The abdominal petiole is mostly clearly transverse, but sometimes almost subquadrate; always on either side with two longitudinal edges, one above the other. It is however mainly the form of the gaster in female that is taken, partly in combination with some minor differences in the antennae *(planiventris),* as a specific character by Graham. It was therefore this body part on which I tried to find some positive characters that would support the conception of the various forms as independent species.

The most promising seemed the relative length of the sixth gastral tergite (the last but one; the one bearing spiracles), which I tried to evaluate biometrically. I measured the length of the freely exposed part in median line and the width of the tergite basally at the spiracles (these included) which are mostly visible from above as slight tubercles on either side (Fig. 64, 65). It is true that also in this method some inexactness in measures is inavoidable, but the more individuals are ex-

amined, the less important is the influence on the result of the eventually inaccurate data.

The results of my measurements are presented on the scatter diagram. The typical *eubius* figured recently by von Rosen, 1959 (p. 166) has the gaster slightly longer than head plus thorax, with the sixth gastral tergite semicircular, about twice as broad as long (Fig. 64). Most specimens belonging to this form are relatively large (up to 3.5 mm.) and occupy in the diagram the upper part. They are known to me to attack some larger species of the genus *Tetramesa,* e. g. *T. eximia* and *calamagrostidis* (see Nos. 1 and 2 on the scatter diagram). In these larger specimens also the sublateral excavations of the occiput are unusually deep, on bottom beset with coarse tubercles bearing strong curved black bristles. In smaller specimens, however, these excavations are shallower or indistinct



Scatter diagram showing variation of the sixth gastral (postpetiolar) tergite in females of the *eubius* aggregate. Every dot represents measurements on one specimen (of the more than 300 measured) of the width of the tergite (horizontally on the diagram) and of its length (vertically). The densest dots represent the form known as *planiventris* (Thomson). The larger the size of the body, the better two forms may be separated as shown in the right-hand part of the diagram. These two forms are known as *eubius* (Walker) (i. e. the nominate form) and *alaspharus* (Walker) (the latter below to the right). The figures in circles indicate specimens reared from *Tetramesa ?petiolata* in *Deschampsia* (1), from *Tetramesa calamagrostidis* (2) and from *Tetramesa eximia* (3).

On the digram the lower part to the right is occupied by forms with short sixth gastral tergite and, consequently, with a relatively shorter gaster (Fig. 66). They belong to *P. alaspharus* (Walk.). In these the sixth tergite is in general only one-third as long as broad and often dull, densely reticulate-alutaceous, as well as the other tergites except for base of the basal one. There is a distinct gap between the larger specimens of the two forms. But the smaller the size, the less distinct is the gap and, oddly enough, the more numerous are the specimens (represented by individual dots in the diagram). These numerous specimens belong to a form called *P. planiventris* (Thomson) as I see from my notes on the type and from the fresh Graham's paper of 1963 available to me by Dr. Graham's generosity in a manuscript copy. Not all of them have the very slender antennae mentioned above. Numerous specimens of this form were reared by me from *Deschampsia caespitosa* attacked by *Tetramesa petiolata* (Walk.) and from *Agropyrum repens* with *Tetramesa linearis* (Walk.), mostly of size 2—2.1 mm. (females). Some further specimens were swept from *Brachypodium* attacked by *Tetramesa fulvicollis* (Walk.). All these ascertained or assumed host-species are of smaller size, mostly 2.5—3.5 mm.

Thus in females I failed to find a reliable character for a subdivision of the *eubius*-complex.

The m a l e s of this complex may be readily distinguished from other species, but within the *eubius*-group itself in larger males doubt may arise whether they belong to this complex or to *P. nigritarsis* (or to *polanensis* described below as new the males of which are not yet known). In *nigritarsis* they always have the mid and hind tarsi dark-coloured and the antennae are rather stout and very densely pubescent; the scrobal grooves are widely separated above. It is difficult to separate them reliably from larger *eubius* and *alaspharus*. The males of the *eubius*-complex should have pale tarsi, but this character obviously is not constant, as is also the dense pubescence of the antennae (so far I have not looked for characters in the genitalia). There is also a wide variation in the configuration of the scrobal grooves: in most males these grooves are clearly separated above, or they are hardly separated, while in about 30 p. c. they meet just at the angle of the frontal fork (in most females they meet just below the fork). Also the form of the abdominal petiole and the propodeal carinae are subject to considerable variation and have provided so far no reliable character. The forewings in males vary in relation of width to length from 27:59 to 28:65. The marginal vein is straight to slightly bent, in the latter case usually thicker, at least in basal half. The middle and hind tarsi may be entirely dark or partly pale at base, or even with segments 1—3 abruptly whitish. The first funicle segment in antennae is subequal in length to the third to decidedly longer than the latter; all the funicle segments vary considerably in relative length: in extreme cases the first segment may be only twice as long as broad to four times as long as broad (!). The body size 1.0—2.0 mm.

I intentionally do not mention the variation in metallic colouring;

this is probably dependent on some microclimate conditions during the pupal period.

Concluding from my examination of the available material I am much inclined to consider the whole *eubius*-complex one extremely variable species in which only with uncertainty three forms may be distinguished: *eubius* (s. str.), *alaspharus,* and the intermediate *planiventris.* If this opinion is confirmed by further study then the name *eubius* should be accepted for the species.

Pediobius eubius (Walker) f. *alaspharus* (Walker), n. status

Entedon Alaspharus Walker, 1839, Monogr. Chalc., **1**: 108—109; ♀.
Pediobius alaspharus; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 190.

I was enabled to see the type of *E. alaspharus* during my stay in London in 1962, as well as some specimens compared with it by Dr. Graham.

For comments on the validity of this form see above.

Hosts: not yet known for certain; probably some robuster-built *Tetramesa* species.

Distribution: Britain, Germany, Czechoslovakia, Hungary.

Material examined (as already mentioned I could not find reliable limits as against *planiventris* and *eubius,* therefore here only female specimens clearly attributable to *alaspharus* are mentioned). — Czechoslovakia: Bohemia, Kamenná near Sokolov; Fláje in the Krušné hory Mts.; Děčínský Sněžník; Bělá near Děčín; Jedlová near Rumburk; Lovoš near Lovosice; Praha-Ruzyně; Velký Vřešťov; Hradec Králové-Věkoše; Týniště nad Orl.; Moravia, Karlova Studánka; Dubňany; Slovakia, High Tatra Mts. (Temnosmrečenská dolina). — Apart from the Czechoslovak material i saw specimens from Germany, England and Hungary.

Pediobius eubius (Walker) f. *planiventris* (Thompson)

Pleurotropis planiventris Thomson, 1878, Hym. Scand., **5**: 252; ♀♂.
Pediobius planiventris: Graham, 1959, Trans. Soc. Brit. Ent., **13**: 190.

Through the kindness of Dr. H. Andersson of Lund I was enabled to examine the type material of *planiventris* including the lectotype designated by Dr. Graham. This is the most common form of the *eubius*-complex (at least in Czechoslovakia). For comments on its validity see above.

Hosts: (HYM.) *Tetramesa ?fulvicollis* (Walk.) in Britain and Czechoslovakia; *Tetramesa ?linearis* (Walk.) in Czechoslovakia; *Tetramesa ?petiolata* (Walk.) in Czechoslovakia; probably (Graham, 1963) also *Eurytoma collaris* (Walk.) in both countries.

Distribution: Britain, Sweden, Germany, Czechoslovakia.

Material examined is not mentioned in full because of the uncertainty in identification. — Czechoslovakia: Moldava in Krušné hory Mts., with *Tetramesa petiolata* in *Deschampsia,* VI. 1957 (Bouček) (see No. 3 on the scatter diagram); Praha-Ruzyně, from dry *Agropyrum* with *Tetramesa linearis,* V. 1955 (Bouček); Velký Vřešťov, swept in numbers from *Brachypodium* with *Tetramesa fulvicollis* and *Eurytoma collaris,* VIII. 1953 (Bouček).

Pediobius eubius (Walker), s. str.

Entedon Eubius Walker, 1839, Monogr. Chalc., **1**: 109; ♀♂.
?Entedon Alaspharus Walker, 1839, Monogr. Chalc., **1**: 108—109; ♀♂.
?Elachestus angularis Förster, 1841, Beitr. Monogr. Pteromal., p. 40; ♂.
Pleurotropis nitifrons Thomson, 1878, Hym. Scand., **5**: 252; ♀♂.
?Pleurotropis planiventris Thomson, 1878, Hym. Scand., **5**: 252; ♀♂.
Pediobius eubius; Graham, 1959, Trans. Soc. Brit. Ent., **13**: 190. — Rosen, 1959, Ent. Tidskr., **80**: 165—167.

As already mentioned I was enabled to see the respective type material of *eubius, alaspharus, planiventris,* also of *nitifrons* and *angularis.* In the Förster collection in the Vienna Museum there are five pins each bearing a male on a triangular card and a label *"Elach. angulat.* F." All these specimens agree with the original description and may be syntypes of *E. angularis.* I selected one of them labelled also *"Elachestus angulatus* nob. ded. Förster" as lectotype. The assumed syntypes belong to the *eubius*-complex. Another pin with one male belonging here and with poor remnants of another specimen is labelled *"M. angularis* Förster Type" and *"Pleurotropis angularis* m." Still another pin bears the label *"M. angularis* Förster Type", but the specimen is a female of f. *alaspharus* and does not fit the description (described from the male sex).

This form is sufficienty discussed above where also some characters are mentioned. I refer also to the figures of *eubius* published by von Rosen, 1959 (pp. 166, 167).

Hosts: (HYM.) *Tetramesa angustipennis* (Walk.) in *Allopecurus pratensis* L. in Sweden and probably in Britain; *Tetramesa calamagrostidis* (Schlecht.) and *T. eximia* (Giraud) in *Calamagrostis epigeios* Roth in Czechoslovakia; *Tetramesa hyalipennis* (Walker) in *Agropyrum* in Czechoslovakia. — Probably a primary parasite of various *Tetramesa* species in grass stems.

Distribution: probably throughout Europe, but positive records are available so far only from Britain, Sweden, Germany, Czechoslovakia, Austria, Hungary, Yugoslavia and the USSR.

Material examined. — Germany: (DDR) Ins. Rügen, Baabe. — Czechoslovakia: Bohemia, Karlovy Vary-Dvory; Fláje in the Krušné hory Mts.; Děčínský Sněžník; Bělá near Děčín; Růžová hora near Děčín; Jedlová near Rumburk; Deblík Hill near Ústí nad Lab.; Mt. Milešovka; Lovoš Hill near Lovosice; Česká Lípa; Bříve near Praha; Praha-Ruzyně, ex *Tetramesa hyalipennis* in *Agropyrum repens,* V. 1956 (Bouček); Slivenec near Praha; Radotín; Štěchovice near Praha; Rožmitál pod Třemšínem; Rožmberk near Třeboň; Neratovice nad Lab.; Choťovice nad Cidl.; Luční hora in the Krkonoše Mts.; Kačerov near Hořice v Podkrkonoší, ex *Tetramesa calamagrostidis,* IV. 1952 (Bouček); Velký Vřešťov, ex *Tetramesa eximia,* VI. 1956 (Bouček); Piletice near Hradec Králové; Černilov; Nový Hradec Králové; Opatovice nad Lab.; Týniště nad Orl.; Horní Lipka near Králíky; Moravia, Unčín; Dubňany; Slovakia, Čenkov near Štúrovo; Hodrúša near Banská Štiavnica; Mt. Poľana near Zvolen; Starý Smokovec in the High Tatra Mts.; Temnosmrečenská dolina in the H. Tatra Mts. — Austria: Hüttelsdorf near Wien. — U. S. S. R.: Ladoga Lake Station near Leningrad; Vladimir. — Moldavian SSR: Strasheny; Kotovskoye; Karmanovo.

Pediobius polanensis, sp. nova

This species, although belonging to the most difficult group of the genus, the *eubius*-subgroup, should be readily distinguished from the allied species by the characteristic shape of abdomen in female (Fig. 77).

Female. — Body bluish green with face vividly green (as in most species dwelling in grass stems, mainly *epigonus* and the whole of the *eubius*-complex); mid and hind tarsi dark; wings hyaline.

Occiput sharply margined between eyes but without sublateral excavations. Malar space 4.7 times as short as longest eye diameter. Mandibles bidentate. Antenna slender, subfiliform to filiform; scape as long as first two funicle segments combined; pedicellus fully twice as long as broad, but shorter than third funicle segment which is 1.8—2.5 times as long as broad, subequal to the first clava segment; first funicle segment decidedly longer than the third; second clava segment much narrower and shorter than the preceding one, the terminal spine rather short and stout.

In thorax morphology much alike to *eubius.* Propodeum: submedian carinae united about in middle, single carina anteriorly ending at a triangular basal pit; lateral callus with only one bristle and another bristle situated laterad from the spiracle. Forewing narrow, speculum small, closed; disc densely hairy; relative measurements: length of wing 77, maximum width 32, length of marginal vein together with prestigma and postmarginal vein 44, stigmal vein 2.5; postmarginal vein slightly longer than the stigmal.

Abdominal petiole clearly transverse (8:5). Gaster longer than head plus thorax (Fig. 77), lanceolate, conically tapering to apex from the middle of second tergite. Basal tergite not reaching one-fifth of length of gaster, shorter than two following tergites combined; disc of the first tergite posteriorly and tergites 2—6 except for apical belt on each, obsoletely alutaceous, shiny; last tergite smooth (except for insertion points of hairs on sides and apically), its exposed part at least as long as broad; sixth tergite also relatively long, 1.34—1.71 times as broad as long only.

Length 2.3—2.6 mm. (holotype 2.35 mm.).

Male not yet known.

Host: unknown.

Distribution: Czechoslovakia.

Holotype(female): Slovakia, Mt. Poľana SE. of Banská Bystrica, 1400 m., VI. 1953 (Bouček); deposited in the Prague National Museum (Entomology), Cat. No. 25634.

Further material (5 females, paratypes): with the holotype. During one-week stay at the locality no male was taken.

Non-included European species of Pediobius

Apart from several species belonging here and described by Walker chiefly under *Entedon* which will be treated (and synonymized) by my English colleagues, the following names were mentioned in literature as belonging to *Pediobius (=Pleurotropis).* They are all *nomina nuda.*

Pleurotropis erucarum Giraud, 1877, *orchestis* Giraud, 1877, *viridanae* Giraud, 1877 (this may be the present *Ped. cassidae!*), *Pleurotropis rimosus* (Först.) Heyden, 1894, *caenus* (Walk.) Heyden, 1894.

According to Förster, judging from his identifications (and according to Heyden, 1894) also *Eulophus lucens* Nees, 1834 (p. 175) should belong to *Pediobius.* His identifications were however not unambiguous and the species in question does not fit completely the original description.

For *Pediobius diluticrus* Erdös, 1958, see under *Kratoysma* above, for *Pleurotropis specularis* Erdös, 1954, under *Horismenus* below.

Genus **Horismenus** Walker

Horismenus Walker, 1843, Ann. Mag. nat. Hist., **11**: 117.
Type (by monotypy): *Horismenus cleodora* Walker.

Pseudomphale Schrottky, 1909, An. Soc. cient. Argent., **67**: 209.
Type (by monotypy): *Pseudomphale opsiphanis* Schrottky.

Triolynx Cameron, 1913, Timehri, Journ. Roy. Agr. commerc. Soc. Brit. Guiana, **3**: 130. **N. syn.**
Type (by monotypy): *Triolynx clavicornis* Cameron.

Akonda Cameron, 1913, Timehri, Journ. Roy. Agr. commerc. Soc. Brit. Guiana, **3**: 131. **N. syn.**
Type (by monotypy): *Akonda hipparchia* Cameron.

Holcopeltomorpha Blanchard, 1942, An. Soc. cient. Argent., **134**: 126. **N. syn.**
Type (by orig. design.): *Holcopeltomorpha christenseni* Blanchard.

During my stay at the British Museum (Nat. Hist.) in London in 1962 I was enabled to examine the type of *Triolynx clavicornis* Cam., type-species of the genus *Triolynx* Cam., and the type of *Akonda hipparchia* Cam., type-species of the genus *Akonda* Cam. In the original publication the former genus was attributed to Aphelininae and *Akonda* to Tetracampinae, but they both are synonymous, in my opinion, with *Horismenus* Walk. Consequently the two type-species must be recombined as *Horismenus hipparchia* (Cam.) and *Horismenus clavicornis* (Cam.), new combb., being subjectively congeneric with the type-species of *Horismenus, H. cleodora* Walk., the type of which I have seen also.

In my opinion also *Holcopeltomorpha* Blanchard is a junior subjective synonym of *Horismenus* and its type-species should be called *Horismenus christenseni* (Blanchard); n. comb. I have not seen the type material, but the only difference from *Horismenus* should be the different number of ring segments. Like in *Pediobius* also in *Horismenus* this number obviously varies and does not provide a reliable character.

The type-species of the present genus, *Horismenus cleodora* Walker, the type of which I have seen, is known so far only from Peru, South America. It is in no way identifical with, nor similar to, *Holcopelte sulciscuta* (Thomson) from Europe, as believed by Dr. Erdös (1958, p. 219). The latter species belongs to *Holcopelte* Förster, justly revived recently by Graham, 1959 (p. 200).

Taxonomically *Horismenus* Walk. is closely allied to the American

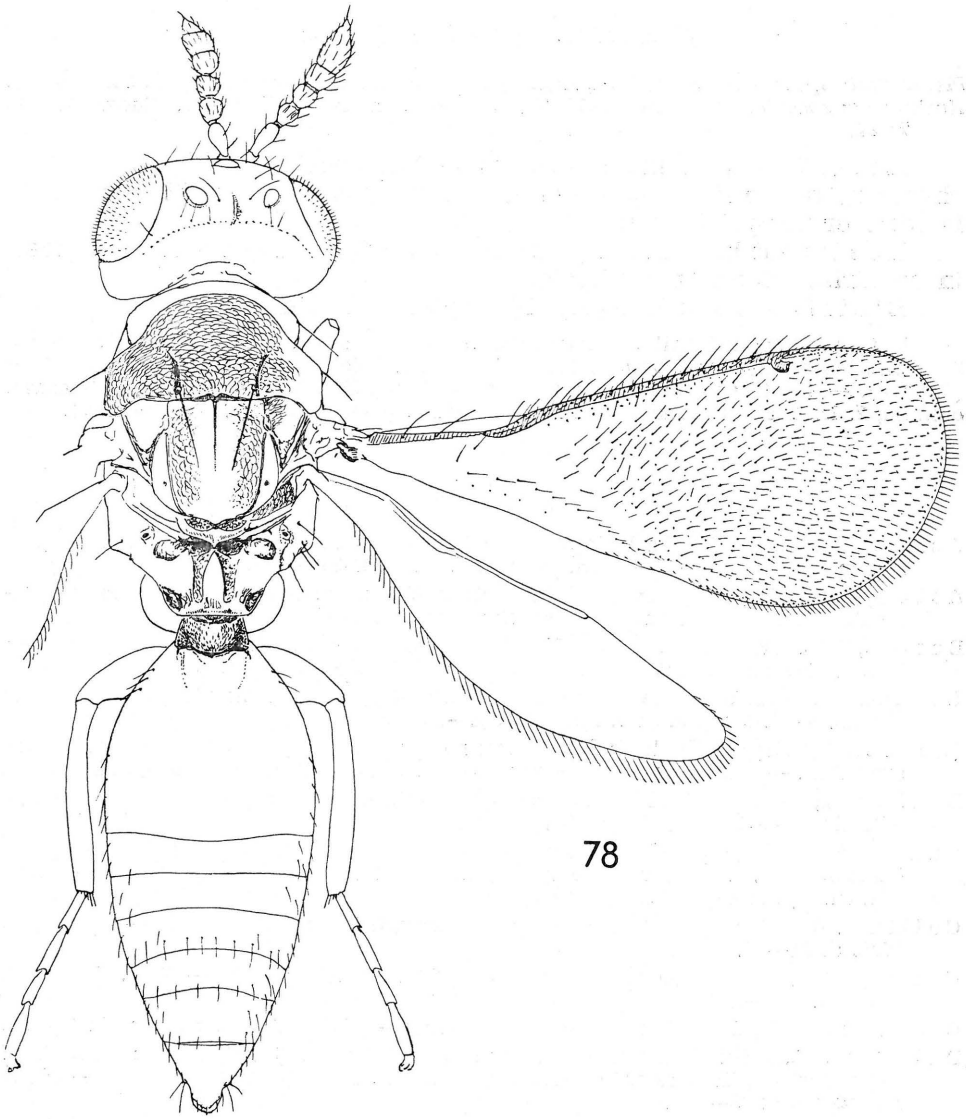


Fig. 78. *Horismenus specularis* (Erdös). Sculpture on the thorax partly indicated.

Paracrias Ashmead, 1904, which has a similar propodeum, but the scutellar grooves are absent as in *Pediobius* Walk.

Horismenus is very rich in species in the Americas, but in Europe hitherto only one species undoubtedly belongs to this genus, *H. specularis* (Erdös). The American species are mostly parasitic or hyperparasitic on pupae of various Lepidoptera.

Horismenus specularis (Erdös)

Pleurotropis specularis Erdös, 1954, Ann. hist.-nat. Mus. Nat. Hung. (s. n.), **5**: 350—351; ♀.
Horismenus specularis; Bouček, 1961, Trudy Moldav. n.-issl. Inst. Sadov. Vinogr. Vinod., **7**: 24.

Among the European Entedontinae this species is very distinctive, chiefly by the form of its scutellum and propodeum (Fig. 78). The male is however not yet known.

Hosts: not known. All specimens were found associated with trees, in countries with warm climate.

Distribution: Hungary, Moldavian SSR, Italy.

Material examined (all specimens known so far, 5♀♀). — Hungary: Tompa, Zsíroskút Wood, in *Ulmus glabra,* 11. VI. 1952, the holotype (Erdös); Tompa, X. 1954 (Bouček). — Moldavian SSR: Kishinev, orchard, 23. IX. 1957 (Talitzki); Kalarash, orchard, 2. IX. 1957 (Talitzki). — Italy: Portici, park, 15. VII. 1927 (Novitzky).

REFERENCES

Askew, R. R., 1961: On the biology of the inhabitants of oak galls of Cynipidae (Hymenoptera) in Britain. — *Trans. Soc. Brit. Ent.,* **14**: 237—268.

Askew, R. R., 1962: Some species of Pediobius Walker (Hymenoptera, Eulophidae) inhabiting Cynipid oak galls. — *Entomophaga,* **7**: 337—342.

Barnes, H. S., Walton, C. L., 1934: The asparagus miner, Melanagromyza simplex Loew (Diptera: Agromyzidae). — *Ent. mon. Mag.,* **70**: 183—185.

Blunck, H., 1931: Über die Parasiten der Rohrglanzgrasgallmücke Mayetiola phalaris Barnes. — *Zeitschr. angew. Ent.,* **18**: 582—589.

(Bouček, Z.) Боучек, З., 1961: Материалы по фауне хальцид (Chalcidoidea) Молдавской ССР. — *Trudy Mold. n. issl. Inst. Sadov. Vinogr. Vinod.,* Kishinev, **7**: 5—30.

Bouček, Z., 1964: Proctotrupoidea und Chalcidoidea aus den Resten der Ratzeburg-Sammlung. — *Beitr. z. Ent.,* **14**: in press.

Bukowski, W. (Буковский, В.), 1938: Новые и малоизвестные хальциды (Hymenoptera Chalcidoidea). I. Neue und wenig bekannte Chalcididen (Hymenoptera). I. — *Rev. Ent. URSS,* **27**: 152—171.

Collin, J. E., 1918: A short summary of our knowledge of the frit fly. — *Ann. appl. Biol.,* **5**: 81—96.

Crawford, J. C., 1912: Descriptions of new Hymenoptera, No. 5. — *Proc. U. S. Nat. Mus.,* **43**: 163—188.

Crawford, J. C., 1914: Three new Hymenoptera. — *Insec. Inscit. menstr.,* **2**: 36—38.

Delucchi, V., 1958: Lithocolletis messaniella Zeller (Lep. Gracilariidae): Analysis of some mortality factors with particular reference to its parasite complex. — *Entomophaga,* **3**: 203—270.

Dlabola, J., Syřínek, V., 1962: Některé příčiny kolísání četnosti výskytu bekyně zlatořitné (Euproctis chrysorrhoea L.). Einige Ursachen der Häufigkeitsschwankungen beim Goldafter (Euproctis chrysorrhoea L.). — *Rostlinná výroba,* Praha, **8**: 1353—1362.

Domenichini, G., 1953: Studio sulla morfologia dell'addome degli Hymenoptera Chalcidoidea. — *Boll. Zool. agr. Bachicolt.,* **19**, fasc. 3: 1—116, 1 pl.

Erdös, J., 1951: Eulophidae novae. — *Acta biol. Acad. Sci. Hung.,* **2**: 169—237.

Erdös, J., 1954: Eulophidae hungaricae indescriptae. — *Ann. hist.-nat. Mus. Nat. Hung. (s. n.),* **5**: 323—366.

Jansson, A., 1952: Studier över svenska Chalcidider. 2. Ur minerande smågflugor och småfjärilar kläckta arter. — *Opusc. ent.,* **17**: 1—10.

Erdös, J., 1956: Additamenta ad cognitionem faunae Chalcidoidarum in Hungaria et regionibus finitimis. VI. 19. Eulophidae. — *Folia ent. Hung., s. n.*, **9**: 1—64.

Erdös, J., 1958: Eulophidae novae gallicae (Eulophidae nouveaux de France) (Hym.) — *Bull. Soc. ent. France,* **62** (1957): 279—287.

Erdös, J., 1958: Eulophidae in Hungaria recenter detectae. — *Acta zool. Acad. Sci. Hung.,* **3**: 205—223.

Erdös, J., 1961: Fauna Eulophidarum Hungariae generibus speciebusque novis aucta (Hymenoptera). — *Ann. hist.-nat. Mus. Nat. Hung., Zool.,* **53**: 471—489.

Ferrière, C., 1953: Les parasites de « Lithocolletis platani » en Italie. — *Boll. Ist. Ent. Univ. Bologna,* **19**: 395—404.

Fonscolombe, B. de, 1832: Monographia Chalciditum Galloprovinciae circa Aquas Sextias degentium. — *Ann. Sci. nat.* Paris, **26**: 186—192.

Forsius, R., 1915: Om några kläckta parasitsteklar. — *Medd. Soc. Fauna Flora Fenn.,* 1914—1915, pp. 136—138.

Förster, A., 1841: Beiträge zur Monographie der Pteromalinen Nees. — Aachen; 46 pp., 1 pl.

Förster, A., 1856: Hymenopterologische Studien, II. Heft. Chalcidiae und Proctotrupii. — Aachen; 152 pp.

Förster, A., 1861: Ein Tag in den Hochalpen. — *Programm der Realschule zu Aachen für* 1860—1861: I—XLIV.

Fulmek, L., 1962: Parasitinsekten der Blattminierer Europas. — W. Junk, den Haag, Holland, 203 pp.

Gahan, A. B., 1921: Remarks on the genus Pleurotropis with description of a parasite of Trachelus tabidus Fabricius. (Hymenoptera: Chalcidoidea). — *Proc. ent. Soc. Wash.,* **23**: 113—120.

Gahan, A. B., 1927: Description of a new Eulophid parasitic on Bucculatrix canadensiela Chambers. — *Psyche,* **34**: 171—173.

Gahan, A. B., 1932: Miscellaneous descriptions and notes on parasitic Hymenoptera. — *Ann. ent. Soc. Amer.,* **25**: 736—757.

Gahan, A. B., 1933: The Serphoid and Chalcidoid parasites of the Hessian fly. — *U. S. Dept. Agr. Misc. Publ.,* **174**: 1—147.

Giraud, J. E., 1863: Mémoire sur les Insectes qui vivent sur le Roseau commun, Phragmites communis Trin. (Arundo phragmites L.) et plus spécialement sur ceux de l'ordre des Hyménoptères. — *Verh. zool.-bot. Ges. Wien,* **13**: 1251—1288.

Giraud, J. E., Laboulbène, A., 1877: Liste des éclosions d'Insectes. — *Ann. Soc. ent. France,* (5), **7**: 397—436.

Graham, M. W. R. de V., 1959: Keys to the British genera and species of Elachertinae, Eulophinae, and Euderinae (Hym., Chalcidoidea). — *Trans. Soc. Brit. Ent.,* **13**: 169—204.

Graham, M. W. R. de V., 1963: Additions and corrections to the British list of Eulophidae (Hym., Chalcidoidea), including some species new to science. — *Trans. Soc. Brit. Ent.,* **15**: 167—275.

Györfi, J., 1941: Lithocolletis platani Stgr. und ihre Parasiten. — *Erdészeti Kisérletek,* **43**: 224—235.

Györfi, J., 1942: Faunistische Angaben zur Kenntnis der Verbreitung der Chalcididen im Karpathen-Becken. — *Fragm. faun. Hung.,* **5**: 1—8.

Hadersold, O., 1939: Ergebnisse von Parasiten-Zuchten der Zweigstelle Stade der Biologischen Reichsanstalt für Land- und Forstwirtschaft. — *Arb. phys. angew. Ent.,* **6**: 1—14.

Hårdh, H., 1950: On the Hessian fly and its parasites in Finland. — *Ann. ent. Fenn.,* **16**: 92—93.

Heyden, L. von, 1894: Beiträge zur Kenntnis der Hymenopteren-Fauna der weiteren Umgebung von Frankfurt a. M. — *Ber. Senckenberg. naturf. Ges. Frankfurt a. M.,* 1894: 169—194.

Lindeman, K., 1887: Die Pteromalinen der Hessenfliege (Cecidomyia desctructor Say). — *Bull. Soc. Imp. Nat. Moscou, n. s.,* **1**: 178—192.

Masi, L., 1940: Descrizioni di Calcididi raccolti in Somalia dal Prof. G. Russo con note sulle specie congeneri. — *Boll. R. Lab. Ent. agr. Portici,* **3**: 247—324.

Meyer, R., 1923: Die parasitischen Hymenopteren der Fritflige (Oscinosoma frit L.). — *Zeitschr. angew. Ent.,* **9**: 111—120.

Mokrzecki, Z., 1933: Bleskotki (Chalcidoidea), zyjace jako pasorzyty I i II stopnia na szkodnikach lesnych. Die in den Forstschädlingen lebenden Parasiten des 1. und 2. Grades aus der Gruppe der Chalcidoidea. — *Pol. Pismo ent.,* **12**: 143—144.

Muesebeck, C. F. W., Dohanian, S. M., 1927: A study in hyperparasitism, with particular reference to the parasites of Apanteles melanoscelus (Ratzeburg). — *U. S. Dept. Agr. Bull.,* 1487: 1—35.

Nikolskaya, M. N., 1934: List of Chalcid flies (Hym.) reared in U.S.S.R. — *Bull. ent. Res.,* **25**: 129—143.

Nikolskaja, M. N., 1937: Паразиты злаковых мушек и комариков из семейства Chalcididae (Hymenoptera). The Chalcidoid parasites (Hymenoptera) of some injurious flies of the grain crops. — *Rev. Ent. URSS,* **27**: 3—27.

(Nikol'skaya, M. N., Kyao, N. N., 1954) Никольская, М. Н., Кяо, Н. Н., 1954: Фауна хальцид (Hymenoptera, Chalcidoidea) района среднего течения р. Урала и их хозяйственное значение. — *Trudy Zol. Inst. Akad. Nauk SSSR,* **16**: 404—416.

Otten, E., 1940: Gezogene Chalcididen und ihre Wirte. (Hymenoptera.) — *Arb. morph. tax. Ent.,* **7**: 177—202.

Otten, E., 1941: Gezogene Chalcididen und ihre Wirte. II. (Hymenoptera: Chalcidoidea). — Arb. morph. tax. Ent. **8**: 255—264.

Peck, O., 1951: Superfamily Chalcidoidea, in Muesebeck et alii, Hymenoptera of America north of Mexico, synoptic catalog. — *U. S. Dept. Agr., Agr. Monogr.,* **2**: 410—594.

Peck, O., 1963: A catalogue of the nearctic Chalcidoidea (Insecta: Hymenoptera). — *Canad. Ent. Suppl.* **30**, 1092 pp.

Ratzeburg, J. T. C., 1844, 1848, 1852: Die Ichneumonen der Forstinsecten in entomologischer und forstlicher Beziehung. Ein Anhang zur Abbildung und Beschreibung der Forstinsecten. — Berlin; I (1844): 224 pp., pls. VI—IX; II (1848): 238 pp., Clavis I—III, pls. I—III; III (1852): 272 pp., Clavis I—III.

Risbec, J., 1951: Les Chalcidoïdes d'A.O.F. — *Mém. Inst. Fr. Afrique Noire,* **13**: 5—409.

Rosen, H. von, 1959: Zur Kenntnis von drei auf Getreide vorkommenden Arten der Gattung Pediobius Walker 1846 (Hym., Chalc., Eulophidae). — *Ent. Tidskr.,* **80**: 163—167.

Szelényi, G. 1941: Contribution to the knowledge of the Chalcidoid fauna of the Carpathian's Basin. — *Fragm. faun. Hung.,* **4**: 37—43.

Szelényi, G., 1957: Újabb adatok az amerikai fehér szövölépke élösködöinek ismeretéhez. Some new data on the hymenopterous parasites of Hyphantria cunea Drury. — *Ann. Inst. Prot. Plant. Hung.,* **7** (1954—1956): 295—312.

Szöcs, J., 1959: The parasitization of mining moths. — *Acta zool. Acad. Sci. Hung.,* **5**: 147—164.

(Talitzki, V. I., 1961) Талицкий, В. И., 1961: Наездники и мухи-тахины — паразиты вредителей сада в Молдавии. — *Trudy Mold. n.-issl. Inst. Sadov. Vinogr. Vinod.,* **7**: 119—154.

Viggiani, G., 1962: La Lithocolletis millierella Stgr. e i suoi parassiti. — *Monti e Boschi,* **2**: 7 pp. (reprint).

Walker, F., 1846: Characters of some undescribed species of Chalcidites. — *Ann. Mag. nat. Hist.,* **17**: (continued) 177—185.

Waterston, J., 1915: Notes on African Chalcidoidea-II. — *Bull. ent. Res.,* **5**: 343—372.

Wolff, M., 1916: Über die Chalcidiergattung Chrysocharis Förster 1856 (1861) (Hym.) und die erste aus Deutschland bekannt gewordene Art Chr. kraussei n. sp., sowie über die Gattungen der Derostenus-Gruppe Thomsons. — *Ent. Mitt.,* **5**: 258—282, pl. 4.

Краткое содержание

В настоящей четвертой части своих исследований европейских хальцид семейства Eulophidae автор обрабатывает виды родов *Kratoysma,* n. g., *Pediobius* Walker и *Horismenus* Walker.

Новый род *Kratoysma* выставлен для единственного вида *Derostenus usticrus* Erdös, к которому автор считает синонимом *Pediobius diluticrus* Erdös. Вид до сих пор известен из западной и средней Европы, как паразит минирующей моли *Phyllocnistis suffusella* Zell.

В роде *Pediobius* Walker, известном раньше под названием *Pleurotropis* Förster, автор различает 33 европейских видов, но два из этих видов являются очень изменчивыми комплексами и каждый из них содержит три формы, которые считаются некоторыми другими авторами как самостоятельные виды. За дискуссией о синонимике и за характеристикой рода следует таблица для определения видов и их обзор по степени предполагаемого родства. Интересно, что многие из видов с резко 3-члениковым жгутиком усиков у самок являются вторичными паразитами и виды с 2-члениковым жгутиком первичными паразитами орехотворок (Cynipidae). Десять видов описывается как новых для науки, но только в роде *Pediobius* около 20 старых названий сведено в работе в синонимику. Как валидные в работе намечены следующие виды: *Pediobius coxalis,* n. sp. описан из Чехословакии; *P. flaviscapus* (Thoms.) известен из Швеции и Молдавской ССР; *P. epeus* (Walk.) разпространен от Британии по Молдавскую ССР; *P. ulmi* (Erdös) приводится из Чехословакии и Венгрии; *P. deplanatus,* n. sp. описан из Чехословакии; *P. alcaeus* (Walk.) разпространен по всей Европе, включая СССР; *P. termerus* (Walk.) приводится из северной и средней Европы; *P. tetratomus* (Thoms.) из западной и средней Европы, на восток по Крым; *P. cothurnatus* (Nees) из Европы, с Британии по Молдавскую ССР и из Канады; *P. claviger* (Thoms.) из Швеции и Британии; *P. saulius* (Walk.) из всей Европы на восток до Казахстана; *P. italicus,* n. sp. из Италии; *P. moldavicus,* n. sp. из Молдавской ССР; *P. crassicornis* (Thoms.) из северной и средней Европы, на восток по Крым; *P. cassidae* Erdös из различных стран, с Франции по Молдавскую ССР; *P. pyrgo* (Walk.) из всей Европы, южной Сибири, Японии и США; *P. obtusiceps,* n. sp. описывается из средней и южной Европы, но распространен на восток до Таджикистана; *P. phragmitis,* n. sp. из Чехословакии, Венгрии и Молдавской ССР; *P. grunini* (Nik.) из Чехословакии и западного Казахстана; *P. facialis* (Giraud) из многих стран, с Британии по южную Сибирь; *P. brachycerus* (Thoms.) из северной и средней Европы, на восток по Украину и тоже из восточной Канады; *P. lysis* (Walk.) с Британии по Молдавскую ССР; *P. chilaspidis,* n. sp. из Чехословакии, Австрии и Венгрии; *P. sublaevis* (Erdös) из Франции; *P. clita* (Walk.) наблюден из средней Европы, с Британии по Венгрию и Югославию; *P. plagiotrochi* (Erd.) из Франции, Португалии и Испании; *P. epigonus* (Walk.) из всей Европы, на восток до СССР, и из северной Америки; *P. acantha* (Walk.) с Британии по СССР (*P. helianthemellae* Erd. и *dorycniellae* Erd. являются очень близкими к *acantha,* они вероятно только его формами); *P. glabratus,* n. sp. описывается из Британии, Гер-

мании и Чехословакии; *P. oviventris,* n. sp. из Чехословакии; *P. nigritarsis* (Thoms.) распространен по северной и средней Европе, с Британии по СССР, и также в северной Америке;*P. eubius* (Walk.), вместе с формами *alaspharus* и *planiventris,* приводится из всей Европы и *P. polanensis,* n. sp. из Чехословакии. У каждого вида приводится синонимика, данные по типам, дискутируются родственные связи, у большинства видов описываются морфологические признаки, у всех видов автор приносит сводку данных по хозяевам (многие из этих данных — новые для науки), по распространении и по материале осмотренном автором.

В конце работы приводится еще род *Horismenus* Walker с единственным европейским видом *H. specularis* Erd., известным из Венгрии, Италии и Молдавской ССР.

Index to Chalcid names

(In *italics* names not considered valid on specific or generic level.)