

Parasites of Hemipterous Grain-pests in Europe.

(Hymenoptera: Proctotrupoidea.)

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(With 3 Text-Figures.)

The material which forms the basis of this paper was received some time ago from the Deutsches Entomologisches Institut, Berlin-Dahlem, with a request for identification. It comprises five species, all belonging to five genera in the subfamily *Telenominae*. It is highly probable that all these species have at one time or another received names, but, owing to the poor quality of the work which has been done on the *Telenominae*, it has been possible to identify only two of them from the literature. For the sake of convenience, the other three species are described as new. Their types are in the Deutsches Entomologisches Institut, Berlin-Dahlem.

The insects are all parasitic in the eggs of the following species of Hemiptera: *Eurygaster maura* L., *Aelia acuminata* L., *Palomena praecox* L., *Dolycoris baccarum* L. and *Carpocoris pudicus* Poda. An excellent and detailed account of the biology of these Hemiptera has been given by W. Tischler¹⁾.

I take this opportunity of making my acknowledgements to the authorities of the Deutsches Entomologisches Institut for allowing me to work out this material bred by Dr. W. Tischler and of expressing my warmest thanks to Dr. F. Maidl of the Naturhistorisches Museum, Vienna for sending me, for purposes of comparison, species of *Telenominae* determined by the late Gustav Mayr.

Subfamily *Telenominae*.

Telenomus tischleri sp. n. (Fig. 1).

♂. Black. Antennae virtually black throughout; scape reddish at extreme base. Coxae blackish; femora infuscated; tibiae and tarsi light brownish-yellow.

Head not at all crescentic seen from above and, seen along a line perpendicular to a line between the posterior ocelli, twice as wide as its greatest length. Frons in greater part smooth and shining; towards the basal sulcus with weak scaly-reticulation; a few punctures arranged more or less in a row along the inner orbits. Surface around each posterior ocellus weakly scaly-reticulate; a longitudinal row of 4—5 punctures on

¹⁾ Untersuchungen über Wanzen an Getreide, Arb. phys. angew. Ent. 4, 1937, pp. 231—236. Zur Ökologie der wichtigsten in Deutschland an Getreide vorkommenden Pentatomiden. I. Zeitschr. Morph. u. Ökol. Tiere, 34, 317—366, 1939; II. l. c., 35, 1939 (in print).

each side of the anterior ocellus. Posterior (declivous) surface of the vertex with a very feeble surface-sculpture; along the crest of the vertex is a row of very ill defined, puncture-like impressions. Antennae: segment of the flagellum distinctly longer than the pedicel; flagellum somewhat slender, the club not sharply defined (fig. 3, f). Head behind the eyes convex away at an angle of about 30° to the axis of the head. Eyes thick and covered with minute hairs.

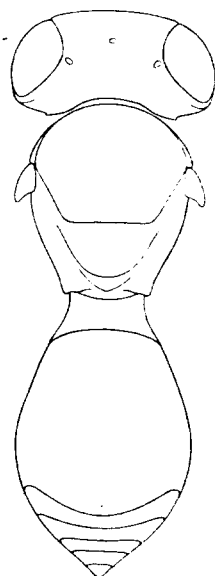


Fig. 1. *Telenomus tischleri* sp. n., ♀.

Thorax: Mesonotum somewhat dull, covered with an indefinite subalutaceous sculpture. Scutellum more or less smooth, shining, all over. Posterior scutellum medially with a sub-triangular, rugose swelling. Fringe at widest part of hind wing half the width of the wing at the same place.

Abdomen: Tergite 2 very slightly longer than its greatest width, feebly striated over about basal two-fifths.

♂. Antennae black throughout; flagellum rather long, segments 5—9 being about 1½ times as long as wide; flagellum 1 fully twice as long as wide (fig. 3, g). Genitalia (fig. 2, a).

Length: ♂ ♀, 1,15 mm.

Germany: East Prussia, Sensburg, 8 ♀♀ (one the type), 5 ♂♂, bred 1938 from eggs of *Dolycoris baccarum* Linn. (Dr. Tischler).

This species has at most the merest trace of a ridge behind each ocellus, though the vertex gives the impression of having the beginnings of some sort of raised line right across.

Microphanurus Kieffer

The species dealt with may be separated by the following key:

1. Frons between the antennal insertions and the eye distinctly bulging; margin bordering the posterior orbits continued as a sharp, smooth, completely differentiated ridge right across the vertex immediately behind the posterior ocelli. *cultratus* (Mayr)
- Frons between the antennal insertions and the eye not bulging; vertex without such a ridge, being at most somewhat sharply angled between the posterior ocelli. 2
2. Mesonotum behind with short, sharply defined parapsidal furrows. (Sp. with the legs, except the coxae, reddish-brown to reddish, the femora slightly darker.) *choaspes* sp. n.
- Mesonotum posteriorly without parapsidal furrows 3

Striations of tergite 2 extending over at least basal half of segment; mesonotum with a well marked, longitudinally striate element in the sculpture; hind femora black or blackish, except perhaps at extremities *semistriatus* (Nees).

Striations of tergite 2 extending hardly beyond the basal furrow; mesonotum without a striate element in the sculpture; hind femora uniformly reddish *anitus* sp. n.

Microphanurus choaspes sp. n.

♂♀. Black. Antennae, except apex of pedicel, which is pale, black throughout. All the coxae blackened; legs otherwise brownish red, though femora, especially the front pair, are slightly darkened. Wings markedly brownish.

♀. Head strongly transverse, not bulging between the lowest point of the eye and the antennal insertions. Frons towards the genal sulcus all, more or less evenly but somewhat coarsely scaly-reticulate, almost agreened; towards the upper half of the inner orbits becoming finely rugose; medially tending to become smooth, the smooth area surrounded by short, fine, transverse striation. Vertex to the sides of the anterior cellus dull, with a scaly-reticulation similar to that of the lower part of the frons. Vertex fairly sharply angled between the ocelli; the sculpture of the posterior (declivous) part is slightly less strong and definite than that of the anterior part. Head cut away almost at right angles behind the eyes; the surface here less dull but with a sculpture somewhat like that of the lower part of the frons. Antennae (fig. 3, c): flagellum 1 as long as the pedicel, twice as long as its greatest width; flagellum 3 clearly transverse; club 6-segmented, rather stout.

Thorax: Parapsidal furrows showing posteriorly as sharply defined conspicuous grooves which are fully as long as the scutellum. Mesonotum hardly shining, finely rugose all over, the sculpture appearing to be a coarser representation of that on vertex and lower part of frons; virtually no indication of a longitudinal element in the sculpture. Scutellum shining, polished, virtually without a trace of sculpture. Medial, transverse swelling of the postscutellum rugose. Mesopleural depression almost smooth and with a feeble, broken margin below in front. Marginalis of the fore wing of normal length for the genus.

Abdomen a little longer than its greatest width, about 6:5. Tergite 2 clearly transverse, striated over three quarters its length. Tergite 3 finely punctulate and with a transverse row of slightly larger punctures.

♂. Flagellum slender, of equal width throughout; segments 5—9 a little longer than wide.

Length: ♂♀, 1,3 mm.

Germany: Schleswig-Holstein, Mölln, 7 ♀♀ (one the type), 1 ♂, bred
1937 from eggs of *Aelia acuminata* L. (Dr. Tischler).

This species is characterised by a combination of the shape of the head, sculpture of mesonotum, sharply defined parapsidal furrows and smooth scutellum. It appears to resemble very closely *Microphanurus vassieliewi* (Mayr, 1903), a species bred from *Eurygaster integriceps* Put. in Transkaspia. Apart from having a different host, though this may be of no significance, since the allied *Microphanurus semistriatus* (Nees) has been bred from several hosts, *M. vassieliewi* is described as having the sides of the frons with scattered, rather large, indistinct punctures in addition to the fine punctate-reticulation. No such punctures occur anywhere on the frons of *M. choaspes* sp. n.

Microphanurus anitus sp. n.

♂♀. This species seems to be fairly closely related to *M. choaspes* sp. n., with which it may be compared as follows:

♀. Size considerably smaller. Legs of a clearer red colour, but the coxae blackened as in *choaspes*. Scape with a variable amount of reddish suffusion towards base.

Sculpture of the head on the whole finer. A somewhat strong scaly-reticulate sculpture extends from the vertex along the inner orbits to the cheeks; there is less indication of fine, transverse striation around the central smooth area of the frons. Vertex less scooped out behind the anterior ocellus and with a less sharp separation between its anterior and posterior (declivous) surfaces. Antennae: club not so stout and less sharply 6-segmented (fig. 3, a).

Thorax: Mesonotum more shining, its sculpture indefinite, lacking the somewhat beaded appearance characteristic of *choaspes*. Parapsidal furrows virtually absent. Scutellum sculptured all over, more or less scaly-reticulate. Postscutellar swelling with a regular row of foveae the row margined posteriorly by a sharp ridge which marks the upper boundary of the posterior perpendicular wall of the postscutellum. Mesopleural depression virtually without a margin below in front. Forewing: stigmalis distinctly shorter than in *choaspes*, thicker, its outline less sharp.

Abdomen: Tergite 2 with only a trace of fine striation arising from the usual costate basal furrow; hence the tergite virtually smooth by comparison with that of *choaspes*. Following tergites less distinctly punctulate.

♂. Antenna (fig. 3, b) shorter and stouter than in *choaspes*; flagellar segments 1 and 2 hardly longer than wide; 5—9 not at all longer than wide. Genitalia (fig. 2, b).

Length: ♂♀, about 9.5 mm.

Germany: Schleswig-Holstein, Mölln, 20 ♀♀ (one the type), 4 ♂♂
 red 1937 from eggs of *Aelia acuminata* L. (Dr. Tischler).

In Mayr's key (1879) to the European species of *Telenomus* (including
Microphanurus), this species runs to *Telenomus pentopherae* Mayr. I
 have seen cotypes of Mayr's species, which is a true *Telenomus* and not
 all like *Microphanurus anitus* sp. n. Also it is stated by Mayr to be
 parasite of the eggs of the Lymantriid, *Pentophera morio* L.

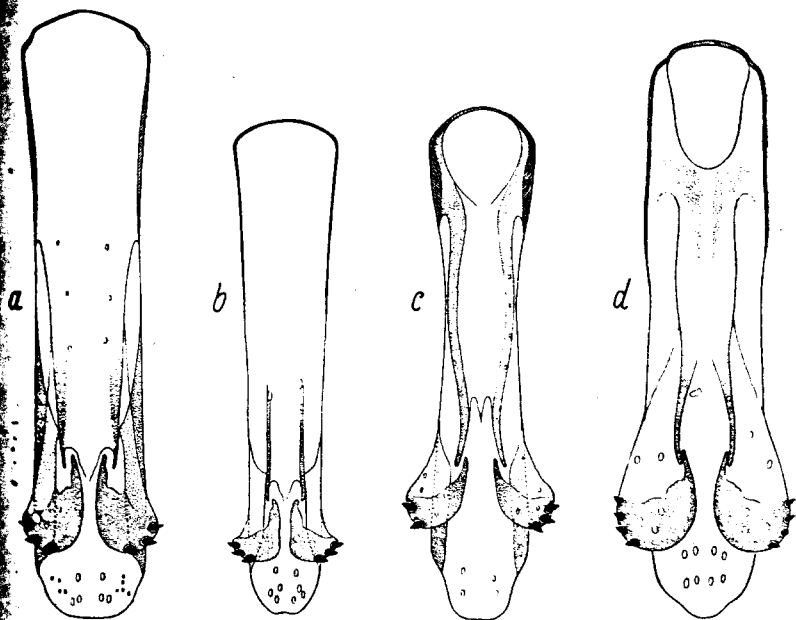


Fig. 2. ♂ Genitalia of: a, *Telenomus tischleri* sp. n.; b, *Microphanurus anitus* sp. n.; c, *Microphanurus semistriatus* (Nees); d, *Microphanurus cultratus* (Mayr).

Microphanurus cultratus (Mayr).

This species, as far as European *Microphanurus* is concerned, is
 very distinctive. Mayr's description of it is so good that there need be
 little doubt about its identity. From the material available, I have
 drawn up the following description.

♀. Black. Pedicel and first 4 segments of the flagellum pale brown,
 sometimes with a yellowish tinge, rather sharply contrasting with the
 black apical flagellar segments. All the coxae black; legs otherwise pre-
 dominantly obscure brownish with a yellowish tinge, especially on tarsi.

Head, seen from above so that the tip of the antennal prominence
 is just visible, very slightly more than twice as wide as its greatest
 length, 21:10. Frons between the antennal insertions and the lowest

point of the eye conspicuously bulging; these convexities are covered with a fine scaly-reticulate sculpture; the middle part of the frons deep, smooth, subconfluent striation which tends to be concentric about the antennal insertions; towards the orbits above, and narrowly along the orbits as far as the frontal convexities, the frons has distinct, separated punctures, and the surface between them faintly scratched; the sides of, and behind the anterior ocellus, the vertex has similar, less clearly defined punctures and the surface between them duller and more sharply scratched than on frons. Immediately behind the posterior ocelli, the vertex has a completely differentiated, evenly curved, shallow keel dividing it into two parts. Antennae: flagellum 1 very slightly longer than pedicel; flagellum 4 clearly a little transverse; radicle about $\frac{1}{4}$ the length of the scape.

Thorax: Mesonotum shining, finely rugose, showing distinct traces of longitudinal striation, especially posteriorly; short, clearly defined parapsidal furrows present posteriorly, but they are not very conspicuous owing to the striate nature of the surrounding sculpture. Scutellum faintly shining, very closely scaly-reticulate all over. Transverse, posterior scutellar swelling foveolate posteriorly, rugose along the posterior crest. Mesopleural depression smooth, shining, with an almost complete ridge bordering it below in front.

Abdomen: Tergite 2 clearly transverse, striate to within a quarter of apex. Following tergites finely punctulate.

♂. Flagellar segments 5—9 very slightly longer than wide. Genitalia (fig. 2, d): the „ventral plate“ shows a rather conspicuous deepening of pigmentation on each side at base.

Length: ♂ ♀, about 1.4 mm.

Germany: East Prussia, Sensburg, bred 1938 from eggs of *Carpocoris pudicus* Poda (Dr. Tischler).

Microphanurus semistriatus (Nees).

Gustav Mayr (1879), who was apparently first revisor of this species, states that he saw Nees' type. The specimens of *semistriatus* sent to me by Dr. Maidl bear Mayr's determination label and I have accepted them as representative of Nees' species.

Below, I give a redescription of the species.

♂ ♀. Black. Antennae black throughout. All the femora and middle and hind tibiae black, the extremities faintly reddish; front tibiae with a considerable extent of pale colour at apex. Wings nearly hyaline; venation blackish.

♀. Head, seen from above along a line perpendicular to a line between the posterior ocelli, $2\frac{1}{2}$ times as wide as long. Frons not bulging

between the antennal insertions and the eye, becoming smooth along the mid-line above the antennal insertions; the middle part of the frons, especially towards sides, is irregularly, transversely rugose, though the transverse element is often absent; upper surface of the frons dull, very feebly scaly-reticulate, giving a beaded effect or sometimes appearing rarely rugulose; this fine sculpture occurs also on lower part of frons towards the genal sulcus. Vertex feebly angled between the posterior ocelli; its sculpture to sides of anterior ocellus like that of the upper part of the frons; sculpture of the posterior (declivous) part less definite. Anterior ocelli separated from the eye-margin by a variable distance, sometimes nearly touching the eye-margin, sometimes separated from it by a distance virtually equal to the greater diameter of an ocellus. Antennae (fig. 3, d): flagellum 1 distinctly longer than the pedicel; club not especially thick.

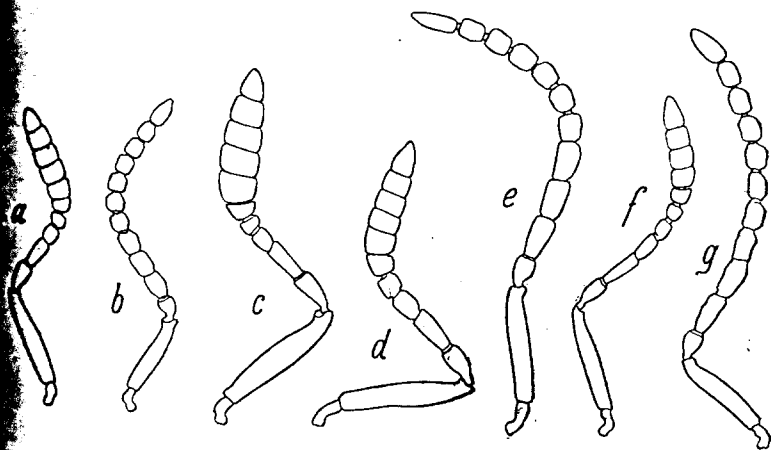


Fig. 3. Antenna of: a, *Microphanurus anitus* sp. n., ♀; b, *Microphanurus anitus* sp. n., ♂; c, *Microphanurus choaspes* sp. n., ♀; d, *Microphanurus semistriatus* (Nees), ♀; e, *Microphanurus semistriatus* (Nees), ♂; f, *Telenomus tischleri* sp. n., ♀; g, *Telenomus tischleri* sp. n., ♂.

Thorax: Mesonotum finely rugose all over, glistening; the sculpture shows a very distinct longitudinal element, which is most in evidence anteriorly. Scutellum vaguely scaly-reticulate laterally but becoming smooth and shining medially, its entire surface usually covered with very coarse raised points. Medial transverse swelling of the postscutellum punctulate along anterior margin, coarsely rugose along posterior margin. Oblique furrow of the mesopleurae smooth with at most a trace of a furrow below in front. Stigmatalis of normal length for the genus.

Abdomen as long as wide. Tergite 2 clearly transverse, striated medially over about $\frac{2}{3}$ its length. Following tergites finely punctulate.

♂. Flagellum very slightly narrowed to apex; flagellum 5—9
tually square in outline (fig. 3, e). Genitalia (fig. 2, c).

Length: ♂♀, 1.3 mm.

Germany: Schleswig-Holstein, Mölln, 1937, bred from *Palomena prasina* L., *Eurygaster maura* L. (Dr. Tischler); East Prussia, Seeburg, bred from eggs of *Carpocoris pudicus* Poda.

I refer to this species a series of 13 ♀♀ from Finkenkrug near Berlin, bred (Dr. K. Sellke) 23. VI. 1937 from eggs of the Pentatomid *Troilus luridus* L.; 9 of these females have the tibiae entirely red, others have them predominantly black as in typical *semistriatus*; except that this series has the head slightly less transverse, the frons with more conspicuous transverse-striate element and very shining, I can find no difference between these females and typical *semistriatus*. From the same host, *Troilus luridus* L. I have examined a series of typical *semistriatus* from England: Bucks, Slough; eggs of host found on birch 8. VI. 1934, parasites emerged 20. VI. 1934 (O. W. Richards).

In the series bred from *Carpocoris pudicus* Poda the posterior ocelli are separated from the eye-margin by a distance virtually equal to their greater diameter. In the two series from *Eurygaster maura* and *Palomena prasina* L., they are separated from the eye-margin by a distance obviously shorter than their greater diameter.

Of the two series sent by Dr. Maidl, one (4 ♀♀, pinned on pith, no locality data) has the posterior ocelli almost touching the eye-margin; in the other, (1 ♂, 1 ♀, pinned on pith, Rostow am Don, Vassiliev, ex *Eurygaster integriceps* Puton, VI. 1905), the posterior ocelli are separated from the eye-margin by nearly their greater diameter.

References.

- Mayr, G., Über die Schlupfwespengattung *Telenomus*. Verh. Zool.-bot. Ges. Wien, 29, 697—714, 1879.
Mayr, G., Hymenopterologische Miscellen. Verh. Zool.-bot. Ges. Wien, 51, 399, 1903.