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Revision of the genus *Trachyarus* Thomson

(Insecta, Hymenoptera, Ichneumonidae, Alomyini)

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A revision of the Palaearctic genus *Trachyarus* is presented. This genus includes 15 described and valid species (including nine species described in this paper): *Trachyarus bacillatus*, spec. nov., *T. decipiens*, spec. nov., *T. edilleri*, spec. nov., *T. hemichneumonoides*, spec. nov., *T. khrulevae*, spec. nov., *T. parvipennis*, spec. nov., *T. punctigaster*, spec. nov., *T. solyanikovi*, spec. nov. and *T. subtilipiceus*, spec. nov.). *Trachyarus specularis* Roman is considered a junior synonym of *T. anceps* (Berthoumieu).

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Introduction

Trachyarus is a medium-sized Palaearctic genus of the tribe Alomyini (= Phaeogenini sensu Perkins 1959, Wahl & Mason 1995). The genus and its type species were described at the end of the nineteenth century (Thomson 1891). However, it is poorly known although several other species now belonging to *Trachyarus* were discovered since that time (Berthoumieu 1906, Roman 1918, Diller 1988, 1989). The examination of the extensive material from collections of the Zoologische Staatssammlung (Munich, Germany), Zoological Institute, Russian Academy of Sciences (St. Petersburg, Russia), and the Zoological Museum of the Moscow University (Moscow, Russia) resulted in the discovery of several new species. Moreover, a revision of *Trachyarus* is necessary because of the considerable intraspecific variation in this genus, especially regarding wing structure.

Abbreviations used: MNHN – Muséum National D'Histoire Naturelle, Paris, France; NHM – Natural History Museum, London, UK; NHRM – Naturhistoriska Riksmuseet, Stockholm, Sweden; UZI – Museum of Zoology and Entomology, Lund University, Lund, Sweden; ZIN – Zoological Institute, Russian Academy

of Sciences, St. Petersburg, Russia; ZMMU – Zoological Museum, Moscow State University, Moscow, Russia; ZSM – Zoologische Staatssammlung, Munich, Germany. Unless otherwise stated, all type material of newly described species is deposited in the ZSM collection.

Genus *Trachyarus* Thomson

Trachyarus Thomson, 1891: 1612.

Type species. *Trachyarus corvinus* Thomson, 1891: 1612, by monotypy.

Description

Female. Head conspicuously inflated. Clypeus strongly convex, well separated from the face. Lower edge of the clypeus thin, usually more or less rounded, with an apical margin. Clypeus about twice as wide as high. Face about twice as wide as high, median part rising above the lateral ones. Antennal scrobe weak. Frons obviously convex. Head transverse, sometimes narrowed behind eyes in dorsal view. Temples usually enlarged in profile, with their maximum length somewhat equal to transverse ocular diameter. Malar space more or less equal to

width of mandibular base. Scape oviform, its apical truncation inclined. Maximum length of the scape slightly exceeds its width. Flagellum filiform, with 21-27 segments. Mandibles sometimes narrowed, their upper tooth longer or shorter than the lower tooth.

Mesoscutum convex. Scutellum distinctly convex, its lateral carinae usually very short. Sternauli stretch almost to the middle of mesopleura. Propodeum formed by weakly inclined short basal part and strongly inclined long apical one (except *T. brachypterator* and *T. khrulevae*). Area basalis of propodeum short and indistinct. Area superomedia heart-shaped, narrowed basally, separated from area posteromedia by weak and indistinct carina. Area petiolaris bordered by weak diverging carinae, wide, distinctly concave. Side carinae of area posteromedia hardly visible and very indistinct, sometimes absent. Wings fully developed or reduced. Areolet open, its occluding vein spectral. Second recurrent vein with 2 bullae. Nervellus usually vertical. Coxal armature absent.

Metasoma oval to longish-oval. Petiolus more or less compressed dorsoventrally. Thyridia often wide and slightly inclined. Protruding part of the ovipositor sheath very short. Sterna of metasomal segments II-IV with a median fold. Hypopygium short, far from overlapping the ovipositor slit.

Body weakly to moderately sculptured. Head shining, side parts of face more or less densely punctate, punctures of the median part of the face finer, clypeus finely punctate. Frons with fine scattered punctures. Temples very sparsely and finely punctate. Malar space with a chagrinat groove. Mesoscutum and scutellum usually shining, the former with comparatively dense and fine punctures, the latter more sparsely punctate. Mesopleura usually rugose, speculum more or less smooth. Propodeum rugose (areae superoexternae less sculptured). Base of metasoma usually chagrinat, sculpture disappears towards apex of metasoma.

Body usually brown. Head brown, clypeus, median part of face and mandibles usually lighter. Antennae brown to reddish brown, palps light brown. Thorax brown. Stigma and veins reddish. Legs predominantly brown. Metasoma usually brown with hind margins of terga II-III yellowish and tergum VII reddish brown.

Body length 3.5-6.0 mm, fore wing length 0.3-4.3 mm.

Male. Similar to female. Tyloids, if developed, oval, usually present before the middle of flagellum.

Distribution. Palaearctis.

Biology. All known hosts belong to Psychidae (Lepidoptera).

Differential diagnosis. Members of a few genera of the tribe Alomyini, namely those of *Hemichneumon* Wesm., *Epitomus* Förster and *Tycherus* Förster (*fuscicornis* species group), are closest to *Trachyarus*. Species of *Trachyarus* (as well as those of *Hemichneumon* and *Epitomus*), however, differ from *Tycherus* by having areolet of the fore wing open, its occluding vein spectral; from *Epitomus* – by having propodeum sloping from anterior margin of area superomedia; from *Hemichneumon* – by having large thyridia, rugose mesopleura and short but distinct area superomedia of the propodeum; the former area is often separated from area posteromedia by more or less developed carina (see Selfa & Diller 1994).

1. *Trachyarus anceps* (Berthoumieu)

Figs 1, 2

Hemichneumon anceps Berthoumieu, 1906: 60. Holotype: ♀, France, "Val d'Isère" (MNHN, studied).

Trachyarus anceps: Diller, 1989: 288.

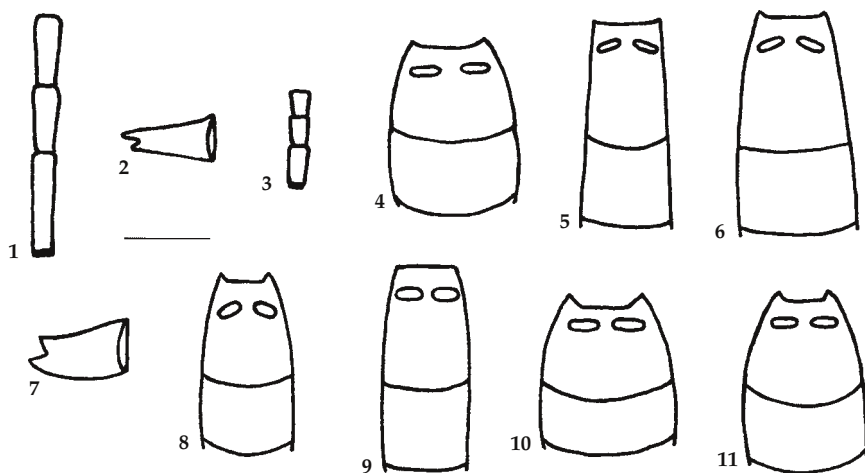
Trachyarus specularis Roman, 1918: 8. Lectotype: ♀, Sweden, "Lapp. suecica merid." (NHRM, designated here, selected by E. Diller). **Syn. nov.**

Material. 12♀, 6♂ (MNHN, NHRM, ZIN, ZSM) including holotype (♀, France, "Val d'Isère", "type", "*Hemichneumon anceps* n. sp. (Berth. vid.)", "Museum Paris", "Holotypus *Hemichneumon anceps* Berth. ♀ Diller 89", "*Trachyarus anceps* (Berth.) ♀ det. E. Diller 89", "montage sur Polypore le 23.III.1989 M. Lachaise") (MNHN). – Paratypes: 12♀, 6♂, same data.

Additional material. Two females and a male reared in the Moscow region from *Siederia* spp. (including *S. liserella*; ZIN) probably also belong to this species.

Differential diagnosis. The female of *T. anceps* is closest to that of *T. brevipennis*, but in *T. anceps* the flagellum is more slender (first flagellar segment 3.6-4.0× as long as wide) and the metasomal sculpture is less developed (especially on tergum III). Among *Trachyarus* males, *T. anceps* is the only species having a combination of the following characters: upper mandibular tooth longer than the lower tooth; flagellum without tyloids; metasomal tergum III 1.6-1.7× as wide as long, its apical half smooth with obscure punctures.

Note. Another species of the genus, *Trachyarus specularis* Roman, appeared to be a synonym of *T. anceps*. Contrary to Diller (1988: 371), this species is not a synonym of *T. fuscipes* (lectotypes compared).



Figs 1-11. *Trachyarus* spp., ♀♀. 1, 3. Base of flagellum. 1. *T. anceps* (Berthoumieu). 3. *T. brevipennis* Roman. 2. *T. anceps*, mandible. 4-6, 8-11. Metasomal terga II and III. 4. *T. corvinus* Thomson. 5. *T. fuscipes* (Thomson). 6. *T. prominulus* Diller. 8. *T. edilleri*, spec. nov. 9. *T. hemichneumonoides*, spec. nov. 10. *T. parvipennis*, spec. nov. 11. *T. solyanikovi*, spec. nov. 7. *T. bacillatus*, spec. nov., mandible. – Scale equals 0.25 mm for Figs 1-3, 7 and 0.5 mm for Figs 4-6, 8-11.

Description

Female. Lower edge of the clypeus very slightly rounded, apical margin hardly visible. Head slightly narrowed behind eyes in dorsal view. Temples more or less enlarged ventrad. Flagellum slightly enlarged in apical half, with 23-26 segments, first segment $3.6-4.0 \times$ as long as wide (Fig. 1), 12th or 13th segment square in lateral view. Mandibles somewhat narrowed, upper mandibular tooth distinctly longer than the lower tooth (Fig. 2). Hypostomal carina meets genal carina before the mandibular base at half its width.

Distinct notauli present in the basal third of mesoscutum. Area superomedia of propodeum about $1.3 \times$ as wide as long. Area petiolaris about $3 \times$ as long as area superomedia. Wings fully developed. Nervellus broken in its lower third. Middle tibiae sometimes with a transverse shallow subapical impression on outer sides. Hind femora $3.5-3.6 \times$ as long as wide.

Metasoma longish-oval. Petiolus slightly compressed dorsoventrally. Distance between spiracles of the first metasomal segment twice as long as the distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of the second tergum by about half their width, approximately twice as wide as the interthyridial space. Metasomal tergum II $1.0-1.1 \times$ as wide as long, tergum III $1.6-1.7 \times$ as wide as long. Protruding part of the ovipositor sheath more or less visible from above.

Body weakly sculptured. Frons shining, very

finely and sparsely punctate. Upper halves of the pronotal lobes shining, with fine scattered punctures, the lower ones longitudinally rugose. Mesopleura almost smooth to rugose-punctate, sometimes only in their apical half, speculum smooth with a few very fine punctures. Metasomal tergum I coarsely punctate, postpetiolus irregularly longitudinally striate, tergum II and sometimes basal fourth of tergum III obviously chagrinately, with obscure punctures, the others sparsely punctate, sculpture almost disappears towards apex of metasoma.

Body brown. Head brown, clypeus and sometimes cheeks and most part of face lighter, mandibles (except teeth) yellowish brown. Antennae brown, slightly reddish beneath, palps light brown. Tegulae whitish. Legs brown, apices of front and middle femora and stripes on inner sides of the front and middle tibiae reddish, the latter sometimes entirely reddish, all tarsi sometimes reddish. Metasoma brown with thyridia and hind margins of terga II-III (IV-V) yellowish, tergum VII sometimes reddish brown.

Body length 3.5-5.0 mm, fore wing length 2.9-3.6 mm.

Male similar to female. Flagellum with 23-24 segments, first segment $2.8-2.9 \times$ as long as wide, several segments before apex of flagellum square in lateral view, tyloids absent. Sculpture of metasoma more robust. Body brown, clypeus sometimes whitish, mandibles sometimes with whitish markings at the middle.

Body length 4.5 mm, fore wing length 3.3 mm.

Biology. Parasitoid of *Dahlica charlottae* (Meier), *D. klimeschi* (Sieder), *D. triquetrella* (Hübner) and *Siederia listerella* (L.).

Distribution. Ukraine (Transcarpathia), Finland, Sweden, Austria, Germany (Bavaria), France (Isère). A boreal-montane species.

2. *Trachyarus brachypterator* Diller

Trachyarus brachypterator Diller, 1988: 372.

Holotype: ♀, Austria, "Niederösterreich, Wimpassing, an Schwarzföhre" (ZSM, not examined).

Material: Paratype: ♀, Austria, "Paratypus", "Österreich", "Parasit e Psychidae, leg. H. Meier", "NÖ, Wimpassing, an Schwarzföhre, Mai 1974, Sied. pineti Z.", "Paratypus ♀ *Trachyarus brachypterator* ♀ Diller, 87" (ZSM).

Differential diagnosis. Among *Trachyarus* species, the wings are also strongly reduced in *T. parvipennis*, spec. nov., from which *T. brachypterator* well differs by the structure of mandibles, number of flagellar segments, proportions of metasomal terga and general colour of the body and legs.

Description

Female. Lower edge of the clypeus slightly rounded, with a visible apical margin. Head moderately transverse, not narrowed behind eyes in dorsal view. Temples prominently enlarged ventrad. Flagellum slightly enlarged in apical half, with 21 segments, first segment 1.7-1.8 × as long as wide, 4th or 5th segment square in lateral view. Upper mandibular tooth distinctly longer and wider than the lower tooth. Hypostomal carina meets the genal carina before mandibular base at about half its width.

Distinct notauli present in the basal third of mesoscutum. Scutellum comparatively small, its lateral carinae developed in its basal half. Propodeum formed by comparatively long and horizontal, convex basal part and strongly inclined, slightly concave long apical part, the latter about 1.2 × as long as the former. Areolation of the propodeum very indistinct or absent. Area superomedia very inconspicuous, rounded, about 1.5 × as long as wide. Wings vestigial, hardly reaching base of propodeum. Hind femora 3.1-3.2 × as long as wide.

Metasoma oval. Petiolus slightly compressed dorsoventrally. Distance between spiracles of the first metasomal segment about 1.2 × as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from base of second tergum by about one-third their width, approximately 1.5 × as wide as the interthyridial space.

Metasomal tergum II 1.2-1.3 × as wide as long, tergum III 1.8-1.9 × as wide as long.

Body moderately sculptured. Head weakly shining, finely chagrinate. Thorax chagrinate. Metasomal terga I-III chagrinate, sculpture disappears towards apex of metasoma.

Body yellowish brown. Head brown, mandibles (except teeth), clypeus and median part of face yellowish brown. Scape and pedicel brown, flagellum reddish ventrally, 1st to 4th flagellar segments reddish, 5th to 7th with white markings, other segments brown, palps light brown. Thorax yellowish brown. Legs yellowish, middle and hind femora somewhat darker. Metasomal terga I-II, basal third and hind margin of tergum III yellowish brown, other terga brown, tergum VII reddish brown.

Body length 3.5 mm, fore wing length 0.3 mm. Male unknown.

Biology. Parasitoid of *Siederia listerella*.

Distribution. Austria, Hungary (Diller 1988).

3. *Trachyarus brevipennis* Roman

Fig. 3

Trachyarus brevipennis Roman, 1918: 7. Lectotype: ♀, Sweden, "Lapp. suecica meridionalis" (NHRM, designated here, selected by E. Diller).

Material. 12♀♀, 7♂♂ (NHRM, ZIN, ZSM), including lectotype (♀, Sweden, "Lp.m.", "Bhm", "28/7", "60 81", "Riksmuseum Stockholm", "Lectotypus *Trachyarus brevipennis* Roman ♀ Diller 1981", "Naturhistoriska Riksmuseet Stockholm Loan no 574/94") (NHRM) and paralectotype (♀, Sweden, "Lp.m.", "Bhm", "28/7", "61 81", "Riksmuseum Stockholm", "Paralectotypus *Trachyarus brevipennis* Roman ♀ Diller 1981", "Naturhistoriska Riksmuseet Stockholm loan no 575/94") (NHRM).

Differential diagnosis. The female of *T. brevipennis* is closest to that of *T. anceps*, but in *T. brevipennis* the flagellum is more slender (first flagellar segment 2.2-2.3 × as long as wide) and the metasomal tergum III is distinctly shagrinate in its basal half. The male of *T. brevipennis* is closest to that of *Trachyarus* sp. C, but in *T. brevipennis* flagellum and metasomal tergum II are stouter (17th or 18th flagellar segment square in lateral view; tergum II as long as wide).

Note. *T. brevipennis* was previously considered to be the commonest European species of that genus, but the majority of specimens deposited in ZSM actually belongs to *T. edilleri*, spec. nov., *T. decipiens*, spec. nov., and *T. solyanikovi*, spec. nov. (see below).

Description

Female. Lower edge of the clypeus very slightly rounded, straight medially, with a visible apical margin. Head slightly narrowed behind eyes in dorsal view. Temples moderately enlarged ventrad, with their maximum length somewhat less than transverse ocular diameter. Flagellum with 23-24 segments, first segment $2.2-2.3\times$ as long as wide (Fig. 3), 9th or 10th segment square in lateral view. Upper mandibular tooth distinctly longer but not wider than the lower tooth. Hypostomal carina meets the genal carina before mandibular base at a distance of two-thirds its width.

Distinct notauli present in the basal third of mesoscutum. Area superomedia $1.4-1.5\times$ as wide as long (up to equal length and width in the paralectotype). Area petiolaris about $2.5\times$ as long as area superomedia. Wings from fully to partially developed, in the latter case they may hardly reach apex of propodeum. Hind femora $3.3-3.4\times$ as long as wide.

Metasoma oval. Distance between spiracles of the first metasomal segment approximately $1.5\times$ as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from base of the second tergum by about one-third their width, approximately $1.5\times$ as wide as interthyridial space. Metasomal tergum II as wide as long, tergum III $1.4-1.5\times$ as wide as long.

Body moderately sculptured. Head shining, side parts of face more or less densely punctate and obscurely chagrinata, median part of face and clypeus more finely punctate and chagrinata. Frons very finely punctate and sometimes obscurely chagrinata. Mesoscutum and scutellum finely and sparsely punctate; pronotal lobes punctate and chagrinata, longitudinally rugose posteriorly. Mesopleura longitudinally rugose, speculum smooth. Metasomal tergum I chagrinata, petiolus rugose, tergum II and basal half of tergum III (sometimes terga II-III and basal half of tergum IV) obviously chagrinata with obscure scattered punctures, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head brown, clypeus, median part of face and sometimes cheeks somewhat lighter, mandibles (except base and teeth) yellowish brown. Antennae brownish, scape and pedicel usually yellowish brown, palps light brown. Tegulae whitish. Legs reddish, last segments of middle and hind tarsi sometimes infusate. Metasoma brown with the very apex of the first segment medially, thyridia and hind margins of terga II-III yellowish, tergum VII reddish brown.

Body length 3.5-4.5 mm, fore wing length 0.9-3.0 mm.

Male (described provisionally) similar to female. Flagellum with 23-24 segments, first segment $2.4\times$ as long as wide, 17th or 18th segment square in lateral view. Short-oval tyloids present on 10th-11th flagellar segment. Clypeus (except its lower margin) and mandibles (except teeth) sometimes whitish.

Body length 3.5-4.5 mm, fore wing length 2.8-3.6 mm.

Biology. Parasitoid of *Anapروتia comitella* (Bruand), *A. raiblensis* (Mann), *Brevantennia siederi* (Sauter) as well as of *Dahlia* and *Siederia* spp., including *D. charlottae* and *S. listerella*.

Distribution. Sweden, Russia (Centre and Far East), Austria, Italy (Alps), Switzerland, Germany (Bavaria).

4. *Trachyarus corvinus* Thomson

Fig. 4

Trachyarus corvinus Thomson, 1891: 1612. Lectotype: ♀, Sweden, "Pålsjö" (UZI, studied).

Material. 8♀♀, 3♂♂ (NHM, UZI, ZIN, ZSM), including lectotype (♀, Sweden, "Pål", "*corvinus* m", "1978 163", "Lectotypus *Trachyarus corvinus* Thm. Tow'58", "1981 765", "1994 201") (UZI).

Differential diagnosis. *T. corvinus* is most closely related to *T. anceps*, *T. brevipennis* and *Trachyarus* sp. C from which it differs by having a stouter flagellum (7th or 8th flagellar segment (in the female) and 11th or 12th segment (in the male) square in lateral view).

Note. A similar form (13♀♀, 7♂♂, ZIN) also occurs in the Russian Far East: female flagellum with 23-25 segments, facial orbits and usually central part of the face in the male with whitish markings.

Description

Female. Lower edge of the clypeus very slightly rounded, straight medially, with a visible apical margin. Head distinctly narrowed behind eyes in dorsal view. Temples slightly enlarged at the middle, with their maximum length equal to transverse ocular diameter. Flagellum with 22-24 segments, first segment $2.4-2.5\times$ as long as wide, 7th or 8th segment square in lateral view. Upper mandibular tooth distinctly longer and hardly wider than the lower tooth. Hypostomal carina meets the genal carina before the mandibular base at half its width.

Distinct notauli present in the basal third of mesoscutum. Area superomedia heart-shaped to reniform, about twice as wide as long. Area petiolaris about $5\times$ as long as area superomedia. Wings

fully developed. Nervellus broken slightly below the middle. Middle tibiae sometimes with a transverse shallow subapical impression on outer sides. Hind femora $3.5\text{--}3.6\times$ as long as wide.

Metasoma oval. Petiolus distinctly compressed dorsoventrally. Distance between spiracles of the first metasomal segment twice as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of the second tergum by about one-third their width, approximately $1.5\times$ as wide as the interthyridial space. Metasomal tergum II $1.2\text{--}1.3\times$ as wide as long, tergum III $1.8\text{--}1.9\times$ as wide as long (Fig. 4).

Body moderately sculptured. Frons very obscurely chagrinata and sparsely punctate. Mesoscutum and scutellum weakly shining, the former chagrinata, comparatively roughly punctate, the latter much more finely punctate; pronotal lobes strongly and coarsely rugose-punctate, longitudinally rugose in their lower half. Mesopleura rugose, speculum smooth. Postpetiolus of the first metasomal segment irregularly longitudinally striate, petiolus rugose-punctate. Metasomal terga II-III and basal two-thirds of tergum IV obviously chagrinata with obscure scattered punctures, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head brown, clypeus and median part of face a little lighter, mandibles (except base and teeth) yellowish brown. Antennae brown, base of flagellum sometimes slightly reddish ventrally, palps light brown. Tegulae reddish brown. Legs brown, apices of front femora and all tibiae and tarsi reddish; legs sometimes entirely reddish. Metasoma brown with the very apex of metasomal tergum I medially, thyridia and hind margins of terga II-III (sometimes also of terga IV-V) yellowish, VII tergum reddish brown.

Body length 4.0-4.5 mm, fore wing length 3.1-3.4 mm.

Male similar to female. Flagellum with 22 segments, first segment $2.8\times$ as long as wide, 11th or 12th segment square in lateral view, longish-oval tyloids present on (7)8th-10th segment. Metasoma more slender (metasomal tergum II $1.0\text{--}1.1\times$ as long as wide, tergum III $1.5\text{--}1.6\times$ as wide as long), its sculpture more robust. Body brown, clypeus often whitish, apex of fore femora and stripes on inner sides of all tibiae reddish.

Body length 4.0-4.5 mm, fore wing length 3.1-3.3 mm.

Biology. Parasitoid of *Luffia ferchaultella* (Stephens), *Narycia duplicella* (Goeze) and *Siederia* sp.

Distribution. Sweden, Poland, United Kingdom, the Netherlands.

5. *Trachyarus fuscipes* (Thomson)

Fig. 5

Hemichneumon fuscipes Thomson, 1891: 1612. Holotype: ♀, Sweden, "Öland" (UZI, studied).

Trachyarus fuscipes, Diller 1988: 371.

Material. 67♀, 126♂ (UZI, ZIN, ZSM), including holotype (♀, Sweden, "Ö", "*fuscipes* m", "*Hemichneumon fuscipes* Ths. 1891 Holotype ♀ det. M. G. Fitton 1978", "1981 757", "1994 198") (UZI).

Differential diagnosis. *T. fuscipes* is most closely related to *T. prominulus*, from which it differs by having more slender metasoma, whitish tegulae and no tyloids on the male flagellum.

Note. *T. fuscipes* appears to be the commonest recorded species of its genus in Western Europe.

Description

Female. Lower edge of the clypeus very slightly rounded, apical margin hardly visible. Head hardly narrowed behind eyes in dorsal view. Temples moderately enlarged at the middle, with their maximum length slightly less than transverse ocular diameter. Flagellum distinctly enlarged in apical half, with 25-27 segments, first segment $2.6\text{--}2.7\times$ as long as wide, 10th or 11th segment approximately square in lateral view. Upper mandibular tooth distinctly longer and hardly wider than the lower tooth. Hypostomal carina meets the genal carina before the mandibular base at two-thirds its width.

Distinct notauli present in the basal fourth of mesoscutum. Area superomedia about $1.3\times$ as wide as long. Area posteromedia bordered by hardly visible although distinct carinae, approximately $3\times$ as long as area superomedia. Wings fully developed. Nervellus broken in its lower third. Hind femora $3.4\text{--}3.5\times$ as long as wide.

Metasoma longish-oval. Petiolus hardly compressed dorsoventrally. Distance between spiracles of the first metasomal segment about twice as long as distance between the spiracle and hind corner of the segment. Thyridia wide, medially removed from the base of the second tergum by about two-thirds their width, $1.5\times$ as wide as the interthyridial space. Metasomal tergum II $1.2\text{--}1.5\times$ (rarely to $1.1\times$) as long as wide, tergum III $1.1\text{--}1.3\times$ as wide as long (Fig. 5).

Body weakly sculptured. Mesoscutum and scutellum finely and sparsely punctate; pronotal lobes shining, rugose ventrally. Mesopleura longitudinally rugose (sometimes only in their apical half), speculum smooth. Petiolus of the first metasomal segment chagrinata, postpetiolus weakly longitudinally striate. Metasomal tergum II and basal third of tergum III obviously chagrinata with obscure

scattered punctures, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head brown, clypeus and median part of face somewhat lighter, mandibles (except base and teeth) yellowish brown. Antennae brown, flagellum reddish ventrally, palps light brown. Tegulae whitish. Legs reddish brown, apices of fore and middle femora and stripes on inner sides of fore and middle tibiae reddish, all tarsi reddish, their last segments infuscate. Metasoma brown with the very apex of tergum I medially, thyridia and hind margins of tergum II and usually also of tergum III yellowish, tergum VII reddish brown.

Body length 4.0-5.0 mm, fore wing length 2.9-3.5 mm.

Male similar to female. Flagellum with 23-26 segments, first segment 2.6-2.7 × as long as wide, one or two segments before apex square in lateral view. No visible tyloids were found. Metasomal tergum II 1.3-1.4 × as long as wide, tergum III 1.1-1.2 × as wide as long. Clypeus (usually), central part of mandibles and markings on the lower side of scape often whitish.

Body length 3.5-5.0 mm, fore wing length 3.1-3.9 mm.

Biology. Parasitoid of *Anaprouitia raiblensis*, *Bacotia claustrilla* (Bruand), *Brevantennia styriaca* Meier, *Siederia listerella* as well as of *Dahlica*, *Eosolenobia* and *Siederia* spp. (including *D. charlottae*, *D. goppensteinensis* (Sauter), *D. nickerlii* (Heinemann), *D. triquetrella*, *E. manni* Zeller and *S. alpicolella* (Rebel)) and *Taleporia tubulosa* (Retzius).

Distribution. Sweden, Finland, Georgia, Italy, Austria, Switzerland, Germany (Lower Saxony, Bavaria). A boreal-montane species.

6. *Trachyarus prominulus* Diller

Fig. 6

Trachyarus prominulus Diller, 1989: 282. Holotype: ♀, Austria, "Steiermark, Österreich", "Frauenalpe" (ZSM, not studied).

Material. Paratypes: 2♀♀, Austria, "Paratypus", "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Frauenalpe, b. Muren, Mai 1966, 2000 m *S. meierella* Sied.", "Paratypus *Trachyarus prominulus* ♀ Diller, 1989" (ZSM); 2♂♂, Austria, "Paratypus", "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Frauenalpe e *S. meierella* Sied.", "Paratypus *Trachyarus prominulus* ♂ Diller, 1989" (ZSM).

Additional material. 10♂♂ from Hampshire (United Kingdom, NHM) probably also belong to this species.

Differential diagnosis. *T. prominulus* is most closely related to *T. fuscipes*, from which it differs by having more stout metasoma, reddish brown tegulae and presence of tyloids on the male flagellum.

Description

Female. Clypeus weakly flattened in its apical third. Lower edge of the clypeus very slightly rounded, almost straight medially, apical margin hardly visible. Head slightly narrowed behind eyes in dorsal view. Temples moderately enlarged at the middle, with their maximum length slightly less than transverse ocular diameter. Flagellum with 24 segments (23-25 according to the original description), first segment 2.5-2.6 × as long as wide, 11th or 12th segment square in lateral view. Upper mandibular tooth obviously longer and wider than the lower tooth. Hypostomal carina meets the genal carina before the mandibular base at a distance hardly less than width of the latter.

Distinct notauli present in the basal third of mesoscutum. Area superomedia about 1.3 × as wide as long. Area petiolaris about 3 × as long as area superomedia. Wings fully developed. Nervellus broken hardly below the middle. Hind femora 3.3-3.4 × as long as wide.

Metasoma longish-oval. Distance between spiracles of the first metasomal segment about twice as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of second metasomal tergum by about two-thirds their width, twice as wide as the inter-thyridial space. Metasomal tergum II 1.1-1.2 × as long as wide, tergum III 1.4-1.5 × as wide as long (Fig. 6).

Body moderately sculptured. Frons shining, very finely and sparsely punctate. Pronotal lobes punctate, rugose ventrally. Mesopleura longitudinally rugose to rugose-punctate, speculum smooth with more or less distinct punctures. Postpetiolus of the first metasomal segment rugose, petiolus rugose-punctate. Metasomal tergum II and basal half of tergum III obviously chagrinately, terga II-IV(V) punctate with large but obscure punctures, sculpture disappears towards apex of metasoma.

Body brown. Head brown, clypeus and median part of face a little lighter, mandibles (except base and teeth) yellowish brown. Antennae brown, flagellum slightly reddish ventrally, palps light brown. Tegulae reddish brown. Legs brown, apices of fore femora and all tibiae and tarsi reddish (except last segments), fore tibiae somewhat darker on outer sides. Metasoma brown with the very apex of tergum I medially, thyridia and hind margins of terga II-III segments yellowish, apex of tergum VII reddish brown.

Body length 5.0 mm, fore wing length 3.3-3.5 mm.

Male. Similar to female. Apical third of the clypeus almost not flattened. Flagellum with 22-24 segments, first segment 2.7-2.8× as long as wide, longish-oval tyloids present on (8)9th-10(11)th segment. Side carinae of area posteromedia more or less visible. Hind femora 3.7-3.8× as long as wide. Metasomal tergum II 1.0-1.1× as long as wide, tergum III 1.1-1.3× as wide as long. Sculpture more developed (i.e., more dense and coarse) than in female. Body brown to dark brown. Clypeus often whitish or with white markings. Fore tibiae entirely reddish. Last metasomal tergum brown.

Body length 4.0-5.5 mm, fore wing length 2.9-4.2 mm.

Biology. Parasitoid of *Siederia meierella* (Sieder).

Distribution. Austria.

7. *Trachyarus bacillatus* Gokhman, spec. nov. Fig. 7

Types. Holotype: ♀, Russia, Kavalerovo, Primorsky district, from *Eosolenobia* sp., 25.V.1983 (Solyanikov). – Paratypes: 1♀, Russia, Primorsky district, Kentsuche River, from *Eosolenobia* sp., without date (Solyanikov); 2♂♂, same data; 1♂, Russia, Kavalerovo, Primorsky district, from *Eosolenobia* sp., 13.V.1983 (Solyanikov); 1♂, same locality, from *Eosolenobia* sp. (?), 10.V.1983 (Solyanikov). The material is deposited in the ZIN collection.

Differential diagnosis. Among *Trachyarus* species having lower mandibular tooth longer than the upper tooth, *T. bacillatus*, spec. nov. is most closely related to *T. edilleri*, spec. nov. and *T. hemichneumonoides*, spec. nov., from which it differs by having more flattened clypeus (especially in its basal part) and larger body size.

Description

Female. Clypeus somewhat flattened in its apical half. Lower edge of the clypeus hardly rounded, straight medially, with a narrow apical margin. Head slightly narrowed behind eyes in dorsal view. Temples slightly enlarged at the middle, with their maximum length a little less than transverse ocular diameter. Flagellum with 25 segments, first segment 2.5-2.6× as long as wide, 10th or 11th segment square in lateral view. Lower mandibular tooth distinctly longer than the upper tooth (Fig. 7). Hypostomal carina meets the genal carina before the mandibular base at its width.

Distinct notauli present in the basal third of mesoscutum. Area superomedia heart-shaped, sometimes not separated from area posteromedia, about as long as wide. Area petiolaris about twice as long as area superomedia. Wings fully developed or reduced, in the latter case stretching to the middle of the second metasomal segment. Nervellus broken slightly below the middle. Hind femora 3.7-3.8× as long as wide.

Metasoma longish-oval. Petiolus not compressed dorsoventrally. Distance between spiracles of the first metasomal segment twice as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of metasomal tergum II by about 2/3 their width, slightly wider than the interthyridial space. Metasomal tergum II 1.2-1.3× as long as wide, tergum III 1.1-1.2× as wide as long.

Body moderately sculptured. Frons shagrinated with obscure scattered punctures. Mesoscutum and scutellum shagrinated, whole scutellum and medio-apical part of mesoscutum also sparsely punctate, pronotal lobes rugose. Mesopleura rugose, speculum smooth with a few punctures. Postpetiolus of the first metasomal segment irregularly longitudinally striate, petiolus shagrinated. Metasomal terga II-V distinctly shagrinated, sculpture becomes more smooth towards apex of metasoma.

Body dark brown. Head dark brown, clypeus and mandibles a little lighter. Antennae reddish brown, palpi light brown. Tegulae reddish. Legs reddish brown, middle and hind coxae brownish. Metasoma brown with the very apex of tergum I medially, thyridia and hind margins of metasomal terga II-III (sometimes also of terga IV-V) and apex of tergum VII reddish brown.

Body length 5.5 mm, fore wing length 2.0-3.6 mm.

Male similar to female. Flagellum with 24-25 segments, first segment 2.8-2.9× as long as wide, 9th-11(12)th flagellar segment with longish-oval tyloids, 17th or 18th segment square in lateral view. Hypostomal carina meets the genal carina just at the corner of the mandibular base. Metasomal tergum II 1.3-1.4× as long as wide, tergum III 1.1-1.2× as wide as long. Body sculpture more robust than in female. Clypeus, apex of scape (ventrally) and often central parts of mandibles whitish.

Body length 5.0-5.5 mm, fore wing length 3.7-4.9 mm.

Biology. Parasitoid of *Eosolenobia* sp.

Distribution. Russia (Primorsky district).

8. *Trachyarus decipiens* Gokhman, spec. nov.

Types. Holotype: ♀, Austria, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Seckauer Alpen, Sechs Zinken, 2000 m, 1959, *Sol. triquetrella* Hbn.". – Paratypes: **Austria:** 1♀, 1♂, same data as holotype; 1♀, same data, "*Trachyarus brevipennis* Rom. ♀ det. E. Diller 87"; 2♂♂, "Österreich, Seckauer Zinken, 2000 m, Juni 1957, leg. Meier", "ex *Sol. triquetrella*"; 3♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Leoben, Häuslberg, 1960, e *Brev. styriaca* Meier"; 2♂♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Permegg, 1960, *Sol. triquetrella* Hbn. parth."; 1♀, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Utschgraben b. Bruck, 1963, *B. styriaca* Meier"; 1♀, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Frohnleiten, Buche, 1960, *S. nickerlii* Hein."; 1♀, "Parasit e Psychidae, leg. H. Meier", "Knittelfeld, Steiermark, Österreich", "Eppenstein, 1964, *Sol. charlottae* Meier"; 2♂♂, "Österreich, Steiermark, Reiting, 1500 m, 1956, leg. Sieder, ex *Sol. klimeschi*"; 1♀, "Österreich, Parasit e Psychidae, leg. H. Meier", "Kärnten, Koralpe, 1800-2000 m, 1967, *S. triquetrella* Hbn."; 1♂, "Österreich, Kärnten, Urbitz Kogel, 200 m, 13.VI.1951, leg. Sieder", "ex 2 jährig *Sol. thurneri*"; 1♀, "Österreich, Parasit e Psychidae, leg. H. Meier", "Linz, St. Magdalena, 1962, *Sol. triquetrella* Hbn."; 2♂♂, "Österreich, Parasit e Psychidae, leg. H. Meier", "Linz, Kaltenberg, 1962, *Sol. triquetrella* Hbn."; 1♀, same data, "*Trachyarus brevipennis* Rom. ♀ det. E. Diller 87"; 1♀, "Waidhofen/Y., Austria, leg. Lichtenberger", "ex *Solenobia triquetra* parth.", "*Trachyarus corvinus* Thom. ♀ det. E. Diller 84"; 1♂, "ex *Solenobia triquetra* parth., 1.4.1978, ex 14.5.78", "Waidhofen/Y., Austria, leg. Lichtenberger". **Germany:** 1♀, "Bayern-München, Aubinger Lohe, 1.VIII.1987, leg. Diller 550 m"; 1♂, "Bayern, Deggendorf, A.V.1963, leg. Schätz"; 1♂, "Bayern, Nürnberg, Altdorf, 3.V.73, leg. Schätz"; 1♂, "Bav. mer. Ammergauer Berge, Frieder Gebiet, 1700-2000 m, e-e.12.VI.1949, F. Daniel leg.". **Switzerland:** 1♀, "Parasit e Psychidae, leg. H. Meier", "Schweiz, Wallis, Simplon, 1963, *S. goppensteinensis* Saut.". **Italy:** 2♂♂, "Parasit e Psychidae, leg. H. Meier", "Matajur, 1961, *Sol. juliella* Rbl."; 1♀, same data, "*Trachyarus brevipennis* Rom. ♀ det. E. Diller 87"; 1♀, "Parasit e Psychidae, leg. H. Meier", "Italien, Mt. Grappa, 1960, 1000-1700 m, e *Sied. meierella* Sied."; 2♀♀, same data, "*Trachyarus brevipennis* Rom. ♀ det. E. Diller 87"; 1♂, "Italia (Bolzano), Sarntal, 1250 m, 24-VI.1976, C. J. Zwakhals"; 2♂♂, "Italien, Kurtsch, Oberfennberg, 1300 m, 1.6.1976, Diller leg.". **Slovenia:** 1♀, "Istrien, Snežnik, 1971, 1200-1300 m, *S. triquetrella* Hbn.". **Romania:** 2♀♀, 3♂♂, "Parasit e Psychidae, leg. H. Meier", "Rumanien, Süd-Karpaten, Bombesti-Jiu 300 m", "Südabhang Pietroasa, *Sol. triquetrella* Hbn."; 1♀, same data, "*Trachyarus brevipennis* Rom. ♀ det. E. Diller 87".

Differential diagnosis. Among *Trachyarus* species having the lower mandibular tooth longer than the upper tooth, *T. decipiens*, spec. nov. is the only species having a combination of the following characters in the female: long and slender flagellum with 24-26

(rarely with 23) segments (10th or 11th segment square in lateral view), metasomal tergum II not longer than its width and tergum III 1.3-1.4× as wide as long. The male of *T. decipiens*, spec. nov. is closest to that of *T. solyanikovi*, spec. nov., from which it differs by having longer flagellum with 24-25 segments, wider mandibles and more slender metasomal tergum III (1.3-1.4× as wide as long).

Description

Female. Lower edge of the clypeus very slightly rounded, straight medially, with a visible apical margin. Head slightly narrowed behind eyes in dorsal view. Temples moderately enlarged at the middle, with their maximum length distinctly less than transverse ocular diameter. Flagellum hardly enlarged in apical half, with 24-26 (rarely 23) segments, first segment 2.5-2.6× as long as wide, 10th or 11th segment square in lateral view. Lower mandibular tooth distinctly longer and wider than the upper tooth. Hypostomal carina meets the genal carina before the mandibular base at two-thirds its width.

Distinct notauli present in the basal third of mesoscutum. Area superomedia as wide as long, weakly separated from area posteromedia. Area petiolaris about 2.5× as long as area superomedia. Wings fully developed. Nervellus broken in its lower third. Hind femora 3.4-3.5× as long as wide.

Metasoma longish-oval. Distance between spiracles of the first metasomal segment about 2.5× as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of metasomal tergum II by about two-thirds their width, approximately twice as wide as the interthyridial space. Metasomal tergum II 1.0-1.1× as wide as long, tergum III 1.3-1.4× as wide as long.

Body moderately sculptured. Head shining, side parts of face coarsely punctate, median part of the face finely and sparsely punctate, clypeus with a few fine punctures. Frons finely and sparsely punctate. Mesoscutum and scutellum finely and sparsely punctate; pronotal lobes more densely and coarsely punctate, rugose ventrally. Mesopleura longitudinally rugose, speculum smooth with a few punctures. Metasomal tergum I rugose-punctate, petiolus weakly striate. Terga II-III (sometimes also the very base of tergum IV) obviously chagrinately, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head dark brown, mandibles (except teeth) and often clypeus reddish brown. Antennae brownish, flagellum reddish ventrally, palps light brown. Tegulae reddish to whitish. Legs reddish, hind coxae, all femora, trochanters I and last tarsal segments infusate. Metasoma brown with

the very apex of tergum I medially, thyridia and hind margins of terga II-III and often of tergum IV yellowish, tergum VII reddish brown.

Body length 4.0-5.0 mm, fore wing length 3.4-3.5 mm.

Male similar to female. Flagellum with 24-25 segments, first flagellar segment $2.5\times$ as long as wide, all flagellar segments longer than wide in lateral view, 8th-11th segment with longish-oval tyloids. Body sculpture more robust. Clypeus and mandibles (except teeth) white.

Body length 4.5-5.5 mm, fore wing length 3.7-4.1 mm.

Biology. Parasitoid of *Brevantennia styriaca*, *Dahlia charlottae*, *D. goppensteinensis*, *D. klimeschi*, *D. nickerlii*, *D. triquetrella*, *Postsolenobia juliella* (Rebel) and *Siederia meierella*.

Distribution. Austria, Germany (Bavaria), Switzerland, Italy (Alps), Romania (Carpathians), Slovenia (Istria). A montane species.

9. *Trachyarus edilleri* Gokhman, spec. nov.

Fig. 8

Types. Holotype: ♀, Austria, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Leoben, Häuslberg, 1960, e *Brev. styriaca* Meier". – Paratypes: **Austria:** 1♀, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Österreich, Knittelfeld, 1957, leg. Meier"; "ex *Brev. styriaca*"; 1♀, 2♂♂, "Österreich, Steiermark, Leoben, 1956, leg. Sieder ex *Brev. styriaca*", 7♂♂, same data, "Kaisersberg"; 2♀♀, same data, "Kaisersberg", "*Trachyarus brevipennis* Rom. ♀ det. E. Diller 87"; 1♂, "Österreich, Leoben, Kaisersberg, Mai 1957, leg. Meier", "*Sol. pineti*"; 1♂, "Österreich, Steiermark, Seiz, Liesingtal, 1956, leg. Sieder ex *Brev. styriaca*"; 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Leoben, Seiz, 1956, *Brev. styriaca* Meier"; 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Leoben, St. Stefan, 1954, *Sied. pineti* Z."; 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Leoben, Trabach, 1954, *Brev. styriaca* Meier"; 2♂♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Preggraben, 1958, *B. styriaca* Meier"; 1♂, "Österreich, Steiermark, Oberzeiring, 1956, leg. Sieder"; 1♂, "Österreich, Steiermark, Koflach, leg. Meier, ex *Brev. styriaca*"; 1♀ and 15♂♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Leoben, Häuslberg, 1960, e *Brev. styriaca* Meier", 1♀, 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Häuslberg – Leoben, 1963, *B. styriaca* Meier"; 2♀♀, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier"; 1♂, "Österreich, Steiermark, St. Michael bei Leoben, 1956, leg. Sieder ex *Sol. klimeschi*"; 2♀♀, 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Gulsen, 1956, *Sol. pineti* Z."; 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Pernegg,

1960, *Sol. triquetrella* Hbn. parth."; 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Proleb, 1956, *Sied. pineti* Z."; 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Hinterlobening, Stefan Serpentin, e *S. nickerli* Hein."; 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Seebergkogel, Hochalpe, 1900 m, e *Sol. triquetrella* Hbn."; 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Seckauer Alpen, Sechs Zinken, 2000 m, 1954, *Sol. triquetrella* Hbn."; 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Ameringkogel, 1900 m, 1967, *Sol. triquetrella* Hbn."; 1♂, "Steiermark, Österreich, Parasit e Psychidae, leg. H. Meier", "Judenburg, 1954, *Sol. klimeschi* Sied."; 1♂, "Österreich, Parasit e Psychidae, leg. H. Meier", "Hohe Wand, 1965, *Sied. pineti* Z."; 1♂, "Österreich, Parasit e Psychidae, leg. H. Meier", "Kärnt. Pölling, 1959, *Brev. reliqua* Sied."; 1♂, "Österreich, Villach, Warmbad, Mai 1957, leg. Meier", "*Brev. santicensis*"; 1♂, "Österreich, Knittelfeld, 1957, leg. Meier", "ex *Brev. styriaca*". **Italy:** 1♀, 2♂♂, "Parasit e Psychidae, leg. H. Meier", "Matajur, 1961, *Sol. juliella*"; 1♀, "Italien-Nord, Matajur 150 m, 14.V.1961, leg. Sieder", "ex *Bank. juliella* Rbl.", "*Trachyarus corvinus* Thoms. det. E. Diller 1977 ♀"; 1♀, 2♂♂, "Italien, Mt. Generoso, 1700 m, Juni 1957, ex *Sol. siederi*, leg. Meier". **Romania:** 1♂, "Rumänien, Süd-Karpaten, Bombesti-Jiu 300 m", "Südabhang Pietroasa, *Sol. triquetrella* Hbn.", "Parasit e Psychidae, leg. H. Meier"; 1♀, same data, "*Trachyarus brevipennis* Rom. ♀ det. E. Diller 87". One ♀ paratype is deposited in the ZIN collection.

Differential diagnosis. The female of *T. edilleri*, spec. nov. is closest to that of *T. hemichneumonoides*, spec. nov., but in *T. edilleri* flagellum and metasomal tergum II are stouter (9th or 10th flagellar segment square in lateral view; tergum II $1.1-1.2\times$ as long as wide). The male is similar to that of *T. bacillatus*, spec. nov., but smaller, with evenly convex clypeus.

Description

Female. Lower edge of the clypeus very slightly rounded, straight medially, with a visible apical margin. Head slightly narrowed behind eyes in dorsal view. Temples moderately enlarged at the middle, with their maximum length distinctly less than transverse ocular diameter. Flagellum with 23-26 segments, first segment $2.4-2.5\times$ as long as wide, 9th or 10th segment square in lateral view. Lower mandibular tooth distinctly longer and wider than the upper tooth. Hypostomal carina meets the genal carina before the mandibular base at a distance of its width.

Distinct notauli present in the basal third of mesoscutum. Area superomedia about as wide as long, weakly separated from area posteromedia. Area petiolaris about $2.5\times$ as long as area superomedia. Wings fully developed. Nervellus broken in its lower third. Hind femora $3.5-3.6\times$ as long as wide.

Metasoma longish-oval. Distance between spiracles of the first metasomal segment about twice as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of metasomal tergum II by about two-thirds their width, approximately $1.5\times$ as wide as the interthyridial space. Metasomal tergum II $1.1\text{--}1.2\times$ as long as wide, tergum III $1.1\text{--}1.2\times$ as long as wide as long (Fig. 8).

Body moderately sculptured. Head shining, side parts of face densely and coarsely punctate, median part of the face and clypeus more finely punctate. Frons finely punctate. Mesoscutum and scutellum finely and sparsely punctate; pronotal lobes shining and finely punctate in their upper part, longitudinally rugose ventrally. Mesopleura longitudinally rugose, speculum smooth, sometimes with obscure rugosity. Metasomal segment I chagrinata, petiolus longitudinally rugose. Metasomal tergum II and basal half of tergum III (sometimes also the very base of tergum IV) obviously chagrinata, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head brown, clypeus somewhat lighter, mandibles (except base and teeth) yellowish brown. Antennae brownish, flagellum slightly reddish ventrally, palps light brown. Tegulae reddish to whitish. Legs reddish, middle and hind coxae, all femora and last tarsal segments slightly infusate. Metasoma brown with the very apex of tergum I medially, thyridia and hind margins of terga II-III and often of tergum IV yellowish, tergum VII reddish brown.

Body length 3.5-5.0 mm, fore wing length 2.3-3.4 mm.

Male similar to female. Flagellum with 23-24 segments, first segment $2.8\times$ as long as wide, 8th-11(12)th segment with longish-oval tyloids. Body sculpture more robust than in female. Clypeus and often mandibles (except teeth) white, scape with whitish marking. Legs infusate (except for reddish inner surfaces of fore femora, the very apex of middle femora, fore and middle tibia).

Body length 3.5-4.5 mm, fore wing length 2.8-3.1 mm.

Biology. Parasitoid of *Brevantennia reliqua* Sieder, *B. siederi*, *B. styriaca*, *Dahlia klimeschi*, *D. nickerlii*, *D. triquetrella*, *Postsolenobia juliella* and *Siederia listerella*.

Distribution. Austria, Italy, Romania. A montane species.

10. *Trachyarus hemichneumonoides* Gokhman, spec. nov.

Fig. 9

Holotype: ♀, Austria, "Koralmschutzhaus m 1940, Koralpe, K., 8.VI.1957, K. Rath".

Differential diagnosis. *T. hemichneumonoides*, spec. nov. is most closely related to *T. edilleri*, spec. nov., but in *T. hemichneumonoides*, spec. nov. flagellum and metasomal tergum II are more slender (11th or 12th flagellar segment square in lateral view, tergum II $1.3\text{--}1.4\times$ as long as wide).

Description

Female. Clypeus distinctly convex. Lower edge of the clypeus slightly rounded, with a visible apical margin. Head almost not narrowed behind eyes in dorsal view. Temples very slightly enlarged ventrad, with their maximum length distinctly less than transverse ocular diameter. Flagellum filiform, with 25 segments, first segment $2.3\text{--}2.4\times$ as long as wide, 11th or 12th segment square in lateral view. Lower mandibular tooth distinctly longer and slightly wider than the upper tooth. Hypostomal carina meets the genal carina before the mandibular base at approximately one-third its width.

Distinct notauli present in the basal fourth of mesoscutum. Area superomedia slightly longer than wide, weakly separated from area posteromedia. Area petiolaris about twice as long as area superomedia. Wings fully developed. Nervellus broken at the middle. Hind femora about $3.5\times$ as long as wide.

Metasoma longish-oval. Distance between spiracles of the first metasomal segment twice as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of metasomal tergum II by about two-thirds their width, approximately twice as wide as the interthyridial space. Metasomal tergum II $1.3\text{--}1.4\times$ as long as wide, tergum III $1.0\text{--}1.1\times$ as long as wide as long (Fig. 9).

Body moderately sculptured. Head shining, side parts of face moderately punctate, median part of the face finely and densely punctate, clypeus with a few punctures. Frons finely and sparsely punctate. Mesoscutum and scutellum finely and sparsely punctate; pronotal lobes more densely and coarsely punctate, rugose in their lower half. Mesopleura longitudinally rugose, speculum rugose-punctate. Metasomal tergum I shagrinata, postpetiolus laterally striate. Tergum II and basal two-thirds of tergum III obviously chagrinata, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head dark brown, mandibles (except teeth) and clypeus reddish brown. Antennae reddish brown, their scape, pedicel and a few basal segments of flagellum infusate, palps light brown. Tegulae whitish. Legs reddish brown, hind coxae and all last tarsal segments infusate. Metasoma brown with the very apex of metasomal tergum I medially and hind margins of terga II-IV reddish, tergum VII reddish brown.

Body length 4.5 mm, fore wing length 3.1 mm.

Male unknown.

Biology. Parasitoid of an undetermined Psychidae.

Distribution. Austria.

11. *Trachyarus khrulevae* Gokhman, spec. nov.

Types. Holotype: ♀, Russia, Wrangel Island, 31.VII.1983 (O. Khruleva). – Paratypes: 4♀, same locality and collector, 1-23.VIII.1983; ♀, Russia, Buryatiya, Vitim River, Baissa, 7.VII.1983 (V. Zherikhin, D. Shcherbakov). The material is deposited in the ZMMU collection.

Differential diagnosis. Among *Trachyarus* species having the lower mandibular tooth longer than the upper tooth, *T. khrulevae*, spec. nov. is the only species having a combination of the following characters: metasomal tergum II longer than its width and stout flagellum (5th or 6th flagellar segment square in lateral view).

Description

Female. Lower edge of the clypeus moderately rounded, with a visible apical margin. Head not narrowed behind eyes in dorsal view. Temples distinctly enlarged ventrad, with their maximum length slightly exceeding transverse ocular diameter. Flagellum with 22-24 segments, first segment 1.6-1.7× as long as wide, 5th or 6th segment square in lateral view. Lower mandibular tooth distinctly longer and wider than the upper tooth. Hypostomal carina meets the genal carina before the mandibular base at about its width.

Distinct notauli present in the basal fourth of mesoscutum. Horizontal part of propodeum comparatively long. Area superomedia about 1.2-1.3× as long as wide. Area petiolaris about 1.5× as long as area superomedia. Wings partly reduced, not extending beyond apex of the first metasomal segment. Wing venation variable, 2 to 3 closed cells present in the fore wing, pterostigma subapical. Nervellus reclivous, continually curved. Hind femora 3.1-3.2× as long as wide.

Metasoma longish-oval. Petiolus hardly com-

pressed dorsoventrally. Distance between spiracles of the first metasomal segment twice as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of metasomal tergum II by about one-third their width, approximately 1.5× as wide as the interthyridial space. Metasomal tergum II 1.2-1.3× as long as wide, tergum III 1.2-1.3× as wide as long.

Body weakly sculptured. Frons smooth and strongly shining. Mesoscutum and scutellum strongly shining, very obscurely and finely punctate; pronotal lobes shining, longitudinally rugose in their lower half. Mesopleura weakly rugose, speculum smooth. Postpetiolus of the first metasomal segment longitudinally striate, petiolus rugose-punctate. Metasomal tergum II and basal half of tergum III obviously chagrinata, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head brown, clypeus, mandibles (except teeth) lighter, up to yellowish brown. Antennae brown, scape and pedicel sometimes reddish ventrally, palps light brown. Mesoscutum and mesosternum sometimes reddish brown. Tegulae light reddish. Legs reddish. Metasoma brown with the very apex of tergum I medially, thyridia and hind margins of terga II-III (sometimes also of terga IV-V) yellowish, tergum VII reddish brown.

Body length 4.5-5.5 mm, fore wing length 0.8-1.3 mm.

Male unknown.

Biology. Unknown.

Distribution. Russia (Wrangel Island and Buryatiya).

12. *Trachyarus parvipennis* Gokhman, spec. nov.

Fig. 10

Holotype: ♀, Russia, Moscow region, Bronnitsy station, from *Solenobia* sp., collected 1.V.1982, emerged 6.V.1982 (Solyanikov). Holotype deposited in the ZIN collection.

Differential diagnosis. Among the described *Trachyarus* species, wings are also strongly reduced only in *T. brachypterator*, from which *T. parvipennis*, spec. nov. well differs by the structure of mandibles, number of flagellar segments, proportions of metasomal terga and general colour of the body and legs.

Description

Female. Lower edge of the clypeus rounded, with a visible apical margin. Head not narrowed behind

eyes in dorsal view. Temples distinctly enlarged ventrad, with their maximum length equal to transverse ocular diameter. Flagellum slightly enlarged in apical half, with 23 segments, first segment 2.2–2.3× as long as wide, 5th or 6th segment square in lateral view. Lower mandibular tooth distinctly longer than the upper tooth. Hypostomal carina meets the genal carina before the mandibular base at two-thirds its width.

Mesoscutum moderately transverse, distinct notauli present in its basal third. Area superomedia about as wide as long. Area posteromedia approximately twice as long as area superomedia. Wings strongly reduced, not extending beyond apex of propodeum. Fore wing bears small triangular stigma on the top and the only closed cell evidently formed by median and cubital veins. Nervellus reclivous, continually curved. Hind femora 3.3–3.4× as long as wide.

Metasoma oval. Petiolus distinctly compressed dorsoventrally. Postpetiolus wide, distance between spiracles of the first metasomal segment about 3× as long as distance between the spiracle and hind corner of the segment. Thyridia not inclined, very wide, removed from the base of the metasomal tergum II by about one-third their width, approximately 3× as wide as the interthyridial space. Metasomal tergum II 1.4–1.5× as wide as long, tergum III 2.5–2.6× as wide as long (Fig. 10).

Body shining, moderately sculptured. Side parts of face densely and obscurely punctate, frons hardly chagrinata. Mesoscutum and scutellum weakly shining, pronotal lobes chagrinata above, longitudinally rugose ventrally. Mesopleura longitudinally rugose, speculum smooth. Petiolus of the first metasomal segment chagrinata, postpetiolus irregularly longitudinally striate. Metasomal terga II–III and apical half of tergum IV roughly chagrinata, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head brown, mandibles (except teeth) and clypeus yellowish brown. Antennae brown (scape reddish ventrally), palps whitish. Thorax brown with yellow spots on pronotal lobes (above their lower corner), mesopleura (ventrad to sternali) and propodeum near areae posteroexternae. Tegulae white. Legs yellowish brown. Metasoma brown with thyridia and hind margins of terga II–IV yellowish brown, tergum VII reddish brown. Body length 3.5 mm, fore wing length 0.7 mm.

Male unknown.

Biology. Parasitoid of *Dahlica* or *Siederia* sp.

Distribution. Russia (Moscow region).

13. *Trachyarus punctigaster* Gokhman, spec. nov.

Types. Holotype: ♀, Italy, “Parasit e Psychidae, leg. H. Meier”, “Matajur, 1961, *S. juliella* Rbl.”. – Paratypes: 1♀, same data as holotype, “*Trachyarus brevipennis* Rom. ♀ det E. Diller 1987”; 1♀, “Parasit e Psychidae, leg. H. Meier”, “Tessin, Mt Generoso, 1963, *B. siederi* Sauter”.

Differential diagnosis. *T. punctigaster*, spec. nov. is most closely related to *T. subtilipiceus*, spec. nov., but in *T. punctigaster*, spec. nov. the flagellum is stouter (11th or 12th flagellar segment square in lateral view).

Description

Female. Clypeus convex. Lower edge of the clypeus very slightly rounded, straight medially, apical margin hardly visible. Head somewhat inflated, almost not narrowed behind eyes in dorsal view. Temples moderately enlarged at the middle, with their maximum length approximately equal to transverse ocular diameter. Flagellum filiform, with 22–23 segments, first segment 2.7–2.8× as long as wide, 11th or 12th segment square in lateral view. Lower mandibular tooth distinctly longer and wider than the upper tooth. Hypostomal carina meets the genal carina before the mandibular base at half its width.

Distinct notauli present in the basal fourth of mesoscutum. Area superomedia about as wide as long, weakly separated from area posteromedia. Area petiolaris approximately twice as long as area superomedia. Wings fully developed. Nervellus broken in its lower third. Hind femora 3.0–3.1× as long as wide.

Metasoma longish-oval. Distance between spiracles of the first metasomal segment about twice as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of metasomal tergum II by about half their width, approximately equal to the interthyridial space. Metasomal tergum II 1.1–1.2× as wide as long, tergum III 1.8–1.9× as wide as long.

Body moderately sculptured. Head shining, side parts of face coarsely punctate, median part of the face finely and sparsely punctate, clypeus with a few fine punctures. Frons almost smooth. Mesoscutum and scutellum finely and sparsely punctate; pronotal lobes rugose in their lower two-thirds. Mesopleura longitudinally rugose, speculum smooth. Metasomal tergum I chagrinata, postpetiolus sometimes striate. Terga II–III more or less coarsely punctate apically and obviously chagrinata in their basal halves (tergum II sometimes fully chagrinata), sculpture becomes more smooth towards apex of metasoma.

Body brown. Head dark brown, mandibles (except teeth) and clypeus reddish brown. Antennae brownish, flagellum reddish beneath, palps light brown. Tegulae reddish. Legs brownish, stripes on inner sides of fore tibiae reddish. Metasoma brown with hind margins of tergum II and often of tergum III and thyridia yellowish, tergum VII reddish brown.

Body length 3.0-4.0 mm, fore wing length 2.3-2.6 mm.

Male unknown.

Biology. Parasitoid of *Brevantennia siederi* and *Post-solenobia juliella*.

Distribution. Italy.

14. *Trachyarus solyanikovi* Gokhman, spec. nov.

Fig. 11

Types. Holotype: ♀, Russia, Moscow region, Bronnitsy station, from *Solenobia* sp., 26.IV.1982 (Solyanikov). – Paratypes: **Russia:** 2♀, same data; 1♂, same locality and collector, from *Solenobia cembrella*, IV.1973; 1♂, same locality, host and collector, 1-19.V.1974, 1973-1977; 2♂♂, same locality, host and collector, 22.IV.1974; 3♂♂, same locality and collector, from *Solenobia* sp., 24.IV.1982; 2♀, 3♂♂, same locality, host and collector, 25.IV.1982; 1♂, same locality, host and collector, 29.IV.1982; 1♂, same locality, host and collector, 30.IV.1982; 4♀, same locality, host and collector, coll. 1.V, emerged 6.V.1982; 1♀, same locality, host and collector, 1982; 1♀, same data, “21”, “*Tycherus* sp.”; 2♀, 2♂♂, Moscow region, Lyubertsy station, 5.V.1982 (Solyanikov); ♂, Moscow region, VNIIPriroda, 14.VI.1982 (Butovsky); **Ukraine:** ♀, Ivano-Frankovsk region, Mt. Pozhizhevskaya, 1500 m, 26.7.1989 (Kasparyan); **Hungary:** ♀, “Parasit e Psychidae, leg. H. Meier”, “Ungarn, Bükk-Geb., 1974, An Bäumen, *Sol. nickerli* Hein.”; **Austria:** ♀, “Knittelfeld, Steiermark, Österreich”, “Parasit e Psychidae, leg. H. Meier”, “Eppenstein, 1964, *Sol. charlottae* Meier”, “*Trachyarus brevipennis* Rom. ♀ det. E. Diller 87”; ♂, “Steiermark, St. [illegible]”, “Leoben, 15.V.1955, leg. [illegible]”, “*Solenobia pineti* Z.”; ♂, “Österreich, Parasit e Psychidae, leg. H. Meier”, “Linz, Puchenu, 1962, *Sol. triquetrella* Hbn.”; 2♂♂, “Bernstein (Burgenland)”, “17.5.55, leg. H. Meier”; 4♂♂, same locality and collector, 18.5.55; 3♂♂, same locality and collector, 20.5.55; ♂, same data, “Staatssammlung München”, “*Trachyarus corvinus* Thoms. (Ichneumonidae, Ichneumoninae)”, “det. Hedwig”; **Germany:** ♂, “5.VI.28 el, *Bacc. sepium*, Barrien, Brem., Jäckh.”, “[illegible] nicht *B. sepium*, [illegible] *Sol. triquetrella*”, “*Dicaelotus pusillus* Holmgr. ♀”[!], “det. Haberm.”. ♀, “Bayern-Süd, Irlbasch, VI.1962, leg. Diller”; **The Netherlands:** ♀, “Ede E.L., V.1967, C. J. Zwakhals”; ♀, “Putten E.L., V.1967, C. J. Zwakhals”. Material from Russia and the Ukraine is deposited in the ZMMU (1 paratype ♂) and ZIN collections.

Differential diagnosis. Among *Trachyarus* species having the lower mandibular tooth longer than the upper tooth, the female of *T. solyanikovi*, spec. nov. is closest to those of *T. subtilipiceus*, spec. nov. and *T. punctigaster*, spec. nov. from which it differs by having a stouter flagellum (7th or 8th flagellar segment square in lateral view), narrowed mandibles as well as by occurrence of brachypterous specimens. The male of *T. solyanikovi*, spec. nov. is closest to that of *T. decipiens*, spec. nov., from which it differs by having narrowed mandibles, shorter flagellum with 21-23 segments and stouter metasomal tergum III (1.5-1.6 × as wide as long).

Description

Female. Lower edge of the clypeus very slightly rounded, straight medially, apical margin hardly visible. Head weakly narrowed behind eyes in dorsal view. Temples moderately enlarged ventrad, with their maximum length distinctly less than transverse ocular diameter. Flagellum slightly enlarged in apical half, with 21-23 segments, first segment 2.2-2.3 × as long as wide, 7th or 8th segment square in lateral view. Mandibles narrowed, lower mandibular tooth distinctly longer and wider than the upper tooth. Hypostomal carina meets the genal carina before the mandibular base at one-third its width.

Distinct notauli present in the basal fourth to third of mesoscutum. Area superomedia about 1.5 × as wide as long, weakly separated from area posteromedia. Area petiolaris about 3 × as long as area superomedia. Wings of variable length, from fully developed to reduced, in the latter case stretching to the apex of propodeum or even to the apex of the first metasomal segment. Pterostigma absent only in the shortest fore wings. Nervellus broken in its lower third. Hind femora 3.2-3.3 × as long as wide.

Metasoma oval. Distance between spiracles of the first metasomal segment about 2 to 3 × as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of metasomal tergum II by about half their width, approximately 1.5 × as wide as the interthyridial space. Metasomal tergum II 1.1-1.2 × as wide as long, tergum III 1.7-1.8 × as wide as long (Fig. 11).

Body moderately sculptured. Head shining, side parts of face sparsely punctate, median part of the face and clypeus almost smooth. Frons smooth. Mesoscutum and scutellum smooth; pronotal lobes weakly chagrinate. Mesopleura weakly rugose, speculum smooth. Metasomal tergum I weakly chagrinate (more strongly at petiolus). Terga II-III (sometimes also base of tergum IV) obviously cha-

grinate, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head dark brown, clypeus and mandibles (except teeth) yellowish brown. Antennae brownish, flagellum reddish ventrally, palps light brown. Thorax from dark to yellowish brown, tegulae whitish. Legs reddish, hind coxae sometimes slightly infusate, last segments of all tarsi infusate. Metasoma brown with the very apex of tergum I medially, thyridia and hind margins of terga II-III and often of tergum IV yellowish; terga II-IV sometimes lighter.

Body length 3.5-4.5 mm, fore wing length 0.7-3.1 mm.

Male similar to female. Flagellum with 21-23 segments, first segment 2.3-2.4 × as long as wide, 17th or 18th segment square in lateral view, longish-oval tyloids present on (7)8th-10th segment. Metasoma more slender (tergum II 1.0-1.1 × as long as wide, tergum III 1.5-1.6 × as wide as long), its sculpture more robust. Body brown, clypeus often whitish. All coxae, trochanters I, femora (fore femora only on their outer sides), tarsi and hind tibiae infusate. Apex of metasoma brown.

Body length 3.5-4.5 mm, fore wing length 3.0-3.7 mm.

Biology. Parasitoid of *Dahlica* and *Siederia* spp., including *D. charlottae*, *D. nickerlii*, *D. triquetrella* and *S. listerella*.

Distribution. Russia (Moscow region), Ukraine, Hungary, Austria, Germany (Lower Saxony, Bavaria), the Netherlands.

15. *Trachyarus subtilipiceus* Gokhman, spec. nov.

Holotype: ♀, Italy, "Italia, Mte Baldo, Prada, 1300 m, el M 5.1967, leg. Burmann".

Differential diagnosis. *T. subtilipiceus*, spec. nov. is most closely related to *T. punctigaster*, spec. nov., but in *T. subtilipiceus*, spec. nov. flagellum is more slender (17th or 18th flagellar segment square in lateral view).

Description

Female. Lower edge of the clypeus very slightly rounded, almost straight medially, apical margin hardly visible. Head slightly narrowed behind eyes in dorsal view. Temples moderately enlarged at the middle, with their maximum length somewhat equal to transverse ocular diameter. Flagellum thin, with 23 segments, first segment about 3 × as long as wide, 17th or 18th segment square in lateral view. Lower

mandibular tooth distinctly longer and wider than the upper tooth. Hypostomal carina meets the genal carina approximately at the mandibular base.

Distinct notauli present in the basal third of mesoscutum. Sternauli weak but stretch almost to the middle of mesopleura. Area superomedia about as wide as long, weakly separated from area posteromedia. Area petiolaris about 2.5 × as long as area superomedia. Wings fully developed. Nervellus broken in its lower third. Hind femora about 4 × as long as wide.

Metasoma longish-oval. Distance between spiracles of the first metasomal segment about twice as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of metasomal tergum II by about their width, slightly narrower than the interthyridial space. Metasomal tergum II as long as wide, tergum III 1.4-1.5 × as wide as long.

Body moderately sculptured. Head shining, side parts of face sparsely punctate, median part of the face and clypeus almost smooth. Frons smooth. Mesoscutum and scutellum finely and sparsely punctate; pronotal lobes rugose except for their upper part. Mesopleura longitudinally rugose, speculum smooth. Metasomal terga I-II strongly chagrinate except for the apical margin of tergum II. Tergum III chagrinate in its basal half, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head dark brown, clypeus somewhat lighter, mandibles with reddish markings. Antennae brownish, palps light brown. Tegulae whitish. Legs brownish, apices of fore femora and stripes on inner sides of fore tibiae reddish. Metasoma brown with hind margin of tergum II yellowish, tergum VII reddish brown.

Body length 3.5 mm, fore wing length 2.7 mm. Male unknown.

Biology. Parasitoid of *Brevantennia siederi*.

Distribution. Italy.

Trachyarus sp. A.

Material. Finland: 1♂, "Kohde R/K, Leivo A., Puulaju L/P Koivu", 1♂, same data, "no *brevipennis* ♂ det. E. Diller 2002"; 1♂, "Suomi, U. Askola, 1971, T. Suomalainen", "*Trachyarus corvinus* Ths. ♂, Karvonen det.", "Ranin"; 1♂, "Suomi, U: Tuusula, 6665: 389, *16.5.1975, E.O. Peltonen leg", "*Solenobia* Dup. *fumosella* n Hein. ? Ioinen", "Ranin"; Austria: 1♂, "Österreich, Innsbruck, Kranebitten, 500 m", "A.IV.1966, leg. Burmann", "e.p. 19.IV.1966, host: *Talaeporia* oder *Solenobia*". All material is deposited in the ZIN collection.

Differential diagnosis. *Trachyarus* sp. A is most closely related to *Trachyarus* sp. B, but *Trachyarus* sp. A has a longer flagellum with 24-25 segments and the area superomedia of propodeum separated from the area petiolaris by a strong and distinct carina.

Note. A closely related female from Finland (♀, "Suomi, U. Askola, 1971, T. Suomalainen", "*Trachyarus corvinus* Ths., Karvonen det.", "Ranin") with very broad postpetiolus probably belongs to this species.

Description

Female unknown.

Male. Lower edge of the clypeus very slightly rounded, almost straight medially. Head slightly narrowed behind eyes in dorsal view. Temples almost parallel, with their maximum length distinctly less than transverse ocular diameter. Flagellum with 24-25 segments, first segment $2.9-3.0\times$ as long as wide, a few subapical segments square in lateral view, tyloids absent. Upper mandibular tooth distinctly longer and hardly wider than the lower tooth. Hypostomal carina meets the genal carina before the mandibular base at about one-third its width.

Distinct notauli converge in the basal third of mesoscutum. Area superomedia heart-shaped, bordered by strong carinae, about as wide as long. Area petiolaris approximately twice as long as area superomedia. Wings fully developed. Nervellus broken slightly below the middle. Hind femora $3.2-3.3\times$ as long as wide.

Metasoma longish-oval. Petiolus distinctly compressed dorsoventrally. Distance between spiracles of the first metasomal segment twice as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of metasomal tergum II by about one-third their width, approximately $3\times$ as wide as the interthyridial space. Metasomal tergum II $1.2-1.3\times$ as wide as long, tergum III $1.7-1.8\times$ as wide as long.

Body moderately sculptured. Frons obviously chagrinata. Mesoscutum chagrinata and comparatively roughly punctate, scutellum weakly shining and more finely punctate; pronotal lobes longitudinally rugose in their lower half. Mesopleura rugose, speculum smooth. Postpetiolus of the first metasomal segment rugose-punctate and chagrinata, petiolus chagrinata. Metasomal terga II-III and basal half of tergum IV obviously chagrinata with obscure scattered punctures, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head brown, clypeus (except its lower margin), ventral markings of scape and sometimes mandibles (except teeth) whitish. Antennae brown, palps whitish. Tegulae brownish. Legs

brownish, apices of all femora (and inner surfaces of fore femora), tibiae and tarsi reddish, hind tibiae and last segments of all tarsi infusate. Metasoma brown with the very apex of tergum I medially, thyridia and hind margin of tergum II reddish.

Body length 4.0-4.5 mm, fore wing length 3.5-3.7 mm.

Biology. Parasitoid of *Dahlica lazuri* (Clerck) and undetermined Psychidae.

Distribution. Austria, Finland. A boreal-montane species.

Trachyarus sp. B.

Material. 2♂♂, Russia, Primorsky district, "GTS" (Montane Forest Station), ex *Solenobia*, 28.IV.1983 (Solyanikov); 1♂, same date, locality and collector, ex *Eosolenobia suifunella*. All material is deposited in the ZIN collection.

Differential diagnosis. *Trachyarus* sp. B is most closely related to *Trachyarus* sp. A, but *Trachyarus* sp. B has a shorter flagellum with 21-23 segments and the area superomedia of propodeum separated from the area petiolaris by a weak and indistinct carina.

Description

Female unknown.

Male. Lower edge of the clypeus slightly rounded. Head almost not narrowed behind eyes in dorsal view. Temples parallel, their maximum length a little less than transverse ocular diameter. Flagellum with 21-23 segments, first segment $3.2-3.3\times$ as long as wide, a few subapical segments almost square in lateral view, tyloids absent. Upper mandibular tooth distinctly longer and wider than the lower tooth. Hypostomal carina meets the genal carina before the mandibular base at about half its width.

Distinct notauli converge in the basal third of mesoscutum. Area superomedia heart-shaped, about as wide as long. Area petiolaris approximately $2.5\times$ as long as area superomedia. Wings fully developed. Nervellus broken in its lower third. Hind femora $3.6-3.7\times$ as long as wide.

Metasoma longish-oval. Distance between spiracles of the first metasomal segment twice as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of metasomal tergum II by about half their width, approximately twice as wide as the interthyridial space. Metasomal tergum II $1.1-1.2\times$ as wide as long, tergum III $1.5-1.6\times$ as wide as long.

Body moderately sculptured. Frons distinctly chagrinata. Mesoscutum chagrinata (except for lat-

eral lobes) and comparatively densely punctate, scutellum punctate and more weakly chagrinata. Pronotal lobes chagrinata, longitudinally rugose in their lower half. Mesopleura rugose-punctate and chagrinata, speculum smooth. Postpetiolus of the first metasomal segment rugose-punctate and chagrinata, petiolus chagrinata. Metasomal terga II-IV obviously chagrinata with obscure scattered punctures, sculpture becomes more smooth towards apex of metasoma.

Body brown. Head brown, clypeus sometimes light brown to whitish (except its lower margin), mandibles whitish (except teeth). Antennae brown, palps brownish to whitish. Tegulae brownish. Legs brownish, apices of all femora (and inner surfaces of fore femora), tibiae and tarsi (except hind tarsi) reddish, last segments of all tarsi infuscate. Metasoma brown with the very apex of tergum I medially, thyridia, all margins of terga II-III and hind margin of tergum IV yellowish brown.

Body length 4.0-4.5 mm, fore wing length 3.6-4.1 mm.

Biology. Parasitoid of *Eosolenobia suifunella* (Christoph) and *Dahlica* or *Siederia* sp.

Distribution. Russia (Primorsky district).

Trachyarus sp. C.

Material. 1♂, Germany, "Bayern, Penzberg, IV.1976, e Psychidae, leg. Hinterholzer"; 1♂, Yugoslavia, "Parasit e Psychidae, leg. H. Meier", "Jugoslavien, Steiner Alpen, 1000-2000 m, *Sied. meierella* Sied.". All material is deposited in the ZIN collection.

Differential diagnosis. *Trachyarus* sp. C is most closely related to *T. brevipennis* Roman, but in *Trachyarus* sp. C the flagellum is more slender (just a few subapical segments square in lateral view) and metasomal tergum II longer than its width.

Description

Female unknown.

Male. Lower edge of the clypeus very slightly rounded, almost straight medially. Head slightly narrowed behind eyes in dorsal view. Temples almost parallel, with their maximum length about 1.5 × less than transverse ocular diameter. Flagellum with 22-23 segments, first segment 2.8 × as long as wide, a few subapical segments square in lateral view, longish-oval tyloids present on 8th-11th flagellar segment. Upper mandibular tooth distinctly longer and hardly wider than the lower tooth. Hypostomal carina meets the genal carina before the mandibular base at about one-third its width.

Distinct notauli present in the basal third of mesoscutum. Area superomedia heart-shaped, bordered by strong carinae, about as wide as long. Area petiolaris approximately 2.5 × as long as area superomedia. Wings fully developed. Nervellus broken slightly below the middle. Hind femora 3.9-4.0 × as long as wide.

Metasoma longish-oval. Distance between spiracles of the first metasomal segment about twice as long as distance between the spiracle and hind corner of the segment. Thyridia medially removed from the base of metasomal tergum II by about half their width, approximately 2.5 × as wide as the interthyridial space. Metasomal tergum II 1.2-1.3 × as long as wide, tergum III 1.5-1.6 × as wide as long.

Body moderately sculptured. Frons obviously chagrinata. Mesoscutum and scutellum finely punctate and shining; pronotal lobes rugose centrally. Mesopleura rugose-punctate, speculum smooth. Metasomal tergum I rugose-punctate and chagrinata. Terga II-V obviously chagrinata with dense but obscure punctures, sculpture becomes more smooth towards apex of metasoma.

Body dark brown. Head brown, mandibles and clypeus somewhat lighter, clypeus sometimes whitish. Antennae and palps brown. Tegulae brownish. Legs brownish, apices of all femora (and inner surface of fore femora), fore and middle tibiae reddish. Metasoma brown with the very apex of tergum I medially and hind margins of terga II-III (IV) reddish.

Body length 3.5-4.0 mm, fore wing length 2.7-2.9 mm.

Biology. Parasitoid of *Siederia meierella* and an undetermined Psychidae.

Distribution. Germany (Bavaria), Yugoslavia (Alps). A boreal-montane species.

Table for the identification of the species of the genus *Trachyarus*

1. Females (unknown for a few species).....2.
- Males (unknown for many species) 16.
2. Upper mandibular tooth longer than the lower tooth (Fig. 2).....3.
- Upper mandibular tooth shorter than the lower tooth (Fig. 7)..... 8.
3. Wings very short, not stretched beyond base of propodeum.....*brachypterator* Diller
- Wings fully developed, if short, obviously stretched beyond base of propodeum 4.

4. Metasomal tergum II 1.1-1.5× as long as wide (Figs 5, 6).....5.
 - Metasomal tergum II not longer than wide (Fig. 4)..... 6.
5. Metasomal tergum III 1.1-1.3× as wide as long (Fig. 5). Tegulae whitish.....*fuscipes* (Thomson)
 - Metasomal tergum III 1.4-1.5× as wide as long (Fig. 6). Tegulae reddish brown.....*prominulus* Diller
6. 7th or 8th flagellar segment square in lateral view. Tegulae usually reddish brown*corvinus* Thomson
 - 7th or 8th flagellar segment longer than its width. Tegulae usually whitish 7.
7. First flagellar segment 3.6-4.0× as long as wide (Fig. 1). Metasomal tergum III smooth or shagrinated at the very base. Wings fully developed....*anceps* (Berthoumieu)
 - First flagellar segment 2.2-2.3× as long as wide (Fig. 3). Metasomal tergum III distinctly shagrinated in its basal half. Often brachypterous.....*brevipennis* Roman
8. Metasomal tergum III 2.5-2.6× as wide as long (Fig. 10). Wings strongly reduced.....*parvipennis*, spec. nov.
 - Metasomal tergum III at least 1.8× as wide as long (Figs 8, 9). Wings fully developed or reduced 9.
9. Metasomal tergum II longer than wide (Figs 8-9)10.
 - Metasomal tergum II not longer than wide (Fig. 11)..... 13.
10. 5th or 6th flagellar segment square in lateral view. Brachypterous *khrulevae*, spec. nov.
 - 5th or 6th flagellar segment distinctly longer than wide 11.
11. Clypeus obviously flattened in apical half. Brachypterous. Body length 5.0 mm and more*bacillatus*, spec. nov.
 - Clypeus convex. Fully winged. Body length 5.0 mm or less 12.
12. Flagellum more stout, 9th or 10th flagellar segments square in lateral view. Metasomal tergum II 1.1-1.2× as long as wide (Fig. 8).....*edilleri*, spec. nov.
 - Flagellum more slender, 11th or 12th flagellar segments square in lateral view. Metasomal tergum II 1.3-1.4× as long as wide (Fig. 9).....*hemichneumonoides*, spec. nov.
13. Flagellum with 24-26 (rarely with 23) segments. 10th or 11th flagellar segment square in lateral view. Mandibles not narrowed. Wings fully developed. Metasomal tergum III 1.3-1.4× as wide as long *decipiens*, spec. nov.
 - Flagellum with 21-23 segments. If approximately 11th flagellar segment square in lateral view, then metasomal tergum III 1.8-1.9× as wide as long 14.
14. 7th or 8th flagellar segment square in lateral view. Mandibles narrowed. Wings sometimes partly reduced*solyanikovi*, spec. nov.
 - 7th or 8th flagellar segment longer than wide. Mandibles not narrowed. Wings fully developed 15.
15. 17th or 18th flagellar segment square in lateral view*subtilipiceus*, spec. nov.
 - 11th or 12th flagellar segment square in lateral view *punctigaster*, spec. nov.
16. Upper mandibular tooth longer than the lower tooth.....17.
 - Upper mandibular tooth shorter than the lower tooth. Flagellum with tyloids 24.
17. Width/length ratio of metasomal tergum III = 1.5-1.718.
 - Width/length ratio of metasomal tergum III = 1.1-1.3 23.
18. Flagellum with tyloids on (7)8th-10th segment....19.
 - Flagellum without tyloids..... 21.
19. Metasomal tergum II 1.0-1.1× as wide as long. 11th or 12th flagellar segment square in lateral view*corvinus* Thomson
 - Flagellum and metasoma more slender 20.
20. Metasomal tergum II as long as wide. 17th or 18th flagellar segment square in lateral view*brevipennis* Roman
 - Metasomal tergum II 1.2-1.3× as long as wide. A few subapical flagellar segments square in lateral view sp. C
21. Apical half of metasomal tergum III smooth, with obscure punctures*anceps* (Berthoumieu)
 - Apical half of metasomal tergum III obviously chagrinated 22.
22. Area superomedia separated from area postero-media by strong carina. Flagellum with 24-25 segments sp. A

- Area superomedia separated from area postero-media by weak and indistinct carina. Flagellum with 21-23 segments.....sp. B
- 23. Flagellum with tyloids on (8)9th-10(11)th segment. Length/width ratio of metasomal tergum II = 1.0-1.1.....*prominulus* Diller
- Flagellum without tyloids. Length/width ratio of metasomal tergum II = 1.3-1.4.....*fuscipes* (Thomson)
- 24. Width/length ratio of metasomal tergum III = 1.1-1.2.....25.
- Width/length ratio of metasomal tergum III = 1.3-1.6.....26.
- 25. Larger (body length 5.0 mm and more).....*bacillatus*, spec. nov.
- Smaller (body length 4.5 mm or less).....*edilleri*, spec. nov.
- 26. Flagellum with 21-23 segments. Mandibles somewhat narrowed. Width/length ratio of metasomal tergum III = 1.5-1.6.....*solyanikovii*, spec. nov.
- Flagellum with 24-25 segments. Mandibles not narrowed. Width/length ratio of metasomal tergum III = 1.3-1.4.....*decipiens*, spec. nov.

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Buchbesprechungen

8. Richarz, K.: Fledermäuse beobachten, erkennen und schützen. – Franckh-Kosmos Verlags-GmbH & Co. KG, Stuttgart, 2004. 126 S., 173 Abb., ISBN 3-440-09691-2

Klaus Richarz, seit langer Zeit aktiv im Fledermausschutz tätig und für sein Engagement bereits mit mehreren Preisen ausgezeichnet, ist Autor des vorliegenden Taschenbuches über europäische Fledermäuse. Diesen angeblich unheimlichen oder unglückbringenden "Geschöpfen der Nacht", die die Erde seit rund 50 Millionen Jahren bevölkern, begegnen viele Menschen noch immer mit Mißtrauen und zahlreichen mythologisch behafteten Fehlinformationen. Richarz liefert nun sorgfältig recherchierte Beiträge zu ihrer Lebensweise, portraitiert alle mit uns lebenden Arten und erklärt, wie man sie am besten beobachten und schützen kann. So wird mit Sicherheit mit vielen Vorurteilen gegenüber diesen faszinierenden und mittlerweile stark gefährdeten Tieren gründlich aufgeräumt.

Das erste Kapitel "Echos aus einer versunkenen Welt" beleuchtet kurz die Evolution der Chiroptera und die Entwicklung ihrer ungewöhnlich vielfältigen, erfolgreichen Ernährungsstrategien. Die folgenden vier Abschnitte begleiten die Fledermäuse durch die Jahreszeiten Frühling, Sommer, Herbst und Winter und liefern gleichzeitig wichtige Details zu ihren bevorzugten Lebensräumen, zur Echoortung durch Ultraschall und zum Erkennen der Arten im Gelände durch Beobachtung und Fledermaus-Detektoren. Sie beschreiben die Aufzucht der Jungen, informieren über die verschiedenen Tages- und Wochenstuben-Quartiere, ihre Erhaltung, Gestaltung und Betreuung und streifen auch kurz die Methoden, Fledermäuse zu beringen und zu erforschen. Ein weiteres Kapitel stellt die 32 in Europa und im Mittelmeerraum heimischen Arten mit anschaulichen Bildern und einem kurzen Text vor. Sogar der auf Zypern und im äußersten Süden der Türkei vorkommende Nilflughund wird berücksichtigt.

Empfehlungen zum Schutz der stark bedrohten Fledermäuse ziehen sich wie ein roter Faden durch das gesamte Werk. Ein "Service für Fledermausschützer", Literatur-Tips, eine Liste nützlicher Adressen und ein informatives Register runden dieses sehr empfehlenswerte, dabei preiswerte Buch ab, das durch seine schöne Aufbereitung und ansprechende Illustration nicht nur ältere, sondern besonders auch junge Fledermausfreunde begeistern wird, die für den künftigen Schutz unserer Natur und Umwelt Verantwortung übernehmen wollen.

J. Diller

9. Rabitsch, W. (Hrsg.): Hug the bug – For love of true bugs. – Festschrift zum 70. Geburtstag von Ernst Heiss. Denisia Bd. 19, Linz, 2006. 1184 S. ISBN 3-85474-161-8

Der vorliegende Monumentalband ist eine Liebeserklärung an die sonst so oft geschmähten Wanzen und zugleich eine Hommage für den bekannten Wanzenliebhaber und Wissenschaftler Dr. Ernst Heiss. Seine Begeisterung hat vielfach angesteckt, seine Hilfsbereitschaft ist in diesem Werk vielfach bekundet und seine wissenschaftliche Leistung ist zweifelsohne beeindruckend.

In dem Werk haben fast einhundert Autoren aus 25 Ländern einen Beitrag zur Entomologie der Wanzen verfaßt. Im ersten Teil der Arbeiten sind Artikel zusammengestellt, die dem Leben und Werk von Ernst Heiss gewidmet sind, sowie eine Geschichte und Bibliographie der österreichischen Wanzenkunde und ein unterhaltsamer Artikel über "... ernstes und kuriozes - ein heteropterologisches Panoptikum". Mehrere Arbeiten beschäftigen sich mit den Aradidae, der Wanzenfamilie, der E. Heiss in besonderer Weise verbunden ist. Diese abgeflachten Wanzen, zu deutsch "Rindenwanzen", leben bevorzugt (aber nicht immer) unter der Rinde von Bäumen und saugen an Pilzmycelien. Hier, wie in dem gesamten Werk, faszinieren die vielen farbigen Abbildungen, mit denen insbesondere die Tiere im Habitus vorgestellt werden, sowie die schönen Tafeln mit REM Abbildungen. Beeindruckend ist zum Beispiel die mit herrlichen REM-Tafeln illustrierte Beschreibung einer atypischen micropteren Aradide, die zu Ehren von Ernst Heiss *Breviscutheissia ernsti* genannt und in Südafrika an sukkulenten Kletterpflanzen gefunden wurde. Der größte Teil des Bandes enthält taxonomische Arbeiten über verschiedene Wanzentaxa: Tingidae, Miridae, Coreidae, Pentatomidae, Pyrrhocoridae und so fort. Viele Arten wurden neu beschrieben, mehrere Arbeiten sind mehr vergleichend morphologisch (z. B. Genitaluntersuchungen) orientiert. Es wundert nicht, daß die meisten neuen Namen dem Jubilar gewidmet sind, aber wie viele das sind, das erstaunt dann doch! Es werden in dem Band eine Unterfamilie, 18 Gattungen und Untergattungen 116 Arten und Unterarten beschrieben. Im weiteren werden noch eine Reihe von Arbeiten zur Biogeographie und zur Biologie der Wanzen vorgestellt.

In dem Werk sind praktisch alle derzeit aktiven Taxonomen der vielgestaltigen Heteropteren vertreten. Das vorliegende Werk ist mit weit mehr als tausend Seiten und unzähligen Farbabbildungen ein Prachtband und ein Meilenstein der aktuellen Wanzentaxonomie und das alles zu einem überraschend moderaten Preis. Ein Werk, zu dem man Autoren und Herausgeber nur herzlich gratulieren kann, besonders aber jenem, dem das Werk gewidmet ist: Ernst Heiss. Ad multos annos!

K. Schönlitzer und T. Kothle