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The subgenus *Dasymolophilus* of the genus *Tasiocera* from the Western Palaearctic with the description of a new species (Diptera: Limoniidae: Chioneinae)

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ABSTRACT

In this paper, we describe a new species of *Tasiocera* of the subgenus *Dasymolophilus*, collected in southern Italy. This discovery brings the number of Western Palaearctic *Dasymolophilus* species to nine. In addition, we compile taxonomic information on the known species. We provide an identification key based primarily on male genitalia, avoiding the use of macrotrichia patterns on the wing membrane as a distinguishing feature due to the difficulty of assessing this character. *Tasiocera* are among the smallest crane flies, and little is known about their biology. Where data are available, we include brief information on the species' biology and ecology. Additionally, we present the known distribution based on data from the *Catalogue of the Craneflies of the World*.

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KEYWORDS
Aspromonte National Park; Italy; crane flies; gonostylus; taxonomy

Introduction

The Palaearctic is the most extensive of the eight realms dividing the Earth's surface. Often, it is divided into the Eastern and Western Palaearctic because of its large size. The Western Palaearctic comprises North Africa, Europe, and the Middle East, with the Ural Mountains being roughly its border in the east and the Sahara Desert representing the limit in the south. However, its exact borders can vary according to different authors, and in this paper, we follow the boundaries given by the *Catalogue of the Craneflies of the World* (CCW) (Oosterbroek 2025).

The Limoniidae fauna is quite well studied in the Western Palaearctic; still, in the years between 1980 and 2024, 324 new species were described (Petersen et al. 2025). In Europe, as elsewhere, distributional and ecological data at the regional scale are lacking or incomplete. Therefore, surveys aimed at improving ecological and taxonomic knowledge of less well-known insect groups, such as *Tasiocera* and Limoniidae in general, are of great importance.

The genus *Tasiocera* Skuse, 1890 was erected to accommodate the species *T. gracilicornis* Skuse, 1890 and *T. tenuicornis* Skuse, 1890. Skuse distinguished these species from other genera, particularly based on the characteristics of their flagellar segments (Skuse 1890).

The genus comprises 74 species subdivided into two subgenera, *Tasiocera* s. str. and *Dasymolophilus* Goetghebuer, 1920 (Oosterbroek 2025). In 1920, Goetghebuer introduced *Dasymolophilus* as a subgenus of *Molophilus* Curtis, 1833, designating *T. murina* (Meigen, 1818) as its type species. The presence of long setae on the wing membrane and simpler genitalia, characterized by a single gonostylus, justified the introduction of this subgenus (Goetghebuer & Tonnoir 1920). However, other authors considered these traits to indicate a closer affinity between *Dasymolophilus* and *Tasiocera* rather than *Molophilus*. *Dasymolophilus* exhibits a narrower wing base, setose mediotergite, and long setae on both the thorax and abdomen (Edwards 1938). These features are shared with tropical species of *Tasiocera*, with the primary distinction being the absence of setae on the wing membrane in *Tasiocera* s. str.

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Tasiocera is included in the subfamily Chioneinae, although classification of the Limoniidae is still an unresolved issue (Oosterbroek & Theowald 1991; Ribeiro 2008; Petersen et al. 2010).

They are very setose and dark in colour, vaguely resembling members of the family Psychodidae. With a wing length of 1.5 to 5 mm, *Tasiocera* are among the smallest known crane flies. Being so small, they often go unnoticed and not much is known about their biology. Hancock (2021) observed males of *T. murina* swarming on the ground in an airspace of about 40 cm. Swarming behaviour has also been observed for *T. minima* Mendl, 1974 (Mendl 1974) and *T. fuscescens* (Lackschewitz, 1940). Larvae of the genus *Tasiocera* are unknown.

Three species of *Tasiocera* are known from fossil records. All fossil species belong to the subgenus *Dasymolophilus* and are from Baltic amber, suggesting an Eocene origin for this subgenus (Kania-Kłosok et al. 2024). Permanent rotation of the terminalia is known in different families of Nematocera. This can be fixed or facultative (Lukashevich 2018). In Limoniidae, rotation of terminalia occurs in some genera of Chioneinae and can be complete, i.e. 180°, as in *Cheilotrichia* Rossi, 1848, *Hoplolabis* Osten Sacken, 1869, and *Molophilus*, or partial, i.e. 45° to 90°, as in *Erioconopa* Starý, 1976, *Ormosia* Rondani, 1856, and *Rhypholophus* Kolenati, 1860 (Hennig 1973).

In *Tasiocera*, rotation of the hypopygium is complete and, as far as is known, permanent.

In the Western Palaearctic eight species of *Tasiocera* are reported. All of the species belong to the subgenus *Dasymolophilus*.

In this paper, we describe a new species of *Tasiocera* collected on the Aspromonte massif, located at the southernmost tip of the Italian Peninsula, and near the town of Pignola, in the province of Potenza, updating the total number of Western Palaearctic species to nine. In addition, we discuss the taxonomy of the currently known *Tasiocera* species from the Western Palaearctic, providing an identification key and short notes on their ecology and biology. We also present the known distribution based on Oosterbroek (2025).

Material and methods

Study area

Two specimens of the new species were collected during a survey on the Aspromonte massif in June 2024. An additional male specimen was found during a survey conducted by the first author between the end of May and the end of June 2025. The latter investigated area extends roughly from the town of Avigliano to the village of Calvello, in the province of Potenza, Basilicata Region.

The Aspromonte National Park is a protected area of 650 km^2 located in the Calabria Region. The highest peak is Mt. Montalto (1956 m), located only 20 km from the sea (Robustelli & Sorriso-Valvo 2017). Due to its geological history, geographic position, and variation in altimetry and climate, the Aspromonte massif is a very peculiar and interesting area (Robustelli & Sorriso-Valvo 2017).

Despite the presence of a very active group of entomologists (Castiglione et al. 2021), and the fact that in recent years new species and new faunistical records have regularly been reported (e.g. Liberti 2017; Nardi & Biscaccianti 2017; Castiglione et al. 2019, 2021; Poggi et al. 2019; Ballarin & Pantini 2020; Corso et al. 2020; Bartolozzi et al. 2021; Piccini et al. 2021; Biscaccianti et al. 2022; Bonacci et al. 2022; Patacchiola et al. 2022; Mazzei et al. 2025), much remains to be discovered.

The area between Avigliano and Calvello is situated within the southern Apennines and is characterized by a predominantly mountainous landscape rich in water. The territory is covered by forests, interspersed with pasture and agricultural fields. Entomological research in this area is scarce.

Fieldwork, identification, and taxonomic procedures

The Limoniidae fauna in southern Italy is poorly known and scarcely studied. The survey carried out in 2024 and 2025 aimed to partially fill this gap.

Collection of crane flies, in the Aspromonte National Park, was done primarily with an entomological net from 6 to 13 June 2024. During the same period, a Malaise trap was operated near a stream around the Cascate Tre Limiti waterfalls.

In the province of Potenza, crane flies were collected exclusively with an entomological net between 30 May and 30 June 2025.

The specimens collected with the entomological net were first stored in a paper envelope and subsequently pinned on their side, while the specimens collected with the Malaise trap were stored in 96% ethanol. When needed for identification purposes, the last segments of the abdomen were cut and cleared for 24 h in cold potassium hydroxide (KOH) 10%. Genitalia were neutralized using acetic acid, then stored in a microvial filled with glycerol and pinned under the corresponding specimen. Identification was made using an Olympus SZX10 binocular microscope. Photographs were taken with a Canon EOS R5. All photographs were taken by S. Podėnas, unless otherwise noted. When specimens were unavailable, drawings and relevant images were obtained from Oosterbroek (2025). All illustrations and images were edited by S. Podėnas to highlight important details.

Wing venation terminology (Figure 1) follows the Comstock-Needham system as used in the Manual of Afrotropical Diptera (Kirk-Spriggs & Sinclair 2017).

Information on taxonomy, distribution, and ecology of the species was gathered from Oosterbroek (2025) and literature reported therein.

Additional specimens were studied from the following museums and research institutions: the State Scientific Research Institute Nature Research Centre, Vilnius, Lithuania (NRC); the Zoological Museum of the Vilnius University (MZVU); the Naturalis Biodiversity Center, Leiden, The Netherlands (RMNH); and the Museum Koenig Bonn, LIB, Bonn, Germany (ZFMK).

All the collected specimens are deposited in the NRC.

Results

Key to males of western Palaearctic species of the subgenus Dasymolophilus

The following key is primarily based on characters of the male genitalia. In particular, the shape of the aedeagus and the paramere in lateral view provide useful diagnostic features. The length of the paramere in relation to the length of the aedeagus is also informative.

The position and size of the teeth on the gonostylus are also valuable characters, although they require high magnification to be observed. The position of the cross veins is another helpful feature, although these may be very faint. Some *Tasiocera* species possess rows of macrotrichiae on the wing membrane, whereas others have only a few scattered macrotrichiae that are not arranged in rows. Although some authors have used this feature (e.g. Freeman 1951), we do not consider it reliable, as the macrotrichiae are easily lost. Therefore, we regard this character as unsuitable for species differentiation.

1. Gonostylus bifurcated (e.g. Figures 3(A), 7(C)) 2
– Gonostylus single, not branched (e.g. Figure 5(B,C)) 4
2. Dorsal and ventral branch of gonostylus of same length (Figure 8(B)) ..... *T. malickyiana*
– Gonostylus with either long-toothed ventral branch that reaches level of dorsal branch or short-toothed ventral branch 3

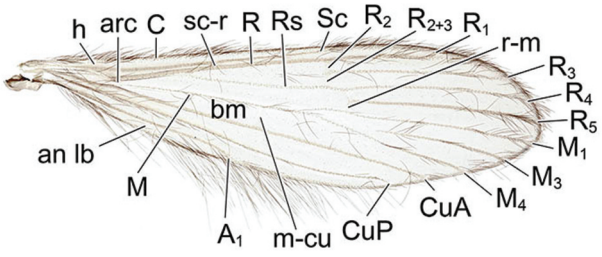

Figure 1. Wing venation of *Tasiocera murina*. Abbreviations: A_1 – first branch of anal vein; an lb – anal lobe; *arc* – arculus; *bm* – basal medial cell; *C* – costal vein; *CuA* – anterior branch of cubital vein; *CuP* – posterior branch of cubital vein; *h* – humeral vein; *M* – medial vein, or media; M_1 – first branch of media; M_3 – third branch of media; M_4 – fourth branch of media; *m-cu* – medial-cubital cross vein; *R* – radius, or radial vein; R_1 – anterior branch of radius; R_2 – second branch of radius; R_{2+3} – stem of radial branches R_2 and R_3; R_3 – lower branch of second branch of radius; R_4 – upper branch of third branch of radius; R_5 – lower branch of third branch of radius; *r-m* – radio-medial cross vein; *Rs* – radial sector; *Sc* – subcostal vein; *sc-r* – subcostal-radial cross vein.

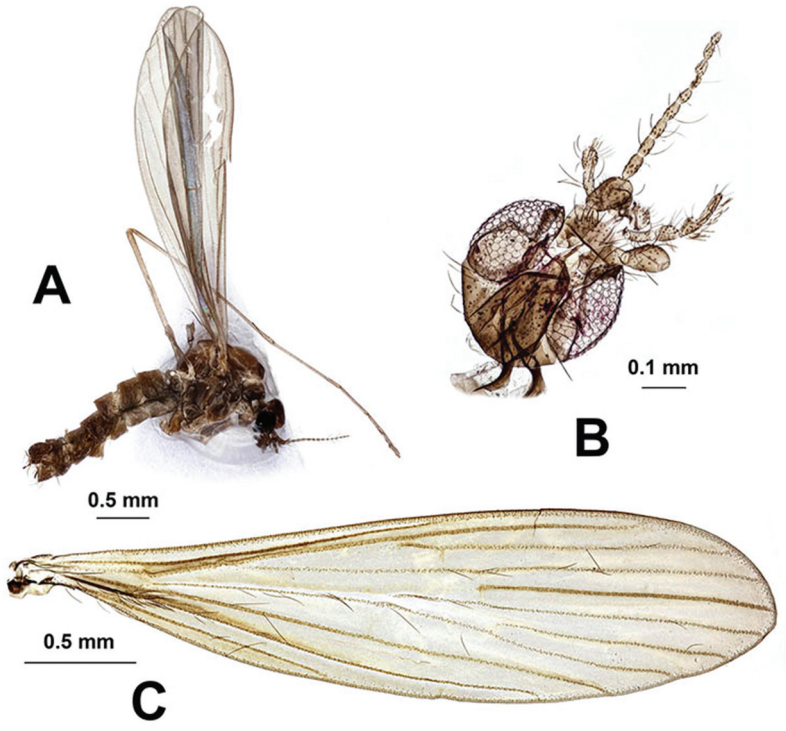

Figure 2. *Tasiocera denticulata* sp. n. A, habitus of the holotype; B, head of the paratype; C, wing of the paratype. The photographs of the paratype are of the specimen collected at Cascate Tre Limiti, Aspromonte National Park. Note that the head and wing of the paratype were cleared in 10% KOH overnight.

3. Ventral branch of gonostylus long, curved, with strong irregular teeth (Figure 3(B,C)). Cross vein *m-cu* at origin of M_1 (Figure 2(C)) ..... *T. denticulata sp. n.*
– Ventral branch of gonostylus as a short blunt projection, with teeth (Figure 7(C,E)). Cross vein *m-cu* beyond origin of M_1 (Figure 7(A)) ..... *T. jenkinsoni*
4. Gonostylus smooth, without prominent teeth (e.g. Figure 4(B)) 5
– Gonostylus with teeth (e.g. Figure 10B,C) 6
5. Gonostylus pale yellow. Paramere bifid. Aedeagus pointing downward in lateral view (Figure 5(B)) ..... *T. fuscescens*
– Gonostylus not pale yellow. Paramere single. Aedeagus upcurved in lateral view (Figure 4(B)) ..... *T. exigua*
6. Prominent tooth on gonostylus at half length, smaller teeth apically (Figure 6(B)). Paramere single, with teeth dorsally (Figure 6(C)) and reaching the level of aedeagus. Aedeagus pointing downward in lateral view (Figure 6(C)) ..... *T. halesus*
– Gonostylus without a single subapically prominent tooth. Either few prominent teeth subapically (Figure 11(C)) or smaller teeth along dorsal and ventral surface (Figures 9(C), 10(B,C)). Paramere either short or reaching end of aedeagus, with teeth dorsally or smooth. Aedeagus pointing downward in lateral view 7
7. Paramere much shorter than aedeagus, rod-like, without prominent teeth dorsally and concave (Figure 9(D)). Aedeagus pointing downward in lateral view, turning abruptly down, at almost right angle (Figure 9(D)) ..... *T. minima*
– Paramere short or reaching the level of aedeagus, but not concave. Aedeagus pointing downward but turning more smoothly 8
8. Gonostylus with teeth on apical part. Paramere short, not reaching the level of aedeagus, club shaped and toothed dorsally (Figure 10(C)). In lateral view, aedeagus pointing downward, concave (Figure 10(C)) ..... *T. murina*

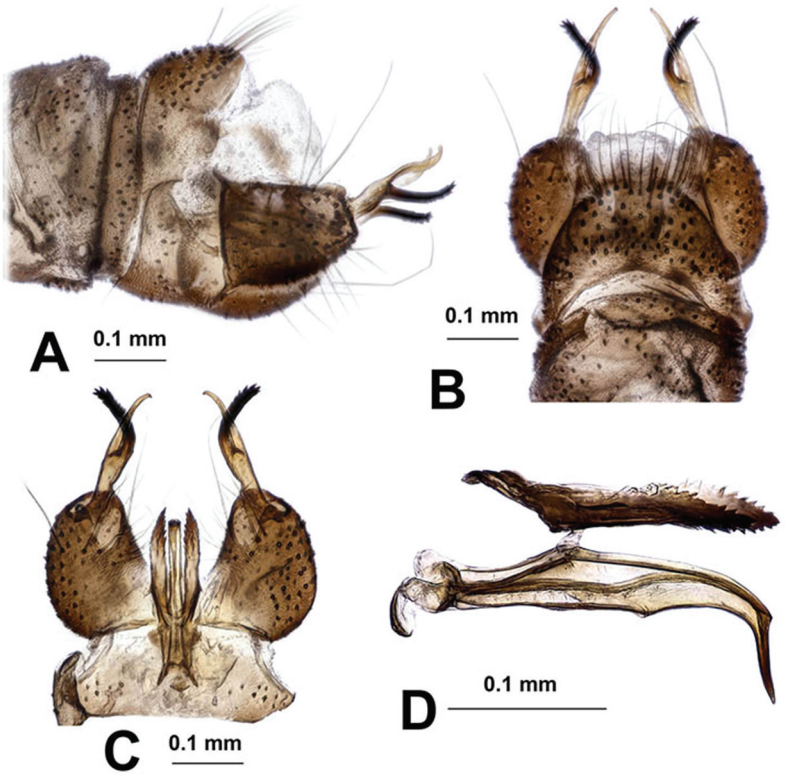

Figure 3. Genitalia of *Tasiocera denticulata* sp. n. A, Lateral view of hypopygium; B, dorsal view of hypopygium; C, hypopygium with aedeagal complex in dorsal view, epandrium removed; D aedeagal complex in lateral view. The photographs are of the paratype collected at Cascate Tre Limiti, Aspromonte National Park.

– Teeth on gonostylus placed more subapically and at mid length, somewhat bigger (Figure 11(C)). Paramere reaching the level of aedeagus and thin for most of its length, with teeth on dorsal surface (Figure 11(B)). In lateral view, aedeagus concave and pointing downward (Figure 11(B)) . . . .*T. robusta*

Description of the new species

Genus ***Tasiocera*** Skuse, 1890

Type species: ***Tasiocera tenuicornis*** Skuse, 1890 designated by Alexander, 1920: 52

Subgenus ***Dasymolophilus*** Goetghebuer, 1920

Type species: ***Erioptera murina*** Meigen, 1818 by original designation

Molophilus **(*Dasymolophilus*):** Goetghebuer, 1920: 132

Tasiocera **(*Dasymolophilus*):** Edwards, 1938: 151

Diagnostic characters

Minute flies, wing length 1.5 to 5.0 mm, very dark in colour and very setose.

Antenna with 16 segments. Scape conical, pedicel rounded and constricted at its base, flagellar segments barrel shaped gradually becoming shorter. Verticils in basal half and much longer than the respective segments, on the last one also on top. Palpus with four segments.

Wing cuneiform, anal lobe reduced (Figure 1). Vein *Sc* reaching beyond or just before the fork of *Rs*. Cross vein *sc-r* retracted. Vein *Rs* forks in R_{2+3}, R_{4+5}. Discal cell missing due to reduction of *m-m*, cross vein *m-cu* before, in line, or beyond fork of *M*. Wing membrane with long setae; in some species these long setae are

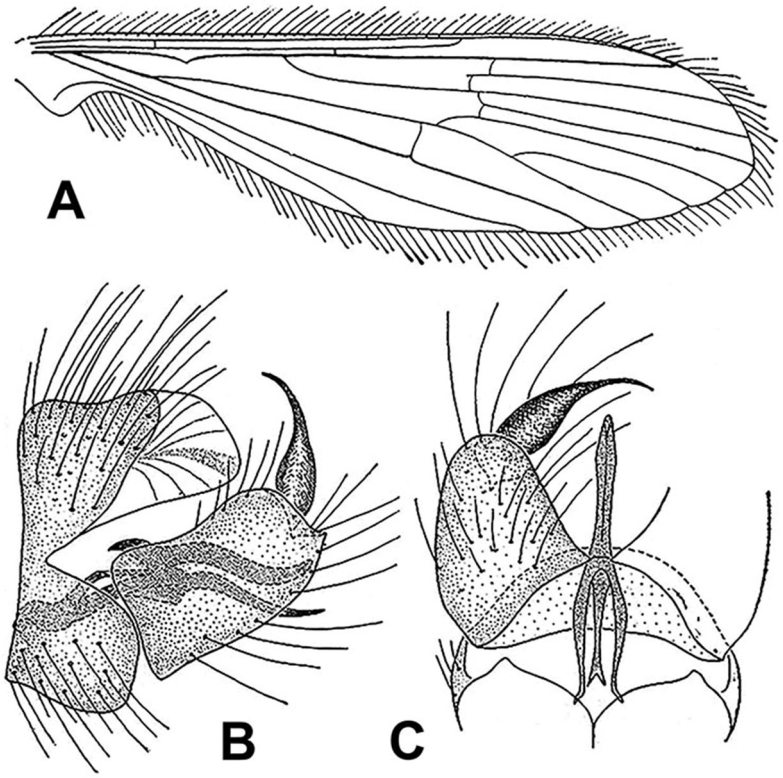

Figure 4. *Tasiocera exigua*. A, wing; B, hypopygium, lateral view; C, hypopygium, dorsal view. Drawings by Savchenko (1973), downloaded from the Catalogue of Crane flies of the World (CCW).

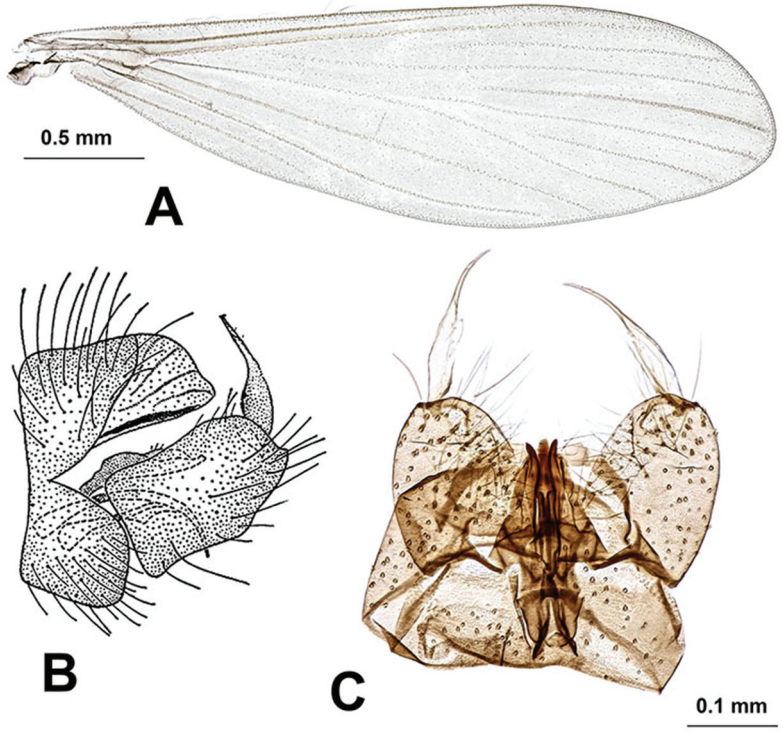

Figure 5. *Tasiocera fuscescens*. A, wing; B, hypopygium, lateral view; C, hypopygium, dorsal view. Drawing of B by Savchenko (1982). Drawing downloaded from the CCW.

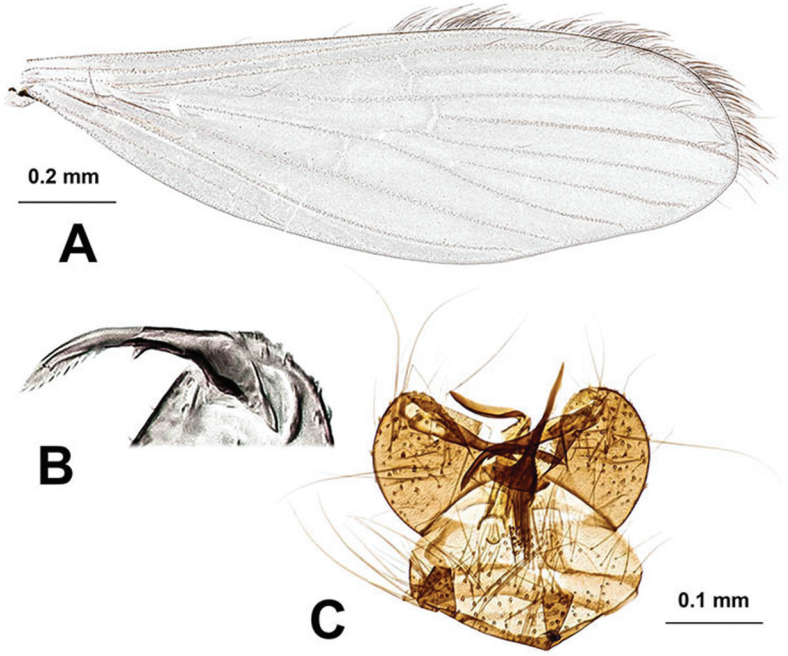

Figure 6. *Tasiocera halesus*. A, wing; B, detail of gonostylus; C, hypopygium. Photo of B by John Kramer (2017). Photo of B downloaded from the CCW.

arranged in rows and are conspicuous, while in some species, few setae are present and scattered. Long setae on thorax and abdomen as well. Mediotergite with a patch of setae. Male hypopygium of the inverted type with one pair of gonostyli. Gonostylus can be bifurcated, smooth, or toothed; size and position of teeth differ between species. Aedeagus pointing downward or upcurved, paramere bifid or not, in some species with teeth. Females of some species have brushes of setae on the last abdominal segments.

Tasiocera denticulata Ciliberti and Podėnas, sp. n.

Material examined

Holotype: 1♂ pinned, Italy, Calabria, Reggio Calabria province, Aspromonte National Park, Sant'Eufemia d'Aspromonte, Contrada San Paolo, 38.21745ºN, 15.86654ºE, ca. 1060 m, 9.VI.2024, collected with an entomological net, leg. P. Ciliberti and S. Podėnas, NRC; Paratypes: 1♂ in ethanol 96%, wing, head and genitalia slide mounted, Italy, Calabria, Reggio Calabria province, Aspromonte National Park, Cascate Tre Limiti, 38.13881ºN, 15.86029ºE, ca. 1490 m, 6.VI.2024, collected with an entomological net, leg. P. Ciliberti and S. Podėnas, NRC; 1♂ pinned, Italy, Basilicata, Potenza province, stream near Pignola, 40.571819ºN, 15.794323ºE, ca. 824 m, 20.VI.2025, collected with an entomological net, leg. P. Ciliberti, NRC.

Diagnosis.

General appearance dark brown to brown. Main feature distinguishing *T. denticulata* sp. n. from other species of the subgenus *Dasymolophilus* is the shape of the ventral branch of the gonostylus (Figure 3(A–C)). This is rather unique and justifies its description as a new species. It is black in colour, strongly toothed, and curved and it reaches the dorsal branch. Among the species with a bifurcated gonostylus, *T. denticulata* sp. n. is the one with the longest ventral branch. *Tasiocera denticulata* sp. n. is very similar to *T. jenkinsoni* Freeman, 1951. The aedeagal complex of the two species is practically identica (Figures 3(D),7(B)). However, in *T. jenkinsoni* the ventral branch of the gonostylus is very short (Figure 7(C,E)). Differences are also to be seen in details of the wing venation. Cross vein *m-cu* is placed more or less at the origin of vein M_1 in *T. denticulata* sp. n. (Figure 2C), while it is placed beyond vein M_1 in *T. jenkinsoni* (Figure 7(A)).

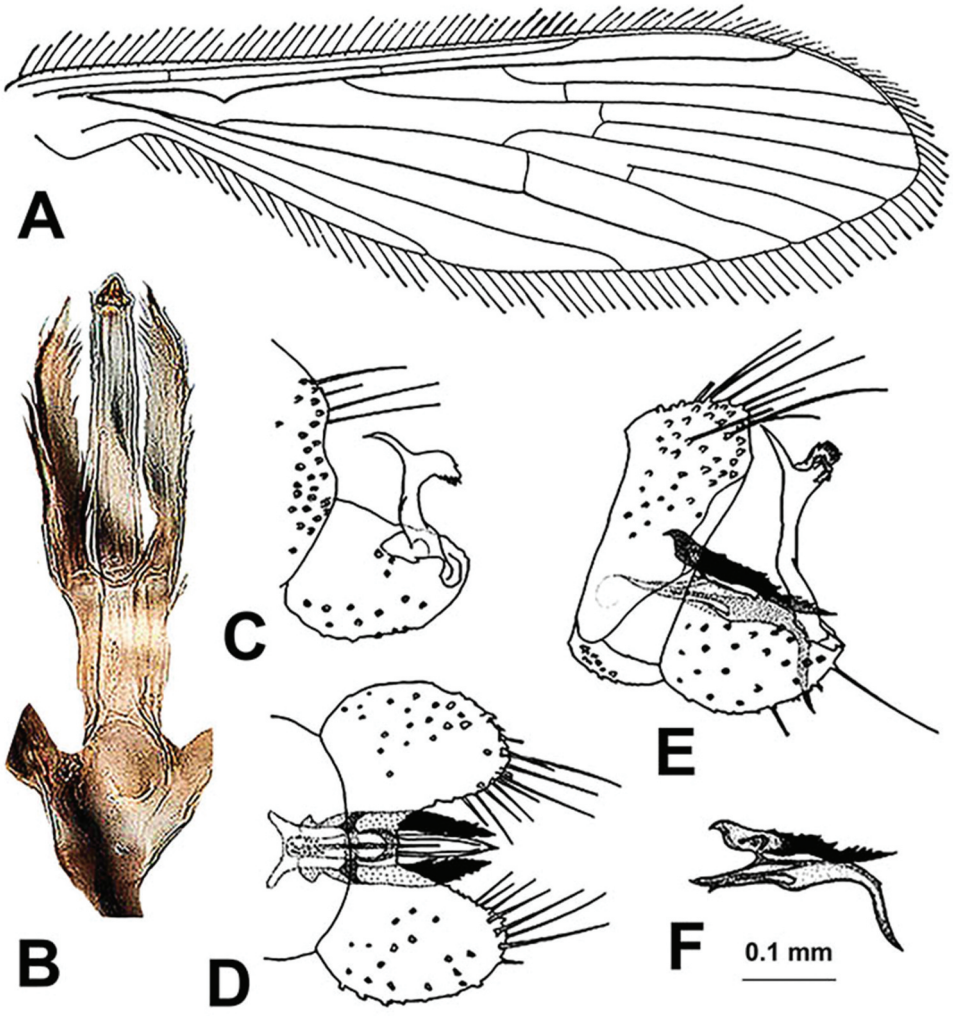

Figure 7. *Tasiocera jenkinsoni*. A, wing; B, aedeagal complex, dorsal view; C, hypopygium, dorsal view; D, hypopygium, ventral view; E, hypopygium, lateral view; F, aedeagal complex, lateral view. Photo of B by J. Kramer (2017). Drawing of A by Savchenko (1982), drawings of C–F by Caspers and Noll (1981). Photograph and drawings downloaded from the CCW.

Description

Head (Figure 2(B)).

Eyes large and widely separated, rostrum short. Palpus with four segments. First conical, second ovoid, third rounded, slightly constricted at base, fourth cylindrical and longer than preceding segments. The colour of the palpus is brown. Antennae composed of 16 segments. Scape cylindrical, pedicel ovoid, asymmetrical, and wider than scape, slightly constricted at base. There are 14 flagellar segments, first five barrel shaped, following nine gradually becoming shorter. The last flagellar segment is short. Verticils on the basal half of flagellomeres, on the last one also on top, much longer than corresponding segments. Colour of antennal segments is brown. Colour of head brown, dark brown on vertex.

Thorax (Figure 2(A)).

Cervical sclerites and pronotum are dark brown. Mesonotonal praescutum and pleuron are also dark brown. Scutum and scutellum are brown. Mediotergite dark brown with a patch of setae at base. Legs pale brown.

Wings (Figure 2(C)).

Greyish brown. *Sc* ends just beyond level of R_{2+3}. R_{2+3} straight. Cross vein *r-m* straight, cross vein *m-cu* at the origin of M_1, which appears very faint and arched. Cross vein *m-cu* very faint as well. Base of M_3 is strongly arched. Anal vein straight. Halteres greyish black on knob and most of the stem, light at base.

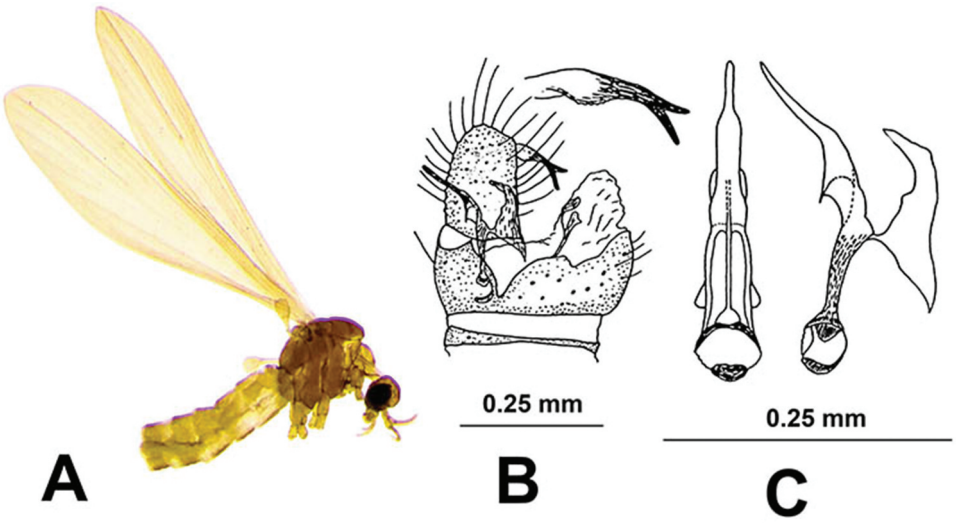

Figure 8. *Tasiocera malickyiana*. A, habitus of holotype; B, hypopygium with detail of gonostylus; C, aedeagal complex, dorsal and lateral view. Photograph in A by Ximo Mengual, ZFMK Bonn. Drawings of B and C by Mendl (1985). Drawings downloaded from the CCW.

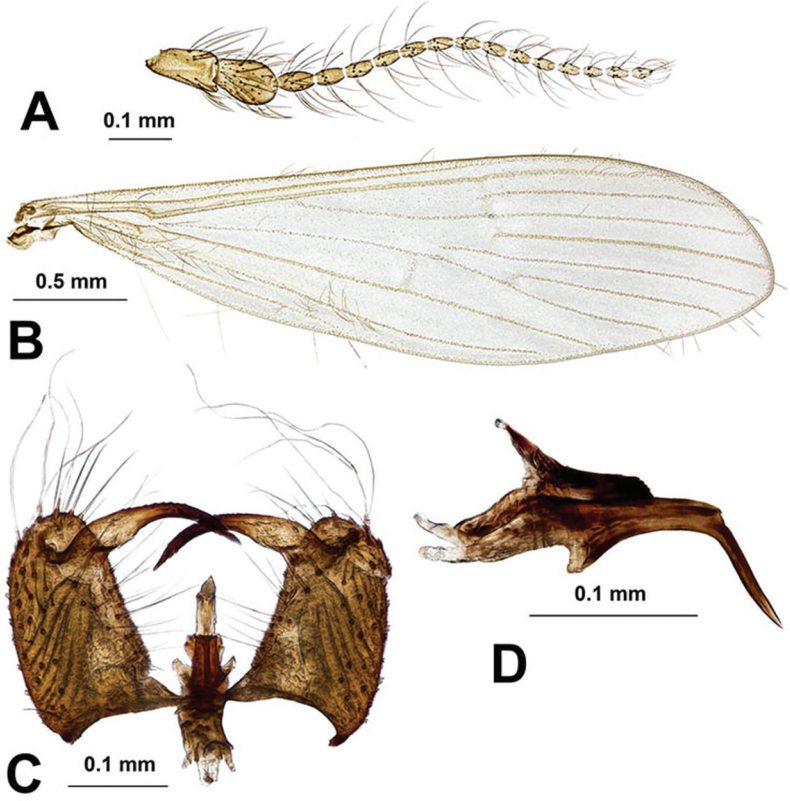

Figure 9. Photographs of paratype of *Tasiocera minima* (ZFMK-DIP-00114762). A, antenna; B, wing; C, hypopygium, dorsal, with epandrium removed; D aedeagal complex, lateral.

Abdomen (Figure 2(A)).

Tergal segments appearing brown

Hypopygium (Figure 3(A–D)).

Gonocoxite cylindrical and asymmetrical, wider at base, and with one gonostylus. Gonostylus bifurcated. Dorsal branch pale brown thin, sinuously curved in lateral view, apex blunt. Ventral branch black, broad,

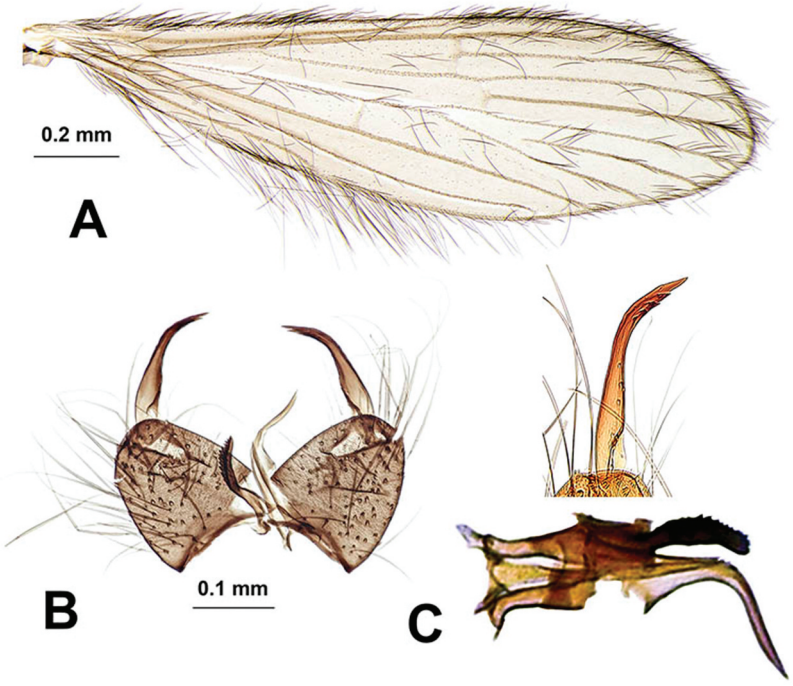

Figure 10. *Tasiocera murina*. A, wing; B, dorsal view of hypopygium; C, detail of gonostylus and aedeagal complex, lateral view.

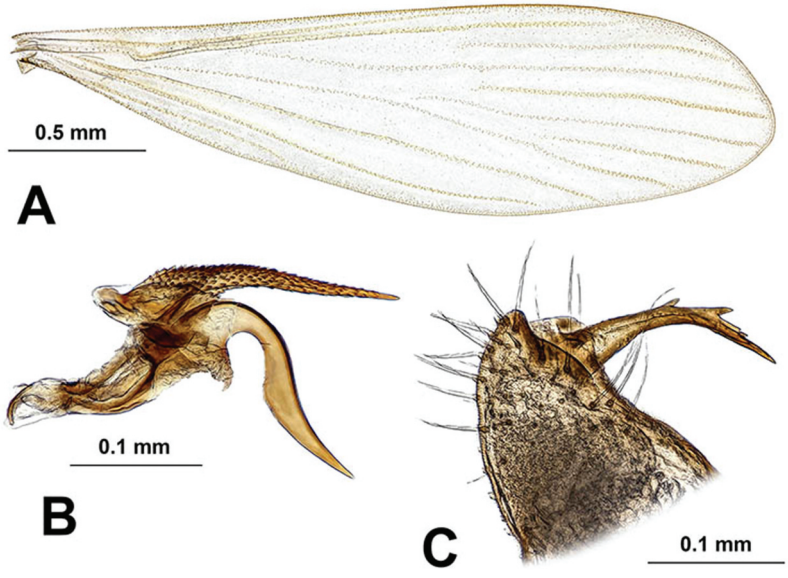

Figure 11. Photographs of specimen of *Tasiocera robusta* collected in Lithuania. A, wing; B, aedeagal complex in lateral view; C, gonocoxite and gonostylus.

strongly toothed and curved, reaching the dorsal branch. Paramere deeply bifid, with many strong teeth on distal third. Aedeagus pointing downward in lateral view; in dorsal view, it appears blunt ended.

Remarks

The description of the new species is based on three males. The holotype and paratypes have lost most of their macrotrichiae (Figure 2(A)). Furthermore, the wing membrane of the left wing of the holotype is slightly broken while the right wing is curled (Figure 2(A)). Only one leg and one antenna are intact. The paratype collected at

Cascate Tre Limiti, Aspromonte National Park, was cleared in KOH 10% for one night (Figure 2(B,C)). The paratype collected near the town of Pignola is intact and pinned. Alive specimens could be darker in colour.

Habitat

Tasiocera denticulata sp. n. was collected along a slow-running stream shaded by trees at ca. 1490 m altitude, very close to the Cascate Tre Limiti waterfalls. The second collection location was a small pond surrounded by alder trees, near agricultural fields at an altitude of ca. 1060 m. The pond served as a water source for the agricultural fields. The third collection location was a slow-running stream very close to the town of Pignola. All the collection locations were quite shaded and dark.

Etymology

The species name refers to the irregular teeth present on both the ventral branch of the gonostylus and the paramere.

Synopsis of the Western Palaearctic *Tasiocera*

Tasiocera (*Dasymolophilus*) *exigua* Savchenko, 1973

Tasiocera exigua Savchenko, 1973: 39

Diagnostic characters

According to the original description, *T. exigua* is a brown species covered with long setae. The thorax exhibits sparse grey pruinosity. The head is dark grey and the coxae and trochanters are brownish yellow. Body length approximately 2.0 mm, with a wing length of nearly 2.5 mm. Vein *Sc* ends at the level of the *Rs* fork (Figure 4(A)). Vein R_{2+3} is positioned before R_2, it is angulate, and short spurred. Cross vein *m-cu* before the origin of M_1. The origins of M_1 and M_3 are arched. Vein A_1 is straight for most of its length and bends at the tip towards the wing base (Figure 4(A)). Gonostylus pointed and smooth (Figure 4(B)), broad and barrel shaped basally, and tapering distally. In lateral view, the aedeagus and paramere are fairly straight basally and upcurved distally (Figure 4(B)).

Remarks

Tasiocera exigua was described by Savchenko in 1973 from the Rakhov district in the oblast of Transcarpathia, based on 17 males.

Savchenko (1973) distinguished the species from other *Tasiocera* primarily on the basis of the aedeagal complex, in which the aedeagus and the paramere are quite straight and only upcurved distally.

The species is quite widely distributed, from Eastern to Central and Northern Europe, and it is also known from the island of Corsica, where it has been collected at ca. 1570 m altitude.

Autio and Salmela (2010) reported *T. exigua* from ditches in the Åland Islands, defining it as a brook specialist. Wiedenska (2014) collected one individual in a bog spring with *Caltha laeta* and *Chaerophyllum hirsutum*. In addition, *T. exigua* has been collected at different altitudes, from about 90 m to above 1600 m (Kolcsár et al. 2021). Possibly, it is a species well adapted to temperate climatic conditions.

Distribution.

Austria, Czech Republic, Finland, France, Germany, Italy, Kazakhstan, Norway, Poland, Romania, Russia, Serbia, Slovakia, Sweden, Switzerland, Ukraine.

Tasiocera (*Dasymolophilus*) *fuscescens* (Lackschewitz, 1940)

Molophilus fuscescens Lackschewitz, 1940: 14

Dasymolophilus muscula Schmid, 1949: 238

Tasiocera (Dasymolophilus) fuscescens: Starý, 2002

Material examined

1♂, 1♀ pinned, Italy, Calabria, Reggio Calabria province, Aspromonte National Park, Cascate Tre Limiti, 38.13881°N, 15.86029°E, ca. 1490 m, 8.VI.2024, collected with an entomological net, leg. P. Ciliberti and

S. Podėnas, NRC; 11♂, 5♀, in ethanol 96%, Italy, Calabria, Reggio Calabria province, Aspromonte National Park, Cascate Tre Limiti, 38.13881°N, 15.86029ºE, ca. 1490 m, 6–13.VI.2024, collected with a Malaise trap, leg. P. Ciliberti and S. Podėnas, NRC; 1♂ in ethanol 70%, Italy, Abruzzo, L'Aquila province, Collelongo, Selva Piana, 21.VI–5.VII.2006, 1500 m, collected with a Malaise trap, leg. M. Romano, RMNH.

Diagnostic characters

A dark species with wing length of approximately 5 mm (Lackschewitz 1940). The wing has vein *Sc* ending beyond the level of R_2 (Figure 5(A)). Vein R_{2+3} is straight and forms a right angle with vein R_3, while R_2 is straight, and beyond vein R_{2+3}. Cross vein *m-cu* is positioned before the origin of M_1. The basal sections of M_1 and M_3 are arched. Vein M_4 is slightly downcurved. Vein *CuP* straight, distally sinuous. Vein A_1 is straight for most of its length and then bends towards wing base (Figure 5(A)).

The abdomen is brown, lighter than the dark brown thorax and head. Legs are pale brown.

Gonostylus single and without teeth, broad and barrel shaped basally, tapering distally to a pointed end; pale yellow. The paramere is deeply bifid, toothless, large basally and then tapers towards a thin, pointed end. The aedeagus is dark coloured and points downward in lateral view (Figure 5(B,C)).

Females with brushes of setae on tergites 6th and 7th.

Remarks

Tasiocera fuscescens is a common and widespread species. Schmid (1949) described *D. muscula* from specimens collected in the canton of Vaud, Switzerland, near Lake Geneva, based on the shape of the aedeagal complex. Later, Starý (2002) synonymized *D. muscula* with *T. fuscescens*.

Tasiocera fuscescens has a simple gonostylus without bifurcation or teeth and can be distinguished from other *Tasiocera* species by its pale yellow gonostylus.

Hövemeyer and Schauermann (2003) reared a single *T. fuscescens* individual from dead beech wood, identifying the larva as phytosaprophagous. This species has been recorded in a wide range of habitats, including small streams with prominent riparian vegetation (Salmela 2011), headwater streams with flowing and intermittent water (Salmela 2012), moist woodlands (Boardman 2016), tufa rich woodland streams (Howe & Howe 2001), and *Dentario glandulosae–Fagetum* forests (Wiedenska 2014).

The recorded altitude for *T. fuscescens* varies between 475 m and 900 m (Starý & Vonička 2018; Starý & Oboňa 2020), although this data is likely incomplete, as suggested by the records presented in this study. Additionally, Hewitt et al. (2017) suggest that *T. fuscescens* prefers acidic soils.

Distribution.

Albania, Azerbaijan, Bulgaria, Czech Republic, Finland, France, Georgia, Germany, Great Britain, Hungary, Ireland, Italy, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, Ukraine.

***Tasiocera* (*Dasymolophilus*) *halesus* (Schmid, 1949)**

Dasymolophilus halesus Schmid, 1949: 238

Tasiocera collini Freeman, 1951: 33

Tasiocera (*Dasymolophilus*) *halesus*: Starý 2002; Kramer 2017: 6

Diagnostic characters

Tasiocera halesus is a dark species, with a wing length of 1.5 to 3.5 mm. The wing is very similar to that of *T. murina* (Freeman 1951). Vein *Sc* ends beyond level of R_2 and cross veins R_2 and R_{2+3} are nearly straight and aligned with each other (Figure 6(A)).

The cross vein *m-cu is* positioned before origin of M_1 and vein *Cu-P* is distinctly sinuous distally (Figure 6(A)).

The gonostylus is not bifurcated, bears teeth along the distal portion of the ventral margin, and has a larger tooth approximately at mid length (Figure 6(B,C)). The paramere reaches the level of the aedeagus and bears teeth dorsally (Figure 6(C)). The aedeagus is concave and directed downward in lateral view (Figure 6(C)).

Remarks

Tasiocera halesus was described in 1949 by Schmid based on two specimens collected near Lausanne, Switzerland, at Belmont and Vidy on 4 July 1948 and on 28 July 1948, respectively (Schmid 1949). The collecting sites were located along a river running through a wood near Belmont and on the margin of Lake Geneva at Vidy. In 1951 Freeman described a new species, *T. collini*. He collected nine males and two females on poplar trees at Chippenham, in southern England.

In his paper Freeman (1951) reports five species of Palaearctic *Tasiocera*, without mentioning *T. halesus*. *Tasiocera collini* and *T. halesus* were later synonymized by Starý (2002). Kramer (2017) compared pictures of the holotype of *T. collini*, deposited at the Natural History Museum of London, with the paratypes of *T. halesus*, preserved at the Museum of Zoology of Lausanne, and confirmed the synonymy proposed by Starý (2002). Alexander (2002) suggested that the larvae of *T. collini* could develop from decaying wood of poplar trees.

Distribution.

France, Great Britain, Ireland, Switzerland.

Tasiocera (*Dasymolophilus*) *jenkinsoni* Freeman, 1951

Tasiocera jenkinsoni Freeman, 1951: 36

Dasymolophilus jelenae Schmid, 1958: 22

Diagnostic characters

Wing length 3.0–3.5 mm. Wing membrane with few macrotrichiae. Vein *Sc* beyond fork of *Rs*. R_{2+3} straight. R_3 originates before R_{2+3}. Cross vein *m-cu* beyond the origin of M_1. Basal section of M_1 arched. Basal section of M_3 is strongly arched. Vein *CuP* is straight for most of its length, then bends towards the wing margin. Vein A_1 is straight for most of its length and then bends towards wing base (Figure 7(A)). Gonostylus is bifurcated, with dorsal branch thin and pointed. Ventral branch very short, broad, and with teeth (Figure 7(C,E)).

Paramere bifid and with irregular teeth. Aedeagus pointing downward in lateral view.

Remarks

Tasiocera jenkinsoni is very similar to *T. denticulata* sp. n. The main differences are the length and shape of the ventral branch of the gonostylus. The short, broad and toothed ventral branch of the gonostylus easily distinguishes the species from other *Tasiocera*.

Schmid (1958) described *T. jelenae* from the village of Capari, at 1500 m altitude. From the drawings in his publication, it is clear that *T. jelenae* is the same species as *T. jenkinsoni* (Savchenko et al. 1992).

Reusch and Hohmann (2009) collected *T. jenkinsoni* along a stream in Bad Harzburg from two locations, at 375 m and 435 m altitude, respectively. Boyce (2002) reports *T. jenkinsoni* in his study on the invertebrate fauna of woodland seepages.

Distribution.

Czech Republic, France, Germany, Great Britain, Hungary, Italy, North Macedonia, Poland, Slovakia.

Tasiocera (*Dasymolophilus*) *malickyiana* Mendl, 1985

Tasiocera malickyiana Mendl, 1985: 155

Diagnostic characters

Tasiocera malickyiana is known only from a single male specimen collected in Sardinia. According to the original description (Mendl 1985), the wing is tinged light brown (Figure 8(A)), with cross veins faint and the origin of *Rs* retracted. The wing venation closely resembles that of *T. murina*. The gonostylus is bifurcate, darkened apically, with dorsal and basal branches smooth and without teeth, and the two branches similar in length. The paramere is short, broader at the base and tapered distally. In lateral view, both the aedeagus and paramere are directed downward (Figure 8(B,C)).

Remarks

Tasiocera malickyiana was collected with a light trap by Hans Malicky in 1981 and stored in ethanol 75%. The collecting locality is Setzu in south-eastern Sardinia at an altitude of ca. 250 m. The only known specimen is the holotype preserved in the ZFMK in Bonn. According to Sinclair and Dorchin (2010), the genitalia were dissected and kept separately, but we could not find them in the ZFMK.

Distribution.
Italy (Sardinia).

Tasiocera (*Dasymolophilus*) *minima* Mendl, 1974

Tasiocera minima Mendl, 1974: 221

Material examined

Paratype: 1♂ (ZFMK-DIP-00114762) body and legs in ethanol 70%, antennae, genitalia and wings slide mounted, Italy, Umbria, Perugia province, Assisi, right tributary of stream Tescio, 15.IV.1971, leg. et det. H. Mendl, ZFMK; 2♂ (ZFMK-DIP-00114752 and ZFMK-DIP-00114758) in ethanol 70%, Italy, Toscana, Firenze province, Reggello, Vallombrosa, forest stream, 19.V.1990, det. H. Mendl 1993, ZFMK.

Diagnostic characters

Small, dark brown species. Wing length 3 mm. Body length approximately 2 mm.

The wing membrane bears rows of macrotrichiae in apical part. *Sc* extends beyond fork of *Rs*. R_{2+3} and R_2 straight (Figure 9(B)). *r-m* placed just beyond R_{2+3}. *m-cu* before the origin of M_1. The origin of vein M_3 is arched, whereas the origin of vein M_1 is very faint. *CuP* sinuous distally (Figure 9(B)).

Gonostylus with teeth on ventral and dorsal side, dark coloured apically (Figure 9(C)). Paramere small, rod-like, blunt ended, and concave in lateral view (Figure 9(D)). Aedeagus straight for most of its length, then abruptly turning downward at nearly a right angle in lateral view (Figure 9(D)). In dorsal view, the aedeagus tapers to a point (Figure 9(C)).

Remarks

Mendl (1974) described *T. minima* from Umbria, central Italy. The collection site of the type series is a stream tributary to the river Tescio, near Assisi. The type locality was an almost dry small stream between a meadow and arable lands. The species was described from ca. 70 males that were swarming.

Tasiocera minima is very similar to *T. murina* and can be distinguished by the shape of the paramere. In *T. murina* the paramere is club shaped and toothed whereas in *T. minima* is banana-like, concave and smooth dorsally.

Starý (2014) collected *T. minima* in the island of Palma de Mallorca at Fangar, in the vicinity of the torrent Massana.

Distribution.
Italy, Spain.

Tasiocera (*Dasymolophilus*) *murina* (Meigen, 1818)

Erioptera murina Meigen, 1818: 113

Erioptera pygmaea Macquart, 1826: 165

Dasymolophilus phlebotomus Schmid, 1949: 240

Molophilus (*Dasymolophilus*) *murinus*: Goetghebuer, 1920: 132

Tasiocera (*Dasymolophilus*) *murina*: Edwards 1938: 151; Starý 2002

Material examined

1♂ pinned, Lithuania, Mažeikiai district, pond near Varduva, black alder groves near dam, 16.VI.1988, collected with an entomological net, leg. S. Podėnas, NRC; 1♂ pinned, Lithuania, Kaunas district, Ringovė entomological sanctuary, deep valley with spruce, alder, hornbeam, 55.0520°N, 23.5140°E, 8.VI.1990, collected with an entomological net, leg. S. Podėnas, NRC: 1♂ pinned, Lithuania, Kaunas district, Ringovė

entomological sanctuary, meadow near pond and stream, 55.0520°N, 23.5140°E, 8.VI.1990, collected with an entomological net, leg. S. Podėnas, NRC; 1♂ pinned, Lithuania, Varėna district, Puvočiai, near Merkys River, 54.1167°N, 24.3000°E, 19.VI.1992, collected with an entomological net, leg. R. Kazlauskas, NRC; 1♂ pinned, Lithuania, Kaišiadorys district, Dijokiškės village, meadow near stream, 30.V.1994, collected with an entomological net, leg. V. Dobrovolskytė, MZVU; 1♂ pinned, Lithuania, Švenčionys district, Obelų Ragas, margin of Lake Žeimenis, 55.28852°N, 26.04626°E, 29.VI.1994, collected with an entomological net, leg. V. Dobrovolskytė, MZVU; 6♂ pinned, Lithuania, Tauragė district, Viešvilė Nature Reserve, mixed alluvial forest, 6–13.VI.2003, collected with a Malaise trap, leg. S. Podėnas and V. Uselis, NRC; 5♂, 2♀ pinned, Lithuania, Tauragė district, Viešvilė Nature Reserve, mixed alluvial forest, 27.V-3.VI.2003, collected with a Malaise trap, leg. V. Uselis, NRC; 12♂, 5♀ pinned, Lithuania, Tauragė district, Viešvilė Nature Reserve, mixed alluvial forest, 3–12.VI.2003, collected with a Malaise trap, leg. V. Uselis, NRC; 3♂, 1♀ pinned, Lithuania, Tauragė district, Viešvilė Nature Reserve, mixed alluvial forest, 12–19.VI.2003, collected with a Malaise trap, leg. V. Uselis, NRC; 11♂, 1♀ pinned, Lithuania, Tauragė district, Viešvilė Nature Reserve, mixed alluvial forest, 19–26.VI.2003, collected with a Malaise trap, leg. V. Uselis, NRC; 7♂, 1♀ pinned, Lithuania, Tauragė district, Viešvilė Nature Reserve, mixed alluvial forest, 26.VI–1.VII.2003, collected with a Malaise trap, leg. V. Uselis, NRC; 31♂, 1♀ pinned, Lithuania, Tauragė district, Viešvilė Nature Reserve, mixed alluvial forest, 1–10.VII.2003, collected with a Malaise trap, leg. V. Uselis, NRC; 10♂, 2♀ pinned, Lithuania, Tauragė district, Viešvilė Nature Reserve, mixed alluvial forest, 10–17.VII.2003, collected with a Malaise trap, leg. V. Uselis, NRC; 8♂ pinned, Lithuania, Tauragė district, Viešvilė Nature Reserve, mixed alluvial forest, 17–24.VII.2003, collected with a Malaise trap, leg. V. Uselis, NRC; 9♂, 1♀ pinned, Lithuania, Tauragė district, Viešvilė Nature Reserve, mixed alluvial forest, 7–15.VIII.2003, collected with a Malaise trap, leg. V. Uselis, NRC; 1♀ pinned, Lithuania, Tauragė district, Viešvilė Nature Reserve, mixed alluvial forest, 15–25.VIII.2003, collected with a Malaise trap, leg. V. Uselis, NRC; 1♂ pinned, Lithuania, Skuodas district, Drupių village, margin of the Sata River, 56.21147°N, 21.69517°E, 17–24.VI.2005, collected with a Malaise trap, leg. S. Podėnas and V. Buivydaitė, NRC; 1♂ pinned, Lithuania, Telšiai district, Vembūtai, 17–24.VI.2006, at light, leg. J. Plečiavičiūtė, NRC; 1♀ pinned, Lithuania, Telšiai district, Vembūtai, 24.VI–1.VII.2006, at light, leg. J. Plečiavičiūtė, NRC; 1♂ pinned, Lithuania, Telšiai district, Vembūtai, 1–8.VIII.2006, at light, leg. J. Plečiavičiūtė, NRC; 8♂ in ethanol, Lithuania, Vilnius, Verkiai Regional Park, heliocrenic shaded spring, 3.VI.2008, collected with an entomological net, leg. V. Buivydaitė, NRC; 39♂ pinned, Lithuania, Molėtai district, margin of Lake Virintai, lower reaches of a small stream, swampy forest, 55.28481°N, 25.47518°E, 141 m, 26.V.2012, collected with an entomological net, leg. S. Podėnas, NRC; 3♂, 1♀ pinned, Lithuania, Molėtai district, Skardis River, slope covered by deciduous trees, many dead trees, springs, 55.29132°N, 25.45485°E, 150 m, 26.V.2012, collected with an entomological net, leg. S. Podėnas, NRC; 1♂ pinned, Lithuania, Molėtai district, margin of Lake Virintai, deciduous forest, meadow, 55.29918°N, 25.45641° E, 148 m, 27.V.2012, collected with an entomological net, leg. S. Podėnas, NRC; 1♂, 1♀ pinned, Lithuania, Molėtai district, Skardis River, Lake Virintai, mixed forest on river slopes, lake margin, 55.29077°N, 25.45412°E, 158 m, 26.VI.2012, collected with an entomological net, leg. S. Podėnas, NRC; 58♂, 1♀ pinned and slide mounted, Lithuania, Trakai district, mouth of the Bražuolė River, slope to the river, 54.75419°N, 24.97734°E, 11.VI.2014, collected with an entomological net, leg. S. Podėnas, NRC.

Diagnostic characters

A very small, brown to dark brown species, with a wing length of 1.5–3.5 mm. The apex of vein *Sc* extends just beyond the fork of *Rs* (Figure 10(A)). Veins R_2 and R_{2+3} are straight, and the cross vein *m-cu* is distinctly before the fork of *M*. Vein *CuP* is sinuous distally, while vein A_1 is straight for most of its length, bending towards the wing base at its tip (Figure 10(A)). The gonostylus bears apical teeth, is curved, and tapers to a point. Teeth of the gonostylus are small and visible only at high magnification (Figure 10(B)). The paramere is club shaped with a blunt end and bears dorsal teeth (Figure 10(C)). The aedeagus, in lateral view, points downward; it is broad basally and tapers distally to a point, with a small ventral notch (Figure 10(C)).

Remarks

Tasiocera murina is a very common species in the Western Palaearctic. The description is very short (Meigen 1818) and concerned with the colour of the body, wings and halteres. Macquart (1826) described *E. pygmaea*, also based on a short description. According to the latter author, *E. pygmaea* is a greyish blackish species, with lighter pleuron, setose wings and abdomen, and the first submarginal cell (cell r_1) being sessile and

the second one (cell r_3) being petiolate. Schmid (1949) described *D. phlebotomus* based on characters of the paramere. He recognized a closer affinity to *T. murina*. In his drawings the distal part of the paramere of *T. murina* is much thinner compared to that of *D. phlebotomus*. *Erioptera pygmaea* and *Dasymolophilus phlebotomus* were synonymized with *Tasiocera murina* by Starý (2002).

Tasiocera murina is very similar to *T. minima* and *T. robusta* and can be distinguished by details of the gonostylus and aedeagal complex.

Tasiocera robusta has the teeth of the gonostylus more pronounced and placed apically and at mid length. In addition, *T. robusta* possesses a much thinner paramere than *T. murina*, and, relative to the aedeagus, the paramere of *T. robusta* is longer than that of *T. murina*.

Tasiocera murina and *T. minima* can be distinguished by the shape of the paramere as discussed above.

Tasiocera murina is collected in open brooks, marshes, springs (Starý & Oboňa 2020), swamps (Ujvárosi 2005) and wet woodlands (Quindroit 2020). Driauach and Belqat (2016) reports *T. murina* from Morocco at two sites on the Rift mountains, at 394 m and 1134 m altitude, respectively.

In a study on Diptera emerging from dead beech wood, Hövemeyer and Schauermann (2003) caught five specimens of *T. murina*, and they suggest larvae of this species are phytosaprophagous. Stubbs (2006) observed *T. murina* walking with head down on leaves of *Acer pseudoplatanus*, suggesting a feeding behaviour.

In summary, *T. murina* is a widespread species, possibly developing in dead wood and moist decaying organic material, although evidence on its biology at this moment is mainly based on observations and not on experimental work.

Distribution.

Austria, Azerbaijan, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Hungary, Ireland, Italy, Lithuania, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine.

Tasiocera (*Dasymolophilus*) *robusta* (Bangerter, 1947)

Dasymolophilus robustus Bangerter, 1947: 366

Tasiocera laminata Freeman, 1951: 33

Tasiocera (*Dasymolophilus*) *robusta*: Savchenko etal., 1992: 295; Kramer, 2017: 6

Material examined

4♂ in ethanol, wings of 2♂ and genitalia of 1♂ slide mounted, Lithuania, Kaišiadorys district, Strošūnai, 54.80796°N, 24.55205°E, 16.VI.1995, leg. et det. S. Podėnas, MZVU.

Diagnostic characters

Small dark species with a wing length of ca. 3 mm. In the material examined, cross veins R_2, R_{2+3}, and *m-cu* are very faint (Figure 11(A)). Vein *Sc* extends beyond fork of *Rs*. Vein R_2 is straight and beyond R_{2+3}, which is straight as well and forms a right angle with vein R_3. The cross vein *m-cu* appears aligned with the origin of M_1. The base of M_3 forms a right angle with the remainder of the vein. Vein *CuP is* sinuous distally while vein A_1 is straight for most of its length and then bends towards wing base (Figure 11(A)).

The gonostylus is toothed and pointed (Figure 11(C)), with prominent teeth apically and at mid length. The paramere is broad at the base, tapering for most of its length, covered with small teeth dorsally; it reaches the level of the aedeagus (Figure 11(B)). In lateral view the aedeagus appears concave. It is broad basally and blade-like distally, pointing downward (Figure 11(B)).

Remarks

Bangerter (1947) described *Dasymolophilus robustus* from Sensetal and Ober Sense in Switzerland. Freeman (1951) described *T. laminata* from a specimen collected at Woodditton Wood as a new species based on the pattern of macrotrichiae on the wing membrane and the genitalia. He did not mention *T. robusta* in his paper (Freeman 1951). Savchenko et al. (1992) proposed the synonymy between *T. robusta* and *T. laminata*, and this was confirmed by Kramer (2017). The latter author compared pictures of the holotype of *T. laminata* in the

collection of the Natural History Museum of London with the drawings of the original description of Bangerter (1947) and came to the conclusion that indeed *T. laminata* is a junior synonym of *T. robusta*.

Tasiocera robusta is similar to *T. halesus* and *T. murina*. They can be distinguished by details of the gonostylus, wing venation, and genitalia. In *T. robusta*, the teeth of the gonostylus are more prominent compared to *T. murina* and are placed apically and at mid length, while *T. halesus* has a very prominent tooth at mid length. The cross vein *m-cu* is in line with the origin of vein M_1 in *T. robusta*, while it is placed before vein M_1 in *T. halesus* and *T. murina*. The paramere of *T. robusta is* much longer and thinner compared to that of *T. murina*.

Tasiocera robusta is collected from woodland seepages, carr (Godfrey 2000), and wet woodlands (Boyce 2002). Kramer and Langlois (2019a) collected *T. robusta* in the Ravin de Valbois, France, which is a wooded gorge with a stream running through it, characterized by clay soil (Kramer & Langlois 2019b).

Conclusions

Tasiocera crane flies of the subgenus *Dasymolophilus* are small, dark flies with bodies and wings densely covered with setae. The gonostylus and the aedeagal complex provide key characteristics for species identification.

The gonostylus can be bifurcated, toothed, or smooth, while the paramere varies in size and shape, being either bifid or single. The size and shape of the aedeagus are also important traits for distinguishing species.

Wing venation also exhibits differences between species, particularly in the position of the cross vein R_{2+3} and *m-cu*. Furthermore, the origin of veins M_1 and M_3 may have a diagnostic significance. However, wing venation alone is insufficient for reliable species identification.

Tasiocera denticulata sp. n. was immediately recognized as a new species due to its remarkably long, curved, and toothed ventral branch of the gonostylus. Morphologically, *T. denticulata* sp. n. resembles *T. jenkinsoni* and the two species seem to be evolutionarily closely related. However, to our knowledge, a phylogenetic analysis of the subgenus *Dasymolophilus* has never been conducted. Little is known about the biology and ecology of these species: some of them have been reared from dead wood or collected in wet woodlands, ditches, brooks, around springs, and in clay or acidic soils. The larval stages are unknown. Some species develop in decaying wood, while others possibly inhabit decomposing organic matter in aquatic or moist substrates.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

All of the data supporting the findings of these studies are included in the text.

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