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New synonyms, combinations and records of biting midges (Diptera: Ceratopogonidae)

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ABSTRACT. Thirty five species previously placed in *Lasiohelea* KIEFFER are transferred to *Forcipomyia* MEIGEN as new combinations. As a result of the studies three new names are proposed for the following junior homonyms: *Forcipomyia neodebenhamae* **nom. n.** for *F. debenhamae* CRANSTON, 1997, *F. neotokunagai* **nom. n.** for *F. tokunaga* (YU et WIRTH, 1997), and *F. neowirthi* **nom. n.** for *F. wirthi* (YU et WIRTH, 1997). Ten new synonyms are proposed for eight species of *Atrichopogon* KIEFFER and *Forcipomyia*: *Atrichopogon luteicollis* BECKER, 1903 (= *A. sanani* BOORMAN et HARTEN, 2002), *A. muelleri* (MÜLLER, 1905) (= *Atrichopogon trifasciatus* var. *globularis* MAYER, 1934), *A. taizi* BOORMAN et HARTEN, 2002 (= *A. wirthi* DELÉCOLLE et BRAVERMAN, 1997 emended name preoccupied, = *A. shaubensis* BOORMAN et HARTEN, 2002), *Forcipomyia* (*F.*) *ciliata* (WINNERTZ, 1852) (= *F. zlatensis* DAMIAN-GEORGESCU, 1972), *Forcipomyia* (*F.*) *hirtula* (ZETTERSTEDT, 1838) (= *F. simulata* WALLEY, 1932; = *F. paradoxa* KRIVOSHEINA, 1968), *Forcipomyia* (*F.*) *longisetosa* KRIVOSHEINA et REMM, 1974 (= *F. helvetica* DELÉCOLLE et SCHIEGG, 1999), *Forcipomyia* (*Thyridomyia*) *monilicornis* (COQUILLETT, 1905) (= *Dasyhelea microcera* KIEFFER, 1919), *F.* (*Euprojoannisia*) *titillans* (WINNERTZ, 1852) (= *F. maricarmenae* SAHUQUILLO et GIL COLLADO, 1982). Seven species are reported for the first time for the Polish fauna and one species for the Bulgarian fauna.

KEY WORDS: Diptera, Ceratopogonidae, synonymy, new combinations, new names, new records, Poland, Bulgaria.

INTRODUCTION

The classification of biting midges requires a number of taxonomic changes. In this paper we resolve relations of some specific names in *Atrichopogon* KIEFFER and *Forcipomyia* MEIGEN, and we propose ten new synonyms. Moreover, some species formerly placed in *Lasiohelea* KIEFFER are transferred to *Forcipomyia*.

Seven species of *Forcipomyia*, *Dasyhelea* KIEFFER, *Alluaudomyia* KIEFFER, *Stilobezzia* KIEFFER, *Serromyia* KIEFFER and *Palpomyia* KIEFFER are reported for the first time from Poland, thus 190 species are known now from this country in the following genera, as follows: *Atrichopogon* KIEFFER (19), *Forcipomyia* (32), *Dasyhelea* (17), *Culicoides* LATREILLE (48), *Allohelea* KIEFFER (1), *Alluaudomyia* (2), *Brachypogon* KIEFFER (13), *Ceratoculicoides* WIRTH et RATANAWORABHAN (1), *Ceratopogon* MEIGEN (2), *Kolenohelea* DE MEILLON et WIRTH (1), *Schizohelea* (1), *Serromyia* (8), *Stilobezzia* (3), *Clinohelea* KIEFFER (1), *Macropeza* MEIGEN (1), *Mallochohelea* WIRTH (4), *Probezzia* KIEFFER (1), *Sphaeromias* CURTIS (3), *Bezzia* KIEFFER (17), *Palpomyia* (14), *Phaenobezzia* HAESELBARTH (1 species).

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TAXONOMY

Atrichopogon (*Psammopogon*) *luteicollis* (BECKER, 1903)

Ceratopogon luteicollis BECKER, 1903: 74 (female, Egypt).

Atrichopogon luteicollis: SZADZIEWSKI 1984: 184 (combination, male, female, = *A. aegyptius* KIEFFER, 1925; *A. phrixus* DE MEILLON, 1943); DELÉCOLLE & RIEB 1993: 110 (record from Spain); SZADZIEWSKI & KNOZ 2002: 249 (= *C. flavoscutellatus).*

Ceratopogon flavoscutellatus BECKER, 1908: 74 (female, Canary Islands).

Atrichopogon aegyptius KIEFFER, 1925: 250 (male, female, Egypt).

Atrichopogon phrixus DE MEILLON, 1943: 105 (male, South Africa).

Atrichopogon (*Psammopogon*) *sanani* BOORMAN et HARTEN, 2002: 434 (male, female, Yemen), **syn. n.**

Discussion

A. luteicollis is a distinctive species with uniquely shaped male genitalia and two seminal capsules. The holotype male of *A. sanani* has a distinctive hammer-like gonostylus and forked apex of the aedeagus typical of *A. luteicollis*, and its name is therefore considered a junior synonym. However, females of *A. sanani* (4 paratypes) have a single seminal capsule and therefore likely represent another species. Females of *A. luteicollis* have two seminal capsules with long heavily sclerotized necks (SZADZIEWSKI 1984).

A. luteicollis has previously been recorded from Africa, the Middle East and southern Europe [South Africa, Sudan, Yemen, Egypt, Algeria, the Canary Islands (Spain) and the Iberian Peninsula (Spain)].

Atrichopogon (Psammopogon) muelleri (MÜLLER, 1905)

Ceratopogon muelleri MÜLLER, 1905: 224 (larva, pupa, Poland).

Ceratopogon muelleri KIEFFER, 1906: 336 (male, female, Poland) (preoccupied by *Ceratopogon muelleri* MÜLLER, 1905).

Forcipomyia muelleri: RIETH 1915: 434, 435, 438 (larva, pupa, Germany).

Atrichopogon muelleri: SZADZIEWSKI et al. 1996: 315 (= *A. cornutus*, male, female); SZADZIEWSKI et al. 1997: 247, 251 (larva, pupa).

Atrichopogon cornutus NIELSEN, 1951: 25, 53, 70 (male, female, larva, pupa, Denmark).

Atrichopogon trifasciatus: BANGERTER 1933: 250 (larva, pupa, Switzerland).

Atrichopogon trifasciatus var. *globularis* MAYER, 1934: 214 (larva, pupa, Sweden); LENZ 1934: 110 (larva, pupa), **syn. n.**

Atrichopogon globularis MAYER, 1934: BORKENT & WIRTH 1997: 24 (status).

Discussion

BORKENT & WIRTH (1997) recognized *A. trifasciatus* var. *globularis* as a valid specific name in the genus *Atrichopogon* and reported that MAYER was its author. MAYER (1934) and LENZ (1934) indicated that KIEFFER was the author of *globularis*, but apparently KIEFFER never published the name. BORKENT & WIRTH (1997) considered MÜLLER rather than KIEFFER as the author of the name *A. muelleri*.

Detailed comparison of the descriptions of larvae and pupae of *A. globularis* (MAYER 1934) with those of *A. muelleri* (MÜLLER 1905, RIETH 1915, LENZ 1934, NIELSEN 1951, SZADZIEWSKI et al. 1997) indicate they are of the same aquatic species in the subgenus *Psammopogon* REMM of *Atrichopogon*, and therefore *A. globularis* should be considered as a junior synonym of *A. muelleri*. The larva of this species has a smooth ovoid patch of clear cuticle on the mesothoracic and each of abdominal segments 1-7, and a characteristic location of dorsal and lateral setae. Furthermore, the immature stages of *A. globularis* were described from Sweden. Otherwise, *A. muelleri* is the only known species of *A.* (*Psammopogon*) in the whole of Scandinavia and northern Europe (SZADZIEWSKI et al. 1996). The larva described by BANGERTER (1933) from Switzerland as *A. trifasciatus* probably is that of *A. muelleri*. However, this statement is uncertain, since more species of *A.* (*Psammopogon*) occur there, and the morphology of those other species are unknown.

Atrichopogon (Psilokempia) taizi BOORMAN et HARTEN, 2002

Atrichopogon (*Atrichopogon*) *taizi* BOORMAN et HARTEN, 2002: 433 (male, Yemen).

Atrichopogon (*Psilokempia*) *wirthi* DELÉCOLLE et BRAVERMAN, 1997: 101 (female, male, Israel) (emended from *wirthorum*; preoccupied by *Atrichopogon wirthi* CHAN et LINLEY, 1988: 189, Florida, USA), **syn. n.**

Atrichopogon (*Psilokempia*) *shaubensis* BOORMAN et HARTEN, 2002: 434 (female, Yemen), **syn. n.**

Discussion

DELÉCOLLE & BRAVERMAN (1997) named the species *A. wirthorum*, but specifically stated that the name was to honour Dr. W. W. Wirth. The name must therefore be emended to *A. wirthi*, a name, which is preoccupied.

The unique male gonocoxite armed with an internal lobe of *A. taizi*, and the characteristic female abdominal sternite 8 with 4 pairs of dark pointed spines of *A. shaubensis* are the same as those of *A.* (*Psilokempia*) *wirthi* DELÉCOLLE et BRAVERMAN, and therefore we consider them conspecific. Because the name *A. wirthi* DELÉCOLLE et BRAVERMAN is preoccupied, we have chosen *A. taizi* to be the name of this species (of the two available in BOORMAN & HARTEN, 2002).

Forcipomyia (*Euprojoannisia*) *titillans* (WINNERTZ, 1852)

Ceratopogon titillans WINNERTZ, 1852: 27 (female, Germany).

Ceratopogon divaricatus WINNERTZ, 1852: 25 (male, Germany).

Forcipomyia (*Euprojoannisia*) *titillans*: REMM, 1962: 180 (male, female, Estonia); REMM, 1988: 100 (synonymy, distribution).

Forcipomyia (*Lasiohelea*) *maricarmenae* SAHUQUILLO et GIL COLLADO, 1982: 303 (male, female, Spain), **syn. n.**

Discussion

The characters of *F. maricarmenae* described from Spain indicate that it should be transferred from the subgenus *Lasiohelea* KIEFFER to the subgenus *Euprojoannisia* BRÉTHES. Moreover, the shape of parameres and the aedeagus in the male genitalia (REMM 1962, Fig. 45) and two seminal capsules in females are identical to those in *F. titillans*, and therefore we propose to treat *F. maricarmenae* as its junior synonym.

F. titillans is a Holarctic species reported from North America, Siberia, the Far East of Russia, and many countries of Europe.

Forcipomyia (*F.*) *ciliata* (WINNERTZ, 1852)

Ceratopogon ciliatus WINNERTZ, 1852: 21 (female, Germany).

Forcipomyia ciliata: SZADZIEWSKI 1986: 11 (male, female, synonymy, distribution).

Ceratopogon brunnipes PERRIS, 1847: 556 (larva, pupa, male, female, France). Preoccupied by *Ceratopogon brunnipes* MEIGEN, 1804.

Ceratopogon perrisi KIEFFER, 1901: 147 (new name for *C. brunnipes*).

Ceratopogon boleti KIEFFER, 1901: 157 (male, female, France).

Forcipomyia turfosa KIEFFER, 1925: 146 (female, Estonia).

Forcipomyia canicularis GOETGHEBUER, 1948: 36 (male, female, Belgium).

Forcipomyia zlatensis DAMIAN-GEORGESCU, 1972: 18 (male, Romania), **syn. n.**

Discussion

DAMIAN-GEORGESCU (1972, Fig. 4) showed the distinctive male genitalia of *F. zlatensis* with a slender gonostylus on its distal half and parameres broadly fused at the bases, which were typical of *F. ciliata* (SZADZIEWSKI 1986, Fig. 11). We, therefore, consider *F. zlatensis* as a junior synonym of *F. ciliata*.

Forcipomyia (F.) hirtula (ZETTERSTEDT, 1838)

Chironomus hirtulus ZETTERSTEDT, 1838: 815 (male, female, Sweden).

Forcipomyia hirtula: SZADZIEWSKI 1986: 17 (redescription of holotype male, northern Sweden).

Forcipomyia simulata WALLEY, 1932: 165 (female, Ontario in Canada), **syn. n.**

Forcipomyia texana simulata: WIRTH 1952: 139 (male, female, Canada, USA).

Forcipomyia paradoxa KRIVOSHEINA, 1968: 588 (male, female, larva, pupa, north European Russia – Arkhangel'skaya Oblast, central European Russia – Yaroslavskaya Oblast, Tulskaya Oblast), **syn. n.**

Discussion

SZADZIEWSKI (1986) redescribed and removed *F. hirtula* from the synonymy of *F. bipunctata*. He concluded the species was close to *F. costata* (ZETT.) and *F. kaltenbachi* (WINN.) and suggested that *F. simulata* from North America was possibly synonymous with *F. hirtula* (rather than with *F. costata* as suggested by WIRTH (1975). Subsequently, we found that KRIVOSHEINA (1968) described all stages of *F. paradoxa* from Russia and the male was very similar to that of *F. hirtula*. The male genitalia of *F. hirtula*, *F. simulata* and *F. paradoxa* have characteristic U-shaped parameres with a broad base and pointed lateral arms. We conclude that they are all the same species. In contrast, *F. kaltenbachi* has H-shaped parameres and *F. costata* has more elongate parameres, which are more narrowly fused at their bases.

F. hirtula is a boreal Holarctic species with larvae living under the dead bark of *Picea*.

Forcipomyia (F.) longisetosa KRIVOSHEINA et REMM, 1974

Forcipomyia (F.) longisetosa KRIVOSHEINA et REMM, 1974: 118 (female, male, larva, pupa, Far East of Russia).

Forcipomyia helvetica DELÉCOLLE et SCHIEGG, 1999: 389 (female, male, Switzerland), **syn. n.**

Discussion

Adults of *F. longisetosa* and *F. helvetica* have low value of the hind leg tarsal ratio (0.6-0.7), slender palpus with a shallow sensory pit, yellow legs in both sexes, unique male genitalia with slender and straight gonostylus and U-shaped parameres, which are broadly fused, with a vase-like basal portion and stout pointed apices. Other descriptive characters are also similar in both species and we conclude that they are of the same species.

Larvae have been found on logs devoid of bark of several tree species in the Far East of Russia.

Forcipomyia (*F.*) *radicicola* EDWARDS, 1924

New country record

POLAND: Rzegnowo near Przasnysz, 12 June 1993, 1 male, K. Grędzińska.

Distribution

This species has previously been reported from England, Germany, Belgium, Austria, Czech Republic, Estonia, and Kirghizia. It is recorded from Poland for the first time.

Forcipomyia sg. *Lasiohelea* KIEFFER

Cladistic analysis indicates that *Forcipomyia* and *Atrichopogon* form a monophyletic group, but the relationships between these two genera and their included subgenera is uncertain (BORKENT & CRAIG in press). Although evidence indicates that *Atrichopogon* is monophyletic, it is possible that *Forcipomyia* is paraphyletic in relation to *Atrichopogon*. Furthermore, the cladistic relationships between 29 subgenera of *Forcipomyia* are unknown. *Lasiohelea* was considered a valid genus by some early workers, but today it is generally accepted as a subgenus of *Forcipomyia*. Some recent publications have described species in the genus *Lasiohelea* and we here transfer those to *Forcipomyia* as new combinations, as follows.

F. angyria (YU et WIRTH), 1997: 21 (*Lasiohelea*) , **comb. n.**
F. araea (YU et WIRTH), 1997: 23 (*Lasiohelea*), **comb. n.**
F. bernicla (YU et WIRTH), 1997: 24 (*Lasiohelea*), **comb. n.**
F. bidenta (YU et WIRTH), 1997: 26 (*Lasiohelea*), **comb. n.**
F. bifidipenis (YU et WIRTH), 1997: 27 (*Lasiohelea*), **comb. n.**
F. binifoliaceus (YU et WIRTH), 1997: 29 (*Lasiohelea*), **comb. n.**
F. bispica (YU et WIRTH), 1997: 30 (*Lasiohelea*), **comb. n.**
F. bonasa (YU et WIRTH), 1997: 31 (*Lasiohelea*), **comb. n.**
F. borneoensis (YU et WIRTH), 1997: 32 (*Lasiohelea*), **comb. n.**
F. chiengmai (YU et WIRTH), 1997: 35 (*Lasiohelea*), **comb. n.**
F. collessi (YU et WIRTH), 1997: 36 (*Lasiohelea*), **comb. n.**
F. dirus (LIU, YAN et LIU), 1996: 11 (*Lasiohelea*), **comb. n.**
F. ficula (YU et WIRTH), 1997: 41 (*Lasiohelea*), **comb. n.**
F. forficula (YU et WIRTH), 1997: 44 (*Lasiohelea*), **comb. n.**
F. hainana (LIU, YAN et LIU), 1996: 12 (*Lasiohelea*), **comb. n.**
F. latifolia (YU et WIRTH), 1997: 48 (*Lasiohelea*), **comb. n.**
F. lepta (YU et WIRTH), 1997: 51 (*Lasiohelea*), **comb. n.**
F. longipalpula (YU et WIRTH), 1997: 54 (*Lasiohelea*), **comb. n.**
F. lui (LIU, YAN et LIU), 1996: 14 (*Lasiohelea*), **comb. n.**
F. luzona (YU et WIRTH), 1997: 56 (*Lasiohelea*), **comb. n.**

F. nepala (YU), 2000: 12 (*Lasiohelea,* misspelled as *nepaia)*, **comb. n.**
F. ostiola (YU et WIRTH), 1997: 60 (*Lasiohelea*), **comb. n.**
F. oxypenis (YU et WIRTH), 1997: 62 (*Lasiohelea*), **comb. n.**
F. pensiledentia (YU et WIRTH), 1997: 63 (*Lasiohelea*), **comb. n.**
F. rhamphis (YU et WIRTH), 1997: 67 (*Lasiohelea*), **comb. n.**
F. ripa (YU et Liu), 2000:125 (*Lasiohelea*), **comb. n.**
F. sirycta (YU et Liu), 2000:126 (*Lasiohelea*), **comb. n.**
F. stellaris (YU et WIRTH), 1997: 68 (*Lasiohelea*), **comb. n.**
F. tambunana (YU et WIRTH), 1997: 73 (*Lasiohelea*), **comb. n.**
F. tawauensis (YU et WIRTH), 1997: 74 (*Lasiohelea*), **comb. n.**
F. tenuidentis (YU et WIRTH), 1997: 75 (*Lasiohelea*), **comb. n.**
F. tokunaga (YU et WIRTH), 1997: 77 (*Lasiohelea*), **comb. n.**
F. uncusidentis (LIU, YAN et LIU), 1996: 16 (*Lasiohelea*), **comb. n.**
F. wirthi (YU et WIRTH), 1997: 80, **comb. n.**
F. yui (LIU, YAN et LIU), 1996: 13 (*Lasiohelea*), **comb. n.**

F. (*Lasiohelea*) *neotokunagai*, nom. n.

Lasiohelea tokunagai YU et WIRTH, 1997: 77 (male, Malaysia). Preoccupied by *Forcipomyia* (*Pterobosca*) *tokunagai* (OKA et ASAHINA, 1948).

Discussion

The transfer of this species to *Forcipomyia* results in *F. tokunagai* YU et WIRTH being preoccupied, and therefore we propose *F. neotokunagai* as a new name for it.

F. (*Lasiohelea*) *neowirthi*, nom. n.

Lasiohelea wirthi YU et WIRTH, 1997: 80 (male, female, Malaysia). Preoccupied by *Forcipomyia* (*Euprojoannisia*) *wirthi* SAUNDERS, 1957.

Discussion

The transfer of this species to *Forcipomyia* results in *F. wirthi* YU et WIRTH being preoccupied, and therefore we propose a new name for it, namely *F. neowirthi.*

F. (*Panhelea*) *brevicubita* GOETGHEBUER, 1920

New country record

POLAND: N. Poland, Babi Dół, nr Gdańsk, 13 May 1989, umbelliferous flowers, 2 males, R. Szadziewski.

Distribution

This rare species has been reported from Georgia in the Caucasus, Crimea in Ukraine,

Algeria in North Africa, Spain, France, Belgium, the Netherlands, Great Britain and Germany. It is recorded from Poland for the first time.

F. (*Pterobosca*) *neodebenhamae*, nom. n.

Forcipomyia debenhamae CRANSTON, in ORR & CRANSTON 1997: 1850 (female, Brunei). Preoccupied by *Forcipomyia* (*Trichohelea*) *debenhamae* CLASTRIER et DELÉCOLLE, 1991.

F. (*Thyridomyia*) *monilicornis* (COQUILLETT, 1905)

Ceratopogon monilicornis COQUILLETT, 1905: 63 (female, British Columbia, Canada).

Forcipomyia (*Thyridomyia*) *monilicornis*: SZADZIEWSKI 1986: 19 (female, synonyms, distribution).

Dasyhelea microcera KIEFFER, 1919: 54 (female, Slovakia, fig. palpus, flagellum); GOETGHEBUER 1934: 34 (female); ZILAHI-SEBESS 1940: 51 (Hungary); BORKENT & WIRTH 1997: 56 (Slovak Republic), **syn. n.**

Forcipomyia (*Thyridomyia*) *microcera*: REMM 1988: 98 (combination).

Discussion

In the original description of the female of *Dasyhelea microcera,* KIEFFER (1919) indicated that the third palpal segment was swollen on its basal half and the terminal flagellomere had an apical prolongation. Such a combination of characters is absent in *Dasyhelea*. KIEFFER & REMM (1988) correctly placed the species in the subgenus *Thyridomyia* SAUNDERS of *Forcipomyia*. The shape of its flagellomeres and palpus are the same as those of *F. monilicornis* described by SZADZIEWSKI (1986) and we propose to treat *F. microcera* as its junior synonym.

Dasyhelea (*Pseudoculicoides*) *bicrenata* KIEFFER, 1923

New country record

BULGARIA: Pirin Mts, Sandanski, 12 June 1984, 2 males, W. Krzemiński.
POLAND: Starogard Gdański, 3 September 1987, 1 male, J. Krzywiński.

Distribution

This species is widely distributed in the Palaearctic Region: Algeria, Spain, Germany, Moldova, Georgia in the Caucasus, and western Siberia. It is recorded here from Bulgaria and Poland for the first time.

Alluaudomyia splendida (WINNERTZ, 1852)

New country record

POLAND: N. Poland, Wyskok nr Kętrzyn, light trap, 29 July 1994, 1 female, R. Szadziewski.

Distribution

This species has previously been reported from Central and North Europe (Austria, Czech Republic, Germany, France, Great Britain, Hungary, Slovakia, Russia) and the Far East of Russia. It is recorded from Poland for the first time.

Serromyia bicolor BORKENT, 1990

New country record

POLAND: N. Poland: Nadole at the Żarnowieckie Lake, 14 May 1982, reared from moist soil taken from a pool on a forest road, 2 males.

Distribution

This species has been previously recorded from Germany and the Caucasus. It is recorded here from Poland for the first time.

Stilobezzia (*Stilobezzia*) *flavirostris* (WINNERTZ, 1852)

New country record

POLAND: Central Poland: Rzegnowo near Przasnysz, 12 June 1993, 1 female, R. Grędzińska.

Distribution

This species has previously been recorded from Austria, Belgium, Bulgaria, Czech Republic, Germany, Estonia, France, Great Britain, Hungary, Italy, Lithuania, the Netherlands, Russia, Ukraine, and the Caucasus. It is recorded from Poland for the first time.

Palpomyia tinctipennis KIEFFER, 1919

New country record

POLAND: S. Poland: the Carpathians: Bieszczady Mts, Ustrzyki Górne, 27 July 1980, netted along stream Wołosaty, 1 male, R. Szadziewski. Babia Góra Mt., Zawoja-Barańcowa, 26 July-3 July 1989, 1 female, 1 male, R. Szadziewski. Determined by Dr. J. Krzywiński.

Distribution

Probably a boreal species occurring in mountainous and submountainous regions. It has previously been reported from Spain, Italy, France, Croatia, Hungary, Czech Republic, Slovakia, and Ukraine. It is recorded from Poland for the first time.

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