POLSKIE PISMO ENTOMOLOGICZNE
BULLETIN ENTOMOLOGIQUE DE POLOGNE
Tom 56: 3-103 Wrocław 30 IV 1986

ENTOMOLOGIA TEORETYCZNA — ENTOMOLOGIE GÉNÉRALE

Redescriptions and notes on some *Ceratopogonidae* (*Diptera*)

Redeskrypcje i uwagi o niektórych *Ceratopogonidae* (*Diptera*)

RYSZARD SZADZIEWSKI
Katedra Zoologii Bezkręgowców UG, ul. Czołgistów 46, 81–378 Gdynia

ABSTRACT. Redescriptions and notes on 54 species of the genera: *Forcipomyia* MEIG. (13), *Atrichopogon* KIEFF. (5), *Dasyhelea* KIEFF. (16), *Culicoides* LATR. (6), *Ceratopogon* MEIG. (1), *Alluaudomyia* KIEFF. (1), *Stilobezzia* KIEFF. (2), *Monohelea* KIEFF. (1), *Nilobezzia* KIEFF. (2), *Macropeza* MEIG. (1), *Palpomyia* MEIG. (2), and *Bezzia* KIEFF. (4 spp.) aregiven. All the biting midges described by ZETTERSTEDT and some of those described by MEIGEN, WINNERTZ, STROBL, BECKER, ENDERLEIN, EDWARDS, CARTER, INGRAM and MACFIE, MACFIE, GOETGHEBUER and STRENZKE from Europe, Greenland, North Africa, Namibia and Ghana are redescribed and illustrated. For many species lectotypes, and for five species neotypes are designated. Thirty three new synonyms are proposed. Special attention in the descriptions is paid to external morphology of female genitalia. Preliminary analysis of the morphology of female genitalia is presented.

The present study is based mainly on the museum material. For the use of this material I wish to acknowledge the following institutions (listed alphabetically by the abbreviations used in the citing specimens) and thank their respective curators who kindly arranged loans:

BMNH — British Museum, Natural History, London; Dr. R. Lane.
IRSNB — Institut Royal des Sciences Naturelles de Belgique, Bruxelles; Dr. P. Grootaert.
MNHN — Muséum National d'Histoire Naturelle, Paris; Dr. J. Clastrier.
NMW — Naturhistorisches Museum, Wien; Dr. R. Contreras-Lichtenberg.

ZMB — Zoologisches Museum, Museum für Naturkunde an der Humboldt—Universität, Berlin; Dr. H. Schumann.
ZML — Zoological Museum, University of Lund, Lund; R. Danielsson.
ZSM — Zoologische Staatssamlung, München; W. Schacht.
SMF — Senckenberg Museum, Frankfurt am Main; W. Tobias.
USNM — U. S. National Museum of Natural History, Washington; Dr. W. W. Wirth.

I used also my own materials (RSz) collected by Dr. P. Sura (Cracow), Dr. W. Krzemiński (Department of Systematic Zoology, Polish Acad. Sci., Cracow), and by myself.

Specimens were mounted on slides or on pinned plastic plates as described by WIRTH and MARSTON (1968).

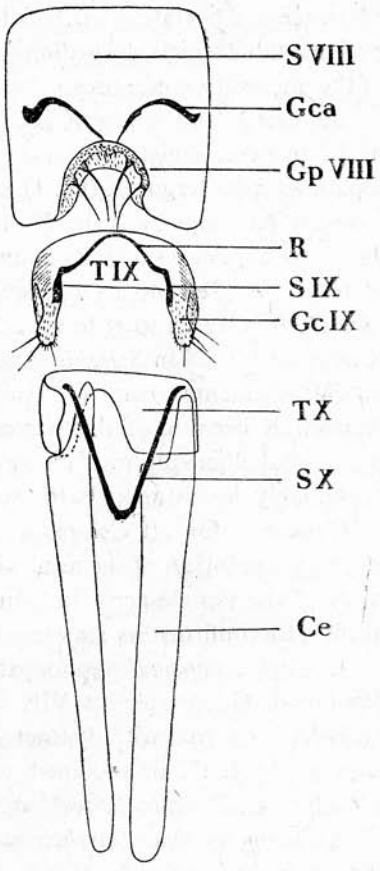
Systematic arrangement of the Ceratopogonidae follows WIRTH et al. (1974).

The following special terms are used in the descriptions: Female antennal ratio (AR) is the combined length of the distal five flagellomeres divided by the combined length of the remaining eight proximal flagellomeres of the female flagellum. Male antennal ratio is the combined length of the distal four flagellomeres divided by the combined length of the remaining nine proximal flagellomeres of the male flagellum. Wing length is measured from the basal arculus to the wing tip, the costal ratio (CR) is the length of costa measured from the basal arculus divided by the wing length. Tarsal ratio (TR) is the length of the basitarsus divided by the length of the second tarsomere; of fore leg — TR (I), middle leg — TR (II), hind leg — TR (III). The length of seminal capsule includes the neck. The terms scutum, scutellum and postnotum which collectively make up the mesonotum are used.

In descriptive morphology of *Ceratopogonidae* female genitalia are usually treated superficially. They are generally termed as genital sclerotizations. For diagnostic purposes shape of unprecisely defined subgenital plate, and shape and number of seminal capsules are used. In the present paper I give more detailed descriptions of female genitalia using mainly terminology of SAETHER (1977).

In the *Ceratopogonidae* as in other nematocerous *Diptera*, elements of abdominal segments VIII–X or XI form the female genitalia (SAETHER, l. c.). Sternite VIII is usually well sclerotized and separated from tergite VIII. In some *Ceratopogoninae* species however sternite and tergite are fused, and continuous around the whole segment VIII. Gonocoxites of the segment VIII are usually absent (? or fused with sternite VIII). In some *Palpomyia* species however gonocoxites are well developed (fig. 206), or rudiments of these appendages are recognizable as gonocoxapodemes as in *Leptoconopinae* (fig.1).

Sternite VIII caudally bears short gonapophyses VIII which are distinct in *Leptoconopinae* (fig. 1) and in many *Ceratopogoninae* (fig. 206). Presumably submedian caudal lobes of sternite VIII in *Dasyheleinae* and *Forcipomyiinae* (fig. 66) should be recognized as strongly sclerotized gonapophyses VIII totally fused with the sternite.



1. Female genitalia of *Leptoconops camelorum* KIEFF. Ce – cercus, Gc IX – gonocoxite IX, Gca – gonocoxapodeme VIII, Gp VIII – gonapophysis VIII, R – rami, S VIII, IX, X – sternite VIII, IX, X; T IX, X – tergite IX, X

Rudiments of gonocoxites IX are recognizable in *Leptoconopinae* only (fig. 1), in other *Ceratopogonidae* absent. Sternite IX in nematocerous *Diptera* is usually desclerotized, membranous. In *Ceratopogonidae* however it is sclerotized in various degree and fused with tergite IX directly or through gonocoxite IX in *Leptoconopinae*. Median part of sternite IX is always desclerotized, except for some *Forcipomyia* (figs. 10, 18). In *Leptoconopinae*, *Dasyheleinae* and *Forcipomyiinae* lateral arms of sternite IX are narrow, but in subfamily *Ceratopogoninae* they are more or less broad (figs. 164, 206). SAETHER (1977) proposed the term gonocoxsternapodeme for sternite IX what is justified in case of the tape-shaped, slender rudiments of the sternite, but not for distinct and broad lateral sternal arms occurring usually in *Ceratopogoninae*.

Pair of invered gonapophyses IX form a notum orally with caudolateral arms as rami (ramus). In *Ceratopogonidae* rami are always fused with sternite IX, as in *Simuiidae* and *Thaumaleidae* (SAETHER, l. c.). Notum present in some *Dasyhelea* (fig. 89), and *Forcipomyia* (fig. 3). The arch-shaped rami are found in *Leptoconopinae*, *Dasyheleinae* and *Forcipomyiinae*, but in the subfamili *Ceratopogonidae* usually only basal parts of rami present (figs. 154, 182, 206) or gonapophyses IX are totally reduced (figs. 164, 198). So called subgenital plate corresponds to gonapophyses IX plus adhering parts of sternite IX.

The term spermatheca is used in the present paper after SAETHER for the entire caecum including seminal capsules, spermathecal glands and spermathecal ducts. Spermathecae consist of 1–3 sclerotized seminal capsules. The seminal capsules are completely reduced in the subgenus *Selfia* KHALAF of the genus *Culicoides*, and the spermathecal ducts function as storage organs (ATCHLEY, 1970). In some species of the family caudally of the spermathecal eminence small plate is visible (figs. 64, 83). Presumably the plate is formed by fused labia which, according to SAETHER (l. c.), are remnants of the papillae of the accessory gonopores.

Sternite X and tergite X are fused and continuous around the whole segment. In *Leptoconopinae* sternite X forms a slender strongly sclerotized fork separated from tergite X (fig. 1). *Sciaridae* and *Tetmatogetinae* (*Chironomidae*) have similar shaped sternite X but separated lateral projections directed caudally are more or less clearly connected or fused with the anterolateral margins of tergite X (*Telmatogeton remanei* REMMERT and *Sciaridae* spp. indet. examined). It is worth to note that SAETHER (1977) misnamed so shaped sternite X as gonostyli IX in *Sciaridae* and *Telmatogetinae*.

One–segmented cerci (appendages of segment XI) appear to belong to segment X because of the reduced segment XI. SAETHER (l. c.) divided the postgenital segments into an apparent segment X, and a postgenital plate presumably homologous with sternite XI.

Generally for all *Ceratopogonidae* only one synapomorphous character is found i. e. fusion of the rami with sternite IX. Within the family three main types of the female genitalia can be outlined. Obviously further studies are needed to confirm this statement.

1. *Leptoconopinae*. Gonocoxites VIII absent. Gonocoxapodemes well developed. Gonapophyses VIII with strongly sclerotized margin of ventral excavation covered with distinct setae. Rudiments of gonocoxites IX present. Gonapophyses IX arch–shaped, notum absent. Sternite IX reduced to narrow lateral arms. Sternite X fork–shaped, strongly sclerotized. Cerci very long.

2. *Forcipomyiinae*, *Dasyheleinae*. Gonocoxites VIII and gonocoxapodemes absent. Gonapophyses VIII indistinct, as caudal lobes of sternite VIII. Gonocoxites IX absent. Gonapophyses IX arch–shaped, notum in many species groups present. Lateral arms of sternite IX usually narrow, sometimes in the middle fused. Sternite X plate–shaped. Cerci short.

3. *Ceratopogoninae*. Gonocoxites VIII and gonocoxapodemes sometimes present. Gonapophyses VIII usually distinct. Gonocoxites IX absent. Usually only rudiments of rami fused with sternite IX present, sometimes gonapophyses IX totally reduced or occasionally (for example *Culicoides segnis* and related species) arch–shaped rami present. Lateral arms of sternite IX usually broad. Sternite X plate–shaped. Cerci short.

ZETTERSTEDT (1838, 1850, 1855) described from Scandinavia and Greenland 22 species in the genus *Ceratopogon*, and one biting midge species in the genus *Chironomus*. Present assignments of the species are as follows.:

1. *Ceratopogon coracinus* ZETT., 1850 — *Bezzia* (s. str.).
2. *C. costatus* ZETT., 1838 — *Forcipomyia* (s. str.), comb. n.
3. *C. dorsalis* ZETT., 1850 — jun. syn. of *Stilobezzia gracilis* (HAL.).
4. *C. ephippium* ZETT., 1855 — jun. syn. of *Palpomyia distincta* (HAL.).
5. *C. flavoscutellatus* ZETT., 1850 — *Dasyhelea* (*Pseudoculicoides*).
6. *C. fuscipes* ZETT., 1850 — jun. syn. of *Atrichopogon fuscus* (MEIG.), syn. n.
7. *C. griseolus* ZETT., 1855 — *Atrichopogon* (s. str.), comb. n.
8. *C. humeralis* ZETT., 1838 — syn. of *Cricotopus ephippium* (ZETT., 1838) (*Chironomidae*).
9. *C. lacteipennis* ZETT., 1838 — *Ceratopogon*.
10. *C. leucogaster* ZETT., 1850 — *Bezzia* (*Homobezzia*).
11. *C. lugubris* ZETT., 1855 — *Forcipomyia* (s. str.), comb. n.
12. *C. minutissimus* ZETT., 1855 — *Culicoides* (Oecacta).
13. *C. nigritulus* ZETT., 1838 — *Bezzia* (s. str.).
14. *C. posticatus* ZETT., 1850 — *Nilobezzia*.
15. *C. pusio* ZETT., 1850 — it does not belong to *Ceratopogonidae* but to *Chironomidae* (2 syntypes examined).
16. *C. sordidellus* ZETT., 1838 — *Culicoides* (s. str.).
17. *C. tarsatus* ZETT., 1855 — jun. syn. of *Palpomyia serripes* (MEIG.).
18. *C. tesselatus* ZETT., 1850 — *Monohelea*.
19. *C. univittatus* ZETT., 1838 — nomen dubium, type destroyed.
20. *C. validinervis* ZETT., 1850 — jun. syn. of *Mycetobia pallipes* (MEIG.) (*Anisopodidae*), det. PEDERSON.
21. *C. villosus* ZETT., 1850 — jun. syn. of *Forcipomyia* (*Microhelea*) *fuliginosa* (MEIG.), syn. n.
22. *C. vittiger* ZETT., 1850 — jun. syn. of *Bezzia* (s. str.) *ornata* (MEIG.), syn. n.
23. *Chironomus hirtulus* ZETT., 1838 — *Forcipomyia* (s. str.), comb. n.

Forcipomyiinae

Forcipomyia (*Panhelea*) *brevicubitus* Goetghebuer

(Figs. 2–4)

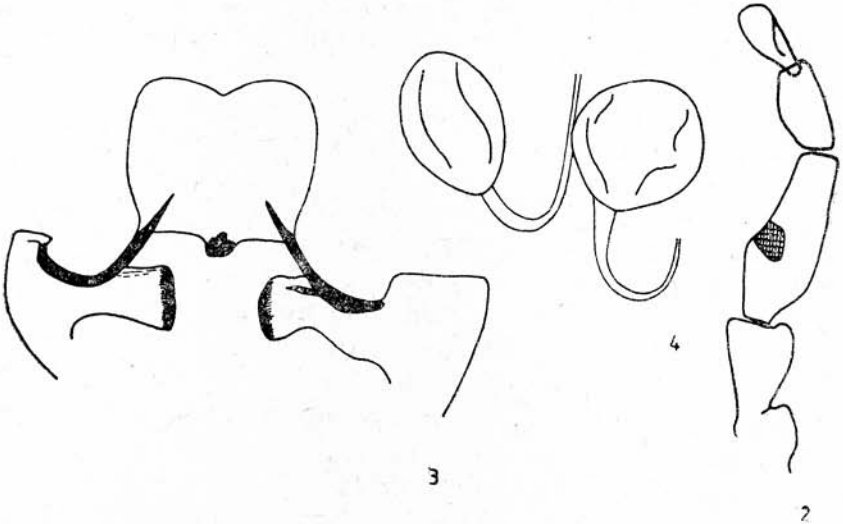
Forcipomyia brevicubitus GOETGHEBUER, 1920: 27 (♀, Belgium).

F. pontica REMM in REMM and ŽOGOLEV, 1968; 831 (♂, ♀, Crimea, Georgia); REMM, 1967: 9 (Caucasus); SZADZIEWSKI, 1983 b: 381 (Algeria), **syn. n.**

DESCRIPTION

♀. Body brown. Legs uniformly brownish. Pale spot at tip of costa present. Halteres yellow.

AR 0.78. Third palpal segment 72 μm long, sensory pit small but distinct (fig. 2). Eyes bare. Wing length 1.10 mm, CR 0.40, cell R_1 absent. TR (I)



2–4. *Forcipomyia* (*Panhelea*) *brevicubitus* GOETGH., holotype female; 2 — palp, 3 — gonapophyses IX and sternite IX, 4 — seminal capsules

1.9, TR (II) 1.9, TR (III) 1.8. Two well sclerotized seminal capsules present, dimensions 58 × 40 μm and 54 × 50 μm. Spermathecal ducts strongly sclerotized for a long distance (fig. 4). Gonapophyses IX well developed, notum large, almost square shaped (fig. 3). Sternite IX with strongly sclerotized and relatively wide lateral arms.

MATERIAL EXAMINED

Belgium: Holotype female of *F. brevicubitus* — "Destelbergen, 17 V 1915, M. GOETGHEBUER, type, ♀, *brevicubitus*, cfr. Mem. Mus. Hist. Nat. Belg. VIII, fasc. pp. 27–28 (1920), R.I.Sc.N.B. 18.073". IRSNB.

DISCUSSION

GOETGHEBUER in his original description gave 7 May 1915 as the collection date while the actual label is 17 May 1915.

DISTRIBUTION

Mediterranean species known from Crimea, Caucasus, Algeria, Belgium, nothern France (Reims, 28 June 1982, sweeping, 1 ♂, leg. R. SZADZIEWSKI, RSz), and Spain (Majorca, Bañai bufar, 9 Aug. 1932, 1 ♂, leg. G. ENDERLEIN, ZMB).

Forcipomyia (Lasiohelea) velox (Winnertz)

(Figs. 5–7)

Ceratopogon velox WINNERTZ, 1852: 28 (♀, West Germany); KIEFFER, 1906; 51 (England, Germany, Austria); GOETGHEBUER, 1920: 28 (♂, Belgium).
Lasiohelea velox: KIEFFER, 1925 a: 51 (♂, ♀, in key); GUCEVIČ, 1973: 264 (♂, ♀, USSR).
Forcipomyia velox: GOETGHEBUER, 1934 a: 17 (♂, ♀, = *pilosipennis*, Germany, Austria, Belgium); ZILAHI-SEBESS, 1940: 32 (♂, ♀, = *hungaricus*, *nitens*, *pilosipennis*, Hungary).
F. (Lasiohelea) velox: REMM, 1962 b: 186 (♂, ♀, = *decrescens*, *hungaricus*, *nitens*, *pilosipennis*, *silesiae*, Estonia); REMM, 1967: 7 (= *montschadskyi*, Caucasus); REMM and ŽOGOLEV, 1968: 831 (Crimea); HAVELKA, 1976: 234 (♂, ♀, West Germany, hosts); HAVELKA, 1979: 60 (Spain); SZADZIEWSKI, 1983 b: 381 (Algeria).
Atrichopogon pilosipennis KIEFFER, 1919: 23 (♀, Hungary).
Ceratopogon nitens KIEFFER, 1919: 20 (♂, Hungary).
C. hungaricus KIEFFER, 1921 b: 298 (n. n. for *C. nitens*).
Lasiohelea decrescens KIEFFER, 1924: 391 (♂, France).
L. silesiae KIEFFER, 1925 a: 49 (n. n. for ♂ of *L. pilosipennis* s. KIEFFER, 1921 a).
L. montschadskyi DZHAFAROV, 1962: 196 (♂, ♀, Caucasus); DŽAFAROV, 1964: 381 (♂, ♀, Caucasus).

DESCRIPTION

♀. Body brown. Legs pale brown, halteres brownish.

Flagellum length 560 μm, AR 1.64 (fig. 5). Third palpal segment ovoid, length 44 μm; sensory pit absent, numerous capitate sensilla on inner surface (fig. 6). Eyes bare. Wing length 0.95 mm, CR 0.57, second radial cell long. TR (I) 1.9, TR (II) 1.6, TR (III) 1.9. Single seminal capsule ovoid, neck absent (fig. 7), dimensions 76×54 μm. Sternite IX narrow, continuous. Rami arch—shaped weakly sclerotized form with sternite IX subgenital plate with circular lumen. Sternite X with large oral excavation.

MATERIAL EXAMINED

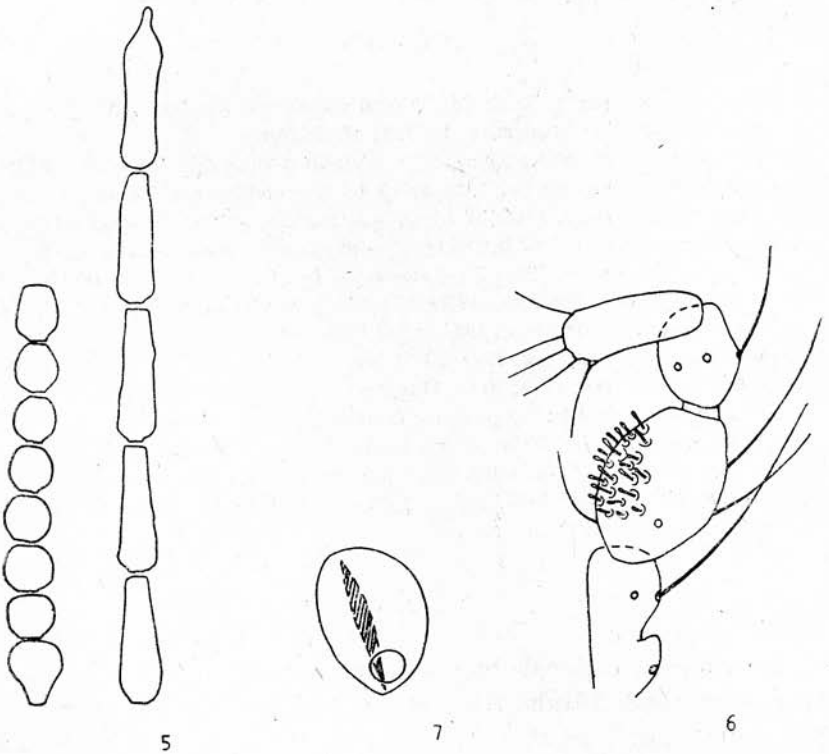
West Germany: Lectotype female of *C. velox*, present designation – "No. 6178, Typus, *velox* WINN., Crefeld". ZMB.

DISCUSSION

WINNERTZ in his original description of *C. velox* mentioned nine females. At present I designate the lectotype since presumably other syntypes of the species exist in other collections.

DISTRIBUTION

Common in Europe, North Africa and Caucasus.



5–7. *Forcipomyia* (*Lasiohelea*) *velox* (WINN.), lectotype female; 5 — flagellum, 6 — palp, 7 — seminal capsule

Forcipomyia (*Microhelea*) *fuliginosa* (Meigen)

Ceratopogon fuliginosus MEIGEN, 1818: 86 (♀, Berlin).
Forcipomyia fuliginosa: REMM, 1962 b: 170 (♂, ♀, synonymy, distribution); WIRTH, 1972: 567 (♂, ♀, synonymy, notes, distribution); WIRTH, 1975: 244 (synonymy, notes, distribution); REMM, 1981: 31 (synonymy).
Ceratopogon villosus ZETTERSTEDT, 1850: 3645 (♂, Sweden), **syn. n.**

DESCRIPTION

♂. Body dark brown. Scutum with long pale setae. Legs yellow, apical portion of hind femur and proximal portion of hind tibia dark. Halteres pale. Pale spot at tip of costa present.

Flagellum length 712 μm, AR 1.02. Third palpal segment slender with deep sensory pit, length 144 μm. Eyes bare. Wing length 1.92 mm, CR 0.50. TR (III) 0.4. Genitalia destroyed.

MATERIAL EXAMINED

Sweden: Holotype male of *C. villosus* — "*C. villosus* ZETT., ♂, Röstanga, 19 Jul.". ZML.

DISCUSSION

Despite the fact that the male genitalia of the holotype of *C. villosus* are destroyed I have no doubts it is a junior synonym of *F. fuliginosa*. The female described by DESSART (1963) with extremely unequal spermathecae (lengths 130 and 80 μm) is not *fuliginosa* since in the European, North African and Korean females of the species I have examined seminal capsules are only slightly unequal, measuring ca. 70–80 μm.

DISTRIBUTION

Cosmopolitan species (?). The adult females attack the caterpillars and feeding upon the haemolymph (WIRTH, 1972, 1975).

Forcipomyia (s. str.) *ciliata* (Winnertz)

(Figs. 8–11)

Ceratopogon ciliatus WINNERTZ, 1852: 21 (♀, West Germany).
Forcipomyia ciliata: SAUNDERS, 1924: 200 (larva, = *boleti*, notes); EDWARDS, 1926: 395 (= *boleti*, England); GOETGHEBUER, 1934 a: 11 (♂, ♀, syn., distribution); REMM, 1962 b: 175 (♂, ♀, = *turfosa*, Siberia, Estonia); WIRTH, 1965: 125 (USA); REMM, 1973a: 172 (Mongolia); HAVELKA, 1976: 229 (♂, ♀, West Germany); REMM, 1979: 54 (= *radicicola* s. REMM, 1962; Estonia); SZADZIEWSKI, 1983 a: 66 (Poland).
Ceratopogon boleti KIEFFER, 1901: 157 (♂, ♀, France); GOETGHEBUER, 1920: 24 (♂, ♀, Belgium); KIEFFER, 1924: 395 (notes).
Forcipomyia turfosa KIEFFER, 1925 b: 146 (♀, Estonia).
F. canicularis GOETGHEBUER, 1948 a: 36 (♂, ♀, Belgium), **syn. n.**
F. radicicola: REMM, 1962 b: 177 (♂, Estonia, Siberia).

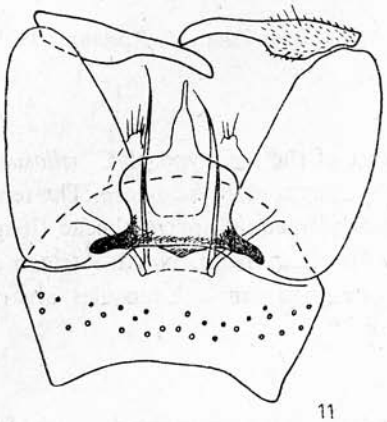
DESCRIPTION

♀. Body uniformly blackish brown. Pale spot at tip of costa absent.

AR 0.97. Third palpal segment 130 μm long with distinct sensory pit at the base (fig. 8). Wing length 1.76 mm, CR 0.52, cell R_1 indistinct. All

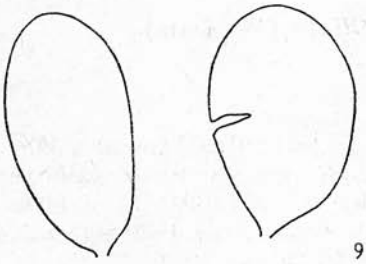
tibiae with lanceolate scales. TR (I) 1.2, TR (II) 1.0, TR(III) 1.0. Two ovoid seminal capsules present (fig. 9), dimensions 96×46 μm and 90×56 μm. Sternite IX narrow, strongly sclerotized and continuous. Arch–shaped rami fused with sternite IX, lumen egg–shaped; notum absent (fig. 10).

♂. Similar to female with the usual sexual differences. Wing length 1.45 mm, CR 0.44. TR (III) 0.9. Genitalia (fig. 11); gonostyle with distinctly slender distal half, parameres fused at the bases.

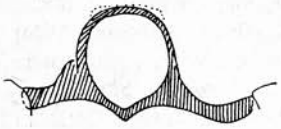


11

8



9



10

8–11. *Forcipomyia* (s. str.) *ciliata* (WINN.). 8–10 — lectotype female of *Ceratopogon ciliatus* WINN, 11 — lectotype male of *Forcipomyia canicularis* GTGH.; 8 — third palpal segment, 9 — seminal capsules, 10 — rami and sternite IX, 11 — male genitalia

MATERIAL EXAMINED

West Germany: Lectotype female of *C. ciliatus*, present designation — "*C. ciliatus* WINNERTZ, Crefeld, No. 6166". ZMB.

Belgium: Lectotype male of *F. canicularis*, present designation — "Heusden, 16. 8. 47, type ♂, *F. canicularis* GTGH., R. I. Sc. N. B. 18. 073". IRSNB.

DISCUSSION

WINNERTZ in his description of *C. ciliatus* mentioned 18 female syntypes. I have found three syntypes in the Zoologisches Museum in Berlin. I designate one of them as the lectotype. Probably there are further syntypes in the British Museum since EDWARDS (1926) wrote that he had seen specimens determined by WINNERTZ. GOETGHEBUER (1948) based *F. canicularis* on 4 ♂ and 1 ♀ from Heusden. I received only single male which at present I designate as the lectotype. The author stated that the female of *F. canicularis* had lanceolate scales on the middle and hind tibiae in contrast to *F. ciliata* with lanceolate scales on all tibiae. Present examination of the lectotype male of *F. canicularis* suggests it is a junior synonym of *F. ciliata*. The female of the species presumably had scales on fore tibiae destroyed, or it belongs to the other species.

DISTRIBUTION, ECOLOGY

Arboreal Holarctic species recorded from northern, central, and western Europe, eastern Siberia, Mongolia and from USA. Larvae living in decaying fruits, fungi and water plants (HAVELKA, 1976). Reared from touchwoods of *Larix* MILL. (Belgium, Bruxelles, 3–8 Nov. 1966, L. ALLAER, 10 ♂, 5 ♀, IRSNB) and from *Isonotus hispidus* (BULL.) (Belgium, Watermael, VI–VIII 1964, E. JANMOULLE, ex *Fomes hispidus*, polypore du moyer mis en élevage, 15 ♂, 17 ♀, IRSNB).

Forcipomyia (s. str.) *nigra* (Winnertz)

(Figs. 12–15)

Ceratopogon niger WINNERTZ, 1852: 17 (♂, ♀, West Germany).
Forcipomyia nigra: GOETGHEBUER, 1934 a: 14 (♂, ♀, distribution); REMM, 1962 b: 177 (♂, ♀, Estonia); HAVELKA, 1976: 231 (♂, ♀, West Germany); SZADZIEWSKI, 1983 b: 366 (Algeria).

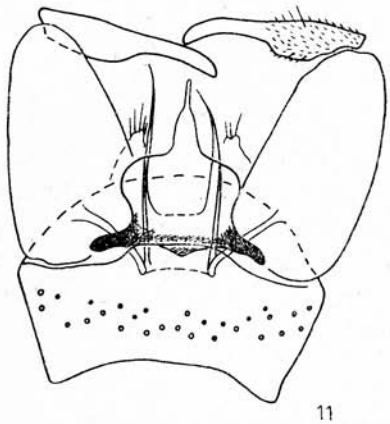
DESCRIPTION

♀. Body blackish brown. Pale spot at tip of costa present. Halter knob pale.

Flagellum length 700 μm, AR 0.76 (fig. 12). Third palpal segment 100 μm. long, slender, sensory pit small (fig. 13). Eyes bare. Wing length 1.31 mm, CR 0.46. Wing membrane covered with dark long scales, especially numerous on costal and radial veins. Tibiae without lanceolate scales. TR (I) 1.0, TR (II) 1.4, hind legs absent. Two slightly unequal seminal capsules present, smaller one measuring 80×60 μm. Sternite IX and gonapophyses IX hardly visible. Sternite X V–shaped (fig. 14).

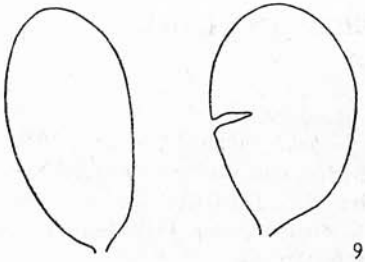
tibiae with lanceolate scales. TR (I) 1.2, TR (II) 1.0, TR(III) 1.0. Two ovoid seminal capsules present (fig. 9), dimensions 96×46 μm and 90×56 μm. Sternite IX narrow, strongly sclerotized and continuous. Arch-shaped rami fused with sternite IX, lumen egg-shaped; notum absent (fig. 10).

♂. Similar to female with the usual sexual differences. Wing length 1.45 mm, CR 0.44. TR (III) 0.9. Genitalia (fig. 11); gonostyle with distinctly slender distal half, parameres fused at the bases.

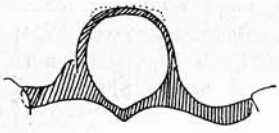


11

8



9



10

8–11. *Forcipomyia* (s. str.) *ciliata* (WINN.). 8–10 — lectotype female of *Ceratopogon ciliatus* WINN, 11 — lectotype male of *Forcipomyia canicularis* GTGH.; 8 — third palpal segment, 9 — seminal capsules, 10 — rami and sternite IX, 11 — male genitalia

MATERIAL EXAMINED

West Germany: Lectotype female of *C. ciliatus*, present designation — "*C. ciliatus* WINNERTZ, Crefeld, No. 6166". ZMB.

Belgium: Lectotype male of *F. canicularis*, present designation — "Heusden, 16. 8. 47, type ♂, *F. canicularis* GTGH., R. I. Sc. N. B. 18. 073". IRSNB.

DISCUSSION

WINNERTZ in his description of *C. ciliatus* mentioned 18 female syntypes. I have found three syntypes in the Zoologisches Museum in Berlin. I designate one of them as the lectotype. Probably there are further syntypes in the British Museum since EDWARDS (1926) wrote that he had seen specimens determined by WINNERTZ. GOETGHEBUER (1948) based *F. canicularis* on 4 ♂ and 1 ♀ from Heusden. I received only single male which at present I designate as the lectotype. The author stated that the female of *F. canicularis* had lanceolate scales on the middle and hind tibiae in contrast to *F. ciliata* with lanceolate scales on all tibiae. Present examination of the lectotype male of *F. canicularis* suggests it is a junior synonym of *F. ciliata*. The female of the species presumably had scales on fore tibiae destroyed, or it belongs to the other species.

DISTRIBUTION, ECOLOGY

Arboreal Holarctic species recorded from northern, central, and western Europe, eastern Siberia, Mongolia and from USA. Larvae living in decaying fruits, fungi and water plants (HAVELKA, 1976). Reared from touchwoods of *Larix* MILL. (Belgium, Bruxelles, 3–8 Nov. 1966, L. ALLAER, 10 ♂, 5 ♀, IRSNB) and from *Isonotus hispidus* (BULL.) (Belgium, Watermael, VI–VIII 1964, E. JANMOULLE, ex *Fomes hispidus*, polypore du moyer mis en élevage, 15 ♂, 17 ♀, IRSNB).

Forcipomyia (s. str.) *nigra* (Winnertz)

(Figs. 12–15)

Ceratopogon niger WINNERTZ, 1852: 17 (♂, ♀, West Germany).
Forcipomyia nigra: GOETGHEBUER, 1934 a: 14 (♂, ♀, distribution); REMM, 1962 b: 177 (♂, ♀, Estonia); HAVELKA, 1976: 231 (♂, ♀, West Germany); SZADZIEWSKI, 1983 b: 366 (Algeria).

DESCRIPTION

♀. Body blackish brown. Pale spot at tip of costa present. Halter knob pale.

Flagellum length 700 μm, AR 0.76 (fig. 12). Third palpal segment 100 μm. long, slender, sensory pit small (fig. 13). Eyes bare. Wing length 1.31 mm, CR 0.46. Wing membrane covered with dark long scales, especially numerous on costal and radial veins. Tibiae without lanceolate scales. TR (I) 1.0, TR (II) 1.4, hind legs absent. Two slightly unequal seminal capsules present, smaller one measuring 80×60 μm. Sternite IX and gonapophyses IX hardly visible. Sternite X V–shaped (fig. 14).

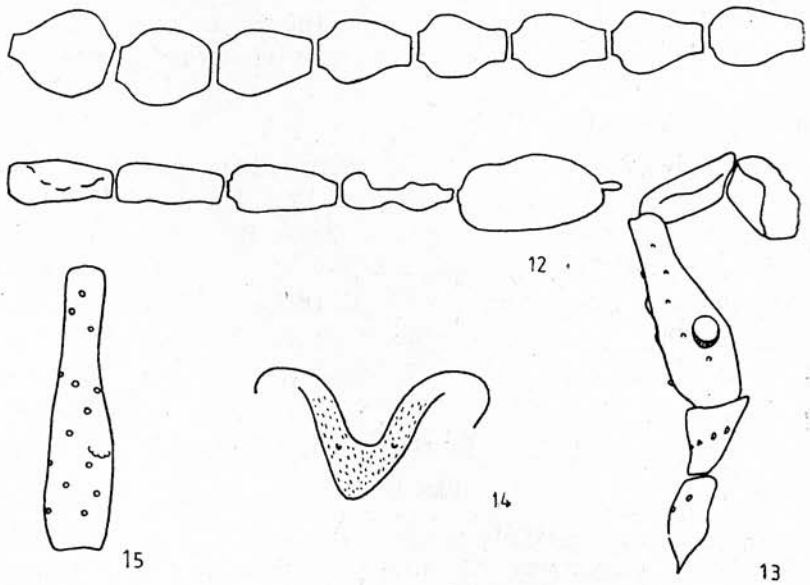
♂. Strongly destroyed. Body black. Third palpal segment slender, length 144 μm, sensory pit indistinct (fig. 15). Wing length 1.70 mm, CR 0.41, pale spot at tip of costa invisible.

MATERIAL EXAMINED

West Germany: Lectotype female and paralectotype male, present designations — "No. 6165, Crefeld, WINN., *Ceratopogon niger*". ZMB.

DISTRIBUTION

Arboreal species recorded from North Africa, Europe and Caucasus.



12–15. *Forcipomyia* (s. str.) *nigra* (WINN.). 12–14 — lectotype female, 15 — paralectotype male; 12 — flagellum, 13 — palp, 14 — sternite X, 15 — palp

Forcipomyia (s. str.) *lugubris* (Zetterstedt), comb. n.

(Figs. 16–18)

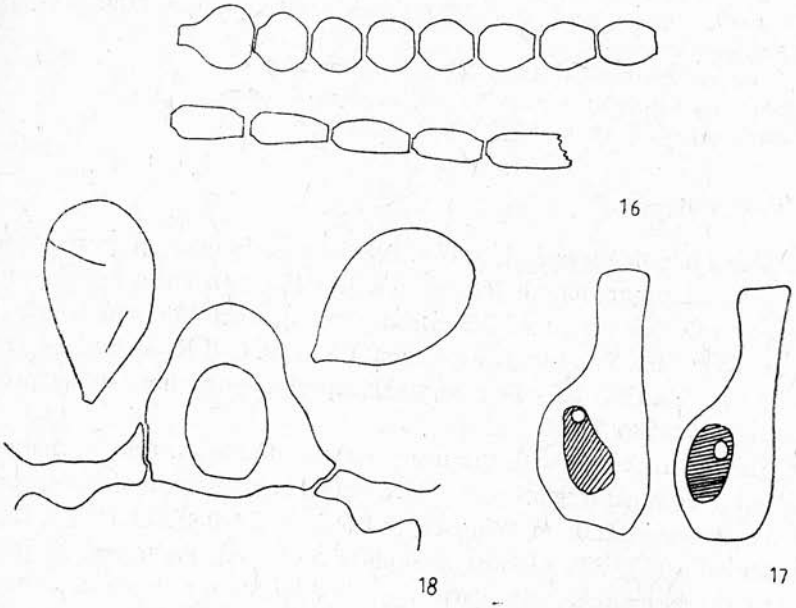
Ceratopogon lugubris ZETTERSTEDT, 1855: 4863 (♀, Sweden).

DESCRIPTION

♀. Body including legs blackish brown. Humeral area with small yellow patch. Halter knob pale. Pale spot at tip of costa present.

Proximal flagellomeres spherical to slightly elongate (fig. 16), length 428 μm; distal flagellomeres cylindrical. AR ca. 0.9. Third palpal segment with

strongly swollen basal half (fig. 17), sensory pit deep, opening small; length 140 μm. Eyes bare. Wing length 1.68 mm, CR 0.49, cell R_1 invisible. Lanceolate scales on tibiae absent. TR (I) 1.3, TR (II) 1.2, TR (III) 1.2. Two seminal capsules egg–shaped with short necks (fig. 18), dimensions 102 × 60 μm and 92 × 62 μm. Subgenital plate with O–shaped lumen (fig. 18). Sternite X with shallow oral excavation, tip evenly triangular.



16–18. *Forcipomyia* (s. str.) *lugubris* (ZETT.), lectotype female; 16 — flagellum, 17 — third palpal segments, 18 — gonapophyses IX and seminal capsules

MATERIAL EXAMINED

Sweden: Lectotype female, present designation — "*Cer. lugubris* ZETT. n.sp. ♀, Esperöd 1820, Scan[ia]". ZML.

DISCUSSION

Paralectotype female labelled, "Mulfj., Mulfjell, Jemtland, 27–28/6 40" belongs to an other *Forcipomyia* (s. str.) species. It is similar to the lectotype but TR 0.8–0.9, AR 1.2 and the subgenital plate is different.

DISTRIBUTION

Sweden.

Forcipomyia (s. str.) *costata* (Zetterstedt), comb. n.

(Figs. 19–22)

Ceratopogon costatus ZETTERSTEDT, 1838: 821 (♂, ♀, Sweden).
Ceratopogon piceus WINNERTZ, 1852: 21 (♂, ♀, West Germany), **syn. n.**
Forcipomyia picea: EDWARDS, 1926: 397 (♂, ♀, England, = *latipalpis*, *corticicola*); GOETGHEBUER, 1934 a: 15 (♂, ♀, = *latipalpis*, *corticicola*); REMM, 1962 b: 170 (♂, ♀, = *corticicola*, *latipalpis*, *meinerti*, *turficola*; Estonia).
Ceratopogon latipalpis KIEFFER, 1901: 159 (♀, France); GOETGHEBUER, 1920: 24 (♂, ♀, Belgium).
Forcipomyia meinerti KIEFFER, 1915: 281 (♂, ♀, Denmark).
Ceratopogon corticicola KIEFFER, 1919: 14 (♂, ♀, West Germany).
Forcipomyia turficola KIEFFER, 1925 b: 147 (♂, ♀, Estonia).

DESCRIPTION

♀. Body including legs dark brown. Pale spot at tip of costa present. Halter knob pale. Flagellum length 760 μm, AR 1.11 (fig. 19). Third palpal segment greatly swollen on proximal 2/3, sensory pit distinct (fig. 20), length 108–120 μm. Eyes bare. Wing length 1.48 mm, CR 0.48. Cell R_1 absent. TR (I) 1.1, TR (II) 0.8, TR (III) 0.9. Two seminal capsules with short necks present, dimensions 76–88 × 72–80 μm.

♂. Similar to female with the usual sexual differences. Caudal margin of proximal abdominal tergites pale. Third palpal segment enlarged on proximal half (fig. 21), length 120 μm. Wing length 1.68 mm, CR 0.45. TR (I) 1.1, TR (III) 0.8. Genitalia (fig. 22). Gonostyle slightly S-shaped. Parameral projections long, at the bases relatively narrowly fused; median portion of parameres 2.1 times longer than width.

MATERIAL EXAMINED

Sweden: Lectotype male and two paralectotypes females of *C. costatus*, present designations — "Lappon". ZML. The lectotype without antennae and middle tarsi. One of the paralectotypes without wings and some leg segments. Types were pinned together.

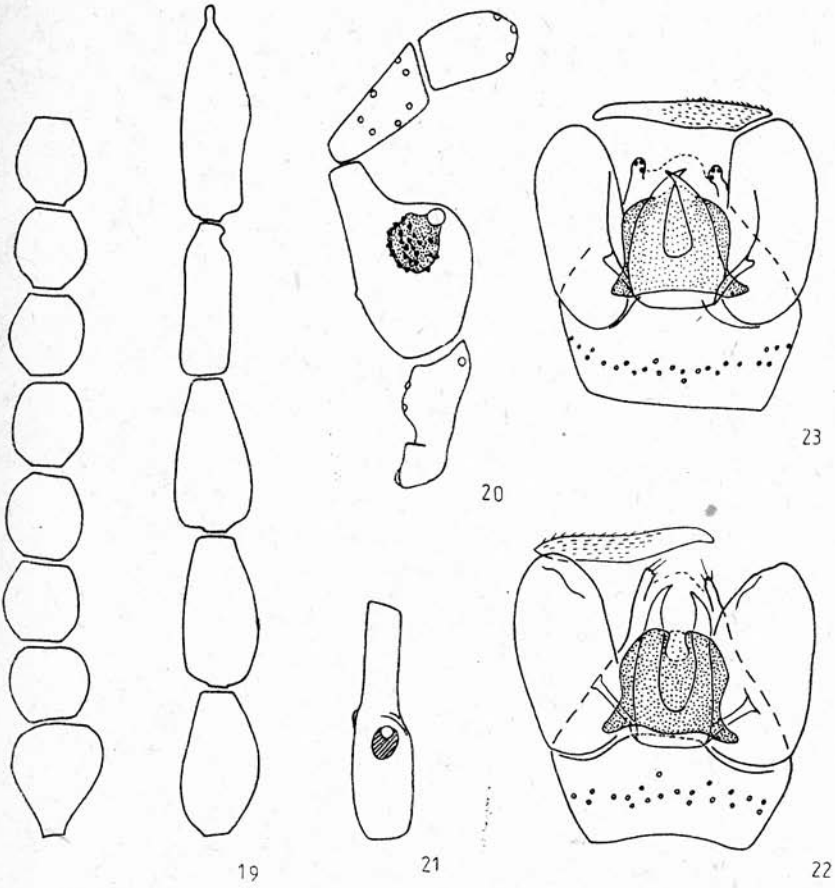
DISCUSSION

ZETTERSTEDT (1850) listed *C. costatus* with the synonyms of *F. bipunctata* "... *Cerat. costatus*... ♂ est sine dubio tantum specimen detritum *Cerat. bipunctati* variet, a." and was followed by KIEFFER (1906 p. 52) and by HAVELKA (1976 p. 228). The synonymy of *F. simulata* WALLEY, 1932 from North America with *F. picea* (WIRTH, 1975 p. 243) is doubtful, since female of the former species has very deep sensory pit and parameres of the male genitalia

(WIRTH, 1952) are broadly fused at the bases. *F. simulata* is rather closer or synonymous with *F. hirtula* (ZETT.) than with *F. costata*.

DISTRIBUTION

Central and northern Europe.



19–23. *Forcipomyia* (s. str.) *costata* (ZETT.), 19–20 — paralectotype female, 21–22 — lectotype male; *F.* (s. str.) *hirtula* (ZETT.), 23 — holotype male, 19 — flagellum, 20 — palp, 21 — third palpal segment, 22, 23 — male genitalia

Forcipomyia (s. str.) *hirtula* (Zetterstedt), comb. n.

(Fig. 23)

Chironomus hirtulus ZETTERSTEDT, 1838: 815 (♂, ♀, Sweden).

DESCRIPTION

♂. Body brown, legs yellowish. Halter knob pale. Pale spot at tip of costa invisible.

Third palpal segment enlarged at the base, sensory pit distinct, length 128 μm. Wing length 1.76 mm, CR 0.45. TR (II) 0.8, TR (III) 0.9. Genitalia (fig. 23) very close to those of *F. costata* but submedian projections of parameres widely fused at the bases. Median portion of parameres 1.5 times longer than width. Basal arms of parameres rather short.

MATERIAL EXAMINED

Sweden: Holotype male of *Chironomus hirtulus* — "*C. bipunctatus* L. ♂. *Chir. hirtulus*, Ins. Lapp., Juckasj[ervi]". ZML.

DISCUSSION

ZETTERSTEDT (1850 p. 3653) synonymized *Ch. hirtulus* with *Forcipomyia bipunctata* which was accepted by KIEFFER (1906 p. 52), and HAVELKA (1976 p. 228). However present examination of the type does not confirm the above synonymy. *F. hirtula* is close to *F. costata* but has pale legs and parameres 1.5 times longer than broad, submedian projections fused for a long distance. *F. costata* has dark legs, median portion of parameres 2.1 times longer than broad and submedian projections fused only at the bases. *F. hirtula* is probably a senior synonym of *F. kaltenbachi* (WINNERTZ, 1852) sensu REMM (1962 b, p. 170).

DISTRIBUTION

Northern Sweden.

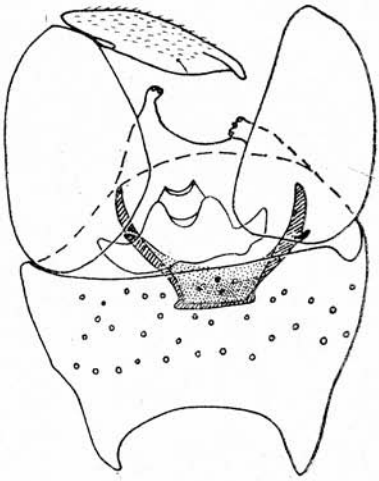
Forcipomyia (*Euprojoannisia*) *palustris* (Meigen), comb. n.

(Fig. 24)

Ceratopogon palustris MEIGEN, 1804: 28 (♂, ♀, Germany).
Ceratolophus palustris: KIEFFER, 1906: 61 (combination).
Dasyhelea palustris: GOETGHEBUER, 1922: 55 (♂, combination).
Euforcipomyia hirtipennis MALLOCH, 1915: 313 (♀, USA), **syn. n.**
Forcipomyia hirtipennis: BYSTRAK and WIRTH, 1978: 26 (♂, ♀, = *turfacea*, distribution).
F. turfacea KIEFFER, 1925 b: 148 (♂, ♀, Estonia); REMM, 1962 b: 180 (♂, ♀, Estonia); REMM, 1971: 186 (Far East of USSR); HAVELKA, 1976: 233 (♂, ♀, West Germany); HAVELKA, 1978 b: 62 (Austria).

DESCRIPTION

♂. Body dark brown. Legs pale brown, tarsi paler. Halter knob pale.



24. *Forcipomyia* (*Euprojoannisia*) *palustris* (MEIG.), male genitalia of the lectotype

Antennae absent. Third palpal segment slender, length 86 μm, sensory pit small and shallow. Eyes bare. Wing length 1.37 mm, CR 0.44. Cell R_1 absent, cell R_2 small, elliptic. TR (I) 1.5, TR (II) 1.2. Male genitalia as on fig. 24.

MATERIAL EXAMINED

Germany: Lectotype male of *C. palustris*, present designation – "coll. MEIGEN, no. 184 a, *Ceratopogen palustris* ♂, MEIGEN 317.40". MNHN. Paralectotype female – "coll. MEIGEN, No. 184 b, *Ceratopogon palustris* ♀, MEIGEN 316.40", MNHN, belongs to *Atrichopogon minutus* (MEIG.).

DISCUSSION

Dr. J. CLASTRIER sent me, mounted on slides, two of three specimens labelled by KIEFFER as *C. palustris*. The male now designated as the lectotype belongs to the genus *Forcipomyia*, not to *Dasyhelea* as stated by GOETGHEBUER (1922) in his paper on the MEIGEN's types. The third male specimen without abdomen also belongs to the genus *Forcipomyia* as informed me Dr. J. CLASTRIER. Old records of *palustris* are not valuable, since even GOETGHEBUER misidentified this species.

DISTRIBUTION

Arboreal boreal (s. str.) Holarctic species recorded from northern North America, Far East of USSR and northern Europe, reaching southward in the mountains.

Forcipomyia (*Thyridomyia*) *monilicornis* (Coquillett)

(Figs. 25–27)

Ceratopogon monilicornis COQUILLETT, 1905: 63 (♀, Canada).

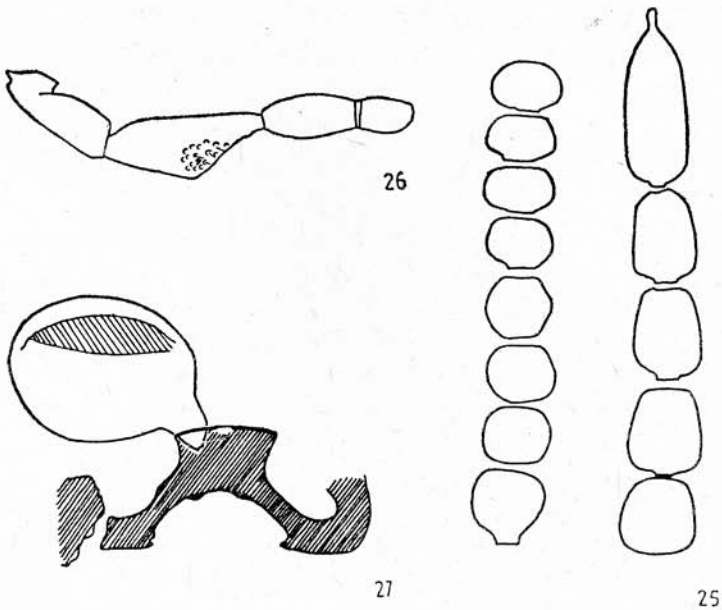
Forcipomyia monilicornis: DOW and WIRTH, 1972: 183 (♂, ♀, = *hirtus*, *palustris*, distribution); de MEILLON and WIRTH, 1981 b: 570 (= *kabashae*, South Africa); SZADZIEWSKI, 1983 b: 377 (Algeria).

Ceratopogon hirtus LUNDSTRÖM, 1910: 34 (♀, Finland).
Thyridomyia palustris SAUNDERS, 1925: 269 (all stages, England).
Forcipomyia curticornis GOETGHEBUER, 1933: 354 (♀, Belgium), **syn. n.**
F. kabashae de MEILLON, 1959: 333 (♂, Zaire).

DESCRIPTION

♀ Body dark brown, tarsi paler. Scutellum pale.

Flagellum length 392 μm, AR 1.14, flagellomeres V–VIII transverse (fig. 25). Third palpal segment slightly swollen with some scattered sensilla (fig. 26), length 60 μm. Eyes in the middle pubescent. Wing length 0.87 mm, CR 0,54. TR (I) 2.2, TR (II) 2.0, TR (III) 2. 1. Claws sharply pointed. Single seminal capsule retort–shaped with short neck (fig. 27), dimension 86×58 μm. Sternite IX desclerotized in the middle, rami arch–shaped, notum broad and short (fig. 27).



25–27. *Forcipomyia* (*Thyridomyia*) *monilicornis* (COQ.), lectotype female of *F. curticornis* GTGH.; 25 – flagellum, 26 – palp, 27 – seminal capsule and gonapophyses IX

MATERIAL EXAMINED

Belgium: Lectotype female of *F. curticornis*, present designation – "Chiny, 17–22.8.33, M. GOETGHEBUER, *Forcipomyia curticornis* GTGH., R.I.Sc.N.B. 18.073, type, M. GOETGHEBUER, ♀". IRSNB. Paralectotype female – "Chiny, 17–22.8.33, M. GOETGHEBUER, Reg.

Mus. Hist. Nat. Belg. I.G. 11.097, Dr. M. GOETGHEBUER det. 1936, *Forcipomyia curticornis* GTGH., paratype, Bull. Ann. Soc. ent. Belg. T. 73, 1933, p. 354" belongs to *F. titillans* (WINNERTZ, 1852).

DISCUSSION

I have examined two of the three type females mentioned by GOETGHEBUER in his description of *F. curticornis*. The author usually did not designate holotypes and paratypes and the labels "type" or "paratype" were pinned later by GOETGHEBUER or by another person, so I treated these two type specimens as syntypes. The lectotype that agrees with the original description is *F. monilicornis*, but the paralectotype is *F. titillans*.

DISTRIBUTION

Widespread in Holarctic and Afrotropical Regions.

Forcipomyia (Synthyridomyia) murina (Winnertz)

(Fig. 28)

Ceratopogon murinus WINNERTZ, 1852: 26 (♂, ♀, West Germany).
Forcipomyia murina: DOW and WIRTH, 1972: 197 (♂, ♀, = *moascari*, distribution); REMM, 1981: 31 (= *aurosparsum*, *moascari*); SZADZIEWSKI, 1983 b: 379 (= *sulfurea*, *hirtipalpis*, *sate*; Algeria).
Apelma aurosparsum KIEFFER, 1919: 65 (♂, Hungary).
Forcipomyia sulfurea KIEFFER, 1923: 664 (♀, Algeria).
F. hirtipalpis KIEFFER, 1924: 392 (♂, France).
F. sate KIEFFER, 1925 c: 245 (♂, ♀, Egypt).
F. longitarsis TOKUNAGA, 1940 b: 92 (♂, Taiwan), **syn. n.**
F. moascari MACFIE, 1943: 147 (♂, ♀, Egypt).
F. attonsa GOETGHEBUER, 1950: 1 (♂, Belgium), **syn. n.**
F. murina sibmurina REMM, 1980: 115 (♂, ♀, southern Siberia), **syn. n.**

DESCRIPTION

♂. Male genitalia (fig. 28). Sternite IX long without caudomedian excavation. Gonocoxite slender and long. Gonostyle slender, slightly curved, basal third pubescent. Aedeagus with long median projection and two pairs of shorter lateral sclerites; basal bridge bearing short and stout caudally directed lateral arms. Parameres with two basal arms, caudal process long, rod-like.

MATERIAL EXAMINED

Belgium: Lectotype male of *F. attonsa*, present designation — "Knocke–s–m, 19. 9. 49, M. GOETGHEBUER, *Forcipomyia attonsa* n. sp., R. I. Sc. N. B. 18.073", originally mounted on plastic plate. Paralectotype male of *F. attonsa* — labelled as above except for date 18. 9. 49 plus label type. IRSNB.

DISCUSSION

The complicated and characteristic male genitalia of *F. murina* readily distinguish the species. There is no doubt that *F. attonsa* now examined is a junior synonym of the species. Basing on the figure of male genitalia given by TOKUNAGA (1940) for *F. longitarsis* I list it also with the synonyms of *F. murina*. REMM (1980) divided the species into two subspecies: *murina sibmurina* (body black, scutellum dark, legs brownish, wing length 1.3–1.7 mm, southern Siberia) and nominate subspecies *murina murina* (scutellum and legs yellow, wing length 0.9–1.3 mm, West Europe, Mediterranean to Kazakhstan). This proposition is quite unjustified, since in my materials from Poland and Algeria I have both dark and pale, smaller and larger specimens of the species. On the other hand it is normal variation in colour without correlation between this character and body size and the geographical distribution.

DISTRIBUTION

Widespread in Holarctic and Afrotropical Regions.

Forcipomyia (Synthyridomyia) acidicola (Tokunaga)

(Fig. 29)

Lasiohelea acidicola TOKUNAGA, 1937: 455 (all stages, Japan).
Forcipomyia acidicola: SZADZIEWSKI, 1983 b: 379 (= *colemani*)
F. minuta GOETGHEBUER, 1947: 228 (♂, Belgium), **syn. n.**
F. colemani WIRTH, 1952: 146 (♂, ♀, USA); DOW and WIRTH, 1972: 193 (♂, ♀, = *knockensis* s. REMM, distribution).
F. knockensis: REMM, 1962 b: 184 (♀, Estonia).

DESCRIPTION

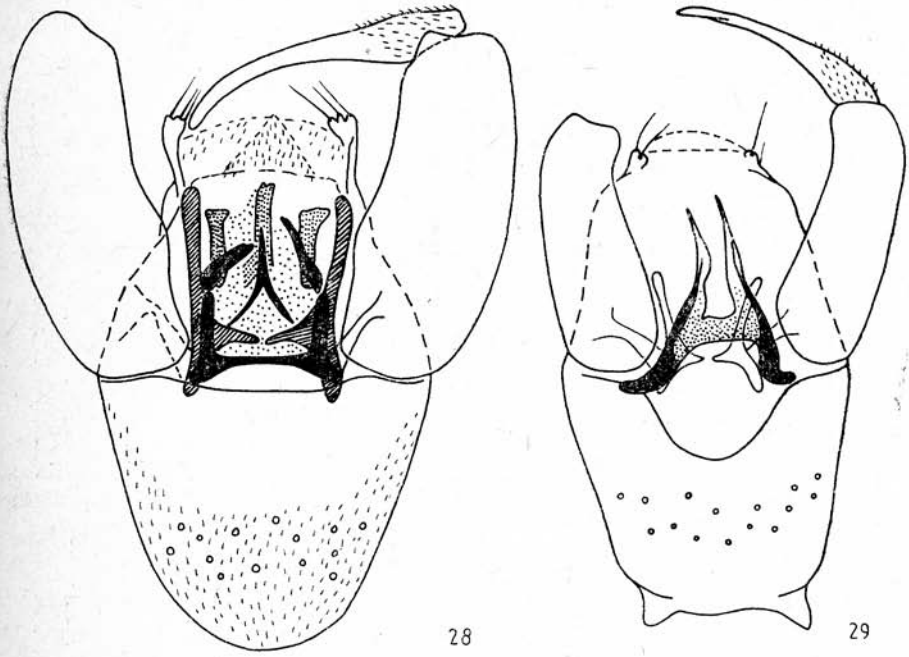
♂. Body dark brown, tarsi and halteres paler. Third palpal segment without sensory pit. Eyes in the middle pubescent. Wing length 0.97 mm, CR 0.48. TR (I) 2.1, TR (III) 2.2. Genitalia (fig. 29). Sternite IX with broad U-shaped caudomedian excavation. Gonocoxite long and slender. Gonostyle long and slender, basal third pubescent. Aedeagus with strongly sclerotized basal arms, lateral sclerites with slender weakly sclerotized posterior projections. Parameres with rather slender distal process somewhat enlarged at apex.

MATERIAL EXAMINED

Belgium: Holotype male of *F. minuta* – "Heusden, 25 VIII 46, M. GOETGHEBUER, *Forcipomyia minuta* GTGH., R.I.Sc.N.B., 18.073, type". IRSNB.

DISTRIBUTION

Arboreal Holarctic species recorded from North America, Japan, Belgium, Estonia and Poland (Kętrzyn, *Umbelliferae* flowers, 22 July 1981, 1♂; Szklarska Poręba and Sosnówka Dolna in Karkonosze Mts., 3–5 Aug. 1982, 3 ♂; leg. R. Szadziewski. (RSz).



28–29. *Forcipomyia* (*Synthyridomyia*) *murina* (WINN.), 28; and *F.* (*S.*) *acidicola* TOK., 29; 28 – male genitalia of paralectotype of *F. attonsa* GTGH., 29 – male genitalia of holotype of *F. minuta* GTGH.

Forcipomyia (*Synthyridomyia*) *knockensis* Goetghebuer

Forcipomyia knockensis GOETGHEBUER, 1938: 375 (♂, ♀, Belgium); DOW and WIRTH, 1972: 195 (= *abludens*); HAVELKA, 1979: 59 (Spain); SZADZIEWSKI, 1983 a: 66 (Poland); SZADZIEWSKI, 1983 b: (= *bequaerti*).

F. bequaerti GOETGHEBUER, 1942: 1 (♂, Begium).

F. abludens REMM in REMM and ŽOGOLEV, 1968: 830 (♂, ♀, Crimea, Voronež distr., Caucasus, Estonia); REMM, 1967: 7 (Caucasus).

MATERIAL EXAMINED

Belgium: Lectotype male and paralectotype female of *F. knockensis*, present designations – "Knocke, 9 V 38, M. GOETGHEBUER, type ♂, coll. et det. M. GOETGHEBUER, *Forcipomyia knockensis* GTGH., R. I. Sc. N. B., 18.073". The paralectotype labelled as above.

IRSNB. Holotype male of *F. bequaerti* — "*Forcipomyia Bequaerti*, Knocke (Zwýn), 21 VIII 1938, Belgique, M. BEQUAERT, cf. Bull. Mus. Hist. Nat. Belg. T. XVIII, No. 46, 1942, pp. 1–2, coll. et det. M. GOETGHEBUER, *Forcipomyia Bequaerti* GTGH., R.I.Sc.N.B., 18.073". IRSNB.

DISCUSSION

The present examination of the types of *F. knockensis* and *F. bequaerti* confirms my previous claim that these two species were synonymous (SZADZIEWSKI, 1983 b). DOW and WIRTH (1972) mentioned a paratype male of *F. knockensis* preserved in USNM which is unusual, since GOETGHEBUER did not divide his types into holotype and paratypes.

DISTRIBUTION

European halobiontic species, according to REMM (1979) steppean, recorded from Spain, Belgium, Poland, Estonia, Crimea, Voronež distr. and Caucasus.

Atrichopogon (*Psammopogon*) *flavolineatus* (Strobl)

(Figs. 30–36)

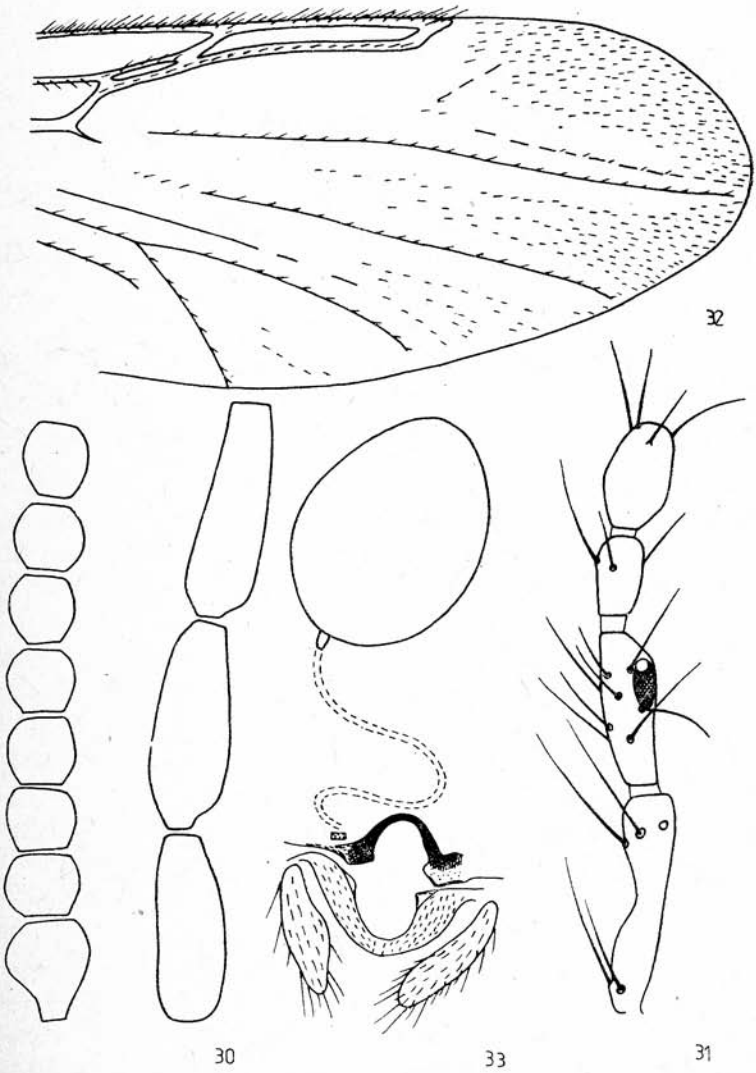
Ceratopogon flavolineatus STROBL, 1880: 52 (♀, Austria).
Atrichopogon flavolineatus: ZILAHI-SEBESS, 1940: 39 (Hungary).
A. trifasciatus KIEFFER, 1918: 90 (♂, ♀, Hungary, Turkey, Greece — Corfu); KIEFFER, 1925 a: 52 (♂, ♀, northern France); EDWARDS, 1926: 400 (Scotland); ZILAHI-SEBESS, 1940: 43 (Hungary); REMM, 1967: 9 (♂, Caucasus); REMM, 1973 b: 355 (Hungary); REMM, 1979: 52 (Estonia), **syn. n.**
A. cornutus NIELSEN, 1951: 25 (♂, ♀, larva, Denmark), **syn. n.**

DESCRIPTION

♀. Head brown, face pale brown. Scape, pedicellus and first flagellomere pale brown, other flagellomeres dark brown. Palp pale, distal half of third and two last segments dark brown. Thorax pale brown. Scutum with three dark stripes, median stripe reaching scutellum. Scutellum and humeral areas yellow. Postnotum and preepisternum dark brown. Halter pale with brownish base. Legs yellowish, distal third of hind femur and tip of hind tibia brownish. Abdomen plainly brown.

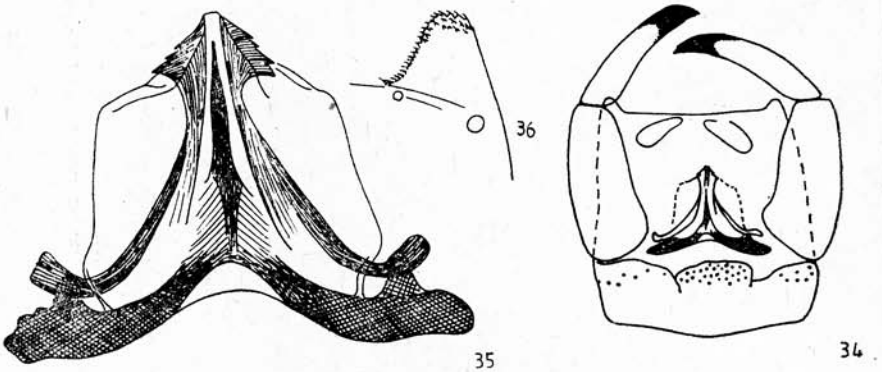
Proximal flagellomeres almost spherical (fig. 30), distal flagellomeres cylindrical, two last segments absent. Palp five-segmented; third palpal segment 84 μm long, sensory pit located on distal half of the segment (fig. 31). Mandible with 24 small teeth. Eyes bare. Scutum covered with short setae, long prescutellar and supraalar setae present. Scutellum with two submedian and two lateral long setae. Wing length 1.87 mm, CR 0.70. Wing membrane densely covered with macrotrichia on distal and caudal surfaces (fig. 32). Second radial cell about three times longer than the first one. Claws with

distinctly bifid apices. TR (I) 2.1, TR (II) 2.2, TR (III) 2.3. Sternite VIII weakly sclerotized. Rami arch-shaped, notum absent. Sternite X with deep oral excavation. Single large seminal capsule present, dimension 228× 160 μm; spermathecal duct well sclerotized (fig. 33).



30–33. *Atrichopogon* (*Psammopogon*) *flavolineatus* (STROBL), lectotype female; 30 — flagellum (without two last flagellomeres), 31 — palp, 32 — distal portion of wing, 33 — seminal capsule, gonapophyses IX, sternite X and cerci

♂. Similar to female with the usual sexual differences. Wing length 1.72 mm, CR 0.69. Macrotrichia present in cells R_5, M_1 and M_2. Genitalia broad (fig. 34). Sternite IX with broad rectangular median plate densely covered with long setae. Tergite IX broad square-shaped with broad and short verrucosed apicolateral processes (fig. 36). Gonocoxite long and slender. Gonostyle slender and long, apical third dark, the tip with two or three visible teeth. Aedeagus (fig. 35) with broad lateral sclerites.



34–36. *Atrichopogon* (*Psammopogon*) *flavolineatus* (STROBL), male genitalia; 34 — general view, 35 — aedeagus, 36 — apicolateral process of tergite IX

MATERIAL EXAMINED

Austria: Lectotype female of *C. flavolineatus*, present designation — "Steiermark, STROBL S., *Ceratopogon flavolineatus* m., Seitenstetten, 31/591 ♀". ZMB.
Bulgaria: Pasarevo at Sofia, 6 June 1984, 1 ♂, leg. W. KRZEMIŃSKI. RSz.

DISCUSSION

STROBL in his original description of *C. flavolineatus* mentioned two females from Seitenstetten. The second specimen from the type series is in the STROBL's collection in Naturhistorisches Museum der Benediktiner–Abtei Admont in Austria (MORGE, 1974 p. 180). From Algeria and Spain (Maiten, Grenada Prov. 11 July 1960, J. R. VOCKEROTH, 1 ♂, USNM; Reserva Nat. de Caza, 21 April 1984, 1 ♂, leg. P. SURA, RSz) is known *A. latipygus* VAILLANT, 1958 which is very close to *A. flavolineatus*. Male of the former species however has aedeagus with narrow lateral sclerites and sternite IX with V or U-shaped median plate covered with long setae. Separation of these two species needs detailed examination of the male genitalia so I suppose that records of *A. flavolineatus* by GOETGHEBUER (1939 p. 59) from Algeria and by STROBL

(1906 p. 398) from Spain are not certain. In my materials from Algeria I have only males of *A. latipygus*. I regard *A. trifasciatus and A. cornutus* as synonyms of *A. flavolineatus*. Types of *A. trifasciatus* do not exist.

DISTRIBUTION

The species recorded from Austria, northern France, Scotland, Denmark, Poland (Tatra Mts., Zakopane, 8 Aug. 1981, 1 ♂. leg. R. SZADZIEWSKI, RSz), Estonia, Hungary, Bulgaria and Caucasus. Records of the species from Turkey and Greece are uncertain.

Atrichopogon (Psammopogon) albiscapula KIEFFER

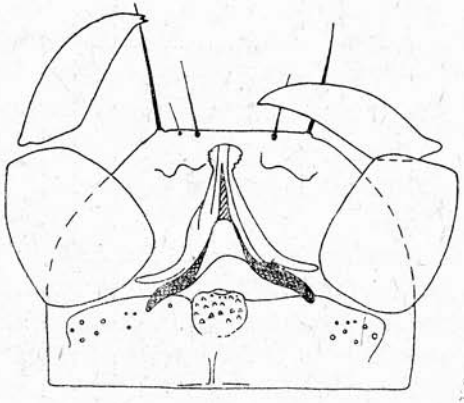
(Fig. 37)

Atrichopogon albiscapula KIEFFER, 1918: 42 (♂, ♀, Algeria, Tunesia); REMM, 1967: 9 (♂, Caucasus); REMM and ŽOGOLEV, 1968: 831 (Crimea); REMM, 1973 b: (Czechoslovakia, Hungary); HAVELKA, 1979: 56 (Spain).
A. bilineatus KIEFFER, 1922 b: 498 (♂, Algeria), **syn. n.**

DESCRIPTION

♀. Similar to *A. flavolineatus* but seminal capsule distinctly smaller: 140× 100 μm (128–154×84–118), n = 8.

♂. Neotype of *A. albiscapula*. Very close to *A. flavolineatus*. Wing length 1.59 mm, CR 0.64. Membrane with only ca. 10 macrotrichia in cell R_5. TR (I) 2.1, TR (II) 2.2, TR (III) 2.3. Genitalia (fig. 37) plainly brown. Sternite IX with almost square median plate covered with long setae. Tergite IX without apicolateral processes, caudal margin straight. Gonocoxite short. Gonostyle long and stout, the tip distinctly tapered with two small teeth.



37. *Atrichopogon (Psammopogon) albiscapula* KIEFF., male genitalia of the neotype

MATERIAL EXAMINED

Algeria: Neotype male, present designation — Akbou, Petite Kabylie, 12 May 1981, leg. R. SZADZIEWSKI. The neotype is deposited in the Institute of Zoology, Polish Acad. Sci., Warsaw.

Tessala Mts., 1 April 1981, 1 ♀, leg. W. KRZEMIŃSKI; Tichi near Béjaia, 8 May 1981, 1 ♂; Kherrata, 12 April 1981, 1 ♀; Ziama Mansouria, 16 April 1981, 1 ♀; Ras Isly in Monts du Hodna, 24 April 1981, 7 ♂, 6 ♀, leg. R. SZADZIEWSKI. RSz.

DISCUSSION

KIEFFER did not preserve his types as a rule. Moreover, old *Diptera* collection in the Hungarian Museum in Budapest was lost in the fire in 1956, so the types of *A. albiscapula* if present in this collection, were also lost. In order to stabilize the nomenclature of the species I designate the neotype. *Atrichopogon bilineatus* described by KIEFFER from Algeria should be regarded as a synonym of *A. albiscapula*, since according to the original description tergite IX is void of apicolateral processes, despite that the gonostyle should be armed of three teeth. It is worth to note that KIEFFER was usually unreliable in his descriptions.

DISTRIBUTION

Mediterranean species known from North Africa, Spain, Hungary, Czechoslovakia, Crimea and Caucasus.

Atrichopogon (s. str.) *fuscus* (Meigen)

(Figs. 38–44)

Ceratopogon fuscus MEIGEN, 1804: 28 (♂, Germany); MEIGEN, 1818: 71 (♂, Germany).
Ceratolophus fuscus: KIEFFER, 1906: 60 (combination).
Kempia fusca: GOETGHEBUER, 1920: 35 (combination).
Ceratopogon fuscipes ZETTERSTEDT, 1850: 3644 (♂, ♀, Denmark, Norway), **syn. n.**
Ceratolophus fuscipes: KIEFFER, 1906: 60 (combination).
Atrichopogon fossicola KIEFFER, 1922 a: 234 (♀, West Germany); GOETGHEBUER, 1934 a: 20 (♀, West Germany); REMM, 1961: 927 (♂, ♀, in keys); REMM, 1967: 10 (Caucasus); REMM, 1971: 192 (Far East of USSR); REMM, 1973 b: 355 (Hungary); REMM, 1979: 52 (Estonia), **syn. n.**

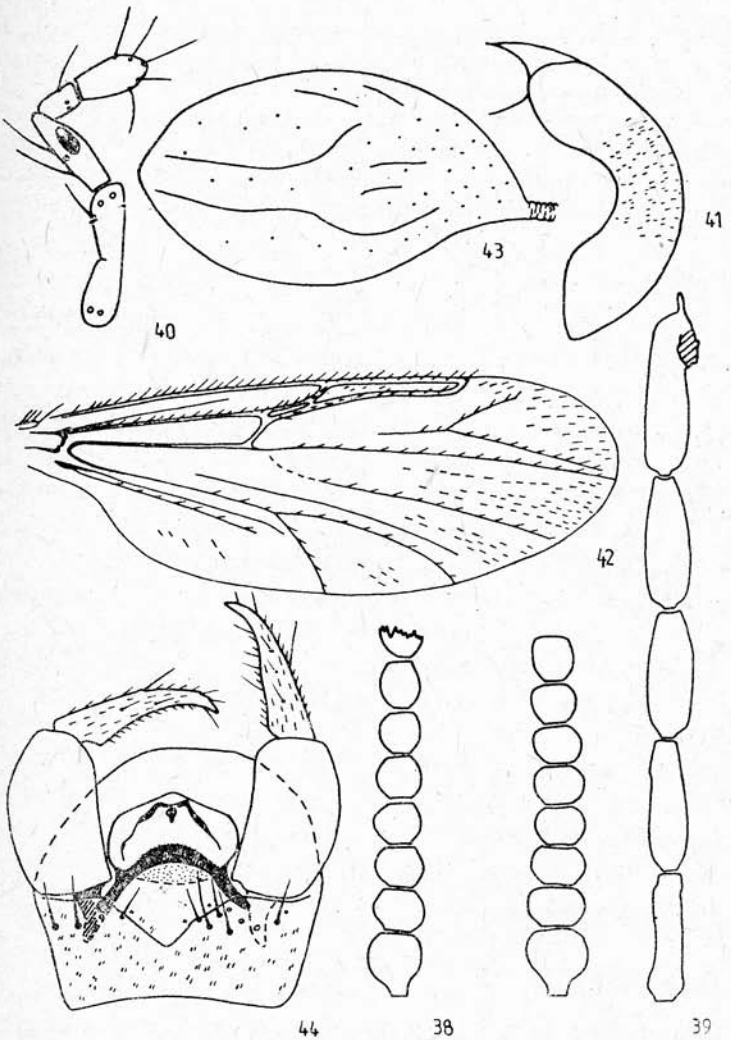
DESCRIPTION

♀. Body dark brown, legs brown. Halter stem dark brown, knob plain brownish.

Flagellum length 828 μm, AR 1.97. Proximal flagellomeres spherical (figs. 38, 39). Third palpal segment 82 μm long, sensory pit on distal half of the segment (fig. 40). Mandible with ca. 23 teeth. Eyes pubescent in the middle (fig. 41). Wing length 1.59–1.72 mm, CR 0.74–0.76, cell R_2 about three times longer than R_1. Wing membrane with macrotrichia in cell R_5,

M_1, M_2, M_4, An and R_2 (fig. 42). Scutellum with two lateral and two submedian long setae. TR (I) 2.6, TR (II) 2.9, TR (III) 2.6. Single seminal capsule strongly sclerotized with pale points, neck short, dimension 154×86 μm (fig. 43). Rami arch-shaped.

♂. Similar to female with the usual sexual differences. Flagellum length 1.02 mm, AR 0.90, some of proximal flagellomeres fused. Third palpal segment



38–44. *Atrichopogon* (s. str.) *fuscus* (MEIG.); 38, 40–42 — holotype female of *C. fuscus*; 39, 43 — lectotype female of *C. fuscipes*; 38 — proximal flagellomeres, 39 — flagellum, 40 — palp, 41 — eye pubescence, 42 — wing, 43 — seminal capsule, 44 — male genitalia

84 μm long. Eyes pubescent in the middle. Wing length 1.70 mm, CR 0.64. Membrane without macrotrichia. Cell R_2 about two times longer than cell R_1. TR (I) 2.8, TR (II) 2.6, TR (III) 2.6. Genitalia (fig. 44). Sternite IX with shallow V–shaped caudomedian excavation. At each side of the excavation several long setae present.

MATERIAL EXAMINED

Germany: Holotype female of *C. fuscus* — "*fuscus*, coll. WINTHEM, *fuscus*, original MEIGEN, *Kempia fusca* MG. det. M. GOETGHEBUER". NMW. The type has incomplete antennae and seminal capsule strongly damaged.

Denmark: Lectotype female of *C. fuscipes*, present designation — "*C. fuscipes* STAEG., ♀, Hafnia, 18". ZML.

Belgium: "Heusden, 16. 5. 14, M. GOETGHEBUER, type, ♂, M. GOETGHEBUER, *infusca*, R.I.Sc.N.B. 18.073, coll. et det. M. GOETGHEBUER, *Dasyhelea littoralis* GTGH." 1 ♂. IRSNB.

DISCUSSION

MEIGEN (1804, 1818) described single male of *C. fuscus*, but in the collection the holotype of the species is actually female. The reasons of this discrepancy are unknown to me. Probably MEIGEN overlooked sex of the type specimen or the mistake was made in his manuscript. I have found three different species among the three syntypes of *C. fuscipes*. Lectotype female is identical with *A. fuscus*. Paralectotype male labelled, *C. fuscipes* STAEG., ♂, Hafnia, 17, is actually *A. rostratus* (WINNERTZ, 1852). The next paralectotype male labelled "Thynäs [Norway]" is *A. griseolus* (ZETTERSTEDT). The label of the male now described from GOETGHEBUER'S collection is incomprehensible. It probably belongs to the type series of *A. infuscus* (see below). *A. fuscus* s. HAVELKA (1976) concerns *A. infuscus* GOETGH., but female of *A. fossicola* s. HAVELKA (l. c.) with AR ca. 1.1 is probably another species not *A. fossicola* s. REMM (1961).

A. fuscus is characterized by having eyes pubescent only in the middle, four long setae on scutellum and brown legs in both sexes. Female has wing with macrotrichia in all cells of distal and caudal surfaces, proximal flagellomeres almost spherical, and seminal capsule with short neck. Male has genitalia with several long setae at each side of the caudomedian excavation of sternite IX.

DISTRIBUTION

Distribution of the species is poorly known, since old and modern records usually concern other species. It seems that *A. fuscus* is common in Europe. According to REMM it has Palaearctic distribution. Recorded from Germany, Belgium, Denmark, Hungary, Estonia, Caucasus and Far East of USSR.

Atrichopogon (s. str.) *infuscus* Goetghebuer

(Figs. 45–51)

Atrichopogon infuscus GOETGHEBUER, 1928: (♂, ♀, Belgium); REMM, 1961: 925 (♂, ♀, in keys); REMM, 1967: 10 (Caucasus); REMM and ŽOGOLEV, 1968: 831 (Crimea); REMM, 1971: 192 (Far East of USSR); REMM, 1973 b: 355 (Hungary); REMM, 1979: 52 (Estonia); SZADZIEWSKI, 1983 a: 66 (Poland).
A. fuscus: HAVELKA, 1976: 215 (♀, West Germany).

DESCRIPTION

♀. Body including legs dark brown. Halter knob brownish.

Flagellum length 596 μm, AR 2.04, proximal flagellomeres short, transverse (fig. 45). Third palpal segment 66 μm long, sensory pit distinct (fig. 46). Eyes densely pubescent (fig. 47). Wing length 1.32 mm, CR 0.69, macrotrichia present in cells R_5, M_1, M_2, M_4 and An (fig. 48). Cell R_2 2.8 times longer than cell R_1. Scutum with short setae. Scutellum with two lateral and two submedian long setae. TR (I) 2.6, TR (II) 2.5, TR (III) 2.4. Single seminal capsule strongly sclerotized with long and stout neck (fig. 49), length 140 μm.

♂. Similar to female with the usual sexual differences. Flagellum length 867 μm, AR 0.87, flagellomeres II–VIII fused (fig. 50). Eyes densely pubescent. Wing length 1.32 mm, CR 0.64, membrane bare. Claws with bifid apices. TR (I) 2.8, TR (II) 3.0, TR (III) 2.8. Genitalia (fig. 51). Sternite IX with deep V-shaped caudomedian excavation. At each side of the excavation one long seta.

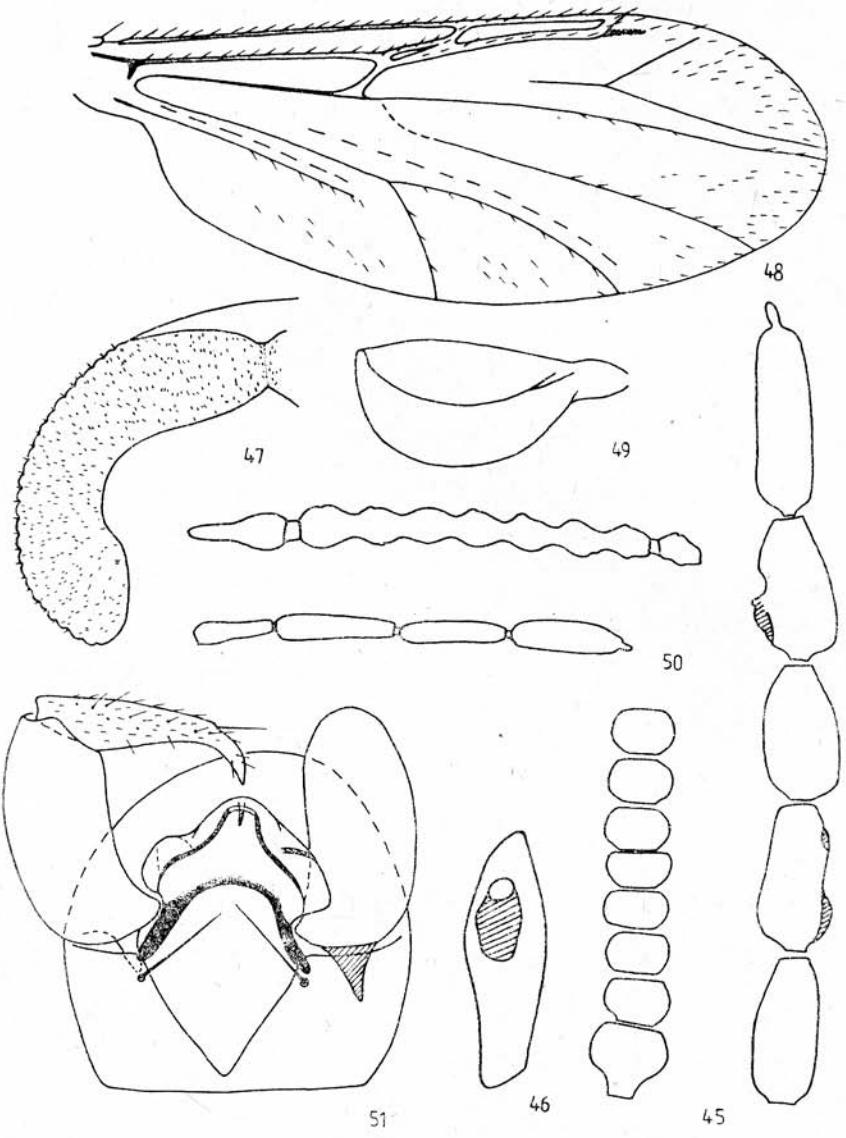
MATERIAL EXAMINED

Belgium: Lectotype male and paralectotype female, present designations — "Vinderhaute, 14.8.20, M. GOETGHEBUER, 334, type, ♀, GOETGHEBUER, R.I.Sc.N.B. 18.073, coll. et det. M. GOETGHEBUER, *Atrichopogon infuscus* GTGH. " IRSNB.

DISCUSSION

A. infuscus is smaller than *A. fuscus*. Female is characterized by having transverse proximal flagellomeres, eyes totally pubescent and seminal capsule with distinct neck. In the male genitalia sternite IX at each side of the deep caudomedian excavation single long seta present. Among specimens from Poland sometimes two setae present at one side of the excavation.

GOETGHEBUER in his original description of *A. infuscus* made the following statement: "Capturé de mai à août, près de fossés d'eau stagnante, à Gand et à Destelbergen". Amongst the specimens determined by GOETGHEBUER as *A. infuscus* three are provided with the label "type". One male from Heusden



45–51. *Atrichopogon* (s. str.) *infuscus* GTGH.; 45–49 — lectotype female; 50, 51 — paralectotype male; 45 — flagellum, 46 — third palpal segment, 47 — eye pubescence, 48 — wing, 49 — seminal capsule, 50 — flagellum, 51 — genitalia

is *A. fuscus* (see p. 30). Two other specimens, male and female pinned together, agree with later interpretation of the species by REMM (1961). I designate the female as lectotype. Unfortunately these two specimens come from Vinderhaute, a small locality at Gand, but not from Gand or Destelbergen. I suppose that GOETGHEBUER included Vinderhaute in Gand.

DISTRIBUTION

Arboreal Palaearctic species recorded from Hungary, West Germany, Belgium, Poland, Estonia, Crimea, Caucasus and from Far East of USSR.

Atrichopogon (s. str.) *griseolus* (Zetterstedt), comb. n.

(Figs. 52–59)

Ceratopogon griseolus ZETTERSTEDT, 1855: 4865 (♀, Sweden).
Culicoides griseolus: ARNAUD, 1956: 145 (combination).
Atrichopogon majusculus REMM, 1961: 920 (♂, ♀, Estonia); REMM, 1973 a: 172 (Mongolia), **syn. n.**

DESCRIPTION

♀. Body dark brown, tarsi paler. Halter knob brown.

Flagellum length 856 μm, AR 1.67–1.84, proximal flagellomeres spherical (fig. 52). Third palpal segment 88 μm long, sensory pit distinct (fig. 53). Mandible with ca. 29 teeth. Eyes totally pubescent. Scutellum with two lateral and two submedian long setae. Wing length 1.76–1.81 mm, CR 0.74; membrane with macrotrichia in cells R_5, M_1, M_2, M_4 and An (fig. 54). TR (I) 2.8, TR (II) 2.8, TR (III) 2.7. Tibial comb composed of eight spines. Rami arch–shaped, sternite IX narrow, strongly sclerotized (fig. 56). Seminal capsule retort–shaped large, dimensions 146+50 (neck) ×90 μm in the lectotype, female from Belgium possesses seminal capsule 176 μm long. Surface of seminal capsule with pale points.

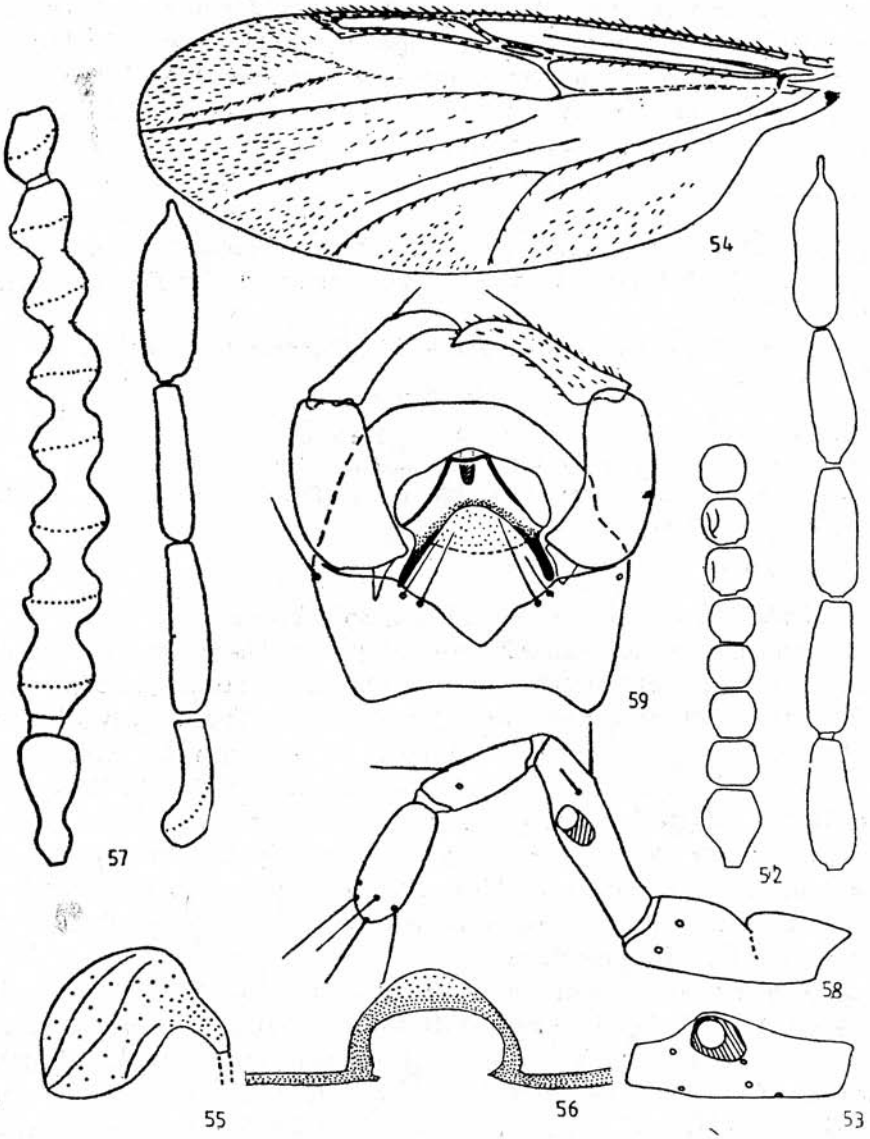
♂. Similar to female with the usual sexual differences. Flagellum length 1074 μm, AR 0.82, flagellomeres II–VIII fused (fig. 57). Third palpal segment 90 μm long, sensory pit distinct (fig. 58). Eyes totally pubescent. Wing length 1.84 mm, CR 0.65, membrane void of macrotrichia. Claws bifid on apices. TR (I) 3.0, TR (II) 2.8, TR (III) 2.7. Genitalia (fig. 59). Sternite IX with broad caudomedian excavation, at each side of the excavation two long setae.

MATERIAL EXAMINED

Sweden: Holotype female of *C. griseolus* — "Tubbot., *Cer. griseolus* ZETT, n. sp. ♀, Tubbotem [Tubbetorp], West. [rogothia], DAHLB." ZML.

Norway: Paralectotype male of *C. fuscipes* ZETTERSTEDT — "Thynäs". ZML.

Belgium: Mirwart (Bords du Parfondry), 6 July 1949, R. TOLLET, 1 ♀. **IRSNB.**



52–59. *Atrichopogon* (s. str.) *griseolus* (ZETT.); 52–56 — holotype female of *C. griseolus*; 57–59 — paralectotype male of *C. fuscipes*; 52 — flagellum, 53 — third palpal segment, 54 — wing, 55 — seminal capsule, 56 — rami and sternite IX, 57 — flagellum, 58 — palp, 59 — genitalia

DISCUSSION

The species is close to *A. fuscus* and *A. infuscus*. Female is characterized by having eyes totally pubescent, proximal flagellomeres spherical and large retort-shaped seminal capsule. Male possesses totally pubescent eyes and genitalia with two long setae at each side of caudomedian excavation of sternite IX. It is a larger species. *Atrichopogon majusculus* should be recognized as a junior synonym of *A. griseolus*. According to the figure of male genitalia of *A. majusculus* given by REMM (1961) two or three setae are present at the each side of the caudomedian excavation of sternite IX.

DISTRIBUTION

The species recorded from Belgium, Norway, Sweden, Estonia and Mongolia.

Dasyheleinae

Dasyhelea (Sebessia) acuminata Kieffer

(Figs. 60–69)

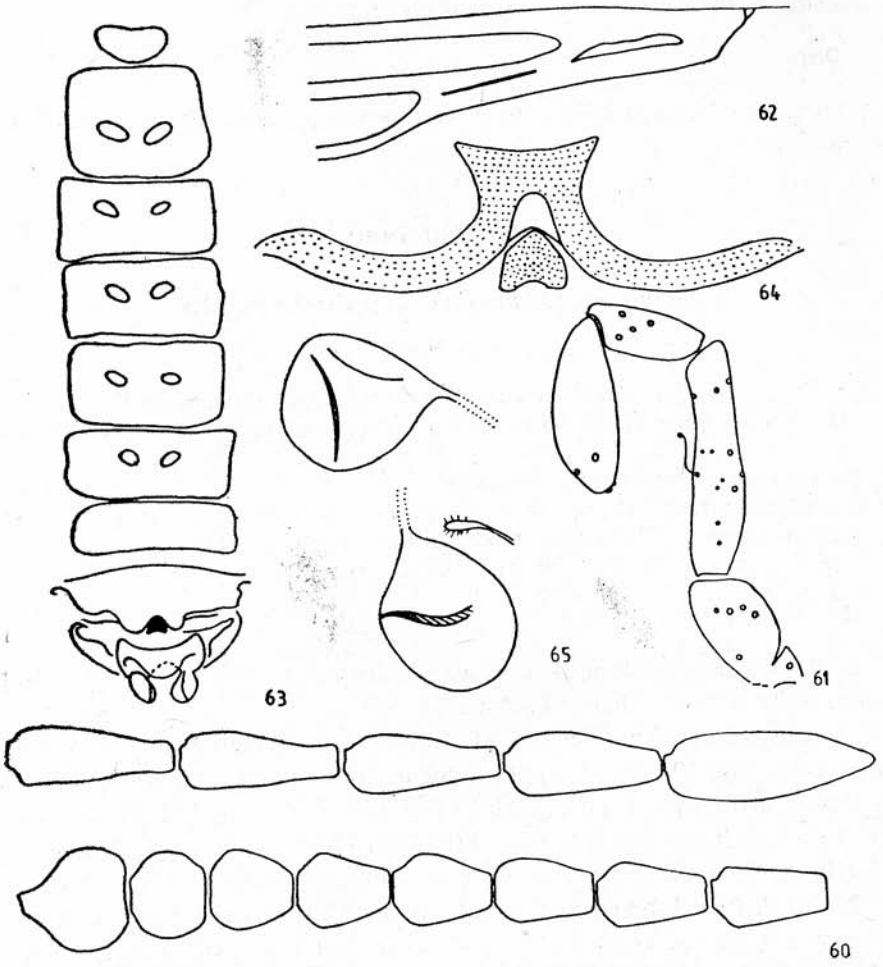
Dasyhelea acuminata KIEFFER, 1919: 60 (♀, Hungary); ZILAHI-SEBESS, 1940: 47, 127 (♂, ♀, Hungary, = ? *verticillata*); REMM, 1973 b: 354 (Hungary); REMM, 1979: 49 (Estonia).
D. obscura: KIEFFER, 1919: 61 (♂, ♀, Hungary).
D. verticillata KIEFFER, 1925 a: 63 (n. n. for *obscura* s. KIEFFER; ♂, ♀, France, Hungary).
D. polita EDWARDS, 1921: 124 (♂, ♀, Scotland); EDWARDS, 1926: 402 (note), **syn. n.**
D. littoralis GOETGHEBUER 1934 b: 289 (♂, ♀, Belgium), **syn. n.**

DESCRIPTION

♀. Body black. Scutum shining with indistinct greyish pruinosity. Tarsi paler. Inner surface of halter knob pale.

Flagellum length 664–709 μm, AR 1.01–1.05; last flagellomere with evenly pointed tip (fig. 60). Third palpal segment 100–116 μm long, with about 9 capitate sensilla on the inner surface (fig. 61). Wing length 1.20–1.37 mm, CR 0.52–0.53, first radial cell present (fig. 62). TR (I) 2.2–2.3, TR (II) 2.0–2.1, TR (III) 1.8–2.0. All pregenital sternites well sclerotized (fig. 63). Sternite VIII with distinct lobe-shaped gonapophyses VIII. Sternite IX narrow and strongly sclerotized. Gonapophyses IX somewhat T-shaped (rami plus part of notum ?). Labia fused in form of heart-shaped plate (fig. 64). Two functional seminal capsules with short necks, dimensions 72–74×52 and 62–74×60 μm, and third rudimentary seminal capsule present (fig. 65).

♂. Similar to female with the usual sexual differences. Flagellum length 985 μm, AR 1.27, last flagellomere with rather long evenly pointed tip (fig. 66). Third palpal segment slender (figs. 67, 68) with capitate sensilla visible at the base. Wing length 1.58 mm, CR 0.50. TR (I) 2.1, TR (II) 1.9, TR (III) 2.0. Genitalia (fig. 69). Sternite IX covers basal half of aedeagus, caudal margin slightly concave. Gonocoxite simple, stout. Gonostyle stout, covered with small setae except for the short pointed tip. Tergite IX large with evenly rounded caudal margin, apicolateral processes undeveloped. Parameres sym-



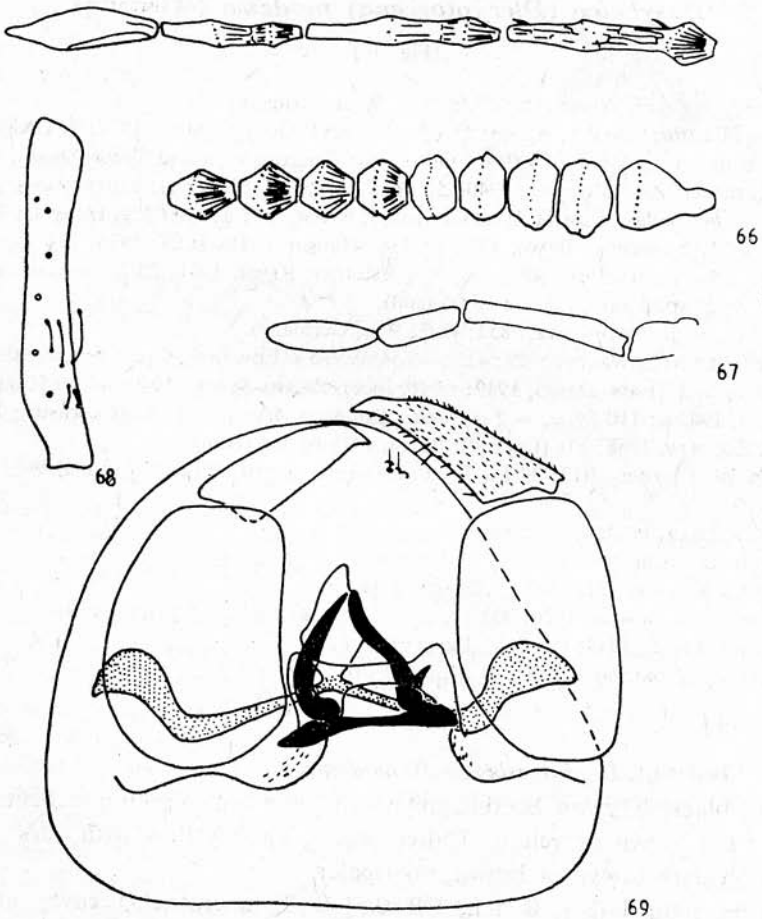
60–65. *Dasyhelea* (*Sebessia*) *acuminata* KIEFF.; paratype female of *D. littoralis* GTGH; 60 — flagellum, 61 — palp, 62 — radial veins, 63 — abdominal sternites, 64 — gonapophyses IX, sternite IX and labia, 65 — seminal capsules

metrical, fused; caudomedian projection short, basal half V-shaped, distal half cone-shaped. Aedeagus with straight median bridge, lateral sclerites strongly sclerotized C-shaped.

MATERIAL EXAMINED

Scotland: Holotype male and paratype female of *D. polita* — "Corriegills, Arran, 2–4 VI 1919, F. W. EDWARDS, 1919–146". BMNH.

Belgium: Two "paratypes" females of *D. littoralis* — "La Panne, 7.9.33, M. GOETGHEBUER, Reg. Mus. Hist. Nat. Belg. I. G. 11. 097, M. GOETGHEBUER det., *Dasyhelea littoralis* GTGH., cf. Bull. Ann. Soc. Ent. Belg. T. LXXIV p. 289, paratype ♀". IRSNB. Second female with the same data except for date 8.9.33.



66–69. *Dasyhelea* (*Sebessia*) *acuminata* KIEFF.; holotype male of *D. polita* EDW.; 66 — flagellum, 67 — palp, 68 — third palpal segment, 69 — genitalia

DISCUSSION

ZILAHI-SEBESS (1940) was the first who made a drawing of characteristic male genitalia of *D. acuminata*. This allows me to recognize *D. polita* and *D. littoralis* as the junior synonyms of *D. acuminata*. Types of *D. acuminata* and *D. verticillata* do not exist.

DISTRIBUTION

The species recorded from Hungary, France, Belgium, Scotland and Estonia.

Dasyhelea (Dicryptoscena) modesta (Winnertz)

(Fig. 70)

Ceratopogon modestus WINNERTZ, 1852: 43 (♀, West Germany).
Dasyhelea modesta: KIEFFER, 1925 a: 65 (♂, ♀, in key); GOETGHEBUER, 1927: 95 (Belgium); GOETGHEBUER, 1934 c: 334 (West Germany); GOETGHEBUER and TIMON-DAVID, 1939: 65 (France); ZILAHI-SEBESS, 1940: 51 (♂, ♀, = *strobli*, Hungary); THIENEMANN, 1954: 614 (= *longipalpis*, Austria, West Germany); REMM, 1962 a: 110 (♂, ♀, Estonia); REMM, 1967: 13 (Caucasus); REMM, 1973 b: 354 (Hungary); HAVELKA, 1976: 226 (♀, West Germany); REMM, 1979: 49 (= *aestiva*, Estonia); REMM, 1981: 29 (= *aestivus*, *densipilosa*); SZADZIEWSKI, 1983 a: 66 (Poland).
Ceratopogon aestivus WINNERTZ, 1852: 42 (♀, West Germany).
Dasyhelea aestiva: EDWARDS, 1929: 425 (= *holosericea* s. EDWARDS, Great Britain); GOETGHEBUER and TIMON-DAVID, 1939: 65 (France); ZILAHI-SEBESS, 1940: 47 (♀, Hungary); REMM, 1962 a: 110 (♂, ♀, = ? *pratensis*, Estonia); REMM, 1967: 14 (Caucasus); REMM and ŽOGOLEV, 1968: 831 (Crimea); REMM, 1973 b: 354 (Hungary).
D. longipalpis KIEFFER, 1913: 37 (♂, West Germany); RIETH, 1915: 425 (pupa, West Germany).
D. strobli KIEFFER, 1919: 63 (♀, Spain).
D. pratensis GOETGHEBUER, 1920: 44 (♂, Belgium).
D. bihamata KIEFFER, 1923: 667 (♂, Algeria), **syn. n.**
D. holosericea: EDWARDS, 1926: 402 (♂, ♀, = ? *aestiva*, ? *pratensis*, Great Britain).
D. moascari MACFIE, 1943: 153 (♂, ♀, Egypt), **syn. n.**
? *D. densipilosa* TOKUNAGA, 1963: 41 (♂, ♀, Japan).

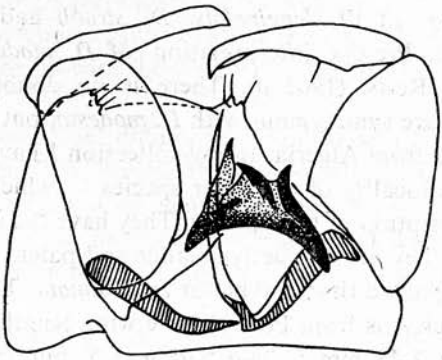
DESCRIPTION

♂. — Types of. *D. pratensis* and *D. moascari*.

Body blackish brown. Scutum greyish and dark brown pollinose. Scutellum black, dark brown or yellow Halter brown, knob yellow with dark outer half. Legs dark brown or brown, tarsi paler.

Wing length 1.48–1.50 mm, CR 0.51–0.52, macrotrichia cover almost whole surface of the wing, cell R_1 present. TR (I) 2.1, TR (II) 2.0, TR (III) 2.0. Genitalia (fig. 70). Sternite IX covering basal bridge of aedeagus. Tergite

IX with evenly rounded distal margin, apicolateral processes short with some long setae. Gonostyle slender, slightly curved, tip pointed, basal half pubescent. Aedeagus with broad and low basal arch, pair of caudoventral sclerites short and divergent, pair of caudodorsal sclerites longer and convergent. Parameres asymmetrical, basal arms strongly sclerotized, not angular; caudomedian projection long and slender with pointed evenly curved ventrally tip.



70. *Dasyhelea* (*Dicryptoscena*) *modesta* (WINN.); male genitalia of the lectotype of *D. moascari* MACFIE.

♂. — Neotype of *D. bihamata*.

Body pale brown. Front of scutum with three indistinct darker stripes. Scutellum yellow. Halter knob yellow with dark outer half. Legs plain brown, tarsi paler. Wing length 1.25 mm, CR 0.49. TR (I) 2.2, TR (II) 2.1, TR(III) 2.1. Male genitalia as described above.

MATERIAL EXAMINED

Belgium: Holotype (?) male of *D. pratensis* — "ex typis, Destelbergen, 17.8.16, coll. M. GOETGHEBUER, *Dasyhelea pratensis*, det. M. GOETGHEBUER 1920, cf. Mem. Mus. Hist. Nat. Belg. T. VIII, fasc. 3 p. 44". IRSNB. Paratype (?) male of *D. pratensis* — "Heusden, 9.5.18, paratype, coll. M. GOETGHEBUER, *Dasyhelea pratensis* GTGH., R.I.Sc.N.B., 18.073". IRSNB.

Egypt: Lectotype male of *D. moascari*, present designation — "Egypt, Moascar, 15–9 II 1942, Dr. J.W.S. MACFIE, on windows, ex coll. J.W.S. MACFIE, B. M. — 1948 585, *Dasyhelea moascari* sp. n. ♂, syntype". BMNH. Paralectotype male of *D. moascari* with the same data except for the date 22–26 II 1942.

Algeria: Neotype male of *D. bihamata*, present designation — Barika near Biskra, 26 April 1981, olive-tree, R. SZADZIEWSKI leg. The neotype is deposited in the Institute of Zoology, Polish Acad. Sci., Warsaw.

Akbou, 12 May 1981, 3 ♂; Tazmalt, 14 May 1981, 4 ♂; Ras Isly near Sala Bey in Monts du Hodna, 24 April and 4 May 1981, *Umbelliferae* flowers, 9 ♂; Barika at Biskra, 26–27 April 1981, 32 ♂ from olive-trees and *Umbelliferae* flowers; 30 km north of Biskra, 27 April 1981, 10 ♂; Chegga near Biskra, spring saline area, 2 May 1981, 2 ♂; oasis Sowalah at El-Oued, 1 May 1981, 3 ♂; leg. R. SZADZIEWSKI. RSz.

Iran: Dezful, Khuzistan, 30 Oct.–10 Nov. 1971, L. V. KNUTSON, Malaise trap, 6 ♂. USNM.

Poland: Gdańsk–Górki Wschodnie, 5–25 May 1977, reared from saline soil, 3 ♂; Gdańsk–Oliwa, on window, June 1977, 1 ♂, leg. R. SZADZIEWSKI; Libiszów at Włodawa, 19 May 1964, at light, 1 ♂, leg. Z. BILIŃSKI. RSz.

DISCUSSION

Location of the types *Ceratopogon modestus* and *C. aestivus* is unknown. Types of *D. longipalpis*, *D. strobli* and *D. bihamata* presumably do not exist. Present interpretation of *D. modesta* follows ZILAHI-SEBESS (1940) and REMM (1962 a). There is no doubt that *D. pratensis* and *D. moascari* are synonymous with *D. modesta*, but I have some doubts about *D. bihamata* from Algeria. In my collection I have two males found at Biskra — the type locality of the latter species — which agree with the original KIEFFER'S description of this species. They have the same genitalia as typical *D. modesta* but they are distinctly smaller and paler. This is the main reason why I have designated the neotype for *D. bihamata*. The neotype has wing 1.25 mm long. Specimens from Poland have wing length 1.54 mm (1.42–1.64), n = 5; from Iran 1.44 mm (1.38–1.50); n = 5, but from Algeria 1.33 mm (1.20–1.40), n = 10. Egyptian lectotype of *D. moascari* has quite long wing measuring 1.48 mm. Algerian specimens were found in semidesert habitats and probably it is a reason why they are smaller.

GOETGHEBUER in his original description of *D. pratensis* mentioned male (or males) collected on meadows at Heusden in 17 Aug. 1916, but the supposed holotype is actually from Destelbergen (these two localities are close). The next specimen labelled as paratype althought from Heusden it was collected two years later in 9 May 1918. Probably it does not belong to type series of the species.

DISTRIBUTION

The species is common in Europe (Estonia, Poland, Great Britain, Belgium, West Germany, Austria, Hungary, France, Spain, Crimea), Caucasus, North Africa (Algeria, Egypt), Middle East (Iran) and Japan (?).

Dasyhelea (*Dicryptoscena*) *notata* Goetghebuer

(Figs. 71–73)

Dasyhelea notata GOETGHEBUER, 1920: 47 (♂, ♀, Belgium).

D. semistriata GOETGHEBUER, 1921: 176 (♂, Belgium), **syn. n.**

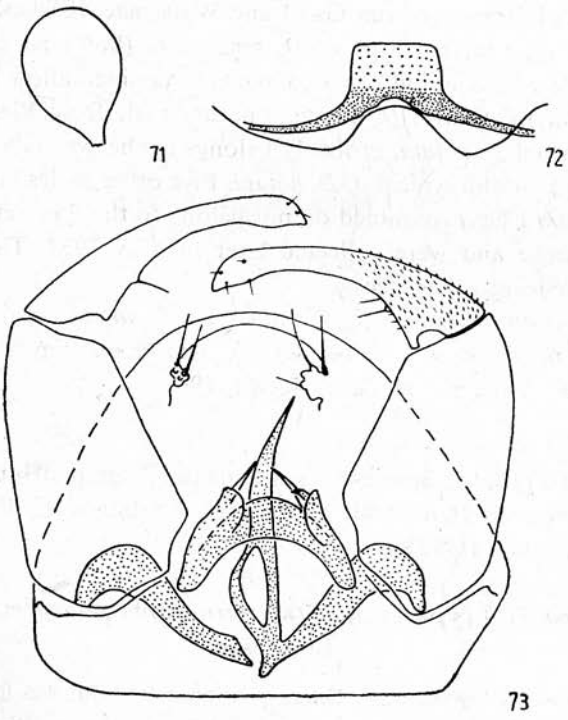
D. sziladyi ZILAHI-SEBESS, 1936: 42 (♂, ♀, Hungary); ZILAHI-SEBESS, 1940: 54 (♂, ♀, Hungary); REMM, 1962 a: 111 (♂, ♀, Estonia); REMM, 1967: 14 (Caucasus); REMM, 1971: 198 (Far East of USSR); REMM, 1979: 49 (Estonia), **syn. n.**

DESCRIPTION

♀. Body blackish brown. Scutum greyish pollinose, frontal surface shining, humeral areas yellowish. Scutellum brown. Halter knob yellow, outer surface dark.

Last flagellomere blunt pointed. Third palpal segment 78–100 μm long with capitate sensilla on proximal half. Wing length 0.98–1.17 mm, CR 0.53, narrow cell R_1 present. TR (III) 2.0. Pregenital sternites well sclerotized. Sternite IX narrow, apical portion of gonapophyses IX rectangular (fig. 72). Seminal capsule strongly sclerotized, ovoid with short neck (fig. 71), dimension 42–54 × 36 μm.

♂. Similar to female with the usual sexual differences. Wing length 1.14–1.20 mm, CR 0.49–0.53. Genitalia (fig. 73). Tergite IX with evenly rounded caudal margin, apicolateral processes shifted on ventral surface. Gonostyle slender, slightly curved, at the tip enlarged, proximal half pubescent. Aedeagus with a pair of short convergent caudoventral sclerites and with a pair



71–73. *Dasyhelea* (*Dicryptoscena*) *notata* GTGH., lectotype male and paralectotype female; 71 — seminal capsule, 72 — gonapophyses IX and sternite IX, 73 — male genitalia.

of longer and slender convergent caudodorsal sclerites; basal arch high. Parameres asymmetrical, basal arms tapered distally; caudomedian projection swollen at the base with ovoid desclerotized lumen, distal portion tapered to pointed tip curved ventrally.

MATERIAL EXAMINED

Belgium: Lectotype male of *D. notata*, present designation — "Watermael, 23 Mai 1917, A. TONNOIR, *Dasyhelea notata* GTGH., det. M. GOETGHEBUER, 1920, ex typis, cf. Mem. Mus. hist. nat. Belg. T. VIII, fasc. 3, p. 47". IRSNB. Paralectotypes females of *D. notata* — "Gand, 8.6.10, collection M. GOETGHEBUER, *Dasyhelea notata* GOETGH., det. GOETGHEBUER, 1920, ex typis, cf. Mem. Mus. hist. nat. Belg. T. VIII, fas. 3 p. 47", 1 ♀; "Watermael, 23 Mai 1917, A. TONNOIR, det. *Dasyhelea notata* (GOETGH. R.M.H.N. Belg. 10.638, ex typis, cf. Mem. Mus. hist. nat. Belg. T. VIII, fasc. 3 p. 47", 1 ♀. IRSNB.

Holotype (?) male of *D. semistriata* — "Virton, 2 Sept. 1920, A. TONNOIR, 762, *Dasyhelea semistriata*, cf. Mem. Mus. hist. nat. Belg. VIII, fasc. IV p. 176, ex typis". IRSNB. "Virton, 2 Sept. 1920, A. TONNOIR, *Dasyhelea notata* GOETGH., type ♂, coll. R.I.Sc.N.B.", 1 ♂. IRSNB. This specimen does not belong to type series of *D. notata*.

DISCUSSION

Specimens of *D. notata* from Gand and Watermael labelled as "ex typis" belong to the type series. Type of *D. semistriata* (holotype ?) from Virton is without male genitalia, but other characters examined allow the conclusion that it is synonymous with *D. notata*. Another male from Virton, althought labelled as type of *D. notata*, probably belongs to the type series of *D. semistriata* and has genitalia typical of *D. notata*. Five other males labelled as types of *D. semistriata* I have examined do not belong to the type series, since they are from Knocke and were collected later in May 1937. These specimens belong to *Forcipomyia knockensis*.

D. sziladyi is synonymous with *D. notata*, but *D. notata* sensu REMM (1962 a) concerns *D. thienemanni* (see below). *D. semistriata* sensu ZILAHI-SEBESS (1940) probably concerns *D. lucida* REMM, 1968.

DISTRIBUTION

Arboreal Palaearctic species recorded from Belgium, Hungary, Estonia, Poland (Gdańsk, 16 June 1980, 1 ♂, leg. R. SZADZIEWSKI, RSz), Caucasus and from Far East (USSR).

Dasyhelea (Dicryptoscena) thienemanni Spataru et Damian-Georgescu

Dasyhelea thienemanni SPATARU and DAMIAN-GEORGESCU, 1970: 425 (all stages, Romania).

D. notata: REMM, 1962 a: 111 (♂, ♀, Estonia); REMM, 1967: 14 (Caucasus); REMM, 1973 b: 354 (Hungary); HAVELKA, 1976: 227 (♀, West Germany).

DISCUSSION

D. notata sensu REMM is synonymous with *D. thienemanni*.

DISTRIBUTION

The species recorded from Bulgaria (Rila Mts., Rilski Monastyr, 26 June 1982, 1 ♂, leg. W. KRZEMIŃSKI, RSz), Hungary, Romania, West Germany, Poland (Sudety Mts., Sosnówka Dolna at Jelenia Góra, 400 m., 4 Aug. 1982, 1 ♂, leg. R. SZADZIEWSKI, RSz), Estonia and Caucasus.

Dasyhelea (s. str.) *pallidiventris* (Goetghebuer), comb. n.

(Figs. 74–78)

Tetrahelea (*Dasyhelea*) *pallidiventris* GOETGHEBUER, 1931: 211 (♀, Germany).
Dasyhelea olivacea REMM, 1962 a: 117 (♂, ♀, Estonia); REMM, 1967: 16 (Caucasus); REMM and ŽOGOLEV, 1968: 832 (Crimea); SZADZIEWSKI, 1983 a: 66 (Poland), **syn. n.**

DESCRIPTION

♀. Body brown. Scutum covered with greyish and brownish pruinescence, humeral areas yellow. Scutellum yellow, brown in middle. Halter knob pale, outer surface infuscated. Legs pale, knees and apices of tibiae dark, femora with indistinct darker rings. Abdominal tergites dark brown with white caudal margins, pleura yellow (or white) with distinct triangular patches. Proximal ventral surface of abdomen yellow.

Flagellum reticulate, length 664 μm, AR 0.82. Third and fourth palpal segments at apical portion with capitate sensilla. Frontal sclerite broad, elliptic with long triangle ventral projection, surface rather smooth (fig. 74). Wing length 1.30 mm, CR 0.51. TR (I) 2.1, TR (II) 2.3. Pregenital sternites V–VII well sclerotized (fig. 75). Sternite IX and rami strongly sclerotized; notum triangular, short, weakly sclerotized (fig. 76). Single seminal capsule strongly sclerotized, pyriform (fig. 77), dimension 86×58 μm.

♂. Similar to female with the usual sexual differences. Genitalia dark brown (fig. 78). Gonocoxite cylindrical with prominent sclerotized hook on mesal margin. Caudomedian projection of parameres stout and long. Gonostyle straight, slightly tapered to rounded tip, pubescent except for the tip.

MATERIAL EXAMINED

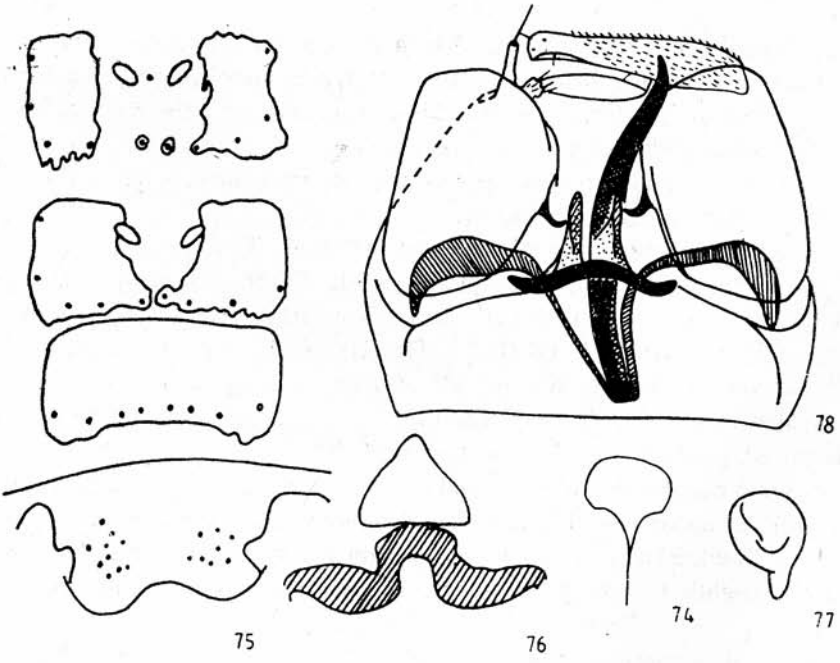
Germany: Holotype female of *T. pallidiventris* – "R. I. Sc. N. B. 18.073, coll. et det. M. GOETGHEBUER, type ♂ [sic !], M. GOETGHEBUER, *Dasyhelea pallidiventris* n. sp.". IRSNB.
Poland: Gdańsk–Górki Wschodnie, 18 Aug. 1975, 1 ♂, leg. R. SZADZIEWSKI, RSz.

DISCUSSION

GOETGHEBUER described *D. pallidiventris* basing on single female from Germany (no precise locality) collected by LENZ in August 1931. *D. olivacea* should be recognized as junior synonym of *D. pallidiventris*. REMM'S (1979) synonymy of *D. olivacea* with *D. versicolor* (WINN., 1852) is quite unjustifiable and arbitrary. Location of the types of the latter species from Crefeld in West Germany is unknown. In the Zoologisches Museum in Berlin I found specimens from Paris determined by WINNERTZ as *Ceratopogon versicolor* (1 ♂, 1 ♀ pinned together) and as *C. versicolor* var. *geniculatus* (GUERIN (1 ♀). They are similar to *D. bilineata*, *D. dufouri* and many other close species described from Europe, but not to *D. pallidiventris*.

DISTRIBUTION

The species recorded from Germany, Poland, Estonia, Crimea and Caucasus.



74–78. *Dasyhelea* (s. str.) *pallidiventris* GTGH., 74–77 — holotype female; 74 — frontal sclerite, 75 — abdominal sternites V–VIII, 76 — gonapophyses IX and sternite IX, 77 — seminal capsule, 78 — male genitalia

Dasyhelea (s. str.) *bensoni* Edwards

(Figs. 79–85)

Dasyhelea bensoni EDWARDS, 1933: 31 (♂, ♀, Scotland).
D. vernalis REMM, 1979: 56 (♂, Estonia, eastern Siberia), **syn. n.**

DESCRIPTION

♀. Body including scutellum black. Scutum covered with greyish pruinescence, humeral area yellow. Halter knob pale. Legs uniformly brown, coxae black.

Flagellum 764 μm long, AR 0.82, flagellomeres reticulate. Frontal sclerite (fig. 80) smooth. Palp (fig. 79) with capitate sensilla at apices of third and fourth segments; third palpal segment 80 μm long. Wing length 1.58 mm, CR 0.53. TR (III) 2.0. Pregenital sternites IV–VII well sclerotized, sternite VI not divided into two plates (fig. 81). Sternite IX narrow, strongly sclerotized. Gonapophyses IX with short triangular notum (fig. 83). Labia well visible caudally of seminal eminence, fused in tear-shaped plate. Single seminal capsule strongly sclerotized with distinct neck, dimension 72×66 μm (fig. 82).

♂. Similar to female with the usual sexual differences. Halter knob pale with infuscated outer surface. Flagellum length 955 μm, AR 1.03. Third palpal segment 98 μm long, capitate sensilla as in female. Wing length 1.72 mm, CR 0.52. TR (I) 2.2, TR (II) 2.4, TR (III) 2.1. Genitalia (figs. 84, 85). Gonocoxite with large mesal swelling, mesal hook present. Gonostyle almost straight with rounded tip, pubescent except for the apical third. Caudomedian projection of parameres slender with pointed tip curved ventrally. Tergite IX with short apicolateral processes.

MATERIAL EXAMINED

Scotland: Lectotype male and paralectotype female, present designations — "Glen Lochay, 8 VI 1932, 500–1500 ft., Perthshire, Killin distr., F. W. EDWARDS, B.M.–1932–243, *Dasyhelea bensoni* EDW., F. W. EDWARDS det. 1932, Syntypes". BMNH.

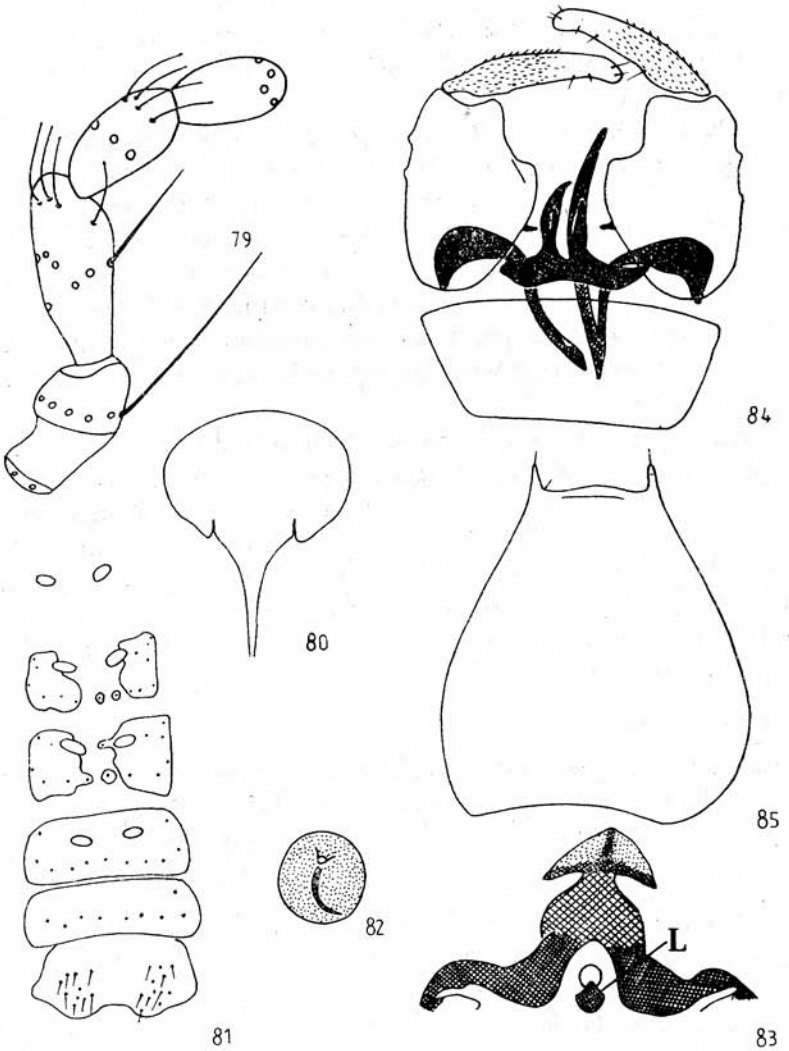
DISCUSSION

D. bensoni is close to *D. pallidiventris*. It is interesting to note that both sexes of these two species have capitate sensilla not only on third but also on fourth palpal segments. They are located at the apices of the segments. In other species of *Dasyhelea* known to me capitate sensilla are found only on third palpal segment, usually on proximal half or scattered on the whole inner surface of the segment.

D. bensoni is darker than *D. pallidiventris*. The female possesses stronger sclerotized notum and abdominal sternite VI is not divided into two lateral

plates. Male has characteristic genitalia with slender caudomedian projection of parameres and gonocoxite with large mesal swelling.

Drawing of male genitalia of *D. vernalis* given by REMM (1979) suggests that it is synonymous with *D. bensoni*. REMM described only male of the species although he recorded also females.



79–85. *Dasyhelea* (s. str.) *bensoni* EDW.; 79–83 — paralectotype female; 84, 85 — lectotype male: 79 — palp, 80 — frontal sclerite, 81 — abdominal sternites III–VIII, 82 — seminal capsule, 83 — gonapophyses IX, sternite IX and labia (L), 84 — male genitalia without tergite IX, 85 — tergite IX

DISTRIBUTION

The species recorded from northern regions of the Palaearctic, i. e. Scotland, Estonia and eastern Siberia.

Dasyhelea (s. str.) *saxicola* (Edwards)

(Figs. 86–93)

Tetraphora saxicola EDWARDS, 1929: 426 (♂, ♀, England).
Dasyhelea lithotelmatica STRENZKE, 1951: 178 (all stages, Austria); DISNEY, 1975: 227 (England); HACKMAN, 1980: 23 (Finland), **syn. n.**

DESCRIPTION

♀. Body blackish brown. Scutum black with bluish pruinescence. Scutellum black, in alcohol brown, darker in middle. Humeral area brown. Halter black, knob brown. Legs blackish brown, tarsi paler, femora and tibiae with unclear paler rings visible in alcohol. Abdomen black, caudal margins of tergites narrowly pale in alcohol.

Flagellum reticulate, length 903–955 μm, AR 0.75–0.81. Third palpal segment with scattered sensilla from the base to apex (fig. 88), length 86–100 μm. Frontal sclerite (figs. 86, 87) with microwaves. Wing length 1.84–1.92 mm, CR 0.52–0.56. TR (I) 2.1–2.4, TR (II) 2.3–2.5, TR (III) 2.2–2.3. Gonapophyses IX including notum strongly sclerotized, notum triangular, long, (figs. 89,90). Labia absent. Seminal capsule dark, retort-shaped (fig. 91), dimension 90×62 μm, n = 1.

♂. Somewhat darker than female. Wing length 1.73–1.86 mm, CR 0.50–0.52. Genitalia dark. Gonocoxite cylindrical with sclerotized hook on mesal margin. Caudomedian projection of parameres stout and long, in lateral view C-shaped (fig. 93). Gonostyle in horizontal position evenly curved, gradually tapered to the blunt tip, pubescent except for the apical third, however on ventral surface small setae reach almost the tip (fig. 92).

MATERIAL EXAMINED

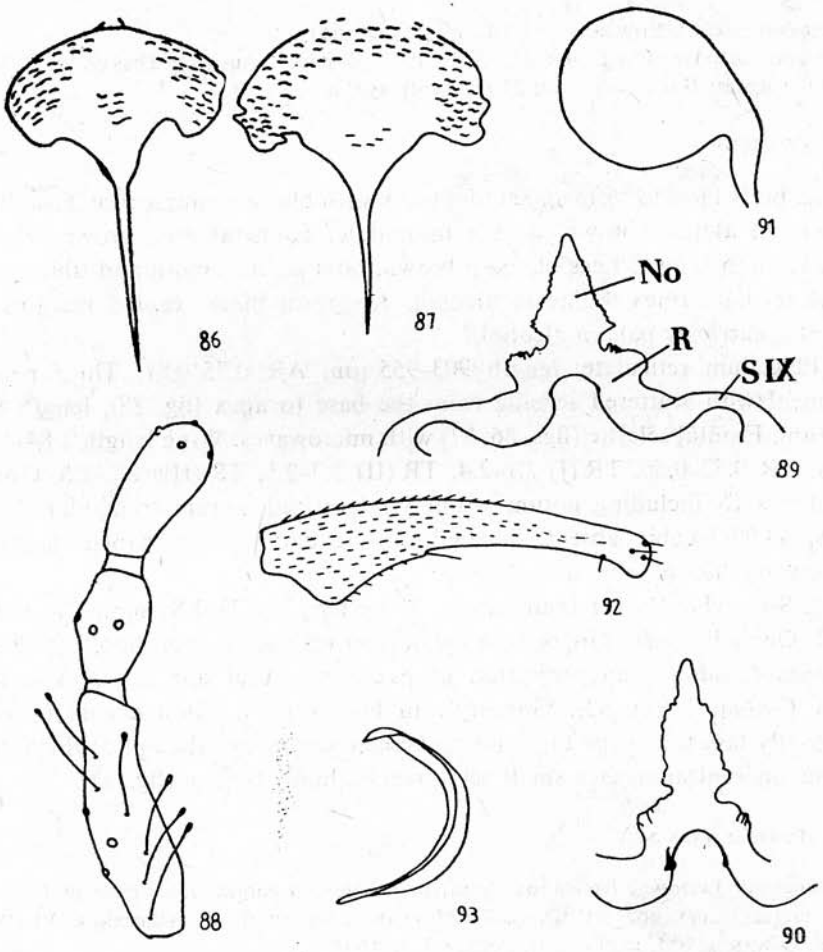
England: Lectotype female, paralectotype female and paralectotype male of *D. saxicola*, present designations – "*D. saxicola* EDWARDS, Westmorland: Witherslack, VI 1929, F. W. EDWARDS, BM. 1929 – 297, syntypes". BMNH.

Hingsfelds, Malham Tarn Inst. pavement, ex larvae, R.H.L. DISNEY, 5 ♂, 2 ♀. RSz.

Austria: Lectotype female and paralectotype male of *D. lithotelmatica*, present designations – "leg. A. THIENEMANN, Lunz 1942 (Rockpools), Typus, *Dasyhelea lithotelmatica* STR., ♂ Kopf, Hypopyg, ♀ – Kopf (9P 130)". SMF. Originally mounted on slide one female, and head plus genitalia of male.

Paralectotypes of *D. lithotelmatica*: "Leg. A. THIENEMANN, LUNZ 1942, (Rockpools), Typus, *Dasyhelea lithotelmatica* STR. P ♂ (ap. 132)". Originally mounted on slide three pupae and male head. "Coll. STRENZKE, Lunz 1941, Rockpools am Mittersee, Paratypus, *Dasyhelea lithotelmatica* STR. ♂♂♀♀ (GP 134)". Originally mounted on slide two female heads, one male head and two male genitalia. "Coll. STRENZKE, Lunz, 1941, Rockpools am Mittersee, Paratypus, *Dasyhelea lithotelmatica* STR. P. (GP 129)". Originally mounted on slide three pupae plus five opercula. SMF.

Lunz, 1941, Mittersee, 2 ♀ from alcohol, SMF. Lunz, 2 ♂ from alcohol, ZSM.



86–93. *Dasyhelea* (s. str.) *saxicola* EDW.; 87–89, 91 — lectotype female of *D. saxicola*; 86 — lectotype female of *D. lithotelmatica* STRENZKE; 92, 93 — paralectotype male of *D. lithotelmatica*; 86, 87 — frontal sclerite, 88 — three last palpal segments, 89, 90 — gonapophyses IX and sternite IX, 91 — seminal capsule, 92 — gonostyle, 93 — lateral view of aedeagus. No — notum, R — ramus, S IX — sternite IX

DISCUSSION

The species belongs to the difficult group of similar species which needs revision. I see no differences between types of *D. saxicola* and *D. lithotelmatica* and because of that I recognize the latter species as a synonym of *D. saxicola*.

DISTRIBUTION

The species recorded from Austria, England, Finland. EDWARDS (1929) mentioned specimens apparently of *D. saxicola* sent him by ZAVŘEL (from Czechoslovakia ?). Larvae in rockpools.

Dasyhelea (Prokempia) luteiventris Goetghebuer

(Figs. 94–99)

Dasyhelea luteiventris GOETGHEBUER, 1934 a: 90 (♀, Austria).
D. spiralis REMM, 1966: 60 (♂, ♀, Lithuania, Estonia, Leningrad distr.); REMM, 1967: 21 (Caucasus); HAVELKA, 1976: 227 (♂, West Germany), **syn. n.**

DESCRIPTION

♀. Scutum shining black. Humeral area, scutellum and halter plain yellow. Legs blackish brown, tarsi paler. Abdominal tergites and distal sternites dark, pleurae and proximal sternites yellow.

Flagellum length 380 μm, AR 0.79. Flagellomeres II–IX almost spherical, three next slightly cylindrical, last flagellomere short with blunt tip (fig. 94). Third palpal segment 40 μm long with capitate sensilla at the base (fig. 96). Frontal sclerite circular with long ventral projection (fig. 95). Wing length 0.81 mm, CR 0.48. TR (I) 2.3, TR (II) 2.4, TR (III) 2.1. Abdominal sternites II–VII sclerotized as on fig. 97. Sternite VIII normal. Seminal capsule well sclerotized, ovoid with short neck, spermathecal duct strongly sclerotized at seminal capsule (fig. 98), dimension 60 × 40 μm. Sternite IX strongly sclerotized, narrow, gonapophyses IX weakly sclerotized, notum long, slightly tapered to the rounded tip (fig. 99).

MATERIAL EXAMINED

Austria: Holotype female of *D. luteiventris* — "Austr. sup., Hammern, 19.8.44, Mik". NMW.

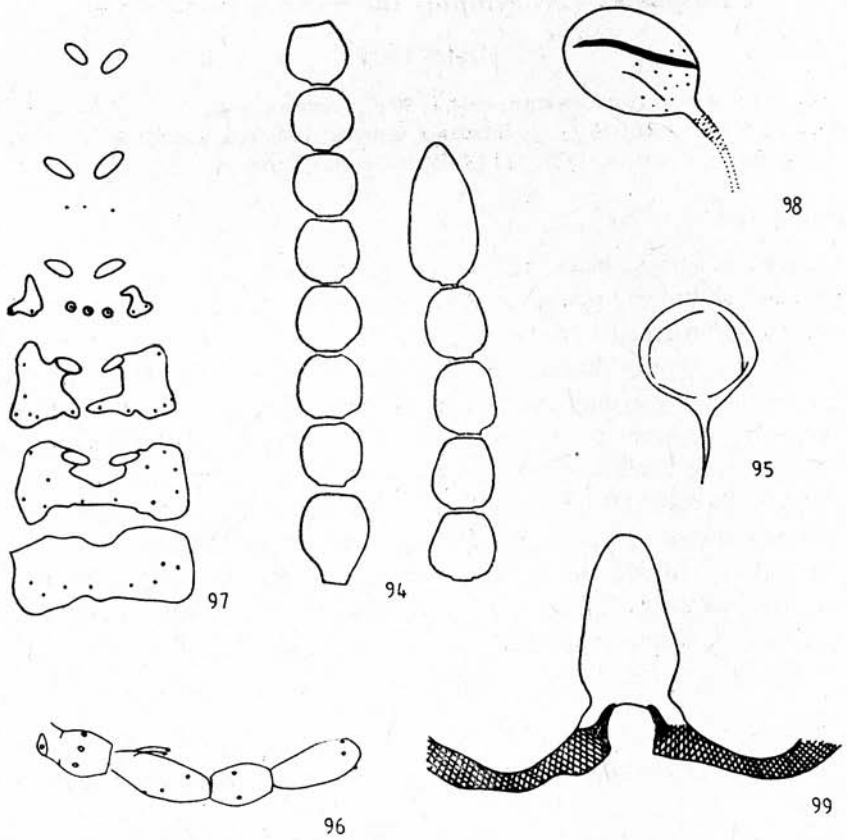
DISCUSSION

The holotype of *D. luteiventris* I mounted on slide and found to be identical with females of *D. spiralis* from my collection, agrees well with the original

description of the latter species by REMM, except for the shape of gonapophyses IX. I suppose that REMMA overlooked distinct notum which is hard to distinguish when tergites are not separated.

DISTRIBUTION

The species is recorded from Austria, West Germany, Lithuania, Estonia, Leningrad distr., and Poland (Karkonosze Mts., Sosnówka Dolna, 3–13 Aug. 1982, 2 ♀, 1 ♂; Popiołówka at Korycin near Białystok, 4 June 1981, 1 ♀; Giżycko, 2 June 1981, 2 ♀; Solanka distr. Kętrzyn, 15 Aug. 1980, 2 ♂, 1 ♀; leg. R. SZADZIEWSKI. RSz).



94–99. *Dasyhelea* (*Prokempia*) *luteiventris* GTGH., holotype female; 94 — flagellum, 95 — frontal sclerite, 96 — palp, 97 — abdominal sternites II–VII, 98 — seminal capsule, 99 — gonapophyses IX and sternite IX

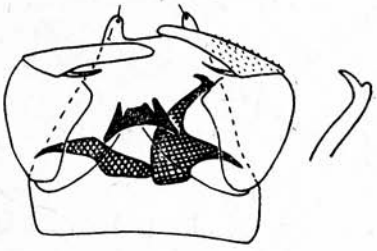
Dasyhelea (Pseudoculicoides) franzella Goetghebuer

(Fig. 100)

Dasyhelea franzella GOETGHEBUER, 1950: 3 (♂, Austria).
D. unbedarfti HAVELKA 1978 a: 177 (♂, West Germany), **syn. n.**

DESCRIPTION

♂. Small, blackish. Genitalia (fig. 100). Apicolateral processes of tergite IX stout and long. Gonostyle at the base with long pointed ventral projection, proximal half pubescent. Parameres asymmetrical with angulated basal arms, caudomedian projection stout at the base, distinctly tapered to fire hook shaped tip. Halter black. Wing length 1.08 mm, CR 0.45.



100. *Dasyhelea (Pseudoculicoides) franzella* GTGH., male genitalia of the lectotype

MATERIAL EXAMINED

Austria: Lectotype male of *D. franzella*, present designation – Admont Umg., 1949, H. FRANZ, originally mounted on plastic plate. Paralectotype male – Admont Umg., 1949, H. FRANZ, pinned. IRSNB.

DISCUSSION

GOETGHEBUER describing *D. franzella* overlooked that gonostyle is forked. On his drawing of male genitalia gonostyle is simple and unusually slender. It was a reason that the species was described for the second time by HAVELKA as *D. unbedarfti*.

DISTRIBUTION

The species is known from Austria and West Germany.

Dasyhelea (Pseudoculicoides) flavoscutellata (Zetterstedt)

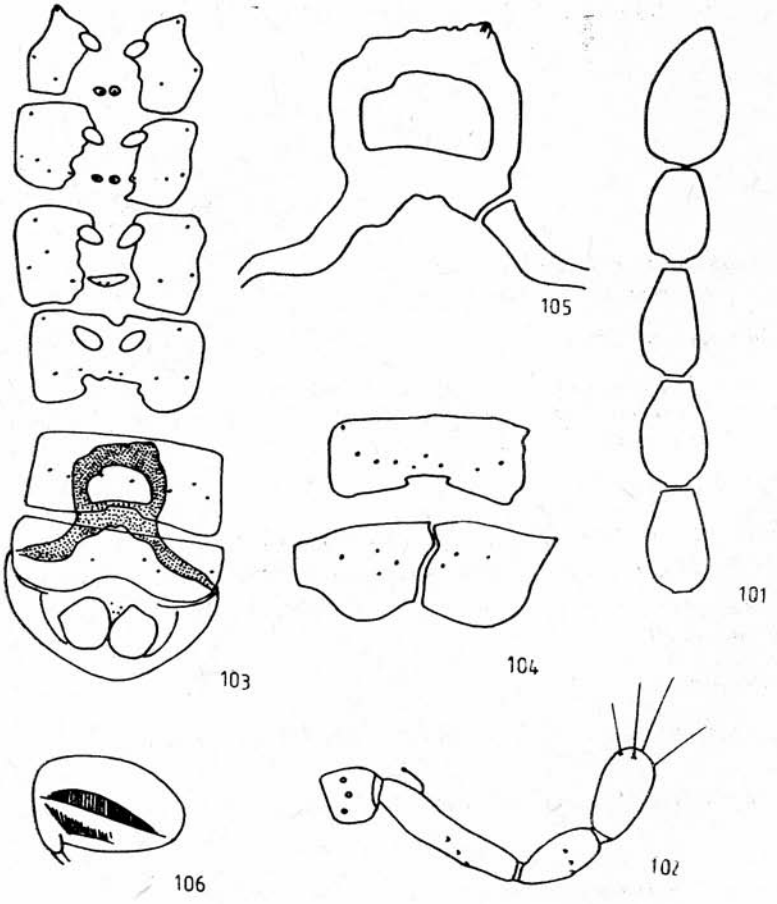
(Figs. 101–110)

Ceratopogon flavoscutellatus ZETTERSTEDT, 1850: 3648 (♀, Norway).
Dasyhelea flavoscutellata: REMM, 1962 a: 120 (♂, ♀, Estonia, Moscov and Riazan distr.); REMM, 1967: 16 (Caucasus); REMM and ŽOGOLEV, 1968: 832 (Crimea); REMM, 1973 a: 172 (Mongolia); REMM, 1973 b: 355 (Hungary); HAVELKA, 1976: 225 (♂, ♀, West Germany).

DESCRIPTION

♀. Body black. Scutum black with indistinct grayish pruinescence, humeral areas and scutellum yellow. Halter dark, knob with small pale patch. Legs blackish brown, tarsi paler.

Distal five flagellomeres 212 μm long, proximal flagellomeres lost. Lengths of distal flagellomeres as follows (in μm): 38–40–42–36–54 (fig. 101). Palp (fig. 102), length of third palpal segment 64 μm. Wing length 0.88 mm, CR 0.46, cell R_1 absent. TR (I) 2.0, TR (II) 1.9, TR (III) 2.0. Pregenital sternites



101–106. *Dasyhelea* (*Pseudoculicoides*) *flavoscutellata* (ZETT.), holotype female; 101 — distal flagellomeres, 102 — palp, 103 — ventral view of abdomen, 104 — sternites VII, VIII, 105 — gonapophyses IX, 106 — seminal capsule

III–VII well developed, sternite VI not divided into two plates (figs. 103, 104). Sternite IX and gonapophyses IX well sclerotized, notum broad with semicircular lumen (figs. 103, 105). Seminal capsule black, neck distinct (fig. 106), length 62 μm.

♂. Similar to female with the usual sexual differences. Scutellum black or dark brown. Whole halter knob dark or apical half yellow. Wing length 1.09–1.12 mm, CR 0.44–0.46. TR (I) 1.8, TR (II) 2.2–2.3, TR (III) 2.1–2.2. Genitalia (fig. 107). Parameres asymmetrical, right basal arm slender and weakly angulate (figs. 108, 109), left basal arm S-shaped distally distinctly desclerotized; apicomedian projection strongly sclerotized, long, rod-like. Bridge joining aedeagus with sternite IX long but extremely narrow (fig. 108). Lateral sclerites of aedeagus parallel with divergent apices, median projection not visible. Gonostyle slender, evenly curved with slender pointed tip, basal half pubescent. Apicolateral processes of tergite IX with long triangular pointed tip, seta located at the middle of the process (fig. 110).

Material examined

Norway: Holotype female of *C. flavoscutellatus* — "*Ceratopogon flavo-scutellatus* Zett. ♀, Christiania, 100". ZML.

Poland: Silec distr. Kętrzyn, May 1980, 1 ♂ in forest, 1 ♂ on window, leg. R. Szadziewski. RSz.

Discussion

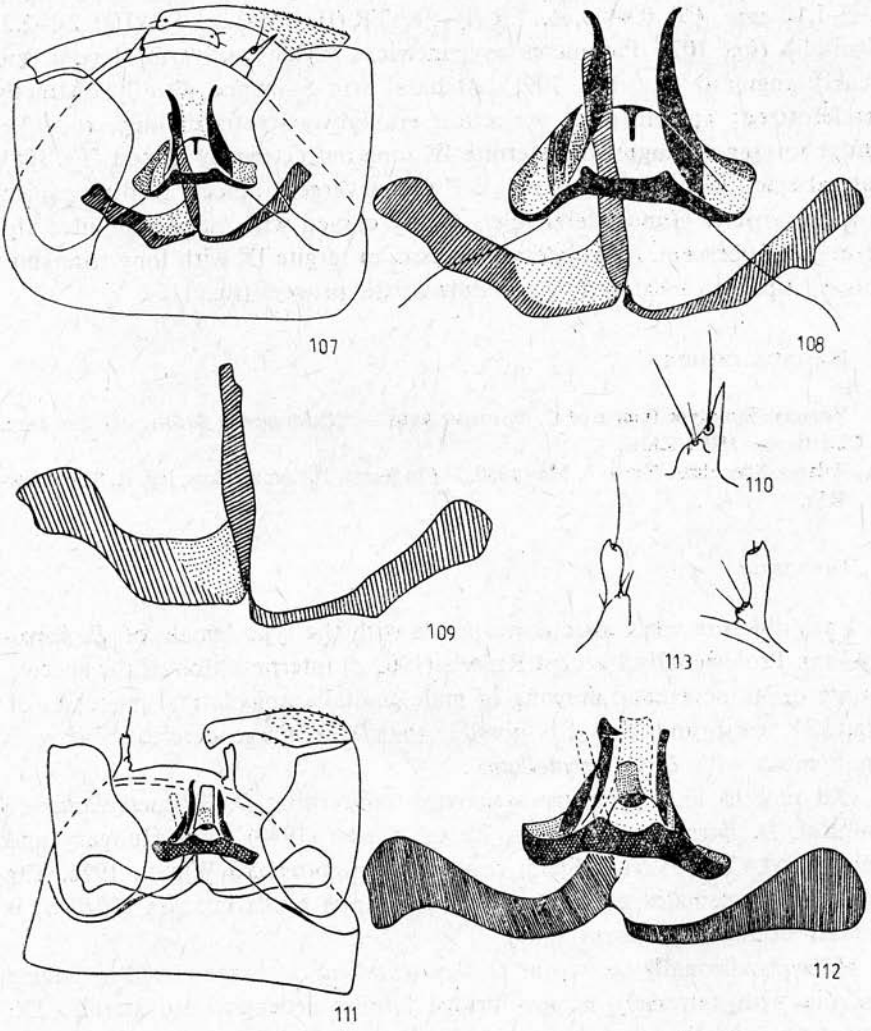
I am not sure what male corresponds with the type female of *D. flavoscutellata*. Provisionally I accept Remm's (1962 a) interpretation of the species, despite on his schematic drawing of male genitalia apicolateral processes of tergite IX are cylindrical. It is possible that *D. arenivaga* described below is synonymous with *D. flavoscutellata*.

Old records and previous synonyms concerning *D. flavoscutellata* are doubtful. *D. flavoscutellata* sensu Zilahi-Sebess (1940) from Hungary and sensu Mayer (1959) from Spain concern *D. neobifurcata* Wirth, 1976. The record of the females of the species from Japan by Tokunaga (1940 b) is at least doubtful (halteres pale).

Male provisionally treated as *D. flavoscutellata* is characterized by having genitalia with extremely narrow bridge joining aedeagus and sternite IX, desclerotized median projection of aedeagus, apicolateral processes of tergite IX with long triangular pointed tip and seta located at the middle, and by having long, strongly sclerotized rod-like caudomedian projection of parameres.

DISTRIBUTION

Detailed distribution of the species is unknown. It is recorded from Norway, Estonia, northern European part of USSR, Poland, West Germany, Hungary, Crimea, Caucasus and Mongolia.



107–113. *Dasyhelea* (*Pseudoculicoides*) *flavoscutellata* (ZETT.), 107–110 — male; *D.* (*Ps.*) *arenivaga* MACFIE, 111–113 — syntype male; 107, 111 — ventral view of genitalia, 108, 112 — aedeagus and parameres, 109 — parameres, 110, 113 — apicolateral processes of tergite IX

Dasyhelea (Pseudoculicoides) arenivaga Macfie, stat. n.

(Figs. 111–113)

Dasyhelea inconspicuosa var. *arenivaga* MACFIE, 1943: 151 (♂, ♀, Egypt).

DESCRIPTION

♂. Body black, scutum mat black, scutellum black. Halter black, inner surface of knob yellow. Legs blackish brown, tarsi pale.

Wing length 1.03 mm, CR 0.42, membrane densely covered with macrotrichia. TR (II) 2.3, TR (III) 2.2. Genitalia black, strongly sclerotized (fig. 111). Parameres asymmetrical; right basal arm claviform, gradually tapered to very narrow distal end; left basal arm S–shaped; caudomedian projection long. Aedeagus with rather parallel lateral sclerites, median projection long with straight or concave apex. Bridge joining aedeagus with sternite IX in ventral view small, elliptic (fig. 112). Gonostyle evenly curved with enlarged pointed tip, basal half pubescent. Apicolateral processes of tergite IX long, cylindrical with somewhat enlarged distal half, long seta located almost on the apex (fig. 113), tip with short prolongation extenting beyond base of the seta.

MATERIAL EXAMINED

Egypt: Syntype male of *D. inconspicuosa* var. *arenivaga* — "Egypt, Moascar, 1–6 III 1942, Dr. J.W.S. MACFIE, On windows, *Dasyhelea inconspicuosa* var. *arenivaga*, syntype". BMNH.

Specimens compared:

Algeria: Aokas, Tazmalt, Sétif and Beni Mansour in Petite Kabylie, Chegga at Biskra on Sahara, April and May 1981, 13 ♂, leg. R. SZADZIEWSKI. RSz.

Poland: Inowrocław–Rąbin, Gdańsk–Górki Wschodnie, Bielawskie Błoto at Mieroszyno, Brzyno at Żarnowiec Lake, Karsibór on Uznam Island, 5 ♂, June to August 1975–1982, leg. R. SZADZIEWSKI. RSz.

DISCUSSION

Male of the species is close to *D. flavoscutellata*. It is characterized by having apicolateral processes of tergite IX long, cylindrical with somewhat enlarged distal half and seta located almost on the apex, left basal arm of parameres S–shaped, in the middle parallel, right arm claviform gradually tapered to the pointed distal end. There is a possibility that the species is synonymous with *D. flavoscutellata*.

DISTRIBUTION

Egypt, Algeria, Poland.

Dasyhelea (Pseudoculicoides) inconspicuosa C. I. M.

(Figs. 114–120)

Dasyhelea inconspicuosa CARTER, INGRAM and MACFIE, 1921: 191 (♂, ♀, Ghana); de MEILLON and WIRTH, 1981 a: 530 (South Africa); de MEILLON and WIRTH, 1981 b: 572 (South Africa).

DESCRIPTION

♀. Scutum black, scutellum yellow. Halter pale, in Canada balsam greyish. Abdomen black, at lateral margins of tergites yellow patches. Legs brown, tarsi paler.

Flagellum 398 μm long, AR 0.84 (fig. 114), reticulation of flagellomeres invisible. Frontal sclerite normal, as in other species of the subgenus. Palp (fig. 115), third palpal segment 46 μm long. Wing length 0.69 mm, CR 0.48, macrotrichia not abundant. Scutellum with two lateral and four median long setae. TR (I) 1.9, TR (II) 2.4, TR (III) 2.2. Abdominal sternites sclerotized as on fig. 116, sternite VI desclerotized in the middle. Gonapophyses IX with heart-shaped lumen. Seminal capsule black, neck strongly curved (fig. 118), dimension 34 × 32 μm.

♂. Similar to female with the usual sexual differences. Third palpal segment 60 μm long. Wing length 0.87 mm, CR 0.48. Genitalia weakly sclerotized. Parameres asymmetrical, basal arms stout and distally angular; caudomedian projection short and slender, reaches base of aedeagus. Lateral sclerites of aedeagus convergent, median projection longer than lateral sclerites, tip straight. Bridge joining aedeagus with sternite IX strongly sclerotized, in ventral view elliptical. Gonostyle evenly curved, tapered to the pointed tip, pubescent on proximal half (fig. 119). Apicolateral processes of tergite IX long, slender and cylindrical with long seta located on the apex (fig. 120).

MATERIAL EXAMINED

Ghana: Two males from type series of *D. inconspicuosa* — "*Dasyhelea inconspicuosa*, described Ann. Trop. Med. and Par. vol XV p. 191, presented by MACFIE and INGRAM".

One female — "Gold Coast, Oblogo, Carter, INGRAM and MACFIE, XII–1919–V 1920, *Dasyhelea inconspicuosa* C.I.M., BM. 1947–81, cotype ♀". BMNH. One male without wings, legs and antennae. I mounted all specimens examined on plastic plates.

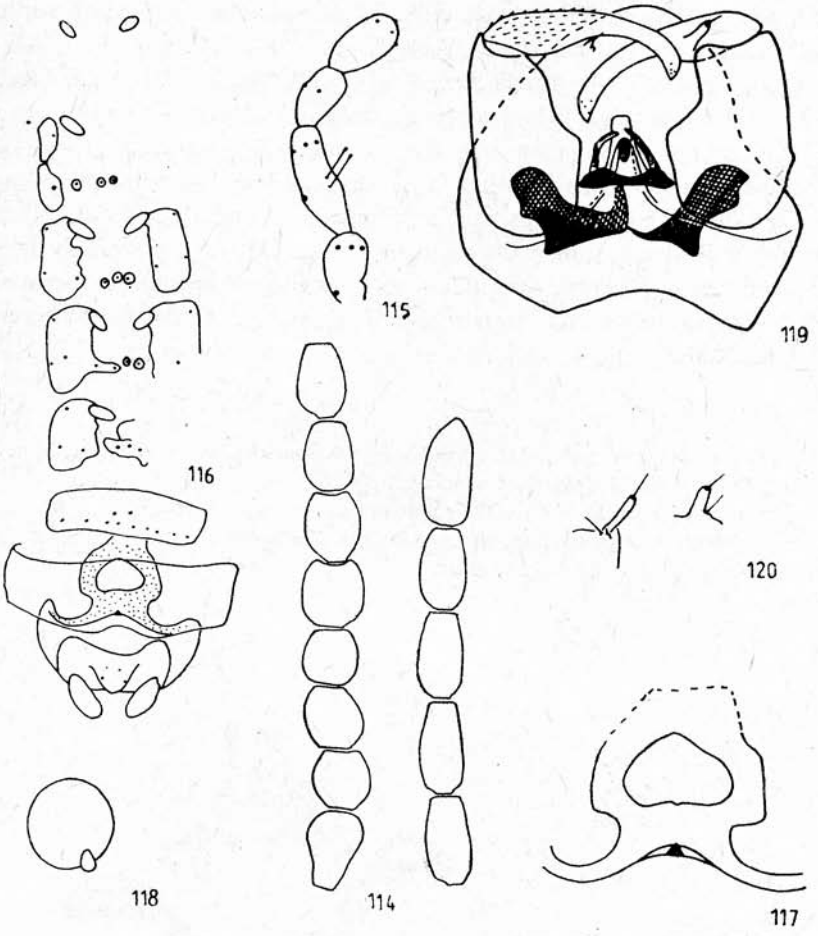
DISCUSSION

It is very small species. Male is characterized by having genitalia with stout angular basal arms of parameres and slender cylindrical apicolateral processes of tergite IX with long seta located on apex.

MACFIE (1943) described three new varieties of *D. inconspicousa* from Egypt, i. e. *egypti*, *heliophila* and *arenivaga* which I treat as distinct species. In my materials from Algeria I have no specimens of *D. inconspicuosa* so I presume it is exclusively subsaharan species.

DISTRIBUTION

Ghana, Mozambique, South Africa. Record of the species from Sudan by MACFIE (1947) is uncertain, since the author supposed it to be var. *egypti*.



114–120. *Dasyhelea* (*Pseudoculicoides*) *inconspicuosa* C. I. M., 114–118 — female, 119, 120 — male; 114 — flagellum, 115 — palp, 116 — ventral view of abdomen, 117 — gonapophyses IX, 118 — seminal capsule, 119 — male genitalia, 120 — apicolateral processes of tergite IX

Dasyhelea (Pseudoculicoides) arenosa Kieffer

(Figs. 121–123)

Dasyhelea arenosa KIEFFER, 1925 c: 255 (♂, Egypt).

DESCRIPTION

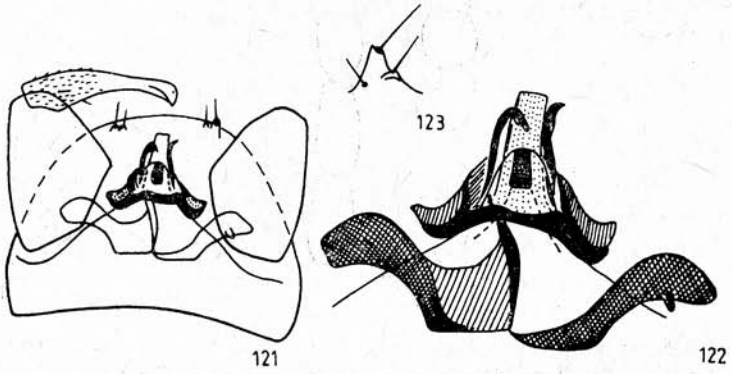
♂. Body blackish brown. Humeral areas, scutellum and halteres pale. Lateral side of thorax with pale patches. Abdominal tergites and genitalia blackish brown. Legs brownish, tarsi paler, hind femur and tibia brown.

Flagellum length 680 μm, AR 0.94. Third palpal segment with capitate sensilla at the base, length 80 μm. Wing length 0.97–1.12 mm, CR 0.44–0.45, membrane densely covered with macrotrichia. TR (I) 2.2, TR (II) 2.5, TR (III) 2.2–2.3. Genitalia (fig. 121) strongly sclerotized. Parameres asymmetrical; left basal arm stout, angular with short caudomedian projection (fig. 122); right basal arm slender, somewhat foot-shaped. Lateral sclerites of aedeagus rather parallel with curved tips, median projection longer than lateral sclerites, tip straight. Bridge joining aedeagus with sternite IX distinct, strongly sclerotized, rectangular in ventral view. Gonostyle evenly curved, gradually tapered to the enlarged pointed tip, proximal half pubescent. Apicolateral processes of tergite IX short and stout with long seta located on apex (fig. 123).

MATERIAL EXAMINED

Egypt: Paralectotype male of *D. ismailiae* — "*D. ismailiae*, syntype, Egypt, Moascar, 1–6 III 1942, Dr J. W. S. MACFIE, on windows". BMNH.

Algeria: Neotype male of *D. arenosa*, present designation — Barika near Biskra, 26 April 1981, flowers of olive-tree, leg. R. SZADZIEWSKI. The neotype is deposited in the Institute of Zoology, Polish Acad. Sci., Warsaw.



121–123. *Dasyhelea (Pseudoculicoides) arenosa* KIEFF., neotype male; 121 — genitalia, 122 — parameres and aedeagus, 123 — apicolateral process of tergite IX

DISCUSSION

D. arenosa is close to *D. inconspicuosa*. Male can be distinguished basing on some details of genitalia, i. e. right basal arm of parameres slender, left basal arm with strongly enlarged distal half, apicolateral processes of tergite IX relatively short and stout.

Type of *D. arenosa* from Cairo does not exist (de MEILLON and WIRTH, 1983 a, p. 349). To preserve this species name I designate the neotype from Algeria which agrees with the original KIEFFER's description of the species. One paralectotype of *D. ismailiae* from Egypt now examined does not agree with the detail description of this characteristic species but belongs to *D. arenosa* (see below). MACFIE (1943) suggested that *D. arenosa* is synonymous with *D. inconspicuosa* var. *egypti* but he was unable to distinguish it from a number of allied species found in Egypt.

DISTRIBUTION

The species known from Egypt and Algeria in North Africa. In addition to the neotype I collected from Algerian Sahara 12 males (Barika, 30 km north of Biskra, Chegga at Biskra, oasis Sowalah at El-Oued, April and May 1981, RSz).

Dasyhelea (*Pseudoculicoides*) *ismailiae* Macfie

Dasyhelea ismailiae MACFIE, 1943: 152 (♂, ♀, Egypt); de MEILLON and WIRTH, 1983 a: 353 (South Africa).

MATERIAL EXAMINED

Egypt: Lectotype male of *D. ismailiae*, present designation– "Egypt, Moascar, 22–26 II 1942, Dr J. W. S. MACFIE, on windows". One paralectotype male labelled as above. Two paralectotypes males with the same data as above except for date 1–6 III 1942. BMNH. One of the paralectotypes collected 1–6 III 1942 belongs to *D. arenosa* (see above).

DISCUSSION

MACFIE described the species in detail and gave an excellent drawing of male genitalia. Among four males from type series of *D. ismailiae* which I examined one paralectotype designated here does not agree with the description and is actually *D. arenosa*. The species is known from Egypt and South Africa.

Dasyhelea (*Pseudoculicoides*) *egypti* Macfie, stat. n.

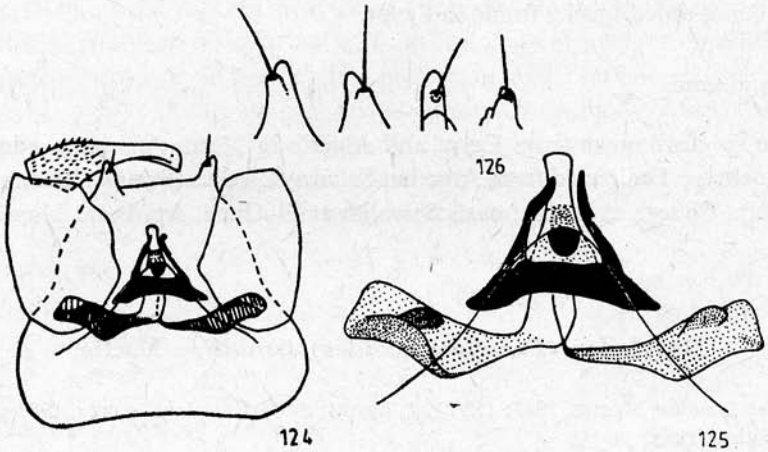
(Figs. 124–126)

Dasyhelea inconspicuosa var. *egypti* MACFIE, 1945: 149 (♂, ♀, Egypt).

DESCRIPTION

♂. Body blackish brown, scutum black with grey and brown pruinescence. Humeral areas and scutellum yellow, halter pale. Legs pale brown, slightly infuscated, knees black, tarsi paler.

Wing pale with sparse macrotrichia, length 0.91–0.94 mm, CR 0.47. TR (I) 2.2, TR (II) 2.6, TR (III) 2.4. Genitalia dark brown (fig. 124). Basal arms of parameres well sclerotized, somewhat angulated, tapered distally,



124–126. *Dasyhelea* (*Pseudoculicoides*) *egypti* MACFIE, lectotype and paralectotype male; 124 — genitalia, 125 — parameres and aedeagus, 126 — apicolateral processes of tergite IX

caudomedian projection wide and short. Lateral sclerites of aedeagus convergent, median projection distinct and long. Bridge joining aedeagus with sternite IX broad and short, in ventral view semicircular (fig. 125). Gonostyle gently curved with enlarged pointed tip, proximal half pubescent. Apicolateral processes of tergite IX distinct, with seta located distinctly before the rounded tip (fig. 126).

MATERIAL EXAMINED

Egypt: Lectotype male and paralectotype male, present designation — "Moascar, 22–26 II 1942, Dr J. W. S. MACFIE, on windows, syntypes, *Das. inconspicuosa* var. *egypti*". BMNH.

DISCUSSION

D. egypti is close to the other species of the group *flavoscutellata*, especially to *D. inconspicuosa*. It is characterized by having rather slender and weakly angulated basal arms of parameres, distal portion of the right basal arm narrow, and apicolateral processes of tergite IX with seta located distinctly before the rounded tip.

DISTRIBUTION

The species known only from Egypt. Record from Sudan by MACFIE (1947 p. 74) is uncertain.

Dasyhelea (Pseudoculicoides) heliophila MACFIE, stat. n.

Dasyhelea inconspicuosa var. *heliophila* MACFIE, 1943: 150 (♂, ♀, Egypt).

MACFIE described the species basing on single male and two females. He examined male genitalia, so I am afraid that this specimen is not preserved. According to the description the species is very small, in the male genitalia caudomedian projection of parameres is long and slender, and aedeagus is shorter than in *D. inconspicuosa*. Apicolateral processes of tergite IX were not visible.

Ceratopogoninae

Culicoidini

Culicoides (Pontoculicoides) saevus Kieffer

(Figs. 127–129)

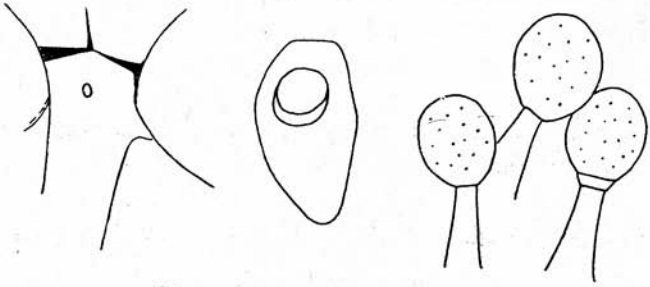
Culicoides saevus KIEFFER, 1922 b: 506 (♀, Algeria); KIEFFER, 1923: 675 (♂, Algeria); SZADZIEWSKI, 1984 b: 164 (Algeria, distribution).
C. puncticeps GOETGHEBUER, 1934 a: 91 (♀, Austria), **syn. n.**

DESCRIPTION

♀. Scutum grey pollinosed with brown spots often fused. Scutellum pale in middle dark. Legs brown with unclear pale rings on femora and tibiae, tarsi paler.

Eyes widely separated (fig. 127), bare. Flagellum length 488 μm, AR 0.94, sensilla coeloconica present on flagellomeres I, V–VIII. Third palpal segment broad with shallow sensory pit (fig. 128), length 74 μm. Mandible with

13 teeth. Wing uniformly pale, only tip of radial veins dark, length 1.23 mm, CR 0.58. TR (I) 1.9, TR (II) 2.4. Three seminal capsules present, spermathecal ducts wide and sclerotized for a long distance (fig. 129), dimensions 36×30, 40×33, 38×30μm.



127 128 129

127–129. *Culicoides* (*Pontoculicoides*) *saevus* KIEFF.; holotype female of *C. puncticeps* GTGH.; 127 — eyes separation, 128 — third palpal segment; 129 — seminal capsules

MATERIAL EXAMINED

Austria: Holotype female of *C. puncticeps* — "Austr. inf. Wien, 12. 9. 68, Mik, *Culicoides puncticeps* n. sp., det. M. GOETGHEBUER". NMW.

DISCUSSION

There is no doubt that holotype female of *C. puncticeps* is identical with *C. saevus*. It is third synonym of *C. saevus* (= *drenskii* ZILAHI-SEBESS, 1934; *micromaculithorax* KHALAF, 1957).

DISTRIBUTION

The species is widely distributed in meridional regions of the Palaearctic.

Culicoides (s. str.) *sordidellus* (Zetterstedt)

(Figs. 130–134)

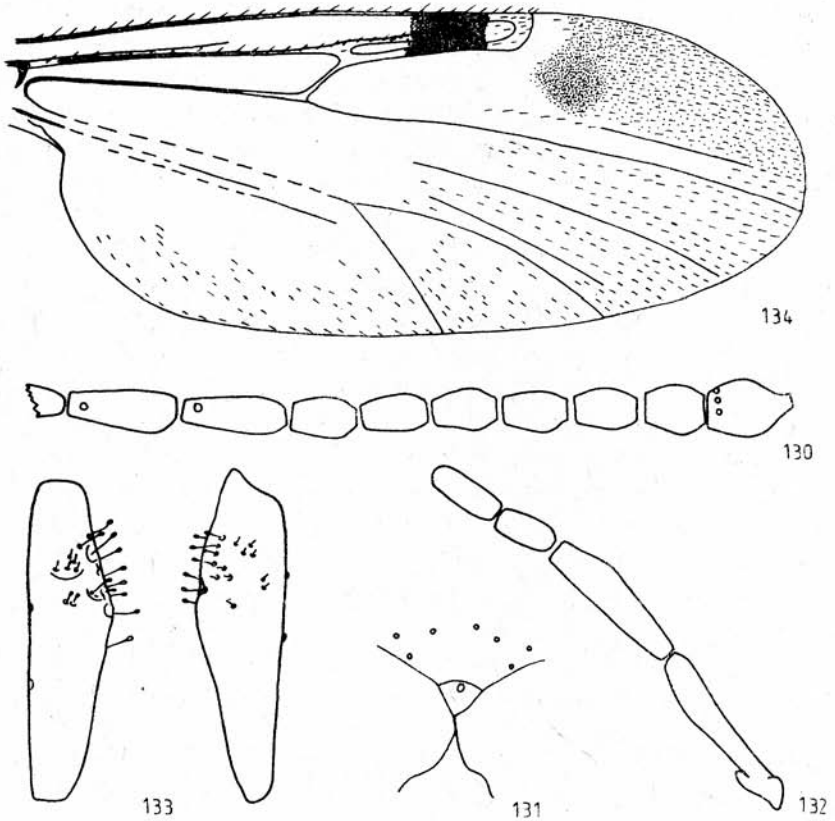
Ceratopogon sordidellus ZETTERSTEDT, 1838: 820 (♀, Greenland).
Ceratolophus sordidellus: KIEFFER, 1906: 61 (combination).
Culicoides sordidellus: ARNAUD, 1956: 148 (combination).

DESCRIPTION

♀. Proximal eight flagellomeres 448 μm long, sensilla coeloconica present on flagellomeres I, IX, X, three last flagellomeres lost (fig. 130). Palp 376 μm long, lengths of palpal segments as follows (in μm): I+II — 140, III — 124,

IV — 45, V — 64 (fig. 132), third palpal segment moderately swollen toward distal third, sensory area with groups of capitate sensilla as on fig. 133. Mandible with 17 and maxilla with 18 teeth. Eyes narrowly joined (fig. 131), bare.

Thorax brown. Scutum uniformly brown, weakly greyish pruinosed. Halter pale. Legs brown, knees and tips of tibiae somewhat darker, tibial comb composed of five spines, first one longest. Lengths of leg segments as follows (in μm): fe (I)—624, fe (II)—749, ti (II)—733, ta_1 (II)—390, fe (III)—796, ta_1 (III)—406, ta_2 (III)—231, other segments lost. TR (III) 1.8. Wing length 2.25 mm, breadth 0.94 mm, CR 0.65; generally weakly brownish, marking very faint, membrane with only one diffused brownish spot in middle of cell R_5 (fig. 134); proximal portion of costa, radius and media darker;



130–134. *Culicoides* (s. str.) *sordidellus* (ZETT.), holotype female; 130 — proximal flagellomeres, 131 — eyes separation, 132 — palp, 133 — third palpal segments, 134 — wing

darker spot covering distal half of cell R_1 and base of cell R_2; macrotrichia abundant over distal and anal portion of wing, basal cell bare.

Basal portion of abdomen distinctly slender, caudal end lost.

MATERIAL EXAMINED

Greenland: Holotype female of *C. sordidellus* — "*C. sordidellus* ZETT., ♀, Grönland, 47". ZML.

DISCUSSION

I sent description of the type specimen of *C. sordidellus* to Dr. WIRTH (Syst. Ent. Lab., USDA, c/o USNM, Washington) with suggestion that the species is synonymous with North American *Culicoides cockerelli* (COQ.). Dr. WIRTH transmitted my letter to Mr J. A. DOWNES of Biosystematic Research Institute in Ottawa who in detail discussed the question. His opinion is as follows: "I think the specimen of *sordidellus* that you describe is not fully typical... The Copenhagen collection of Greenland has about 70 specimens which I borrowed some years ago... Your specimen is either an extremely weakly marked individual or, perhaps just as likely, considerably faded. In *sordidellus*, certainly, the contrast between the light and dark markings is always weak, but nevertheless it is much more evident in some specimens than others, with a maximum of about what EDWARDS shows in his *grisescens* figure [EDWARDS, 1939, p. 146]. In your figure the eyes have a short region in contact, as do some of the Copenhagen specimens; but in others they just touch at a point, and in others again they are clearly though narrowly separated (these same differences in eye contact occur also in *tristriatulus*, *cockerelli*, *neomontanus*, *grisescens*, and doubtless others). Because of this range of variation I tried hard to segregate the Copenhagen specimens into two species, but never succeeded. Moreover, the species has a well integrated and well circumscribed range, from about 60°N to 69 or 70°N on the west coast (only) of Greenland. EDWARDS thought it was closest to *grisescens*, and this seems to me quite reasonable opinion... *C. cockerelli*... is distinctly less closely related to *sordidellus* (though of course it also is a member of that subsection of the *pulicaris* group with a pronounced median hump or lobe on the hind margin of the 9th tergite — one might call this the *cockerelli–grisescens* subgroup). It is smaller, the wing is very clearly paler, brighter in colour, and with contrast between the pale areas (and yellow anterior veins) and the dark markings much greater; in the male the parameres are stouter and they are narrow more markedly in mid-portion, while in *sordidellus* they are more slender overall and they narrow more gradually and

more evenly; the apical points of the 9th tergite are considerably shorter (smaller) in *cockerelli*. *Cockerelli* has a wide range in western N. America, but it is western only and thus again separated by enormous distances from *sordidellus*..."

DISTRIBUTION

Greenland.

Culicoides (*Oecacta*) *minutissimus* (Zetterstedt)

(Figs. 135–137)

Ceratopogon minutissimus ZETTERSTEDT, 1855: 4860 (♀, Sweden).
Culicoides minutissimus: EDWARDS, 1926: 405 (Great Britain); KREMER, 1965: 102 (♂, ♀, France); GUCEVIČ, 1973: 187 (♂, ♀, USSR); ORSZÁGH, 1976: 24 (♂, ♀, Czechoslovakia).
C. pumilus: EDWARDS, 1939: 44, 142 (♂, ♀, Great Britain); ZILAHI-SEBESS, 1940: 63 (♀, Hungary); KREMER, 1965: 103 (♂, ♀, France); HAVELKA, 1976: 244 (West Germany); ORSZÁGH, 1980: 67 (♂, ♀, Czechoslovakia); SZADZIEWSKI, 1984 a: 559 (♂, ♀, synonyms, Poland).
C. nanulus KIEFFER, 1919: 38 (♀, Hungary).
C. albihalter KIEFFER, 1919: 37 (♀, West Germany); KIEFFER, 1921 a: 785 (♀, West Germany).

DESCRIPTION

♀. Body blackish brown; legs dark brown, tarsi paler. Halter pale. Flagellum length 408 μm, AR 1.08, sensilla coeloconica present on proximal eight flagellomeres (fig. 135). Eyes widely separated (fig. 136), bare. Third palpal segment distinctly swollen with moderately deep sensory pit (fig. 137). Wing pale without markings, length 0.87 mm, CR 0.55. Almost whole surface covered with macrotrichia except for subcostall cell. Basal cell with five macrotrichia. TR (I) 1.7, TR (II) 1.9, hind legs lacking. Apical portion of abdomen lost.

MATERIAL EXAMINED

Sweden: Holotype female of *Ceratopogon minutissimus* — "*C. minutissimus* ZETT., n. sp., ♀, Öl [andia], HOLMGR." ZML.

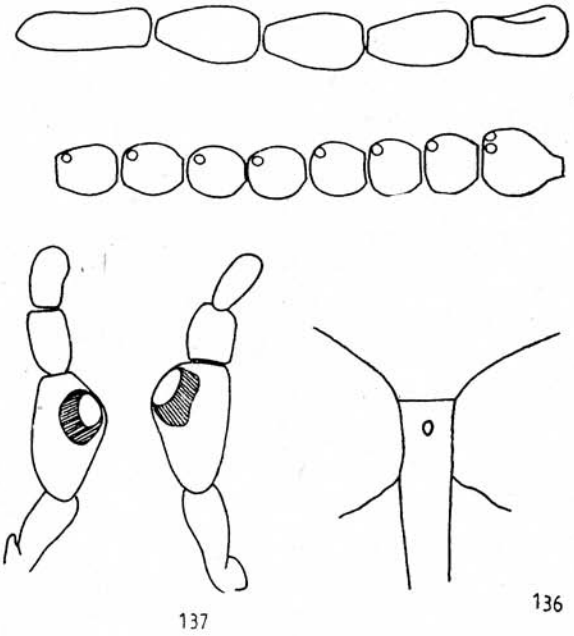
DISCUSSION

In my older paper (SZADZIEWSKI, 1984 a) I accepted EDWARDS's (1939) point of view that *C. minutissimus* is junior synonym of *C. pumilus* and listed synonyms established by older authors for these two species. I also recognized *C. tugaicus* DZHAFAROV as junior synonym of *C. pumilus*. After the letter discussion with Dr. H. REMM I adopt his opinion that *Ceratopogon pumilus*

should be recognized as a nomen dubium since, according to the original description, it is not similar to *C. minutissimus* and even does not belong to the genus *Culicoides*. REMM claims that *C. tugaicus* differs from *C. minutissimus* in paler body, elongated proximal female flagellomeres, shape of parameres and ecology.

DISTRIBUTION

Whole Europe and Marocco in northern Africa.



135–137. *Culicoides* (*Oecacta*) *minutissimus* (ZETT.), holotype female; 135 — flagellum, 136 — eyes separation, 137 — palps

Culicoides (Oecacta) schultzei (Enderlein)

(Figs. 138–143)

Ceratopogon schultzei ENDERLEIN, 1908: 459 (♂, ♀, Namibia).
Culicoides schultzei: KREMER et al., 1975: 800 (= *irroratus*).
C. irroratus GOETGHEBUER, 1948 b: 12 (♀, Zaire).
C. kingi: KHAMALA and KETTLE, 1971: 76 (♂, ♀, Kenya, Tanzania).

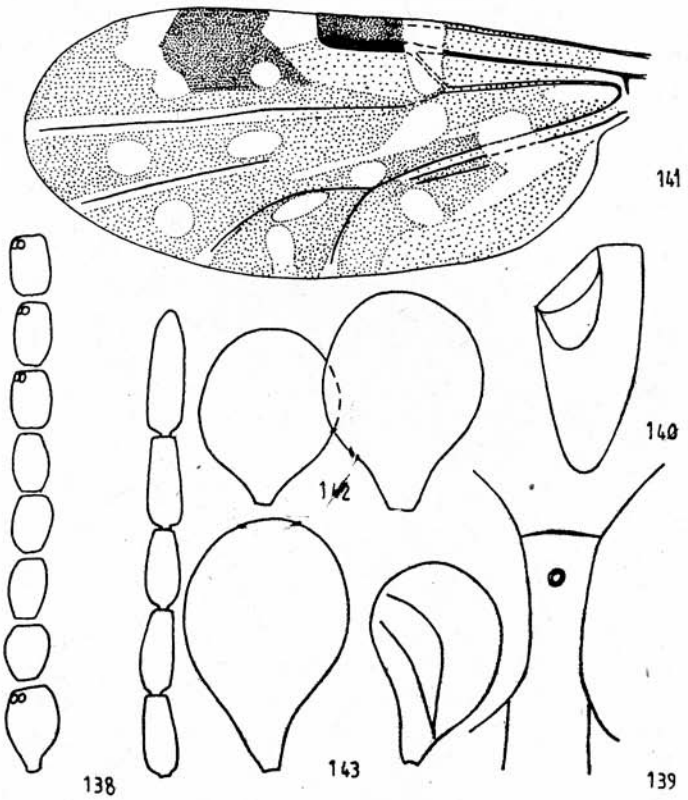
DESCRIPTION

♀. Scutum with dark and light brown patches, scutellum dark with pale lateral regions. Halter pale. Legs pale brown, all femora and tibiae with pale basal bands, fore and middle femora with distinct preapical pale rings, knees dark, tarsi pale. Abdomen pale brown.

Flagellum length 496 μm, AR 0.87, sensilla coeloconica present on flagellomeres I (2), VI (2), VII (2) and VIII (2), proximal flagellomeres cylindrical (fig. 138). Third palpal segment moderately swollen with deep sensory pit (fig. 140), length 62 μm. Eyes bare, widely separated (fig. 139). Wing length 1.09–1.15 mm, CR 0.53; surface dark with characteristic pale spots (fig. 141), basal cell without macrotrichia, cell R_1 and R_2 not developed. TR (III) 1.8–1.9, tibial comb composed of four spines, first the longest. Seminal capsules pyriform (fig. 142, 143), dimensions 56–62×40–42 μm and 44–50×32–34 μm.

MATERIAL EXAMINED

Namibia: Lectotype female and paralectotype female, present designations — "*Ceratopogon schultzei* ENDERL. n. sp., ♀. S. W. Africa, Rooibank, Mai 1905, Dr L. SCHULTZE S. Nr. 1136, type". ZMB.



138–143. *Culicoides* (*Oecacta*) *schultzei* (END.), lectotype and paralectotype female; 138 — flagellum, 139 — eyes separation, 140 — third palpal segment, 141 — wing, 142, 143 — seminal capsules

DISCUSSION

In the collection of the Zoologisches Museum in Berlin male from type series of *C. schultzei* is absent. I do not understand why KREMER et al. (1975) redescribed not only holotype female and paratype female but also "paratype" male of *C. irroratus* since, in the original description of this species only two females are mentioned. Thus this male does not belong to the type series.

Wing pattern of *C. schultzei* is very similar to that of *C. kingi* AUSTEN and some other closely related species. It has however very characteristic male genitalia, i. e. tergite IX distinctly tapered distally, apicolateral processes long and strongly divergent with broad bases occupying all caudal margin (drawings of ENDERLEIN, 1908; KHAMALA and KETTLE, 1971; KREMER et al., 1975). *C. schultzei* seems to be distributed in the Subsaharan Africa only. *C. schultzei* sensu CLASTRIER (1957 p. 425) and GUCEVIČ (1973 p. 123) from North Africa and Middle Asia probably concern *C. kingi*, which has apicolateral processes of tergite IX widely separated and usual in shape.

DISTRIBUTION

Subsaharan Africa.

Culicoides (*Oecacta*) *herero* (Enderlein)

(Figs. 144–148)

Ceratopogon herero ENDERLEIN, 1908: 460 (♀, Namibia).
Culicoides herero: WIRTH et al., 1980: 162 (combination).

DESCRIPTION

♀. Thorax including scutellum dark brown. Halter pale. Legs brown, tarsi paler, knees dark, all tibiae with distinct pale basal ring. Abdomen brown.

Flagellum 376 μm long, AR 0.92, sensilla coeloconica present on all proximal flagellomeres (fig. 144), proximal flagellomeres slightly subcylindrical. Eyes narrowly separated (fig. 145), bare. Third palpal segment distinctly swollen, sensory pit shallow (fig. 146), length 54 μm. Wing length 0.97 mm, CR 0.53. Wing membrane rather dark with indistinct pale spot at tip of costa and indistinct darker long patch occupying anterior surface of cell R_5 (fig. 147). Macrotrichia sparse, in basal cell absent. Tibial comb composed of four spines, first the longest. TR (I) 2.1, TR (II) 2.9, TR (III) 1.9. Seminal capsules ovoid with long necks, dimensions 56×34 and 50×30 μm.

MATERIAL EXAMINED

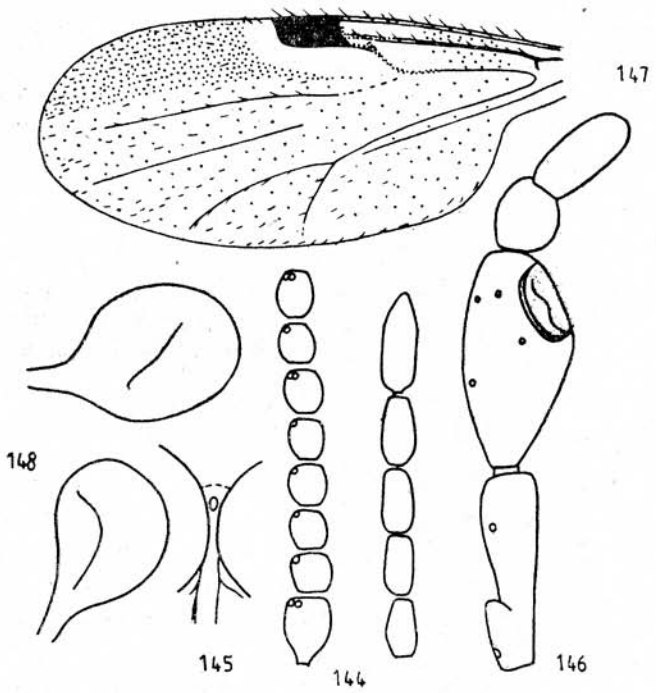
Namibia: Holotype female – "*Ceratopogon herero* ENDERL., n. sp., ♀, S. W. Africa, Rooibank, Dr. L. SCHULTZE S., Nr. 1136, type". ZMB.

DISCUSSION

ENDERLEIN described the species basing on several females, however in the collection of the Zoologisches Museum in Berlin I have found only single female. Presumably the species belongs to the group *similis*.

DISTRIBUTION

Namibia.



144–148. *Culicoides* (*Oecacta*) *herero* (END.), holotype female; 144 – flagellum, 145 – eyes separation, 146 – palp, 147 – wing, 148 – seminal capsules

Culicoides (*Monoculicoides*) *algecirensis* (Strobl)

(Figs. 149–154)

Ceratopogon pulicaris forma *algecirensis* STROBL, 1900: 170 (♀, Spain).
C. algecirensis: STROBL, 1906: 398 (♂, ♀, Spain).
Culicoides algecirensis: KIEFFER, 1919: 39 (♀, Spain).

Ceratopogon puncticollis BECKER, 1903: 75 (♀, Egypt), **syn. n.**
Culicoides puncticollis: EDWARDS, 1939: 133 (♂, ♀, synonyms, Mediterraneis); SZADZIEWSKI, 1984 b: 176 (synonyms, Algeria, distribution).

DESCRIPTION

♀. Flagellum 700–732 μm long, AR 0.79–0.84, sensilla coeloconica present on flagellomeres I, VI–VIII (fig. 149). Thrid palpal segment 108–120 μm long, sensorium composed of two shallow sensory pits (fig. 151). Eyes bare, widely separated (fig. 150). Wing length 1.98–2.03 mm, CR 0.52–0.54. Membrane with rather distinct dark markings as on fig. 152, basal cell without macrotrichia. Scutellum brownish, in middle darker. Legs brownish, tibiae with distinct basal rings, tarsi paler. Two proximal tarsomeres of fore and hind legs with single apical spines, the three first of middle legs with two apical spines (fig. 153). Tibial comb composed of five spines. Sternite IX well sclerotized, narrow, fused with distinct separated rami. Seminal capsule single, reniform, spermathecal duct short and well sclerotized (fig. 154).

MATERIAL EXAMINED

Spain: Neotype female of *C. algecirensis*, present designation — "Algeciras, Andalusien, Prof. G. STROBL, *Cer. algeciracensis* [sic !] m, ♀, Spain 53/30". ZMB. Second female with the same data as the neotype. These two specimens were pinned together.

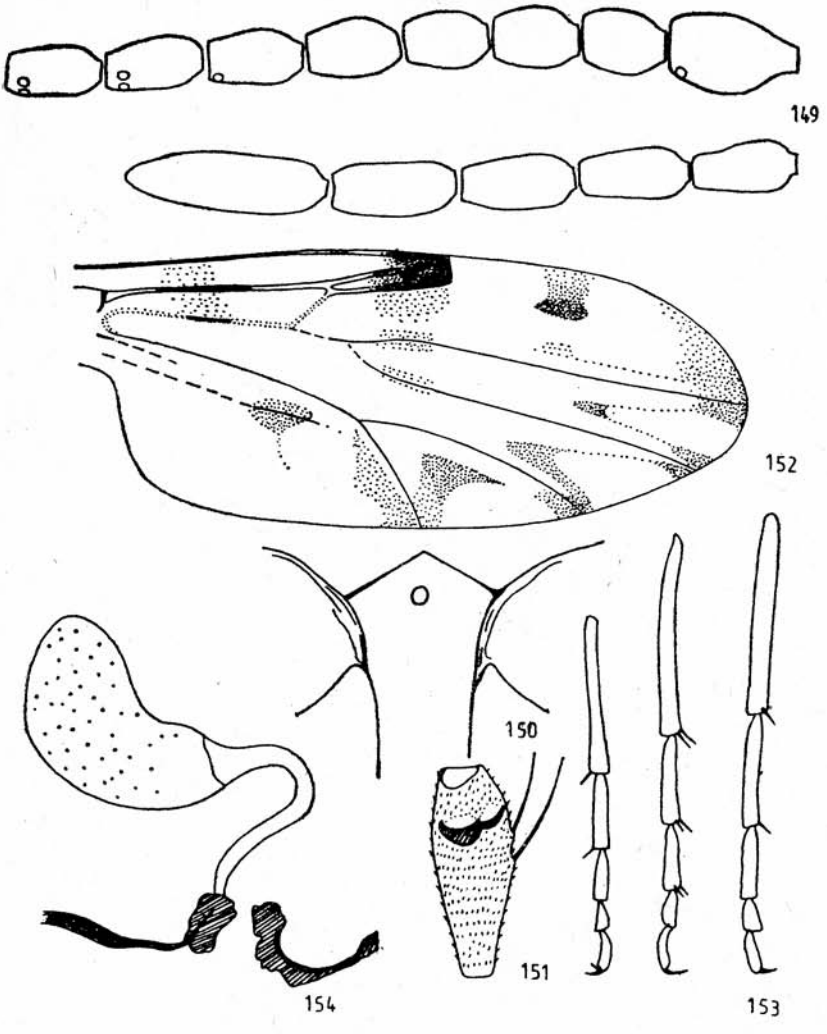
DISCUSSION

STROBL (1900) described the species as *Ceratopogon pulicaris* forma *algecirensis* basing on two females from Algeciras. During his second entomological excursion to Spain STROBL recorded next two females from Algeciras also (STROBL, 1906). These two females I have found in Zoologisches Museum in Berlin. I suppose that types of the species do not exist, since they were certainly sent to KIEFFER who redescribed female of *C. algecirensis* from Algeciras in detail (KIEFFER, 1919). Most probably these specimens were dissected and not preserved by KIEFFER who ordinarily did not preserve even his own types. STROBL and KIEFFER were in personal contact, the former dipterologist sent to KIEFFER some of his own materials (cf. STROBL, 1910, p. 231). In the STROBL's collection in Admont (Austria) types of *C. algecirensis* are absent (MORGE, 1974). It is a reason to designate the neotype of the species.

EDWARDS (1939) without comments placed *C. algecirensis* among synonyms of *C. puncticollis* despite the priority of the former species.

DISTRIBUTION

Mediterranean species known from South, West and Central Europe, steppes of Ukraine, North Africa, Middle East, Asia Minor, Caucasus and Middle Asia.



149–154. *Culicoides* (*Monoculicoides*) *algecirensis* (STROBL), neotype female; 149 — flagellum, 150 — eyes separation, 151 — third palpal segment, 152 — wing, 153 — fore, middle and hind tarsi, 154 — seminal capsule and sternite IX plus rami

Ceratopogonini

Ceratopogon lacteipennis Zetterstedt, 1838

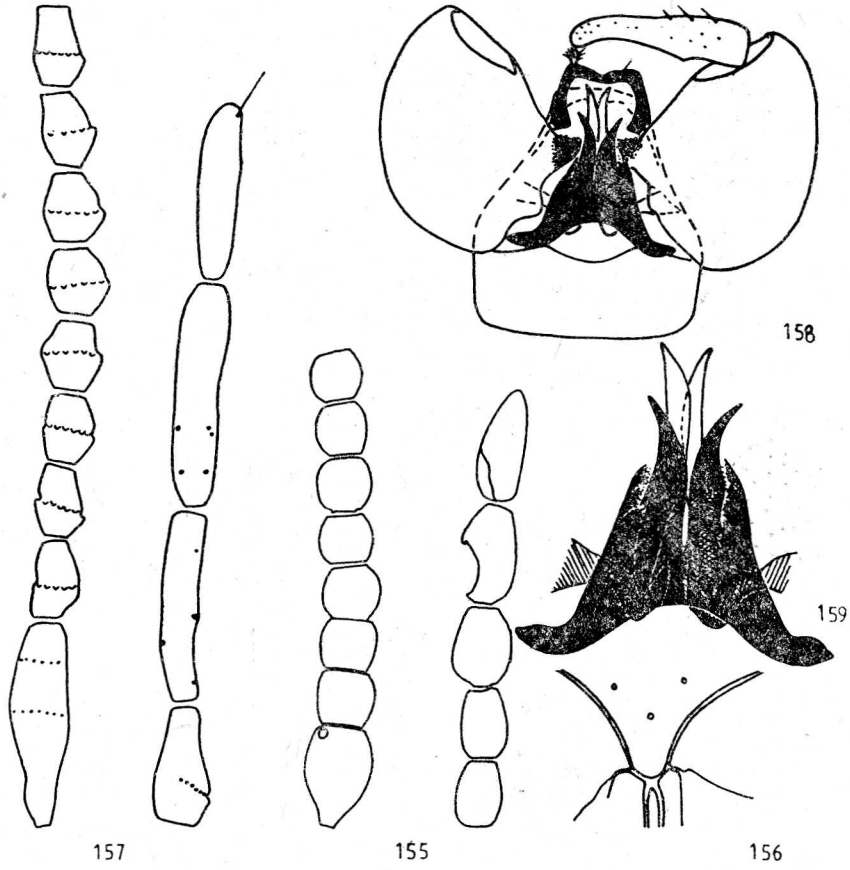
(Figs. 155–159)

Ceratopogon lacteipennis ZETTERSTEDT, 1838: 820 (♂, ♀, Norway); ZETTERSTEDT, 1850: 3639 (as above); EDWARDS, 1926: 408 (♀, = *edentata*, Scotland); WIRTH, 1965: 132 (Greenland); REMM, 1974 a: 38 (♂, ♀, = ? *conjuncta*, ? *sphagnicola*, Estonia, Murmansk distr.).

Psilohelea edentata EDWARDS, 1921: 124 (♀, Scotland).

? *Anakempia sphagnicola* KIEFFER, 1924: 403 (♂, northern France).

? *A. conjuncta* KIEFFER, 1925 d: 416 (♂, Kaliningrad distr. in USSR).



155–159. *Ceratopogon lacteipennis* ZETT., lectotype male and paralectotype female; 155 — female flagellum, 156 — female eyes separation, 157 — male flagellum, 158 — male genitalia, 159 — aedeagus and parameres

DESCRIPTION

♀. Incomplete. Flagellum length 456 μm, AR 0.93 (fig. 155). Eyes pubescent, widely separated (fig. 156). Mandible with 14 teeth. Wing transparent, length 1.34 mm. Claws simple without basal inner teeth. Thorax brown.

♂. Body brown. Legs brown, tarsi paler. Halter knob pale. Wing transparent or milky white. Genitalia dark.

Flagellum with all flagellomeres separated; AR 0.88 (fig. 157). Eyes pubescent, widely separated. Wing membrane without macrotrichia, length 1.48 mm, CR 0.64. Claws simple with bifid apices. Scutellum with four large and five small setae. TR (II) 1.9. Genitalia stout (fig. 158). Sternite IX with shallow caudomedian excavation, tergite X strongly sclerotized with small cerci on caudal margin. Gonocoxite stout with strong triangular inner nodulous tubercle. Gonostyle slightly curved and slightly tapered to rounded tip. Aedeagus (fig. 159) with low basal arch; submedian projections long with pointed apices distinctly divergent. Basal arms of parameres hook–shaped, rod–like submedian projections weakly sclerotized with pointed apices.

MATERIAL EXAMINED

Norway: "*C. lacteipennis* ZETT. ♂♀, Senjen" 809, 1983, five specimens pinned together. ZML. I mounted all specimens on plastic plates separately. 809 a — lectotype male, mouthparts lost, legs incomplete; 809 b — paralectotype male, abdomen lost, legs and head uncomplete; 809 c — paralectotype male, only fragments; 809 d — paralectotype female, head, legs and abdomen incomplete; 809 e — paralectotype male is not *C. lacteipennis* but *Palpomyia spinipes* (MEIGEN, 1818). Present designations.

DISTRIBUTION

It is boreal s. str. species recorded from North Norway, Scotland, Estonia, Murmansk distr., Belgium (Hautes Fagnes, Duzo Moupas, 17 May 1948, A. COLLART, 1 ♀, IRSNB), ? northern France, ? Kaliningrad distr., ? Greenland.

Stilobezziini

Alluaudomyia tiberghieni Neveu

Alluaudomyia tiberghieni NEVEU, 1978: 355 (♂, ♀, Pyrenees in France); NEVEU, 1980: 325 (larva, pupa, France).

A. depuncta REMM, 1980: 101 (♂, ♀, Middle Asia), **syn. n.**

DISCUSSION

There is no doubt that these two species are synonymous, since males have very characteristic triangular aedeagus with a very long slender caudomedian process curved ventrally and two lateral divergent processes, basal arch of aedeagus high.

Stilobezzia gracilis (Haliday)

(Fig. 160)

Ceratopogon gracilis HALIDAY, 1833: 152 (♂, ♀, Ireland).
Stilobezzia gracilis: KIEFFER, 1919: 82 (♂, ♀, Hungary); GOETGHEBUER, 1920: 60 (♂, ♀, = = *dorsalis*, Belgium); KIEFFER, 1925 a: 90 (♂, ♀, North France, East Germany); EDWARDS, 1926: 412 (♂, ♀, England); KARL, 1940: 30 (Poland); HAVELKA, 1976: 237 (♂, ♀, West Germany); HAVELKA, 1978 b: 62 (Austria); REMM 1979: 45 (Estonia); HAVELKA, 1982: 116 (♂, ♀, Spain).
Ceratopogon dorsalis ZETTERSTEDT, 1850: 3644 (♂, ♀, Sweden).

DESCRIPTION

♀. Scutum and abdomen blackish brown, scutellum yellow. Humeral areas, prothorax and pleura pale brown. Flagellum brown, basal half of first flagellomere pale. Fore and middle legs yellow, hind femur and tibia dark brown. Halter pale.

Flagellum length 1.44 mm, AR 1.14. Eyes bare, contiguous. Third palpal segment 108 μm long, sensory pit at apex of the segment. Mandible with seven small teeth. Wing length 2.34 mm, CR 0.75, macrotrichia present in cells R_5, M_1 and M_2. Scutellum with six long setae. Fourth tarsomeres cordiform, claws simple, strongly unequal, hind tibia with a row of long dorsal setae. TR (I) 2.0, TR (II) 2.4, TR (III) 2.0. Two functional seminal capsules present.

♂. Similar to female with the usual sexual differences. Wing length 1.93 mm, CR 0.74, macrotrichia present in cells R_5 and M_1. Scutellum with six large setae. TR (I) 1.8, TR (III) 1.7. Genitalia (fig. 160). Cersi lobe-shaped fused at bases. Gonostyle almost straight indistinctly tapered to rounded tip. Parameres with long basal arms, submedian projections strong and long with short pointed tip. Aedeagus composed of two convergent, somewhat S–shaped black sclerites.

MATERIAL EXAMINED

Sweden: Lectotype male of *C. dorsalis*, present designation — "*C. dorsalis* ZETT., ♂, Scan[ia], Esper[ŏd]", head lost, legs uncomplete. Paralectotype female — "*C. dorsalis* ZETT., ♀, Esp.". Paralectotype male — without original label, strongly destroyed. ZML.

DISCUSSION

Present examination of the types of *C. dorsalis* confirms previous synonymy of the species with *Stilobezzia gracilis*.

DISTRIBUTION

Common arboreal European species recorded from Spain, France, Hungary, Austria, Belgium, West Germany, East Germany, Ireland, Great Britain, Sweden, Poland and Estonia.

Stilobezzia virescens Kieffer

(Fig. 161)

Stilobezzia virescens KIEFFER, 1919: 84 (♀, Hungary); GOETGHEBUER, 1934 a: 55 (♀, Hungary); ZILAHI-SEBESS, 1940: 72 (♀, Hungary).

DESCRIPTION

♂. Head yellow including proboscis, palps darker. Flagellum brownish, plume dark. Thorax dark brown; prothorax, humeral surfaces, pleurae except for preepisternum yellowish. Halter knob somewhat infuscated. Legs yellow with dark apices of all segments. Whole abdomen greenish.

Palp 280 μm long, third palpal segment 72 μm long. Wing length 1.67 mm, CR 0.66, surface without macrotrichia. Scutellum with six long setae. Claws of all legs simple, equal with bifid apices. TR (I) 2.1, TR (II) 2.5, TR (III) 2.0. Genitalia (fig. 161). Sternite IX with shallow caudomedian excavation, membrane covered with small setae. Cerci distinct, separated. Caudal margin of tergite IX with V-shaped incision. Gonocoxite with broad mesal swelling. Gonostyle with distinctly curved distal third, apex evenly pointed. Aedeagus membranous with long, rod-like weakly convergent lateral sclerites. Parameres long, somewhat S-shaped, with curved pointed tip.

MATERIAL EXAMINED

Bulgaria: Neotype male of *S. virescens*, present designation — Jasna Poljana at Burgas, 10 June 1982, leg. W. KRZEMIŃSKI. Neotype is deposited in the Institute of Zoology, Polish Acad. Sci., Warsaw.

DISCUSSION

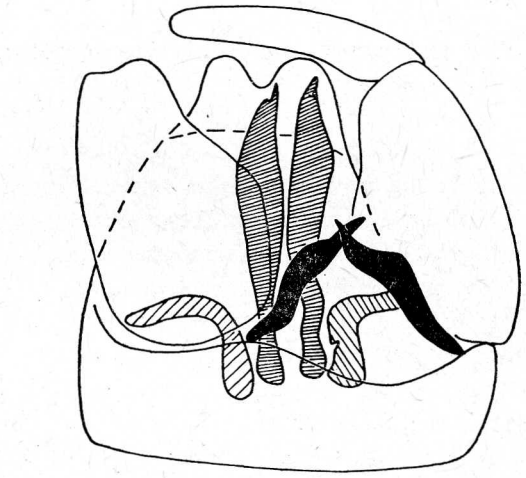
Female type (or types) of *S. virescens* from Hungary probably does not exist. This is the reason why I designate the neotype male collected in Bulgaria which agrees well with the original description of the species.

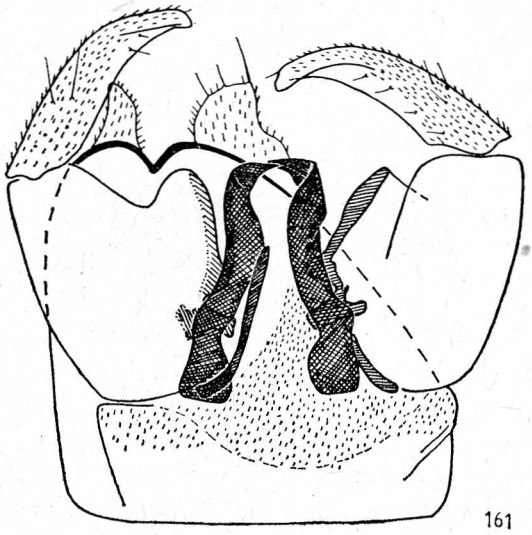
In Europe three close *Stilobezzia* species with wings without macrotrichia are known from old descriptions. These are: *S. flavirostris* WINNERTZ (= *albicornis* KIEFF.), *S. flavirostroides* STROBL, and *S. virescens*. Only for *S. flavirostris* male genitalia are figured by GOETGHEBUER (1920, p. 62) and by REMM (1980, p. 96). *S. virescens* is close (or synonymous) to *S. flavirostris*, but legs

are paler, whole abdomen is greenish, and lateral sclerites of aedeagus are distinctly longer. Further studies should explain what is the relation between *S. flavirostris*, *S. flavirostroides* and now redescribed species.

DISTRIBUTION

Hungary, Bulgaria.





160, 161. Male genitalia. 160 — *Stilobezzia gracilis* (HAL.), lectotype of *C. dorsalis* ZETT.; 161 — *Stilobezzia virescens* KIEFF., neotype

Monohelea tesselata (Zetterstedt)

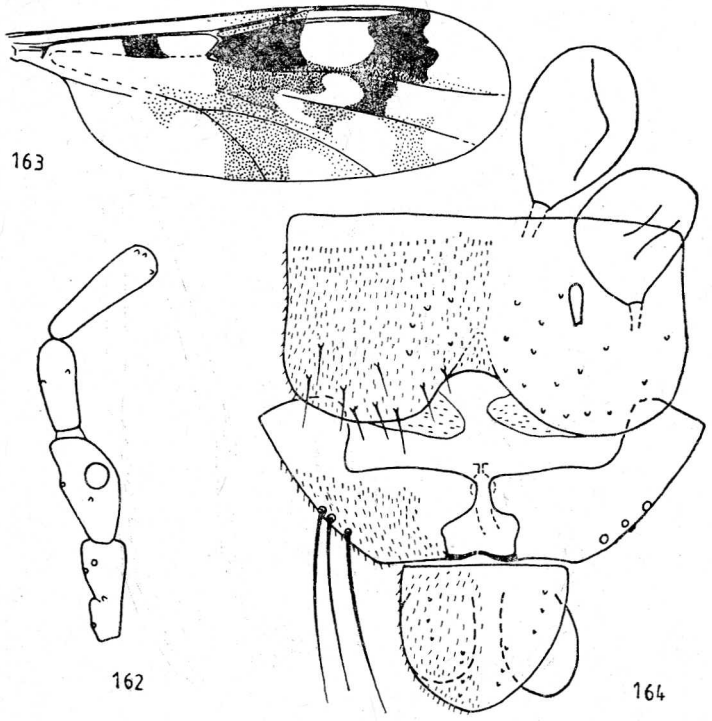
(Figs. 162–169)

Ceratopogon tesselatus ZETTERSTEDT, 1850: 3642 (♀, Sweden).
Monohelea tesselata: EDWARDS, 1926: 410 (♀, = *illustris*, England).
Ceratopogon illustris WINNERTZ, 1852: 53 (♀, West Germany, England).
Monohelea illustris: GOETGHEBUER, 1920: 65 (♀, Belgium).

DESCRIPTION

♀. Body blackish brown. Tenth abdominal segment and tarsi pale, middle of scutellum yellow. Halter pale.

Palp five-segmented (fig. 162), third palpal segment 62 μm long, sensory pit circular. Mandible with eight teeth. Eyes bare, fused. Wing length 1.47 mm, CR 0.80, membrane with characteristic markings as on fig. 163. Scutellum with five large and several small setae. Fore and middle legs slender (figs. 165, 166), hind leg stout (fig. 167) Fourth tarsomeres cylindrical. Length

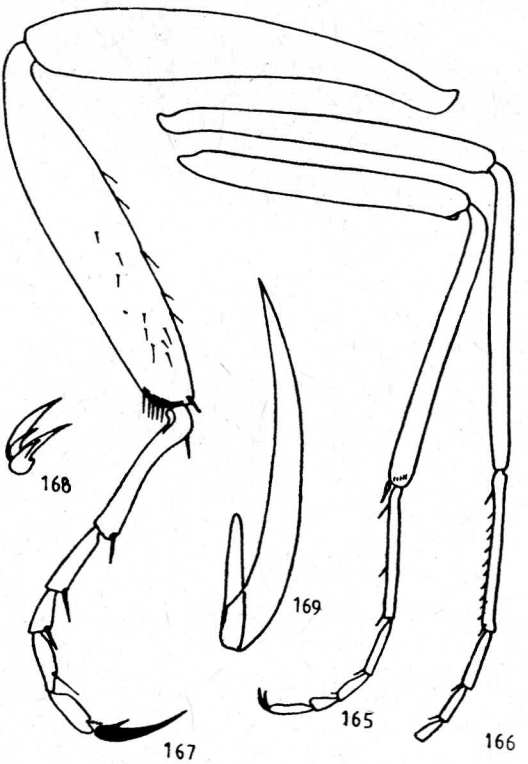


162–164. *Monohelea tesselata* (ZETT.), holotype female; 162 — palp, 163 — wing, 164 — genitalia

of hind femur 858 μm and hind tibia 780 μm. Claws of fore leg equal, small, with inner basal teeth (fig. 168), claws of hind leg strongly unequal (fig. 169). Three first tarsomeres of hind leg with large apical spines, basitarsus with basal spine. TR (I) 2.2, TR (II) 2.4, TR (III) 1.8. Pregenital sternites of abdomen fully sclerotized. Sternite VIII with deep caudal notch, gonapophyses VIII lobe–shaped (fig. 164). Sternite IX broadly sclerotized on caudal half with median bottle–shaped desclerotized area. Gonapophyses IX fully reduced. Sternite X distinct covering cerci, with straight oral margin and evenly rounded tip. Two seminal capsules ovoid without necks, dimensions 82×54 μm and 70×60 μm.

MATERIAL EXAMINED

Sweden: Holotype female of *C. tesselatus* — "*C. tesselatus* ZETT., ♀, Esper [őd]". ZML. The type without antennae and last tarsomere of middle legs.



165–169. *Monohelea tesselata* (ZETT.), holotype female; 165 — fore leg, 166 — middle leg, 167 — hind leg, 168 — claws of fore leg, 169 — claws of hind leg

DISTRIBUTION

West European species recorded from Belgium, England, West Germany, Sweden and ? Austria. *Monohelea tesselata* sensu TOKUNAGA (1940 a, p. 258) from Sakhalin is an other species.

Sphaeromiini

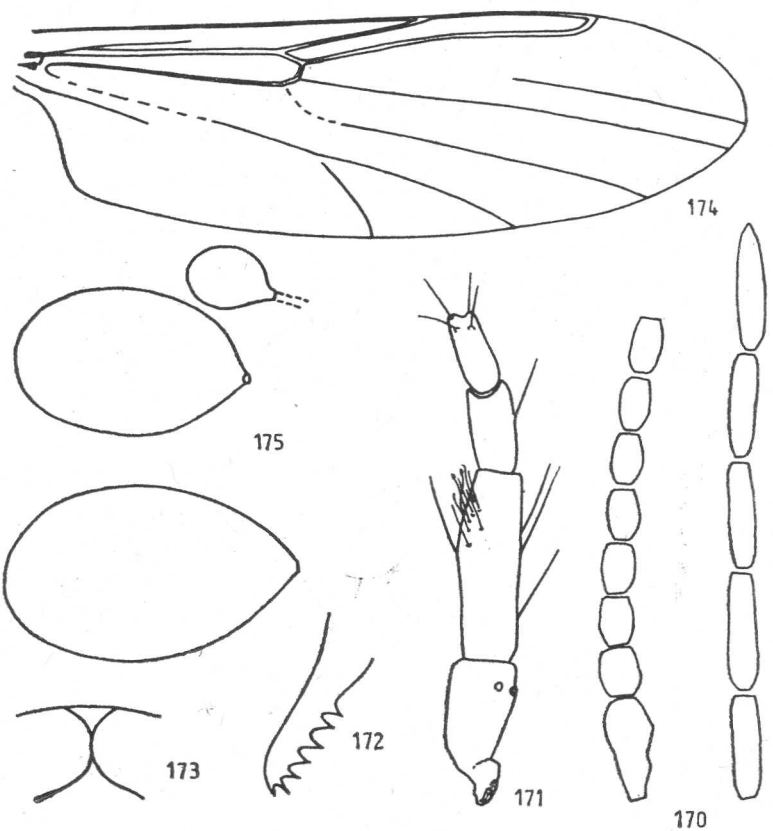
Nilobezzia formosa (Loew)

(Figs. 170–182)

Ceratopogon formosus LOEW, 1869: 1 (♀, Hungary).

Nilobezzia formosa: REMM, 1967: 31 (Caucasus), REMM and ŽOGOLEV, 1968: 841 (Crimea); REMM, 1973 b: 350, 352 (= *paradoxa*, Hungary); GLUCHOVA, 1979: 108 (larva, ecology, Ukraine, Caucasus, Middle Asia).

Bezzia (*Sphaerobezzia*) *paradoxa* ZILAHI-SEBESS, 1940: 108, 131 (♀, Hungary).

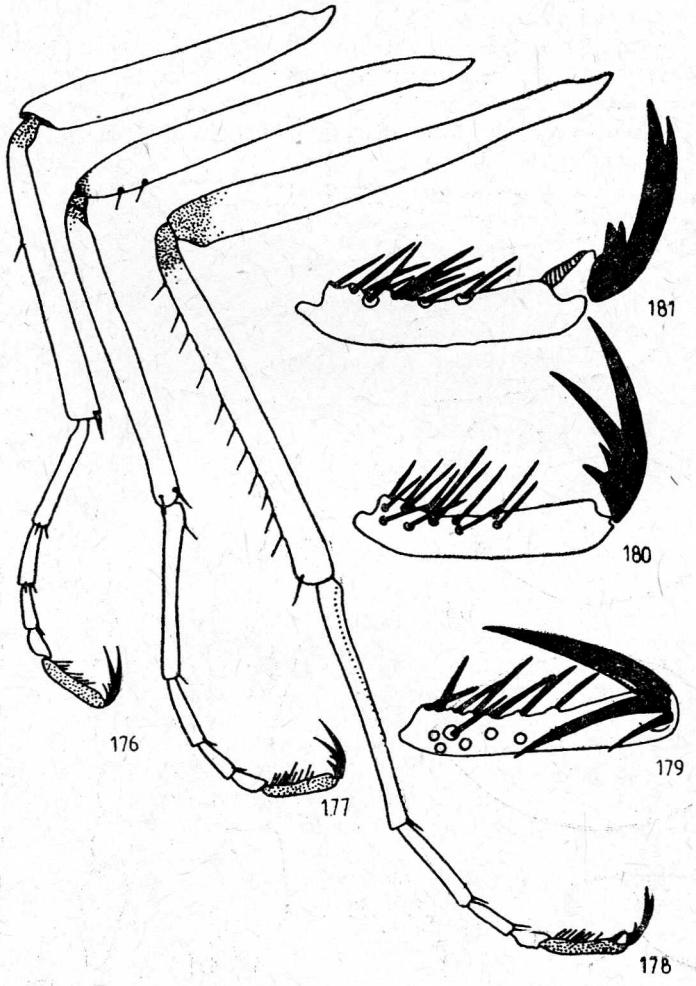


170–175. *Nilobezzia formosa* (LOEW), holotype female; 170 — flagellum, 171 — palp, 172 — tip of mandible, 173 — eyes separation, 174 — wing, 175 — seminal capsules

DESCRIPTION

♀. Body brown. Basal half of first flagellomere yellow. Wing pale with yellow veins. Halter knob pale. Legs plain brownish, coxae, trochanteres, last tarsomeres and knees darker (figs. 176–178). Abdomen pale brown, genital segments darker.

Flagellum length 986 μm, AR 1.18, flagellomeres cylindrical (fig. 170). Palp (fig. 171) with two last segments slender, sensory pit absent. Third palpal



176–181. *Nilobezzia formosa* (LOEW), holotype female; 176 — fore leg, 177 — middle leg, 178 — hind leg, 179 — fifth tarsomere of fore leg, 180 — fifth tarsomere of middle leg, 181 — fifth tarsomere of hind leg

segment 92 μm long. Mandible with seven strong teeth (fig. 172). Eyes bare, joined (fig. 173). Wing length 3.04 mm, CR 0.81, transverse vein between R_1 and R_{2+3} absent, membrane without macrotrichia, distal half of vein R_{4+5} well visible. Scutum covered uniformly with short fine setae, supraalar strong setae present. Scutal tubercle absent. Scutellum with about 20 long setae. Pronotum well developed. Hind tibia with a row of strong dorsal setae. Fifth tarsomeres armed ventrally with 13–16 stout, black, blunt spines (figs. 179–181). Middle femur with 1–2 ventral spines at apex, fore tibia with 0–1 dorsal strong seta at proximal third. Claws equal and long, one claw with inner basal tooth, other claw with outer basal tooth. TR (I) 1.8, TR (II) 2.2, TR (III) 2.5. Pregenital six sternites desclerotized, sternite VIII well developed, rectangular. Sternite VIII fused with tergite VIII, in middle desclerotized (fig. 182). Gonapophyses VIII strongly sclerotized, dark, M–shaped, with U–shaped caudal notch and with long convergent setae. Arms of sternite IX broad with distinct remnants of rami. Sternite X broad with deep oral excavation. Three egg–shaped seminal capsules without necks present (fig. 175), dimensions 144×88 μm, 112×76 μm, and 44×28 μm.

MATERIAL EXAMINED

Hungary: Holotype female of *C. formosus* – "Ungarn u. Friv., 8932". ZMB.

DISTRIBUTION

Meridional steppean species recorded from Hungary, Ukraine, Crimea, Caucasus and Middle Asia. Larvae were found in rivers only (Gluchova, 1979).

Nilobezzia posticata (Zetterstedt)

(Figs. 183–192)

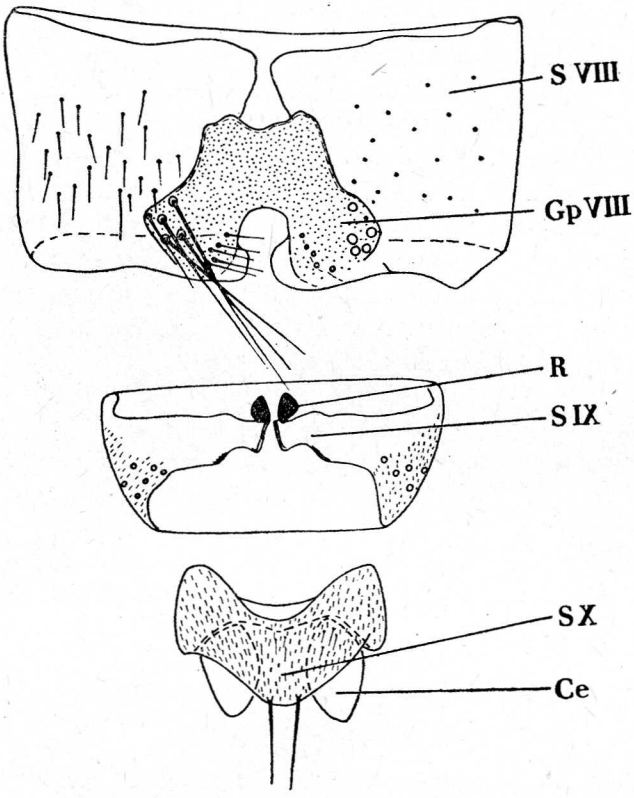
Ceratopogon posticatus ZETTERSTEDT, 1850: 3658 (♀, Norway).
Palpomyia posticata: KIEFFER, 1906: 63 (combination); GOETGHEBUER, 1934 a: 71, 92 (♀, = *schineri*, ? Austria).
Nilobezzia posticata: REMM, 1981: 27 (= *griseus*, East Siberia, Middle Asia).
Palpomyia schineri KIEFFER, 1919: 93 (new name for *leucogaster* sensu SCHINER).
Sphaeromias griseus ZILAHI–SEBESS, 1936: 44 (♀, Hungary); ZILAHI–SEBESS, 1940: 79 (♀, Hungary).
Nilobezzia grisea: REMM, 1967: 31 (Caucasus).

DESCRIPTION

♀. Thorax blackish brown, head dark brown, abdomen brown. Scutum with uniform silvery pruinosity, scutellum yellow, halter white. Legs yellow, all coxae, trochanteres and fifth tarsomeres dark brown. Apical 1/4 to 1/3

portions of all femora, basal 1/3 and apices of fore and middle tibiae, and whole hind tibia brown (figs. 188–190). Base of first flagellomere yellow.

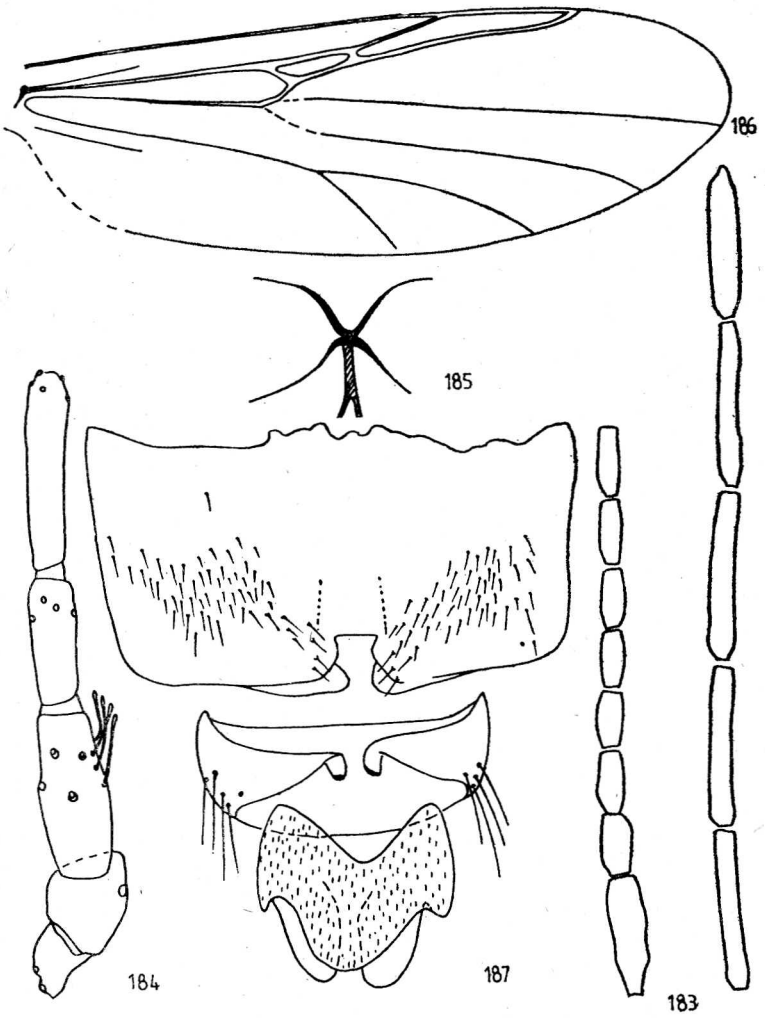
Flagellum 1.30 mm long, AR 1.45, flagellomeres cylindrical (fig. 183). Palp (fig. 184) with long last segment, third palpal segment cylindrical 88 μm long. Mandible with 7–8 teeth. Eyes bare, separated (fig. 185). Wing length



182. *Nilobezzia formosa* (LOEW), female genitalia of the holotype. Ce — cercus, Gp VIII — gonapophyses VIII, R — ramus, S VIII, IX, X — sternite VIII, IX, X

3.66 mm, CR 0.79, radial cell divided by transverse vein into two cells (fig. 186), membrane without macrotrichia. Scutal tubercle absent. Scutellum with about 12 strong and short setae. Pronotum well developed. Fifth tarsomeres armed ventrally with 11–14 stout, black blunt spines (fig. 191). Fore femur with nine ventral and six lateral spine–like setae (fig. 188), middle femur with five ventral and 12 lateral spine–like setae (fig. 189), hind femur with seven ventral, two preapical lateral and with a long row of smaller lateral

spine–like setae (fig. 190). Hind tibia with a row of distinct dorsal setae. Claws stout, long and equal, one claw with inner basal tooth, other claw with outer basal tooth. TR (I) 1.6, TR (II) 1.8, TR (III) 2.4. Pregenital sternites strongly reduced to small spots around bases of setae. Sternite VII well developed, trapezoid in shape. Sternite VIII well sclerotized, almost rectangular with deep somewhat T–shaped caudal excavation, only rudiments of gonapophyses VIII present (fig. 187), long setae absent. Sclerotized arms of sternite IX broad

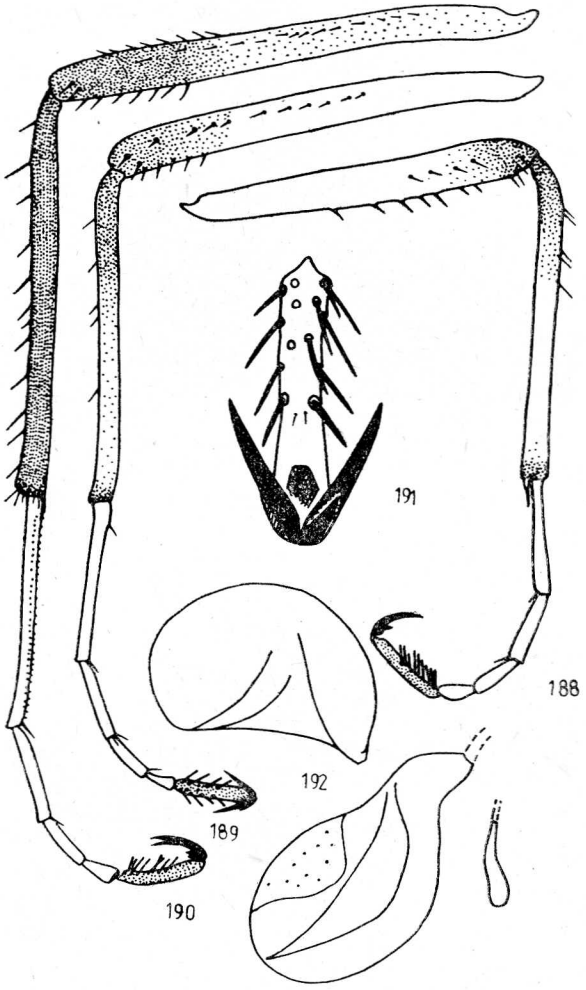


183–187. *Nilobezzia grisea* (ZETT.), holotype female; 183 — flagellum, 184 — palp, 185 — eyes separation, 186 — wing, 187 — genitalia

at tergite IX, gradually tapered to lobe-shaped remnants of rami. Sternite X with deep oral excavation. Seminal capsules ovoid (fig. 192), functional capsules 146 μm and 120 μm long.

MATERIAL EXAMINED

Norway: Holotype female of *C. posticatus* — "Aamodt, 6.7. 48., *C. posticatus* ZETT., ♀, Norweg". ZML.



188–192. *Nilobezzia grisea* (ZETT.), holotype female; 188 — fore leg, 189 — middle leg, 190 — hind leg, 191 — fifth tarsomere of middle leg, 192 — seminal capsules

DISTRIBUTION

The species is known from Norway, Hungary, Caucasus, East Siberia and Middle Asia. Record of the species from Austria is not certain since it is based on unlabelled female determined by SCHINER and LOEW from the Naturhistorisches Museum in Vienna (GOETGHEBUER, 1934 a). No precise localities are given by REMM (1981) from East Siberia and Middle Asia.

Macropeza nuda (Becker)

(Figs. 193–198)

Macroptilum nudum BECKER, 1903: 77 (♂, ♀, Egypt).
Macropeza nuda: WIRTH and RATANAWORABHAN, 1972: 216 (combination).

DESCRIPTION

♀. Head brown. Thorax blackish brown. Scutum shining with weak grayish pruinosity. Halter dark, knob black. Wing with brownish cell R_1. Legs brown, proximal portion of all tibiae, two first tarsomeres of fore and middle legs, and first four tarsomeres of hind leg paler. Abdomen brown.

Flagellum 1.49 mm long, AR 1.50, flagellomeres cylindrical covered with short setae (fig. 193). Palp (fig. 194) with third palpal segment 66 μm long. Mandible (fig. 195) with six teeth. Eyes bare widely separated (fig. 196). Wing length 4.76 mm, costa reaching tip of wing. Membrane void of macrotrichia. Scutellum with two lateral and two submedian setae. Front of scutum triangular, produced over the head. Lengths of legs as follows (in μm):

	fe	ti	ta_1	ta_2
fore leg	936	780	421	194
middle leg	1248	1154	624	234
hind leg	1825	1607	1030	406

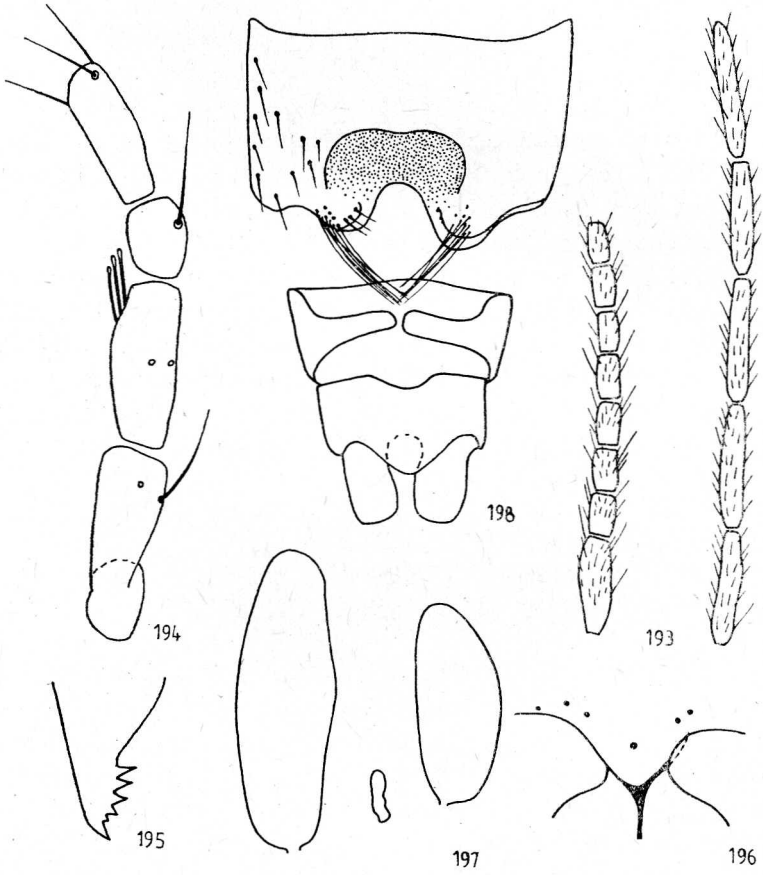
TR (I) 2.2, TR (II) 2.7, TR (III) 2.5. Tibial comb composed of seven spines. Fifth tarsomeres armed ventrally with four black stout spines (two pairs). Claws stout, equal and simple. Pregenital abdominal sternites desclerotized. Sternite VIII fused with tergite VIII. Gonapophyses VIII strongly sclerotized orally, long convergent setae present. Sclerotized lateral arms of sternite IX located in the middle of the segment with parallel margins and blunt tips. Gonapophyses IX totally reduced (fig. 198). Sternite X with small oral excavation. Seminal capsules (fig. 197) elongated, dimensions 232×76 μm, 160× ×66 μm and 42 μm.

MATERIAL EXAMINED

Egypt: Lectotype female, present designation — "Typus ♀, Kairo, XI 44353, Macroptilum nudum Beck., det. Becker". ZMB.

DISCUSSION

BECKER in original description mentioned five specimens of the species. DE MEILLON (1961, p. 24) stated that he examined two specimens (females ?) obtained from Peus. In the Zoologisches Museum in Berlin I have found only one female and I designate it as lectotype, since I believe that the other type specimens also exist.



193–198. *Macropeza nuda* (BECK.), lectotype female; 193 — flagellum, 194 — palp, 195 — mandible, 196 — eyes separation, 197 — seminal capsules, 198 — genitalia

M. nuda can be easily distinguished from *M. albitarsis* MEIGEN, since female of the latter species possesses proximal flagellomeres with numerous lanceolate setae and extremely long hind basitarsus measuring 2.5–2.7 mm.

DISTRIBUTION

Egypt.

Palpomyiini

Palpomyia serripes (Meigen)

(Figs. 199–205)

Ceratopogon serripes MEIGEN, 1818: 82 (♀, Germany); WINNERTZ, 1852: 62 (♀, West Germany).

Palpomyia serripes: GOETGHEBUER, 1920: 90 (♂, ♀, Belgium); GOETGHEBUER, 1922: 51, 59 (note on type); KIEFFER, 1925 a: 101 (♂, ♀, France); EDWARDS, 1926: 422 (♂, ♀, = *transfuga*, *tarsatus*, Great Britain); GOETGHEBUER, 1934 a: 72 (♂, ♀, = *tarsatus*, *ruficeps*, distribution); ZILAHI-SEBESS, 1940: 95 (♂, ♀, Hungary); REMM, 1976: 179 (♂, ♀, Caucasus, European part of USSR, Tomsk in Siberia, Sakhalin, Japan); HAVALKA, 1976: 236 (♂, ♀, West Germany); HAVELKA, 1982: 108 (♂, ♀, Spain).

Ceratopogon transfuga STAEGER, 1839: 598 (♀, Denmark).

C. tarsatus ZETTERSTEDT, 1855: 4874 (♀, Sweden).

Palpomyia ruficeps KIEFFER, 1918: 59 (♀, Tunesia).

DESCRIPTION

♀. Body black. Halter black. Veins of wing dark. Head including palpi and antennae blackish brown. Legs black, fore trochanter and femur, and two first tarsomeres of all legs pale (figs. 202–204).

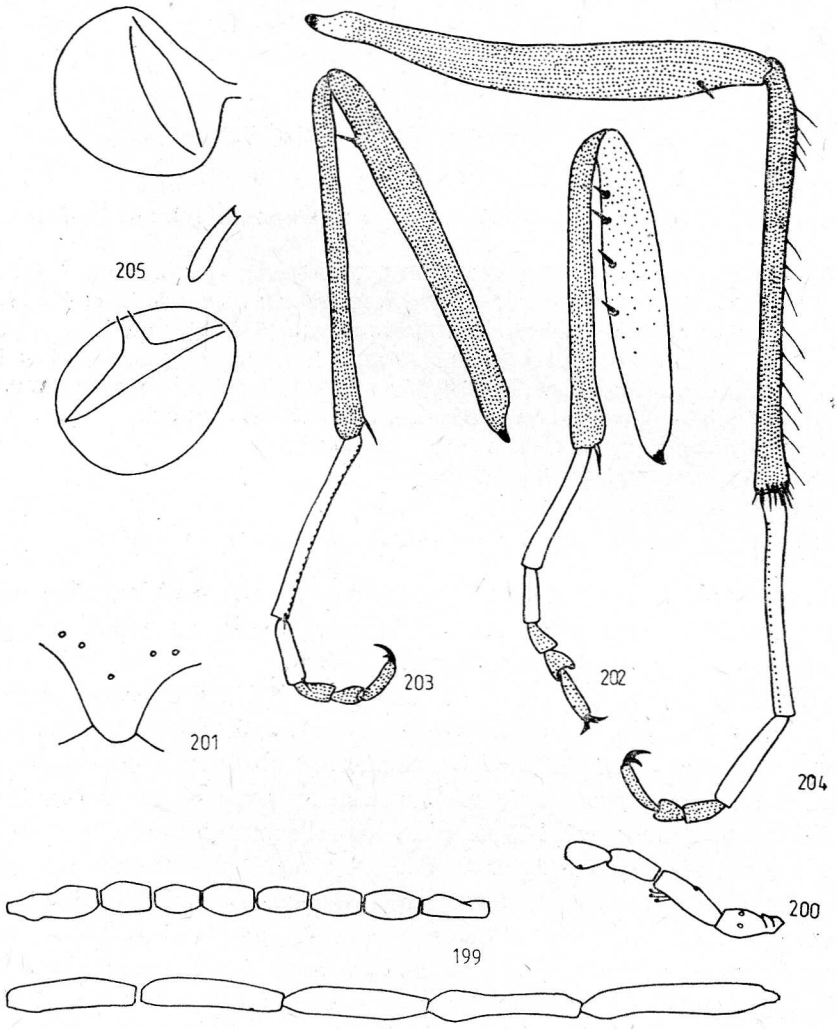
Flagellum length 1.14 mm, AR 1.55 (fig. 199). Third palpal segment 72 μm long (fig. 200). Mandible with seven large and two small teeth. Eyes widely separated (fig. 201), bare. Scutal tubercle absent. Scutellum with six large setae. Fore femur weakly swollen, with four ventral spines (fig. 202), middle femur slender with 1–2 preapical ventral spines (fig. 203), hind femur with 1–2 preapical spines (fig. 204). Fore tibia with apical transparent spur, middle tibia with preapical ventral long spine-like seta. Claws equal and short, with inner basal tooth. Abdomen with three pairs of glandular rods. Pregenital sternites desclerotized except for seventh which is rectangular and well sclerotized. Genitalia generally as in *P. distincta* described below. Two functional seminal capsules with distinct necks present (fig. 205).

MATERIAL EXAMINED

Sweden: Holotype female of *C. tarsatus* — "*Cer. tarsatus* ZETT. n. sp., ♀, Öl[andia], Holmgr." ZML.

DISCUSSION

Present examination the type of *C. tarsatus* confirms statement of EDWARDS (1926) that the species is synonymous with *P. serripes*.



199–205. *Palpomyia serripes* (MEIG.); holotype female of *C. tarsatus* ZETT.; 199 — flagellum, 200 — palp, 201 — eyes separation, 202 — fore leg, 203 — middle leg, 204 — hind leg, 205 — seminal capsules

DISTRIBUTION

The species recorded from whole Europe, North Africa, Caucasus, Siberia, Far East of USSR and Japan.

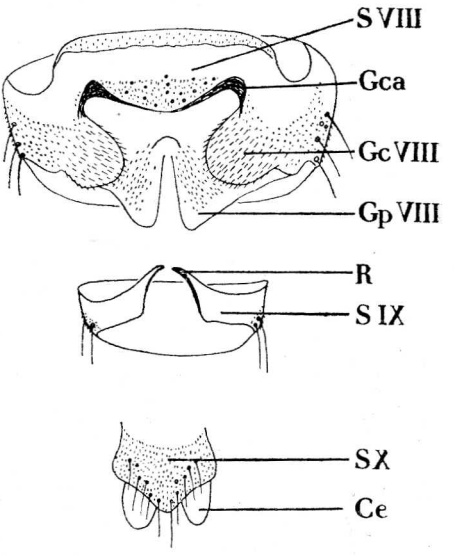
Palpomyia distincta (Haliday)

(Fig. 206)

Palpomyia distincta: EDWARDS, 1926: 420 (Great Britain); REMM, 1976: 180 (♂, ♀, = *ephippium*, *rubra*, *flaviscutellum*, USSR), HAVELKA, 1976: 234 (♂, ♀, West Germany).
Ceratopogon ephippium ZETTERSTEDT, 1855: 4873 (♀, southern Sweden).
Palpomyia ephippium: EDWARDS, 1926: 421 (= *rubra*, Great Britain); GOETGHEBUER, 1934 a: 67 (♂, ♀, = *rubra*, ? *flaviscutellum*); ZILAHI-SEBESS, 1940: 88 (♂, ♀, = *rubra*, Hungary).
P. flaviscutellum KIEFFER, 1919: 103 (♀, Hungary).
P. rubra KIEFFER, 1919: 101 (♀, Hungary).

DESCRIPTION

♀. Body pale brown. Pronotum, humeral surface, scutellum, parts of pleura and halter yellow. Legs yellow; kness, distal 1/4 of middle and hind femora, hind tibia, tip of fore tibia and 2–4 last tarsomeres brown.



206. *Palpomyia distincta* (HAL.); holotype female of *C. ephippium* ZETT., female genitalia. Ce – cercus, Gc VIII – gonocoxite VIII, Gca – gonocoxapodeme, Gp VIII – gonapophyse VIII, R – ramus, S VIII, IX, X – sternite VIII, IX, X

Eyes distinctly separated. Flagellum length 1.35 mm, AR 1.51. Wing length 2.3 mm, CR 0.79. Scutum covered with short pubescence and longer setae, frontal tubercle present. Scutellum with four long setae. Fore femur moderately swollen with 15 ventral spines. Middle and hind femora without spines. Abdomen slender, glandular rods weakly visible. Two functional seminal capsules present, dimensions 60×48 μm and 62×48 μm. Abdominal segment VIII bears well developed lobe-shaped gonocoxites VIII (fig. 206) fused with tergite VIII and connected by rather narrow sternite

VIII, gonocoxapodemes VIII strongly sclerotized. Gonapophyses VIII caudally desclerotized, membranous. Only rudiments of rami fused with wide sternite IX present. Sternite X plate–shaped.

MATERIAL EXAMINED

Sweden: Holotype female od *C. ephippium* — "*Cer. Ephippium* ZETT. n. sp. ♀, Öl[andia] Holmgr." ZML.

DISCUSSION

Present examination the type of *C. ephippium* supports previous opinion that the species is synonymous with *P. distincta.*

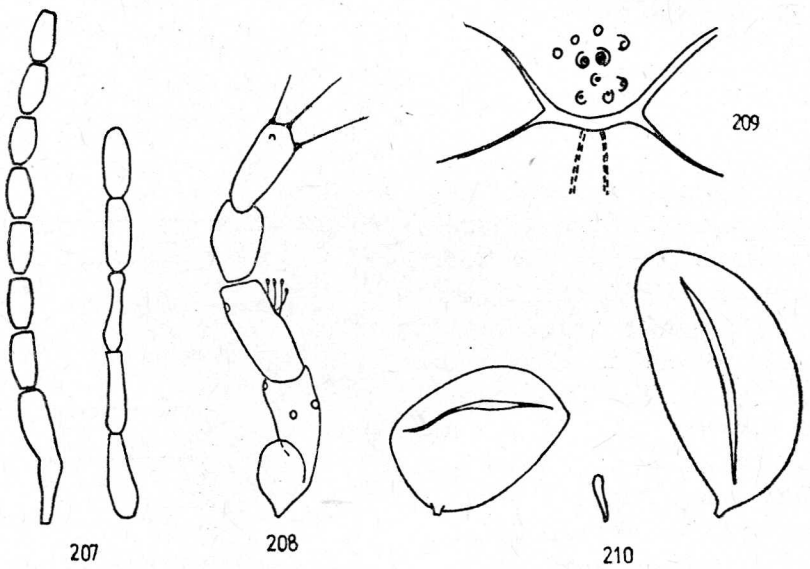
DISTRIBUTION

It seems that the species represents boreal arboreal European faunal element.

Bezzia (Homobezzia) leucogaster (Zetterstedt)

(Figs. 207–213)

Ceratopogon leucogaster ZETTERSTEDT, 1850: 3659 (♀, Sweden); ZETTERSTEDT, 1855: 4871 (as above).
Bezzia leucogaster: GIL COLLADO, 1957: 13 (Spain); HACKMAN, 1980: 23 (Finland).



207–210 . *Bezzia* (*Homobezzia*) *leucogaster* (ZETT.), lectotype female; 207 — flagellum, 208 — palp, 209 — eyes separation, 210 — seminal capsules

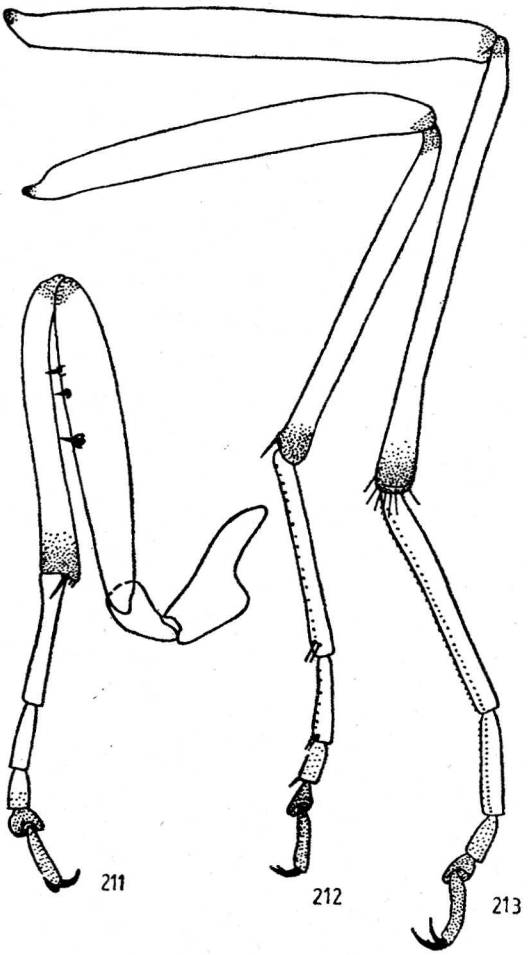
B. xanthocephala GOETGHEBUER, 1911: 95 (♂, ♀, Belgium); GOETGHEBUER, 1912: 6 (♂, ♀, Belgium); GOETGHEBUER, 1920: 107 (♂, ♀, Belgium); GOETGHEBUER, 1934 a: 82 (♂, ♀, = *belgica*, Belgium, England); ZILAHI-SEBESS, 1940: 107 (♂, ♀, = *grisea*, *hungarica*, Hungary); REMM, 1974 b: 436 (♂, ♀, Caucasus, Altaic Mts., Doneck distr., Estonia, = *parvidens*, *picticornis*, *danica*, *brachycera*); GLUCHOVA, 1979: 137 (larva, Estonia, Latvia, Ukraine, Armenia, Kazakhstan, Kirgisia, Altai), **syn. n.**

B. parvidens KIEFFER, 1914: 240 (♂, ♀, Sweden); THIENEMANN and KIEFFER, 1916: 493 (♂, Sweden).

B. picticornis KIEFFER, 1914: 241 (♀, West Germany); HARNISCH, 1922: 89 (Poland).

B. danica KIEFFER, 1915: 291 (♂, ♀, Denmark).

B. belgica KIEFFER, 1919: 120, (♂ ♀, Belgium).



211–213. *Bezzia* (*Homobezzia*) *leucogaster* (ZETT.), lectotype female; 211 — fore leg, 212 — middle leg, 213 — hind leg.

B. brachycera KIEFFER, 1919: 119 (♀, Hungary).
B. grisea KIEFFER, 1919: 119 (♀, Hungary).
B. hungarica ZILAHI-SEBESS, 1930: 190, 201 (all stages, Hungary).

DESCRIPTION

♀. Head brown, flagellomeres with pale bases. Thorax brown, frontal surface of scutum darker, humeral and prescutellar areas pale. Scutellum yellow. Halter pale. Wing yellowish with brownish veins. Legs yellow; knees, tips of all tibiae and and two last tarsomeres dark (figs. 211–213). Abdomen pale, cerci darker.

Flagellum length 822 μm, AR 0.75, flagellomeres cylindrical (fig. 207). Palp (fig. 208) with third palpal segment 58 μm long. Eyes bare, widely separated (fig. 209). Mandible with nine large teeth and some proximal serratings. Wing length 2.40 mm, CR 0.81. Scutellum with seven short spine-like setae. Fore femur slightly swollen with 2–3 ventral spines on distal half (fig. 211). Middle and hind femora unarmed. Middle tibia with preapical ventral spine. TR (I) 2.5, TR (II) 2.3, TR (III) 2.2. Claws equal and small with inner basal teeth. Two functional ovoid seminal capsules with short necks present (fig. 210), length 136 μm and 92 μm. Genital sclerotizations hardly visible. Glandular rods invisible.

MATERIAL EXAMINED

Sweden: Holotype female of *C. leucogaster* — "*C. leucogaster* ZETT., ♀, Fogels [ång]". ZML.

DISTRIBUTION

The species recorded from Europe (Hungary, Belgium, Spain, England, Sweden, Finland, Denmark, West Germany, Poland, Latvia, Estonia, Ukraine), Caucasus and Middle Asia.

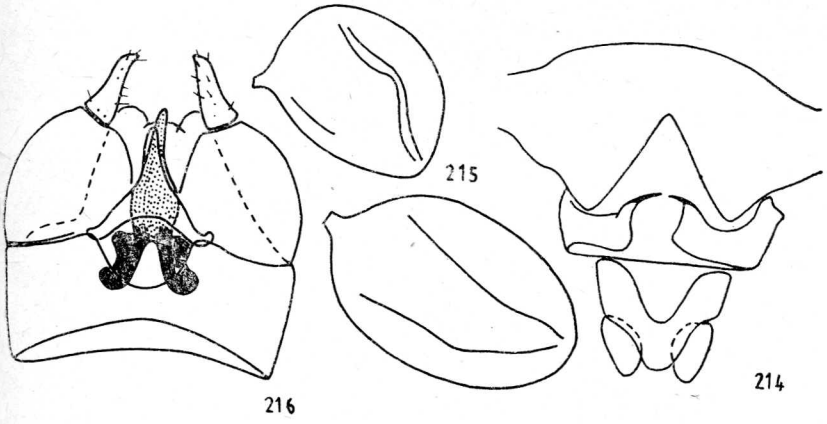
Bezzia (s. str.) *ornata* (Meigen)

(Figs. 214–216)

Ceratopogon ornatus MEIGEN, 1830: 262 (♂, ♀, Germany); WINNERTZ, 1852: 76 (♂, ♀, West Germany).
Bezzia ornata: GOETGHEBUER, 1920, 103 (♂, Belgium); GOETGHEBUER, 1922: 50 (note on type); KIEFFER, 1925 a: 123 (♂, ♀, ? France); EDWARDS, 1926: 423 (Great Britain); GOETGHEBUER, 1934 a: 80 (♂, ♀, Germany, England, Austria, Holland, Belgium, Scandinavia); ZILAHI-SEBESS, 1940: 105 (♂, ♀, Hungary); REMM, 1974 c: 899 (♂, ♀, = *albosignata*, Estonia, Lithuania, Latvia, Belorussia, Marijskaja ASSR); SZADZIEWSKI, 1983 a: 66 (Poland).
Ceratopogon vittiger ZETTERSTEDT, 1850: 3642 (♂, ♀, Sweden), **syn. n.**
Bezzia albosignata KIEFFER, 1919: 117 (♂, ♀, Hungary).

DESCRIPTION

♀. Body blackish brown. Scutum covered with silvery pollinose, median stripe brownish. Head brown, base of all flagellomeres yellow. Halter knob brown. Legs brown. Fore and middle femora yellow with brown preapical ring and tips. Proximal half of hind femur yellow, fore and middle tibiae with basal and preapical yellow rings, hind tibia with indistinct paler rings. Three first tarsomeres of all legs yellow. Abdomen dark brown, ventrally paler.



214–216. *Bezzia* (s. str.) *ornata* (MEIG.); lectotype male and paralectotype female of *C. vittiger* ZETT.; 214 — female genitalia, 215 — seminal capsules, 216 — male genitalia

Flagellum length 873 μm, AR 1.13. Fore femur slender with single ventral spine located on brown preapical ring. Other femora unarmed. Scutum without frontal tubercle. Scutellum with four long setae. Wing length 1.95 mm, CR 0.72. Abdominal sternite VIII well sclerotized (fig. 214), gonapophyses VIII hardly visible. Sternite IX widely sclerotized with distinct long rudiments of rami. Seminal capsules (fig. 215) strongly unequal with short necks, dimensions: 108 × 66 μm and 76 × 58 μm. Third rudimentary seminal capsule present.

♂. Similar to female with the usual sexual differences. Flagellum 1.2 mm long. Wing length 1.84 mm, CR 0.68. Male genitalia (fig. 216). Sternite IX with deep U-shaped caudomedian excavation, gonocoxite broad and short. Gonostyle short, smooth and slightly sinuous. Aedeagus triangular with low basal arch, caudal projection moderately long, smooth. Parameres fused and long, middle portion swollen, tip evenly rounded.

MATERIAL EXAMINED

Sweden: Lectotype male and paralectotype female of *C. vittiger*, present designations — "*C. vittiger* ZETT. ♂, Wadstena", "*C. vittiger* ZETT. ♀, Wadstena". ZML.

DISTRIBUTION

The species is common in Central and North Europe.

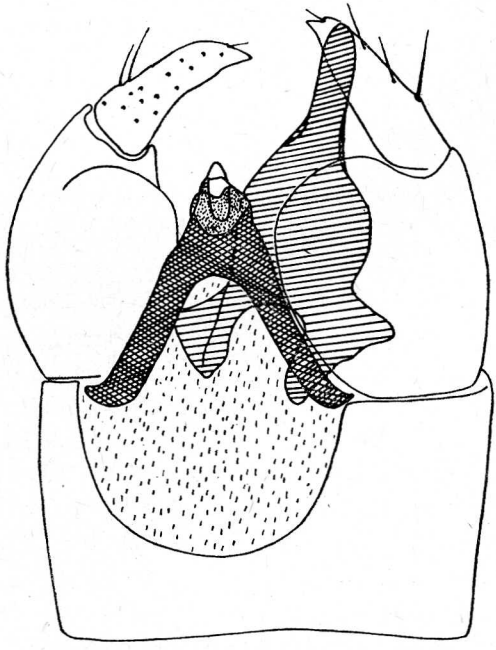
Bezzia (s. str.) *coracina* (Zetterstedt)

(Fig. 217)

Ceratopogon coracinus ZETTERSTEDT, 1850: 3646 (♂, Sweden).
C. albipes WINNERTZ, 1852: 77 (♂, West Germany), **syn. n.**
Bezzia albipes: GOETGHEBUER, 1920: 101 (♂, Belgium); EDWARDS, 1926: 423 (Great Britain, note); GOETGHEBUER, 1934 a: 77 (♂, ♀, Germany, Austria, Belgium, England); REMM, 1974 c: 891 (♂, ♀, Estonia, Latvia, Lithuania, Caucasus, southern Siberia); HACKMAN, 1980: 23 (Finland); SZADZIEWSKI, 1983 a: 66 (Poland).

DESCRIPTION

♂. Body including halteres black, only two first tarsomeres paler. Wing pale, veins weakly darkened.



217. *Bezzia* (s. str.) *coracina* (ZETT.), genitalia of the holotype male

Flagellum length 0.90 mm, AR 0.74. Third palpal segment 60 μm long. Wing length 1.42 mm, CR 0.64. Scutellum with six long setae. All femora unarmed. Middle tibia with preapical ventral spine-like seta. Claws small and equal. TR (I) 1.9, TR (II) 2.1, TR (III) 2.0. Scutal tubercle absent. Genitalia (fig. 217) heavily sclerotized. Sternite IX with deep and broad caudomedian excavation, membrane covered with small setae. Gonocoxite stout with large mesal swelling, gonostyle with strong setae. Aedeagus triangular with high basal arch, caudal portion short and excavated, indistinctly sclerotized tip short, evenly pointed. Parameres large and fused, basal half enlarged, distal half slender with evenly rounded tip.

MATERIAL EXAMINED

Sweden: Holotype male of *C. coracinus* — "*C. coracinus* ZETT., ♂, hortus Lund 49". ZML.

DISCUSSION

EDWARDS (1926, p. 423) recognized coracina as a doubtful synonym of *Bezzia nigritula* (ZETT.). Later GOETGHEBUER (1934 a, p. 80) repeated the information without question mark. Characteristic male genitalia of the holotype of *B. coracina* suggest that the species is a senior synonym of well known *B. albipes*, despite the fact that fore femora of the type are without distinct spines.

DISTRIBUTION

The species is known from West Germany, Austria, Belgium, Great Britain, Sweden, Poland, Latvia, Lithuania, Estonia, Finland, Caucasus and southern Siberia.

Bezzia (s. str.) *nigritula* (Zetterstedt)

(Figs. 218–222)

Ceratopogon nigritulus ZETTERSTEDT, 1838: 820 (♂, ♀, Norway); ZETTERSTEDT, 1850: 3639 (as above).

Bezzia nigritula: EDWARDS, 1926: 423 (= *tenebricosa*, Scotland); GOETGHEBUER, 1934 a: 80 (♂, ♀, Belgium, Austria, England, Scandinavia); REMM, 1974 c: 902 (♂, ♀, Estonia, Leningrad distr., Ukraine — Doneck distr.); HACKMAN, 1980: 23 (Finland).

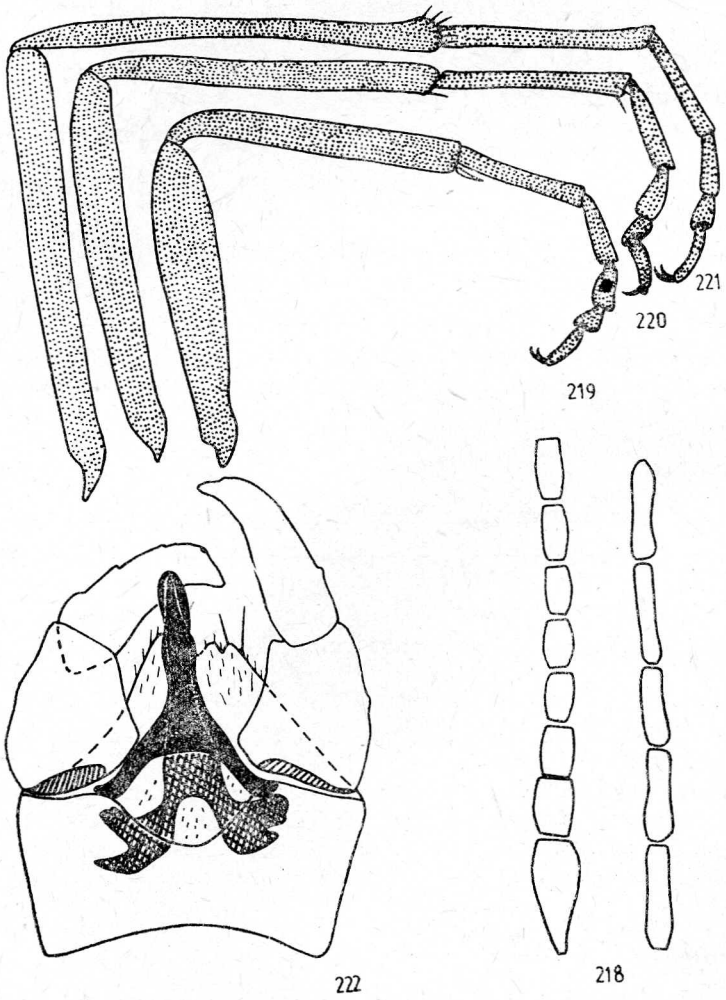
B. tenebricosa GOETGHEBUER, 1912: 5 (♀, Belgium); GOETGHEBUER, 1920: 99 (♂, ♀, Belgium).

DESCRIPTION

♀. Whole body blackish brown, tarsi somewhat paler. Wing pale. Flagellum length 934 μm, AR 0.94, flagellomeres cylindrical (fig. 218). Third palpal segment 76 μm long. Mandible with ca. 10 teeth. Scutal tubercle absent.

Scutellum with nine large setae. Wing length 2.11 mm, CR 0.74. Femora without spines (figs. 219–221), middle tibia with one spine–like seta. TR (I) 1.8, TR (II) 1.9, TR (III) 1.9. Claws equal with inner basal teeth. Abdomen lost.

♂. Similar to female with the usual sexual differences. Flagellum length 1.21 mm, AR 0.84. Third palpal segment 68 μm long. Wing length 1.86–1.87 mm, CR 0.68–0.70. Middle tibia with two preapical spine–like setae. Scutellum



218–222. *Bezzia* (s. str.) *nigritula* (ZETT.); 218–221 — paralectotype female, 222 — lectotype male; 218 — flagellum, 219 — fore leg, 220 — middle leg, 221 — hind leg, 222 — genitalia

with eight long setae. TR (I) 1.9–2.0, TR (II) 1.9-2.0, TR (III) 2.0. Claws small, equal and simple, apices bifid. Genitalia (fig. 222). Sternite IX with shallow caudomedian excavation. Gonocoxite normal. Gonostyle stout, longer than gonocoxite. Caudal projection of aedeagus long and slender with long pointed tip, basal arch low and broad. Parameres fused, slender and long with evenly rounded tip.

MATERIAL EXAMINED

Norway: "*C. nigritulus* ZETT. ♂♀ (...*hortulanus* ♀ et *brunnipes*), Senjen", 3 ♂ and 3 ♀ pinned together. ZML. 811 a — lectotype male of *C. nigritulus*, antennae absent. 811 b — paralectotype male of *C. nigritulus*, incomplete head, tarsi and abdomen lost. 811 c — paralectotype male of *C. nigritulus*, 811 d — paralectotype female of *C. nigritulus*, abdomen lost. Present designations. 811 e — female of *Palpomyia* sp., *C. hortulanus* sensu ZETTERSTEDT; 811 f — female of *Palpomyia spinipes* (MEIGEN, 1818), *C. brunnipes* sensu ZETTERSTEDT. These two specimens do not belong to type series of *C. nigritulus* what is mentioned on the original label and in the ZETTERSTEDT's (1850) redescription of the species.

DISCUSSION

Modern interpretation of the species is agree with the types.

DISTRIBUTION

The species recorded from Belgium, Norway, Scotland, Austria, Finland, Estonia, Leningrad distr., Ukraine (Doneck distr.). Presumably it represents boreal s. str. European faunal element.

REFERENCES

ARNAUD, P., 1956, The heleid genus *Culicoides* in Japan, Korea and Ryukyu Islands (*Insecta*: *Diptera*), Microentomology, **21**: 84–207.

ATCHLEY, W. R., 1970, A biosystematic study of the subgenus *Selfia* of *Culicoides* (*Diptera*: *Ceratopogonidae*), Kans. Univ. Sci. Bull., **49**: 181–336.

BECKER, T., 1903, Ägyptische Dipteren, Mitt. Zool. Mus. Berl., **2**: 67–195.

BYSTRAK, P. G., W. W. WIRTH, 1978, The North American species of *Forcipomyia* subgenus *Euprojoannisia* (*Diptera*, *Ceratopogonidae*), U. S. Dept. Agric. Techn. Bull., 1591, 51 pp.

CARTER, H. F., INGRAM, A., J.W.S. MACFIE, 1921, Observations on the *Ceratopogonidae* midges of the Gold Coast with descriptions of new species. Part IV, Ann. Trop. Med. Parasitol., **15**: 177–212.

CLASTRIER, J., 1957, Notes sur les Cératopogonidés II. Quelques *Culicoides* d'Algerie á ailes tachétees, Archs. Inst. Pasteur Algérie, **35**: 404–444.

COQUILLETT, D. W., 1905, New nematocerous *Diptera* from North America, J. N. Y. Entomol. Soc., **13**: 56–69.

DE MEILLON, B., 1959, *Diptera* (*Nematocera*) *Ceratopogonidae*, In: South Afr. Animal Life, Results of the Lund University Expedition in 1950–1951, **6**: 325–355.

—, 1961, *Ceratopogonidae* of Madagascar (list), Rev. Entomol. Moçambique, **4**: 37–64 (1–28).

DE MEILLON, B., W. W. WIRTH, 1981a, Subsaharan *Ceratopogonidae* (*Diptera*) VI. New species and records of South African biting midges collected by A. L. DYCE, Ann. Natal Mus., **24**: 525–561.

—, 1981b, Subsaharan *Ceratopogonidae* (*Diptera*) VII. The biting midges of the Kruger National Park, South Africa, exclusive of the genus *Culicoides*, Ann. Natal Mus., **24**: 563–601.

—, 1983a, Subsaharan *Ceratopogonidae* (*Diptera*) IX. New species and records from southern Africa, Ann. Natal Mus., **25**: 347–381.

—, 1983b, Subsaharan *Ceratopogonidae* (*Diptera*) XI. The genus *Serromyia* MEIGEN, Ann. Natal Mus., **25**: 383–402.

DESSART, P., 1963, Contribution a l'étude des *Ceratopogonidae* (*Diptera*) (VII). Tableaux dichotomiques illustrés pour la détermination des Forcipomyia Africains, Mem. Inst. Roy. Sci. Nat. Belg., 2 ser., **72**: 1–151 + 16 pls.

DISNEY, R.H.L., 1975, A midge (*Dipt. Ceratopogonidae*) new to Britain that is abundant in the limestone pavement of the Yorkshire Pennines, Entomol. Mon. Mag., **110**: 227–228.

DOW, M. I, W. W. WIRTH, 1972, Studies on the genus *Forcipomyia*. 2. The Nearctic species of the subgenera *Thyridomyia* and *Synthyridomyia* (*Diptera*: *Ceratopogonidae*), Ann. Entomol. Soc. Amer., **65**: 177–201.

DŽAFAROV, Š. M., 1962, Novyj vid krovososuščego roda *Lasiohelea* KIEFF. (*Diptera*, *Heleidae*) iz Azerbajdžana, Entomol. Sborn. AN Az. SSR, Baku, **1**: 193–200.

—, 1964, Krovososuščie mokrecy (*Diptera*, *Heleidae*) Zakavkazja, AN Az.SSR, Baku, 414 pp.

EDWARDS, F. W., 1921, *Diptera Nematocera* from Arran and Loch Etive, Scott. Nat., **1921**: 59–61, 89–92, 121–125.

—, 1926, On the British biting midges, Trans. Entomol. Soc. Lond., **74**: 389–426.

—, 1929, On the British non-biting midges. Appendix, Trans. Entomol. Soc. Lond., **77**: 425–428.

—, 1933, Some Perthshire *Diptera*, Scott. Nat., **201**: 87–92.

—, 1939, Family *Ceratopogonidae*, In: British blood-sucking flies, Brit. Mus. Nat. Hist., pp. 25–50, 129–148.

ENDERLEIN, G., 1908, *Ceratopogoninae*. Neue Ceratopogoninen aus Südafrica. In: Zoologische und anthropologische Ergebnisse einer Forschungreise im westlichen und zentralen Südafrica ausgeführt in den Jahren 1903–1905. Erster Band: Systematik und Tiergeographie, zweite Lief., *Insecta*, E. *Diptera*, Denkschr. Med.-Naturw. Ges. Jena, **13**: 459–461.

GIL COLLADO, J., 1957, Estudios sobre dipteros hematófagos la familia heleidos (= ceratopogonidos), Med. Trop., **30**: 245–263.

GLUCHOVA, V. M., 1979, Ličinki mokrecov podsemejstv *Palpomyiinae* i *Ceratopogoninae* fauny SSSR (*Diptera*, *Ceratopogonidae* = *Heleidae*), AN SSSR, Opredeliteli po faune SSSR, 121, Nauka, Leningrad, 230 pp.

GOETGHEBUER, M., 1911, Un Chironomide nouveau de Belgique, Rev. Mens. Soc. Entomol. Namur., **11**: 95–97.

—, 1912, Quelques chironomides nouveaux de Belgique, Ann. Biol. Lacustre, **5**: 1–11.

—, 1920, *Ceratopogoninae* de Belgique, Mem. Mus. R. Hist. Nat. Belg., **8**, 3: 1–116.

—, 1921, *Chironomidae* de Belgique et spécialement de la zone des Flandres, Mem. Mus. R. Hist. Nat. Belg., **8**, 4: 1–208.

—, 1922, Etude critique des *Ceratopogon* de la collection MEIGEN conservée au Museum National d'Histoire Naturelle de Paris, Bull. Soc. Entomol. Belg., **4**: 50–59.
—, 1927, Nouveaux matériaux pour l'étude de la faune des Chironomides de Belgique. 3e Note (1), Ann. Biol. Lacustre, **15**: 93–104.
—, 1928, Deux formes nouvelles de *Ceratopogonidae* de Belgique, Bull. Annls. Soc. R. Entomol. Belg., **68**: 232–234.
—, 1931, *Ceratopogonidae* et *Chironomidae* nouveaux d'Europe, Bull. Annls. R. Soc. Entomol. Belg., **71**: 211–218.
—, 1933, *Ceratopogonidae* et *Chironomidae* nouveaux ou peu connus d'Europe (quatrième note), Bull. Annls. Soc. Entomol. Belg., **73**: 353–361.
—, 1934a, *Heleidae* (*Ceratopogonidae*), A. Die Imagines, In: GOETGHEBUER M., F. LENZ, Die Fliegen der Paläarkischen Region, 13 a., Stuttgart, 133 pp. + 12 pls.
—, 1934b, Cératopogonides et Chironomides nouveaux ou peu connus d'Europe (cinquième note), Bull. Annls. Soc. Entomol. Belg., **74**: 287–294.
—, 1934c, *Ceratopogonidae* et *Chironomidae* récoltés par M. le Prof. THIENEMANN dans les environs de Garmisch–Parten–Kirchen (Haute–Bavière) et par M. GEISKES près de Bâle, dans le Röserenbach, Bull. Annls. Soc. Entomol. Belg., **74**: 334–350.
—, 1938, Note sur quelques Cératopogonides de Belgique, Bull. Annls. Soc. Entomol. Belg., **78**: 375–389.
—, 1939, Cératopogonides et Chironomides recueillis en Algérie, Bull. Annls. Soc. Entomol. Belg., **79**: 59–62.
—, 1942, *Ceratopogonidae* et *Chironomidae* nouveaux ou beu connus d'Europe (11e note), Bull. Mus. R. Hist. Nat. Belg., **18**: 1–16.
—, 1947, Description de deux Cératopogonides nouveaux de Belgique, Bull. Annls. Soc. Entomol. Belg., **83**: 228–229.
—, 1948a, Deux Diptéres nouveaux de Belgique, Bull. Annls. Soc. Entomol. Belg., **84**: 36–39.
—, 1948 b, *Ceratopogonidae* (*Diptera*: *Nematocera*), Exploration du Parc National Albert. Mission G. F. Witte (1933–1935), Bruxelles, **55**: 3–21.
—, 1950, *Cératopogonidae* et *Chironomidae* nouveaux ou peu connus d'Europe (quatorzieme note), Bull. Inst. R. Sci. Nat. Belg., **26**: 1–15.
GOETGHEBUER, M., J. TIMON–DAVID, 1939, Nouvelles observations sur les Chironomides et Cératopogonides marins de iles du Golfe de Marseille, Bull. Annls. Soc. Entomol. Belg., **79**: 63–70.
GUCEVIČ, A. V., 1973, Krovososuščie mokrecy (*Ceratopogonidae*), In: Fauna SSSR, Nasekomye dvukrylye, III, 5, 107, AN SSSR, Leningrad, 270 pp.
HACKMAN, W., 1980, A check list of the Finnish *Diptera* I. *Nematocera* and *Brachycera* (s. str.), Notulae Entomol., **60**: 17–48.
HALIDAY, A. M., 1833, Catalogue of *Diptera* occurring about Holywood in Downshire, Entomol. Mag., **1**: 147–180.
HAVELKA, P., 1976, Limnologische und systematische Studien an Ceratopogoniden, Beitr. Entomol., **26**: 211–305.
—, 1978 a, Blütenbesuchende Ceratopogoniden (*Diptera*) aus der Umgebung von Tubingen, Beitr. Naturk. Forsch. Südwdtl., **37**: 175–179.
—, 1978 b, *Dasyhelea erici* n. sp., eine neue Ceratopogonide aus der Teichbach–Emergenz (*Diptera*, *Ceratopogonidae*), Ztschr. Arb. Österr. Entomol., **30**: 62–64.
—, 1979, Situation der Ceratopogonidenforschung auf der Inberischen Halbinsel (*Dipt. Ceratopogonidae*), Eos, Rev. Espan. Entomol., **53**: 55–74.
—, 1982, Neue Ceratopogonidenfunde von der Iberischen Halbinsel, Eos, **58**: 47–134.

KARL, O., 1940, Beiträge zur Kenntnis der Mückenfauna Pommerns. Diptera Nematocera. III, Dohrniana, **19**: 29–36.

KHAMALA, C.P.M., D.S. KETTLE, 1971, The *Culicoides* LATREILLE (*Diptera*: *Ceratopogonidae*) of East Africa, Trans. R. Entomol. Soc. Lond., **123**: 1–95.

KIEFFER, J. J., 1901, Synopse des représentants européens du groupe *Ceratopogon*, avec description d'espèces nouvelles, Bull. Soc. Hist. Nat. Metz, **9**: 143–165.

—, 1906, *Chironomidae*, In: Genera Insectorum, 42, Bruxelles, 78 pp.

—, 1913, Nouvelle contribution à la connaisance des Tendipédides d'Allemagne, Bull. Soc. Hist. Nat. Metz, **4**: 37–44.

—, 1914, Zwölf neue Culicoidenarten, Arch. Hydrobiol., Suppl., **2**: 231–241.

—, 1915, Über dänische Chironomiden, Entomol. Meddr., **10**: 280–297.

—, 1918, Chironomides d'Afrique et d'Asie conservés au Musée National Hongrois de Budapest, Ann. Hist. Nat. Mus. Natl. Hung., **16**: 31–139.

—, 1919, Chironomides d'Europe conservés au Musée National Hongrois de Budapest, Ann. Hist. Nat. Mus. Natl. Hung., **17**: 1–160.

—, 1921 a, Neue Chironomiden aus Mitteleuropa, Arch. Hydrobiol., Suppl., **2**: 784–808.

—, 1921 b, Chironomides de Courlande, Ann. Soc. Sci. Brux., **40**: 275–298.

—, 1921 c, Chironomides nouveaux ou peu connus de la région paléarctique, Bull. Soc. Hist. Nat. Metz, **29**: 51–109.

—, 1922 a, Nouveaux Chironomides piqueurs habitant Schleswig-Holstein, Annls. Soc. Sci. Brux., **41**: 230–237.

—, 1922 b, Nouveaux Chironomides piqueurs habitant l'Algerie, Archs. Inst. Past. Afr. Nord, **2**: 494–518.

—, 1923, Ceratopogoninés recueillis au Sahara constantinois, Archs. Inst. Past. Algérie, **1**: 654–684.

—, 1924, Quelques nouveaux Chironomides piqueurs de l'Europe centrale, Archs. Inst. Past. Algérie, **2**: 391–408.

—, 1925 a, *Chironomidae*, *Ceratopogoninae*, In: Fauna de France, 11, Paris, 139 pp.

—, 1925 b, Chironomiden der Hochmoore Nordeuropas und des östlichen Mitteleuropas, Beitr. Kunde Estlands, **10**: 145–163.

—, 1925 c, Chrionomides (sic !) d'Égypte (*Dipt.*), Bull. Soc. R. Entomol. Égypte, **8**: 244–313.

—, 1925 d, Nouveaux genres et nouvelles espèces de Chironomides piqueurs, Archs. Inst. Past. Algérie, **3**: 405–430.

KREMER, M., 1965, Genre *Culicoides* LATREILLE, Encycl. Entomol., **39**: 1–299.

KREMER, M., REBHOLTZ-HIRTZEL, C., J. C. DELECOLLE, 1975, Etude des types de *Culicoides* (*Diptera*, *Ceratopogonidae*) de GOETGHEBUER et des autres *Ceratopogonidae* déposés au Musée de Tervuren, Rev. Zool. Africaine, **89**: 76–820.

LOEW, H., 1869, Beschreibung europäischer Dipteren, Halle, XVI + 310 pp.

LUNDSTRÖM, C., 1910, Beiträge zur Kenntnis der Dipteren Finlands VI. *Chironomidae*, Acta Soc. Fauna Flora Fenn., **33**: 1–46.

MACFIE, J.W.S., 1943, *Ceratopogonidae* (*Diptera*) from Egypt, Proc. R. Entomol. Soc. Lond. (B), **12**: 145–159.

—, 1947, *Ceratopogonidae* from Anglo-Egyptian Sudan, Proc. R. Entomol. Soc. Lond. (B), **16**: 69–78.

MALLOCH, J. R., 1915, Some additional records of *Chironomidae* for Illinois and notes on other Illinois *Diptera* III. State Lab. Nat. Hist. Bull., **11**: 305–363.

MAYER, K., 1959, Zwei *Dasyhelea*-Arten aus spanischen Salzgärten (*Dipt., Heleidae*), Dt. Entomol. Z., **6**: 96–99.

MEIGEN, J. W., 1804, Klassifikation und Beschreibung der europäischen Zweiflügeligen Insekten (*Diptera* LINN.). Erster Band, Braunschweig, XXVIII + 314 pp. + 15 plates.

—, 1818, Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Erster Theil, Aachen, XXXVI + 332 pp. + 11 plts.

—, 1830, Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten, Theil VI, Hamm, 401 pp.

MORGE, G., 1974, *Diptera* Collectionis P. GABRIEL STROBL. V. Die Typensammlung, Beitr. Entomol., **24**: 161–431.

NEVEU, A., 1978, Une nouvelle espéce d'*Alluaudomyia* (*Diptera, Ceratopogonidae*) de l'ouest des Pyrénées: *Alluaudomyia tiberghieni* n. sp., Nouv. Rev. Entomol., **8**: 355–358.

—, 1980, Description de la larve et de la pupe d'*Alluaudomyia tiberghieni* NEVEU, 1978 (*Diptera, Ceratopogonidae*) d'un étang landais, Nouv. Rev. Entomol., **10**: 325–328.

NIELSEN, A., 1951, Contributions to the metamorphosis and biology of the genus *Atrichopogon* KIEFF., K. Danske Vidensk. Selskab. Biol. Skrift., **6**: 1–95.

ORSZÁGH, I., 1976, Die Gattung *Culicoides* LATR., 1809 (*Diptera, Ceratopogonidae*) in Slowakei, Acta F.F.N. Univ. Commen., Zool., **21**: 1–89.

—, 1980, *Ceratopogonidae*, In: Krevsajici mouchy a střečci, Fauna ČSSR, Česk. Akad. Ved., Praha, **22**: 1–538.

REMM, Ch. Ja., 1961, Estonskie vidy mokrecov roda *Atrichopogon* KIEFFER (*Diptera, Heleidae*) II. Opisanie trech novych vidov i tablica dlja opredelenija estonskich vidov podroda *Atrichopogon* s. str., Entomol. obozr., **40**: 920–928.

—, 1962 a, Rod *Dasyhelea* KIEFFER v Estonii (*Diptera, Heleidae*), Tartu Riikl. Ülik. Toim., **120**: 108–133.

—, 1962 b, Obzor vidov roda *Forcipomyia* MEIGEN (*Diptera, Heleidae*) Estonii, Lood, Seltsi Aastar., **54**: 165–195.

—, 1966, K poznaniju fauny mokrecov Litovskoj SSR (*Diptera, Heleidae*), Tartu Riikl. Ülik. Toim., **180**: 53–71.

—, 1967, K faune mokrecov (*Diptera, Ceratopogonidae*) Kavkaza, Tartu Riikl. Ülik. Toim., **194**: 3–37.

—, 1971, K faune mokrecov (*Diptera, Ceratopogon*) [sic !] Južnogo Primorja, In: Živaja priroda Dalnego Vostoka, Tallin, pp. 182–220.

—, 1973 a, 246. *Ceratopogonidae*. Ergebnisse der zoologischen Forschungen von. Dr. Z. KASZAB in der Mongolei (*Diptera*), Reichenbachia, **14**: 171–186.

—, 1973 b, Beiträge zur Ceratopogoniden-Fauna Ungarns (*Diptera*), Folia Entomol. Hung., **26**: 349–357.

—, 1974 a, Sistematičeskij obzor vidov roda *Ceratopogon* MEIGEN (*Diptera*) fauny SSSR, Tartu Riikl. Ülik. Toim., **327**: 23–58

—, 1974 b, Obzor mokrecov roda *Bezzia* KIEFFER (*Diptera, Ceratopogonidae*) fauny SSSR. I, Entomol. Obozr., **53**: 429–442.

—, 1974 c, Obzor mokrecov roda *Bezzia* KIEFFER (*Diptera, Ceratopogonidae*) fauny SSSR. II, Podrod *Bezzia* s. str., Entomol. Obozr., **53**: 888–902.

—, 1976, A synopsis of the *Palpomyia* of the USSR (*Diptera, Ceratopogonidae*), Eesti NSV Tead. Akad. Toim., **65**: 172–197.

—, 1979, Eesti NSV habesääsklaste (*Diptera, Ceratopogonidae*) fauna kataloog, Eesti NSV Tead. Akad., Tartu, 40–60.

—, 1980, Novye vidy mokrecov (*Diptera, Ceratopogonidae*) Srednej Azii, Tartu Riikl. Ülik. Toim., **516**: 85–128.

—, 1981, New synonyms and new names of the Palaearctic *Ceratopogonidae* (*Diptera*), Izv. Akad. Nauk Est. SSR, Biol., **30**: 27–32.

REMM, Ch. Ja., D. T., ŽOGOLEV, 1968, K faune mokrecov (*Diptera, Ceratopogonidae*) Kryma, Entomol. Obozr., **47**: 826–842.

RIETH, J. T., 1915, Die Metamorphose der Culicoidinen (*Ceratopogoninen*), Arch. Hydrobiol., Suppl., **2**: 377–422.

SAETHER, O. A., 1977, Female genitalia in *Chironomidae* and other *Nematocera*: morphology, phylogenies, keys, Bull. Fish. Res. Board Can., **197**: 1–209.

SAUNDERS, L. G., 1924, On the life history and the anatomy of the early stages of *Forcipomyia* (*Diptera, Nemat., Ceratopogoninae*), Parasitology, **16**: 164–213.

—, 1925, On the life history, morphology and systematic position of *Apelma* KIEFF. and *Thyridomyia* n. g. (*Diptera, Nemat., Ceratopogoninae*), Parasitology, **17**: 252–277.

SPATARU, P., A. DAMIAN-GEORGESCU, 1970, Metamorfoza la *Dasyhelea mayeri* n. sp. si *Dasyhelea thienemanni* n. sp. (*Ceratopogonidae, Diptera*), Studii Cerc. Biol., **22**: 421–431.

STAEGER, R. C., 1839, Systematisk fortegnelse over di i Danmark hidtil fundne *Diptera*, Naturhist. Tidsskr., **2**: 549–600.

STRENZKE, K., 1951, *Dasyhelea lithotelmatica* n. sp. In: Lunzer Chironomiden, Arch. Hydrobiol., Suppl., **18**: 178–188.

STROBL, G., 1880, Dipterologische Funde um Seitenstetten. Ein Beitrag zur Fauna Nieder-Österreich, Progr. Ober.-Gymn. Seitenstetten, **14**: 1–65.

—, 1900, Spanische *Diptera*. XI Theil, Wien. Entomol. Ztg., **19**: 169–174.

—, 1906, Spanische Dipteren. II. Beitrag (1), Mem. R. Soc. Esp. Hist. Nat., **3**: 271–422.

—, 1910, Die Dipteren von Steiermark, II. Nachtrag, Mitt. Naturw. Ver. Steierm., **46**: 45–293.

SZADZIEWSKI, R., 1983 a, Flies (*Diptera*) of the saline habitats of Poland, Pol. Pismo Entomol., **53**: 31–76.

—, 1983 b, *Ceratopogonidae* (*Diptera*) from Algeria II. New species, new records and new synonymy in the genus *Forcipomyia* MEIG., Pol. Pismo Entomol., **53**: 363–384.

—, 1984 a, On synonymy and morphology of some *Culicoides* species (*Diptera, Ceratopogonidae*), Pol. Pismo Entomol., **53**: 559–566.

—, 1984 b, *Ceratopogonidae* (*Diptera*) from Algeria VI. *Culicoides* LATR., Pol. Pismo Entomol., **54**: 162–182.

THIENEMANN, A., 1954, *Chironomus*, Leben, Verbreitung und wirtschafliche Bedeutung der Chironomiden, Binnengewässer, **20**, 834 pp.

THIENEMANN, A., J. J. KIEFFER, 1916, Schwedische Chironomiden, Arch. Hydrobiol., Suppl., **2**: 483–554.

TOKUNAGA, M., 1937, Supplementary report on Japanese sand flies (*Ceratopogonidae, Diptera*), Tenthredo, **1**: 455–459.

—, 1940 a, *Chironomoidea* from Japan (*Diptera*), XII. New or little-known *Ceratopogonidae* and *Chironomidae*, Philipp. J. Sci., **72**: 255–311.

—, 1940 b, Biting midges from Japan and neighbouring countries, including Micronesian Islands, Manchuria, North China and Mongolia (*Diptera, Ceratopogonidae*), Tenthredo, **3**: 58–100, 101–165.

—, 1963, Some Japanese biting midges breeding in paddy-field water (*Diptera, Ceratopogonidae*), Sci. Rep. Kyoto Pref. Univ., **15**: 37–49.

WINNERTZ, J., 1852, Beitrag zur Kenntnis der Gattung *Ceratopogon* MEIGEN, Linn. Entomol., **6**: 1–80.

WIRTH, W. W., 1952, The *Heleidae* of California, Univ. Calif. Publ. Entomol., **9**: 95–266.

—, 1965, *Ceratopogonidae*, In: A catalogue of the *Diptera* of America north of Mexico, U.S. Dept. Agr. Handbook **276**: 121–142.

—, 1972, The Neotropical *Forcipomyia* (*Microhelea*) species related to the caterpilar parasite *F. fuliginosa* (*Diptera*: *Ceratopogonidae*), Ann. Entomol. Soc. Amer., **65**: 564–577.

—, 1975, Biological notes and new synonymy in *Forcipomyia* (*Diptera*: *Ceratopogonidae*), Fla. Entomol., **58**: 243–245.

WIRTH, W. W., DE MEILLON, B., E. HAESELBARTH, 1980, *Ceratopogonidae*, In: Catalogue of the *Diptera* of the Afrotropical Region, British Mus. (Nat. Hist.), London, pp. 150–174.

WIRTH, W. W., N. MARSTON, 1968, A method for mounting small insects on microscope slides in Canada balsam, Ann. Entomol. Soc. Amer., **61**: 783–784.

WIRTH, W. W., N. Ch. RATANAWORABHAN, 1972, Notes on the genus *Macropeza* MEIGEN and description of a new species from Florida (*Diptera*: *Ceratopogonidae*), Fla. Entomol., **55**: 213–217.

WIRTH, W. W., RATANAWORABHAN, N. C., F. S. BLANTON, 1974, Synopsis of the genera of *Ceratopogonidae* (*Diptera*), Ann. Parasitol. (Paris), **49**: 595–613.

ZETTERSTEDT, J. W., 1838, *Diptera*, In: Insecta Lapponica, Lipsiae, Sect. 3, pp. 477–868.

—, 1850, *Diptera* Scandinaviae, Lundae, **9**: 3367–3710.

—, 1855, *Diptera* Scandinaviae, Lundae, **12**: 4547–4942.

ZILAHI-SEBESS, G., 1930, Zwei neue Chironomidenarten aus dem Balatongebiet, Arb. Ungar. Biol. Forsch. Inst. Tihany, **3**: 186–205.

—, 1936, Die Heleiden Fauna von Szeged und Umgebung, Acta Biol. (Szeged), **4**: 35–49.

—, 1940, Magyarország Heleidái, Folia Entomol. Hung., **5**: 10–133.