

A review of the Palaearctic *Dasyhelea* (*Pseudoculicoides*) species of the *johannseni* group, with a description of two new species (*Diptera*, *Ceratopogonidae*)

Przegląd palearktycznych gatunków grupy *johannseni* z rodzaju *Dasyhelea* (*Pseudoculicoides*), wraz z opisem dwóch nowych gatunków (*Diptera*, *Ceratopogonidae*)

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ABSTRACT. Ten *Dasyhelea* (*Pseudoculicoides*) species of the *johannseni* group are reviewed and illustrated. *D. skierskae* from Algeria, and *D. wirthicola* from Pakistan are new to science. For *D. communis* KIEFFER, 1918, a neotype is designated. Three new synonyms are proposed for the following species: *D. turficola* KIEFFER, 1925 (= *D. grenieri* CLASTRIER, 1966), *D. arciforceps* TOKUNAGA, 1940 (= *D. clavifulva* TOKUNAGA, 1940), *D. punctiventris* GOETCHEBUER, 1940 (= *D. sericatoides* ZILAHY-SEBESS, 1940). The species group is distributed in Palaearctic, Afrotropical and western Nearctic Regions.

Dasyhelea KIEFFER is a large and complex genus of *Ceratopogonidae*, of worldwide distribution. Relationships of species, species groups or subgenera of the genus remain poorly understood. WIRTH (1952), WAUGH and WIRTH (1976) basing on the North American material divided the genus into species groups which generally correspond to the subgenera (*Sebessia* REMM, *Dicryptoscena* ENDERLEIN, *Dasyhelea* s. str., *Pseudoculicoides* MALLOCH and *Prokempia* KIEFFER) used by REMM (1962, 1979) in his studies of the Palaearctic *Dasyhelea*. In the present paper the subgeneric division of the genus is conformed.

The study is based primarily on my own collection (R. Sz.). I also received valuable material from US National Museum (USNM) in Washington through Dr W. W. Wirth; Institut Royal des Sciences Naturelles de Belgique (RIScNB) in Bruxelles through Dr P. Grootaert; Entomolo-

gical Laboratory, Faculty of Agriculture, Kyushu University (Ent. Lab.) in Fukuoka through Dr Y. Hirashima; Dr P. Havelka, Institut für Ökologie und Naturschutz in Karlsruhe; and from Dr J. Clastrier, Muséum National d'Histoire Naturelle in Paris (Paris Museum). I am greatly indebted to Dr H. Remm of the Tartu University, Estonian SSR, for his valuable suggestions and information on some species of the group.

Special terms used in the descriptions are explained in the paper of SZADZIEWSKI and HAVELKA (1984). The only new abbreviation, i.e. XI/X, is the length of male flagellomere XI divided by the length of flagellomere X.

Genus *Dasyhelea* Kieffer, 1911

Subgenus *Pseudoculicoides* Malloch, 1915

johannseni group

A group of small dark species. Male aedeagus with a strong median projection curved ventrally in addition to one or two pairs of lateral projections curved dorsally. Parameres totally or nearly symmetrical and fused, with a short median projection. Sternite IX strongly produced to cover about half or three-quarter of aedeagus which is joined with the sternite by heavily sclerotized black bridge. Tergite IX with long and slender apicolateral processes. Female without characteristic features; frontal sclerite ovoid, single spermatheca, subgenital plate circular with more or less reniform lumen. Pupa and larva unknown.

The group beside those ten Palearctic listed below includes *D. johannseni* (MALLOCH, 1915) (California; WIRTH, 1952), and *D. boothi* INGRAM et MACFIE, 1921 (Afrotropical Region; CLASTRIER and WIRTH, 1961). The *johannseni* group or *turficola* group sensu REMM is closely related to the *flavoscutellata* group.

Dasyhelea turficola Kieffer, 1925

(Figs 1-10, 43)

Dasyhelea turficola KIEFFER, 1925: 152 (♂, Estonia); KIEFFER, 1929: 296 (♀, at Kalinin-grad, USSR); REMM, 1962: 124 (♂, ♀, Estonia); REMM, 1967: 17 (record, Caucasus); REMM, 1969: 208 (in key); REMM, 1971: 200 (record, South Primorye); SZADZIEWSKI, 1983: 66 (record, Poland).

D. grenieri CLASTRIER, 1966: 703 (♂, ♀, Canary Islands); syn. n.

DIAGNOSIS

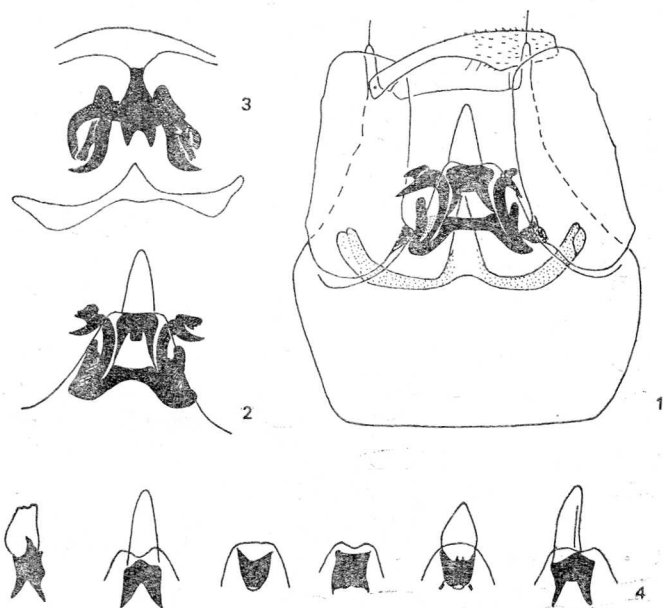
Aedeagus with two pairs of lateral projections, tips of the dorsal pair covered with small teeth.

DESCRIPTION

♂. Flagellum length 640–784 μm ; AR 1.02–1.08; flagellomere X long (fig. 43), XI/X 0.96–1.04. Third palpal segment 70–84 μm long.

Thorax black; scutellum black, brown or yellow; haltere dark, inner surface of knob paler. Wing length 1.01–1.25 mm, CR 0.44–0.48. Legs blackish brown or brown, tarsi paler; TR(I) 2.0–2.1, TR(II) 2.2–2.3, TR(III) 2.1–2.3.

Abdomen blackish brown. Genitalia (figs 1–4); sternite IX covers more than half of aedeagus; tergite IX with long and slender apicolateral processes; gonostyle evenly arched, distal portion slender, proximal half



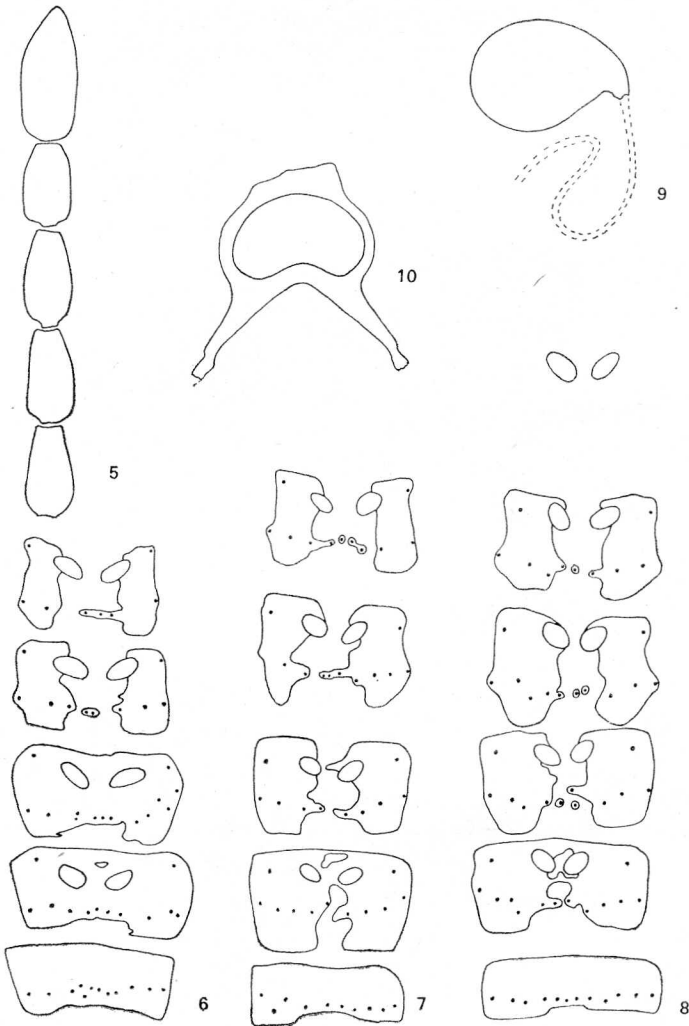
1–4. *Dasyhelea turficola* KIEFF., male genitalia. 1 — ventral view, 2 — aedeagus and sternum IX, 3 — top view, 4 — various shapes of bridge joining aedeagus with sternite IX

covered with small setae; parameres symmetrical and fused, median projection triangular; median projection of aedeagus subconical and blunt; two pairs of lateral projections of aedeagus present, ventral projection long with evenly pointed tip, dorsal projection shorter with tip covered with small teeth or tubercles; bridge joining aedeagus with sternite IX strongly sclerotized, wide, various ventral views of the bridge as on figs 1, 2, 4.

♀. Flagellum length 468–508 μm , AR 0.84–0.90; reticulation on flagellomeres absent (fig. 5). Third palpal segment 62–70 μm long.

Thorax blackish brown; scutellum yellow; haltere dark, inner surface of knob pale. Wing length 0.92–1.09 mm, CR 0.45–0.48. Legs brown, tarsi pale; TR(I) 2.0, TR(II) 2.1, TR(III) 2.1–2.2.

Abdominal tergites and sternites dark brown, shape of sternites as



5–10. *Dasyhelea turficola* KIEFF., female. 5 – distal flagellomeres, 6–8 – various shapes of abdominal sternites, 9 – spermatheca, 10 – subgenital plate

on figs 6–8. Spermatheca black, ovoid with oblique tapered neck (fig. 9), measuring $69\text{--}86 \times 48\text{--}52 \mu\text{m}$. Subgenital plate (fig. 10) with reniform lumen, arms somewhat A-shaped.

MATERIAL EXAMINED

Poland: Gdańsk-Górki Wschodnie, saline meadows, 5 May 1975, 2 ♂, 1 ♀, 25–29 May 1977, 6 ♂, 1 ♀, 6–18 Aug. 1977, 1 ♂, 1 ♀, leg. R. Szadziewski; Gdańsk-Przegalina, June and Aug. 1982, 6 ♂, 2 ♀, leg. G. Okróy; Kieźmark at Gdańsk, 1975, 1 ♂, 1 ♀, leg. B. Skierska; Godętowo near Wejherowo, at stream, 22 June 1978, 2 ♂, leg. R. Szadziewski; Puck, saline meadows, 25 July 1975, 1 ♂, 1 ♀, leg. R. Szadziewski; Lisewo Malborskie at Tczew, 28 May 1982, 1 ♂, leg. R. Szadziewski; Kętrzyn, *Umbelliferae*, 22 July 1981, 3 ♂, leg. R. Szadziewski; Silec at Kętrzyn, *Umbelliferae* in forest, 16 Aug. 1980, 1 ♂, leg. R. Szadziewski; Ciechocinek at Toruń, inland saline area, 16 July 1973, 3 ♂, leg. R. Szadziewski; Toruń-Barbarka, pine forest, 9 July 1981, 2 ♂, leg. R. Szadziewski (R. Sz.).

Belgium: Postel, 9–7–1922, G. Severin, det. M. Goetghebuer as *D. sericata*, 2 ♂, 2 ♀ (RIScNB).

Algeria: Petite Kabylie; Aokas at Souk El Tenine, Tazmalt, Beni Mansour, Akbou, Béjaia, 6–14 May 1981, 17 ♂, leg. R. Szadziewski (R. Sz.).

Canary Islands: Teneriffe Isl., Puerto de la Cruz, 1 Sept. 1962, leg. J. Clastrier, *Dasyhelea grenieri* CLASTRIER, holotype ♂ No. 2638 (Paris Museum), paratype ♂ No. 2641 (R. Sz.).

DISTRIBUTION, ECOLOGY

Arboreal Palaearctic species distributed from Canary Islands to Far East of USSR. Recorded from May to September. In Poland reared from fresh and saline wet soils and semiaquatic habitats. Males visit *Umbelliferae* flowers.

Dasyhelea arciforceps Tokunaga, 1940

(Figs 11–13, 44)

Dasyhelea arciforceps TOKUNAGA, 1940: 129 (♂, ♀, Japan).

D. clavifulva TOKUNAGA, 1940: 135 (♂, ♀, Japan), *syn. n.*

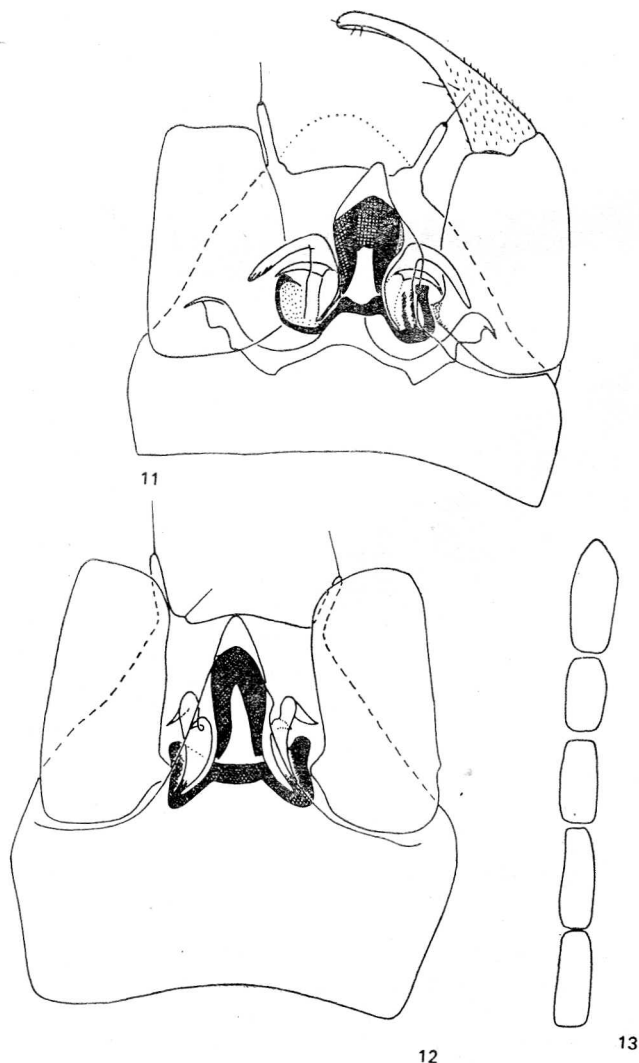
DIAGNOSIS

Aedeagus with two pairs of lateral projections; dorsal pair short with pointed smooth tips. Sternite IX covers about three quarters of aedeagus.

DESCRIPTION

♂. Flagellum length $630\text{--}727 \mu\text{m}$, AR 0.98–1.09; flagellomere X long (fig. 44), XI/X 0.96–1.10. Third palpal segment $62\text{--}80 \mu\text{m}$ long.

Thorax black, scutellum black, haltere dark or inner surface of knob paler. Wing length 1.00–1.17 mm, CR 0.45–0.46. Legs blackish brown, tarsi paler; TR(I) 1.9–2.2, TR(II) 2.1–2.3, TR(III) 1.9–2.1.



11-13. *Dasyhelea arciforceps* Tok. 11, 12 — male genitalia, 13 — distal flagellomeres of female

Abdomen blackish brown. Genitalia (figs 11-12); sternite IX produced to cover about three quarters of aedeagus; tergite IX with long and slender apicolateral processes; gonostyle evenly arched, distal portion slender, proximal portion covered with small setae; parameres symmetrical and fused, median projection triangular; median projection of aedeagus sub-conical and blunt; two pairs of lateral projections of aedeagus present,

ventral projection long, in some position with ridges at tip, dorsal projection short with slender pointed tip; bridge joining aedeagus with sternite IX in ventral position large.

♀. Flagellum length 424–533 μm , AR 0.80–0.91. Third palpal segment 52–64 μm long.

Wing length 0.91–0.95 mm, CR 0.48–0.49, TR(I) 1.9–2.1, TR(II) 2.0–2.3, TR(III) 2.0–2.3.

Spermatheca ovoid with oblique tapered neck, measuring $52 \times 32 \mu\text{m}$.

MATERIAL EXAMINED

Japan: Sybeating, loc. Kushimoto, Apr. 8 1934, coll. Tokunaga, 3 ♂, 2 ♀, paratypes of *D. arciforceps* (Ent. Lab.); specimens are strongly cleared, only one male has genitalia. Kyoto, Kitasirakawa, June 8 1936, coll. M. Tokunaga, 3 ♂, 2 ♀, types of *D. clavifulva*, specimens are strongly cleared, all males are without genitalia; one male has been labelled as lectotype, other specimens paralectotypes (Ent. Lab.). Honshu, Kyoto Prefect., Midoro Pond, June 1955, light trap, P. H. Arnaud, 2 ♂; Shiga Pref., Lake Biwa, June 1955, light, P. H. Arnaud, 1 ♂ (USNM).

Democratic People's Republic of Korea: Mjohjang-san, 22 June 1981, 1 ♂, leg. W. Krzemiński; Sinchön, 19 June 1981, 1 ♂, leg. W. Krzemiński (R. Sz.).

USSR: Southern Sakhalin, Novo-Aleksandrovsk, 5 July 1970, 2 ♂ on *Umbelliferae* flowers (det. H. Remm, personal communication).

DISTRIBUTION

East Palaearctic species known from Japan, Korea and Sakhalin (USSR).

DISCUSSION

Synonymization of *D. clavifulva* with *D. arciforceps* is uncertain, since in the type material of the former species there are no male genitalia. These specimens were preserved in alcohol, and presumably male genitalia have been mounted on slides or lost after examination by TOKUNAGA. Differences between *D. clavifulva* and *D. arciforceps* given by TOKUNAGA (1940) at original description of *D. clavifulva* have no taxonomic value: "This species is closely allied to *D. arciforceps* TOKUNAGA; but differs in the following points: in the male wing R4+5 ends far before middle of the wing; the styles of the hypopygium are less arched and in the female, the abdominal tergites are entirely dark uniformly including cerci and the abdominal sternites are provided with paired brown sclerites, differing from allied species". In the examined lectotype and paralectotypes of *D. clavifulva* costal ratio (CR) of male wing is rather high 0.46–0.46, as in *D. arciforceps* or in some other species of the group.

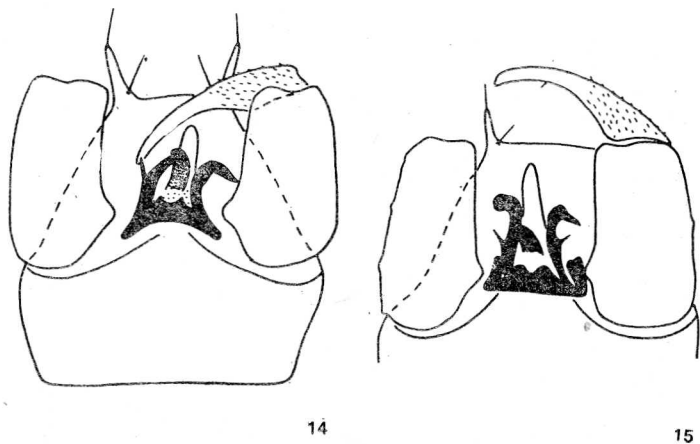
Dasyhelea tessicola Remm, 1972

(Figs 14–15)

Dasyhelea tessicola REMM, 1972: 74 (♂, southern Siberia); DAMIAN-GEORGESCU, 1975: 97 (♂, Romania).

DIAGNOSIS

The species is very close to *D. arciforceps*. According to the short descriptions and schematic figures given by REMM (1972) and DAMIAN-GEORGESCU (1975) it differs only in the following points: lateral projections of aedeagus longer and sternite IX produced to cover only about half of aedeagus, and dorsal pair of lateral projections of aedeagus are needle-shaped (figs 14–15).



14–15. *Dasyhelea tessicola* REMM, male genitalia (del. H. Remm)

DISTRIBUTION

Southern Siberia, Romania.

Dasyhelea punctiventris Goetghebuer, 1940

(Figs 16–23, 45)

Dasyhelea punctiventris GOETGHEBUER, 1940: 71 (♂, Holstein).

D. sericatoides ZILAHÍ-SEBESS, 1940: 53, 128 (♂, Hungary), *syn. n.*

D. siccicola REMM in REMM and ŽOCOLEV, 1968: 832 (♂, ♀, Crimea, Caucasus, Kazakhstan, China); REMM, 1967: 17 (record, Caucasus); REMM, 1973: 355 (record, Hungary).

D. sericatoides: REMM, 1981: 30 (= *D. siccicola* REMM).

DIAGNOSIS

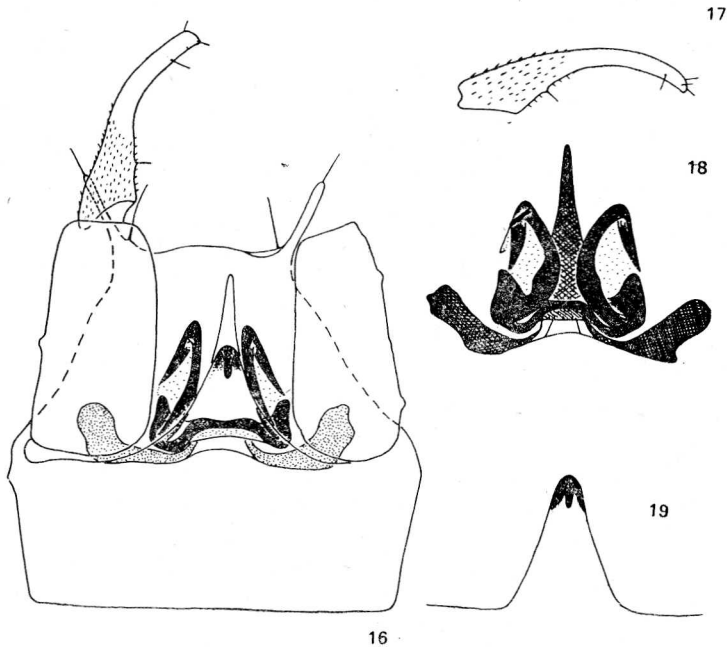
Aedeagus with one pair of long lateral projections, median projection long and very slender.

DESCRIPTION

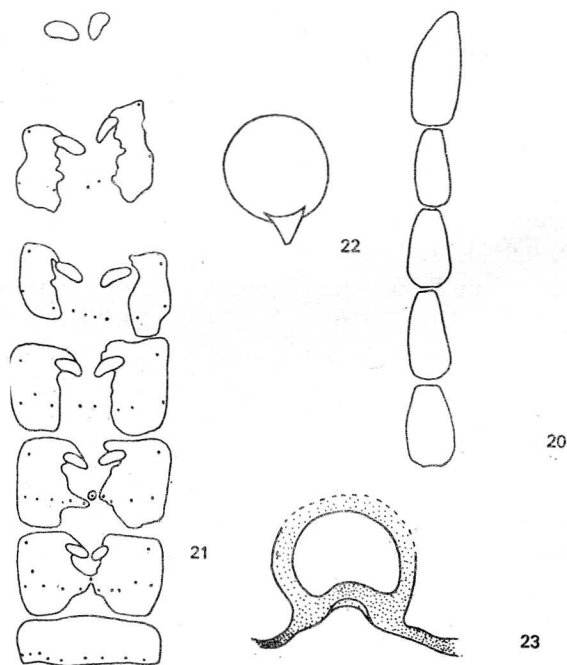
♂. Flagellum length 592–704 μm , AR 0.99–1.10; flagellomere X long (fig. 45), XI/X 0.95–1.11. Third palpal segment 56–72 μm long.

Thorax black; scutellum black, brown or yellow; haltere dark. Wing length 0.87–1.18 mm, CR 0.43–0.46. Legs blackish brown, brown or pale brown, tarsi pale; TR(I) 1.9–2.2, TR(II) 2.1–2.3, TR(III) 1.9–2.1.

Abdomen black. Genitalia (figs 16–19); sternite IX covers slightly more than half of aedeagus; tergite IX with long and slender apicolateral processes; gonostyle evenly arched, distal portion slender, proximal half covered with small setae; parameres symmetrical and fused; median projection of aedeagus long and slender tapered towards tip; one pair of long lateral projections of aedeagus present; bridge joining aedeagus with sternite IX narrow.



16–19. *Dasyhelea punctiventris* GOETCH., male genitalia. 16 – ventral view, 17 – gonostyle, 18 – aedeagus and parameres, 19 – sternite IX



20–23. *Dasyhelea punctiventris* GOETGH., female. 20 — distal flagellomeres, 21 — abdominal sternites, 22 — spermatheca, 23 — subgenital plate

♀. Flagellum length 396–416 μm , AR 0.86–0.87; reticulation on flagellomeres absent (fig. 20). Third palpal segment 56–60 μm long.

Thorax dark brown, scutellum yellow; haltere dark, inner surface of knob more or less pale. Wing length 0.84–0.92 mm, CR 0.43–0.48. Legs brownish, tarsi pale; TR(I) 2.0–2.1, TR(II) 2.0–2.3, TR(III) 2.0–2.2.

Abdominal tergites and sternites dark brown, shape of sternites as on fig. 21. Spermatheca black, spherical with oblique tapered neck (fig. 22), measuring 46–50 \times 58–62 μm . Subgenital plate (fig. 23) with high reniform lumen, arms strongly divergent.

MATERIAL EXAMINED

West Germany: Holotype — ♂ of *D. punctiventris*, Salzboden an der Ostsee, Holstein, leg. Thienemann, coll. et det. M. Goetghebuer (RIScNB, 18.073).

Algeria: Petite Kabylie, Tazmalt, 14 May 1981, 1 ♂, leg. R. Szadziewski; Sahara, Barika at Biskra, 26 April 1981, flowers of olive-trees, 8 ♂, 27 April 1981, 1 ♂ on *Umbelliferae* flowers; Chegga at Biskra, mineral spring area, 2 May 1981, 1 ♂, leg. R. Szadziewski (R. Sz.).

Turkey: Izmir Prov., Bornova, 18 July 1961, light, T. Curtin, 4 ♂, 1 ♀; May 1962 1 ♂; June 1962, 1 ♂, 1 ♀; Izmir Prov., Tire, light, T. Curtin, 1 ♂, 1 ♀ (USNM).

DISTRIBUTION

Meridional Palaearctic species known from Algeria, Turkey, Hungary, Crimea, Caucasus, Kazakhstan and from northern-west China. According to REMM (personal communication) it also occurs in southern Siberia and Mongolia. In western Europe only single male is known from the type locality of *D. punctiventris* in Holstein at Baltic Sea. The species is rather common in steppean and semidesert habitats.

DISCUSSION

The description of *D. punctiventris* was published earlier (20 February 1940) than the description of *D. sericatoides* (1 November 1940, W. W. WIRTH, personal communication), so the latter species is a junior synonym of *D. punctiventris*.

Dasyhelea communis Kieffer, 1918

(Figs 24–29, 46)

Dasyhelea communis KIEFFER, 1918: 55 (♂, ♀, Tunisia).

DIAGNOSIS

Aedeagus with one pair of broad and long divergent lateral projections.

DESCRIPTION

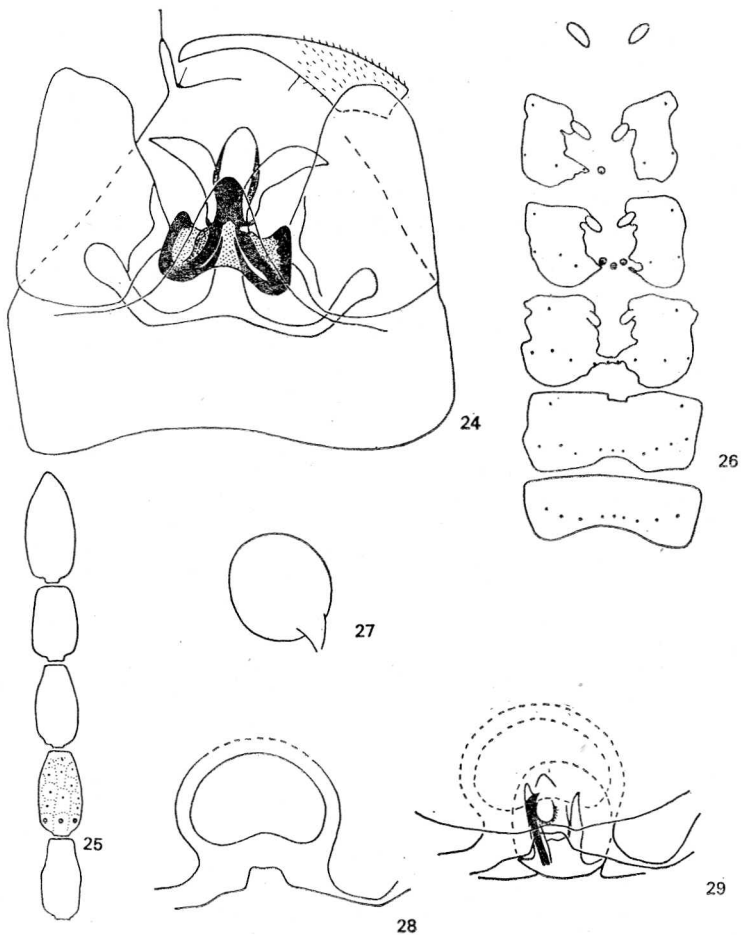
♂. Flagellum length 648–720 μm , AR 1.00–1.09; flagellomere X long (fig. 46), XI/X 0.98–1.04. Third palpal segment about 80 μm long.

Thorax black, scutellum black or yellow, haltere dark. Wing length 1.03–1.12 mm, CR 0.44. Legs black, tarsi paler; TR(I) 2.2–2.3, TR(II) 2.2–2.5, TR(III) 2.0–2.1.

Abdomen black. Genitalia (fig. 24); sternite IX covers more than half of aedeagus; tergite IX with long and slender apicelateral processes; gonostyle evenly arched, distal portion slender, proximal half covered with small setae; parameres symmetrical and fused; median projection of aedeagus with evenly rounded tip; one pair of long and broad lateral projections of aedeagus present, tips divergent; bridge joining aedeagus with sternite IX in ventral view slender at middle.

♀. Flagellum length 440 μm , AR 0.80; reticulation on flagellomeres present (fig. 25). Third palpal segment 64 μm long.

Thorax black, scutellum yellow; haltere dark, inner surface of knob pale. Wing length 0.92 mm, CR 0.46. Legs blackish brown, tarsi pale; TR(I) 2.2, TR(II) 2.3, TR(III) 2.1.



24–29. *Dasyhelea communis* KIEFF. 24 – male genitalia, 25 – distal flagellomeres of female, 26 – abdominal sternites of female, 27 – spermatheca, 28 – subgenital plate, 29 – position of lateral projections of aedeagus during copulation

Abdomen blackish brown, shape of sternites as on fig. 26. Spermatheca black, subspherical with oblique tapered neck (fig. 27), measuring $48 \times 60 \mu\text{m}$. Subgenital plate (fig. 28) with reniform lumen, arms strongly divergent.

On fig. 29 position of lateral projections of aedeagus during a copulation is presented. Male and female of the species were collected in copula and one lateral projection was lost by male in alcohol.

MATERIAL EXAMINED

Algeria: Petite Kabylie, Akbou, 12 May 1981, 2♂, 1♀; Tazmalt, 14 May 1981, 2♂, leg. R. Szadziewski.

In order to stabilize the nomenclature of the species I designate a neotype — ♂ from Tazmalt, since the type material had been lost. Now redescribed species is in agreement with the original description and figures given by KIEFFER (1918). The neotype is deposited in the Institute of Zoology, Polish Acad. Sci., Warsaw.

DISTRIBUTION

Tunesia, Algeria. Record of the species from Hungary by KIEFFER (1919) is not confirmed.

Dasyhelea skierskae sp. n.

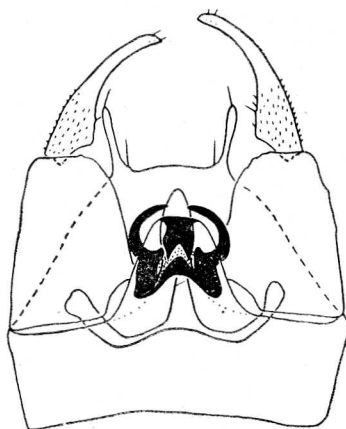
(Figs 30, 47)

DIAGNOSIS

Aedeagus with one pair of long C-shaped convergent lateral projections.

DESCRIPTION

♂. Flagellum length 679–739 μm , AR 1.02–1.11; flagellomere X long (fig. 47), XI/X 1.02–1.08. Third palpal segment 74–78 μm long.



30. *Dasyhelea skierskae* sp. n., male genitalia

Thorax black, scutellum black, haltere dark. Wing length 1.08–1.16mm, CR 0.43–0.46. Legs dark brown, tarsi pale; TR(I) 2.2–2.3, TR(II) 2.2–2.5, TR(III) 2.1.

Abdomen black. Genitalia (fig. 30); sternite IX covers about three quarters of aedeagus; tergite IX with long and slender apicolateral processes; gonostyle evenly arched, distal portion slender, proximal half covered with small setae; parameres symmetrical and fused, median projection triangular; median projection of aedeagus with subconical evenly pointed tip; one pair of long C-shaped convergent lateral projections of aedeagus present; bridge joining aedeagus with sternite IX in ventral view wide and short.

Female unknown.

MATERIAL EXAMINED

Algeria: Holotype — ♂, Petite Kabylie, Akbou, 12 May 1981, leg. R. Szadziewski; paratypes: 1 ♂, the same data as the holotype; Béjaia, 9 May 1981, 1 ♂, 10 May 1981, 1 ♂, leg. R. Szadziewski (R. Sz.). The holotype is deposited in the Institute of Zoology, Polish Acad. Sci., Warsaw.

DISTRIBUTION

Algeria.

ETYMOLOGY

The species is named in honour of the late Docent Dr Barbara Skierska from Gdańsk in recognition of her help in my study of the Polish biting midges.

Dasyhelea parallela Remm, 1962

(Fig. 51)

Dasyhelea parallela REMM, 1962: 125 (♂, ♀, Estonia).

DIAGNOSIS

Aedeagus (fig. 51) with one pair of long and parallel lateral projections, median projection cylindrical with blunt tip. Spermatheca ovoid with oblique tapered neck, subgenital plate circular with circular lumen.

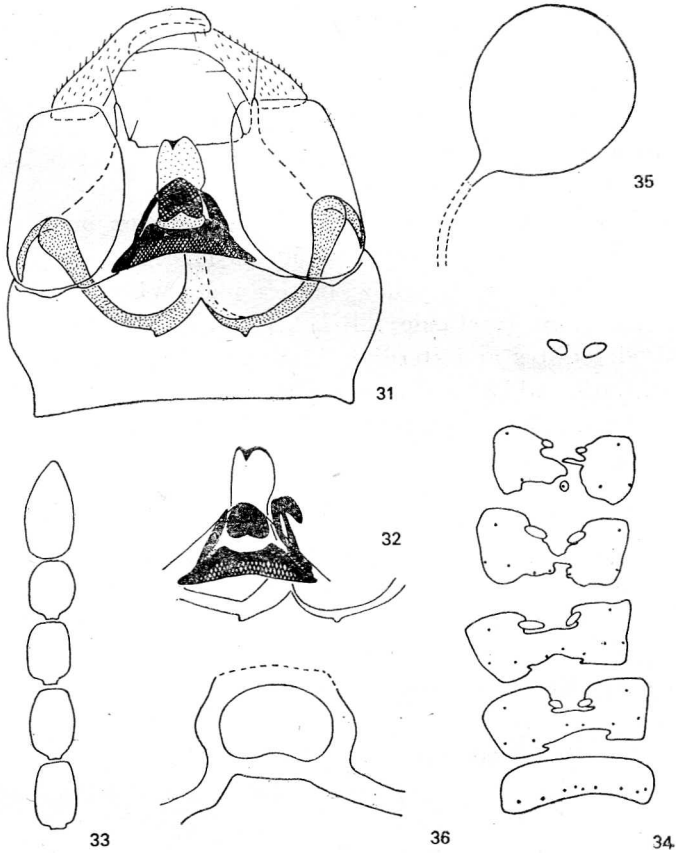
DISTRIBUTION

Estonia.

Dasyhelea turanicola Remm et Nazarmuchamedov, 1969

(Figs 31–36, 48)

Dasyhelea turanicola REMM and NAZARMUCHAMEDOV, 1969: 56 (♂, ♀, Uzbekistan, Kazakhstan, Turkmenia, Tadjikistan, Kirghisia).



31-36. *Dasyhelea turanicola* REMM et al. 31, 32 — male genitalia, 33 — distal flagellomeres of female, 34 — female sternites, 35 — spermatheca, 36 — subgenital plate

DIAGNOSIS

Aedeagus with short lateral projections, parameres somewhat asymmetrical, gonostyle strongly arched with stout distal portion.

DESCRIPTION

♂. Flagellum length 492 μm , AR 0.84; flagellomere X distinctly shorter than flagellomere XI (fig. 48), XI/X 1.15. Third palpal segment 54 μm long.

Thorax brown, scutellum yellow, haltere pale. Wing length 0.84 mm, CR 0.43. Legs brown, tarsi pale; TR(I) 2.1, TR(II) 2.1, TR(III) 2.0.

Abdomen brown. Genitalia (figs 31, 32); sternite IX covers slightly more than half of aedeagus; tergite IX with long and slender apicolateral

processes; gonostyle strongly arched, distal portion stout, proximal half covered with small setae; parameres somewhat asymmetrical and fused; median projection of aedeagus broad with short pointed tip strongly curved ventrally; lateral projections of aedeagus short and straight, leaned to median projection; bridge joining aedeagus with sternite IX in ventral view heart-shaped.

♀. Flagellum length 364 μm , AR 0.78; reticulation on flagellomeres absent (fig. 33). Third palpal segment 50 μm long.

Thorax brown, scutellum yellow, haltere pale. Wing length 0.72 mm, CR 0.41. Legs brown, tarsi pale; TR(I) 2.2, TR(II) 2.2, TR(III) 2.2.

Abdominal tergites and sternites brownish, shape of sternites as on fig. 34. Spermatheca black, spherical with straight neck (fig. 35), measuring $94 \times 72 \mu\text{m}$. Subgenital plate (fig. 36) with low reniform lumen, arms strongly divergent.

MATERIAL EXAMINED

West Germany: Graben-Neudorf, 20 km north of Karlsruhe, 22 Aug. 1978, 1 ♀, 1979, 1 ♂, leg. P. Havelka (R. Sz.).

DISTRIBUTION

Middle Asia, West Germany.

Dasyhelea wirthicola sp. n.

(Figs 37–42, 49)

DIAGNOSIS

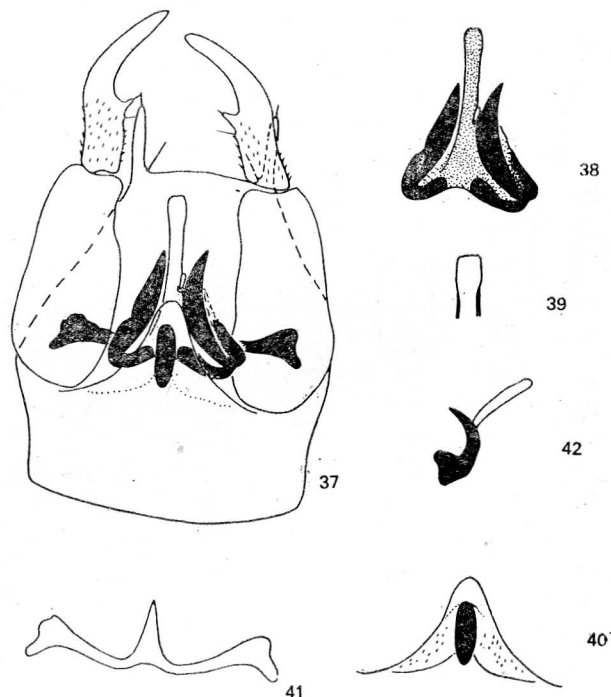
Aedeagus with one pair of long lateral projections, median projection very long with blunt tip. Gonostyle with long ventral process close to middle.

DESCRIPTION

♂. Flagellum length 422 μm , AR 0.80; flagellomere X short (28 μm , fig. 49), XI/X 1.86. Third palpal segment 44 μm long.

Thorax dark brown, scutellum rather pale, haltere not visible. Wing length 0.65 mm, CR 0.44. Legs yellowish, fore femora brownish on proximal half, fore tibiae somewhat infuscated; TR(I) 1.9, TR(II) 1.9, TR(III) 1.8.

Abdomen dark brown. Genitalia (figs 37–42); sternite IX covers less than half of aedeagus; tergite IX with long and slender apicolateral processes; gonostyle curved at middle, distal portion distinctly slender, proximal portion covered with small setae, near middle strong ventral process; parameres symmetrical and fused, median projection triangular;



37-42. *Dasyhelea wirthicola* sp. n., male genitalia. 37 - ventral view, 38 - aedeagus, 39 - tip of aedeagus, 40 - sternite IX, 41 - parameres, 42 - lateral view of aedeagus

median projection of aedeagus extremely long with broad blunt tip, at middle on ventral surface distinct club-shaped papilla; one pair of long and strong lateral projections of aedeagus present; bridge joining aedeagus with sternite IX narrow, in ventral view elliptic.

MATERIAL EXAMINED

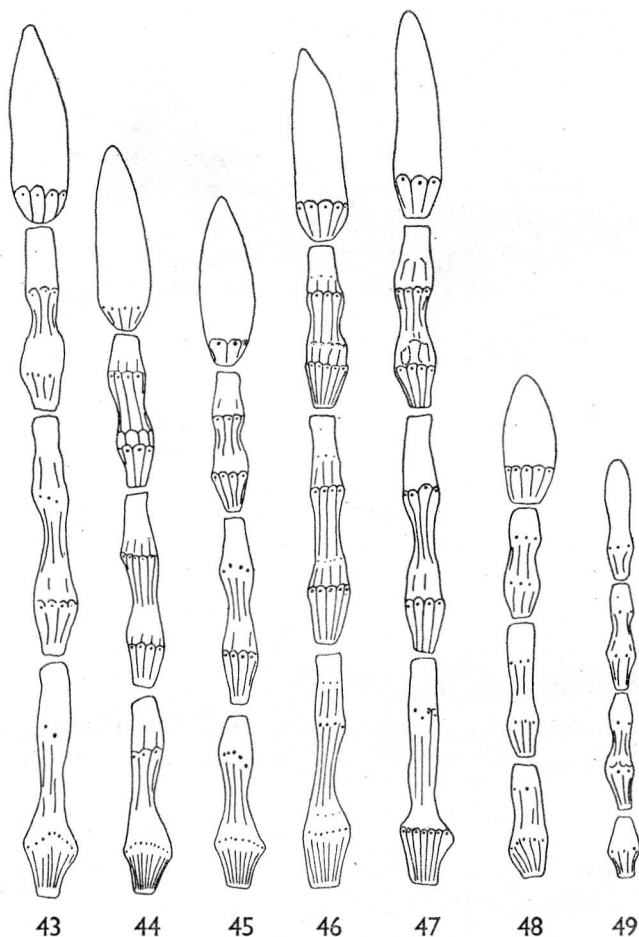
Pakistan: holotype - ♂, Peshawar, 20 Sept. 1960, J. Scanlon, light trap. The holotype is deposited in National Museum of Natural History, Smithsonian Institution, Washington.

DISTRIBUTION

Pakistan, Uzbekistan (Urga at southern shore of Aral sea, 11 Aug. 1964, 1 ♂, leg. Nazarmuchamedov; Dr H. Remm personal communication).

ETYMOLOGY

The species is named in honour of Dr Willis W. Wirth of Systematic Entomology Laboratory, Department of Agriculture c/o US National Museum, Washington, in recognition of his superb contributions to the study of the world *Ceratopogonidae*.



43-49. Distal male flagellomeres. 43 — *Dasyhelea turficola* KIEFF., 44 — *D. arciforceps* TOK., 45 — *D. punctiventris* GOETGH., 46 — *D. communis* KIEFF., 47 — *D. skierskae* sp. n., 48 — *D. turanicola* REMM et al., 49 — *D. wirthicola* sp. n.

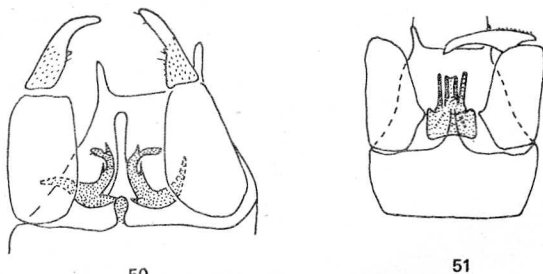
Dasyhelea alboverrucosa Remm, 1967

(Fig. 51)

Dasyhelea alboverrucosa REMM, 1967: 17 (♂, ♀, Caucasus).

DIAGNOSIS

♂. Wing length 1 mm. Body black, scutellum yellow, haltere pale. Legs blackish, tibiae and proximal tarsomeres paler. Genitalia (fig. 50) very close to these of *D. wirthicola* but differs in the following points:



50

51

50, 51. Male genitalia. 50 — *Dasyhelea alboverrucosa* REMM (from REMM, 1967),
51 — *D. parallela* REMM (from REMM, 1962)

gonostyle with small ventral process (papilla) close to middle, lateral projections of aedeagus with forked and strongly divergent apices, bridge joining aedeagus with sternite IX in ventral view club-shaped. Flagellomere X short.

♀. Wing length 0.85 mm. Flagellum length 346 μ m, AR 0.9. Spermatheca spherical with short and straight neck, measuring 60 \times 60 μ m. Subgenital plate with circular lumen.

DISTRIBUTION

Caucasus.

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