

**A review of Polish *Cladotanytarsus* KIEFFER (Diptera: Chironomidae)
with description of three new species**

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ABSTRACT. Ten Polish species of the genus *Cladotanytarsus* KIEFFER are reviewed and diagnosed. Three new species *C. cyrylae*, *C. gedanicus* and *C. matthei* are described and illustrated. *C. atridorsum* KIEFFER, *C. difficilis* BRUNDIN and *C. wexionensis* BRUNDIN are recorded from Poland for the first time. A key to adult males of European species of the genus *Cladotanytarsus* is presented.

KEY WORDS: Diptera, Chironomidae, Tanytarsini, new species, new records, key.

INTRODUCTION

Cladotanytarsus KIEFFER is a worldwide distributed genus, with at least 25 species described from the Holarctic region. The Palaearctic inhabit 16 species, of which 12 are known in Europe. Up to now 5 species were recorded in Poland (BILYJ & DAVIES 1989, REISS 1991, GILKA 1997).

Larvae of most species of the genus *Cladotanytarsus* are unknown or inadequately described. In opinion of some authors, the pupal stage provides the best diagnostic characters. Most European species are clearly diagnosed and separated in a key for pupal exuviae by LANGTON (1991). BILYJ & DAVIES (1989) proposed a key to determination of pupae of the Holarctic *Cladotanytarsus*. However, there is no a revision of the European species including all stages so far. Papers dealing with adults, investigated concurrently with pupae, comprise only selected data on biology and zoogeography (e.g. FITTKAU & REISS 1978) or regional keys including a few species (e.g. PINDER 1978, ALBU 1980).

Larvae of *Cladotanytarsus* are eurytopic. They live in a wide variety of habitats - lakes, ponds, rivers, streams, hot springs and brackish waters, although most species are known from littoral zone of standing reservoirs.

MATERIAL AND METHODS

Over 1700 adult males collected in years 1975-1999 were examined. The material was taken with entomological net, light, Malaise and glue traps. Specimens were killed and preserved in 70% ethanol. The preparation method follows WIRTH & MARSTON (1968). Illustrated descriptions and measurements were taken from slide-mounted specimens. Wing was measured from basal arculus to the tip. Body length was measured from the pedicel to gonostylus. Morphological terminology with their abbreviations follows SAETHER (1980) except for median volsella, which was separated into stem and setae.

The material was sampled in 44 sites in Poland (Fig. 11). Geographical division into regions follows KONDRACKI (1978) with modifications of SZADZIEWSKI (1985). UTM codes of sampling sites are given in brackets.

Sampling sites

Southern Baltic Coasts: Brzyno at Żarnowieckie lake (CF07); Chałupy on Mierzeja Helska peninsula (CF37); Choczewskie lake nr. Choczewo (XA86); Dobre lake nr. Piaśnica (CF16); Gdynia-Orłowo, seepage at Gulf of Gdańsk (CF43); Górki Wschodnie nr. Gdańsk, at Wisła Śmiała mouth (CF52); Salino lake nr. Choczewo (XA86); Władysławowo (CF37). **Eastern Baltic Coasts:** Bajory Wielkie nr. Srokowo, at clay-pit (EF31); Marszałki nr. Srokowo, at Chochlik lake and Kanał Mazurski (EF31); Wyskok nr. Srokowo, at Oświn lake (EF31). **Southern Baltic Lakelands:** Borzestowo nr. Kartuzy, at Długie lake (XA92); Czaplunek, at Drawsko lake (WV83); Czersk, at Świdno lake (XV96); Iława, at Jeziorak lake (DE04); Kożyczkowo nr. Chmielno, at Osuszyno lake (CF02); Las Piwnicki reserve nr. Toruń (CD38); Łączyno, at Raduńskie Dolne lake (CF01); Mątwy nr. Inowrocław, at saline reservoirs (CD15); Mrowiniec nr. Tuchola, at Spierewnik lake (XV85); Niesiołowice nr. Stężyca, at Długie and Skrzyńka lakes (XA81); Ogonki nr. Sulęczyno, at Sumino lake (XA80); Osowa nr. Gdańsk, at Wysockie lake (CF33); Otałżyno lake nr. Szemud (CF13); Pałubice nr. Sierakowice (XA83); Śnice nr. Stężyca, at clay-pit (XA90); Wysocki Młyn nr. Tuchola, near ponds and Wysocka Struga stream (XV85); Zgorzałe nr. Stężyca, at Raduńskie Górne lake (XA91); Żakowo nr. Sulęczyno, at Martwe lake (XA81). **Eastern Baltic Lakelands:** Augustów (FE36); Giby nr. Sejny (FE59); Przysań nr. Węgorzewo, at Mamry lake (EF40); Ruciane-Nida, at Nidzkie lake (EE34); Silec nr. Srokowo (EF30); Stańczyki nr. Gołdap (FF01). **Central Polish Lowlands:** Rogów nr. Brzeziny (DC24); Teofilów nr. Spała (DC40). **Central Małopolska Upland:** Lubrzanka river in the Świętokrzyskie Mts.: Brzezinki (DB84); Cedzyna (DB73); Leszczyny (DB83). Pilica river: Koniecpol (DB02); Skotniki nr. Sulejów (DB27). Radońka river in Wzgórza Opoczyńskie: Podklasztorze nr. Sulejów (DB29). **Sudety Mts.:** Sosnówka Dolna (400 m a.s.l.) nr. Karpacz (WS52).

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SYSTEMATIC REVIEW

Cladotanytarsus KIEFFER

Diagnosis

Male. Small or moderately large species - wing length: 1.10-2.50 mm. Eyes bare. Antennal flagellum 13-segmented. Wing membrane only distally covered with macrotrichia. Combs of mid and hind tibiae distinctly separated, usually each comb with spur; gonostylus usually shorter than gonocoxite; groups of spinules (anal papillae) on anal tergite always present (Figs. 1-3C); 4 pairs of appendages of hypopygium - digitus always present, usually long, extending over the superior volsella (Figs. 1-3D); median volsella with furcate setae placed on elongated stem (Figs. 1-3E).

Cladotanytarsus cyrylae sp. n.

Figs. 1A-F, 11C

Diagnosis

Male. Small species - wing length 1.1-1.3 mm; frontal tubercles fine (Fig. 1A); AR = 0.65-0.70; hind tibia with single spur (Fig. 1F); anal point triangular with elongated and pointed tip, anal point crests absent (Fig. 1B, C); stem of median volsella as long as its setae (Fig. 1E).

Female, pupa, larva unknown.

Description

Male (n = 9). Body length: 1.9-2.2 mm; wing length: 1.1-1.3 mm. Colour (in alcohol): tentorium dark brown or black; pedicellum, scutal stripes (whole lateral, median in half), postnotum (in distal half) and sternum dark brown; scutellum from olive-green to brown; background of thorax, legs and abdomen green to olive-green; halter light green, somewhat darker at its base. Head: frontal tubercles fine (2-3 μm) (Fig. 1A); AR = 0.65-0.70; length of palpomeres II-V (μm): 25-30: 65-80: 85-95: 125-150. Thorax chaetotaxy: Ac = 4-8 (usually 6), Dc = 5-8 (7), Pa = 1, Scts = 2-5 (4), two pairs of scutellars usually placed symmetrically. Wing: membrane in distal part of cells r_{4+5} and m_{1+2} with several dispersed macrotrichia, r_{4+5} with a single row of macrotrichia running from its center to tip, m_{1+2} with a short row of macrotrichia above M_{3+4} ; veins R, R_{4+5} (distal 1/3 part), M_{1+2} (distal 2/3 part), sometimes R_1 and end of M_{3+4} with macrotrichia, vein An sometimes with 1-2 macrotrichia, other veins bare. Legs: $LR_1 = 2.00-2.21$ (n = 8), $LR_2 = 0.55-0.59$, $LR_3 = 0.63-0.66$; fore tibia with short spur; combs of mid and hind tibia separated; mid tibia with a pair of spurs - each comb bearing short spur; hind tibia with a single spur - only one comb bearing long spur (Fig. 1F); pulvilli absent; Ta_1 of P_2 with 2-3 (usually 2) sensilla chaetica distally; $BR_1 = 2.5-3.0$ (n = 8), $BR_2 = 3.5-5.0$, $BR_3 = 4.0-5.5$.

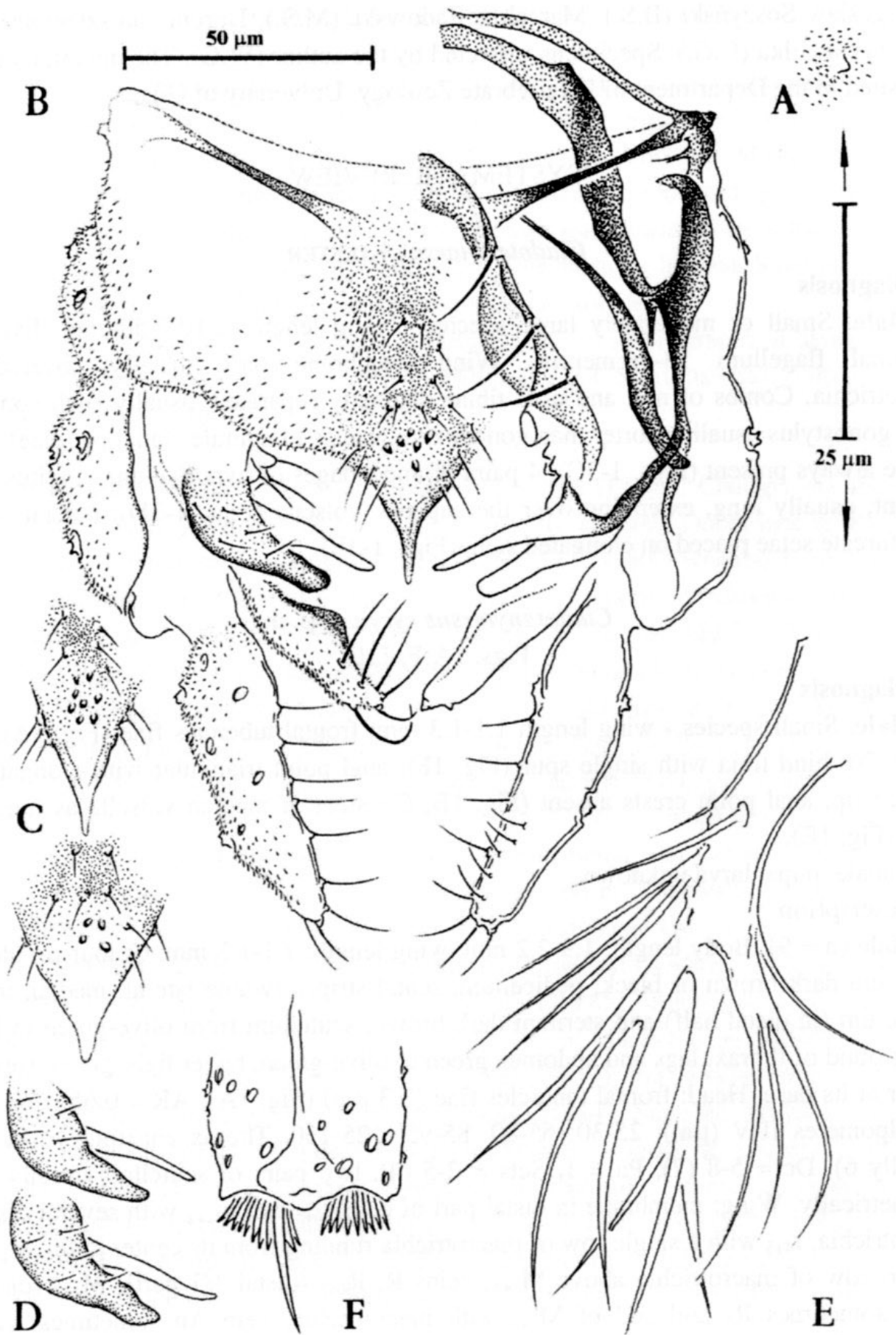


Fig. 1. *Cladotanytarsus cyrylae* sp. n. A - frontal tubercle, B - hypopygium, C - anal point (variability), D - superior volsella and digitus (variability), E - median volsella, F - distal part of hind tibia.

Hypopygium (Fig. 1B-E): gonostylus (50-60 μm) shorter than gonocoxite; anal tergite with 5-10 dispersed median setae, anal tergal bands separated V-type, lateral teeth absent; anal point wide at its base, triangular, tip elongated and pointed, 4-8 groups of spinules (anal papillae) dorsally and 2-4 lateral setae on each side of anal point, crests absent (Fig. 1B, C); superior volsella slender, narrowed in median part, 3 setae at its base and 5-7 setae in dorsal position, digitus long, extending over the superior volsella, slightly curved, tip pointed (Fig. 1B, D); inferior volsella slender, slightly curved with distinct ridge in dorso-median part; stem of median volsella erected or slightly curved, short (25-35 μm), with 4-5 furcate setae, stem as long as its setae (Fig. 1E).

Type material

Holotype, male, dissected and slide-mounted in Canada balsam, labelled: *Cladotanytarsus cyrylae* sp. n., holotypus, Poland: Eastern Baltic Coasts: Bajory Wielkie nr. Srokowo, 20.06.1998, leg. W. Giłka, netting. Paratypes: eight males prepared and labelled as above, with labels „paratypus”. Type series deposited in the Department of Invertebrate Zoology, University of Gdańsk.

Etymology

I dedicate the species to my mother, Cyryla.

Discussion

The material was collected at a little clay-pit (area - ca. 2 ha, depth - to 3 m, muddy bottom with abundant flora). Males of *C. cyrylae* were taken by net from willow leaves, shortly after emergence (three specimens incompletely pigmented).

C. cyrylae is the smallest species among European *Cladotanytarsus*. Males are easy to distinguish by the shape of anal point, fine frontal tubercles and low AR. Hind tibiae of all specimens have only single spur. However, it is known, that spurs of mid or hind tibiae can or cannot be developed in different populations [e.g. *Rheotanytarsus ringei* (LEHMANN 1970)]; a great variability of these structures was also observed in *Cladotanytarsus wexionensis* (SHILOVA 1976; Fig. 10H, I).

Some characters mentioned in description of *Tanytarsus nietzkei* GOETGHEBUER [transferred to *nomina dubia* in *Tanytarsus* WULP by REISS & FITTKAU (1971, p. 80)], show similarity to *Cladotanytarsus* (wing chaetotaxy, shape of digitus). Several features given by GOETGHEBUER (1935) are similar to characters found also in the male of *C. cyrylae* (body length, shape of anal point and superior volsella). However, the simple setae on median volsella (l.c.) present in *nietzkei* indicate that it cannot be included in *Cladotanytarsus*.

Cladotanytarsus gedanicus sp. n.

Figs. 2A-E, 11C

Diagnosis

Male. Frontal tubercles stout (Fig. 2A); AR = 0.70-0.90; stem of median volsella stout, -shaped, with dense furcate setae placed apically, setae strongly curved, stem of median volsella twice longer than its setae (Fig. 2E).

Female known but not described, pupa and larva unknown.

Description

Male (n = 15). Body length: 2.5-3.2 mm; wing length: 1.3-1.8 mm. Colour (in alcohol): tentorium, pedicel, scutal stripes (whole lateral, median in half), postnotum (except short proximal part) and sternum black; background of thorax, ventral side of abdomen and halter green; scutellum, legs and dorsal side of abdomen from olive-green to black. Head: frontal tubercles stout (18-28 μm) (Fig. 2A); AR = 0.70-0.90; length of palpomeres II-V (μm): 25-40: 70-110: 75-125: 125-175. Thorax chaetotaxy: Ac = 6-12, Dc = 7-12, Pa = 1-2 (usually 1), Scts = 4-8, scutellars usually placed in a regular row. Wing: membrane with macrotrichia only in apical part (cells r_{4+5} and usually m_{1+2}); veins R, R_{4+5} (distal 1/3 part), M_{1+2} (distal part) and sometimes R_1 with macrotrichia on proximal part, other veins bare. Legs: $LR_1 = 1.28-1.51$, $LR_2 = 0.47-0.53$, $LR_3 = 0.54-0.58$; fore tibia with slightly curved spur; combs of mid and hind tibia separated, each comb bearing short spur; pulvilli absent; Ta_1 of P_2 with 3-5 (usually 4) sensilla chaetica distally; $BR_1 = 2.0-3.0$, $BR_2 = 2.5-3.5$, $BR_3 = 3.5-5.0$.

Hypopygium (Fig. 2B-E): gonostylus (80-110 μm) shorter than gonocoxite; anal tergite with 2 irregular rows of median setae, sometimes setae dispersed at the base of anal point, anal tergal bands separated V-type, lateral teeth absent; anal point triangular, proportionally tapering to tip or slightly narrowed in distal part, 4-10 groups of spinules (anal papillae) dorsally and 4-5 lateral setae on each side, anal point crests narrow (Fig. 2B, C); superior volsella stout, with 3 setae at its base and 6-9 setae in dorsal position, digitus long, extending over the superior volsella, curved, tip rounded (Fig. 2B, D); inferior volsella distinctly curved, with good visible ridge in dorso-median part; stem of median volsella stout, S-shaped, with dense furcate setae placed apically, setae strongly curved, stem of median volsella twice longer than its setae (Fig. 2E).

Material examined

Ex coll. (leg.) R.Sz., netting: **Southern Baltic Coasts**: Gdynia-Orłowo, 12.07.1975, 1 σ . Górki Wschodnie nr. Gdańsk, 11.07.1975, 1 σ ; 18.07.1975, 8 $\sigma\sigma$; 24.07.1975, 1 σ ; 28.08.1975, over 200 $\sigma\sigma$, 32 $\varphi\varphi$; 01.08.1977, 1 σ ; 18.08.1977, 5 $\sigma\sigma$; 27.07.1978, over 300 $\sigma\sigma$, 53 $\varphi\varphi$. **Southern Baltic Lakelands**: Mątwy nr. Inowrocław, at saline reservoirs, 04.08.1975, 1 σ + 1 hypopygium (slide-mounted). Ex coll. (leg.) W.Giłka, netting: Górki Wschodnie nr. Gdańsk, 15.07.1998, swarming, 17 $\sigma\sigma$.

Type material

Holotype, male, dissected and slide-mounted in Canada balsam, labelled: *Cladotanytarsus gedanicus* sp. n., holotypus, Poland: Southern Baltic Coasts: Górki Wschodnie nr. Gdańsk, 15.07.1998, leg. W. Giłka, netting. Paratypes: four males prepared as above, with labels „paratypus”. Type series deposited in the Department of Invertebrate Zoology, University of Gdańsk.

Etymology

Gedanum is a Latin name of Gdańsk.

Discussion

In accordance with the classification used by SZADZIEWSKI (1983), *C. gedanicus* should be regarded as an inland halobiont (ecological group includes organisms which require inland conditions but occur in marine habitats as well). Adults of *C. gedanicus* were taken in abundance at brackish waters (locus typicus: 5-7‰) and strongly saline inland reservoir as

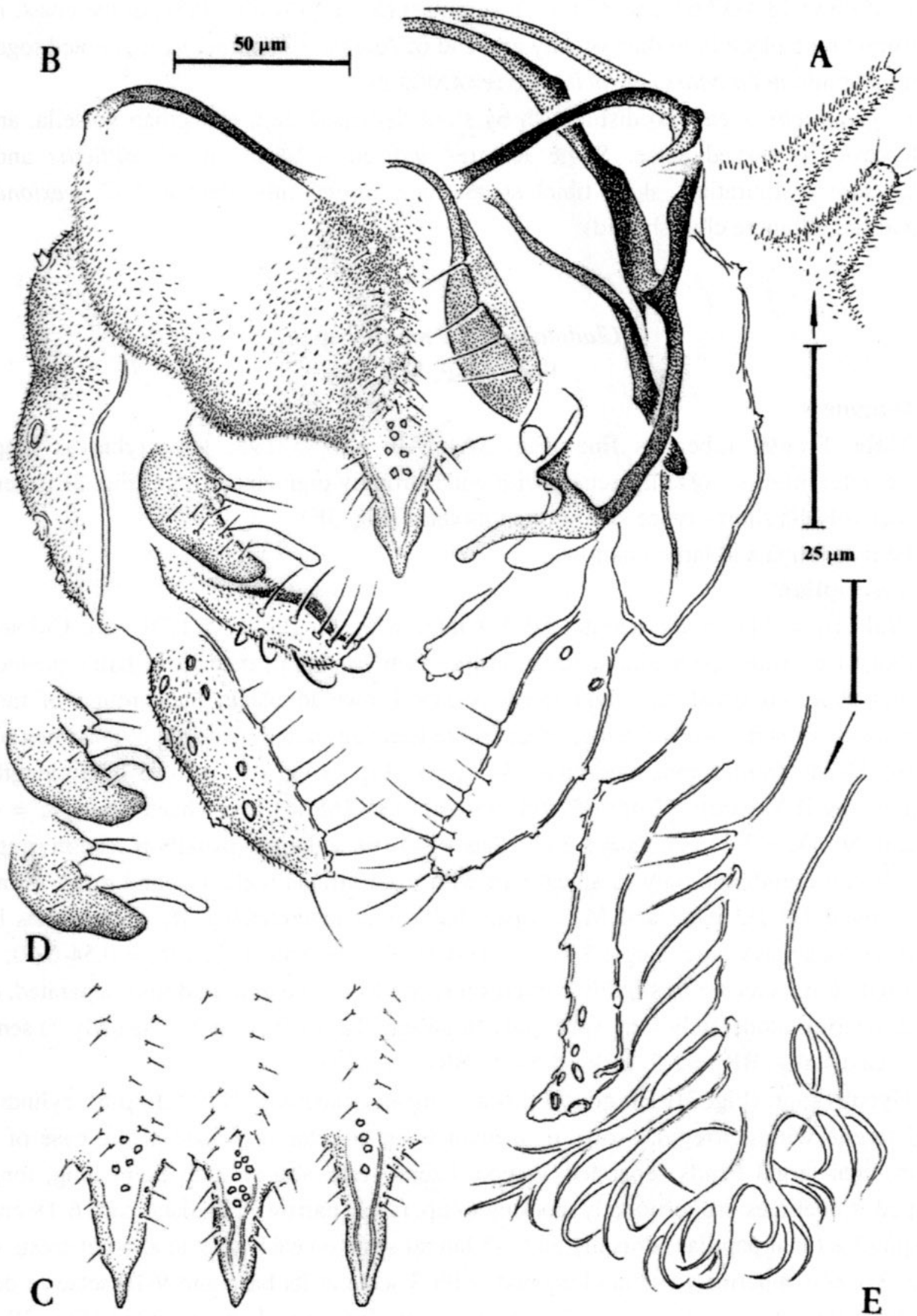


Fig. 2. *Cladotanytarsus gedanicus* sp. n. A - frontal tubercles, B - hypopygium, C - anal point (variability), D - superior volsella and digitus (variability), E - median volsella.

well (Małwy: 18.4-37.6‰, to 84.6‰ in summer) (SZADZIEWSKI 1983). In the coast, mass swarming take place in middle of July and end of August. *C. gedanicus* was noted together with halophilous *Tanytarsus gracilentus* (HOLMGREN).

C. gedanicus is easy to distinguish by stout S-shaped stem of median volsella, armed with strongly curved setae. Some features indicate relations to *C. difficilis* and *C. atridorsum* (colouration, short tibial spurs, long frontal tubercles) and *C. wexionensis* (apical flagellomere club-shaped).

Cladotanytarsus matthei sp. n.

Figs. 3A-F, 11B, 12

Diagnosis

Male. Frontal tubercles fine (Fig. 3A); AR = 0.85-0.95; gonostylus as long as gonocoxite; inferior volsella arcuate with wide strongly pigmented ridge (Fig. 3F); stem of median volsella short - twice shorter than its setae (Fig. 3E).

Female, pupa and larva unknown.

Description

Male (n = 11). Body length: 2.5-2.9 mm; wing length: 1.55-1.70 mm. Colour (in alcohol): tentorium, pedicellum, scutal stripes (whole lateral, median in half), postnotum (except short proximal part) and sternum dark brown to black; background of thorax, ventral side of abdomen and halter green, scutellum, legs and dorsal side of abdomen olive-green. Head: frontal tubercles fine (3-5 μm) (Fig. 3A); AR = 0.85-0.95; length of palpomeres II-V (μm): 35-45: 85-105: 95-110: 135-165. Thorax chaetotaxy: Ac = 4-10 (usually 9), Dc = 7-11 (9), Pa = 1-2 (1), Scts = 4-7 (6), scutellars usually placed in irregular row. Wing: membrane only in apical part with macrotrichia (cells r_{4+5} and m_{1+2}); veins R, R_{4+5} (distal 1/3-1/2 part) and M_{1+2} (distal half) with macrotrichia, R_{4+5} sometimes bare, other veins always bare. Legs: $LR_1 = 1.38-1.60$, $LR_2 = 0.49-0.52$, $LR_3 = 0.54-0.60$; fore tibia with long, erected or slightly curved spur; combs of mid and hind tibia separated, each comb bearing moderately long spur; pulvilli absent; Ta_1 of P_2 with 2-3 (usually 2) sensilla chaetica distally; $BR_1 = 2.5$, $BR_2 = 3.5-4.0$, $BR_3 = 4.5-5.0$.

Hypopygium (Fig. 3B-E): gonostylus as long as gonocoxite (110-130 μm), cylindrical; anal tergite with 2 irregular rows of median setae or setae dispersed at the base of anal point, anal tergal bands separated V-type, lateral teeth absent; anal point long, tongue-shaped, sometimes proportionally tapering to tip, rarely narrowed in distal part, 6-18 groups of spinules (anal papillae) dorsally and 2-5 lateral setae on each side, anal point crests wide (Fig. 3B, C); superior volsella elongated, with 3 setae at its base and 9-10 setae in dorsal position, digitus extending over the superior volsella, curved, tip rounded (Fig. 3B, D); inferior volsella distinctly shorter than gonostylus, arcuate, tapering to tip, directed medially with wide and strongly pigmented ridge (Fig. 3F); stem of median volsella stout and twice shorter than its setae (Fig. 3E).

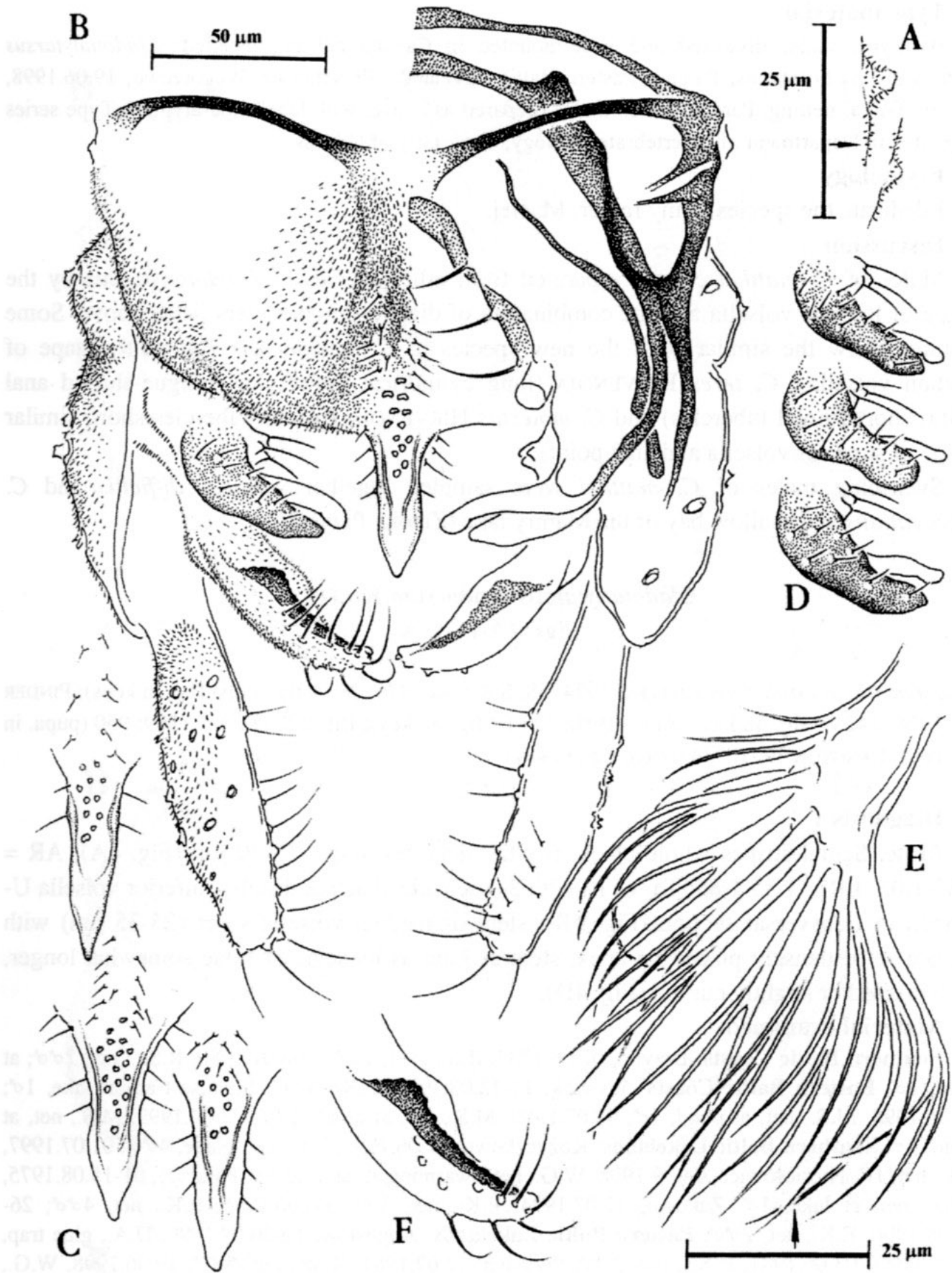


Fig. 3. *Cladotanytarsus matthei* sp. n., adult male. A - frontal tubercles, B - hypopygium, C - anal point (variability), D - superior volsella and digitus (variability), E - median volsella, F - tip of inferior volsella.

Type material

Holotype, male: dissected and slide-mounted in Canada balsam, labelled: *Cladotanytarsus matthei* sp. n., holotypus, Poland: Eastern Baltic Lakelands: Przysań nr. Węgorzewo, 19.06.1998, leg. W. Gilka, netting. Paratypes: ten males prepared as above, with labels „paratypus”. Type series deposited in Department of Invertebrate Zoology, University of Gdańsk.

Etymology

I dedicate the species to my father, Maciej.

Discussion

Males of *C. matthei* can be separated from other species of *Cladotanytarsus* by the shape of inferior volsella and the combination of diagnostic characters listed above. Some features show the similarity of the new species to *C. wexionensis* BRUNDIN (shape of median volsella), *C. teres* HIRVENOJA (long cylindrical gonostylus, tongue-shaped anal point, short frontal tubercles) and *C. molestus* HIRVENOJA (frontal tubercles short, similar shape of superior volsella and anal point).

Swarming males of *C. matthei* were sampled together with *C. difficilis* and *C. nigrovittatus* at a shallow bay of the Mamry lake (Zatoka Przysań).

Cladotanytarsus atridorsum KIEFFER

Figs. 4A-D, 11A

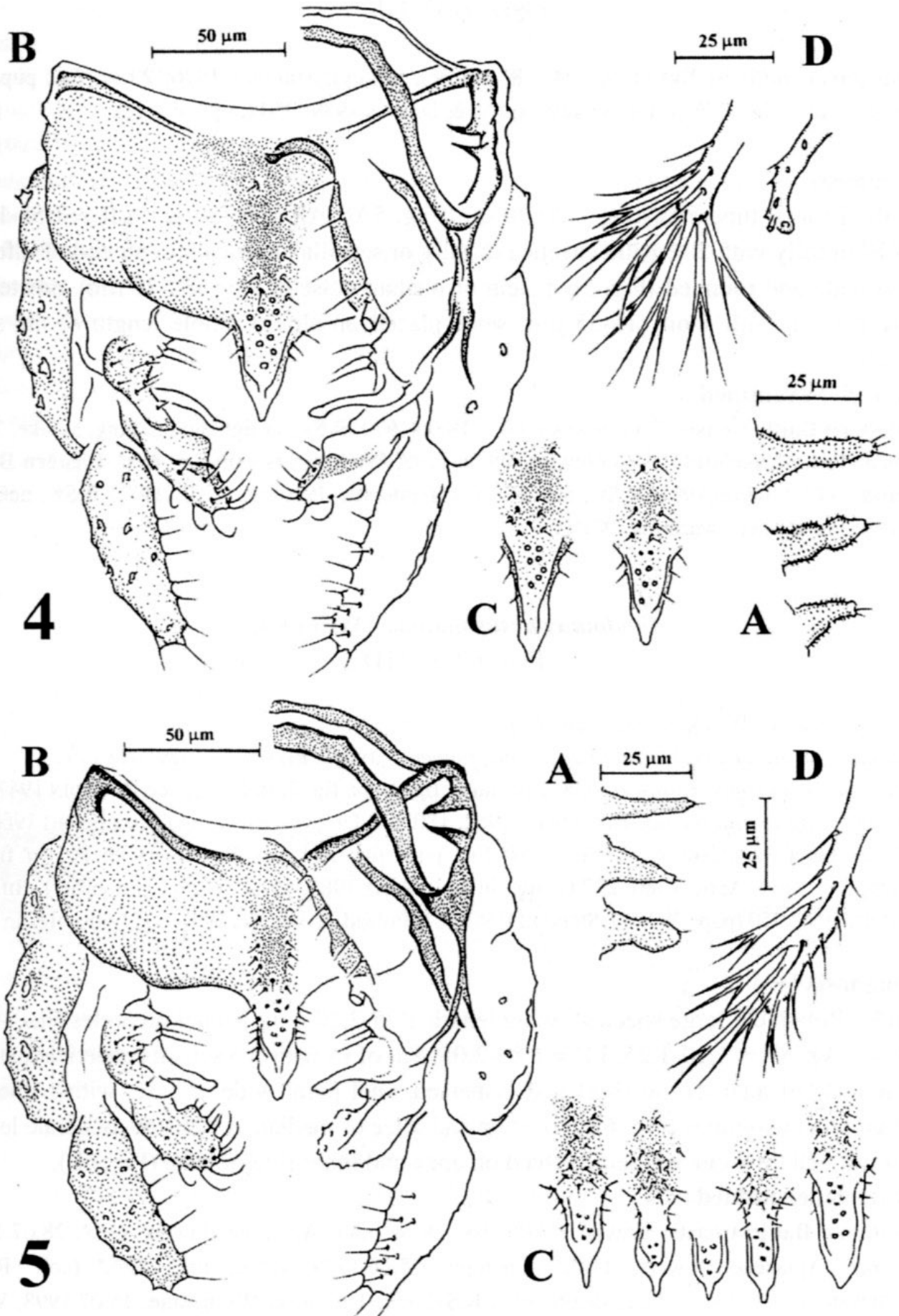
Cladotanytarsus atridorsum KIEFFER, 1924: 38; SHILOVA 1976: 28 (♂ fig., pupa fig., in keys); PINDER 1978: 142 (♂ fig., in key); ALBU 1980: 275 (♂ fig., in key); BILYJ & DAVIES 1989: 950 (pupa, in key); LANGTON 1991: 334 (pupa, fig., in key).

Diagnosis

Male. Scutal stripes whole black; frontal tubercles long - 15-30 µm (Fig. 4A); AR = 0.85-1.05; LR = 1.55-1.85; Ta₁ of P₂ with 3-4 sensilla chaetica distally; inferior volsella U-shaped in transversal section (Fig. 4B); stem of median volsella short (25-35 µm) with furcate setae densely placed on apex, stem as long as its setae or setae somewhat longer, both erected or slightly curved (Fig. 4D).

Material examined

Southern Baltic Coasts: Brzyno, 02.06.1982, R.Sz., net, 14♂♂; 08.07.1980, R.Sz., net, 2♂♂; at light, 1♂. **Eastern Baltic Coasts:** Wyskok, 11-12.08.1996, R.Sz, W.G, Malaise trap, at lake, 1♂; 24.06.1998, M.S., net, at pond, 1♂; 08.07.1998, M.S., net, at pond, 2♂♂; 23.04.1999, M.S., net, at pond, 1♂. **Southern Baltic Lakelands:** Kożyczkowo, 01.06.1997, E.S., net, glade, 4♂♂; 01.07.1997, E.S., net, 1♂. Niesiołowice, 04.09.1998, W.G., net, swarming at lake, 15♂♂. Pałubice, 01-15.08.1975, R.Sz., net, at lake, 1♂. Żakowo, 17.07.1994, E.K., net, 3♂♂; 06.06.1996, E.K., net, 4♂♂; 26-27.08.1996, E.K., net, 2♂♂. **Eastern Baltic Lakelands:** Augustów, 10-20.07.1990, D.A., glue trap, 2♂♂. Giby, 03.06.1981, R.Sz., net, 3♂♂. Przysań, 12.07.1981, R.Sz., net, 5♂♂; 19.06.1998, W.G., net, 2♂♂. Silec, 14.06.1980, R.Sz., net, 3♂♂; 02-03.07.1981, R.Sz., net, Apiaceae flowers, 13♂♂; 11.07.1981, R.Sz., net, at lake, 4♂♂. Stańczyki, 02.09.1979, R.Sz., net, 2♂♂. **Central Małopolska Upland:** Ameliówka, 19.05.1978, J.S., mud, ex cult. 3♂♂ (coll. J.S.); 23.06.1978, J.S., sandy bottom with mud, ex cult. 1♂ (coll. J.S.) (SICIŃSKI 1982, sub *Cladotanytarsus* sp.). Skotniki, 19.05.1979, J.S., lentic place, ex cult. 2♂♂ (coll. J.S.) (SICIŃSKI 1990, sub *Cladotanytarsus* sp. 1).



Figs. 4-5. 4 - *Cladotanytarsus atridorsum* KIEFFER, 5 - *C. difficilis* BRUNDIN. A - frontal tubercles (variability), B - hypopygium, C - anal point (variability), D - median volsella.

Cladotanytarsus difficilis BRUNDIN

Figs. 5A-D, 11C

Cladotanytarsus difficilis BRUNDIN, 1947: 80 (♂ fig., in key); SHILOVA 1976: 29 (♂ fig., pupa, in keys); ALBU 1980: 276 (♂ fig., in key); BILYJ & DAVIES 1989: 950 (pupa, in key).

Diagnosis

Male. Frontal tubercles long – 20-30 µm (Fig. 5A); AR = 0.75-0.95; LR = 1.55-1.67; Ta₁ of P₂ usually with 2 sensilla chaetica distally or sensilla chaetica absent; end of inferior volsella wide and rounded (Fig. 5B); stem of median volsella long (60-70 µm), erected or slightly curved, with short (15-35 µm) setae placed on almost whole length of the stem (Fig. 5D).

Material examined

Southern Baltic Coasts: Choczewskie lake, 18.06.1979, R.Sz., at light and netting, at lake, 2♂♂. **Southern Baltic Lakelands:** Niesiołowice, 09.06.1998, W.G., net, swarming, 8♂♂. **Eastern Baltic Lakelands:** Giby, 03.06.1981, R.Sz., net, 10♂♂ + 1 intersex. Przyszań, 12.07.1981, R.Sz., net, 1♂; 19.06.1998, W.G., net, swarming, 98♂♂.

Cladotanytarsus mancus (WALKER)

Figs. 6A-E, 11D

Chironomus mancus WALKER, 1856: 161 (♂).

Tanytarsus (*Tanytarsus*, gr. F- *Cladotanytarsus*) *mancus*, „type”: EDWARDS 1929: 418 (♂).

Cladotanytarsus mancus: KRÜGER 1938: 216 (larva fig., pupa fig. 7, in keys); nec BRUNDIN 1947: 80, misdet. (= *nigrovittatus*); nec HIRVENOJA 1962: 180, misdet. (= *nigrovittatus*); LINDEBERG 1964: 74 (♂ fig., pupa fig.); SHILOVA 1976: 29 (♂ fig., pupa fig., in keys); PINDER 1978: 142 (♂ fig. of syntype, in key); ALBU 1980: 277 (♂ fig., in key); PRAT 1985: 65-88 (♂ fig., variability); BILYJ & DAVIES 1989: 950 (pupa, in key); SICIŃSKI 1990: 381 (Poland); LANGTON 1991: 335 (pupa fig., in key).

Diagnosis

Male. Relatively large species - wing length 1.75-2.10 mm; frontal tubercles fine – to 5 µm (Fig. 6A); AR = 1.10-1.25; LR = 1.89-2.05; Ta₁ of P₂ with 3-5 sensilla chaetica distally; median setae of anal tergite short and dispersed, anal point wide at base, with numerous round groups of spinules (Fig. 6B, C); stem and setae of median volsella of moderate length (40-50 µm), slightly curved, setae placed on apex and inner side of stem (Fig. 6E).

Material examined

Southern Baltic Coasts: Brzyno, 02.06.1982, R.Sz., net, Apiaceae flowers, 6♂♂; 28.07.1982, R.Sz., net, Apiaceae flowers, 11♂♂. Chałupy; 25.06.1979, R.Sz., net, 22♂♂ (coll. R.Sz.) (SZADZIEWSKI 1983). Dobre lake, 08.06.1981, R.Sz., net, 1♂. Górki Wschodnie, 15.07.1998, W.G., net, 4♂♂. Salino lake, 19.06.1979, R.Sz., net, 4♂♂. Władysławowo, 23.06.1979, R.Sz., at light, 4♂♂ (coll. R.Sz.) (SZADZIEWSKI 1983). **Eastern Baltic Coasts:** Bajory Wielkie, 20.06.1998, W.G., net, swarming, 11♂♂. Marszałki, 31.05.1998, W.G., net, swarming, 21♂♂; 03.07.1998, M.S., net, on

Kanał Mazurski, 1♂. Wyskok, 11-12.08.1996, R.Sz., W.G., Malaise trap, at lake, 1♂; 29.05.1998, W.G., net, swarming, 11♂♂; at light, 1♂; 24-25.06.1998, M.S., net, at pond, 3♂♂. **Southern Baltic Lakelands:** Borzestowo, 10.07.1998, W.G., net, 3♂♂. Czaplinek, 06.09.1979, R.Sz., net, 6♂♂. Czersk, 23.07.1998, W.G., net, swarming, 13♂♂. Iława, 10.07.1981, R.Sz., net, 7♂♂. Koźyczkowo, 31.05.1997, E.S., net, 4♂♂; 01.06.1997, E.S., net, glade, 2♂♂; 01.07.1997, E.S., net, 8♂♂. Łączyno, 17.07.1997, W.G., net, swarming, 26♂♂. Mrowiniec, 24.06.1997, W.G., net, on *Humulus lupulus* and *Ribes nigrum*, 8♂♂; 25.06.1997, W.G., net, from boat, swarming, 4♂♂. Niesiołowice, 07.06.1997, W.G., net, swarming, ca. 300♂♂; 13-16.07.1997, W.G., net, 4♂♂; 09.05.1998, C.G., net, swarming, 20♂♂; 05-06.06.1998, W.G., net, 4♂♂; 09.06.1998, W.G., net, swarming, 30♂♂ [attacked by females of *Palpomyia lineata* (MEIG.) and *Probezzia seminigra* (PANZ.) (Ceratopogonidae)], 04.09.1998, W.G., net, swarming, 34♂♂; 11-14.09.1998, W.G., net, 6♂♂. Ogonki, 14.07.1997, W.G., net, swarming, ca. 200♂♂. Sulęczyno, 26.07.1997, W.G., net, 1♂. Śnice, 18.07.1998, W.G., net, swarming, 12♂♂ [attacked by female of *Nilobezzia* sp. (Ceratopogonidae)]. Wysocki Młyn, 23.06.1997, W.G., net, Apiaceae flowers, swarming, 10♂♂; 25.06.1997, W.G., net, on *Humulus lupulus*, *Urtica* sp. and Apiaceae flowers, 30♂♂. Zgorzale, 22.08.1981, R.Sz., at light, 1♂. Żakowo, 28-30.07.1995, E.K., net, 1♂. **Eastern Baltic Lakelands:** Augustów, 10-20.07.1990, D.A., glue trap, 7♂♂. Giby, 03.06.1981, R.Sz., net, 5♂♂. Ruciane-Nida, 03-09.1979, R.Sz., at light, 1♂. Silec, 06.08.1979, R.Sz., net, 1♂ (coll. R.Sz.). Stańczyki, 02.09.1979, R.Sz., net, 6♂♂, at light, 17♂♂. **Central Polish Lowlands:** Rogów, 14.07.1997, E.S., net, at pond, 1♂. **Central Małopolska Upland:** Brzezinki, 23.06.1978, J.S., mud, ex cult. 1♂ (coll. J.S.) (SICIŃSKI 1982, sub *Cladotanytarsus* sp.). Cedzyna, 20.05.1978, J.S., mud, ex cult. 1♂ (coll. J.S.); 24.06.1978, J.S., mud from sandy bottom, ex cult. 1♂ (coll. J.S.) (SICIŃSKI 1982, sub *Cladotanytarsus* sp.). Konicopol, 08.09.1978, J.S., mud from sandy bottom, ex cult. 1♂ (coll. J.S.) (SICIŃSKI 1990). Leszczyny, 25.05.1977, J.S., 1♂ (coll. J.S.). Skotniki, 15-19.05.1979, J.S., periphyton, lentic place, ex cult. 2♂♂ (coll. J.S.) (SICIŃSKI 1990). **Sudety Mts.:** Sosnówka Dolna (400 m a.s.l.), 07.08.1982, R.Sz., net, Apiaceae flowers, 1♂.

Published data (material not examined). Nowe Miasto on Pilica river (SICIŃSKI 1990).

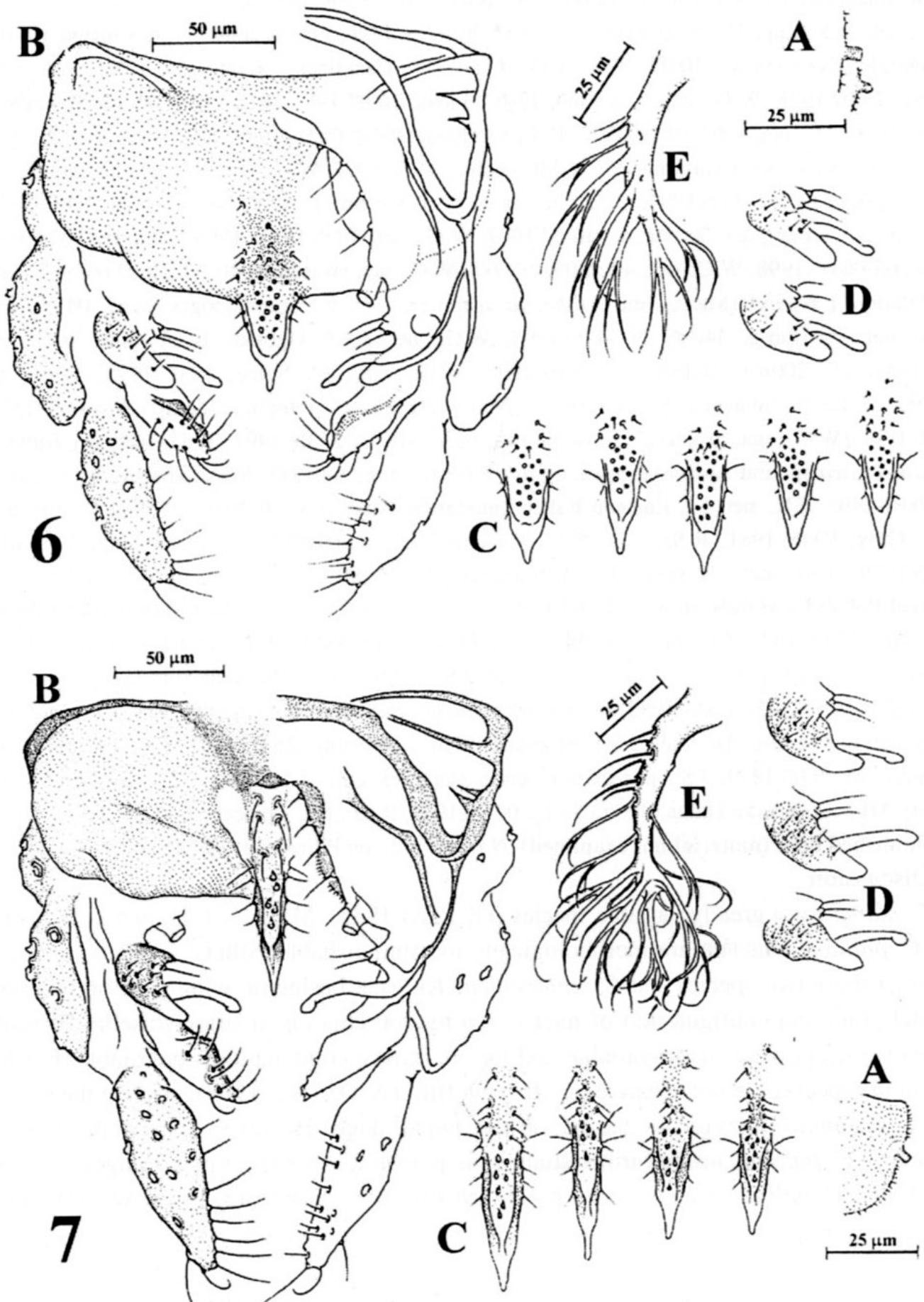
Discussion

C. mancus is a greatly variable species (i.e. PRAT 1985). Males of *C. mancus* (WALKER) and *C. pallidus* KIEFFER are morphologically indistinguishable. SHILOVA (1976) separates males of these two species and *C. lepidocalcar* KRÜGER basing on wing chaetotaxy, shape of anal point and configuration of micro- and microtrichia on superior volsella. Presently these characters were found variable and the diagnostic combination - unreliable. For this reason the species are not separated in the key. BILYJ & DAVIES (1989) separate the species and *C. iucundus* HIRVENOJA basing on the pupal stage. However, the combination *C. mancus* + *C. pallidus* needs further studies (as potential synonyms) of all stages and their variability. *C. pallidus* was recorded by HARNISCH (1922) from Brzeg near Wrocław (Fig. 11D).

Cladotanytarsus nigrovittatus (GOETGHEBUER)

Figs. 7A-E, 11B

Tanytarsus nigrovittatus GOETGHEBUER, 1922: 41 (♂ fig., in key).



Figs. 6-7. 6 - *Cladotanytarsus mancus* (WALKER), 7 - *C. nigrovittatus* (GOETGHEBUER). A - frontal tubercles, B - hypopygium, C - anal point (variability), D - superior volsella and digitus (variability), E - median volsella.

Cladotanytarsus mancus: KRÜGER 1938: 219 (sub *varia mancus*, pupa fig. 8, in keys).

Cladotanytarsus mancus: BRUNDIN 1947: 80 (♂ fig.); HIRVENOJA 1962: 180 (♂ fig., ♀, pupa fig.).

Cladotanytarsus nigrovittatus: LINDEBERG 1964: 74 (♂ fig., pupa fig.); SHILOVA 1976: 31 (♂ fig., pupa fig., in keys); PINDER 1978: 142 (♂ fig., in key); KOWNACKI 1991: 98 (Poland); LANGTON 1991: 335 (pupa fig., in key).

Diagnosis

Male. Relatively large species - wing length 1.75-2.00 mm; frontal tubercle fine - to 5 µm (Fig 7A); AR = 0.95-1.15; LR = 1.74-1.86; Ta₁ of P₂ with 3-4 sensilla chaetica distally; median setae of anal tergite relatively long, placed in 2 rows, anal point slender with elongated groups of spinules (Fig. 7B, C); stem of median volsella long (to 70 µm), distinctly curved, with strongly curved setae densely placed on apex (Fig. 7E).

Material examined

Southern Baltic Coasts: Choczewskie lake, 18.06.1979, R.Sz., at light and netting, 4♂♂. **Southern Baltic Lakelands:** Koźyczkowo, 28.05-01.06.1997, E.S., net, 2♂♂. Otalżyno, 05.07.1979, R.Sz., net, 9♂♂ (+ 1♂ ex coll. R.Sz.). Żakowo, 28-30.07.1995, E.K., net, 1♂; 08.07.1995, E.K., net, 1♂. **Eastern Baltic Lakelands:** Przysań, 01.09.1979, R.Sz., net, 1♂; 19.06.1998, W.G., net, swarming, at lake, 50♂♂.

Cladotanytarsus teres HIRVENOJA

Figs. 8A-C, 11E

Cladotanytarsus teres HIRVENOJA, 1962: 173 (♂ fig., ♀, pupa fig.); SHILOVA 1976: 26 (♂, in key); BILYJ & DAVIES 1989: 950 (pupa, in key); GIŁKA 1997: 271 (♂ figs., Poland).

Diagnosis

Male. Frontal tubercles very fine (Fig. 8A); AR = 0.90; LR = 1.44; Ta₁ of P₂ with 5 sensilla chaetica distally; gonostylus (180 µm) distinctly longer than gonocoxite, cylindrical; anal point long, tongue-shaped; superior volsella stout with rounded apex and 4-5 setae at its base (basal setae), digitus short, erected, hidden under superior volsella (Fig. 8B); stem of median volsella distinctly curved with long slightly bent setae (Fig. 8C).

Material examined

Southern Baltic Lakelands: Koźyczkowo, 01.06.1997, E.S., net, glade, 1♂.

For information on biology and geographical distribution see GIŁKA (1997).

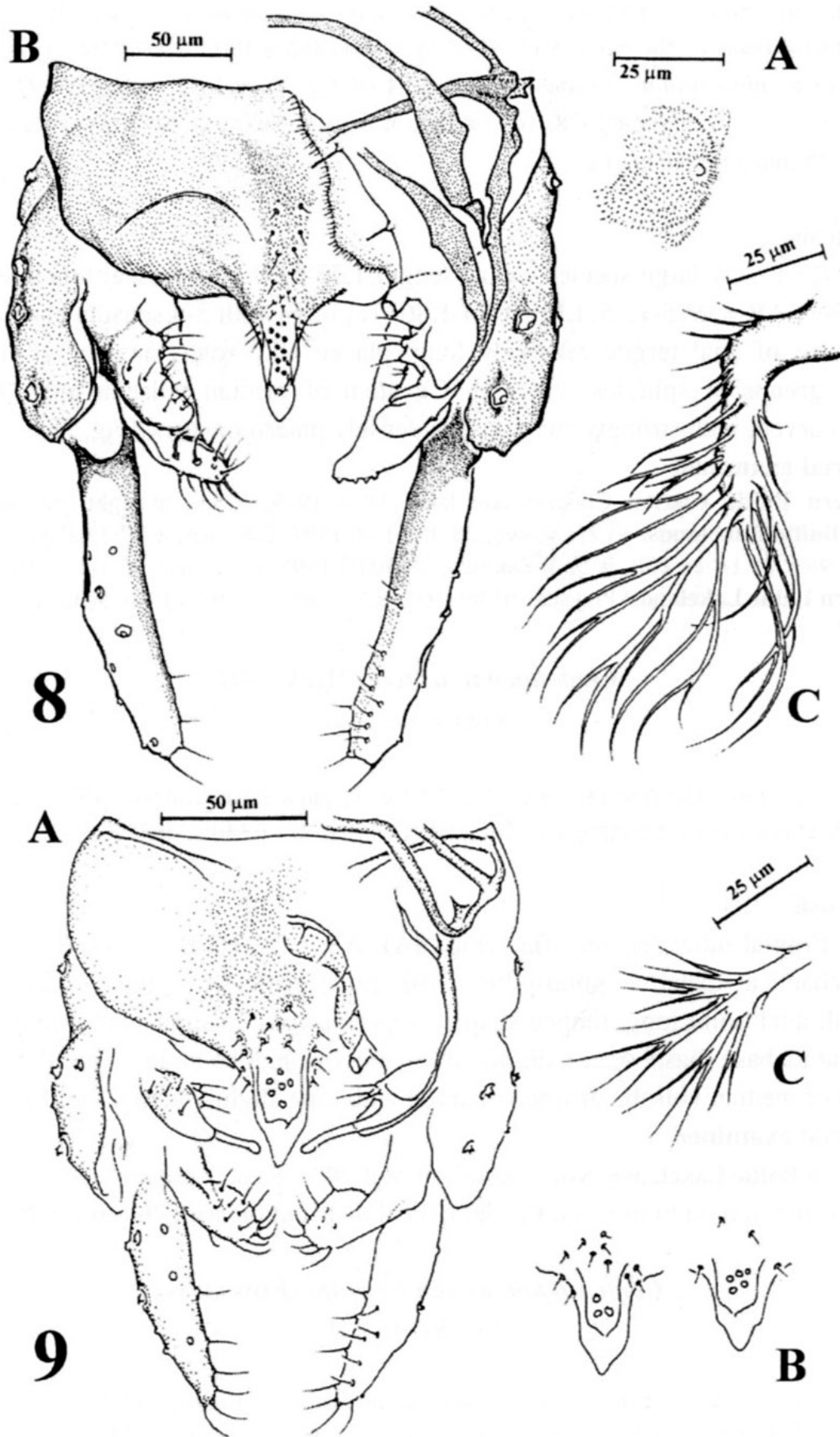
Cladotanytarsus vanderwulpi (EDWARDS)

Fig. 9A-C, 11E

Tanytarsus (*Tanytarsus*, gr. *F-Cladotanytarsus*) *van-der-wulpi* EDWARDS, 1929: 418 (♂ fig.).

Tanytarsus (*Cladotanytarsus*) *van der Wulpi*: GOETGHEBUER 1937-54: 135 (♂ fig.).

Cladotanytarsus vanderwulpi: KRÜGER 1938: 213 (larva fig., pupa fig., in keys); BRUNDIN 1947: 81 (♂ fig., in key); SHILOVA 1976: 26 (♂, in key); PINDER 1978: 142 (♂ fig. syntype, in key); ALBU 1980: 279 (♂ fig., in key); BILYJ & DAVIES 1989: 950 (in key); KOWNACKI 1982: 379 (Poland); LANGTON 1991: 334 (pupa fig., in key).



Figs. 8-9. 8 - *Cladotanytarsus teres* HIRVENOJA: A - frontal tubercle, B - hypopygium, C - median volsella. 9 - *C. vanderwulpi* (EDWARDS): A - hypopygium, B - anal point (variability), C - median volsella.

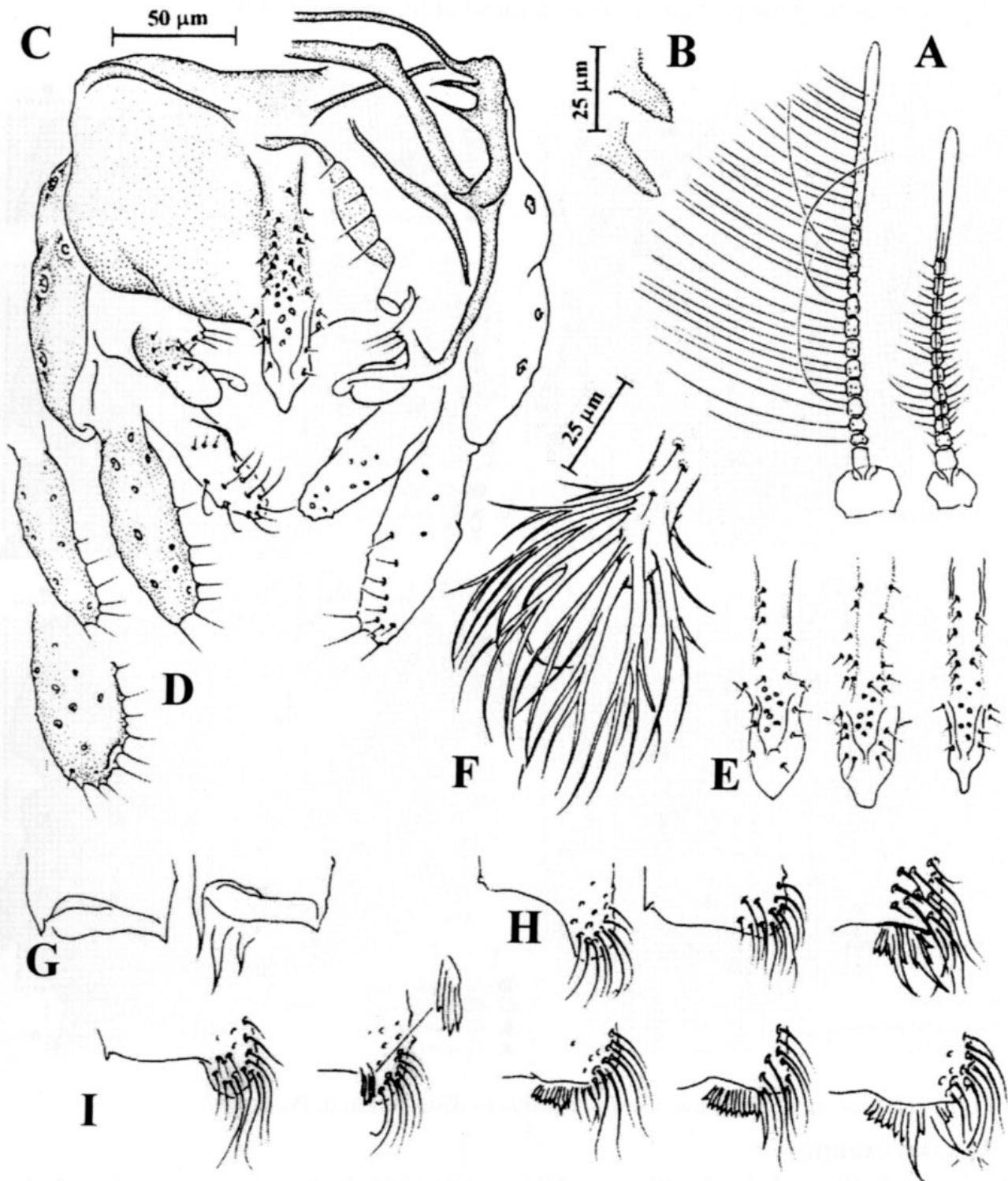


Fig. 10. *Cladotanytarsus wexionensis* BRUNDIN: A - male antenna (variability); B - frontal tubercles (variability); C - hypopygium; D - gonostylus (variability); E - anal point (variability); F - median volsella; G-I - distal part of tibia: G - fore leg, H - mid leg, I - hind leg.

Diagnosis

Male. Small species – wing length 1.50-1.70 mm; frontal tubercles absent; AR = 0.80-0.90; LR = 2.15-2.22; Ta₁ of P₂ with 3-5 sensilla chaetica distally; anal point short and

wide, slightly narrowed subapically, apex blunt (Fig. 9B); inferior volsella rounded apically (Fig. 9A); stem of median volsella short (25-30 μm), erected, with 4-5 short setae placed apically; stem as long as its setae or setae somewhat longer (Fig. 9C).

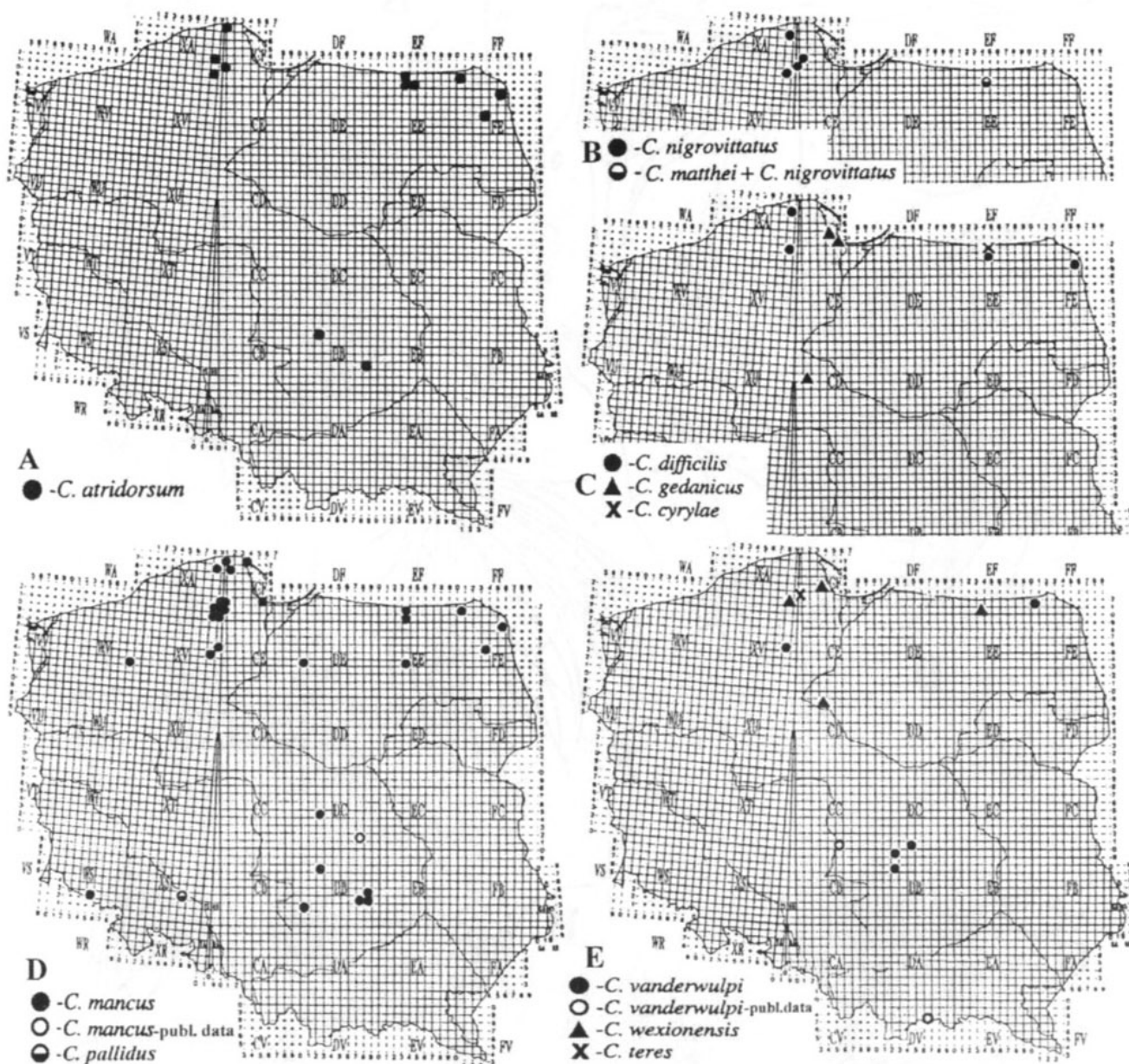


Fig. 11. Polish species of the genus *Cladotanytarsus* - distribution in Poland.

Material examined

Southern Baltic Lakelands: Wysocki Młyn, 23.06.1997, W.G., net, near ponds and stream, Apiaceae flowers, 1♂. **Eastern Baltic Lakelands:** Stańczyki, 02.09.1979, R.Sz., at light, 1♂. **Central Polish Lowlands:** Teofilów, 27.07.1991, B.S., at light, 5♂♂. **Central Małopolska Upland:** Podklasztorze, 06.05.1978, J.S., ex cult. 1♂ (coll. J.S.). Skotniki, 15.05.1979, J.S., ex cult. 1♂ (coll. J.S.) (SICIŃSKI 1990, sub *Cladotanytarsus* sp. 1).

Published data (material not examined). **Central Polish Lowlands:** Grabia and Widawka rivers nr. Zduńska Wola - CC50 (GRZYBKOWSKA 1989, GRZYBKOWSKA & WITCZAK 1990). **Outer West Carpathians:** Pieniny Mts.: Biała Woda stream - DV67 (KOWNACKI 1982, *Cladotanytarsus* „vandervulpi” EDW.).

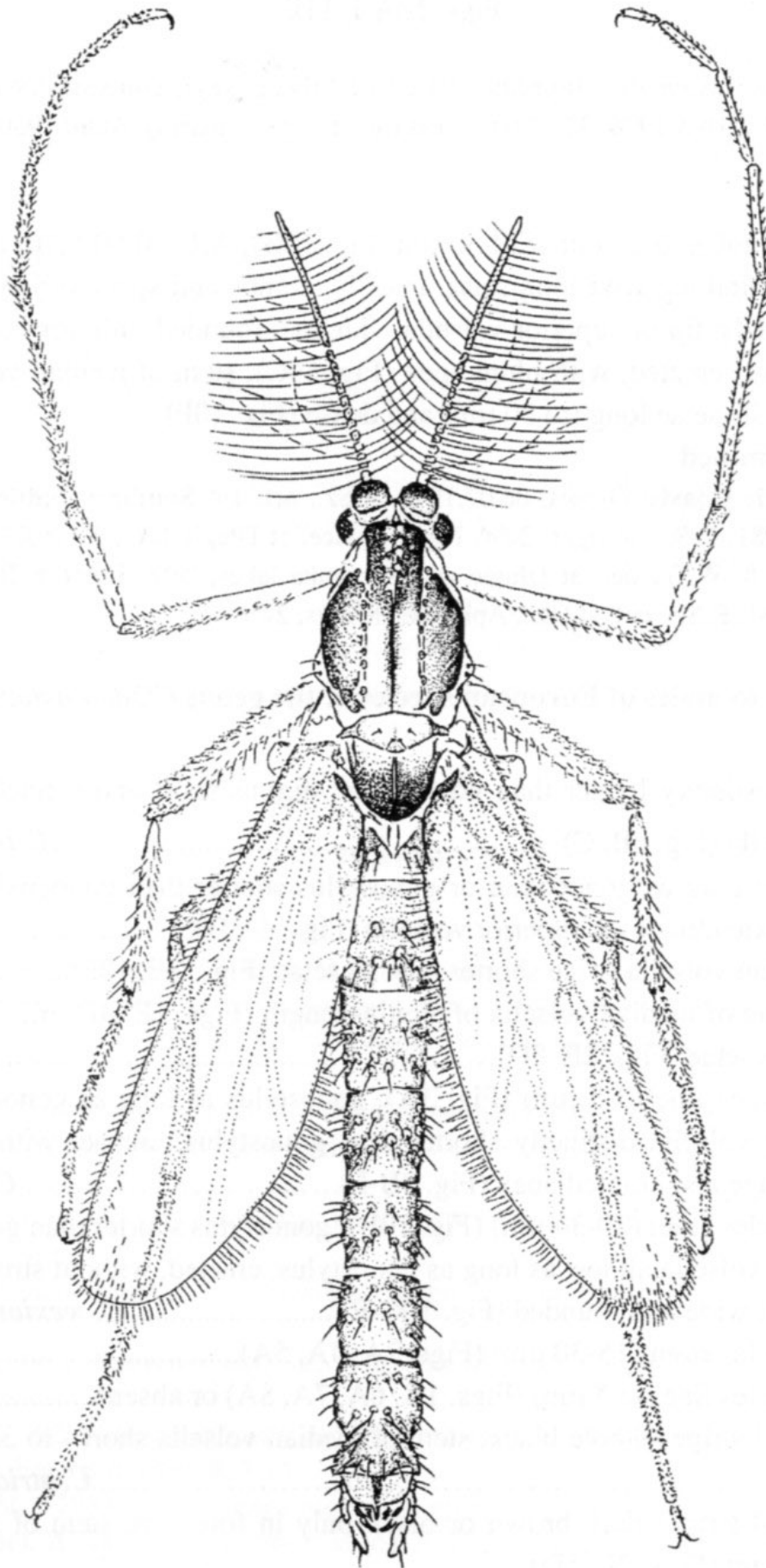


Fig. 12. *Cladotanytarsus matthei* sp. n. - general habitus.

Cladotanytarsus wexionensis BRUNDIN

Figs. 10A-I, 11E

Cladotanytarsus wexionensis BRUNDIN, 1947: 81 (♂ fig., in key); THIENEMANN 1951: 642 (♂ fig., remarks); SHILOVA 1976: 32 (♂ fig., pupa fig., in keys, remarks); ALBU 1980: 280 (♂ fig.).

Diagnosis

Male. Frontal tubercles stout – 20-30 µm (Fig. 10B); AR = 0.50-0.70; LR = 1.48-1.67; tibia of mid and hind leg with long setae apically, combs and spurs variable with shape if present (Fig. 10H-I); tip of superior volsella wide and rounded, inferior volsella almost as long as gonostylus, erected, with blunt apex (Fig. 10C); stem of median volsella stout but short (to 40 µm), its setae long (to 80 µm) and dense (Fig. 10F).

Material examined

Southern Baltic Coasts: Osowa, 06.07.1979, R.Sz., net, 1♂. **Southern Baltic Lakelands:** Las Piwnicki, 09.07.1981, R.Sz., at light, 2♂♂. Niesiołowice, at Długie lake, 13-16.07.1997, W.G., net, 2♂♂; 11-14.09.1998, W.G., net, at Długie and Skrzyńka lakes, 2♂♂. **Eastern Baltic Lakelands:** Silec, 02-03.07.1981, R.Sz., net, at lake, Apiaceae flowers, 2♂♂.

Key to males of European species of the genus *Cladotanytarsus*

1. Gonostylus distinctly longer than gonocoxite; digitus short and erected, hidden under superior volsella (Fig. 8B, C).....*C. teres* HIRVENOJA
- Gonostylus as long as gonocoxite or gonostylus shorter than gonocoxite; digitus long and curved, extending over superior volsella (Figs. 1-3D).....2
2. Stem of median volsella twice shorter than its setae (Figs. 3E, 10F).....3
- Stem and setae of median volsella of similar length (Figs. 1E, 4D, 6E, 7E, 9C) or stem longer than its setae (Figs. 2E, 5D).....4
3. Frontal tubercles fine (3-5 µm) (Fig. 3A); gonostylus as long as gonocoxite (110-130 µm); inferior volsella distinctly shorter than gonostylus, arcuate with wide, strongly pigmented ridge and pointed apex (Fig. 3B-F).....*C. matthei* sp. n.
- Frontal tubercles stout (20-30 µm) (Fig. 10B); gonostylus shorter than gonocoxite (to 90 µm); inferior volsella almost as long as gonostylus, erected, without strongly pigmented ridge, its apex wide and rounded (Fig. 10C-F).....*C. wexionensis* BRUNDIN
4. Frontal tubercles stout (15-30 µm) (Figs. 2A, 4A, 5A).....5
- Frontal tubercles fine (to 5 µm) (Figs. 1A, 6A, 7A, 8A) or absent.....7
5. Median scutal stripes whole black, stem of median volsella short - to 35 µm. (Fig. 4B-D).....*C. atridorsum* KIEFFER
- Median scutal stripes dark brown or black only in fore part, stem of median volsella long - 60-90 µm (Figs. 2E, 5D).....6
6. Stem of median volsella erected or slightly curved, with erected setae placed on almost whole length of the stem (Fig. 5B-D).....*C. difficilis* BRUNDIN

- Stem of median volsella curved, S-shaped, with strongly curved setae placed densely on apex of the stem (Fig. 2B-E).....*C. gedanicus* sp. n.
- 7. Gonostylus as long as gonocoxite.....*C. molestus* HIRVENOJA
- Gonostylus shorter than gonocoxite.....8
- 8. Small species - wing length: 1.10-1.70 mm; AR = 0.65-0.91.....9
- Large species - wing length: 1.75-2.20 mm; AR = 0.95-1.38.....11
- 9. Anal point with elongated and pointed tip (Fig. 1B-E).....*C. cyrylae* sp. n.
- Anal point with blunt apex (Fig. 9A, B).....10
- 10. Frontal tubercles present; median volsella with bunch of dense setae apically.....*C. amandus* HIRVENOJA
- Frontal tubercles absent; median volsella without bunch of dense setae apically. (Fig. 9A-C).....*C. vanderwulpi* (EDWARDS)
- 11. Median setae of anal tergite long, placed in 2 rows, anal point slender (Fig. 7B, C); stem of median volsella distinctly curved with strongly curved setae (Fig. 7B-E).....*C. nigrovittatus* (GOETGHEBUER)
- Median setae of anal tergite short, dispersed, anal point wide at base (Fig. 6B, C); stem and setae of median volsella erected or slightly curved (Fig. 6E).....*C. iucundus* HIRV., *C. mancus* (WALK.), *C. lepidocalcar* KRÜGER, *C. pallidus* KIEFF. ¹

¹ See *C. mancus* - discussion.

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