

## New data on Ceratopogonidae from lake shore habitats in NW Russia (Diptera)

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New records are given for 13 species of Ceratopogonidae belonging to the genera *Clinohelea*, *Mallochohelea*, *Palpomyia*, *Bezzia*, *Alluaudomyia*, and *Dasyhelea*. *Palpomyia spinipes* (Mg.) and *P. terrea* (Mg.) are recorded for the first time from Russia, *Mallochohelea inermis* (Kieffer) and *Alluaudomyia mynistensis* Remm, from Northern Europe, *Bezzia fascispinosa* Clastrier and *Dasyhelea spiralis* Remm, from NW Russia. Ecological information on larval habitats is provided for all the species; all these are shown to develop within the shore zone of lakes.

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The paper is based on the material collected by the author in 1995-2000 at eight small lakes in the North-Western Russia: lakes Krivoje and Krugloe (66°21'N 33°35'E; Loukhi Distr. of Karelia), Chashechka, Pionerskoe and Pridorozhnoe (60°18'N 29°17'E; Vyborg Distr. of Leningrad Prov.), Gladyshevskoe (60°17'N 29°23'E; same district), Anninskoe and Anisimovo (56°12'N 28°40'E; Sebezh Distr. of Pskov Prov.). Below, in the "Material" section for each species, only the names of lakes are given.

At each lake, I studied the littoral zone (depth range: 0.05-1.5 m) and the zone of water margin (= water line zone; within the borders: from 5 cm below the water level to 10 cm above it). Within the latter, three morphological types are recognized (see Przhiboro, 2001b, 2003, 2004).

The two northern lakes are oligotrophic, characterized by the littoral vegetation poorly developed and the zone of water margin almost entirely represented by type 1. The two lakes of the southern group are eutrophic, rich in littoral vegetation; types 2 and 3 of the water margin zone predominate. The lakes in Leningrad Prov. take an intermediate position (in particular, types 1 and 2 are common within the water margin zone). For details of the study lakes and habitats, see Przhiboro (1999, 2000, 2001a, 2001b, 2004).

Most of ceratopogonid imagines were reared from separate larvae and pupae extracted from samples that were taken in littoral and water margin zones, as well as from substrata collected in the zone of water margin and kept in laboratory conditions. In addition, some adults were collected from Lake Anninskoe using emergence

traps; a construction similar to those proposed by Sublette & Dendy (1959) and Lammers (1977) (both cited by Davies, 1984) was used. All ceratopogonid specimens are deposited at the Zoological Institute, St.Petersburg. For comparison, I examined the material of several species determined by Remm and kept in the collections of Zoological Institute, St.Petersburg, and Museum of Zoology, University of Tartu: *Mallochohelea munda* (2 ♀, St.Petersburg), *M. silvicola* (2 ♀, 1 ♂, Tartu), *Palpomyia fulva* (2 ♀, St.Petersburg and Tartu) and *P. terrea* (3 ♀, Tartu).

The following abbreviations are used in the text:

(1) new records: K, for Karelia; LP, for Leningrad Prov.; PP, for Pskov Prov.; \*, far outside the previously known range.

(2) larval habitats in lakes of the respective regions: LZ, lake littoral zone; MZ, zone of water margin, with number corresponding to the type of this zone (see Przhiboro, 2001b, 2003, 2004).

### Subfamily PALPOMYIINAE

#### **Clinohelea unimaculata** (Macquart, 1826) (PP: MZ3)

*Material.* Lake Anninskoe, water margin zone: 1 ♂ reared 12.VI.1998 from substratum collected 4.VI.1998; 1 ♀ reared 11.VI.1998 from larva collected 1.VI.1998.

#### **Mallochohelea inermis** (Kieffer, 1909) (K\*: LZ)

*Material.* Lake Krugloe, water margin zone: 1 ♂ reared 26.VI.1997 from pupa collected 18.VI.1997.

*Note.* This common Transpalaeartic species is for the first time recorded from Northern Europe. The nearest reliable records are from Leningrad Prov. and Estonia (Remm, 1979, 1988).

**Mallochohelea munda** (Loew, 1864)  
(LP: ?LZ)

*Material.* Lake Gladyshevskoe, water margin zone: 1 ♀ reared 10.VI.1995 from pupa collected 8.VI.1995.

**Mallochohelea nitida** (Macquart, 1826)  
(PP: LZ)

*Material.* Lake Anninskoe, upper littoral zone (in point with depth ca. 0.2 m): 1 ♂ reared 9.VI.1998 from pupa collected 30.V.1998.

**Mallochohelea silvicola** (Goetghebuer, 1920)  
(PP\*: LZ)

*Material.* Lake Anninskoe, upper littoral zone (in points with depths 0.3-0.5 m): 1 ♂ reared 25.V.1998 from pupa collected 17.V.1998; 1 ♂, emergence trap, 25.V.1998.

*Note.* The species was known from Belgium, Murmansk Prov. and Yakutia (Remm, 1973, 1988). I examined also a male specimen from the Taimyr Peninsula ("27.7.73. Taim. Nizhn. Agapa. Zherikhin" [in Russian]) kept in the Museum of Zoology, University of Tartu, and determined by Remm as *M. silvicola*.

**Palpomyia spinipes** (Meigen in Panzer, 1806)  
(PP\*: MZ3)

= *Palpomyia fulva* (Macquart, 1826)

*Material.* Lake Anisimovo, water margin zone: 1 ♀ reared 11.VI.1998 from larva collected 12.V.1998.

*Note.* New record for Russia. This species was known from Western and Central Europe, Georgia and Japan (Remm, 1976, 1988; Krzywiński, 1996).

**Palpomyia pubescens** Kieffer, 1919  
(K: LZ)

= *Palpomyia spinipes*: Remm, 1976, 1988.

*Material.* Lake Krugloe, water margin zone: 1 ♂ reared 11.VII.1997 from pupa collected 2.VII.1997; 2 ♂ and 1 ♀ pupae not reared (pharate adults with formed terminalia, inside pupal skin), collected 2 and 11.VII.1997; 4 larvae, 2 and 22.VII.1997; littoral zone: 10 larvae, depth ca. 1 m, 2.VII.1997.

**Palpomyia terreia** (Meigen, 1818)  
(PP\*: MZ3)

*Material.* Lake Anninskoe, water margin zone: 1 ♀, emergence trap, 19.V.1998; 1 ♀ reared 17.V.1998 from pupa collected 10.V.1998.

*Note.* New record for Russia. The species was known from Estonia, Lithuania, the Ukraine and Germany (Remm, 1976, 1988).

**Bezzia fascispinosa** Clastrier, 1962  
(LP\*: LZ)

*Material.* Lakes Pionerskoe and Pridorozhnoe, littoral and water margin zones: 14 ♂ and 8 ♀ reared since late July till mid-September 1998-1999 from separate larvae and pupae, and from shore substrata.

*Notes.* This is the first record from NW Russia and the northernmost record of this Holarctic species, which was known from Western Europe, Lithuania, Ivanovo Prov., Altai, Primorsk Terr. and North America (Remm, 1974, 1988; Isaev, 1991). Larvae were common in the shore zone of the above lakes. See Przhiboro (2004) for the details of larval habitats and bionomics.

#### Subfamily CERATOPOGONINAE

**Alluaudomyia mynistensis** Remm, 1979  
(K\*: LZ, MZ1)

*Material.* Lake Krivoe, water margin zone: 3 ♂ and 2 ♀ reared 19 and 20.VII.1997 from pupae collected 15.VII.1997; 1 ♂ pupa not reared (pharate adult with formed terminalia, inside pupal skin), collected 8.VII.1997; 16 pupae, collected in July 1997 and 2000. Lakes Krivoe and Krugloe, littoral and water margin zones: over 100 larvae of instars 3-4, collected since June till October, in 1996, 1997 and 2000.

*Notes.* New record for Russia and for Northern Europe. The species was described from Estonia and later recorded from Spain and France (Remm, 1979, 1988). For details of the larval habitats, see Przhiboro (1999, 2001b). It is remarkable that the species is rather abundant in the water margin zone; in 1997, its biomass (larvae and pupae) ranged from 0.015 to 0.150 g/m<sup>2</sup>, density, from 100 to 2200 ind./m<sup>2</sup>. In Northern Karelia, *A. mynistensis* is univoltine, with emergence period in July.

**Alluaudomyia splendida** (Winnertz, 1852)  
(LP: LZ, MZ1, MZ2)

*Material.* Lakes Pionerskoe and Pridorozhnoe, water margin zone: 3 ♂ and 5 ♀ reared since mid-June till early July 1998 from separate larvae and pupae, and from shore substrata; littoral and water margin zones: several hundred larvae, collected since May till October 1998-1999 (in littoral zone, larvae occurred mostly at depths less than 30 cm).

#### Subfamily DASYHELEINAE

**Dasyhelea lugensis** Brodskaya, 1995  
(MZ1)

*Material.* Lake Chashechka, water margin zone: 1 ♀ reared 5.VIII.1998 from pupa collected 15.VII.1998.

*Notes.* This recently described species was known only from the south of Leningrad Prov. (Luga Distr., type locality; Brodskaya, 1995) and from Pskov Prov. (Brodskaya, 2001). Its larval habitat in the lake is the shore turf with *Sphagnum* and *Carex* predominating.

**Dasyhelea spiralis** Remm, 1966  
(K\*: MZ1)

*Material.* Lake Krivoe, water margin zone: 1 ♂ and 1 ♀ reared 8 and 11.VII.1997, respectively, from pupae collected 29.VI.1997; 1 ♀ reared 15.VII.1997 from larva collected 29.VI.1997; 1 ♂ pupa not reared (pharate adult with formed terminalia, inside pupal skin), collected 29.VI.1997; 3 pupae and 27 larvae, 29.VI.1997.

*Notes.* New record for NW Russia and the northernmost record of the species. The nearest records are from Estonia and southern Norway (Remm, 1979, 1988; Thunes et al., 2004). In Lake Krivoe, the larvae of *D. spiralis* inhabit only cushions of mosses and liverworts on rocks in the zone of water margin; the species was not found in other habitats.

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**References**

**Brodskaya, N.K.** 1995. A new species of biting midge of the genus *Dasyhelea* Kieff. (Diptera, Ceratopogonidae) from Leningrad Region. *Int. J. dipterol. Res.*, **6**(1): 9-12.

**Brodskaya, N.K.** 2001. Biting midges (Diptera: Ceratopogonidae). In: Fetisov, S.A. & Konechnaya, G.Yu. (Eds.). *Bioraznoobrazie i redkie vidy Natsional'nogo Parka "Sebezhskiy"* [Biodiversity and rare species of the National Park "Sebezhskiy"]. *Trudy St.-Peterburgsk. Obschest. Estestvoispyt.*, ser. 6, vol. 4: 184-187. (In Russian).

**Davies, I.J.** 1984. Sampling aquatic insect emergence. In: Downing, J.A. & Riegler, F.A. (Eds.). *A manual on methods for the assessment of secondary productivity in fresh waters*. IBP Handbooks, **17**: 160-227. Oxford etc.: Blackwell Sci. Publ.

**Isaev, V.A.** 1991. Life cycles and synanthropization of biting midges in Ivanovo Province. In: *Morfologiya i ekologiya dvukrylykh nasekomykh* [Morphology and ecology of dipterans]: 17-28. Ivanovo. (In Russian).

**Krzywiński, J.** 1996. Notes on some Scandinavian Palpomyiini (Diptera, Ceratopogonidae). *Entomol. Tidsskr.*, **117**(3): 113-119.

**Lammers, R.** 1977. Sampling insects with a wetland emergence trap: design and evaluation of the trap with preliminary results. *Amer. Midland Natur.*, **97**: 381-389.

**Przhiboro, A.A.** 1999. The quantitative characteristics of Diptera (Insecta) of the shallow littoral zone of small lakes in North Karelia. *Zoological sessions. Annual reports 1998. Trudy Zool. Inst. Ross. Akad. Nauk*, **281**: 129-134.

**Przhiboro, A.A.** 2000. Synusia of the turf inhabitants of monocotyledones: a poorly known component of the lake macrobenthos. *Zoological sessions. Annual reports 1999. Trudy Zool. Inst. Ross. Akad. Nauk*, **286**: 113-120.

**Przhiboro, A.A.** 2001a. A new species of the snail-killing fly genus *Sciomyza* (Diptera: Sciomyzidae), and a list of Sciomyzidae collected at Anninskoe and Anisimovo Lakes, Pskov Province. *Zoosyst. Ross.*, **10**(1): 183-188.

**Przhiboro, A.A.** 2001b. *Ekologiya i rol' bentosnykh dvukrylykh (Insecta: Diptera) v pribrezhnykh soobshchestvakh malykh ozer Severo-Zapada Rossii* [Ecology and role of benthic dipterans (Insecta: Diptera) in shallow water communities of small lakes in the North-West of Russia]. Cand. Sci. (Biol.) Diss. Abstract. St.Petersburg: Zool. Inst. Russ. Acad. Sci. 25 p. (In Russian).

**Przhiboro, A.A.** 2003. New records of crane-flies from NW Russia, with ecological notes on some species (Diptera: Tipulidae, Limoniidae). *Zoosyst. Ross.*, **11**(2), 2002: 361-366.

**Przhiboro, A.A.** 2004. Dipterans (Insecta: Diptera) inhabiting the shallow water zone of lakes Pionerskoe and Pridorozhnoe and quantitative assessment of their abundance. In: Alimov, A.F. & Ivanova, M.B. (Eds.). *Zakonomernosti gidrobiologicheskogo rezhima vo doemov raznogo tipa* [Regularities of hydrobiological regime in water basins of different type]: 102-121 + 3 pl. Moscow: Nauchnyi Mir. (In Russian).

**Remm, H.J.** 1973. *Mokretsy (Diptera, Ceratopogonidae) fauny SSSR* [Biting midges (Diptera, Ceratopogonidae) of the USSR]. Doct. Sci. (Biol.) Diss. Tartu: Tartu State Univ. 456 p. (In Russian).

**Remm, H.J.** 1974. A review of species of the genus *Bezzia* Kieffer (Diptera, Ceratopogonidae) of the fauna of the USSR. I. *Entomol. Obozr.*, **53**(2): 429-442. (In Russian).

**Remm, H.** 1976. A synopsis of the *Palpomyia* of the USSR (Diptera, Ceratopogonidae). *Eesti NSV Teaduste Akadeemia Juures Asuva Eesti Looduseuurijate Seltsi Aastaraamat*, **64**: 172-197.

**Remm, H.** 1979. A catalogue of the Ceratopogonidae (Diptera) of the Estonian S.S.R. In: Elberg, K. (Ed.). *Dipteroloogilisi Uurimusi* [Dipterological Studies]: 40-60. Tartu: Eesti Looduseuurijate Selts.

**Remm, H.** 1988. Ceratopogonidae. In: Soós, Á. & Papp, L. (Eds.). *Catalogue of Palaearctic Diptera*, **3**: 11-110. Budapest: Akadémiai Kiadó.

**Sublette, J.E. & Dendy, J.S.** 1959. Plastic material for simplified tent and funnel traps. *SW Natur.*, **3**: 220-223.

**Thunes, K.H., Skartveit, J., Gjerde, I. et al.** 2004. The arthropod community of Scots pine (*Pinus sylvestris* L.) canopies in Norway. *Entomol. Fenn.*, **15**: 65-90.

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