

FIRST RECORDS OF THAUMALEIDAE (DIPTERA) IN LITHUANIA

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Introduction

Thaumaleidae, the solitary midges or trickle midges, are a group of Nematoceros flies related to the biting midges (Ceratopogonidae), non-biting midges (Chironomidae) and blackflies (Simuliidae). Larvae can be found in water films on rocks and the non-feeding adults are usually found on foliage along the same streams (Wagner, 1997; Calolichin, 2001).

Three genera (*Androprosopa*, *Protothaumalea*, *Thaumalea*) and 76 species of Thaumaleidae have different distribution in European countries (Wagner, 2012). Most of the species of Thaumaleidae occur in Central Europe, especially in the Alps (Wagner, 1997). Trickle midges have not been recorded from Lithuania earlier. The family is represented by 8 species in Poland (2 *Androprosopa* species and 6 *Thaumalea* species) (Wagner, 2012) and by 5 *Thaumalea* species in North Europe (Wagner, 1997), but the family is not known from Belarus, Latvia and Estonia.

Material and methods

The research of Thaumaleidae was carried out as the part of aquatic benthic macroinvertebrate survey in springs of Southern and Eastern Lithuania in 2012. Samples of macroinvertebrates were collected by multihabitat kick-sampling method using a standard dip net (25×25 cm opening net bag with a mesh size of 0.5 mm) and supplemented by 5 minutes of hand-picking from submerged stones, wooden debris, foliage (Arbačiauskas, 2009). Hydrochemical parameters (Table 1) were measured at the same time by using multiparameter water quality sonde 6600 V2-4.

Results

Two larvae of *Thaumalea* sp. were found in two (Table 1) out of 9 springs investigated. Water in the springs can be characterised as good or high ecological status (Table 1). Both springs are located in Vilnius town. Larvae and pupae of Thaumaleidae have not yet been intensively studied in Europe, so larvae can be identified only to the generic level.

Table 1. Studied springs with their coordinates (N, E), date, water temperature (T, C°), conductivity (C, $\mu\text{S cm}^{-1}$), oxygen saturation (OS, %), dissolved oxygen (DO mg/l), pH, oxidation / reduction potential (ORP, mV), total dissolved solids (TDS, g/l).

Spring name, District	N	E	Date	T	C	OS	DO	pH	ORP	TDS
Spalvoti, Vilnius	54°43'24"	25°18'54"	10 07 2012	9.1	1.10	72.5	8.3	7.3	83.6	0.71
Pūčkoriai 2, Vilnius	54°41'05"	25°22'07"	12 07 2012	12.3	0.55	93.6	10.0	8.0	88.0	0.36

Both springs are shallow (about 2–12 cm in different parts), surrounded by trees, with fine gravel and distinct stones as a dominant bottom structure. Sticking out of the water stones, fallen branches of trees and other deposits in the springs have complicated accurate measurement of current velocity. Current velocity varied between 0.1 and 0.4 m/s in different spring bends.

Larvae have a very similar morphology to larvae of the family Chironomidae (Calolichin, 2001) and to some representatives of the family Ceratopogonidae (Oscoz *et al.*, 2011). The upper part of the body has a green-gray design, the lower part of the body is white (Calolichin, 2001) (Fig. 1). Head capsule is well-developed, mouth parts hypognathous. Prothorax with a pair of short respiratory tubes and with an unpaired proleg armed with series of curved hooks (Wagner, 1997) (Fig. 2). Unlike in Chironomidae, both the thoracic and abdominal prolegs are not pair structures (Oscoz *et al.*, 2011). A pair of anal gills are present on the last abdominal segment. (Fig. 3).



Figure 1. *Thaumalea* sp. larva, lateral view



Figure 2. *Thaumalea* sp. head, lateral view



Figure 3. *Thaumalea* sp. terminal segment, lateral view

Discussion

Larvae of trickle midges live on the thin water layers in hygropetric zones of springs or banks of streams and small rivers. Larvae also may be found on stones, foliage, dripping rocks that are kept wet by spraying stream water (Wagner, 1997). Larvae are scrapers grazing on diatoms and biofilm. Pupation often occurs in deeper layers of organic material near the larval habitats (Wagner, 1997). Larvae prefer low

temperatures, are most frequent in fully shaded localities and live only in unpolluted water bodies. This information is confirmed by water quality data collected in investigated springs (Table 1) as well as from water quality assessment system in Poland - in polish BMWP (Biological Monitoring Working Party) index Thaumaleidae have the highest 10 point score (Kownacki & Soszka, 2004).

These specimens are the first for Lithuanian Thaumaleidae fauna, so imagoes and additional species or more distribution localities are expected.

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Pirmi duomenys apie Thaumaleidae (Diptera) šeimos dvisparnius Lietuvoje

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Santrauka

Tiriant šaltinių bentoso makrobetuburinius, pirmą kartą Lietuvoje (Vilniuje), buvo rastos 2 Thaumaleidae šeimos (*Thaumalea* sp.) dvisparnių lervos. Straipsnyje aprašomos lervų radvietės bei trumpa jų morfologija.

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