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Contribution to the freshwater gastrotrich fauna of wetland areas of southwestern Ontario (Canada) with redescriptions of seven species and a check-list for North America

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Abstract

This study gives additional, detailed information on the freshwater gastrotrich species described and reported from the southwestern regions of Ontario and New Brunswick, Canada by Schwank (1990). *Aspidiophorus ontarioniensis*, *Chaetonotus (Chaetonotus) furculatus*, *Chaetonotus (Chaetonotus) ontariensis*, *Chaetonotus (Primochaetus) annae*, *Ichthyidium malleum*, *Lepidodermella forficulata* and *Setopus lemnicola* are all redescribed. In addition, a complete list of freshwater species currently known from North America is given.

Key words: Gastrotricha, Nearctic, Natural wetlands, Check-list, Paucitubulatina

Introduction

Gastrotricha is a phylum of small aquatic invertebrate animals. They are a common component of the meiofauna but are usually overlooked in freshwater because of their very small size and soft bodies. In limnic habitats they are predominantly dwellers of shallow, mostly small, stagnant water bodies which are densely overgrown with water-plants or mosses. Certain species prefer epibenthic muddy habitats (Kisielewski 1991).

Compared to Europe, the freshwater gastrotrich fauna of North America is poorly known. Most records are from the USA, but Schwank (1990) reported numerous species from Canada. There are no identified freshwater species from Mexico but Kånneby *et al.* (2012; 2013) reported several species from St. John, U.S. Virgin Islands. One of the first records of freshwater species in North America was Fernald's (1883) report of *Chaetonotus larus* (Müller, 1773) from Maine, USA. Stokes (1887a, b) provided the first report of several species from New Jersey, and described several species new to science from that state. During the 1900s, freshwater species were reported or described as new to science from Illinois (Goldberg 1949; Sacks 1964; Robbins 1965; 1973; Horlick 1975; Anderson & Robbins 1980), Indiana (Pfaltzgraff 1967), Kansas (Bovee & Cordell 1970), Louisiana (Krivanek & Krivanek 1958; 1959), Michigan (Brunson 1948; 1949a; b; 1950), New Hampshire (Packard 1936), New Jersey (Stokes 1887a; b; Davison 1938; Weiss 2001), North Dakota (Bryce 1924; Young 1924), Ohio (Shelford & Boesel 1942; Emberton 1981; Evans 1982; 1993), Virginia (Packard 1956–58; 1957; 1959; 1962; 1970) and Washington (Hatch 1939).

In this paper we give further information on the freshwater gastrotrichs collected in southwestern Ontario and New Brunswick, Canada during August 1984. Most of the taxa are mentioned or included in the identification keys in Schwank (1990), but no detailed descriptions are provided. Seven species for which information is given in the taxonomic identification keys in Schwank (1990) have been considered *nomina nuda* by Balsamo *et al.* (2009). In order for a species name published after 1930 but before 1999 to be considered a *nomen nudum* it should fail to conform to Article 13 of the ICZN (1999). However in a strict sense, the names are made available according to Article 13.1 of the ICZN (1999), since the characters given in the key fulfill the function of a description purported to differentiate the taxon in the sense of article 13.1.1.

much higher. Only a few localities could be visited during the same season. It is known that different species of Gastrotricha do not appear together during the same season (Kisielewski, 1981; Schwank, 1990). An estimate of the species number in the vicinity of Waterloo and Guelph is not easy to make, but as many as 150-200 species could be expected.

Table 1 provides a comparison between German average biotopes and the investigated area in Ontario. The Canadian biotopes differ distinctly from the European biotopes. The results could be explained by the fact that the existing Canadian wetlands are larger and cover wide regions. The remaining European wetlands may be considered as relict areas. Running waters do not offer suitable habitats for most gastrotrich species compared to stagnant waters. The richest habitats that offer the highest diversity of freshwater gastrotrichs are weakly acidic *Lemna* pools, small lakes and bogs. Only a small number (5-10 species) could be found in comparable samples of streams and muddy pools in Ontario.

More than 200 nominal species have now been described from Europe. This number is probably just a fraction of the true number of species. Recent investigations from Sweden and Denmark (see Kånneby *et al.* 2009; 2012; Kånneby, 2011; 2013; Grilli *et al.* 2010) have shown that gastrotrich diversity at higher latitudes is richer than previously thought.

TABLE 1. Recorded and estimated number of gastrotrich species from different locations in Germany and Canada.

Habitat	# Recorded species	# Estimated species
The rivers of Schlitz and Fulda in Eastern Hesse, Germany (potamon)*	17	20–25
Breitenbach, Eastern Hesse, Germany (including springs)*	23	25–27
Various streams in the high regions of the Black Forest, Germany (including springs)*	15	20–25
Fens in the Black Forest, Germany (peat mosses, marshy pools)	15	35–40
Fliede river, Eastern Hesse, Germany (old river bed destroyed by architectural actions)	7	10–15
Swamps in the Fulda valley near Schlitz, Germany	19	~30
Ponds and high water pools, Schlitz valley, Germany	22	~30
Großenmoor, Eastern Hesse, Germany (peat mosses and <i>Lemna</i> pools)	45	60–70
Kitchener, Ontario, Canada: Natural wetlands with lakes and <i>Lemna</i> pools	64	~150

*indicates running waters. Numbers based on Schwank (1990).

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APPENDIX 1

List of recorded nominal fresh water species from North America. Below each species a rough distribution with references is given.

Suborder Paucitubulatina d'Hondt, 1971 (76 spp.)

Family Chaetonotidae Gosse, 1864 (65 spp.)

Subfamily Chaetonotinae Gosse, 1864 (65 spp.)

Genus *Aspidiophorus* Voigt, 1903 (3 spp.)

1. *Aspidiophorus ontarioniensis* Schwank, 1990
Canada: Ontario (Schwank 1990; this study)
2. *Aspidiophorus paradoxus* Voigt, 1903
Canada: Ontario (Schwank 1990). USA: New Jersey (Davison 1938)
3. *Aspidiophorus schlitzensis* Schwank, 1990
Canada: New Brunswick, Ontario (Schwank 1990)