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## New species and records of freshwater *Chaetonotus* (Gastrotricha: Chaetonotidae) from Sweden

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## Abstract

*Chaetonotus* is the most speciose genus of the family Chaetonotidae within Gastrotricha, a small phylum of aquatic acoelomate invertebrates. The freshwater gastrotrich fauna of Sweden has been studied during the last five years and so far 44 species have been reported in the literature from the country. This study describes the new species, *Chaetonotus (Primochaetus) veronicae* n. sp., and reports 9 species new to the Swedish fauna raising the known number of freshwater species from the country to 54. Some records stand out from a biogeographic point of view: *Chaetonotus (Primochaetus) soberanus* is reported for the first time from Europe and *Chaetonotus (Chaetonotus) arethusae*, *Chaetonotus (Chaetonotus) naiadis* and *Chaetonotus (Hystricochaetonotus) euhystrix* are reported for the first time outside the countries from which they were originally described.

**Key words:** Chaetonotida, Freshwater fauna, taxonomy, biodiversity, Meiofauna

## Introduction

Gastrotricha are small aquatic acoelomate metazoan animals, with close to 800 species (see Balsamo *et al.* 2009; Hummon & Todaro, 2010). In freshwater they are epiphytic or epibenthic and to some extent also interstitial and semi-planktonic. The largest genus is *Chaetonotus* Ehrenberg, 1830 which includes more than 200 nominal species, is very common, and is taxonomically defined as having scales with spines (Schwank 1990; Balsamo *et al.* 2009). According to Kisielewski (1997), the genus is divided into 8 subgenera based on the evolution of cuticular scales and spines (but see also Schwank 1990; Weiss 2001; Balsamo *et al.* 2009): *Chaetonotus (Captochaetus)* Kisielewski, 1997; *C. (Chaetonotus)* Ehrenberg, 1830, *C. (Hystricochaetonotus)* Schwank, 1990; *C. (Marinochaetus)* Kisielewski, 1997; *C. (Primochaetus)* Kisielewski, 1997; *C. (Schizochaetonotus)* Schwank, 1990; *C. (Wolterecka)* Mola, 1932; and *C. (Zonochaeta)* Remane, 1927. According to current classification *C. (Marinochaetus)* is the only subgenus consisting solely of marine species. On the other hand *C. (Captochaetus)*, *C. (Primochaetus)*, *C. (Wolterecka)* and *C. (Zonochaeta)* are represented in freshwater environments only, while *C. (Chaetonotus)*, *C. (Hystricochaetonotus)* and *C. (Schizochaetonotus)* have representatives in both environments.

*Chaetonotus* has long been known to be a polyphyletic group based on morphological data and most recent based on molecular data (Kånneby *et al.* 2013). Moreover, also the subgenera *C. (Chaetonotus)*, *C. (Hystricochaetonotus)*, *C. (Primochaetus)* and *C. (Schizochaetonotus)* are non-monophyletic groups based on molecular data (Kånneby *et al.* 2013). A revision of *Chaetonotus* and its subgenera is highly desirable but a daunting and very time consuming task. Many species suffers from incomplete descriptions and poor delimitation from closely related morphological species, which make a proper identification very hard and sometimes impossible. Additionally, many species have been found on few occasions and/or are restricted to certain geographical areas, which further complicate sampling, re-description and genetic studies.

The freshwater gastrotrich fauna of Sweden has been studied during the past five years. To date 44 freshwater species have been reported including five new species that have been described from the country: *Heterolepidoderma acidophilum* Kånneby *et al.*, 2012; *H. joermungandri* Kånneby, 2011; *H. trapezoidum* Kånneby, 2011; *Ichthyidium skandicum* Kånneby *et al.*, 2009; and *Lepidodermella intermedia* Kånneby *et al.*, 2012. The genus *Chaetonotus* has not been dealt with in any greater detail except for a couple of records presented as associated fauna or used in molecular studies (see Kånneby *et al.* 2009; 2013). To date 21 freshwater species belonging to *Chaetonotus* have been reported from Sweden (see Table 1).

The purpose of this paper is to present a species new to science and new records of *Chaetonotus* from Sweden. Moreover, detailed taxonomic accounts are given for most species of *Chaetonotus* previously only nominally reported from Sweden.

## Material and methods

Collection was concentrated in the spring, summer and early fall, took place from August 2007 to July 2010 and included most of the Swedish mainland (Fig. 1). Sampling was conducted with a plankton net with a mesh size of 25 µm or simply by scooping up or squeezing aquatic vegetation, moss and benthic material into a container. Samples were kept in aerated aquaria or in a refrigerator to prevent decomposition. Subsamples were taken from