



First record of rare dasydytid gastrotrich *Setopus tongiorgii* (Balsamo, 1982) from central Europe with some biological data

ALEXANDER KIENEKE & OLE RIEMANN

Institut für Biologie und Umweltwissenschaften (IBU), Carl von Ossietzky Universität Oldenburg, 26111 Oldenburg, Germany
E-mail: akieneke@senckenberg.de; ole.riemann@uni-oldenburg.de

Members of the freshwater family Dasydytidae belong to the rarest gastrotrichs although some species like *Stylochaeta scirtetica* may develop high population densities (Schwank 1990). The taxon Dasydytidae is characterised by several apomorphic features correlated to a semi-planktonic lifestyle. Species of Dasydytidae have, for example, completely lost their caudal adhesive tubes, they possess a system of ciliary bands in the head region with which they swim like ciliated larvae of annelids, and most species have motile spines to perform saltatory movements in the water column. So far, our knowledge on the biology, life cycle and their distribution is very limited. This is probably due to the rareness and difficult preparation and handling of Dasydytidae.

In an attempt to obtain freshwater meiofauna organisms for morphological studies, we have repeatedly found specimens of *Setopus tongiorgii* (Balsamo, 1982) in our samples (Fig. 1A). The samples were taken by rinsing submerged macrophytes and filtering the supernatant water through a plankton gauze (40 µm) or by using a small plankton net mounted on a stick. Several specimens were studied in vivo, some narcotised with a 0.25% aqueous solution of bupivacain chloride (Buccain®), some immobilised by slight squeezing between microscopic slide and coverslip. The microscopic observations and documentation of specimens were done with a Leica DMLB compound microscope equipped with differential interference contrast and an Olympus Color View I digital camera.

Within the genus *Setopus* Grünspan, 1908 (see Kisielewski (1991) for the emended diagnosis) eight species have been described as yet. *Setopus chaticus* (Schwank, 1990) is probably the sister species of *Setopus tongiorgii* (Balsamo, 1982). Characteristic features of *S. tongiorgii* which separate it from *S. chaticus* are the small ovoid keeled scales in the interciliary field, two prominent ventral terminal plates and the possession of short spines on the head (Fig. 1B, D–E). Additionally, *S. tongiorgii* has six paired groups of motile spines and a pair of conspicuous asymmetrical terminal spines of unequal length (Fig. 1A). Most of the head, trunk and the terminal spines have secondary spikes around the distal third (see Fig. 1A–C). Maximum body length (measurement without terminal spines) varied between 105 and 140 µm (Tab. 1). We could detect specimens with mature oocytes in almost all samples we have observed (Fig. 1A, C, Tab. 1). Furthermore, some specimens contained a well developed x-organ that probably occurs in the late summer only (Fig. 1F, Tab. 1). In some specimens, we could observe reinforcements in the caudal part of the pharynx (Fig. 1A).

The animals were found in two ditches in north-west Germany, one situated in moist grasslands in East Frisia near the city of Leer (N 53° 14' 11'' E 7° 31' 15''), the other within the municipal area of Oldenburg/Lower Saxony (N 53° 9' 46'' E 8° 10' 43''). Animals could be detected in different seasons, always in comparable low abundances (Tab. 1). Variability of abundance in different seasons was not recognised but may occur. The filtrate of 10 l rinsed plant material contained only between one and two dozen specimens. The ditches where we have found *S. tongiorgii* are eutrophic, stagnant waters with a muddy, detritus-rich and H₂S containing bottom. The ditch in Oldenburg is partially shaded by riverine vegetation (willows and alders) and is completely filled with submerged macrophytes (*Ceratophyllum demersum*) and in places covered with *Lemna minor*. The ditch near Leer lies in an open landscape and does not have that many submerged macrophytes but a partial cover of *Lemna minor* as well. Measurements in early October 2007 revealed a water temperature of 12.9 °C and a pH of 6.9 (ditch in Oldenburg).

This is the first record of *Setopus tongiorgii* since its discovery in an Italian appenine bog tarn (Lake Greppo) near Pistoia, where it lives over detritus and in floating *Sphagnum*-cushions (Balsamo 1982). Slight differences between the original description and the specimens observed in northern Germany (a mean body length of 90 µm vs. 125 µm) are, however, regarded as natural variability within the species. This new record of *S. tongiorgii* is an important piece of information for understanding the distribution patterns and biological requirements of those rare freshwater meiofauna organisms such as Dasydytidae. Due to extensive land consolidation activities in the past decades, which destroyed the

bulk of wetlands and natural stagnant waters in central Europe, the whole family Dasydytidae is regarded as an endangered taxon (Schwank 1990). However, this new record shows that even less common species, such as *S. tongiorgii* can be found in understudied waterbodies as, for example, agricultural and urban drainage ditches. With this new distribution record we conclude that *S. tongiorgii* is not exclusively adapted to a special biotope like alpine bog lakes and has a wider range of distribution and ecological requirements. The north-western lowlands near the German coast with their oceanic and moist climate, hundreds of drainage channels, ponds and fragments of the former huge moors constitute ideal conditions for stable populations of rare and endangered species of Dasydytidae.

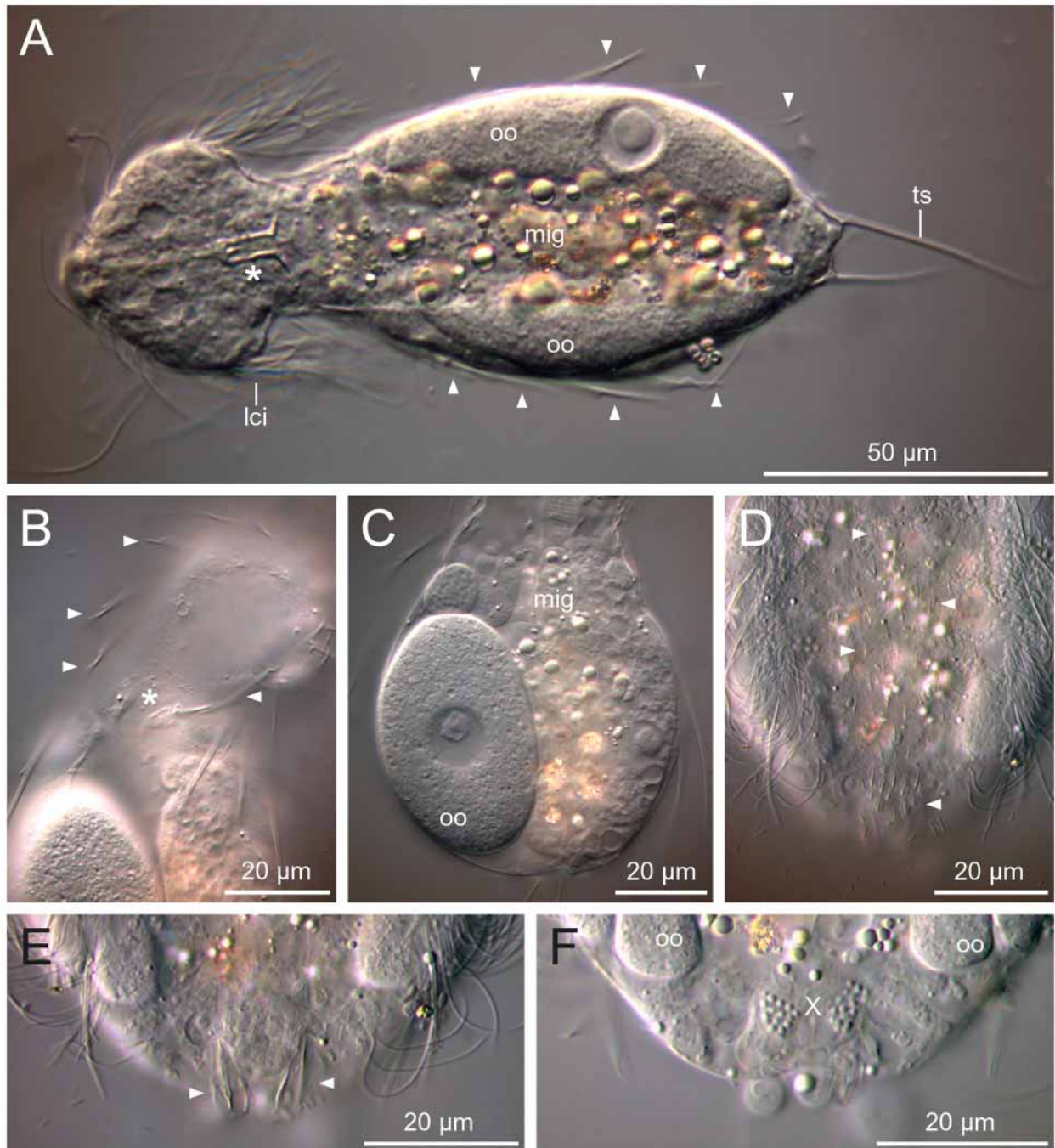


FIGURE 1 A–F. *Setopus tongiorgii*. Light microscopic images (differential interference contrast). A: Habitus. Some motile spines visible (arrowheads). Note the reinforcements within the pharynx (asterisk) B: Dorsal view of anterior part showing spines of the head (arrowheads). Note the special scales with sensory setae (asterisk) C: Trunk region with mature egg D: Ventral view of the trunk with keeled scales (arrowheads) E: Close-up of the ventral terminal plates (arrowheads) F: Close-up of the x-organ (X). lci – locomotory cilia of the head; mig – midgut; oo – mature egg; ts – terminal spines.

TABLE 1. Sample sites and dates. For details see text.

locality	sampling date	abundance	mature oocytes	X-organ	mean body length
Leer	2005-08-31	low	yes	yes	125 μm
Leer	2005-12-12	low	yes	no	105 μm
Oldenburg	2006-11-02	low	yes	no	130 μm
Oldenburg	2007-08-22	low	yes	yes	140 μm

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