



Taxonomic studies on three marine species of *Frontonia* from northern China: *F. didieri* n. sp., *F. multinucleata* n. sp. and *F. tchibisovae* Burkovsky, 1970 (Ciliophora: Peniculida)

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Abstract

The morphology and infraciliature of three marine ciliates, *Frontonia didieri* n. sp., *F. multinucleata* n. sp. and *F. tchibisovae*, isolated from northern China seas, were investigated using living observation and silver impregnation methods. *Frontonia didieri* n. sp. is recognized by: *in vivo* ca. 100–150 × 45–80 μm; 61–71 somatic, 3 vestibular and 3–5 postoral kineties; 4-rowed peniculus 1 and 2; peniculus 3 three-rowed; contractile vacuole centrally-located, with about eight conspicuous collecting canals. *Frontonia multinucleata* n. sp. is characterized by: 70–120 × 40–75 μm *in vivo*, dorsoventrally flattened about 2:1; 58–67 somatic, 3 vestibular and 4–5 postoral kineties; 3 peniculi each with 4 kineties; 2–4 globular macronuclear nodules; contractile vacuole located in posterior 1/3 of cell length. Based on both original and the Qingdao population, the poorly-defined *Frontonia tchibisovae* is redefined and a new diagnosis is supplied.

Key words: Peniculid ciliates; *Frontonia*; morphology and redescription; new species

Introduction

Species belonging to the peniculid genus *Frontonia* are commonly seen in marine and freshwater habitats (Bullington 1939; Carey 1992; Dragesco 1960; Dragesco 1972; Dragesco & Dragesco-Kernéis 1986; Fokin *et al.* 2006; Foissner 1987; Foissner *et al.* 1994; Kahl 1931; Roque 1961; Song 1995). However, only some of them have been well-described, based upon both live observations and silver impregnations, while many marine forms remain unknown or insufficiently described (Aleksperov 2005; Burkovsky 1970a, b; Long *et al.* 2005; Petz *et al.* 1995; Roque & Puytorac 1972). These organisms should be identified morphologically by the combination of features like the buccal and somatic ciliature, position and character of contractile vacuole, size and shape of body, as well as the habitat (Foissner 1987; Foissner *et al.* 1994; Foissner & Song 2002). During the recent investigations on the ciliate biodiversity in the northern China seas, three *Frontonia* species were sampled and morphological data were collected, revealing that two forms are new to science and one belongs to a poorly-defined species, *Frontonia tchibisovae*.

Materials and methods

Frontonia didieri n. sp. and *F. multinucleata* n. sp. were sampled from sandy beaches at Qingdao, northern China (36°08' N, 120°43' E) on November 24, 2005 and June 1, 2006, respectively. *Frontonia tchibisovae*