



## Morphology and morphogenesis of *Strongylidium pseudocrassum* Wang and Nie, 1935, with redefinition of *Strongylidium* Sterki, 1878 (Protista: Ciliophora: Stichotrichia)

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### Abstract

A population of the rare species *Strongylidium pseudocrassum* Wang and Nie, 1935, was discovered from a lagoon in the northern region of Rio de Janeiro, Brazil, and its morphology was investigated through protargol-impregnation, scanning electron microscopy and *in vivo* observations. Morphogenetic events of cell division and physiological reorganization were described for the first time to this species. It was found that *S. pseudocrassum* has the ventral cirral rows organized in the same manner as *Pseudouroleptus caudatus* Hemberger, 1985. However two independent primordia VI, one for the proter and other for the opisthe, are generated intrakinetally from the rightmost ventral cirral row. In addition, dorsal kineties replicate entirely “de novo” and do not fragment. Based on the data obtained, the genus *Strongylidium* was redefined and the species currently assigned to it were classified into five groups according to current knowledge on their ciliature and the combination *S. lentum* (Biernacka, 1963) nov. comb. is proposed.

**Key words:** Amphisiellidae; Brazil; Ciliate; Spirofilidae; *Strongylidium*

### Introduction

The genus *Strongylidium* Sterki, 1878 comprises a rather heterogeneous group of marine, freshwater, and soil species of stichotrich ciliates. According to the diagnosis proposed in Lynn and Small (2002), they usually display an elongate body with tapered posterior and rounded anterior end, presenting several frontal cirri and the leftmost cirral row beginning at the dorsal posterior surface. As mentioned by Wang and Nie (1932), several species have been included in this genus since its erection by Sterki (1878), and after the monographic work by Kahl (1932), some subsequent major revisions of stichotrich ciliates included *Strongylidium* (e.g. Borror 1972; Jankowski 1979; Stiller 1975). However reinvestigation of the infraciliature from modern protargol-impregnation and perhaps electron microscopy techniques are still needed for most species. To our knowledge, divisional morphogenesis, which is of great importance in the systematics of the stichotrichs (e.g., Corliss 1968; Berger 1999, 2004, 2006; Berger & Foissner 1997; Borror 1979; Borror & Evans 1979; Eigner 1995, 1997, 1999, 2001; Eigner & Foissner 1994; Fleury 1983; Foissner *et al.* 2004; Hemberger 1982; Jerka-Dziadosz 1972; Tuffrau 1969; Tuffrau & Fryd-Versavel 1977; Wallengren 1902; Wicklow 1981, 1982; Wirnsberger 1987), has never been scrutinized in the type species *Strongylidium crassum* Sterki, 1878. Nor has it been described in other congeners with two long marginal and two long ventral cirral rows, which represent the majority of species assigned to *Strongylidium*.

In the present paper, we describe the morphology of interphasic, dividing and reorganizing cells from a Brazilian strain of *S. pseudocrassum* Wang and Nie, 1935, a typical species of *Strongylidium*. A redefinition of *Strongylidium* on the basis of morphologic and morphogenetic features of *S. pseudocrassum* is proposed and its relations to other genera are discussed.