Zootaxa 3965 (1): 001–077
www.mapress.com/zootaxa/

Monograph

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3965.1.1
http://zoobank.org/urn:lsid:zoobank.org:pub:F6145596-87C2-49F0-A71C-6114F00D7199

ZOOTAXA

3965

Redescription of *Cateria gerlachi* (Kinorhyncha, Cyclorhagida) from Sri Lanka and of *C. styx* from Brazil, with notes on *C. gerlachi* from India and *C. styx* from Chile, and the ground pattern of the genus

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Magnolia Press
Auckland, New Zealand

Accepted by D. Gordon: 13 Mar. 2015; published: 8 Jun. 2015

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(*Zootaxa* 3965)

77 pp.; 30 cm.

8 Jun. 2015

ISBN 978-1-77557-709-6 (paperback)

ISBN 978-1-77557-710-2 (Online edition)

FIRST PUBLISHED IN 2015 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: zootaxa@mapress.com

http://www.mapress.com/zootaxa/

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

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Abstract

Cateria gerlachi is redescribed based on specimens from the west coast of Sri Lanka by light microscopical observations of 57 adult and 47 juvenile specimens and by SEM investigations of 33 adult and 10 juvenile specimens. *Cateria styx* from Brazil is redescribed from 33 adult and 5 juvenile specimens mounted for light microscopy (original material). The original material of *C. gerlachi* from India and new material of *C. styx* from Chile have been studied for comparison. *Cateria gerlachi* can be distinguished from *C. styx* by leaf-like cuticular hairs dorsally but not laterally on the tergal plate of segment 1 and on the midsternal plate of segments 1–2 *vs* scales with a posterior process on the entire tergal plate of segment 1 and on the midsternal plate of segments 1–2 in *C. styx*, fewer lines of leaf-like hairs of the secondary fringe on segments 2–10 in *C. gerlachi*, broader scales in the central part of the segments in *C. gerlachi*, the blunt tube on segment 5 in a lateral accessory *vs* a lateroventral position in *C. styx*, the lack of a midlateral spine on segment 11 *vs* its existence on segment 11 of *C. styx*, the lack of a protrusible dorsal organ at the border of segments 5 and 6 *vs* its existence in *C. styx* and type-5 sensory spots and gland cell outlets present on different segments and positions in the two species. We report and document for species of *Cateria* detailed morphological data, including variability within populations, a female and a male life-history stage, as well as moulting of an adult stage to another adult stage. In contrast to previous records, *C. gerlachi* occurs in sandy intertidal habitats not only deeply buried in the sediment but also at the surface.

Key words: redescription, taxonomy, life cycle, moult, postembryonic development

Introduction

During the past decade, a considerable number of new species of Kinorhyncha, representing almost all genera and even new genera, have been reported and several species redescribed in order to gain more characters for phylogenetic analyses. These efforts have significantly benefited from SEM investigations (Higgins & Kristensen 1988; Pardos *et al*. 1998; Adrianov & Malakhov 1999; Adrianov *et al*. 2002a–c; Neuhaus 2004; Neuhaus & Blasche 2006; Sørensen 2007, 2008; Sørensen *et al*. 2007, 2009, 2010a–c, 2012a, b, 2013; Sørensen & Rho 2009; Sørensen & Thormar 2010; Dal Zotto *et al*. 2013; Herranz & Pardos 2013; Neuhaus *et al*. 2013, 2014; Neuhaus & Sørensen 2013; Sánchez *et al*. 2011, 2013, 2014a, b; Thomsen *et al*. 2013; Yamasaki & Kajihara 2012; Yamasaki & Fujimoto 2014). Only some studies also considered a large-enough number of specimens that resulted in new findings about the life cycle of several cyclorhagid Kinorhyncha, viz, at least two adult stages (Neuhaus 2013; Neuhaus *et al*. 2013, 2014; Neuhaus & Sørensen 2013). The most peculiar taxa among Kinorhyncha certainly represent species of *Cateria* with their cuticular ornamentation and ventral lobes of the free flap, the dorsal organ at the border of segments 5 and 6 of *Cateria styx* Gerlach, 1956, and their uncertain phylogenetic relationships to other kinorhynchs (Gerlach 1956; Higgins 1968).

The two known species of *Cateria* are *C. styx* and *C. gerlachi* Higgins, 1968 (see Gerlach 1956; Higgins 1968). A third species was described from the North Sea as *Cateria submersa* Gerlach, 1969, but synonomized some 20 years later as *Zelinkaderes submersus* (Gerlach, 1969) Higgins, 1990 (see Gerlach 1969; Higgins 1990). Species of *Cateria* have been reported occasionally, namely from Brazil, Chile, Angola, India, and the Andaman Islands (Gerlach 1956; Delamare Deboutteville 1957; Rao & Ganapati 1966, 1968; Higgins 1968; Rao 1972, 1987; Higgins & Rao 1979; Brown & Higgins 1983). Among these authors, only Gerlach (1956), Delamare Deboutteville