Zootaxa 4021 (1): 169–177
www.mapress.com/zootaxa/

Article

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

http://dx.doi.org/10.11646/zootaxa.4021.1.7
http://zoobank.org/urn:lsid:zoobank.org:pub:BC1772C0-FDF8-48FB-ACED-25E2B92BE9A8

Rossella podagrosa Kirkpatrick, 1907—A valid species after all

CHRISTIAN GÖCKE[1, 4], DORTE JANUSSEN[1], HENRY M. REISWIG[2], SHANNON C. JARRELL[3] & PAUL K. DAYTON[3]

[1]*Forschungsinstitut und Naturmuseum Senckenberg, Senckenberganlage 25, D-60325 Frankfurt am Main, Germany*
[2]*Biology Department, University of Victoria and Royal British Columbia Museum, P.O. Box 3020 Stn CSC, Victoria, British Columbia, Canada, V8W 3N5*
[3]*Scripps Institution of Oceanography, La Jolla, California, United States of America*
[4]*Corresponding author. E-mail: christian.goecke@senckenberg.de*

Abstract

In this study we provide evidence that the species *Rossella podagrosa* Kirkpatrick, 1907, commonly considered a synonym of *Rossella racovitzae* Topsent, 1901, is truly a valid species. We show that it can be clearly distinguished from other species especially when taking into consideration the *in situ* habitus of the sponge in combination with the spicules. Furthermore we demonstrate the weaknesses in the so far published synonymy concept for the very complicated genus *Rossella* Carter, 1872. From this we conclude that the best strategy for further analysis of *Rossella* and establishment of acceptable synonymies will need to be based on detailed examination of the spicules, the holotypes, and *in situ* habitus. When possible it will be useful to analyze specimens from all Antarctic oceanographic regions.

Key words: Porifera, Hexactinellida, Rossellidae, Synonymy, Antarctica, Ross Sea

Introduction

The sponges of the genus *Rossella* Carter, 1872 are amongst the most remarkable invertebrates of the Antarctic shelf. They reach enormous sizes and show a distinctive habitus, being commonly barrel-shaped with one wide central osculum, with the outer surface in most species bearing conules. Often long and thick bundles of spicules protrude from the conules (Barthel & Tendal 1994). Budding has been regularly reported (Barthel & Tendal 1994; Teixidó *et al.* 2006) but without definitive patterns. Classically thought to be rather slow growing, *Rossella* and *Anoxycalyx (Scolymastra) joubini* have recently been shown to be capable of fast growth and proliferation in the case of favourable environmental conditions (Dayton *et al.* 2013; Fillinger *et al*. 2013). *Rossella* spp. reach high abundance in undisturbed areas of the Antarctic shelf, where they appear as a structuring benthic element. Dayton *et al*. (1974) documented a sponge assemblage which was highly dominated by what they called *R. racovitzae*, making up 42 % of the ground cover and 71 % of the sponge biomass. These sponges, forming the basis of this present study, are here re-identified as representatives of the species *R. podagrosa*. Similar densities have been documented by Gutt & Koltun (1995), Gutt & Piepenburg (2003), and Teixidó *et al*. (2004). *Rossella* spp. are also important as substrate and habitat for several benthic invertebrates and juvenile fishes (Kunzmann 1996; Barthel 1997; Gutt & Schickan 1998; Kersken *et al.* 2014). Still, despite the unquestionable high ecological importance of *Rossella* in the Antarctic and nearly 150 years of research, the taxonomy of *Rossella* and its many species remains complicated and not fully understood.

The taxonomic history of *Rossella* is long and complicated: the genus was established by Carter (1872), followed by rather quick descriptions of a large number of additional species (e.g. by Topsent 1901; Kirkpatrick 1907; Schulze & Kirkpatrick 1910 (in fact, 25 species and varieties: Ijima 1927; Reiswig 1990). Soon after, doubts arose whether all these species are truly valid, and, synonymies were postulated. The first revision of the genus was done by Burton (1929); this led to a reduction into five Antarctic species and included the synonymization of the genus *Aulorossella* Kirkpatrick, 1907 with *Rossella*. A further reduction was proposed by Koltun (1976), who also

Accepted by E. Hajdu: 20 Aug. 2015; published: 24 Sept. 2015