Pedunculate *Molgula* species (Asciidiidae, Molgulidae) from the French Antarctic sector. Redescription and taxonomic revision

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Abstract

Following the Challenger Expedition in the southern Hemisphere, several international surveys have studied Antarctic ascidians. Several pedunculate *Molgula* were successively described under various names. From the French part of the Antarctic continent and the Kerguelen area, numerous *Molgula* were recently collected. They are described here in different species, but closely allied. Their taxonomy is revised with an historical review of the most detailed publications and a link to the ancient names.

Key words: Antarctic, Ascidians, *Mulgula* species

Introduction

From the nineteenth century successive expeditions have investigated the benthic marine invertebrate fauna around the Antarctic continent. The “Challenger Expedition” (1873–1876) was the first to collect a large amount of invertebrates at different depths. Later, simultaneous surveys have also explored the southern ocean: the “Deutsch Sud-Polar Expedition” (1901–1903), the British “National Expedition” (1901–1904), the “Swedish Antarctic Expedition” (1901–1903), the “French Antarctic Expedition” (1903–1905), the “Australian Antarctic Expedition” (1911–1914). All have collected ascidians, including large and spectacular pedunculate Molgulidae. These specimens were described successively by several authors as different species. Herdman (1881) was the first scientist to describe very accurately specimens collected by the “Challenger” and he dispatched several pedunculate species into 2 genera: *Molgula* (with spiral stigmata) and /Ascopera/ n.g. with straight stigmata. Further authors like Sluiter (1905, 1906, 1914), Hartmeyer (1911), Ärnbäck-Christie-Linde (1938), or Herdman himself (1910), while studying new collections, have adopted Herdman's species or have created new names for very similar forms. This introduced a large confusion of synonyms. Almost half a century later, American cruises brought abundant material from the Antarctic Peninsula. A part of these ascidians were studied by Kott (1969) and Monniot & Monniot (1983). A synonymy with species in the literature was listed. Later authors have only used the name *M. pedunculata* for Antarctic specimens collected from different regions but they have not given enough morphological details, and this often does not allow to compare these citations to one or other previous descriptions.

Recently, numerous specimens of pedunculate *Molgula* were collected during successive surveys in the Southern Ocean in a sector extending from Terre Adélie to the south of Kerguelen Islands: CEAMARC (2007–2008), REVOLTA (2011–2012) and POKER (2011–2013). This abundant material added to the specimens stored in the MNHN collections gives the opportunity for these very similar anatomies, to evaluate which characters are variable or constant in a population and can represent a species. New descriptions of 4 pedunculate *Molgula* are given and compared to old data. Sequences for the barcode region of the cytochrome oxidase I gene could be obtained for two of the four species following Monniot *et al.* (2011). While these sequences represent only a few specimens from a restricted area of the Southern Ocean, they can serve as a useful reference for future studies in other regions.
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