



## On the identity of *Spio filicornis* (O.F. Müller, 1776)—with the designation of a neotype, and the description of two new species from the North East Atlantic Ocean based on morphological and genetic studies

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### Abstract

The aim of this study is to solve taxonomic problems pertaining to *Spio filicornis* (O.F. Müller, 1776). The original description by O. F. Müller was very brief and type material was not deposited. Based on the literature the confusion about the identity of the species has been tremendous; e.g., it was only recently realized that at least two different species from the North and Baltic Seas could be identified as *S. filicornis* (Bick *et al.* 2010). The present study is based on material collected by the authors in 2009 at the type locality in Iluulárssuk, near Paamiut, SW Greenland. *Spio filicornis* is re-described in detail and illustrated comprehensively. A neotype has been designated and deposited in the collection of Rostock University. Species formerly referred to as *S. cf. filicornis* from the North and Baltic Seas (Bick *et al.* 2010) are formally described as two new species, *Spio arndti* **sp. nov.**, and *S. symphyta* **sp. nov.** The morphological diagnostic characters within *Spio* are discussed. Information on three molecular markers (16S rDNA, 18S rDNA, cytochrome c oxidase subunit I) is also provided. The genetic divergence between the three *Spio* species corroborates the taxonomic discrimination.

**Key words:** Arctic, Baltic Sea, COI, dorsal ciliated organs, nuchal organs, morphology, North Sea, *Spio arndti* **sp. nov.**, *Spio symphyta* **sp. nov.**, subepidermal glands, taxonomy, 16S rDNA, 18S rDNA

### Introduction

*Spio filicornis* (O.F. Müller) is one of the earliest described polychaete species. It was described as *Nereis filicornis* by O. F. Müller in 1776 in his famous “*Zoologicae Danicae Prodrum, seu Animalium Daniae et Norvegiae indigenarum characteres, nomina et synonyma imprimis popularium*”. Considering how long ago since scientists learned about its existence, one could expect that this species would be one of the best known polychaetes—but the opposite is the case. The original description by O.F. Müller (1776) was very brief: The reader is told that *Nereis filicornis* has two long thick white tentacles which are black-ringed. The Greenlandic common name included into the diagnosis, *Iglulualik* (=one who has a comfortable house), allows the interpretation that the species is living in a tube. Also, the information was provided that these three (specimens?—*author’s comment*) were found by O. Fabricius in Greenlandic bays. Type material was obviously never deposited.

The collector of the material, the Danish Otho Fabricius, was a theologian, linguist, and zoologist and did missionary work in Fredrikshåb (today’s Paamiut), Greenland, from 1768 to 1773 (Cotta-Schönberg 2007). He came to Greenland as a young man at the age of 24 and even lived among the sealers for a few years to take part in their lives. Fabricius also did natural history studies; during these he obviously also collected the *Spio filicornis* speci-