

***Goniodoris nodosa* (Montagu, 1808): a new «old» species to the Belgian marine fauna**

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Abstract

A 3 mm long specimen of *Goniodoris nodosa* (Montagu, 1808) (Mollusca, Gastropoda, Opisthobranchia, Nudibranchia) was discovered amongst samples determined as *Acanthodoris pilosa* (Abildgaard in Müller, O.F., 1789) in the century-old collection of marine organisms gathered by Gustave Gilson and held at the Royal Belgian Institute for Natural Sciences, Belgium. This discovery constitutes the first record in the Belgian maritime zone. *G. nodosa* should be considered a naturally rare species in this area.

Samenvatting

Een 3 mm lang specimen van *Goniodoris nodosa* (Montagu, 1808) (Mollusca, Gastropoda, Opisthobranchia, Nudibranchia), de brede plooislak, werd ontdekt tussen stalen die gedetermineerd waren als *Acanthodoris pilosa* (Abildgaard in Müller, O.F., 1789) in de honderd jaar oude collectie van mariene organismen verzameld door Gustave Gilson, bewaard in het KBIN (Koninklijk Belgisch Instituut voor Natuurwetenschappen) in België. Deze ontdekking is de eerste melding voor de Belgische maritieme zone. *G. nodosa* moet beschouwd worden als een soort die van nature zeldzaam is in dit gebied.

Résumé

Un spécimen de *Goniodoris nodosa* (Montagu, 1808) (Mollusca, Gastropoda, Opisthobranchia, Nudibranchia), long de 3 mm, a été découvert parmi les échantillons, identifiés comme *Acanthodoris pilosa* (Abildgaard in Müller, O.F., 1789), appartenant à la collection rassemblée il y a un siècle par Gustave Gilson et aujourd'hui conservée à l'IRScNB (Institut Royal des Sciences Naturelles de Belgique) en Belgique. Cette découverte constitue la première observation dans la zone maritime belge. *G. nodosa* doit être considérée comme une espèce naturellement rare dans cette zone.

INTRODUCTION

I had the opportunity to undertake a revision of the Opisthobranchia (Mollusca, Gastropoda) collected mostly between 1898 and 1914 by Professor Gustave Gilson, a Belgian pioneer in the field of marine ecology (van Loen et al., 2002). The collection consists of thousands of samples rigorously collected according to a pre-established network of stations, which resulted in a dense and thorough survey of the bottom fauna and the sediment of a large part of the Belgian maritime zone (van Loen et al., 2002).

A large part of the samples of sediments and benthic invertebrates could be processed since 2000 in the course of various research projects. Details on collection methods and dredging, data structure and processing, geographic positioning, etc. of Gilson's collection are given in Houziaux (2008).

Despite the fact that human impacts were already significant in the late 19th century, they never reached current levels of exploitation rates. A data-set of such quality is exceptional for this period, and this makes it a unique gateway to reconstruct the past status of the southern North Sea benthos.

MATERIAL AND METHODS

An initial inventory of Opisthobranchia collected by Gilson was carried out in 2006. In this framework, I firstly checked the species name of the estimated 1.800 specimens and actualised the taxonomy where necessary. Most original determinations were carried out by J. J. Tesch (1913-1914) and W. Adam (1945); to our knowledge, they were never published. The specimens were initially preserved in formalin and are now stored in 70% ethanol.

Examination of every specimen was then carried out to check the accuracy of the original determinations, using a LEITZ/WILD microscope with continuous magnification from x8 to x80. This task is still going on.

RESULTS

Among the numerous jars containing *Acanthodoris pilosa* (more or less 110), the one labelled "INV. n° 52.045\1; jar n° 8188/45; Gilson station n° G 3212, collected the 15.IX.1904, at the southern tip of the Westhinderbank (51° 21' N – 02°25' E" (see Fig. 1), contains 4 specimens, one of which is obviously not an *A. pilosa* (Fig. 2).

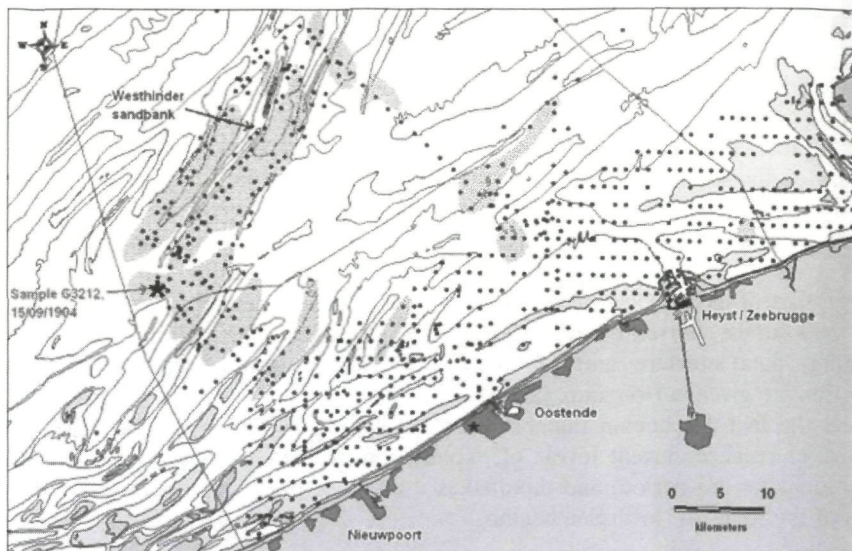


Fig. 1. Geographic position of sampling station "G3212" (asterisks) in the sampling grid of Gilson (black dots: benthic dredge samples, median points of the tows). Green areas: distribution of sandy gravel fields according to Gilson's data. Data compiled from Houziaux, 2008).

Description of the specimen

This specimen (3 mm long) displays a very different external morphology (Figs 2-3). Its colour in alcohol is white and translucent, with opaque white patches.

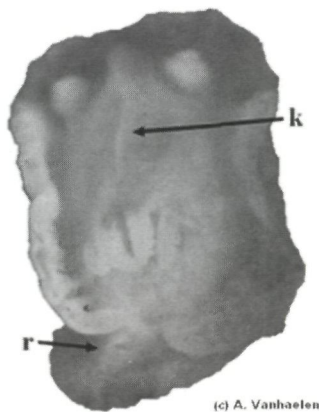
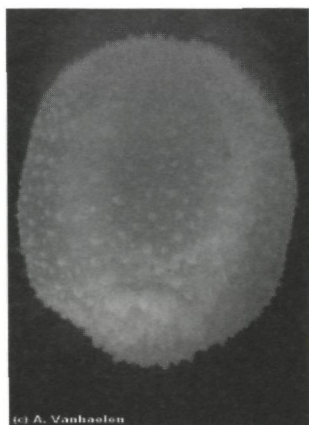


Fig. 2. *Acanthodoris pilosa* (Abildgaard in Müller, O.F., 1789) (left) and *Goniodoris nodosa* (Montagu, 1808) (right), with median keel (k) and ridge on the foot (r).

The mantle's edge is well developed and runs, on the sides of the dorsum, from the branchial circlet, all around the head, in front of the rhinophores. The mantle does not cover the foot because it slightly curls upwards. A median keel runs down the back, from between the rhinophores to the branchial crown. A low median ridge runs on the backside of the aft extension of the foot. The rhinophores are obliquely lamellate, with the lamellae appearing to be at the sides and the rear of the rhinophoral stem (Fig. 3). There are 5 fleshy pinnate gills around the anal papilla. The head bears a pair of broad, flattened, triangular oral tentacles, whose base joins at their inner side, in the middle of the body, forming a flattened "V" shape. No small conical tubercles were observed on the back, on either side of the keel.

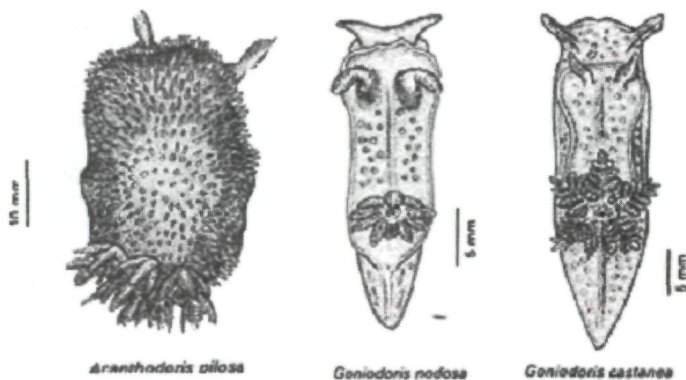


Fig. 3 drawings from Hayward, P.J. & Ryland, J.S., 1990 vol. II; p. 713 - after Thompson & Brown, 1976 - © Oxford University Press, Walton Street, Oxford OX2 6DP

DISCUSSION

Alive, the animal sometimes shows shades of yellow or pink on the mantle and the rhinophores are tinged with yellow. Adults of *Goniodoris nodosa* may reach a length of up to 27 mm. (Thompson, & Brown, 1976) but are usually found to measure 12 to 18 mm (Swennen, 1987). Our 3-mm long specimen must be considered a juvenile or, at most, a sub-adult. It already presents the characteristics of the adult.

The presence of apparent rhinophores and of a branchial crown on the back of the specimen is characteristic of the Dorididae. The keel running in the middle of the back

from between the rhinophores down to the branchial crown is typical of the genus *Goniodoris* Forbes & Goodsir, 1839. The compact form of the branchial feathers of the specimen is characteristic of the species *Goniodoris nodosa*. The adult bears a few small conical tubercles on the back, on either side of the keel, but these are lacking in our specimen. Their absence may be due to the juvenile stage of the specimen, to a body contraction when put into formalin, or to a combination of both factors.

There are only two known species belonging to the genus *Goniodoris* in the N.E. Atlantic:

G. nodosa and *G. castanea* Alder & Hancock, 1845. *G. nodosa* differs from *G. castanea* by the oral tentacles, which are broad, triangular and together form a flattened "V" shape (Fig. 3), whereas *G. castanea* tentacles are slender, with a lance-shaped end, and together form a broad "U" shape. The gills of *G. nodosa* are fleshy and compact, while those of *G. castanea* are branched.

Acanthodoris pilosa (Abildgaard in Müller, O. F., 1789) is easily distinguished from *G. nodosa* by external morphological characters such as the presence of numerous, more or less triangular soft papillae covering the mantle.

Interestingly, branching bryozoans (among others, various species of the genus *Alcyonidium*) were collected by Gilson in these surroundings (see De Blauwe et al, 2006 and Houziaux, 2008). Indeed, juveniles of *G. nodosa* typically feed on such branching bryozoans (Thompson, & Brown, 1976): this could be a clue to explain the presence of the species at juvenile status in this area by then. When becoming adult, *G. nodosa* switches to compound ascidians such as *Botryllus schlosseri* and *Diplosoma listerianum* or to the colonial ascidian *Dendrodoa grossularia* (Picton & Morrow, 1994; Thompson & Brown, 1976; Hayward & Ryland, 1990).

G. nodosa typically lives on a hard bottom and is known from the Atlantic coast of Europe from Norway to Spain and all around the U.K. (Hayward & Ryland, 1990; Picton & Costello, 1998; Picton & Morrow, 1994; Thompson & Brown, 1976). Its presence in Belgian waters is not surprising and our record, the first in this area, fills a gap in its distribution. Indeed, the species was recently observed in neighbouring waters: France (Dewarumez, 1999), the Netherlands (van Bragt, 2004) and the U.K. (Picton & Morrow, 1994). As the species produces a planktonic larva, it should still be present in Belgian waters if its habitat has not been significantly altered.

G. nodosa must thus be considered as a naturally rare species in this area, since this "new-old" record is the only one documented so far. Intensive study of Belgian soft bottom sediments from 1970 to 2006 (Cattrijsse & Vinck, 2001), examination of all the issues of De Strandvlo (from 1981 to 2007), a taxonomic revision of Belgian marine molluscs (Backeljau, 1986) and more recent sampling efforts on shipwrecks (Zintzen,

2007) and gravels (Houziaux, 2008) all failed to reveal its presence in the last decades. However, it must be stressed that accurate sampling effort on gravels has been extremely reduced in the past decades, which much explains the lack of data for many such species typically occurring on this habitat in Belgian waters (Kerckhof and Houziaux, 2003). It is thus very likely that the species would yet be collected nowadays if a targeted sampling operation was carried out, except if the habitat and/or epibenthic cover has been modified since then.

G. nodosa must probably also be considered as a rare species in the Netherlands since it is not mentioned by Van Moorsel et al. (1991; 2002). This is in agreement with the statement by Houziaux (2008) that the gravels of the Westhinder area, in the southern bight of the North Sea, could represent the northern edge of the typical hard substrate epifauna of the eastern English Channel.

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