

Short communications

Variability of radular apparatus in Bathydorididae (Gastropoda, Doridida)

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Изменчивость радулярного аппарата Bathydorididae (Gastropoda, Doridida)

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The family Bathydorididae strikingly differs from many other doridid molluscs in many features evidencing the primitiveness of the family. This family includes representatives with two types of respiratory organs. More advanced representatives of the family possess a perianal corolla similar to that of other doridids. In primitive species, bundles of gill are located asymmetrically (to the right of anus), thus preserving the relationships characteristic of the ancestral shell-bearing forms.

According to the last revision of Bathydorididae [Wägele, 1989], three few-gill species widely spread in the Antarctic and Subantarctic — *Bathydoris clavigera* Thiele, 1912, *B. obliquata* Odner, 1934, and *B. argentina* Kaiser, 1980 — represent a single polymorphic species *B. clavigera*.

The present study provides new data on the variability in *Bathydoris*. Collections of several Soviet antarctic expeditions comprised the material for this study. Examination of radular apparatus in 15 specimens of *B. aff. clavigera* (Table 1) revealed extensive variability in the structure of the central region of the radula.

Table 1. Characteristics of gill apparatus and central radula tooth in studied individuals of *Bathydoris*. (s — symmetrical, a — asymmetrical structure of medial blade of the central tooth).

Specimen	Region of collection	Gill number	Tooth structure
3		2	a
9		2	s
11	South Georgia Islands	2	s
12		2	s
2		3	a
10		5	s
7	Orkney Islands	2	s
4		4	a
15	Davis Sea	2	s
8		2	s
1	Cosmonauts Sea	3	a
5		3	a
6		3	s
14		3	s
9	Risser-Larsen Sea	2	s

In the systematics of gastropods the radula plays an important role, and its characters are usually used in both description of species and higher taxon characterisation [Thiele, 1931; Ivanov, 1990]. The role of the radula especially increases in identification of Nudibranchia whose external features are usually distorted during collection and fixation of material. However, in the case of *Bathydoris* the use of radula in the species identification is hardly possible due to its high variability.

The radula in bathydoridids is formed by many poorly differentiated teeth. A well developed central tooth and a pair of lateral teeth occupy the medial position in the row; they are followed by numerous marginal plates with long blade-like processes.

The variability of the radula central part is surprising: practically every specimen possesses original structure of it. The high variability of radular apparatus in studied specimens of *Bathydoris* is observed at stable external morphology, in particular at the same mantle apparatus (see Table 1). Even specimens from the same sample and with the same number of gills greatly differ in the structure of central tooth. Lateral teeth are of similar structure, denticles of the cutting edge are more clearly expressed in some specimens. The first marginal teeth also have standard form, some specimens possess a wing-like protuberance at the edge of the tooth. We shall confine ourselves to the consideration of taxonomically significant central part of the radula, because the central row is considered to be the functional unit moving in a straight line, while paired teeth move along a curve and take food particles towards the middle [Starobogatov, 1990].

The central tooth plate is especially variable: its medial blade may be symmetrical or asymmetrical, continuous or bifid, smooth or ribbed, round or almost rectangular; the armament varies from almost smooth edge with few tubercles to greatly indented edge with sharp denticles; the structure of marginal blades also varies (Fig. 1).

What is the cause of such striking variability? In most cases the radula ontogenesis has not been studied as yet. There are some reasons to believe that central teeth in Gastropoda may be formed in ontogenesis (as well as in phylogenesis) by the