

On the morphology and homology of the “central tooth” in the radulae of Turrinae (Conoidea: Turridae)

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ABSTRACT. Radular morphology was studied in detail in 64 species of 7 genera of Turrinae. It is suggested that the so-called “central tooth” is formed by a fusion of 3 teeth: the central one and a pair of lateral. A similar condition was found in some representatives of the subfamilies Cochlespirinae and Crassispirinae (Turridae).

The radular morphology, together with the shell characters is still the basis for discriminating the taxa of Gastropoda at the family level. For some of the groups, e.g. most of Caenogastropoda, the radula is rather conservative in terms of the number of teeth in a transverse row (most of the families possess a taenioglossan radula), while in others it is rather variable. Neogastropoda are characterized by 5 to one tooth in the transverse row, while most of them have only 3 teeth in a row.

The superfamily Conoidea is unique among neogastropods, since the variability of their radulae is comparable to the rest of the Neogastropoda. The most “complete” radular segment is found in the family Drilliidae, which have 5 teeth in a row, while representatives of other families have only 2-3 teeth in a row.

Radulae of a number of species of Turridae have been illustrated and described recently [Taylor *et al.*, 1993; Kantor, Taylor, 2002; Medinskaya, 2002] with the major emphasis on marginal teeth. In this family the marginal teeth are usually referred as “wishbone”. This ill-defined term was based probably on incorrect interpretation of the tooth as consisting of two separate limbs. It was demonstrated, that despite the obvious morphological variability of “wishbone” teeth it is a single blade-shaped unit with thickened edges and without separation between the two thickened limbs [Kantor, Taylor, 2002]. Contrary, little attention was paid to the central teeth in Turridae, and it is usually considered, that they either possess a large central tooth, or the tooth is missing. This strongly opposes Turridae to Drilliidae, that always have small central and a pair of comb-like lateral teeth.

Radula in the subfamily Turrinae has been illustrated for a number of species, mostly as line dra-

wings, by Powell [1966], while SEM micrographs of several species have recently been published by Medinskaya [2002]. Both authors characterized the radula of the species of the subfamily as consisting of wishbone marginal teeth and with or without a broad unicuspid central tooth with a needle-shaped cusp.

In the course of preparation of collective monograph on the Conoidea of New Caledonia region I examined in detail the radulae of 64 species of 7 genera (*Gemmula* Weinkauff, 1875, *Gemmuloborsonia* Shuto, 1989, *Lophiotoma* Casey, 1904, *Luce-rapex* Iredale, 1936, *Turridrupa* Hedley, 1922, *Turris* Röding, 1798, and *Xenuroturris* Iredale, 1929) out of 13 of the subfamily Turrinae, found in the New Caledonia region, some new for science and still undescribed. It became clear that the usual interpretation of the “central” tooth is incorrect and requires clarification.

The purpose of this paper is to demonstrate the variability of the “central tooth” of radula of Turrinae and to establish its homology.

Material and methods

In the current paper I deal with a small selection of the species (9 species illustrated). The radular morphology of these selected species covers the entire observed range of variability of the “central tooth” morphology. The material is stored in the Muséum National d’Histoire Naturelle, Paris, France (MNHN).

Radulae were extracted from dried specimens after re-hydration of the body. Radulae were cleansed in dissolved bleach, mounted on the clean glass slides, air-dried, coated with gold and examined with JEOL JSM 840A Scanning Microscope. The folding of the radular membrane was observed under highest magnification of the stereomicroscope while extending it for the SEM preparation.

Since some of the species mentioned below are not yet described, they are referred to under “working” numbers, which they bear in the collections of MNHN.

“SL” stands for the shell length, “AL” for length of the aperture (excluding siphonal canal).