

## The anatomy of *Zemacies excelsa*, with a description of a new subfamily of Turridae (Gastropoda, Conoidea)

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**ABSTRACT.** The anatomy of *Zemacies excelsa* is characterized by an absence of typical conoidean foregut organs, viz. radula and poison gland. There are autapomorphic features, such as the large rhynchodeal pyriform gland of unknown function. The anatomical organization of the foregut is dissimilar to any other group of Turridae. Because of these distinctive anatomical features a new subfamily Zemaciinae is proposed included in the family Turridae for the reason of conchological similarity.

sv — secretory vesicles, tf — tall folds underlain by glandular tissue, tn — tentacles.

### Description of anatomy

The snout is very elongated and resembles a rather long and thick proboscis, slightly flattened at the tip (Fig. 2 A). Near the snout tip, on each side, there are two lobes bearing subterminal eyes. The rhynchostome is round and situated at the snout end, in the center of a flattened area. Snout length is approximately 5 mm at a body length about 20 mm. Rhynchodeum length only slightly exceeds that of elongated snout.

The species *Zemacies excelsa* (Fig. 1) was recently described from bathyal waters of New Caledonia [Sysoev, Bouchet, 2001: 284-286, figs. 40-41, 51-56, 160-162]. It was included in the genus *Zemacies* Finlay, 1926, which has long been considered as consisting of only fossil species and was usually included in the subfamily Cochlespirinae (Turridae) on conchological grounds. To reveal the taxonomic position of the genus and to clarify its relationships with other groups of turritiform gastropods, we studied the anatomy of *Z. excelsa*, which appears to have many unique features.

The rhynchodeum is narrow and long. The rhynchodeal sphincter is very large, lying slightly behind the rhynchostome. Rhynchodeal walls are thick and very muscular in the anterior part but thin to the posterior. This part is lined with large and regular longitudinal folds. In cross-section they are fungiform (Fig. 2 B). Along the external surface of folds there are aggregations of large hollow vesicles, partially filled by a finely granulate secretion. This secretion is irregularly distributed, mostly concentrated near the outer surface. Similar vesicles are scattered in the epithelium of the rhynchodeum anterior part (this part comprises about a half of the entire rhynchodeum length). The epithelium of both anterior and posterior parts of rhynchodeum is uniform and not glandular. Rhynchodeal walls in the posterior part are not attached to the body cavity walls, so this part is probably evertable. In the posterior part the rhynchodeum curves at a right angle and abruptly finishes.

### Material and methods

Three specimens of *Z. excelsa* were used for the anatomical study. The collection data are as follows: R/V "Vauban", MUSORSTOM 4, st. 226, 22°47' S, 167°22' E, 390 m (2 specimens); st. 227, 22°46' S, 167°20' E (off S New Caledonia), 320 m (1 specimen). The anatomy was studied by hand dissection under a stereomicroscope, and in longitudinal serial sections 10 µm thick, stained with Masson's triple stain.

Both proboscis and buccal tube are absent. The buccal mass protrudes into the rhynchodeum (the length of the protruding part is about 1.5 mm, i.e. about a quarter of the entire buccal mass length) (Fig. 2 C). The buccal mass is perpendicular to the long axis of rhynchodeum.

**Abbreviations in figures:** bl — bulb, bm — buccal mass, btw — buccal mass wall; che — change of epithelium, cm — columellar muscle, ey — eyes, fsf — fungiform folds, gt — glandular tissue, lf — low folds, ms — muscles, nr — nerve ring, oe — oesophagus, pg — pyriform gland; rcoel — rhynchocoel, rl — rhynchodeum limits; rstm — rhynchostome, rw — rhynchodeal wall, rwg — outgrowth of rhynchodeal wall, sg — salivary gland, sgp — semicircular glandular pad, sn — snout,

The buccal mass is surrounded by a thin-walled non-evertable outgrowth of rhynchodeal wall, resembling very thin and long lips. Visually it resembles a semitransparent film, surrounding the basal half of the protruding buccal mass (Fig. 2 C, E). It may represent a rudiment of a proboscis. Buccal