

# A New Species of *Gastropteron* (Gastropoda: Opisthobranchia) from Reunion Island, Indian Ocean

by

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**Abstract.** *Gastropteron michaeli* sp. nov. is described from Reunion Island. Aspects of its external and internal morphology clearly differentiate this species from other members of the genus.

## INTRODUCTION

During the course of a collecting expedition to Reunion Island in the western Indian Ocean in July 1977, one of us (G.C.W.) and Michael Gosliner collected 16 species of opisthobranch gastropods. Included in this collection is an undescribed species of *Gastropteron*. This paper describes the morphology of this species and compares it with closely allied congeners.

## METHODS

Penial morphology was determined by clearing and staining of the material. The whole penis was stained in a dilute solution of 70% EtOH and acid fuchsin for 1 min. It was then dehydrated in a series of three alcohols (80%, 95%, 100% EtOH, for 1 min each). The specimen was then cleared in xylene for 2 min and mounted in Permount on a microscope slide.

## DESCRIPTION

Family GASTROPTERIDAE Swainson, 1840

*Gastropteron* Meckel (in Kosse), 1813

*Gastropteron michaeli* Gosliner & Williams, sp. nov.

(Figures 1, 2)

**Type material:** Holotype, California Academy of Sciences, San Francisco, CASIZ 063270, 2 km S of St. Giles,

Reunion Island, Indian Ocean, under rocks on dead coral reef, 2 m depth, 28 July 1977, Michael L. Gosliner. Paratype, one specimen, CASIZ 063271, 2 km S of St. Giles, Reunion Island, under rocks on dead coral reef, 2 m depth, 28 July 1977, M. L. Gosliner.

**Etymology:** This species is named after Michael L. Gosliner. He has been an enthusiastic collector and supporter of our research efforts. He collected both of the specimens of this species.

**External morphology:** The living animals (Figure 1) were 3-5 mm in length. The body was uniformly yellow-orange with large maroon-brown spots scattered over the surface of the head shield, posterior shield, and dorsal and ventral surfaces of the foot.

The head shield is roughly triangular in shape, broadest anteriorly. Its posterior end is involuted to form a siphon with a thin, cylindrical medial crest. The parapodia are thin and low, barely extending on to the dorsal surface of the animal. The posterior shield is ovoid and elongate, without a flagellum or auxiliary appendages. The foot is not distinctly separated from the parapodia. When the animal is actively crawling, the foot is extended well behind the posterior end of the visceral hump. A distinct pedal gland was not observed on the ventral side of the foot, but this may be a result of preservation. The simply plicate



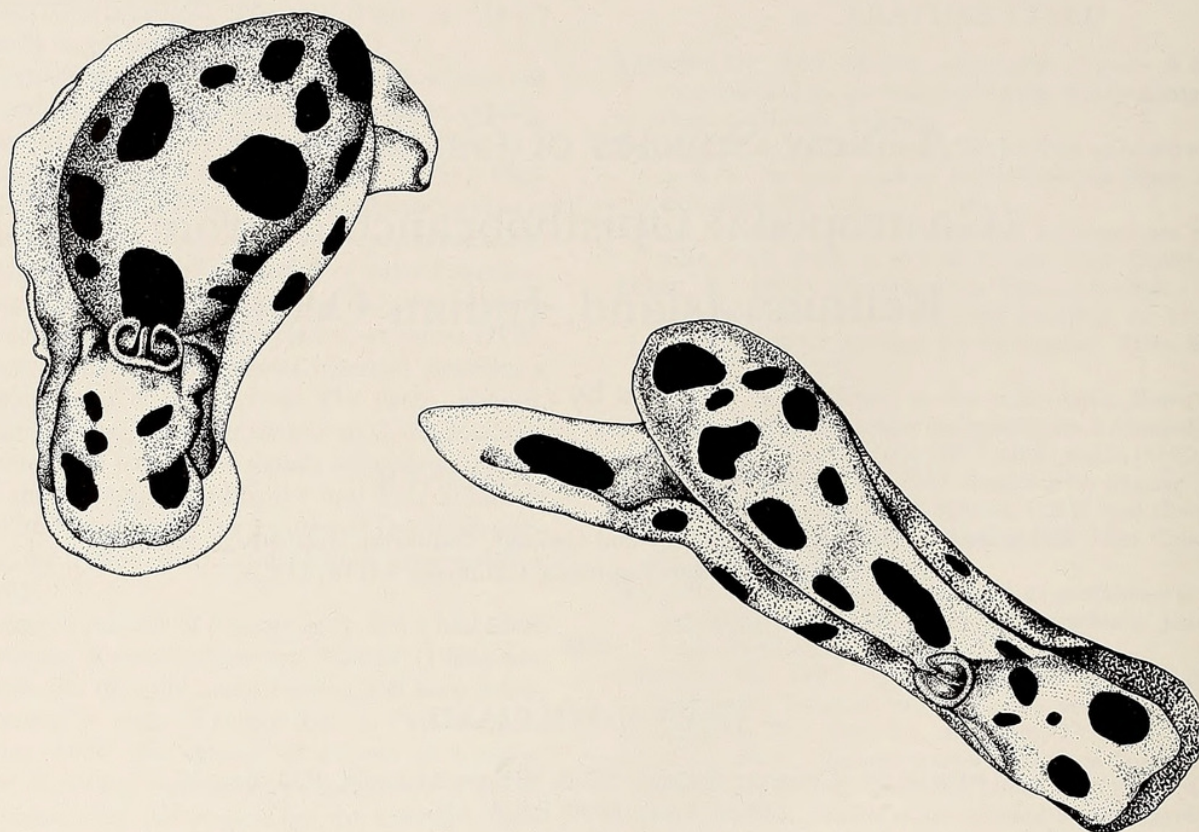


Figure 1

*Gastropteron michaeli* sp. nov., living animal.

ctenidium is poorly developed, consisting of 3 or 4 simple leaflets. The anus is located immediately posterior to the ctenidium. The genital aperture is situated anterior to the ctenidium. From it, the sperm groove runs anteriorly to the male genital aperture on the right side of the head. Owing to fixation of the material in Bouin's solution, the shell, if present, was dissolved.

**Digestive system:** The buccal mass is muscular throughout its length. From the posterior end of the buccal mass, emerges the narrow esophagus. It expands into a short, thin-walled crop, which approximates the buccal mass in size. The crop is devoid of chitinous plates or folds. It narrows again posteriorly, where a short esophageal portion enters the digestive gland. The intestine emerges from the digestive gland, curves posteriorly, and emerges at the anus, posterior to the gill.

Within the buccal mass the jaws are poorly developed, devoid of distinct chitinous rodlets, and reduced to a thin cuticular lining. The radular formula is  $21-22 \times 3.1.0.1.3$ . in the two specimens examined. The inner lateral tooth (Figure 2A) is broad with an elongate cusp and a broad base. The masticatory border of the tooth may be entirely smooth or with up to five irregular denticles along its margin. The presence or absence of denticles varies within

the radula of a single individual. The outer laterals are narrow with a broader base. They are devoid of denticles.

**Central nervous system (Figure 2B):** The arrangement of ganglia is euthyneurous and highly cephalized, with a short visceral loop. The cerebral ganglia are large and appressed to each other. Large nerve thickenings emerge from the anterior and lateral sides of each cerebral ganglion. The pedal ganglia are as large as the cerebrals, and are separated from each other by a short, narrow commissure. The left pleural ganglion is separated from the left cerebral and pedal ganglia by a short connective. Immediately posterior and appressed to the left pleural is the subintestinal ganglion. The larger visceral ganglion is directly behind the subintestinal ganglion. Emanating from the posterior end of the visceral ganglion are three nerves. The innermost of these is the visceral loop. The short visceral loop joins the posterior end of the suprainintestinal ganglion adjacent to the osphradial nerve. The suprainintestinal ganglion is partially fused with the right pleural ganglion.

**Reproductive system (Figure 2C):** The system is monaulic. The ovotestis consists of numerous round bodies. The ampulla is narrow and winding. It narrows further proximally and winds around the outer surface of the



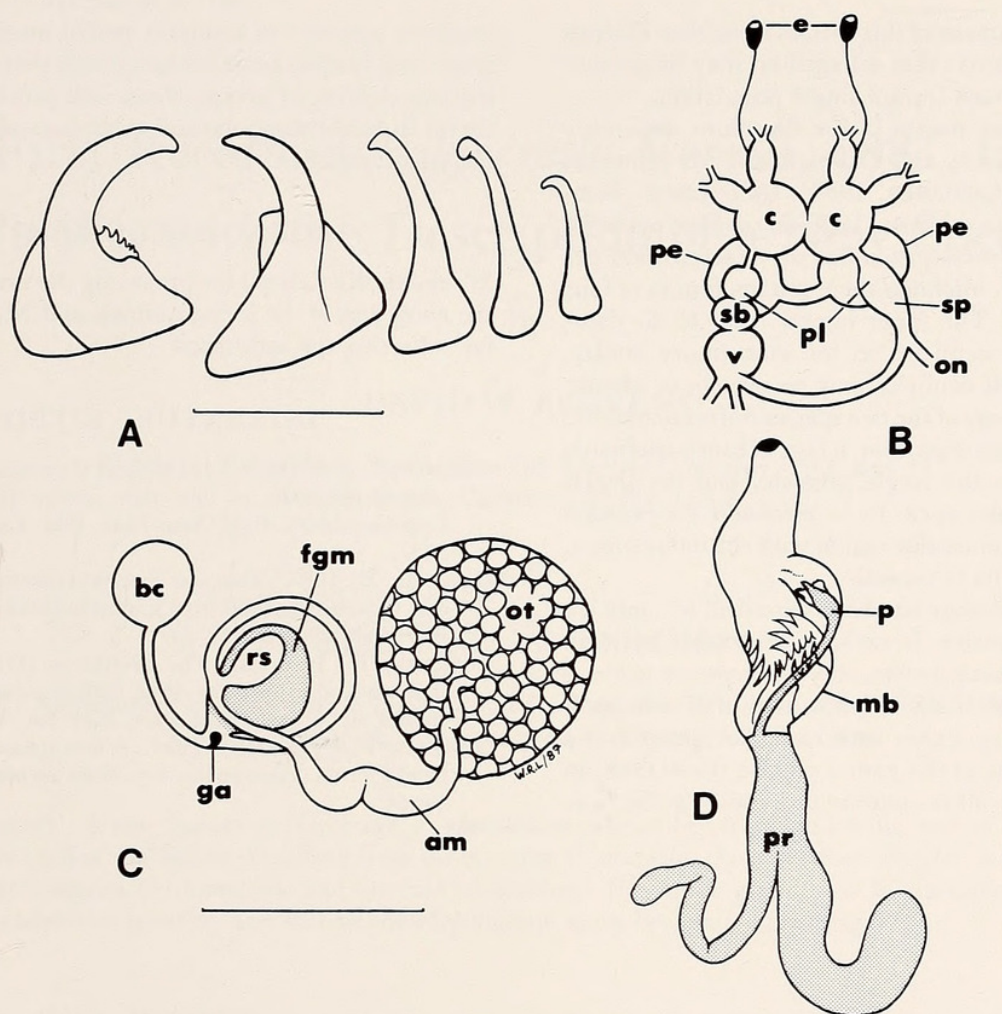


Figure 2

*Gastropteron michaeli* sp. nov. A. Radular teeth, showing variation in inner lateral tooth and outer laterals, scale = 20  $\mu$ m. B. Central nervous system. Key: c, cerebral ganglion; e, eye; on, osphradial nerve; pe, pedal ganglion; pl, pleural ganglion; sb, subintestinal ganglion; sp, supraintestinal ganglion; v, visceral ganglion; scale = 250  $\mu$ m. C. Reproductive system. Key: am, ampulla; bc, bursa copulatrix; fgm, female gland mass; ga, genital atrium; ot, ovotestis; rs, receptaculum seminis; scale = 1.0 mm. D. Penis. Key: mb, muscular bulb with chitinous spines; p, penial papilla; pr, prostate; scale = 0.5 mm.

female gland mass. Near the middle of the hermaphroditic duct, a short duct leads to the pyriform receptaculum seminis. The hermaphroditic duct curves proximally and terminates at the common genital atrium. The spherical, thin-walled bursa copulatrix has a narrow, elongate duct, which also joins the common genital atrium near the gonopore. The female glands could not be differentiated from one another in the fully dissected specimen.

The penis (Figure 2D) is well developed and complex in its structure. The prostate is bilobed, with one of the lobes significantly thicker than the other. The two lobes are united for their proximal one-third. From the proximal end of the prostate, a narrow duct emerges and enters the small, conical penial papilla. A curved fleshy, papilla is situated more proximally, within the penial sac. The largest portion of the prostate enters a bulbous, muscular sec-

tion. Within this muscular region are four rows of curved, chitinous spines. The left lobe has four spines, the posteriormost three, the middle lobe seven, and the anteriormost four. The anterior end of the muscular portion joins the penial sac anteriorly. The penial sac is thin and elongate, terminating at the male gonopore.

## DISCUSSION

In a recent review of the genus, GOSLINER (1984) listed 15 described species of *Gastropteron*. Since then, one additional species, *G. vespertilium* Gosliner & Armes, 1984, has been described. Of these 16 species, only six are known to lack a flagellum or other auxiliary process on the posterior shield. *Gastropteron brunneomarginatum* Carlson & Hoff, 1974, was recorded as lacking a flagellum. However,



examination of specimens of this species from New Guinea (present study) indicates that a flagellum may be present or absent in individuals from a single population.

Of the species that always lack a flagellum, only *Gastropteron flavobrunneum* and *G. michaeli* are yellowish with brown spots (GOSLINER, 1984). *Gastropteron flavobrunneum* is lighter in color and lacks any orange pigment. The radula of *G. flavobrunneum* has six or seven teeth per half row, while in *G. michaeli* there is a maximum of four teeth per half row. The inner lateral teeth of *G. flavobrunneum* lack any denticles on the masticatory border, while in *G. michaeli* denticles may be present or absent. The penial morphology of the two species differs markedly. The penis of *G. flavobrunneum* has a distinct spermatic bulb, in addition to the single prostate, and the penial papilla has a discoidal apex. In *G. michaeli* the prostate is bilobed, there is a muscular region with chitinous spines, and the penial papilla is conical.

The penial morphology has been described for only six of the 16 known species. It varies considerably between species. Of the described species, only *Gastropteron ladrones* Carlson & Hoff, 1974, is similar to that of *G. michaeli* in having a muscular region with cuticular spines and a separate duct leading to the penial papilla (GOSLINER, in press). At least one other undescribed Indo-Pacific *Gas-*

*tropteron* species has a similar penial morphology. It appears that further examination of this character, by staining and clearing of preparations, will provide information useful in establishing natural groupings of species within the Gastropteridae.

#### ACKNOWLEDGMENTS

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