

A NEW *AMPHITHALAMUS* CARPENTER, 1864 SPECIES (GASTROPODA, RISSOIDEA, BARLEEIDAE) FROM THE BRAZILIAN COAST

LUIS RICARDO L. SIMMONE¹

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Abstract: *Amphithalamus glabrus*, a new species of Barleeidae, is described from the coast of São Paulo State, and is the first record of this family in the region.

Key words: *Amphithalamus*, Rissoidea, Brazil.

INTRODUCTION

The genus *Amphithalamus* Carpenter, 1864 (type species *A. inclusus* Carpenter, 1864), Barleeidae – Anabathrinae, was hitherto unknown from the Brazilian coast. *Amphithalamus vallei* Aguayo & Jaume, 1947 was, however, found on the Brazilian oceanic islands of Abrolhos and Atol das Rocas (Leal, 1991).

In studies on the associated fauna of the coral *Mussismilia hispida* (Verrill), in progress by João Miguel M. Nogueira (doctoral thesis), some specimens belonging to the genus *Amphithalamus* were found. Analysis of the shell characters suggested these specimens were of a undescribed species.

Anatomical data on Barleeidae, and in particular on *Amphithalamus*, are scant. Ponder (1983) reviewed the Barleeidae at the generic level, and some anatomical data on *Amphithalamus incidatus* (Frauenfeld) and *A. vallei* Aguayo & Jaume were described. A full historical review on *Amphithalamus* in Western Atlantic waters is given by Rolan, (1991).

MATERIAL AND METHODS

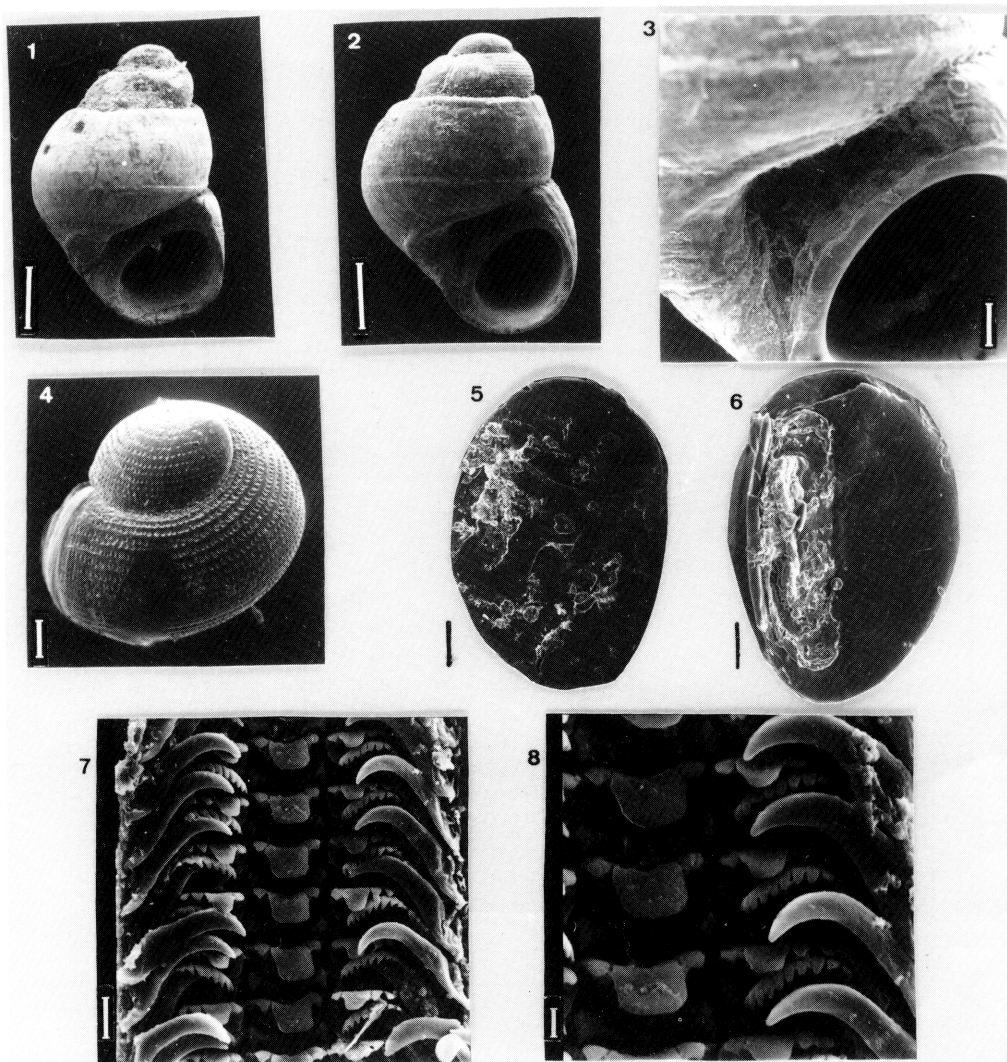
The specimens were collected by scuba-diving, and fixed in 4% formalin, subsequently preserved in 70% ethanol and deposited in the Museu de Zoologia da Universidade de São Paulo (MZUSP) collection.

Two females, studied anatomically, had their shells decalcified in Railliet-Henry fluid, another five specimens, two of them were males, had the head-foot extracted by means of a small hole pierced in the body whorl of the shell. They were then dehydrated in ethanol series, stained in carmine, cleared and fixed in creosote. Serial sections of two specimens were obtained by standard technique, stained by haematoxylin and eosin. Shell, radula and operculum were examined with SEM in the Laboratório de Microscopia Eletrônica do Instituto de Biociências da USP, using the technique of Solem (1970, 1972). All drawings were made with a camera lucida. The systematics and terminology are based on Ponder (1983).

Seção de Moluscos, Museu de Zoologia da Universidade de São Paulo Caixa Postal 7172, CEP 01064-970, São Paulo, SP, Brazil.

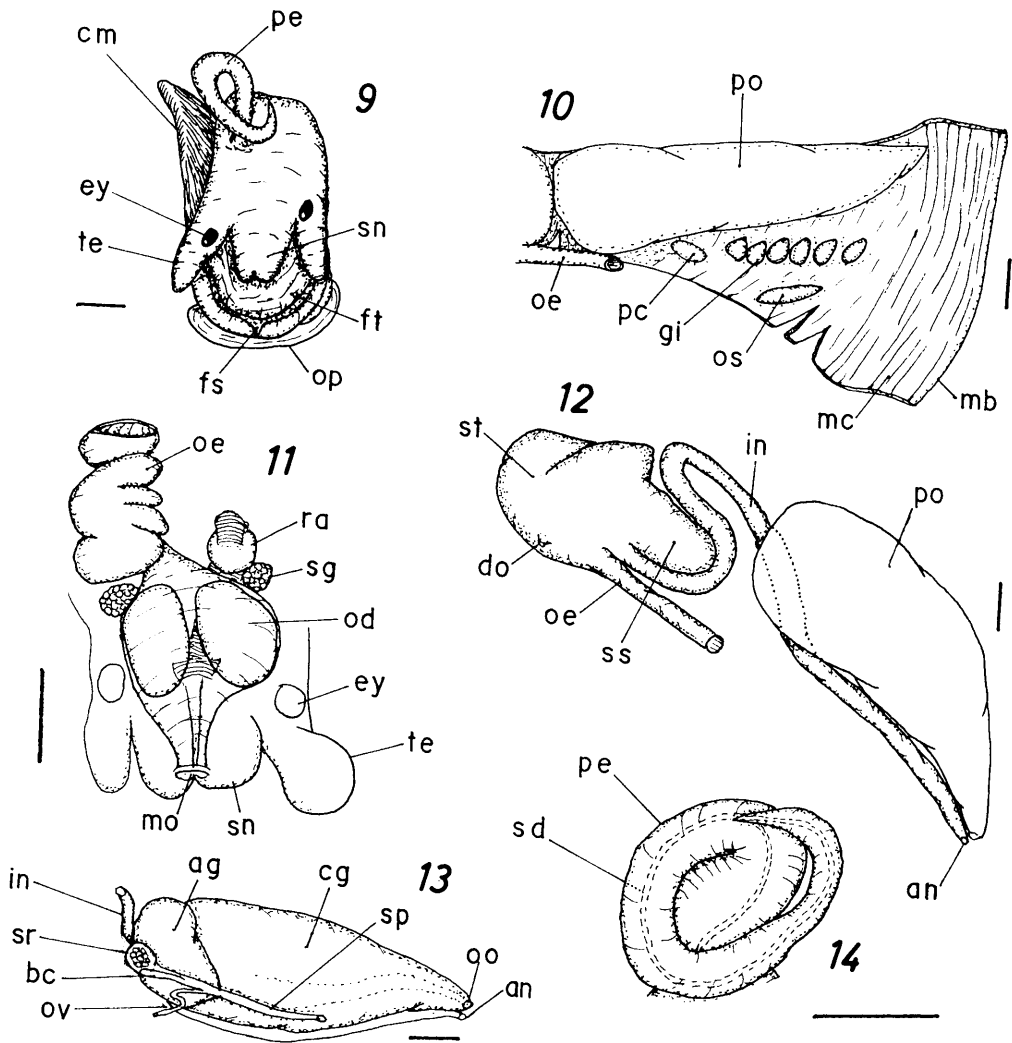
SYSTEMATICS

Amphithalamus glabrus new species
(Figs. 1–15)



Figs. 1 to 8: *Amphithalamus glabrus* n.sp., SEM photos: 1) frontal view of a paratype shell, specimen with periostracum, scale = 200 μm ; 2) the same for a specimen with removed periostracum, scale = 200 μm ; 3) detail of the umbilical region of the same, scale = 50 μm ; 4) protoconch, scale = 50 μm ; 5) outer view of the operculum, scale = 50 μm ; 6) inner view of the same, scale = 50 μm ; 7) radular teeth, scale = 5 μm ; 8) the same, scale = 2 μm .

Types: Holotype: MZUSP 28997. Paratypes: MZUSP 27998, 1 specimen; MZUSP 27999, 5 specimens, all from the type locality; MZUSP 28000, 1 specimen, São Paulo, Ubatuba, Mar Virado Island; MZUSP 28001, 1 juvenile specimen, São Paulo, Ubatuba, Palmas Island;



Figs. 9 to 14: *Amphithalamus glabrus* n.sp., anatomical drawings: 9) head-foot of a male, penis partially uncoiled; 10) pallial organs of a female, inner view; 11) anterior region of the digestive system, ventral view; 12) digestive system, ventral-right view; 13) pallial oviduct, ventral-right view (anterior side at right); 14) penis in dorsal view. Scales = 0.1 mm. Abbreviations: ag, albumen gland; an, anus; bc, bursa copulatrix; cg, capsule gland; cm, columellar muscle; do, digestive gland cut; ey, eyes; fs, foot slit; ft, foot; gi, gill; in, intestine; mb, mantle border; mc, mantle collar; mo, mouth; od, odontophore; oe, oesophagus; oo, oviducal opening; op, operculum; os, osphradium; ov, oviduct; pc, pericardium; pe, penis; po, pallial oviduct (scheme); ra, radular nucleus; sg, salivary gland; sn, snout; sp, spermathecal duct; sr, seminal receptacle; ss, style sac; st, stomach; te, tentacle.

MZUSP 28002, 2 specimens, São Paulo, Ubatuba, Mar Virado Island. MZUSP 28003, 2 specimens, São Sebastião, Vitória Island, Professora Bay.

Type locality: Brazil, São Paulo State, São Sebastião city, Vitória Island, 23°45'S 45°01'W.

Diagnosis: Shell with rounded body whorl, without carina or perisutural sculpture, small aperture, low spire, suture rather shallow. Operculum thickened around insertion region.

Oesophagus entering stomach close to exist of intestine, style sac without style. Penis with long-slender tip. Pallial oviduct long and sharp anteriorly.

Description: Shell (figs. 1-4): very small (to 1.2 mm), ovate-conic, pale-brown in colour, somewhat transparent. Protoconch (fig. 4) dome-shaped, about 1.25 whorls; sculptured by spiral rows of minute pits. Teleoconch up to two convex whorls, with obsolete growth lines and spiral lines; a low median spiral ridge is found at the beginning of the body whorl (figs. 1, 2). Periostracum thick, velvety (fig. 1), yellowish. Suture rather shallow. Aperture rounded and proportionally small, outer lip orthocone. Umbilical region with low-spiral folds between inner lip and parietal wall; a callus in superior region, near to suture (fig. 3).

Inner chitinous layer very conspicuous when the shell is decalcified, glossy, pale-brown in colour.

Head-foot (fig. 9): Snout short, bilobed. Cephalic tentacles rather long, paddle-shaped, inconspicuously ciliated. Dark eyes at outer tentacles bases, not bulged. Foot short, simple, with posterior mucous gland opening by a longitudinal slit reaching to posterior end. Anterior mucous gland present. Basic colour pale-yellow with dark pigment posteriorly to the eyes.

Operculum (figs. 5, 6): corneous, elliptical, pseudoconcentric, eccentric nucleus, without pegs (fig. 5), transparent-yellowish, conspicuously double-layered. Occupies all aperture. Thickened at its insertion region (fig. 6).

Pallial cavity (fig. 10): about one whorl in length. Mantle border simple, without tentacles nor siphon; broad and thin mantle collar. Gill transversal, with six finger-shaped filaments. Osphradium elliptic, rather long, about a half of the gill length.

Digestive system: oral tube conspicuous, without jaws (fig. 11). Odontophore with a pair of elliptical cartilages. Radula (figs 7, 8): rachidian 1.1/2, with a broad, blunt medium cusp and small, sharp lateral cusps; a pair of small denticles near outer edge; weakly thickened lateral margins at about 45°; ventral margin of rachidian with tongue-like extension. Lateral teeth 1+1+2, primary cusp blunt. Inner marginal teeth simple, curved, with 10 small, rather regular cusps. Outer marginal teeth simple, curved, outer margin smooth, inner margin with about 5 small cusps (fig. 7, bottom-right). A pair of small salivary vesicles just posterior to the odontophore (fig. 11). Oesophagus with some glandular folds in its anterior portion (fig. 11), and simple, without pouches nor special glands in its posterior portion (fig. 12). Stomach spacious (fig. 12), rather long, style sac (about equal in length to the remainder of the stomach) no crystalline style could be found; single digestive gland opening. Intestine narrow, originates near the oesophageic insertion, has typical features (fig. 12). Rectum, runs above and behind the posterior edge of the pallial oviduct (of females), then emerges from the left and runs alongside the pallial oviduct to the anus (fig. 12).

Genital system:

Male: testis (viewed through the shell) not distinctly lobate. Penis (figs. 9, 14) proportionally small and coiled, far back in the head, discretely at right; penis approximately the same length as the pallial cavity when straightened (fig. 9). Penial duct closed simple, non-undulating, near the outer surface of the penis. Penial opening situated at the pointed, distal end of the penis, which is conspicuously slender (fig. 14).

Female: pallial oviduct long (fig. 13). Albumen gland short; capsule gland long (about $\frac{3}{4}$ of total length of the pallial oviduct) and sharply pointed anteriorly, which has the oviduct opening at its tip. Seminal receptacle short and rounded. Bursa copulatrix slender and about the same length of seminal receptacle. Spermathecal tube short with opening to the pallial cavity (fig. 13).

Habitat: the specimens studied were found crawling on coral *Mussismilia hispida*, in about 5 m water depth.

Range: Brazil, São Paulo State, from Ubatuba to São Sebastião, infratidal.

Measurements: (respectively length and width) MZUSP 27997 (holotype) 0.8 by 0.5 mm; MZUSP 27999 (2 paratypes) 0.8 by 0.6 and 0.9 by 0.6.

Etymology: the specific name refers to almost smooth (*glabra*) surface of the shell, which lacks well developed carina or sculpture.

DISCUSSION

Amphithalamus glabrus differs from *A. vallei* (Leal, 1991) in having a shallower suture, taller spire, aperture smaller and in lacking spiral carina.

The operculum of *A. glabrus* differs from those of other congeneric species (Ponder 1983; Rolán 1991) in having the insertion region thickened (fig. 6), in the other species this region is a depressed scar. The low spire, the less dense protoconch sculpture, the absence of subsutural striae, and the head-foot color pattern, also separate *A. glabrus* from the four Cubanian *Amphithalamus* species (Rolán 1991).

The stomach of *A. glabrus* is similar to that of *A. incidatus* (Ponder 1983), but the insertion of the oesophagus is closer to the intestine origin, and the style sac is longer. No jaws and style (within style sac) could be found in *A. glabrus*.

The penis of *A. glabrus* has the slender tip, longer than that of *A. incidatus* (Ponder 1983) whereas the pallial oviduct has a shorter and more rounded seminal receptacle and a sharper anterior region (Ponder 1983).

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