

PANOPEA ABBREVIATA (BIVALVIA: HIATELLIDAE) IN THE
SOUTHWESTERN ATLANTIC OCEAN, TAXONOMIC REVISION AND ANATOMY

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ABSTRACT

The taxonomy and anatomy of the southwestern Atlantic geoduck, *Panopea abbreviata* Valenciennes, 1839, are revised. Materials from several institutions, as well as new living specimens collected from the coast of Argentina were studied. Type materials of all related nominal species are illustrated. The shell morphology, shell ultrastructure, hinge, ligament and mantle cavity organs are described. The symbiotic relationship with the nemertean *Malacobdella arrokeana*, attached to host mantle tissues, is mentioned. *Panopea abbreviata* is abundant in the gulfs of northern Patagonia. It occurs in the subtidal zone from 8 to 25 meters deep, deeply buried in the sediment. It has a large thick shell, shortener at the posterior end, with exposed siphons covered by a dark brownish periostracum; a hinge plate characterized by a single cardinal tooth in each valve; and shell ultrastructure with three layers: an outer layer of nearly vertical and composite prisms, a middle, true homogeneous layer, and an inner layer of alternating sublayers of fine complex crossed lamellar and irregular simple prisms. The fused mantle is only interrupted in the pedal gape. Ctenidia and labial palps association belongs to the Category III and ctenidia type C(1). *Panopea antarctica* is its only synonym. The fossil taxa *Panopea truncata*, *P. inferior*, *P. hauthali*, *P. coquimbensis* and *P. guayacanensis* are excluded from the synonymy.

Key words: *Panopea*, Argentina, taxonomy, anatomy, Hiatellidae.

INTRODUCTION

The suprageneric arrangement of the family Hiatellidae Gray, 1824, was revised by Carter et al. (2011), in which the new Order Hiatellida was introduced to group the superfamilies Edmondioidea W. King, 1850, and Hiatelloidea J. Gray, 1824. Other phylogenetic analyses confirm the relationship of Hiatellidae with the Solenidae and Pharidae (Solenioidea) as a sister group, and excludes it from the Myoida (Adamkewicz et al., 1997; Taylor et al., 2007, among others).

Nine genus-level names were included as valid in the Hiatellidae by Keen (1969). *Degran-gia* Cossmann & Peyrot, 1909, and *Panomya* Gray, 1857, were considered subgenera of *Panopea* by Keen. However, they have since been regarded as valid genera (Yonge, 1971; Vaught, 1989; Huber, 2010).

The genus *Panopea* was introduced by Ménard de la Groye (1807). An historical review of this genus was carried out by Dall (1912). He reviewed the previous illustrations of this genus

from Aldrovandus in 1606 to Ménard de la Groye in 1807, who finally gave the name of *Panopea aldrovandi* to the Mediterranean species. Dall (1912) mentioned that *Panope*, published in a separate “Mémoire”, should be accepted instead *Panopea*, published in the *Annales du Muséum d’Histoire Naturelle*. This taxonomic issue was submitted to the International Commission on Zoological Nomenclature by Vokes & Cox (1961), and almost 25 years after their proposal, the ICZN ruled the correct name to be *Panopea* (ICZN, 1986; Opinion 1414).

Other members of this genus have been studied in different parts of the world. In the northeast Pacific Ocean, several aspects of the biology of *P. generosa*, such as, functional morphology, ecology, morphometry, aquaculture and taxonomic reviews have been carried out (Bower & Blackburn, 2003; Feldman et al., 2004; Fisher et al., 2008; Goodwin & Pease, 1991; Rocha Olivares et al., 2010; Marshall et al., 2012; Leyva-Valencia et al., 2012). In some publications, the name *P. abrupta* (Conrad, 1849) was

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considered as valid, with *P. generosa* regarded as a junior synonym. However, Vadopalas et al. (2010) recognized the Recent *P. generosa* as valid and excluded it from the synonymy of Conrad's fossil species. Arambula-Pujol et al. (2008) studied the reproductive biology of *Panopea globosa* (Dall, 1898) in the Gulf of California. The functional morphology of several species of this family was studied by Yonge (1971).

Along the southwestern Atlantic Ocean, the family Hiattellidae is represented by about 14 species (Carcelles, 1944; Carcelles & Williamson, 1951; Castellanos, 1970; Abbott & Dance, 1986; Scarabino, 2003; Rios, 2009), but only one species of *Panopea* is commonly cited. The geoduck *Panopea abbreviata* (Valenciennes, 1839) is an endemic species well represented all along the Argentine coast (Carcelles, 1944; Carcelles & Williamson, 1951; Castellanos, 1970). It was mentioned by Bernard (1983) as occurring in the Pliocene and as the senior synonym of several species described from the fossil record of Chile and Argentina.

In recent years, this species has been studied as a possible target of artisanal fisheries in north Patagonia (Ciocco et al., 2001; Morsán & Ciocco, 2004; Narvarte & Filippo, 2007; Morsán et al., 2010). The reproductive cycle of *P. abbreviata* was studied by Van der Molen et al. (2007) and Zaidman et al. (2012). The development of these fisheries allowed the study of biological interactions between the geoduck and other organisms. The most studied has been the presence of the symbiotic nemertean *Malacobdella arrokeana* Ivanov, Bigatti, Penschazadeh & Norenburg, 2002, in its mantle cavity (Ivanov et al., 2002; Martorelli et al., 2003; Vázquez et al., 2009, 2010; Teso et al., 2006; Alfaya et al., 2013). In addition, a new species of flat worm (Platyhelminthes) living in the intestine of *P. abbreviata* was recently described (Brusa et al., 2011). During an ongoing study of genetics, population structure and reproduction of the nemertean *Malacobdella arrokeana* the taxonomic revision and anatomical description of *Panopea abbreviata* was carried out. In addition, the type material of related nominal species was illustrated.

MATERIALS AND METHODS

Living specimens were collected by scuba diving at 20 m from San José gulf (42°24'11"S, 64°17'10"W) (Fig. 1). The microstructure of the valves was analyzed with a scanning electron microscope (JEOL JSM-6460LV, Aluar S.A).

The outer shell layer was revealed at posterior shell margin radial section, the middle layer just exterior to the pallial line and the inner layer in the umbonal region. All shell sections were polished with 500 grit sandpaper followed by 1,000 grit sandpaper, then etched the surfaces with 2% hydrochloric for 40 seconds. All type material and additional specimens studied are deposited in the following institutions: Centro Nacional Patagónico (CNP-Inv), Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" (MACN-In), Buenos Aires; Museo de la Plata (MLP); Muséum National d'Histoire Naturelle (MNHN), Paris; Rio Grande do Sul; Museu de Zoologia da Universidade de São Paulo (MZUSP) and the National Museum of Natural History, Smithsonian Institution (USNM), Washington D.C., United States.

Morphological Abbreviations

a	anus
aa	ascendant arm
aam	anterior adductor muscle
cs	ctenidial septum
ct	cardinal tooth
da	descendent arm
dd	digestive diverticula
es	excurrent siphons
fs	fibrous sublayer
f	foot
fg	food groove
g	gonad
hd	hindgut
id	inner demibranch
ilp	inner labial palp
is	incurrent siphon
la	left auricle
lc	left caecum
ls	lamellar sublayer
m	mouth
mc	mantle cavity
md	midgut
od	outer demibranch
olp	outer labial palp
pam	posterior adductor muscle
pa	papillae
p	periostracum
pn	pseudonymphal ridge
r	rectum
ra	right auricle
sa	supporting axis
sae	supraaxial extension
sps	siphonal pallial septum
st	stomach
t	tentacle
v	ventricle



FIG. 1. Distribution map of *Panopea abbreviata* with a detail of collecting localities.

SYSTEMATIC RESULTS

Order Hiatellida Carter, 2011
 Superfamily Hiatelloidea J. Gray, 1824
 Family Hiatellidae J. Gray, 1824
 Subfamily Panopeinae
 Bronn, 1862

Genus *Panopea* Ménéard de la Groye, 1807 (p. 135)

[= *Glycimeris* Lamarck, 1799; type species: *Mya glycimeris* Born, 1778, by tautonymy (suppressed for the purposes of the Principle of Priority by the ICZN, 1986; Opinion 1414); *Panope* Ménéard de la Groye, 1807 (*nom. null.*); *Panodea* Oken, 1817 (*nom. null.*); *Panopaea* Lamarck, 1818 (*nom. null.*); *Myopsis* Agassiz 1840; type species: *Mya mandibula* J. Sowerby, 1813, by the subsequent designation of Cox, 1964; *Heteromya*

Mayer-Eymar 1884; type species: *Panopea (Heteromya) lessepsi* Mayer-Eymar, 1884, by monotypy; *Capistrocardia* Tate, 1887; type species: *Capistrocardia fragilis* Tate, 1887, by original designation].

Type species: Panopea aldrovandi Ménéard de la Groye, 1807 (= *Mya glycimeris* Born, 1778), by subsequent designation of Children, 1822. Pliocene-Recent, Europe.

Remarks

Panopea aldrovandi Ménéard de la Groye, 1807 (= *Mya glycimeris* Born, 1778) is regarded as having been fixed as the type species of the genus by the subsequent designation of Children (1822: 84). A few years prior, Fleming (1818) designated as type *Mya glycimeris* Born, 1778, a designation that was accepted by Winckworth (1929) and later by Keen (1969).

However, the ICZN (1986, Opinion 1414) concluded that Fleming's identification was invalid because *Mya glycimeris* Born was not originally included in *Panopea*.

Panopea abbreviata
Valenciennes, 1839
(Figs. 2–9)

Panopea abbreviata Valenciennes, 1839: 18, pl. 6, fig. 1a, b; Valenciennes, 1843: pl. 9, fig. 1; Lamy, 1925: 276; Castellanos, 1970: 265; Rios, 1975: 253, pl. 80, fig. 1213; 1994: 294, pl. 100, fig. 1433; 2009: 589, fig. 1628; Scarabino, 1977: 214; Lasta et al., 1998: 130, fig. 5d; Scarabino, 2003: 240; Scarabino et al., 2006: 164.

Panopaea abbreviata (Valenciennes) – d'Orbigny, 1846: 509; Woodward, 1854: 220; Woodward, 1856: 378; Mayer-Eymar, 1870: 68; Woodward, 1870: 87; G. B. Sowerby II, 1873: pl. 6, fig. 10; Clessin, 1895: 50, pl. 18, fig. 3.

Panopaea antarctica Gould, 1850: 214; 1852: 386; 1862: 74; H. Adams & A. Adams, 1856: 350.

Glycimeris abbreviata (Valenciennes) – H. Adams & A. Adams, 1856: 350; Tryon, 1868: 60.

Panope abbreviata (Valenciennes) – Carcelles, 1944: 294, pl. 14, fig. 114; Carcelles & Williamson, 1951: 346; Barattini & Ureta, 1961: 183; Figueiras & Sicardi, 1970: 409.

Type Material: *Panopea abbreviata* Valenciennes, 1839, MNHN 25707, two syntypes (Figs. 2–7); *Panopea antarctica* Gould, 1850, USNM 17515, holotype (Figs. 8, 9).

Type Locality: Mouth of Rio Negro, Patagonia, Argentina.

Other Material Examined: Brazil – Niterói, Rio de Janeiro (MZUSP 106418, collected in 1969); São Sebastião, Barra Velha (MZUSP 189720130); Santa Catarina, Cabo Santa Marta (MZUSP 20131, 137 m depth); Santa Catarina Laguna (MZUSP 32714, 110–130 m depth, collected in 2000). Uruguay – Montevideo (MACN 15187); 85 miles southeast from Puerto La Paloma (MACN 16634). Argentina – Mar Chiquita (MLP 2565); Mar del Plata (MACN 377, 9361, 16688, 10309, 9361-38, 10229, 9154-8, 19162, 9379-14, 29560, 15781; MLP 1879, 2087, 2421, 4889); Puerto Quequén (MACN 21071, 416); Bahía San Blas (MACN 20232); Mouth of Río Negro

(MACN 20649); San Antonio Oeste (MACN 9379-12, 13345, 13135, 9151-12, 9379-13; MLP 2706; MZUSP 13134); San Matías gulf (MACN 21277); San José gulf (MACN 9175-24; MLP 2744, 13203); Puerto Pirámides, Nuevo gulf (MACN 26442); Punta Norte, Valdez peninsula (MACN 11492); Punta Ninfas, Nuevo gulf (USNM 869774).

Distribution

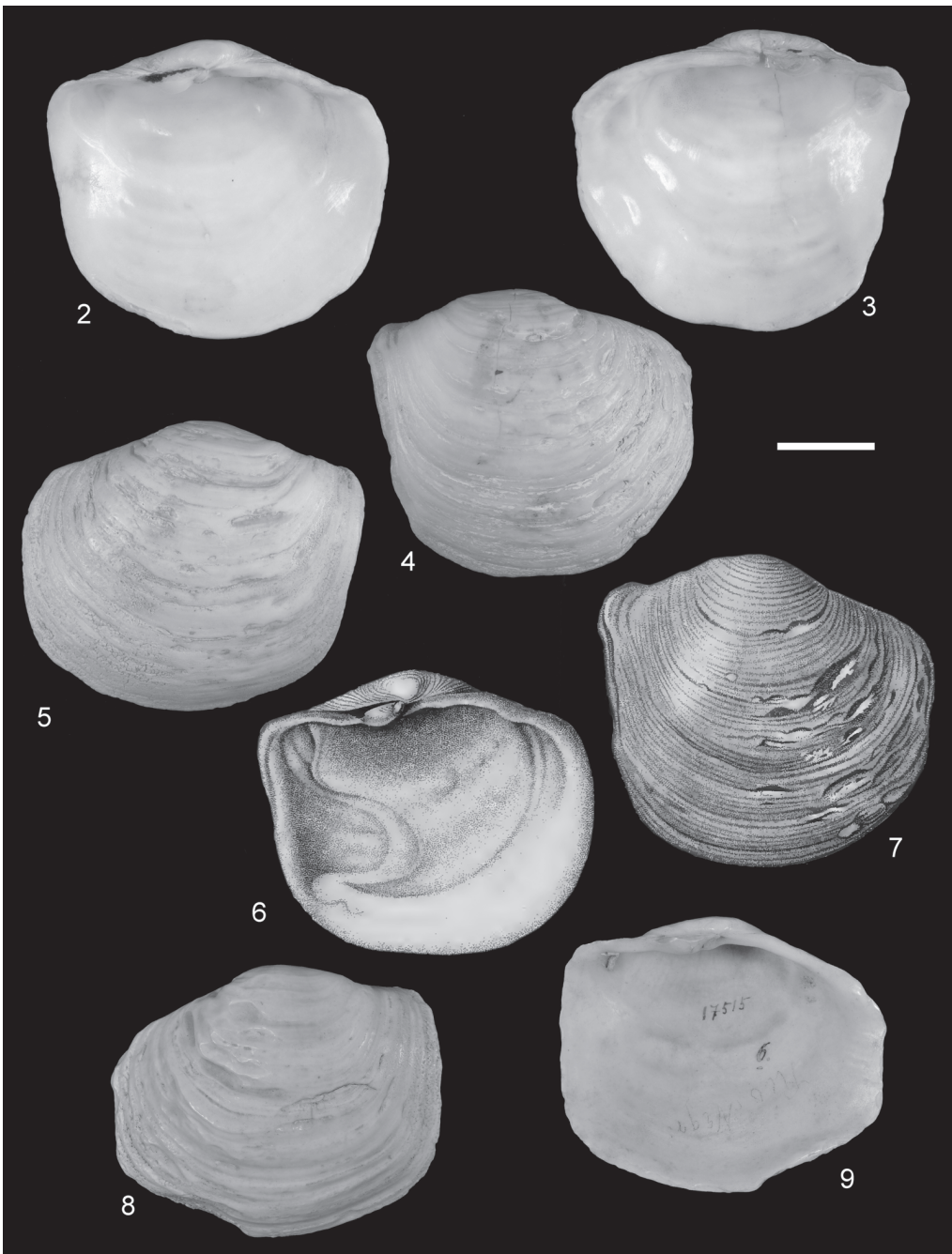
From Rio de Janeiro, Brazil, to Nuevo Gulf, Chubut Province, Argentina.

Diagnosis

Shell thick, rounded, large, up to 15 cm, gaping widely at both ends, elongated but posteriorly shortened, inflated; external ligament strong; periostracum dark brownish; ultrastructure outer prismatic, middle homogeneous and inner complex crossed lamellar (CCL) layers; cardinal tooth sharp, erect.

Description

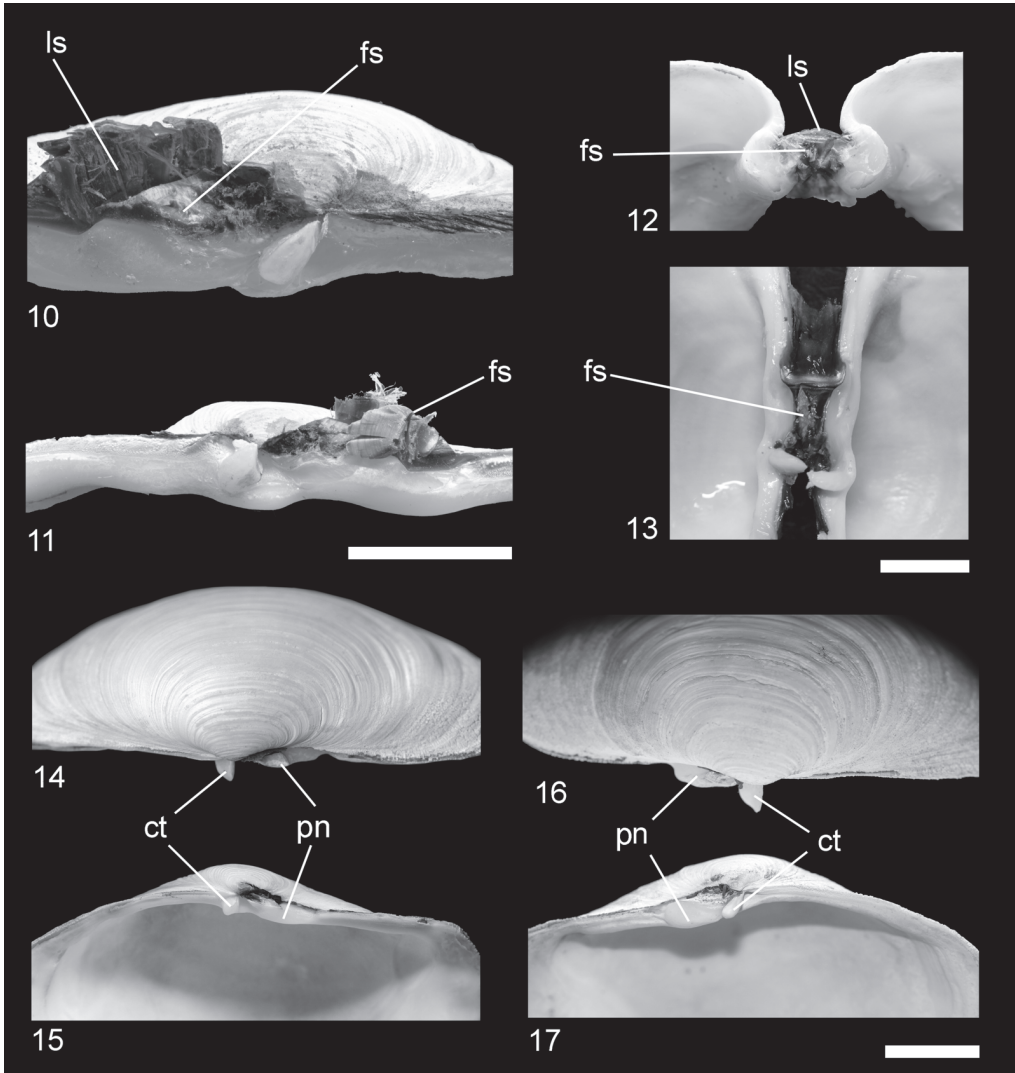
Shell: Thick, large, up to 15 cm length, externally white, surface smooth with irregular growth lines, covered by a thin, yellowish-green periostracum; umbo slightly inflated, prosogyrate; lunule and escutcheon not defined; antero-posteriorly elongated, but shortened at posterior end, anteriorly rounded, ventral margin rounded and usually eroded; widely gaping at both ends; all exposed siphons and tissues covered by dark brownish periostracum (Fig. 18); internally white, pallial line separated from ventral edge of shell about 1.5 cm, pallial sinus U-shaped, higher than deep; adductor muscle scar clearly visible, the anterior larger; nymphal ridge very prominent at posterior side of hinge; external ligament strong, quasiparavincular, wide, dark brown, opisthodic, on strong pseudonymph, with fibrous sublayers attached to dorsal and lateral surfaces of pseudonymph and covered by the lamellar sublayer (Figs. 10–13); hinge plate characterized by sharp, erect single cardinal tooth in each valve, fitting into corresponding socket in other valve (Figs. 14–17); ultrastructure of the shell with three layers (Figs. 23–28): an outer layer of nearly vertical and composite prisms (Figs. 24, 25), a middle true homogeneous layer of rounded units (Fig. 26) and a complex crossed lamellar inner layer with intercalations of irregular simple prisms (Figs. 27, 28).



FIGS. 2–9. *Panopea* spp. FIGS. 2–5: *Panopea abbreviata* Valenciennes, 1839, MNHN 25707, two syntypes; FIGS. 6, 7: *P. abbreviata* original illustration; FIGS. 8, 9: *Panopea antarctica* Gould, 1850, USNM 17515, holotype. Scale bar = 2 cm.

Mantle Cavity Organs: The mantle fusion is only interrupted at the pedal gape, which is anteriorly positioned. Inside the large mantle cavity, two pairs of labial palps surround the mouth, the inner one longer than wider (Figs. 19, 33); the association of ctenidia and labial palps is Category III of Stasek (1963), wherein the ventral tips of the anterior filaments of the inner demibranch are not inserted into the distal

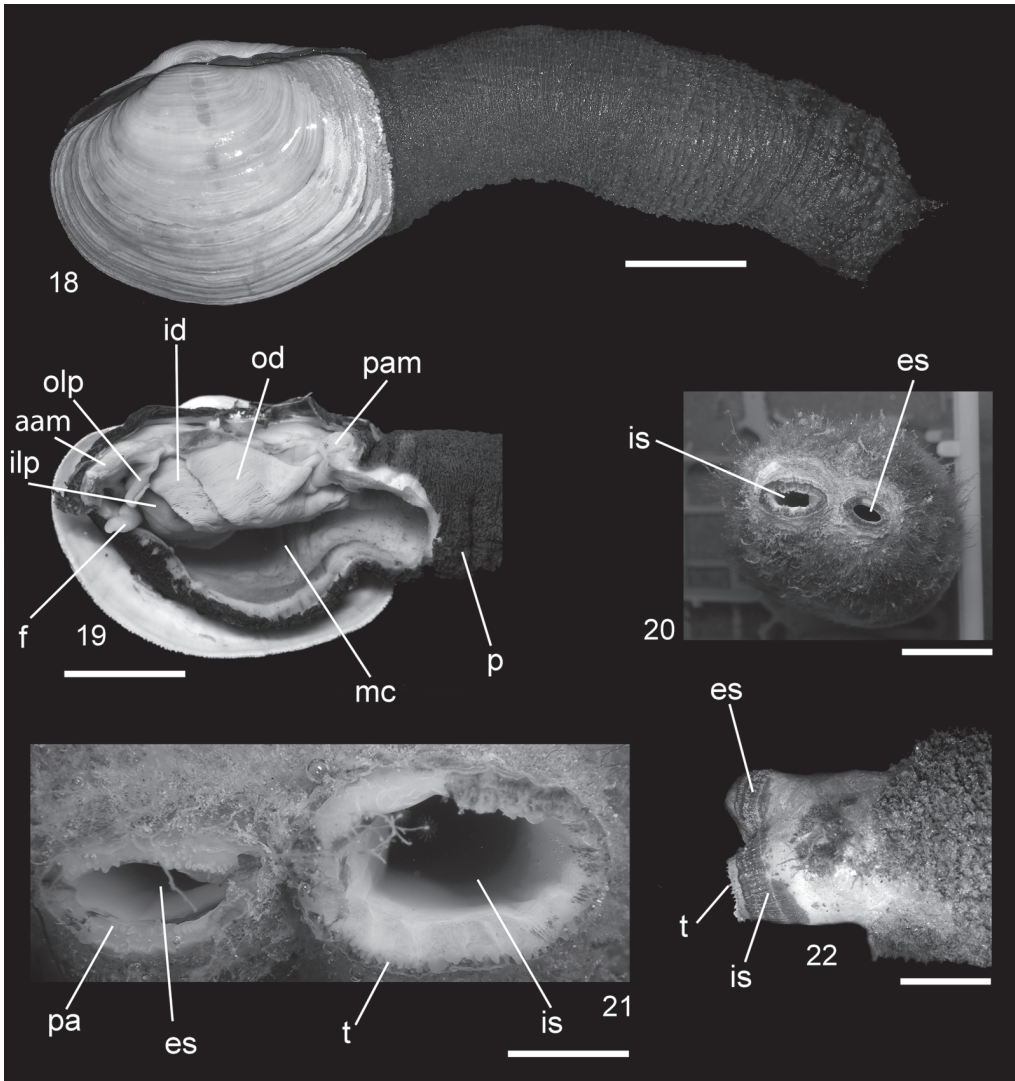
oral groove. However, the anteroventral margin of the inner demibranch is fused to the inner palp lamella. The ctenidia surround the visceral mass laterally (Figs. 29, 30); they belong to type C (1) of Atkins (1937), characterized by an outer demibranch with a distinct supra-axial extension and food groove only present in the inner demibranch (Fig. 31), the outer demibranch less deep than the inner. Frontal currents at



FIGS. 10–17. *Panopea abbreviata*. FIGS. 10–13: External ligament showing fibrous sublayers attached to dorsal and lateral surfaces of pseudonymph covered by lamellar sublayer. Scale bar = 1 cm; FIGS. 14, 15: Right hinge; FIGS. 16, 17: Left hinge.

both sides of inner demibranch go to the food groove. The oral current is observed along the groove as well as between the bases of the two demibranchs on each side of the body. In the outer demibranch, particles are carried ventrally on the ascending lamella and dorsally on the descending lamella (Fig. 31). Ctenidial septum with two rows of perforations that separate the suprabranchial and infrabranchial chambers

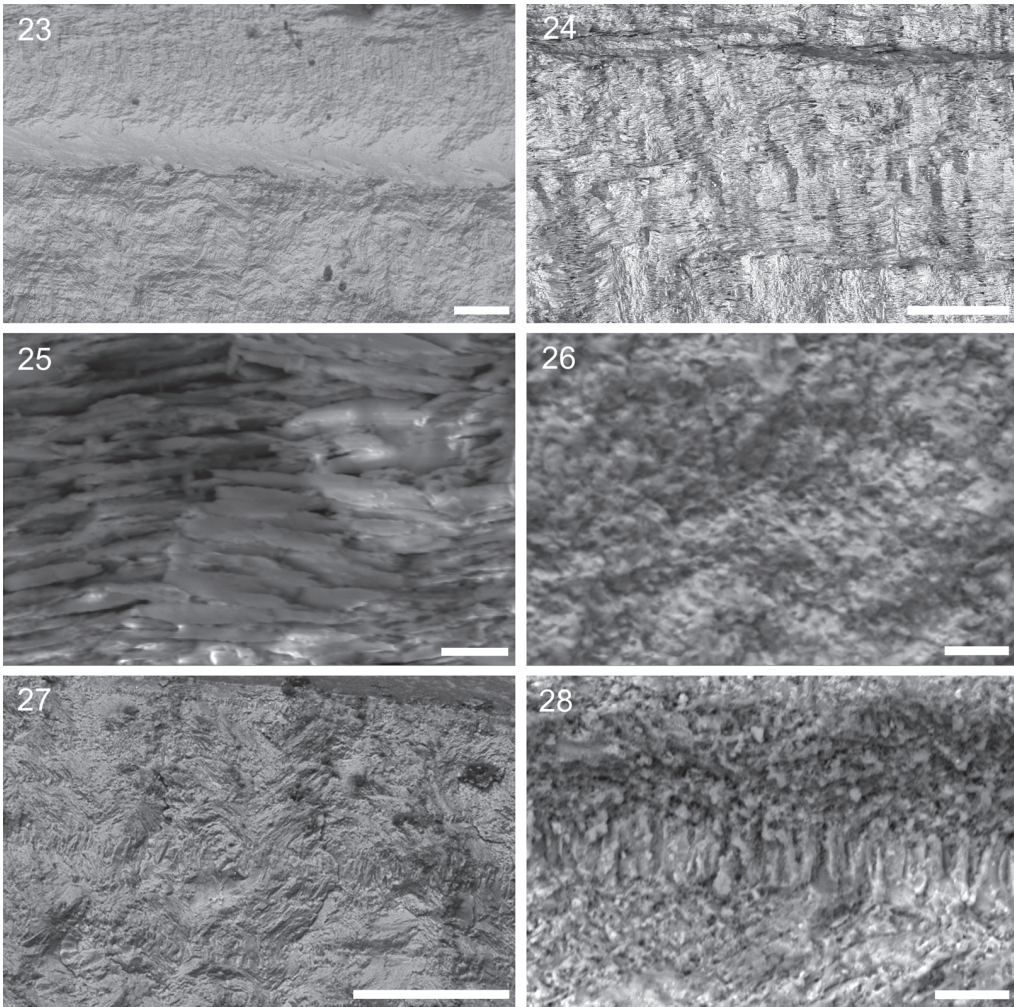
(Fig. 32). It is placed posterodorsal to the visceral mass, and behind it is positioned the base of the siphons. A short, anteriorly directed, rudimentary foot is present at the anterior side of the body (Figs. 29, 30). The adductor muscles are large, the anterior slightly larger than the posterior (Fig. 19); siphons large, hypertrophied, about two times shell length, completely covered, together with all pallial surfaces, with



FIGS. 18–22. *Panopea abbreviata*. FIG. 18: General aspect. Scale bar = 4 cm; FIG. 19: Mantle cavity organs. Scale bar = 4 cm; FIGS. 20–22: Excurrent and incurrent siphons with papillae and short tentacles along the aperture respectively. Scale bar Figs. 20, 22 = 1 cm, Fig. 21 = 5 mm.

a thick, wrinkled, dark brownish periostracum, near the aperture with symbiotic red algae (Figs. 20–22); with small papillae along aperture ring in the excurrent siphon; and with short, irregular tentacles surrounding the apertures in the incurrent siphon (Figs. 20–22); it belongs to type C of Yonge (1957, 1982) formed by fusion of all surfaces of the inner and middle mantle folds (*sensu* Yonge, 1982; Carter et al., 2012), evidenced by the posterior position of

the periostracal groove encircling both siphonal apertures; siphonal pallial septum strong separating the incurrent and excurrent channels by the fused left and right mantle tissue (Fig. 34). Alimentary canal with a mouth followed by a short esophagus that enters the stomach anterodorsally (Figs. 37, 38). The style sac and the midgut are combined leaving the stomach ventrally (Fig. 37); the coiled intestine passes backward through the right side of the visceral

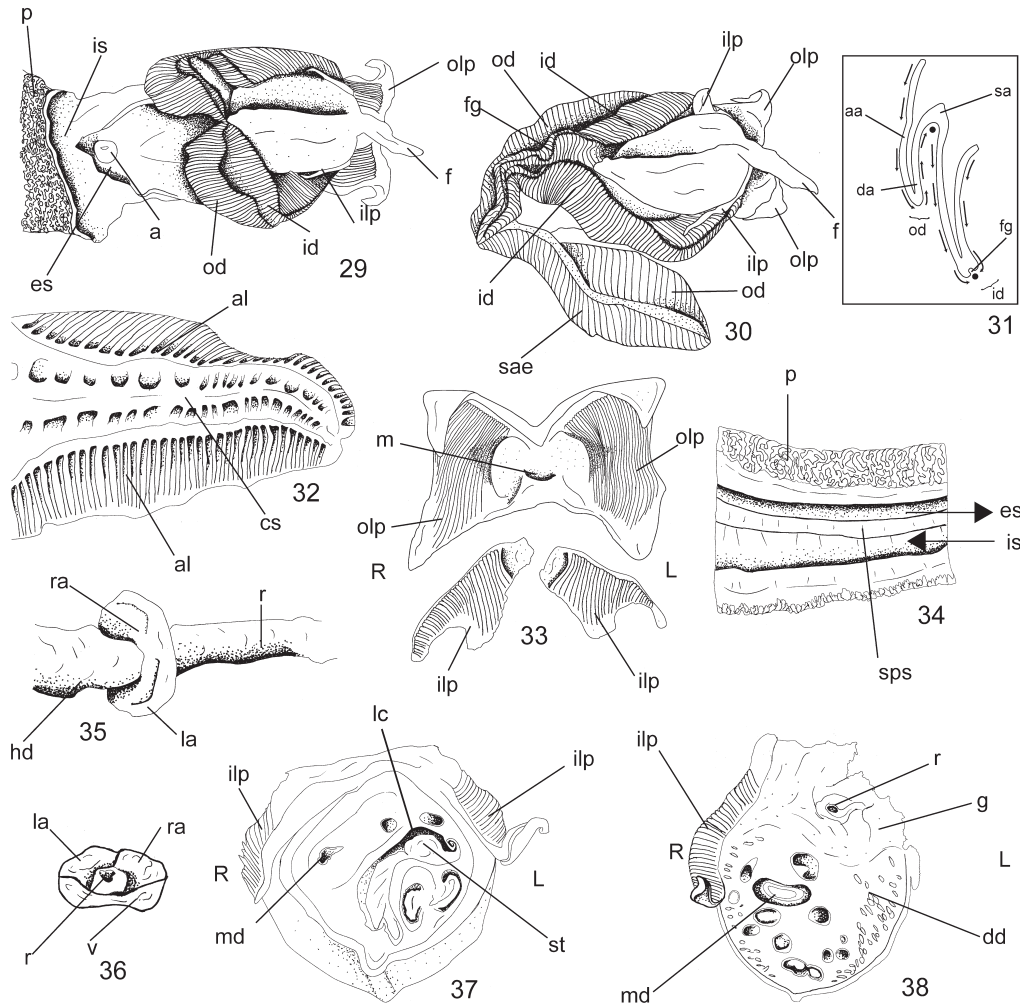


FIGS. 23–28. Shell ultrastructure. FIG. 23: Three layers. Scale bar = 100 μm ; FIGS. 24, 25: Detail of vertical and composite prisms of outer layer. Scale bar = 100 μm and 5 μm respectively; FIG. 26: Middle true homogeneous layer. Scale bar = 10 μm ; FIG. 27: Complex crossed lamellar inner layer. Scale bar = 100 μm ; FIG. 28: Detail of intercalations of irregular simple prisms in the inner layer. Scale bar = 10 μm .

mass ascending to the pericardial cavity as the hindgut, then it passes through the heart to end in the rectum and posteriorly in the anus. The stomach of *P. abbreviata* belongs to Type IVa *sensu* Purchon (1987, 1990) and Carter et al. (2012). The major typhlosole is curved to the left in an incomplete spiral; it goes together with the intestinal groove to its anterior end passing towards the left caecum (Fig. 37). Circulatory sys-

tem pumped by a muscular heart that surrounds the hindgut-rectum placed in a posterodorsal position between visceral mass and posterior adductor muscle in the pericardial cavity, with two inflated auricles, dorsally positioned and one ventral ventricle (Figs. 35, 36).

Symbiosis with Malacobdella arrokeana: The symbiotic relationship between *P. abbreviata*



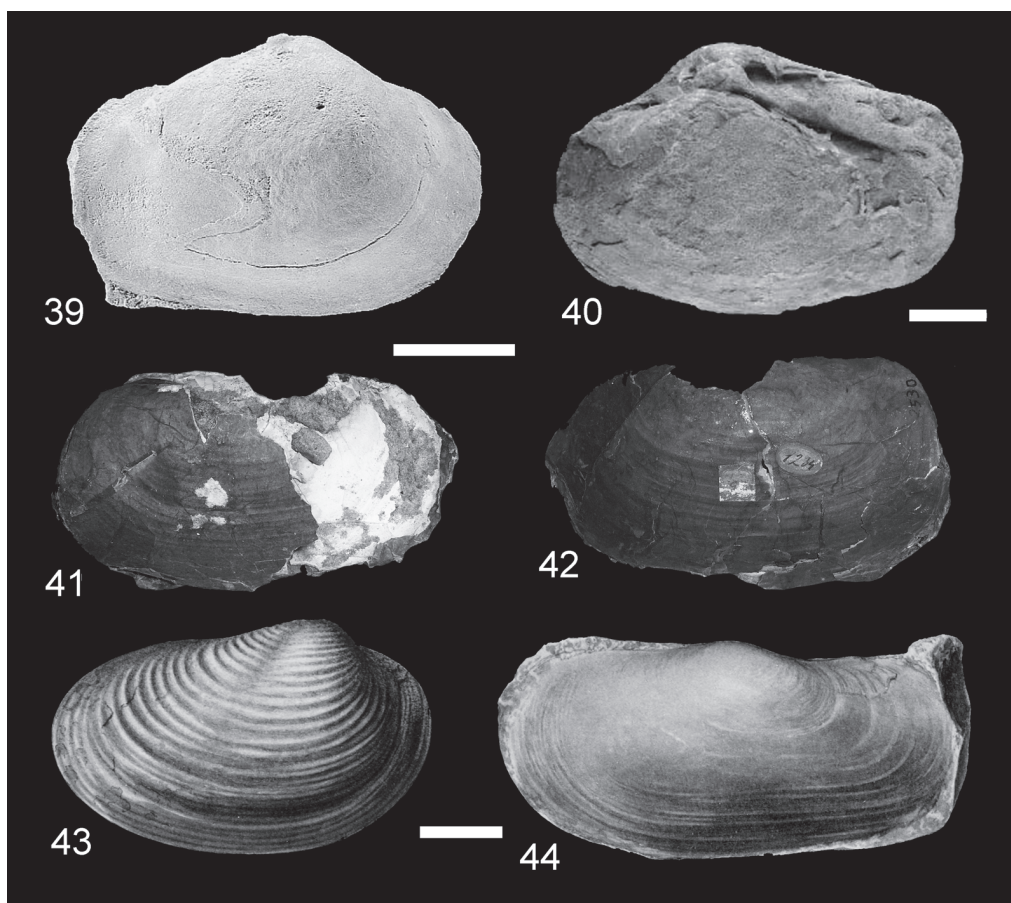
FIGS. 29–38. Anatomy of *Panopea abbreviata*. FIGS. 29, 30: General aspect showing a sectioned outer demibranch and anus aperture; FIG. 31: Diagrammatic transverse section showing the form of the ctenidia and frontal currents direction (from Atkins, 1837); FIG. 32: Ctenidial septum with two rows of perforations; FIG. 33: outer and inner labial palps; FIG. 34: Siphonal pallial septum strong separating the incurrent and excurrent channels; FIGS. 35, 36: Heart with two auricles and one ventricle surrounding the hindgut; FIGS. 37, 38: Transversal section of visceral mass showing digestive system.

and the nemertean *M. arrokeana* has been widely studied (Ivanov et al., 2002; Vazquez et al., 2009; Alfaya et al., 2013). These authors found that almost all collected specimens of *Panopea* (99.4%) were inhabited by the nemertean, which has host specificity, being found only in *P. abbreviata*. *Malacobdella arrokeana*, which lives attached by its terminal sucker, is the only member of the genus reported in the southern Atlantic Ocean (Ivanov et al., 2002). The association allows *M. arrokeana* to obtain food and shelter during its development inside *P. abbreviata*. Immature nemerteans were observed living attached to the gills laminae.

After its development, the nemertean moves and attaches to the mantle cavity by its terminal sucker. The main food sources for both species are diatoms and small crustaceans.

Habitat

Panopea abbreviata has been collected from 8 to 25 meters, deeply buried, up to 40 cm in sand and mud substrata rich in organic matter. It is usually recorded with such other clams as *Ensis macha*, *Leukoma antiqua* and *Retrotapes exalbidus*.



FIGS. 39–44. South American fossil taxa of *Panopea*. FIG. 39: *Panopea coquimbensis* d'Orbigny, 1843, MNHN 13626, syntypes; FIG. 40: *Panopea guayacanensis* Philippi, 1887, MNHNC-Pi 247, holotype; FIGS. 41, 42: *Panopaea truncata* Borchert, 1901, MACN-Pi 2530, holotype; FIG. 43: *Panopaea inferior* Wilckens, 1907, original illustration; FIG. 44: *Panopaea hauthali* Wilckens, 1907, original illustration. Scale bar: Figs. 39, 41, 42 = 1 cm; Fig. 40 = 3 cm; Figs. 43, 44 = 2 cm.

Remarks

Type material examination revealed morphological differences between related nominal species that allow us to update the taxonomic status of *P. abbreviata*. *Panopea coquimbensis* d'Orbigny, 1843 (p. 126, pl. 15, figs. 7, 8), described from Tertiary sands around Coquimbo, in northern Chile was incorrectly synonymized with *P. abbreviata* by Bernard (1983). Study of the syntypes deposited at MNHN, represented by internal molds, shows a more elongate shell with a siphonal gap folding outwards more defined and with a pallial sinus V-shaped (Fig. 39). Herm (1969) synonymized *Panopea guayacanensis* Philippi, 1887 (p. 167, pl. 34, fig. 2) from Guayacan, Chile with d'Orbigny's species. Griffin & Nielsen (2008), after an examination of type material of both nominal species, confirmed the synonymy proposed by Herm. *Panopea guayacanensis*, described from Tertiary deposits of Guayacan, was also considered a junior synonym of *P. abbreviata* by Bernard (1983). The type material of Philippi species coincides with d'Orbigny species and clearly differs from the type material of Valenciennes (Fig. 40). *Panopaea truncata* Borchert, 1901 (p. 212, pl. 9, figs. 1, 2), described from Paraná Formation, was also synonymized in the literature (Bernard, 1983). The type material, as well as the original illustration, revealed that Borchert species must be excluded from the synonymy of *P. abbreviata* (Fig. 41, 42). *Panopea truncata* shows a more elongate, rectangular shell, with a straight ventral edge. However, its articulated valves do not allow the study of the hinge. In addition, del Río (1994) considered it to be a junior synonym of *P. regularis* (Ortmann, 1900). *Panopaea inferior* (p. 47, pl. 9, fig. 2) and *P. hauthali* (p. 49, pl. 9, fig. 3), both described by Wilckens (1907), were incorrectly cited as synonyms of *P. abbreviata* by Bernard (1983). The first was described from deposits exposed in Cerro Cazador, Sierra de los Baguales and Cancha Carrera in Santa Cruz Province, and the second from Sierra de los Baguales only. The characters observed in the original illustrations of Wilckens clearly differ with those of *P. abbreviata* (Fig. 43, 44 respectively). The type material of both species was not found in the collection of Freiburg, and they probably did not survive to the Second World War (Sven Nielsen, pers. comm.).

DISCUSSION

From six nominal species synonymized in the literature, only the recent *P. antarctica* Gould, 1850, can be considered a junior synonym of the Valenciennes species. The others are fossils names described along southern Patagonia of Argentina and Chile. The stratigraphic range of Miocene-Recent mentioned by Aguirre & Farinati (1999) is incorrect. The Recent geoduck was never mentioned in various revisions of the fossil mollusks in the Miocene of Argentina (Ihering, 1907; Martínez & del Río, 2002; del Río, 1992, 1994, 2002, 2004, Griffin, 1991, among others). This is a Quaternary-Recent species, well represented in north patagonian gulfs. The material examined shows a well defined distribution from Rio de Janeiro to Peninsula Valdés. Some lots were found in examined malacological collections from localities beyond this southern limit of distribution. The examination of those materials (MACN 17734; MZUSP 13138) revealed the presence of *Panopea aff. abbreviata* in Puerto Deseado, Santa Cruz Province, Argentina. After field work that included the localities of Bahía Camarones, Bahía Bustamante, Caleta Sara, Comodoro Rivadavia (Chubut Province), Punta Buque and Puerto Deseado (Santa Cruz Province), living specimens of *P. abbreviata* were not found. Within this context, the distribution mentioned by Carcelles & Williamson (1951) and Castellanos (1970) is at least uncertain in the southern localities from Peninsula Valdés to Puerto Deseado, as suggested by Alfaya et al. (2013).

The anatomy of this species is similar to other members of the genus. The mantle cavity organs observed by Yonge (1971) and Bower & Blackburn (2003) for the Pacific species *P. generosa* are similar to those in *P. abbreviata*. The examined morphology of the stomach of *P. abbreviata* agrees with that observed by Narchi (1973) and Purchon (1958) in *Hiatella solida* and *H. arctica* respectively. The shell morphology allows us to differentiate the valid American species of the genus. Additional morphological revisions of other species of the genus are necessary to understand the conservative morphology of this group of bivalves. *Panopea abbreviata* Valenciennes, 1839, constitutes together with *Panopea bitruncata* (Conrad, 1872), the two Recent western Atlantic species of the genus.

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