



CIRRIPEDIA (CRUSTACEA) FROM ROCAS ATOLL ¹

(With 5 figures)

PAULO S. YOUNG ^{2,3}

ABSTRACT: This study redescibes three cirripeds in three different families from Rocas Atoll. *Ceratoconcha floridana* (Poecilasmataidae) is a species previously recorded from Rocas Atoll; whilst *Lepas anatifera* (Lepadidae) and *Octolasmis lowei* (Pyrgomatidae) are new records. *Ceratoconcha floridana* is distributed in the Western Atlantic and the remaining two species are cosmopolitan; all three species were previously recorded from Brazilian waters.

Key words: Cirripedia. Rocas Atoll. *Ceratoconcha*. *Lepas*. *Octolasmis*.

RESUMO: Cirripedia (Crustacea) do Atol das Rocas.

Este estudo redescrive três cirripédios do Atol das Rocas, que pertencem a três famílias diferentes. *Ceratoconcha floridana* (Poecilasmataidae), é uma espécie já registrada para o Atol das Rocas; enquanto que *Lepas anatifera* (Lepadidae) e *Octolasmis lowei* (Pyrgomatidae) são novos registros. *Ceratoconcha floridana* se distribui no Atlântico Ocidental e as demais espécies são cosmopolitas; todas as três espécies foram previamente registradas em águas brasileiras.

Palavras-chave: Cirripedia. Atol das Rocas. *Ceratoconcha*. *Lepas*. *Octolasmis*.

INTRODUCTION

Rocas Atoll has a low diversity of cirripeds, following the general pattern observed on tropical islands (NEWMAN, 1960; YOUNG, 1995). Only *Ceratoconcha floridana* (Pilsbry, 1931) has been recorded from Rocas Atoll, living on the hermatypic coral *Mussismilia hispida* (Verrill, 1902) (YOUNG, 1988). During recent field trips, two more species were sampled, which are presented below, but no coral-barnacles were found living on the corals. The infestation of these barnacle species appears to be related to coral health or stress; in high turbidity and polluted waters, corals are usually highly infested by coral barnacles, but infestations almost disappear in clear waters. The latter is the case of the corals from Rocas Atoll. No other intertidal barnacles, lithotryids or conopeans were found on the atoll. All material is deposited in the collection of the Museu Nacional, Rio de Janeiro, which is abbreviated as MNRJ. Abbreviations used as follows: tl = total length; cl = capitular length.

Family Lepadidae Darwin, 1852
Genus *Lepas* Linnaeus, 1758
Lepas anatifera Linnaeus, 1758
(Fig.1)

Lepas anatifera Linnaeus, 1758:668.

Lepas anatifera – DARWIN, 1852:73, pl.1, fig.1, 1a-c.

Material examined – Rocas Atoll, pool, fixed on buoys, C.S.Serejo & M.C.Rayol, coll. 02/11/2001, 11 specimens, tl: – 20.6 to 44.0 (31.2) mm, MNRJ 18911.

Diagnosis – Plates smooth or delicately striated (Fig.1). Carina forked basally. Umbonal tooth on right scutum. One filamentary appendage at base of cirrus I and another basally.

Remarks – This is a common, cosmopolitan species usually found attached to floating objects and sometimes large pelagic animals. With more sampling, probably other species of *Lepas* and *Dosima* will be found occasionally. *Lepas anatifera* has been recorded from Paraíba to Rio Grande do Sul along the Brazilian coast (YOUNG, 1990; 1998).

Family Poecilasmataidae Annandale, 1909
Genus *Octolasmis* Gray, 1825
Octolasmis lowei (Darwin, 1852)
(Figs.2-4)

Dichelaspis lowei Darwin, 1852:128, pl.2, fig.8.
Dichelaspis darwini – WELTNER, 1897:241.
Octolasmis lowei – LACOMBE, 1977:11; YOUNG, 1990:646, figs.3e-h, 4; 1998:266.

¹ Submitted on August 8, 2005. Accepted on February 9, 2007.

² In memoriam.

³ Correspondence to Cristiana S. Serejo: csserejo@acd.ufrj.br.

Material examined – Rocas Atoll, pool, fixed on branchiae of *Panulirus echinatus* Smith, 1869, P.S.Young, P.C.Paiva & A.A.Aguiar, coll. 18/oct/2000, 3 specimens, tl(cl): 4.0 (1.7) to 5.0 (2.1) mm, MNRJ 18912.

Description – Capitulum (Fig.2) slightly compressed, sub-triangular, covered by thin cuticle. Capitular plates reduced, conspicuous below cuticle. Aperture protuberant, 1/3 length of occludent margin. Peduncle nude, slightly longer than capitulum, covered by thin cuticle. Tergum with inverted V-shape, umbo subapical, forming lid distally; occludent arm shorter, half width of carinal arm. Scutum occludent arm slightly wider and 1.5 times length of basal arm; both arms forming angle of 70°. Carina curving continuously, apex reaching half height of

tergum; basally forked; basal arms short, about half length of and situated below level of basal arm of scutum. Gap between basal arms of scutum and carina.

Labrum (Fig.3a) slightly bullate, with eight large, acute teeth. Palp (Fig.3a) large, paddle-like, with several simple setae on inner margin. Mandible (Fig.3b) with five teeth, third to fifth with subsidiary cusps; distance between first and second teeth three times distance between second and third; lower angle bifid. Maxilla I (Fig.3c) with anterior border irregular, with a small notch above middle, with 3 large, strong stout setae above notch and 9 large to small stout setae below. Maxilla II (Fig.3d) rectangular, anterior margin straight, covered by numerous simple setae; papilla of maxillary gland not projecting.

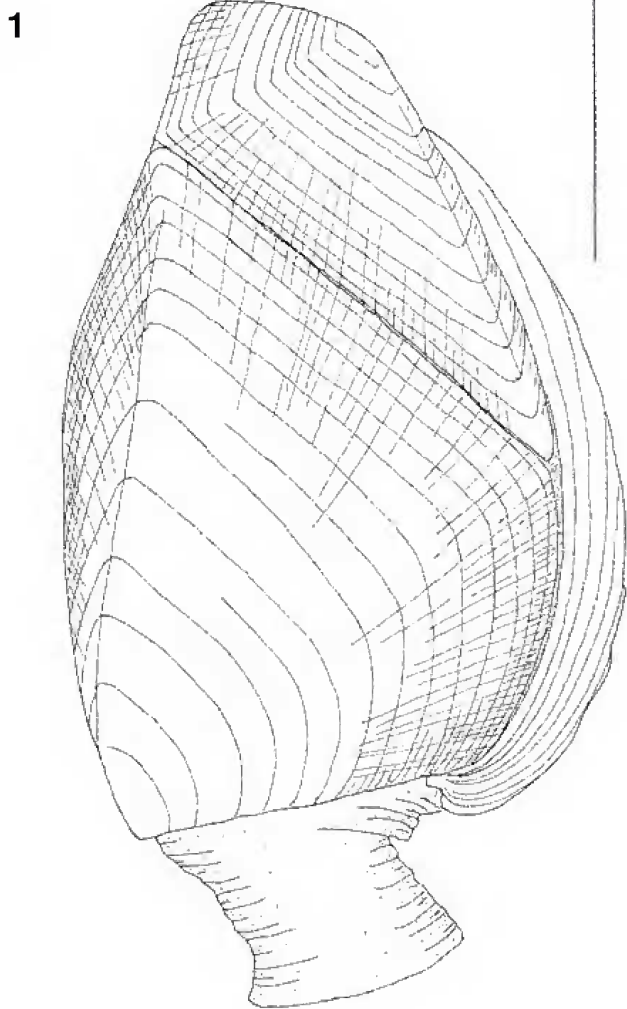


Fig.1- *Lepas anatifera* Linnaeus, 1758, MNRJ 18911, right lateral view. Scale bar = 1mm.

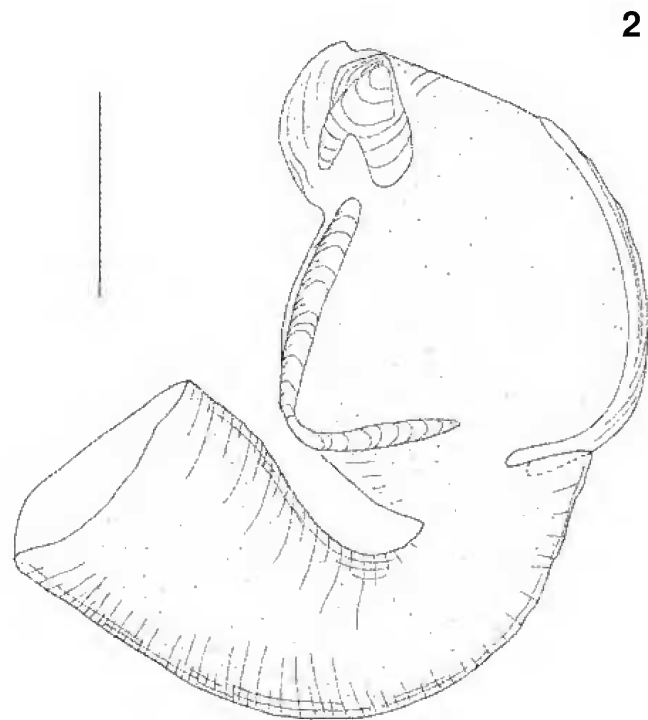


Fig.2- *Octolasmis lowei* (Darwin, 1852), MNRJ 18912, right lateral view. Scale bar = 1mm.

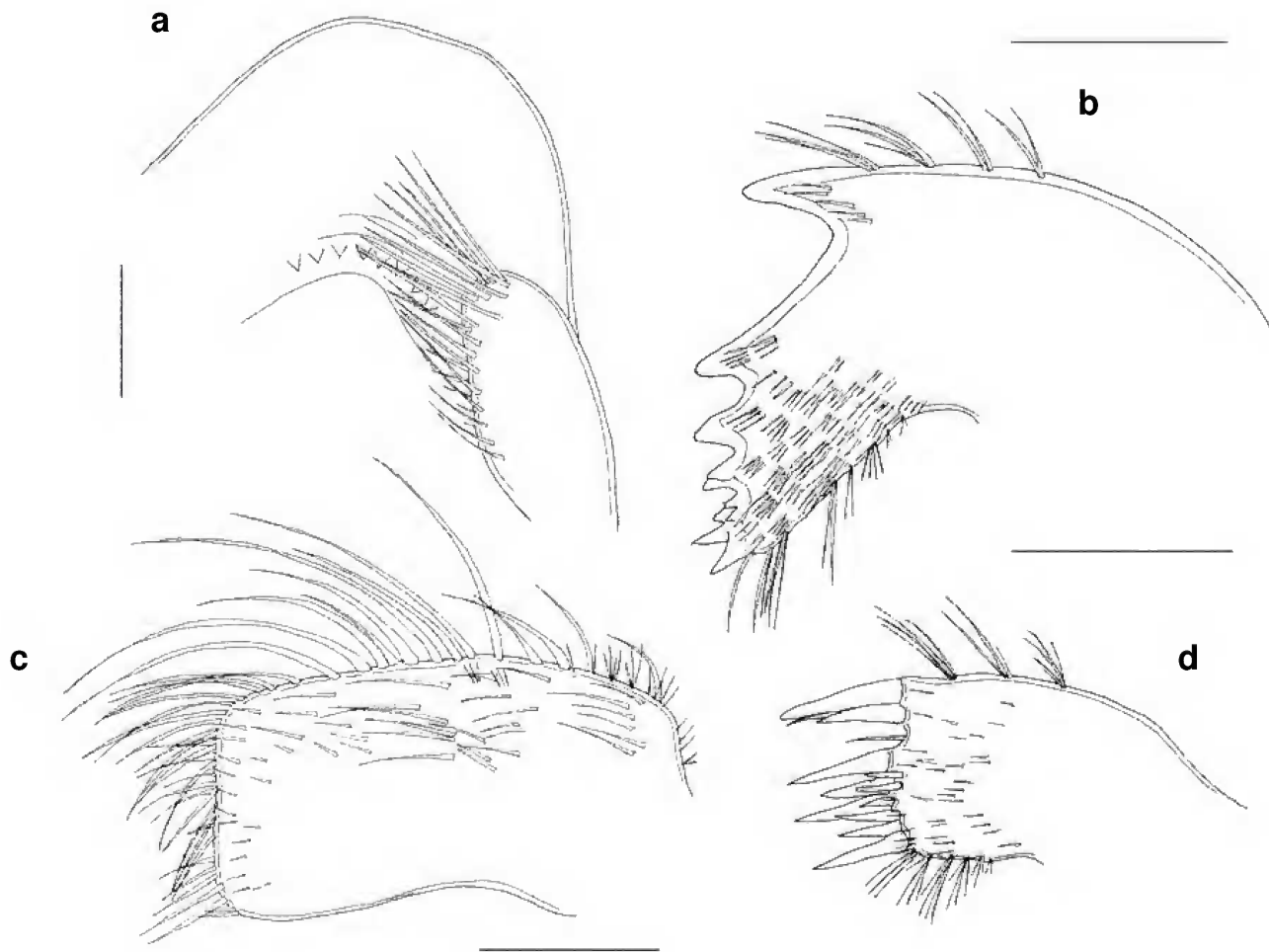


Fig.3- *Octolasmis lowei* (Darwin, 1852), MNRJ 18912. (a) labrum and palp; (b) mandible; (c) maxillae I; (d) maxilla II. Scale bars = 0.1mm.

Cirrus I (Fig.4a) with anterior ramus slightly smaller than posterior ramus. Cirrus II to VI with equal, long rami (Fig.4b). Median article of cirrus VI (Fig.4c) about 2 times longer than wide, 10 pairs of simple setae on anterior margin, 4 setae on posterior angle. Setal-article ratio about 4:1. Caudal appendage (Fig.4d,) unarticulated, a little longer than coxopodite of cirrus VI, with several long setae on mid-distal margin. Penis (Fig.4b, e) annulose, long, covered by setulae, longer distally; with a small terminal languet. Number of articles of cirri I-VI and caudal appendage is presented in table 1.

Remarks: *Octolasmis lowei* was originally described associated with a brachyuran crab from Madeira Island (DARWIN, 1852) and has since been reported from several localities in the Atlantic Ocean. Several other species of *Octolasmis* have been described from the Atlantic (FILLIPI, 1861a, b; COKER,

1902; CAUSEY, 1960), many of which have since been considered synonyms of *O. lowei*. Due to the simple capitular structure and reduced opercular plates of *Octolasmis*, there is a great confusion on the validity of the various species.

Based on the description of DARWIN (1852), some distinctions could be observed in the Rocas specimens. Therefore, they were compared with some *O. lowei* specimens collected from Madeira Island for a better comparison. The following distinctions were observed (Tab.2). The relative position of the distal points of the basal arms of the scutum and carina is very conspicuous and may separate them, but the smaller specimen examined from Madeira do not have these points superposing, which may suggest that it may change during development. Thus, only the characters of the appendages can be proved to be stable and may separate them as distinct species.

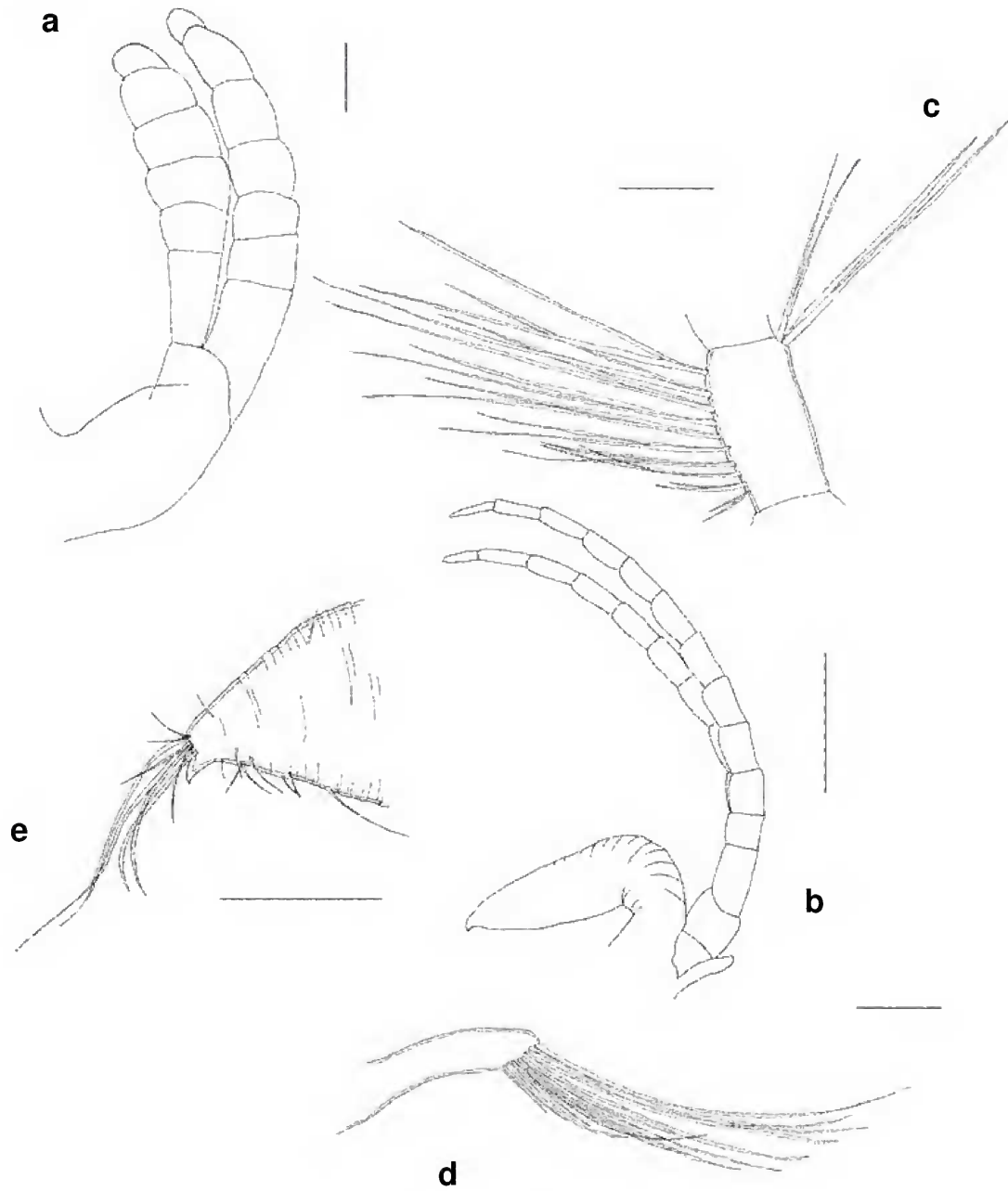


Fig.4- *Octolasmis lowei* (Darwin, 1852), MNRJ 18912. (a) cirrus I; (b) cirrus VI, caudal appendage and penis; (c) median article of cirrus VI; (d) caudal appendage; (e) penis. Scale bars (a, c, d, e) = 0.1mm, scale bar (b) = 0.5mm.

TABLE 1. Number of articles for rami of cirri I-VI of *Octolasmis lowei* (Darwin, 1852).

	CI	CII	CIII	CIV	CV	CVI
RC	5/6	12/12	12/11	11/11	11/11	12/11
LC	6/7	12/12	12/11	11/11	11/11	11/11

(CI-VI) cirri I to VI; (RC) right cirri; (LC) left cirri.

YOUNG (1990) recorded *O. lowei* from the Brazilian coast, from Espírito Santo to Rio Grande do Sul states. With more sampling in the northern area of Brazil, this species probably will have its distribution expanded. *Octolasmis lowei* appears to be associated with several distinct groups of decapod crustaceans and was found on *Panulirus echinatus* Smith, 1869 at Rocas Atoll. Along the Brazilian coast it has been recorded on the branchiae of *Libinia spinosa* H. Milne Edwards, 1834, *Portunus spinicarpus* (Stimpson, 1871), *P. spinimanus* Latreille, 1819, *Callinectes* spp., *Hepatus pudibundus* (Herbst, 1785), and on unidentified Majidae (YOUNG, 1990).

Family Pyrgomatidae Gray, 1825
Genus *Ceratoconcha* Kramberger-Gorjanovic,
1889
Ceratoconcha floridana (Pilsbry, 1931)
(Fig.5)

Creusia spinulosa var. 4 Darwin, 1854:378, pl.14,
fig.6i-k.

Pyrgoma floridanum Pilsbry, 1931:81, figs.1-5.
Ceratoconcha floridanum – YOUNG & CHRISTOFFERSEN,
1984:240, figs.2a-c, 3, 5-6 (with synonymy);

YOUNG, 1988:362.

Ceratoconcha floridana – YOUNG, 1998:275.

Material examined – Rocas Atoll, C.B.Castro, coll.
21/mar/1982, 1 specimen on *Mussismilia hispida*
(Verrill, 1902), tl: 31.2mm, MNRJ 1715.

Diagnosis – Shell (Fig.5a) partially to totally
immerse in coral, with about 24 to 36 external
ribs. Scutum (Fig.5b, c) about as wide as high;
adductor ridge narrow, slightly prominent, never
joining articular ridge; articular ridge covering
almost all tergal margin. Tergum (Fig.5d, e) with
furrow wide; spur usually curved, as wide as its
distance from basi-scutal angle and 1/3 the
height of tergum (YOUNG & CHRISTOFFERSEN,
1984:247).

Remarks – *Ceratoconcha floridana* is known from
the West Atlantic living on several species of
hermatypic corals, especially those from *Faviina*
(YOUNG & CHRISTOFFERSEN, 1984). Previously, this
species was recorded by one specimen from
Rocas Atoll associated with *Mussismilia hispida*
(Verrill, 1902) (YOUNG, 1988). Despite finding
several *M. hispida* colonies, we were not able to
collect any specimen of *C. floridana*. The figures
presented refer to the previously known
specimen (Fig.5).

TABLE 2. Comparison between Madeira Island and Rocas Atoll specimens of *Octolasmis lowei* (Darwin, 1852).

	MADEIRA SPECIMENS	ROCAS ATOLL SPECIMENS
Distal points of basal arms of scutum and carina	most superposing, except juveniles	not superposing
Relative calcification of capitular plates	more calcified	less calcified
Distal point of carina	reaching almost apex of tergum	reaching half length of tergum
Labrum	with several small, sharp teeth	with few (8) large, sharp teeth
Mandible	with obtuse teeth with few subsidiary cusps	sharp with several subsidiary cusps
Penis	with lateral protuberance distally	with a sharp terminal languet distally
Caudal appendage.	with long setae in two tufts, one mid-distal other below	with only mid-distal tuft of setae

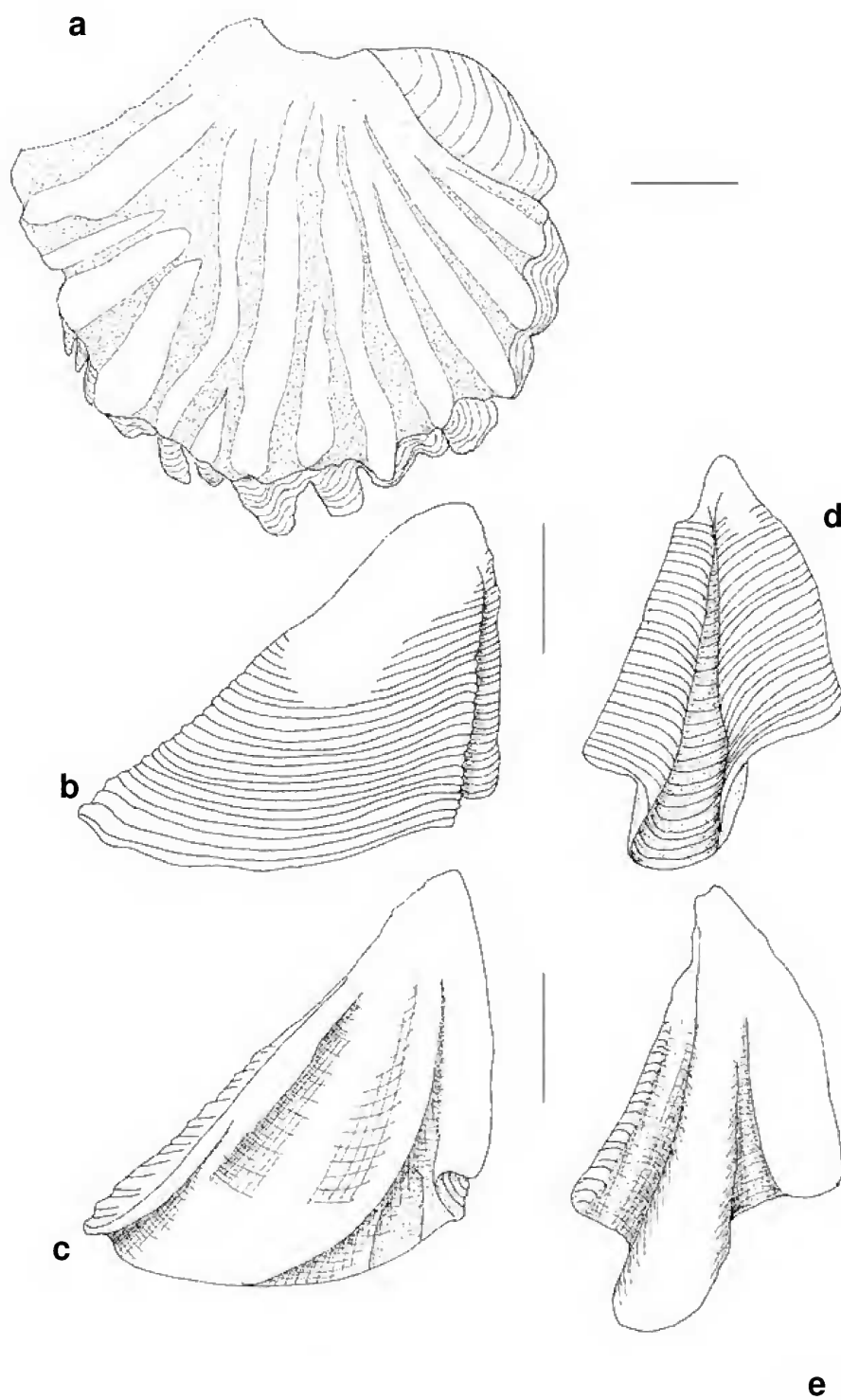


Fig.5- *Ceratoconcha floridana* (Pilsbry, 1931), MNRJ 1715. (a) rostrum, external view; (b-c) scutum, external and internal views; (d-e) tergum, external and internal views. Scale bars = 1mm.

NOTE

This manuscript has been finished by Cristiana Serejo (Museu Nacional - Rio de Janeiro) since Paulo Young has passed away on 31th May, 2004 in a tragic car accident.

LITERATURE CITED

- CAUSEY, D., 1960. *Octolasmis dawsoni*, new species (Cirripedia: Lepadidae) from *Bathynomous giganteus*. **Proceedings of the Biological Society of Washington**, **73**:95-98.
- COKER, R.E., 1902. Notes on a species of barnacle (*Dichelaspis*) parasitic on the gills of edible crabs. **Bulletin of the United States Fisheries Commission**, **21**:401-412.
- DARWIN, C., 1852. **A Monograph on the Subclass Cirripedia, with figures of all the species. The Lepadidae; or pedunculate cirripedes**. London: Ray Society, 400p, 10 pl. 5.
- DARWIN, C., 1854. **A Monograph on the Subclass Cirripedia, with figures of all the species. The Balanidae, the Verrucidae, etc**. London: Ray Society 684p.
- FILIPPI, D. de, 1861a. Sur genere *Dichelaspis* e su di una nuova specie di esso propria del Mediterraneo. **Archivio per la Zoologia, l'Anatomia e la Fisiologia**, **1**:71-73.
- FILIPPI, D. de, 1861b. Seconda nota sulla *Dichelaspis Darwinii*. **Archivio per la Zoologia, l'Anatomia e la Fisiologia**, **1**:200-206, 226, pls.12-13.
- LACOMBE, D., 1977. Cirripédios da Baía da Ribeira, Angra dos Reis, RJ, (Brasil). **Publicações do Instituto de Pesquisas da Marinha** (109):1-13.
- LINNAEUS, C., 1758. **Systema naturae**. Holmiae, Editio Decima, Reformata **1**:1-824.
- NEWMAN, W.A., 1960c. On the paucity of intertidal barnacles in the tropical Western Pacific. **Veliger**, **2**(4):89-94.
- PILSBRY, H.A., 1931. The cirriped genus *Pyrgoma* in American waters. **Proceedings of the Academy of Natural Sciences of Philadelphia**, **83**:81-83.
- WELTNER, W., 1897. Verzeichnis der bisher beschriebenen recnten Cirripedenarten. Mit Angabe der im berliner Museum vorhandenen Species und ihrer Fundorte. **Archiv für Naturgeschichte**, **1**(3):227-280.
- YOUNG, P.S., 1988. Recent cnidarian-associated barnacles (Cirripedia, Balanomorpha) from Brazilian coast. **Revista Brasileira de Zoologia**, **5**(3):353-369.
- YOUNG, P.S., 1990. Lepadomorph cirripeds from Brazilian coast. I - Families Lepadidae, Poecilasmatidae and Heteralepadidae. **Bulletin of Marine Science**, **47**(3):641-655.
- YOUNG, P.S., 1995. New interpretations of South American patterns of barnacle distribution. In: SCHRAM, F.R. & HOEG, J. (Eds.) **New Frontiers in Barnacle Evolution**. **Crustacean issues**, **10**:229-253.
- YOUNG, P.S., 1998. Maxillopoda. Thecostraca: 263-285. In: YOUNG, P.S. (Ed.) **Catalogue of Crustacea from Brazil**. Rio de Janeiro: Museu Nacional/UFRJ, Série Livros 6, 718p.
- YOUNG, P.S. & CHRISTOFFERSEN M.L., 1984. Recent coral barnacles of the genus *Ceratoconcha* (Cirripedia, Pyrgomatidae) from Northeast Brazil (lat. 5°-18°S). **Bulletin of Marine Science**, **35**(2):239-252.