ON POMACEA SORDIDA (SWAINSON, 1823) (PROSOBRANCHIA,
AMPUARIIIDAE)

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A description of Pomacea sordida (Swainson, 1823) collected in Caxias and Nova Iguacu, state of Rio de Janeiro, is presented.

The shell is globose, heavy, with greenish or horn-colored periostracum and dark spiral bands; apex subelevated, 4-5 moderately shouldered whorls, increasing rather rapidly and separated by deep suture. Aperture large, moderately round, yellowish or violaceous; lip thick and sometimes dark brown; umbilicus large and deep; operculum corneous and heavy, entirely closing the aperture. Ratios: shell width/shell length = 0.81-0.91 (mean 0.86); aperture length/shell length = 0.66-0.75 (mean 0.70).

Testis, spermduct and penis pouch as in Pomacea lineata (Spix, 1827). Seminal vesicle whitish and bean-shaped. Prostate cylindric and narrow, cream in color as the testis. Penis whiplike with a closed circular spermduct. Penial sheath elongated and tapered, with its distal tip turned to the right; outer basal gland situated on the left; inner median gland rounded; apical gland elongated and wrinkled. Ovary composed of branched whitish tubules lying superficially on the digestive gland; oviduct and seminal receptacle as in P. lineata; albumen gland yellowish – orange. Vestigial male copulatory apparatus (penis and its sheath) present in all females examined.

Key words: Mollusca – Ampullariidae – Pomacea sordida – Pomacea lineata – morphology

Pomacea sordida was described by Swainson (1823) as follows (without type-locality):

Ampullaria sordida: A. Testá globosá ferrugineá; lineís transversís sub-carinatis instructá, aperture marginé tenuí; umbilíco magnó; operculo corneó?

Orbigny (1837) described this species as Ampullaria intermedia Férussac in the following terms (without figure):

A. Testa ventricosa, crassá, laevigáta, epidermide brunneo; spirá eleváta, erosá, anfractibus quinque, rotundátis; apertúra flává, subrotundá; labro crasso, castaneó.

This author also gave the following additional information: "... Elle est remarquable, d’ailleurs, par sa bouche jaune et par son bord comme brulé. Nous l’avons rencontrée dans les marais des environs de Saint-Cristophe, près de Rio de Janeiro, au Brésil, où elle est assez commune."

Philippi (1851) considered A. intermedia as a synonym of P. sordida and cited Rio de Janeiro as type-locality. He argued that he never saw a description of A. intermedia in Férussac’s paper.

Lopes (1955) described the shell, the radula, the albumen gland and the egg cluster and the male copulatory apparatus of P. sordida from the state of Rio de Janeiro (foot of Serra de Petrópolis, Itaguaí and Rio de Janeiro city).

In this paper a description of P. sordida is presented, based on material collected by the author at Caxias and Nova Iguacu, state of Rio de Janeiro. These cities are situated nearby Rio de Janeiro city. The specimens were collected from ditches and streams in the periphery of the aforesaid cities because they were not found at São Cristóvão, a district of Rio de Janeiro city mentioned by Orbigny (1837). São Cristóvão is nowadays an urbanized area where
favorable natural snail habitats are restricted to the Joana river, which crosses the grounds of Museu Nacional and where only specimens similar to *Pomacea lineata* (Spix, 1827) were found.

*Pomacea sordida* was also found in the localities of Rio das Flores, Rio das Ostras, São Gonçalo, Saquarema and Valença (Rio de Janeiro state).

**MATERIAL AND METHODS**

Eighty-four snails (64 from Caxias and 20 from Nova Iguaçu) were studied.

Sixteen living specimens from Caxias and 9 from Nova Iguaçu were relaxed in a 0.1% solution of nembutal for 16 hr, drawn from the shell and placed in slightly modified Railliet-Henry’s fixative (distilled water 930 ml, sodium chloride 6 g, formalin 50 ml, acetic acid 20 ml). After 48 hr they were dissected under the stereomicroscope.

The radulae were separated from the buccal mass by digestion, for about 2 hr, in a vial with 10% NaOH immersed in gently boiling water.

**DESCRIPTION**

The shell (Fig. 1) is globose, heavy, with greenish or horn-colored periostracum and dark spiral bands; apex subelevated, 4-5 moderately shouldered whorls, increasing rather rapidly and separated by deep suture. Aperture large, moderately round, yellowish or violaceous; lip thick and sometimes dark brown; umbilicus large and deep; operculum conoideus and heavy, entirely closing the aperture. Ratios: shell width/shell length = 0.81-0.91 (mean 0.86); aperture length/shell length = 0.66-0.75 (mean 0.70).

Some specimens have a thick ferruginous layer on the periostracum, some others are wholly dark brown or black, so as to obscure the spiral bands. There are also more elongated shells like that figured by Lopes (1955).

Since in the following description comparison is made with *P. lineata*, the reader is referred to my previous paper on that species (Thiengo, 1987).

The shell of *P. sordida* has shouldered whorls, a large umbilicus and is heavier than that of *P. lineata*. The operculum is remarkably heavier, entirely closing the aperture.

The jaws and the radula have the same appearance as those of *P. lineata* and other known congeneric species (Figs 2, 3).

The animal is longisiphonate. The lung and the ctenidium look like those of *P. lineata*.

The testis (Fig. 4) is a cream-colored mass and lies in the first three whorls of the spire. It is also similar to that of *P. lineata*. The spermiduct is very narrow and runs toward the base of the spire, turning to the right near the pericardium, before opening into the seminal vesicle. The latter is whitish and bean-shaped (Fig. 5). The cream-colored prostate is elongated, cylindric and has a slitlike lumen. It is longer (about 1/3) and narrower than that of *P. lineata*.

The penis (Fig. 7) is whiplike as in *P. lineata*, but it is shorter and thicker (23 mm in length in a 38 mm long specimen). Its duct is circular and closed. When not in use the penis is coiled and housed in an entirely whitish thin-walled pouch, differing from that of *P. lineata* which is pink at its proximal end. There is a flange of tissue in the seminal groove that probably aids in the transference of seminal fluid from prostate to penis.

The well developed penial sheath (Fig. 6) rises to the left of the anus, and is elongated and tapered, with its distal end turned to the right. It is composed of two margins that jut together thus forming a median longitudinal channel. The left margin overlaps slightly the right one until the distal tip of the sheath. There are three glands: an apical, elongated and wrinkled; an inner median one usually rounded and an outer gland embedded in the tissue. This latter takes about 1/3 of the left basal portion of the sheath, has a slitlike opening, and is whitish, differing from that of *P. lineata* which is pink.

The ovary (Fig. 9) lies in the same location as the testis and its whitish branched tubules are easily distinguished from the green digestive gland. It is arborescent in shape as in *P. lineata* but its tubules are more branched and swollen. The oviduct looks like that of *P. lineata*. The seminal receptacle is U-shaped and thick-walled, almost completely enclosed by the albumen gland. Its proximal end is rounded and tapers distally (Fig. 8).
Pomacea sondida — Fig. 1: shell of specimen from Caxias (A = ventral view, B = dorsal view). Fig. 2: jaws, ventral view. Fig. 3: nudula. Fig. 4: male reproductive system. Fig. 5: seminal vesicle and proximal end of prostate. Fig. 6: inner surface of penial sheath. Fig. 7: penis. Fig. 8: capsule gland. Fig. 9: female reproductive system. Fig. 10: egg cluster.

Abbreviations:
TABLE

Differences between *Pomacea sordida* and *P. lineata*

<table>
<thead>
<tr>
<th></th>
<th><em>P. sordida</em></th>
<th><em>P. lineata</em></th>
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<tbody>
<tr>
<td>Whorls</td>
<td>shouldered</td>
<td>not shouldered</td>
</tr>
<tr>
<td>Umbilicus</td>
<td>wide, large</td>
<td>narrow, small</td>
</tr>
<tr>
<td>Operculum</td>
<td>heavy; closes the aperture entirely</td>
<td>thin; does not close the aperture</td>
</tr>
<tr>
<td>Seminal vesicle</td>
<td>bean-shaped</td>
<td>entirely</td>
</tr>
<tr>
<td>Prostate</td>
<td>elongated and narrow</td>
<td>slightly rounded</td>
</tr>
<tr>
<td>Penis</td>
<td>whiplike, shorter and thicker than <em>P. lineata</em></td>
<td>distal tip straight</td>
</tr>
<tr>
<td>Penial sheath</td>
<td>distal tip turned to the right</td>
<td>whiplike, longer and thinner than <em>P. sordida</em></td>
</tr>
<tr>
<td></td>
<td>whitish outer gland occupying 1/3 of the base</td>
<td>distal tip straight</td>
</tr>
<tr>
<td></td>
<td>apical gland elongated and wrinkled</td>
<td>pink outer gland occupying 2/3 of the base</td>
</tr>
<tr>
<td></td>
<td>left margin overlapping</td>
<td>apical gland rounded</td>
</tr>
<tr>
<td></td>
<td>the right one until the tip</td>
<td>left margin overlapping</td>
</tr>
<tr>
<td>Ovary</td>
<td>swollen multibranch tubules</td>
<td>the right one until the middle</td>
</tr>
<tr>
<td>Albumen gland egg</td>
<td>yellowish-orange</td>
<td>less numerous branched tubules</td>
</tr>
<tr>
<td></td>
<td>prismatic and yellowish orange</td>
<td>pink</td>
</tr>
</tbody>
</table>

The albumen gland (Fig. 8) is large and yellowish-orange. The capsule gland is entirely enclosed by it, beginning at the receptacle and forming a spiral channel before it emerges from the distal end of the albumen gland. The main duct of the albumen gland is in the adjacent glandular mass. It is very narrow with some slitlike openings for albumen exit.

The vestigial male copulatory apparatus (penis and its sheath) was present in all females examined (Fig. 9).

The yellowish-orange prismatic calcareous-shelled eggs are roughly 3 mm in width and are laid in clusters above the water level (Fig. 10).

DISCUSSION

The maintenance of *P. sordida* under laboratory conditions is more difficult than that of *P. lineata*, because it does not feed well and in spite of mating and spawning few eggs hatch. On the contrary, *P. lineata* feeds voraciously fresh lettuce, mates well and almost all eggs hatch. According to these data and supported by the places where specimens were collected, it is probably that *P. sordida* is being displaced to the periphery owing to competition with species less vulnerable to environmental changes resulting from urbanism.

*Pomacea sordida* has a characteristic shell which facilitates its discrimination from *P. lineata*. However to identify it with greatest accuracy it is necessary to dissect the animal.

The shells of the specimens here studied are very similar to those figured by Lopes (1955), Philippi (1851), Reeve (1856) and Swainson (1823).

The albumen gland, the egg cluster and the male copulatory apparatus are similar to those described by Lopes (1955).

The differences observed between *P. sordida* and *P. lineata* are shown in the table.

Significant morphological differences between these species are mainly in the male reproductive system. Scott (1957) reported the great morphological similarity in the Ampullariidae and pointed out the male copulatory apparatus for generic discrimination. Kewajam (1987), in a morphological study of *Pila* from Thailand, also observed that only the male reproductive system was different in the various species studied by her.

RESUMO

Sobre *Pomacea sordida* (Swainson, 1823) (Prosobranchia, Ampullariidae) - Neste trabalho é apresentada a descrição de *Pomacea sordida* (Swainson, 1823), coletada em Caxias e Nova Iguaçu, Estado do Rio de Janeiro.

Concha globosa, espessa, com perióstraco esverdeado ou castanho e com faixas espirais escuras; ápice pouco elevado, 4-5 giros moderadamente arredondados, crescendo relativamente rápido, separados por suturas profundas. Aber-
tura grande, moderadamente arredondada, amarelada ou violácea; lábio espesso e algumas vezes marron escuro; umbílico grande e profundo; opérculo córneo e espesso, fechando completa mente a abertura. Razões: largura da concha/ comprimento da concha = 0.81-0.91 (média 0.86); comprimento da abertura/comprimento da concha = 0.66-0.75 (média 0.70).

Testículo, espermiduto e bolsa do pênis como em Pomacea lineata (Spix, 1827). Vesícula seminal esbranquiçada e em forma de feijão. Próstata cilíndrica e estreita, de cor cre me como o testículo. Pênis em forma de chico te, com espermiduto circular e fechado. Bainha do pênis alongada tendo sua largura diminuída da base para a extremidade, sendo esta última voltada para a direita; glândula basal externa situada à esquerda; glândula mediana interna arredondada; glândula apical alongada e com sulcos. Ovário composto de túbulos brancos ramificados dispostos superficialmente sobre a glândula digestiva verde. Oviduto e receptáculo seminal como em P. lineata; glândula de alburme de cor alaranjada; oovs prismáticos e calcáreos de cor alaranjada. Aparelho copulador masculino vestigial (pênis e sua bainha) presente em todas as fêmeas examinadas.

Palavras-chave: Mollusca – Ampullariidae – Pomacea sordida – Pomacea lineata – morfologia

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