

**PLANORBIS MERIDAENSIS PRESTON, 1907 (GASTROPODA: PLANORBIDAE),  
A SYNONYM OF BIOMPHALARIA PRONA (MARTENS, 1873)**

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*Biomphalaria prona* from Lake Valencia, Venezuela (type locality) has a polymorphic shell which in the great majority of specimens is wider, with fewer rapidly expanding whorls, the outer one subcarinate on the left side and more or less strongly deflected leftward. Besides those modal forms there are little frequent variants characterized by narrower shell with less rapidly expanding, regularly curved whorls directed forward. Recent studies have shown that such variants constitute the predominant shell phenotype in extralacustrine populations, but are anatomically and biochemically indistinguishable from the modal class of the Lake.

In the present paper it is demonstrated that the nominal species *Planorbis meridaensis* Preston, 1907, from Mérida, Venezuela, is identical with *B. prona* (Martens, 1873) of which it must be considered a junior synonym.

Key words: Gastropoda Planorbidae – *Planorbis meridaensis* – *Biomphalaria prona* – morphology – synonymy – Venezuela

*Planorbis meridaensis* was described by Preston (1907, Fig. 18), on the basis of shell characters, as follows:

Shell depressed, suborbicular, dull brown; whorls 3½, marked with oblique arcuate lines of growth; right side deeply excavated, especially in the middle; left side somewhat concave; peristome acute, a callus on the parietal whorl joining the two margins of the peristome; aperture obliquely lunate.

Alt. 3, diam. maj. 8 mm.

Aperture: alt. 3, diam. 1.5 mm.

*Hab.* Merida, Venezuela.

As usual with purely shell descriptions, the above one and accompanying figure are insufficient for a sure identification and fit well to several species, e.g. *Biomphalaria havanensis*. Perhaps for this reason, *P. meridaensis* is placed incertae sedis in Harry's (1962) catalogue, where it is wrongly referred to Merida, Yucatan. H. B. Baker (1930) synonymized it with *Planorbula (Tropicorbis) straminea* (= *Biomphalaria straminea*), and F. C. Baker (1945) considered it a valid species under the genus *Tropicorbis*.

In May 1974 I collected from Laguna de Urao (8°31'N, 71°33'W), a pond at Lagunillas, some 30 km west of Mérida city, Venezuela, a planorbid agreeing in shell characters with Preston's description and figure. They proved anatomically indistinguishable from *Biomphalaria prona* (Martens, 1873), as described by Paraense & Deslandes (1958), and their shells corresponded to the variant shown in Fig. 4 of the last-mentioned paper.

#### MATERIAL AND METHODS

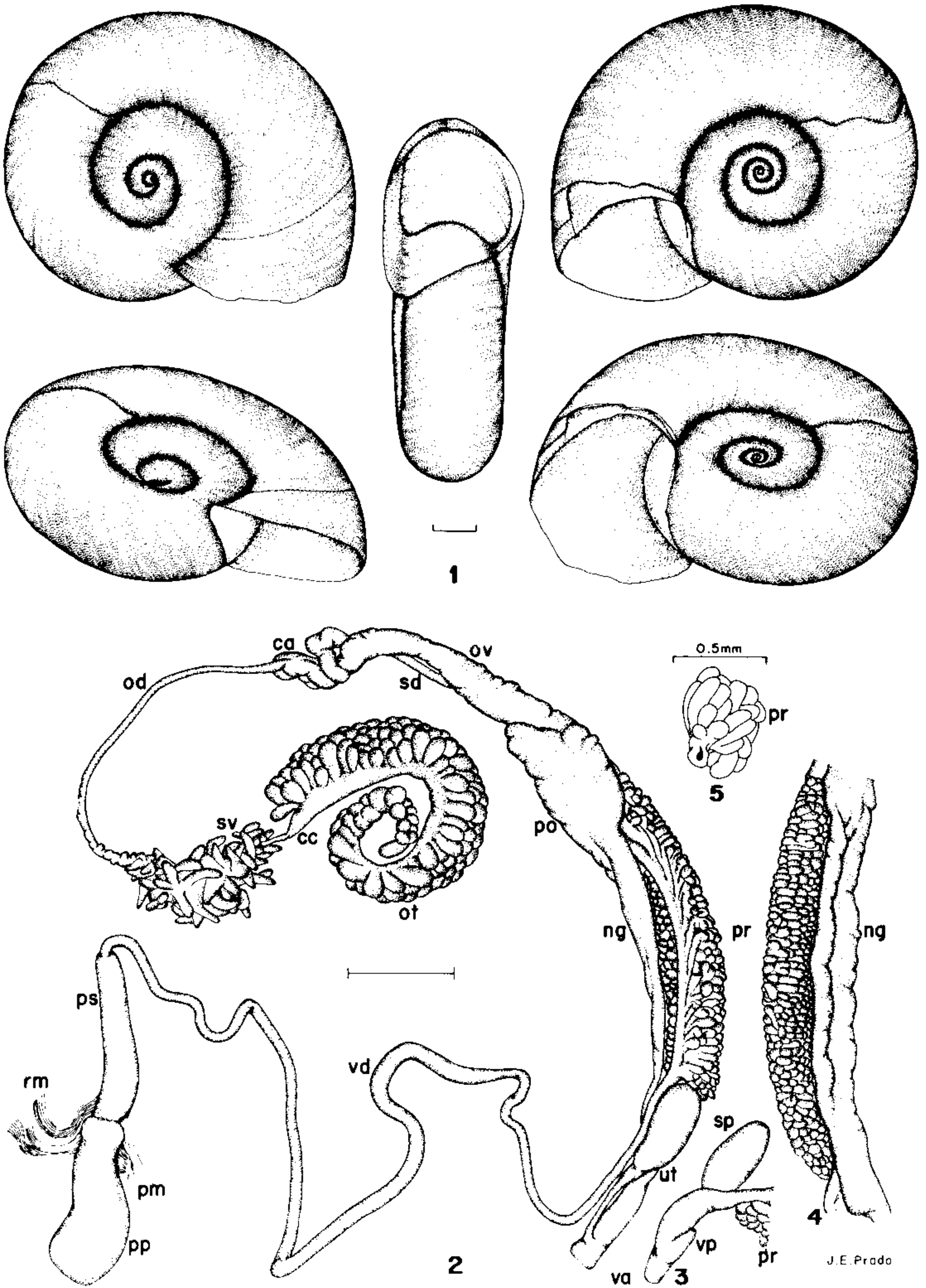
This study is based on the examination of 40 shells and of the reproductive system of 20 dissected specimens.

The specimens to be dissected were allowed to relax overnight in aqueous solution of nembutal (0.05%). Then they were immersed for 40 sec in water heated at 70 °C, from which they were transferred to water at room temperature. The animals (under water) were drawn from the shell with a small forceps applied to the cephalopodal mass, and fixed in slightly modified Railliet-Henry's fluid (distilled water 930 ml, sodium chloride 6 g, formalin 50 ml, glacial acetic acid 20 ml). Measurements were made on camera lucida drawings.

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*Biomphalaria prona* from Laguna de Urao, Mérida, Venezuela - Fig. 1: shell. Fig. 2: reproductive system. Fig. 3: terminal female genitalia, ventral view. Fig. 4: prostate, left side. Fig. 5: prostatic diverticulum, interproximal aspect. ca = carrefour, cc = collecting canal of ovotestis, ng = nidamental gland, od = distal segment of ovispermiduct, ot = ovotestis, ov = oviduct, pm = protractor muscle of penial complex, po = pouch of oviduct, pp = prepuce, pr = prostate, ps = penial sheath, rm = retractor muscle of penial complex, sd = spermiduct, sp = spermatheca, sv = seminal vesicle, ut = uterus, va = vagina, vd = vas deferens, vp = vaginal pouch. Bar = 1 mm, except Fig. 5.

Voucher specimens were deposited in the mollusk collection of the Instituto Oswaldo Cruz (no. 2004).

#### DESCRIPTION

The shell answers perfectly to Preston's description. The largest specimen (Fig. 1) is 8.5 mm in diameter, 3 mm in width at the aperture (2.3 mm at the beginning of the outer whorl) and has 4.5 whorls.

The reproductive system is shown in Fig. 2.

The ovotestis is composed of about 70 chiefly unbranched diverticula. A minutely dissected ovotestis had 65 diverticula, of which 49 were simple, 15 bifurcate and 1 trifurcate. The seminal vesicle is well developed and beset with numerous predominantly fingerlike diverticula.

The oviduct, the pouch of the oviduct and the nidamental gland show no special features. The vagina is short, with a variably developed but well defined swelling on the ventral wall (vaginal pouch, Fig. 3). The spermatheca varies in shape with the amount of its content, being usually obovate, with the body nearly as long as the duct. The proximal segment of the female duct (from the carrefour to the middle of the pouch of the oviduct) is shorter than the distal segment (from the middle of the pouch of the oviduct to the vaginal opening), the ratio between their lengths varying from 0.40 to 0.74 (mean  $0.57 \pm 0.11$  SD).

The spermiduct is sinuous, adherent to the oviduct and longer than the latter. On emerging from the furrow of the pouch of the oviduct it gives off a series of 10-14 diverticula (mean  $11.82 \pm 1.33$  SD). The prostatic diverticula are divided into small branches tightly packed together and spreading on all sides, their abundant terminal ramifications giving the prostate a cauliflower-like appearance (Fig. 4). Many prostatic diverticula inflect ventralward (Fig. 5) to show their tips under the prostatic duct, as seen in Fig. 2. The foremost diverticulum is usually inserted between the spermathecal body and the uterine wall. The vas deferens has a middle portion wider than usual in comparison with other species of *Biomphalaria*. The penial sheath is stout, uniformly cylindrical, somewhat narrower than the prepuce and a little longer than the latter in most in-

stances, the penial sheath to prepuce ratio varying from 0.95 to 1.23 (mean  $1.07 \pm 0.09$  SD). The proximal end of the prepuce has a bulbous appearance owing to the presence of a well developed preputial diaphragm, as shown by Paraense et al. (1992, Fig. 11). The distal segment of the female duct is conspicuously longer than the penial complex (penis sheath plus prepuce), the ratio between their lengths being 1.49 to 1.86 (mean  $1.63 \pm 0.12$  SD).

#### REMARKS

According to Martens' (1873) description, based on specimens from Lake Valencia, Venezuela, the shell of *B. prona* is relatively wide (width at the aperture about half the shell diameter), its whorls increase rapidly in diameter, and the outer whorl is expanded, subcarinate on the left side and strongly deflected leftward. Paraense & Deslandes (1958, Figs 1-4), however, showed that a minority of specimens from the Lake varied from Martens' description, through intermediate forms, toward narrower shells (width at the aperture about one third of the shell diameter). Such variants were anatomically indistinguishable from the predominant morphs. More recently, Paraense et al. (1992) showed that populations from several biotopes outside Lake Valencia, till then mistaken for *Biomphalaria havanensis*, correspond in reality to the narrower variants of *B. prona*. The present study shows that *Planorbis meridaensis* is indistinguishable from those variants, and consequently a junior synonym of *Biomphalaria prona*.

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