TWO NEW SPECIES OF MEGALOBULIMIDAE (GASTROPODA, STROPHOCHEILOIDEA) FROM NORTH SÃO PAULO, BRAZIL

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ABSTRACT

Two new species of *Megalobulimus* are described, *M. riopretensis* from São José do Rio Preto and *M. mogianensis* from Santa Rita do Passa Quatro and São Joaquim da Barra, São Paulo State, Brazil. Detailed anatomy of each species and comparisons with other congener species are also given.

KEYWORDS. Megalobulimidae, *Megalobulimus riopretensis*, *Megalobulimus mogianensis*, Comparative Morphology, Brazil.

INTRODUCTION

A revision of the Neotropical Strophocheiloidea has been developing in the Museu de Zoologia, Universidade de São Paulo (MZSP) based on anatomy and on geographic distribution of each species. A historic and discussion of Strophocheiloidea anatomical characters can be found in LEME (1973).

Specimens of *Megalobulimus* Miller, 1898 which had been sent for identification, were collected in three localities of North and Northeast of São Paulo State, Brazil. The analysis of shell and anatomy reveal the material belongs to two new species (SIMONE, 1995), both described herein.

MATERIAL AND METHODS

Specimens of three localities of the São Paulo State, Brazil, were studied (fig. 1): 1) 63 specimens from São José do Rio Preto (Arif Cais col., XII/77); 2) 20 specimens from Santa Rita do Passa Quatro; 3) 7 specimens from São Joaquim da Barra; (Wagner E.P. Avelar's biologists team and senior author col., summer 1991 and 1993).

The specimens were sacrificed in boil water, extracted from the shell, fixed in Railliet-Henry fluid and deposited in MZSP collection.

The dissection were made according to the technique described by LEME (1973), all drawings were obtained with the aid of a camera lucida. Radulae and jaws were examined in slides with Royer fluid and also mounted permanently with Entelan. Anatomic terminology follows SCOTT (1939) and systematics follows LEME (1973). Shell terminology is according to BEQUAERT (1948). Shells measures are obtained with a pachymether. Number of shell whorls are obtained according to the technique of DIVER (1939).

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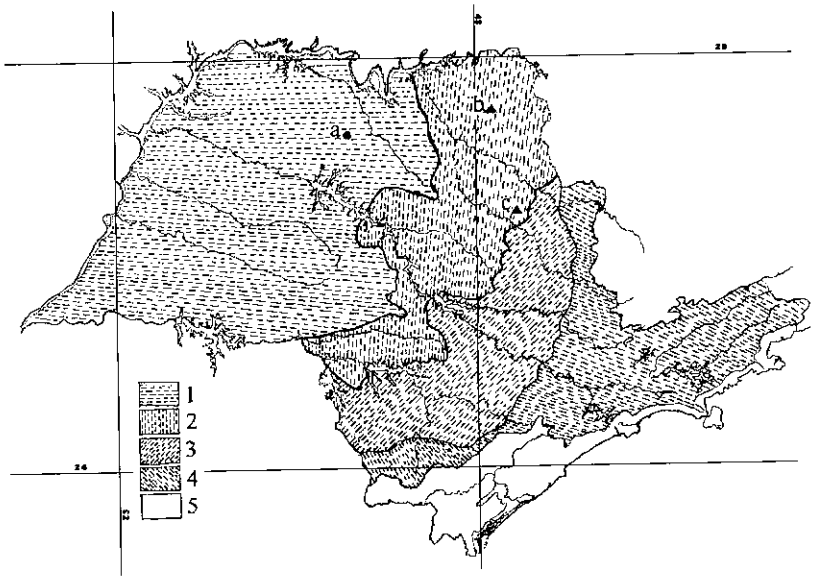


Fig. 1. Map of São Paulo State, Brazil, showing the collect localities: a) São José do Rio Preto; b) São Joaquim da Barra; c) Santa Rita do Passa Quatro. Geomorphological provinces: 1) west plateau; 2) basaltic cuestas; 3) periphery depression; 4) coastal; 5) Atlantic plateau.

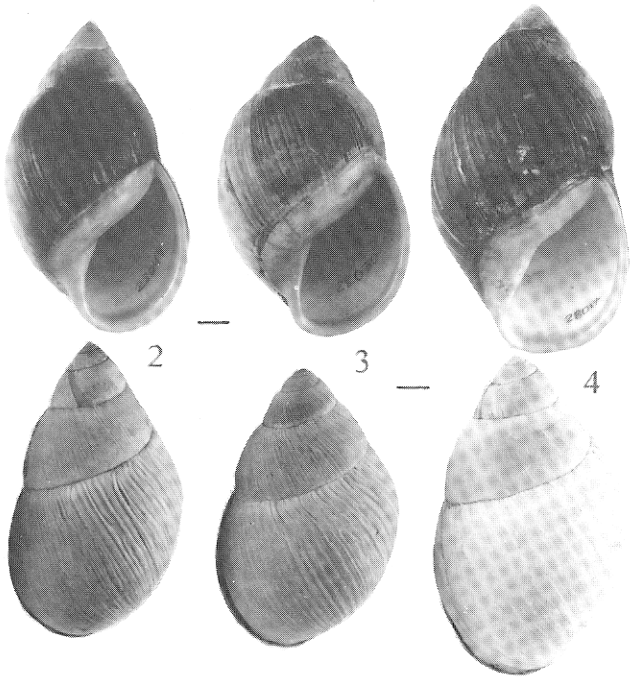
Megalobulimus riopretensis sp. n.

(Figs. 2, 5-32)

Types: holotype MZSP 28044; paratypes: MZSP 28043, 28045-28067, 24 specimens; MZSP 28601, 9 specimens; all these from type locality.

Type locality: Brazil, São Paulo, São José do Rio Preto, 22°49'11"S - 49°22'46"W, average altitude 489m.

Diagnosis. Shell with periostracum lost, aperture red; protoconch from 4.1 to 4.5 whorls and with profile angle between 76° and 87°. Mantle border with two elliptical protuberances. Ureteric groove folds anterior limit in level of anus; its folds in rectal surface discontinuous and with a large folds bordering; its folds in pallial surface separated from mantle septum by a smooth area. Only one accessory vessel of pulmonary vein. Accessory pericardial vessel present. Kidney folds anterior to nephrostome lacking. Radular rachidian tooth with an elliptical central projection. Esophageal typhlosole distal end as a tall fold. Only one small fold in smaller gastric curvature. Uterus inner folds transversal distributed. Bursa copulatrix with short duct. Epiphalus with a small flagellum. Spermatophore with a rounded base possessing a curved flap.



Figs. 2-4. Shells. 2, *Megalobulimus riopretensis* sp. n. (MZSP 28044 holotype, 28065); 3, 4, *M. mogianensis* sp. n., from Santa Rita do Passa Quatro (MZSP 28030- holotype, 28037); 4, from São Joaquim da Barra (MZSP 28017, 28016). Bar 10 mm.

Description. Shell (fig. 2). Large (up to 100mm), oval-acuminate, imperforated, up to 6.5 convex whorls. Periostracum lost. Protoconch sharp, 76° to 87°, from 4.1 to 4.5 slightly convex whorls (most with 4.3 whorls), suture somewhat deep; first whorl smooth and opaque, second whorl gradually appearing thin and orthocline axial ridges in its inferior region; third and fourth whorls with strong axial ridges, somewhat thin, from suture to suture. Teleoconch with about two whorls, suture somewhat deep, sculpturated by strong, discretely irregular and numerous axial ridges. Aperture elliptic, with length about half of total shell length, peristome red. Outer lip arched; inner lip with upper half convex and lower half straight or discretely concave.

Cephalo-pedal mass. Tegument clear, bluish, with superficial furrows. Eyes dark.

Mantle border. Exposed face of mantle collar with two elliptic protuberances (figs.5, 8), one near pneumostome (dd) and other in inferior region (de). A conspicuous furrow

found from pneumostome into angulate extremity of collar (fig. 8).

Pneumostome region. Pneumostome bordered by two folds, inner lip of mantle edge (le) and inner lip of pneumostome (li) which is shorter (fig. 8). There is four-five small folds near pneumostome, perpendicular to mantle border and continuous with anal folds (fig. 7). These folds have small secondary oblique folds between each, limited in a side by series of small folds parallel to mantle border and in other side by smooth surface which also limits ureteric groove. Ureteric groove without folds since region near anus.

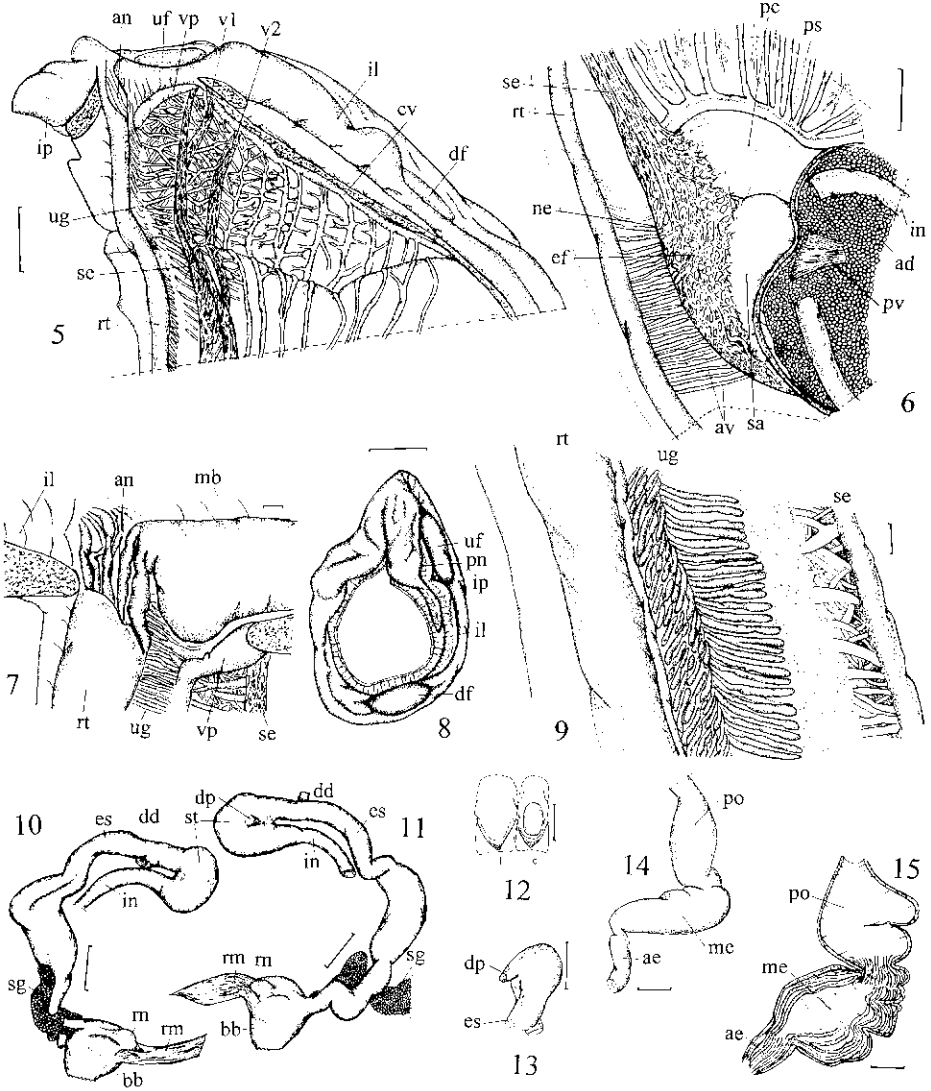
Pulmonary cavity. Ureteric groove running right extremity, edging rectum (figs. 5, 6). Septum, characteristic of family, well developed, formed by a net of anastomosed vessels, which surrounds pulmonary vein (figs. 5, 6). A smooth area between septum and ureteric groove (figs. 5, 9).

The net of vessels of septum extends also by two other vessels of lung, one short (fig. 5: v1) and other long (v2), which inserts in septum posteriorly, near pericardium.

Ureteric groove, in its most length, a furrow with oblique small folds, limited at left by face of outer surface of rectum and at right by inner mantle face adjacent to it (figs. 5, 9). Folds of ureteric groove, in anterior extremity, only differentiable in mantle, disappearing near anus (fig. 7: ug). In middle region (fig. 9), folds also differentiable in outer surface of rectum, discontinuous, oblique, imbricated, bordered by a larger longitudinal fold (fig. 9). Near kidney transversal folds, close one another, only in mantle surface (fig. 6: av).

Kidney sub-triangular (fig. 6). Net of vessels of septum extends by about 3/4 of ventral surface of kidney, called epi-renal plexus. Near digestive gland a small triangular smooth area appears (sa). Pericardium occupies about 1/4 of reno-pericardic area. Nephrostome (ne) a small fissure, without projections, sited in anterior region of right edge of kidney.

Figs. 5-15. *Megalobulimus riopretensis*: 5, pulmonary cavity roof, middle and anterior regions, ventral-inner view; 6, posterior region of pulmonary cavity roof and anterior extremity of visceral mass just in region of kidney, ventral view; 7, region of pneumostome, inner-ventral view, inner lip of pneumostome (il) deflected; 8, exposed region of mantle collar removed from head-foot, frontal view; 9, pulmonary roof in middle region of ureteric groove, inner-ventral view; 10, middle and anterior region of digestive system, left view; 11, same in right view; 12, two radular teeth, central (c) and first left marginal (1); 13, stomach in profile, ventral view; 14, detail of esophagus to show its regions, left view; 15, same, opened longitudinally, inner view. Abbreviations: **aa**, accessory pericardium vessel; **ac**, albumen chamber; **ad**, anterior digestive gland; **ae**, anterior esophagus; **ag**, albumen gland; **al**, accessory glandular sac; **an**, anus; **ao**, aorta; **av**, mantle transversal folds adjacent to kidney; **bb**, buccal mass; **bc**, bursa copulatrix; **cv**, collar vessel; **da**, duct of albumen gland; **db**, duct of bursa copulatrix; **dd**, duct to anterior digestive gland; **df**, inferior fold of mantle border; **dp**, duct to posterior digestive gland; **ef**, epi-renal plexus; **eg**, espermatic gutter; **el**, inner fold of epiphalus; **eo**, espermoviduct; **ep**, epiphalus; **es**, esophagus; **et**, stomach fold correspondent to esophageal typhlosole; **fl**, flagellum; **fo**, free oviduct; **gf**, gastric fold of its smooth region; **gg**, accessory glandular groove of spermoviduct; **go**, gonad; **gp**, genital pore; **hd**, hemarphroditic duct; **il**, inner lamina of mantle border; **in**, intestine; **ip**, inner lip of pneumostome; **it**, intestinal typhlosole; **mb**, mantle border; **me**, middle esophagus; **ne**, nephrostome; **ob**, aperture of duct of bursa copulatrix; **p1- p5**, folds of pre-valvar region of intestine; **p6-p7**, folds of pos-valvar region of intestine; **pc**, pericardium; **pe**, penis; **pm**, penis muscle; **pn**, pneumostome; **po**, posterior esophagus; **pp**, main inner fold of penis; **ps**, pericardium satellite vessel; **pt**, prostate; **pv**, palio-diaphragmatic muscle; **rm**, radular muscle; **rn**, radular nucleus; **rt**, rectum; **sa**, smooth surface of kidney; **se**, septum of lung surrounding pulmonary vein; **sg**, salivary gland; **st**, stomach; **ta**, talon; **tf**, inner transversal fold of penis; **uf**, upper fold of mantle border; **ug**, ureteric groove; **ut**, uterus; **v1 to v3**, accessory vessels of pulmonary vein; **va**, pre-rectal valve; **vd**, vas deferens; **ve**, free oviduct appendix; **vg**, vagina; **vp**, pneumostome vessel. Bar 10 mm: figs. 5,8,10,11,13; 5 mm: figs. 6, 14, 15; 1 mm: figs. 7,9; 0.1 mm: fig. 12.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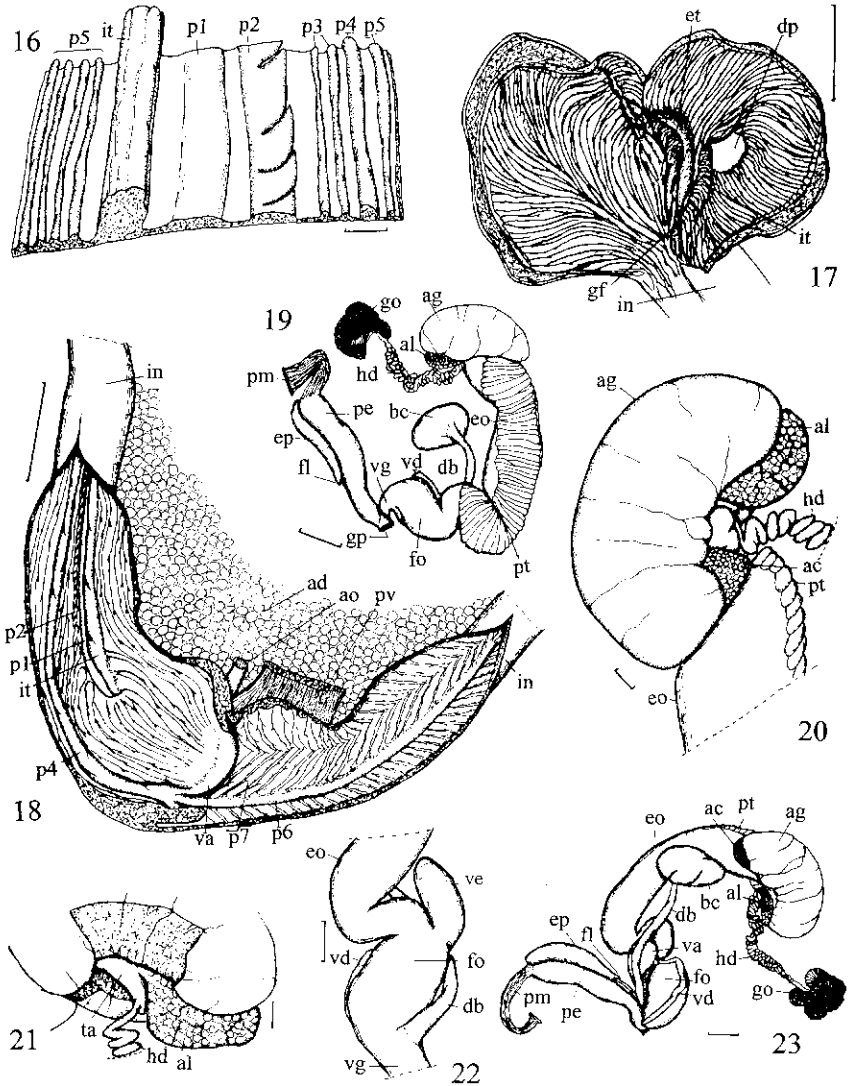
Reno-pericardial aperture in middle region of wall between kidney and heart.

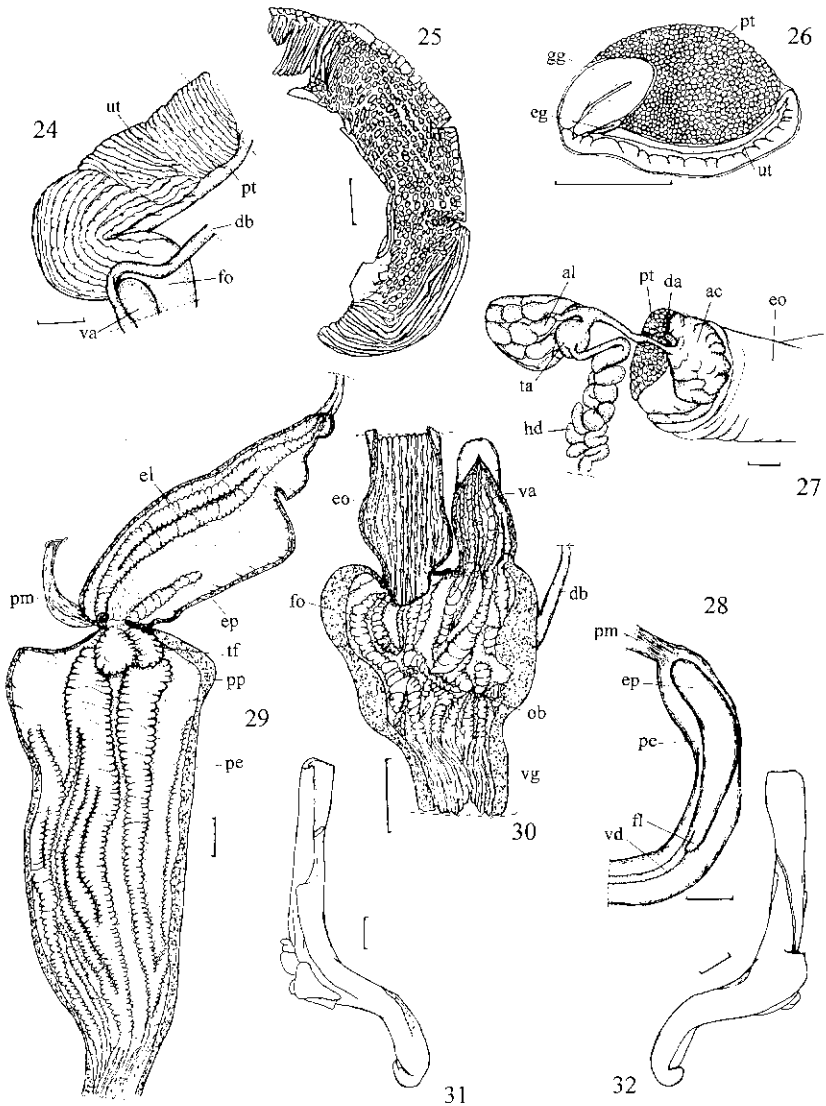
Digestive system. Radula with about 125 teeth by row. Rachidian teeth (fig. 12: c), similar to neighbors, except in being symmetric and by having an elliptic sub terminal projection in mesocone. Lateral teeth form change gradually towards borders, without a clear separation with marginal teeth, which are smaller. Esophagus with three chambers (figs. 14, 15): 1) anterior short, with thick walls and inner surface with about six irregular, longitudinal, low folds; 2) middle somewhat long, thickened walls, with a variable number of inner folds; between middle and posterior chambers a clear sphincter; 3) posterior somewhat long, generally inflated, with thin walls, smooth internally. About 1 cm of insertion of esophagus in stomach a duct to anterior digestive gland appears (figs. 10, 11), in which esophageal typhlosoles begins. Salivary glands cluster around anterior chamber of esophagus (figs. 10, 11). Stomach greatly developed, with very thick muscular walls; duct to posterior digestive gland very oblique in profile (fig. 13). In stomach inner surface (fig. 17) a well developed gastric shield with numerous small folds; only aperture to posterior digestive gland and a small smooth area between esophagus insertion and intestine origin (in its smaller curvature) free from gastric shield. In this smooth area a small oblique fold appears (fig. 17: gf). In gastric shield a tall fold visible, continuous with esophageal typhlosoles (et); another tall fold found originating within duct to posterior digestive gland, borders gastric shield near above cited fold, and continues by intestine as intestinal typhlosoles (it). Intestine with three regions: 1) proximal, between stomach and pre-rectal valve, runs anteriorly near pericardium and bursa copulatrix; 2) middle, between pre-rectal valve and pulmonary cavity, runs posteriorly lying and partially within anterior digestive gland; 3) distal, or rectum, which runs in right margin of pulmonary cavity until anus, near pneumostome (fig. 5). Inner surface of proximal intestine region with following arrangement of longitudinal folds parallel to typhlosole (figs. 16, 18: ty): p1) low, broad, covered by typhlosole; p2) similar to p1 but with oblique, successive and regular furrows which divide this fold in angulate lobes; p3) thin, smooth, vary from 2 to 4 folds far one another, sometimes bifurcate or unite; p4) similar to p3 folds but with about double of width and height of them; p5) similar to the p3 folds, vary from 5 to 6. Near pre-rectal valve (fig. 18), another character of the family, folds p1, p2 and typhlosole suddenly finish; p3 and p5 folds approximate valve edge where faint; p4 fold touches valve with a trifurcation, its lateral branches fuse with valve and its central branch runs by middle region of intestine. In inner surface of middle region of intestine (fig. 18) with several oblique regular folds (p7), successively inserted in a longitudinal fold (p6, continuous with fold p4) and keeping in opposite side a "V" shaped axis (fig. 32). In rectum only longitudinal folds internally.

Pallio-diaphragmatic muscle, other character of family, short. Unites inner surface of diaphragm with inner face of mantle, through anterior digestive gland near pre-rectal valve (Figs.6, 18).

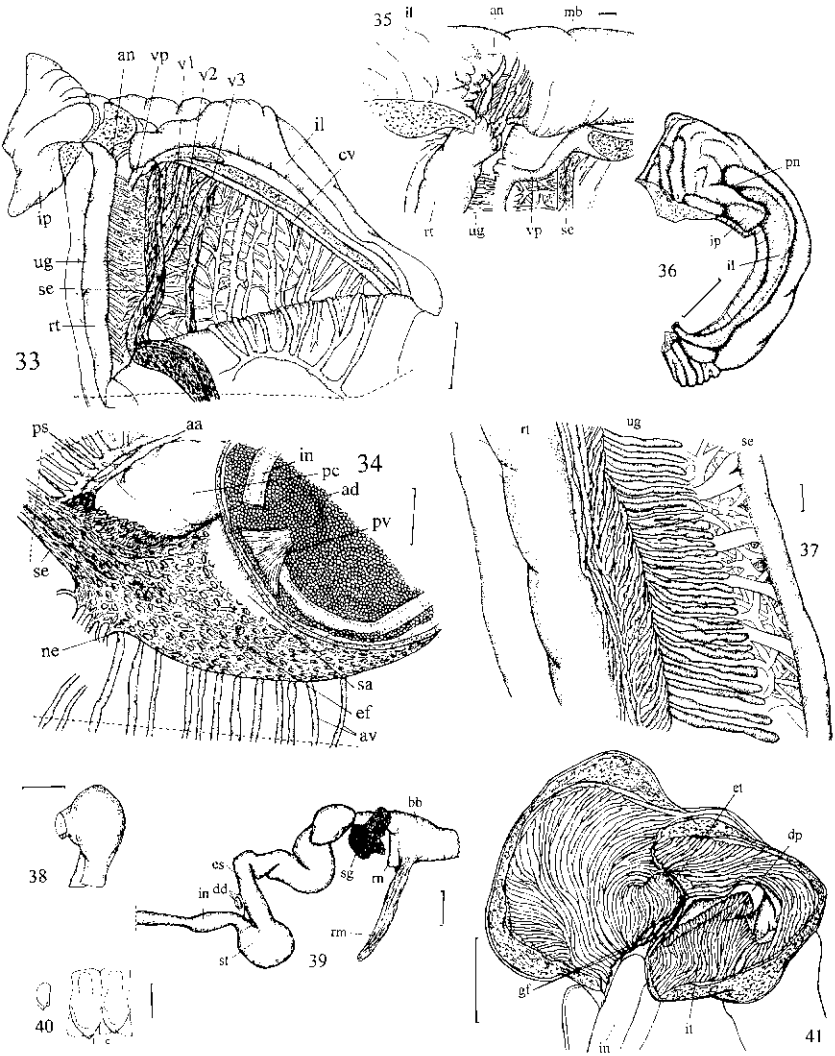
Genital system (figs. 19, 23). Gonad multilobed (from 5 to 8 lobes) (figs.19, 23). Hermaphroditic duct greatly coiled except in its extremities, inserts laterally in a talon partially covered by albumen gland (figs. 19-21, 23). Talon inserts in base of annex glandular sac, which has a long and extremely thin duct deeply surrounded by albumen gland, only visible after total removal of this gland (fig. 27). Duct of annex glandular sac inserts in albumen chamber (fig. 27) just by side of duct of albumen gland (da). Spermoviduct long, such parts shown, by means of a transversal cut of its mid region, in Fig. 26: feminine



Figs. 16-23. *Megalobulimus riopretensis*: 16, proximal region of intestine, an extracted and opened band of its middle level, inner view; 17, detail of inner surface of stomach, exposed by means of horizontal incision; 18, inner surface of transition between proximal and middle regions of intestine, just in pre-rectal valve, exposed by means of a ventral, longitudinal incision; 19, complete view of extracted genital system, dorsal view; 20, detail of carrefour and albumen gland region, ventral view; 21, same, with part of albumen gland extracted to show carrefour structures; 22, detail of anterior region of genital system, dorsal view; 23, same than fig. 19, ventral view. Abbreviations see figs. 5-15. Bar 10 mm: figs. 19, 23; 5 mm: figs. 17, 18, 22; 2 mm: figs. 20, 21; 1 mm: fig. 16.



Figs. 24-32. *Megalobulimus riopretensis*: 24, detail of anterior-ventral region of spermoviduct, inner folds of uterus seen by transparency; 25, inner surface of extracted ventral wall of uterus; 26, transversal cut in middle region of spermoviduct, showing its components; 27, detail of carrefour, albumen gland whole removed, ventral view; 28, detail of penis and adjacent genital tubes, left view; 29, penis and epiphalus opened longitudinally to show their inner surface; 30, detail of genital duct inner surface, exposed by means of longitudinal incision from anterior region of spermoviduct and free oviduct appendix to vagina; 31, 32, two views of spermatophore found in duct of bursa copulatrix. Abbreviations see figs. 5-15. Bar 5 mm except fig. 2: 2 mm.



Figs. 33-41. *Megalobulimus mogianensis*: 33, pulmonary cavity roof, middle and anterior regions, ventral-inner view; 34, posterior region of pulmonary cavity roof and anterior extremity of visceral mass just in region of kidney, ventral view; 35, region of pneumostome, inner-ventral view, inner lip of pneumostome (il) deflected; 36, part of exposed region of mantle collar removed from head-foot, frontal view; 37, detail of pulmonary roof in middle region of ureteric groove, inner-ventral view; 38, stomach in profile, ventral view; 39, middle and anterior region of digestive system, right view; 40, two radular teeth, central (c) and first left marginal (l), marginal tooth; 41, inner surface of stomach, exposed by means of horizontal incision. Abbreviations see figs. 5-15. Bar 10 mm: figs. 33, 36, 38, 39; 5 mm: figs. 34, 41; 1 mm: figs. 35, 37; 0.1 mm: fig. 40.

part the uterus (ut) and masculine part the prostate gland (pt), accessory genital gland (gg) and spermatic gutter (eg). Prostate gland occupies about half of outer spermoviduct surface (figs. 19, 26, 27). Inner folds of uterus shown in Fig. 24 (outer view, by transparency) and Fig. 25 (inner view); in beginning transversal folds, in mid region oblique folds and in basal region longitudinal folds. Free oviduct thick, with about eight inner, irregular, longitudinal folds (fig. 30). Free oviduct appendix (fig. 22: av) cylindrical, somewhat long, with rounded tip; its inner surface with five to seven longitudinal folds similar to those of free oviduct, but one of them always larger (fig. 30). Vagina proportionally short; internally with two regions (fig. 30): posterior with folds similar to those of free oviduct, some of them converge to aperture of duct of bursa copulatrix (ob); and anterior with thin, numerous folds. Genital aperture with a short atrium (fig. 19).

Duct of bursa copulatrix relatively short, runs by anterior half of spermoviduct partially covering free oviduct appendix (fig. 23). Bursa ovoid-irregular (figs. 19, 23), stays near pericardium region. In specimen MZSP 28045 a spermatophore was found within duct of bursa.

Deferent duct runs attached to outer surface of free oviduct and vagina, slightly coiled. Afterwards it crosses to masculine branch. Epiphalus with a small flagellum (fig. 28: fl). Epiphalus long (about half of penis length) and conic; its inner surface with only one longitudinal fold, divided in two branches in its larger part (fig. 29). Penis long and conic, its inner surface with two regions (fig. 29): anterior covered by thin and numerous folds, similar to those of vagina; and posterior covered from five to eight longitudinal, irregular and thick folds, one of them larger; near aperture to epiphalus a transversal and short fold (tf).

Spermatophore (figs. 31, 32) sigmoid, posterior region damaged, anterior region with rounded tip in which possesses a flattened and twisted fold.

Habitat. under vegetation and on florest floor.

Measurements (respectively length, width, aperture length in mm, and number of whorls). Holotype: 95.9; 51.9; 47.5; 6.4; Paratypes: MZSP 28044, 94.1; 51.9; 46.4; 6.3; 28045, 85.5; 54.4; 47.0; 6.2; 28046, 89.5; 53.4; 45.6; 6.2; 27047, 85.0; 49.9; 42.0; 6.1.

Etymology. The specific name refers to the region of São José do Rio Preto, São Paulo.

Megalobulimus mogianensis sp. n.

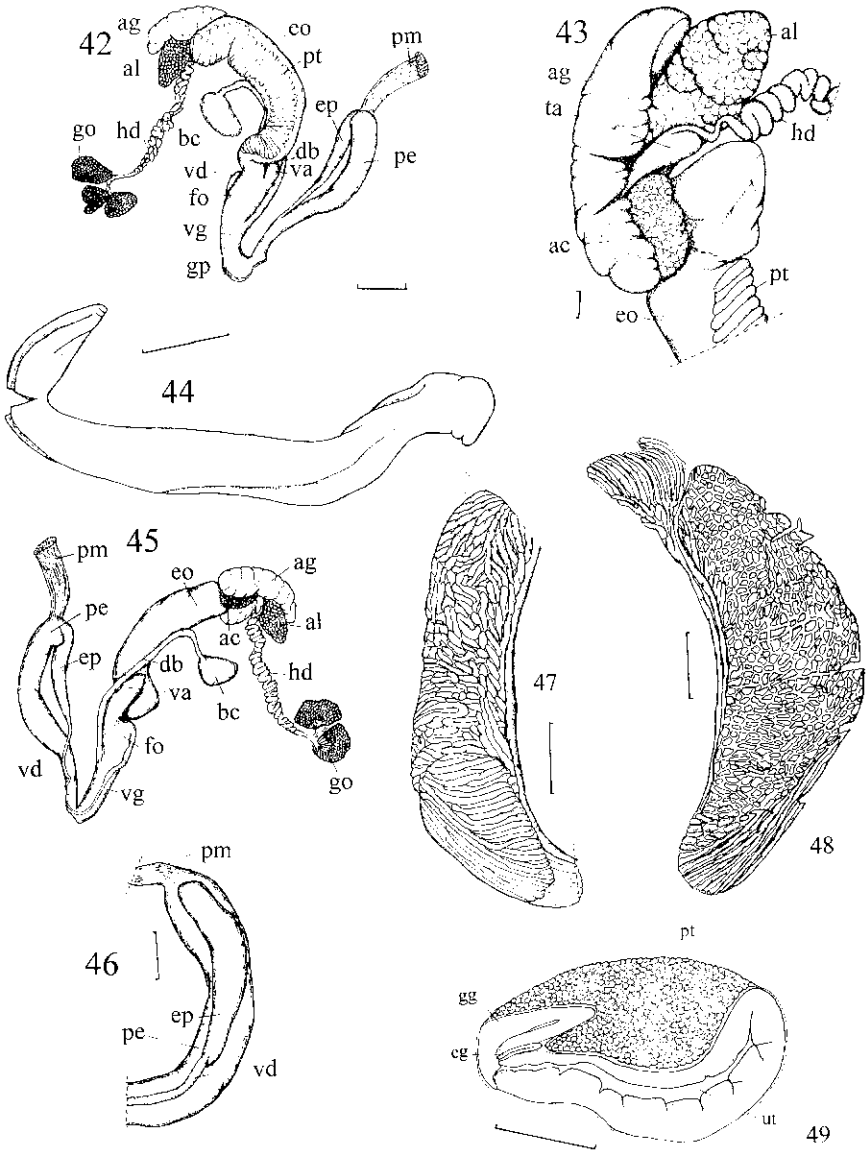
(Figs. 3, 4, 33-49)

Megalobulimus sp; BRAZIL-ROMERO & HOFFMANN, 1988: 115-116.
Megalobulimus sanctipauli; ROMERO & HOFFMANN, 1991: 223-227; 1992: 93-98; ROMERO **et al.**, 994: 37-40 (**non** Ihering & Pilsbry **in** PILSBRY, 1900).

Types: Holotype MZSP 28030. Paratypes: MZSP 28023-29029, 28031 to 28040, 19 specimens, all from type locality; MZSP 28016-28022, 7 specimens, Brazil, São Paulo, São Joaquim da Barra, 20°34'53"S - 47°51'17"W, average altitude 625m.

Type locality: Brazil, São Paulo, Santa Rita do Passa Quatro, 21°42'37"S - 47°28'41"W, average altitude 748m.

Diagnosis. Shell with periostracum lost, aperture red; protoconch from 3.1 to 4.0



Figs 42-49. *Megalobulimus mogianensis*: 42, genital system, ventral view; 43, carrefour and albumen gland region, ventral view; 44, spermatophore; 45, same than fig. 42, dorsal view; 46, penis and adjacent genital tubes, left view; 47, ventral view, uterus folds seen by transparency; 48, inner surface ventral wall of uterus; 49, transversal cut in middle region. Abbreviations see figs 5-15. Bar 10 mm: figs.43, 45; 5 mm: figs. 44, 46-49.

whorls and with profile angle between 88°30' and 98°. Mantle border without two elliptical protuberances. Ureteric groove folds anterior limit in level of mantle; its folds in rectal surface continuous and with about three narrow folds bordering; its folds in pallial surface close mantle septum. Two accessory vessels of pulmonary vein. Accessory pericardial vessel lacking. Kidney folds anterior to nephrostome present. Radular rachidian tooth simple, without elliptical central projection. Esophageal typhlosole distal end fainted. Two or three slightly broad folds in smaller gastric curvature. Uterus inner folds irregular distributed. Bursa copulatrix introduced between pericardium and digestive gland, with long duct. Epiphalus without flagellum. Spermatophore with a broad and simple base.

Description. Shell (figs. 3, 4). Large (up to 110 mm), oval- inflated, imperforated, up to 6 convex whorls. Periostracum lost. Protoconch inflated (88°30' - 98°), from 3.5 to 4 whorls (most with 3.8 whorls), rather deep suture; first whorl smooth and opaque, second whorl gradually appearing thin and prosocline axial ridges in its inferior region, third and fourth whorls with strong axial ridges from suture to suture. Teleoconch with about two convex whorls, rather deep suture. Sculptured by strong axial ridges somewhat thick and irregular. Aperture elliptic, with length about half of total shell length. Peristome red; outer lip arched; inner lip with upper half convex and lower half straight or discretely concave.

Mantle border (fig. 36). Similar to that of preceding species, except by absence of two elliptic protuberances and absence of furrow of angular extremity.

Pneumostome region (figs. 33, 35). Folds of border continuous with anal folds short and simple, without secondary oblique folds between them. Folds of ureteric groove visible until near mantle border, beyond anus line (fig. 35).

Pulmonary cavity (fig. 33). Differs from observed in preceding species, in region at left of septum, in having three larger vessels covered by net of vessels which also forms septum, two short (v1, v2), third long (v3) inserting near pericardium. Left limit of folds of ureteric groove the net of vessels which covers septum, without smooth area between these structures. Folds of ureteric groove differs in its mid region (fig. 37), by having uniform and continuous folds in outer surface of rectum, bordered externally by two or three longitudinal folds (with similar width of remainder folds and an irregular fashion of dichotomy). Near kidney, ureteric groove folds few numerous and well spaced if compared with those of preceding species (fig. 34).

Kidney (fig. 34) site and characters similar to that of preceding species, however, epi-renal plexus is thin, uniform and proportionally broader, keeping a small smooth zone (sa). Nephrostome with four or five short folds anteriorly to it, sited similarly to that of preceding species (ne). Pericardium occupies about 1/3 to 1/4 of total reno-pericardial region. A conspicuous vessel (aa) parallel to pericardial vessel also present.

Digestive system. Outlook in Fig. 39. Following distinctive characters found: radula with rachidian tooth (fig 40: c) without elliptic elevation in mesocone; stomach profile obese, duct to posterior digestive gland broad and somewhat perpendicular (fig. 38); stomach inner surface (fig. 41) with a low fold in which esophageal typhlosoles finishes; an ample smooth and flaccid area near duct to posterior digestive gland and also, in small smooth zone between esophagus insertion and intestine origin, two or three well-developed oblique folds (gf). Intestine characters, regions and inner folds similar to those of anterior species.

Genital system (figs. 42-49). General characters similar to those of preceding species,

except by following aspects: 1) hermaphroditic duct discretely less coiled (figs. 42, 45); 2) carefour region exposed in hilar region of albumen gland (fig. 43) independently of development of this gland; 3) uterus inner folds oblique and divergent in beginning, in mosaic in its mid region and longitudinal in basal region (figs. 47-49); 4) vagina proportionally longer; 5) bursa copulatrix introduced between pericardium and anterior digestive gland (to be extracted, a dissection of this region is necessary). 6) bursa duct longer; 7) flagellum absent in epiphalus (fig. 46).

Spermatophore (fig. 44). Found in duct of bursa of specimen MZSP 28016. Sigmoid and large; sharp and curved tip in which a broad furrow appears, this furrow lies to mid region; near basal region of spermatophore the furrow becomes deeper, its border lean against one another, becoming a duct, which cross to opposite side, near base, where it opens again. Base broad and obtuse, without projections.

Measurements (after collection number follow length, width, aperture length in mm, and number of whorls). MZSP 28023 (holotype), 88.8; 52.0; 44.0; 5.8; 28024, 91.0; 54.0; 44.5; 6.1; 28025, 91.4; 56.0; 47.8; 5.8; 28026, 96.6; 59.0; 49.6; 6.0 (all from type locality); 28016, 103.2; 65.0; 54.8; 6.3; 28017, 104.2; 62.0; 51.3; 6.1; 28018, 94.7; 57.2; 45.2; 5.9 (these three from São Joaquim da Barra).

Etymology. The specific name refers to the train line "Mogiana", which crosses the cities where the species is found, popularly called "Mogiana" region.

DISCUSSION

The following conchologic comparison is restrict to species similar to *M. oblongus* (Müller, 1774), i.e., those included by some author as subspecies of this species (e.g., BEQUAERT, 1948) or in a same taxon (e.g., the genus *Psiloicus* Morretes, 1952).

There is variation in the specimens size of *M. mogianensis* between the two studied lots, the specimens from São Joaquim da Barra are generally larger (adult length 94.7 - *102.6* - 109.6 mm) while those from Santa Rita do Passa Quatro are generally smaller (adult length 81.2 - *91.1* - 96.6 mm), but except this difference, no other morphological differences was found. The specimens of *M. riopretensis* have adult length 85.0 - *91.5* - 95.7 mm.

Both species described herein differ conchologically from *Megalobulimus oblongus* typical (sensu BEQUAERT, 1948) in having shorter spire, amplest aperture and shorter body whorl. Differ from *M. conicus* (Bequaert, 1948) and from *M. elongatus* (Bequaert, 1948) by not being dorso-ventrally flattened. Differ from *M. albescens* (Bequaert, 1948) and from *M. albus* (Bland & Binney, 1972) by having peristome red. Differ from *M. musculus* (Bequaert, 1948) and from *M. formicacorsii* (Barattini & Ledón, 1949) by having larger size. Differ from *M. perelongatus* (Bequaert, 1948) and from *M. haemastomus* (Scopoli, 1786) by having shorter spire.

M. riopretensis differs from *M. lorentzianus* (Döring, 1876) (sensu SCOTT, 1939; BEQUAERT, 1948) by having apex more sharp, taller spire and longer outline. Differs from *M. nodai* (Morretes, 1952) by having apex more sharp, longer spire, shorter penultimate whorl and shorter body whorl. Differs from *M. wohlersi* (Morretes, 1952) by having larger apex, shorter spire, shorter penultimate whorl and taller body whorl.

M. mogianensis differs from *M. lorentzianus* by having smaller aperture [aperture length 0.500 - *0.521* - 0.547 of the total shell length, in contrast with about 0.48 of *M.*

lorentzianus (SCOTT, 1939; BEQUAERT, 1948)]. Differs from *M. nodai* by having broader shell, penultimate whorl shorter, body whorl taller and no umbilicus. Differs from *M. wohlersi* by having shorter and more sharp spire, more obese outline, deeper suture, penultimate whorl shorter and body whorl taller.

The number of accessory vessels of the pulmonary vein, which are covered by the net of anastomosed vessels of the septum, is interesting for helping specific separations, they are absent in *Megalobulimus auritus* (LEME, 1993: 98, figs. 3-4), vary from 4 to 5 in *M. proclivis* (LEME & INDRUSIAK, 1995: 23, Fig. 5) or are diffuse, without differentiation of vessels in *M. lorentzianus* (SCOTT, 1939: 268, Fig. 23). *M. riopretensis* has one and *M. mogianensis* two vessels.

The radular rachidian teeth of *M. mogianensis* and *M. riopretensis* are similar to the neighbor lateral teeth, except in being symmetric, this also occurs with *M. lorentzianus* (SCOTT, 1939: 236, Fig. 8; but has bifid cusps). Meanwhile, *M. lopesi, M. grandis* and *M. ovatus* (LEME, 1989, figs. 11, 14) have the rachidian teeth narrower and shorter than the lateral teeth.

The intestinal folds, mainly in perivalvular region, are similar in both studied species, but differ from those of *M. parafragilior* (LEME & INDRUSIAK, 1990: 101, Fig. 7) and *M. abbreviatus* (LEME, 1973: 316, figs. 32, 35), by having another distribution and the valve in two plates; differ from *M. auritus* (LEME, 1993: 101, figs. 14-15) in having a fold touching the valve and an heterogeneous group of longitudinal folds in proximal region of the intestine.

The presence of a talon in the carefour region of the genital ducts of *M. mogianensis* and *M. riopretensis* differs these species from *M. lopesi* and *M. ovatus* (LEME, 1989: 316, figs.7, 8) and from *M. auritus* (LEME, 1993: 102, figs, 17, 21). The lateral insertion of the hermaphroditic duct in the talon differs the studied species from *M. lorentzianus* (SCOTT, 1939: 26, fig. 21) in such the insertion is terminal.

The width of the prostate gland of both studied species is about half of the spermoviduct, which also occurs in *M. lorentzianus* (SCOTT, 1939: 360, Fig. 20) and *M. gummatus* (LEME, 1973: 318, fig. 39), in contrast with other species, which have narrower prostate gland, such as *M. popeilarianus* (LEME, 1973: 318, fig. 39), *M. lopesi, M. ovatus* (LEME, 1989: 316, figs. 7, 8), *M. parafragilior* (LEME & INDRUSIAK, 1990: 102, fig. 11) and *M. auritus* (LEME, 1993: 102, fig. 16).

The free oviduct appendix, well developed in *M. mogianensis* and *M. riopretensis*, also occurs in *M. lorentzianus* (SCOTT, 1939: 260, fig. 20) and *M. proclivis* (LEME & INDRUSIAK, 1995, figs. 14, 16), but is absent in *M. lopesi, M. ovatus* (LEME, 1989: 316, figs. 7, 8), *M. parafragilior* (LEME & INDRUSIAK, 1990: 102, figs. 10, 11) and *M. auritus* (LEME, 1993: 102, fig. 16). The free oviduct appendix was also described for *M. oblongus* by IHERING (1891, 1912) and BAKER (1926), but SCOTT (1939: 260), founding this structure in *M. lorentzianus*, called it as **bursa hastae**, like that which occurs in Helicidae, an incorrect name once the style and the accessory glands are absent.

The inner folds characters of the reproductive ducts are similar in both species described herein, except those of the uterus (explored above). Both differ from the congener species in such these characters are know, as *M. lorentzianus* (SCOTT, 1939: 265, fig. 22), *M. parafragilior* (LEME & INDRUSIAK, 1990: 103, figs. 15-16) and *M. proclivis* (LEME & INDRUSIAK, 1995: 24, fig. 13), from which the main difference is the transversal fold in the penis tip (fig. 29: tf).

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