

BIOMPHALARIA OCCIDENTALIS PARAENSE, 1981 IN THE STATE OF MINAS GERAIS, BRAZIL

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A population of Biomphalaria occidentalis was found for the first time in the State of Minas Gerais. It was probably introduced into the Várzea das Flores dam, in the municipality of Contagem, the area of study, during fish stocking in 1985.

There is the possibility of "competitive exclusion" between that species and B. glabrata, previously the only Biomphalaria found in the region.

The present geographical distribution of B. occidentalis in Brazil is listed.

Key words: *Biomphalaria occidentalis* – Planorbidae – geographical distribution – snail control

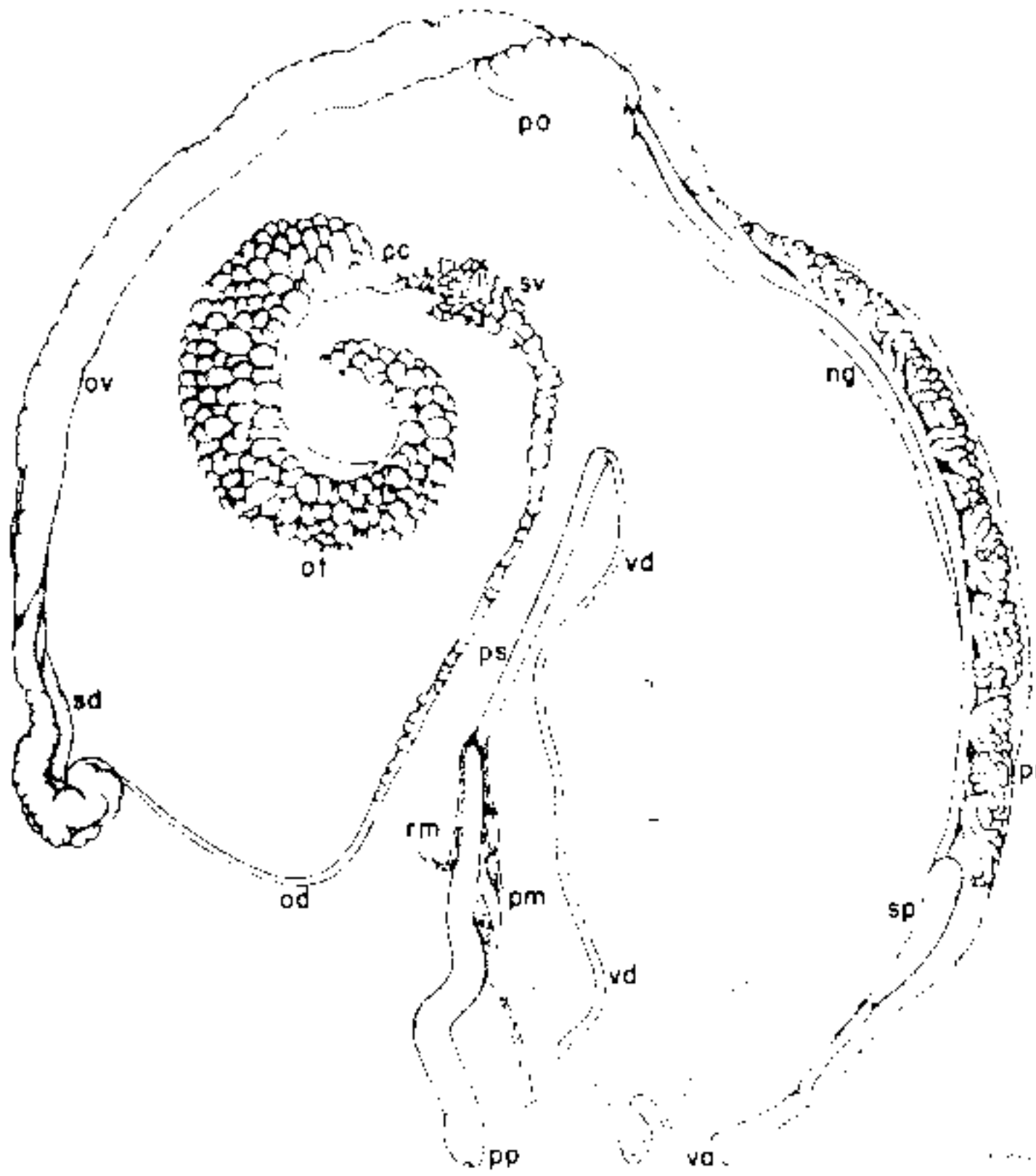
The finding of *Biomphalaria occidentalis* Paraense, 1981 for the first time in Minas Gerais leads us to record its occurrence in the state and to survey its geographical distribution in Brazil.

According to Paraense (1981, 1983, 1984, 1986) and Paraense & Corrêa (1982), *B. occidentalis* was, until recently, confused with *B. tenagophila* (Orbigny, 1835) because of the great similarity of their shells and the majority of their internal organs. Because of this and because *B. occidentalis*, in contrast to *B. tenagophila* is refractory to infection with *Schistosoma mansoni* – at least the SJ2 strain from São José dos Campos (Paraense & Correa, 1982; Coimbra Jr. & Engel, 1982) and Paulista strain from Pernambuco (Coimbra Jr. & Engel, 1982) – knowledge of the geographical distribution of this species is of great value to the health authorities responsible for combating schistosomiasis.

On 5 April 1992, a group of snails were collected from the Várzea das Flores dam (municipality of Contagem, MG) in the area of Represa Farm, property of the firm LEMA Ltda. In this group were 24 planorbids and an undetermined number of *Melania tuberculata* Wagner, 1827 and *Pomacea* sp.

Among the planorbids, there were 21 live specimens which were dissected, showing the same anatomic characters (Fig. 1) as described by Paraense (1981) for *B. occidentalis*, and three empty shells, two of which were characteristic of the same species and the other typical of *B. glabrata* (Say, 1818). The shells of *B. occidentalis* (Fig. 2) had 11 to 13 mm in diameter, 4.0 to 5.5 mm in width, and 4.75 to 5.75 whorls. A test of cercarial elimination, by exposure to light, was negative.

The Várzea das Flores dam, 40 km west of Belo Horizonte in the municipalities of Betim and Contagem, has an area of 121.2 km², an average depth of 7.3 m and a maximum of 24 m, a perimeter of 54 km, a maximum length of 7 km and maximum width of 1.5 km. Its construction was started in 1968 and finished in 1972. It chiefly functions as a regularizing reservoir of water supply to Betim, Contagem and part of Belo Horizonte. The dam is also used for agricultural irrigation and aquatic sports. Floating or emerging macrophytes are not present at the water surface. The marginal vegetation is composed predominantly of grass and some *cerrado*-type arboreal plants. The climate of the region, according to Köppen classification, is Cwa type (mesothermic with a hot summer and a dry winter). Access to the dam is very difficult, particularly during the rainy season (Seebler, 1980). According to personal communication by Drs Tales Viana and Marília Bouchardet, about 1,500 fry were released in the dam in May 1985.



Biomphalaria occidentalis from Contagem, Minas Gerais - Fig. 1: reproductive system. cc = collecting canal of ovotestis, ng = nidamental gland, od = ovispermiduct, ot = ovotestis, ov = oviduct, pm = protractor muscle of penial complex, po = pouch of oviduct, pp = prepuce, pr = prostate, ps = penis sheath, rm = retractor muscle of penial complex, sd = spermiduct, sp = spermatheca, sv = seminal vesicle, va = vagina, vd = vas deferens. Bar = 1 mm.

In studies carried out in the Várzea das Flores basin, at the request of COPASA MG (Companhia de Saneamento de Minas Gerais), the following molluscs were collected in 1980: *Pomacea* sp., *Physa* sp., *Drepanotrema* sp., *B. glabrata* and bivalves (Seebla, 1980); and in 1985, in addition to these, *Lymnaea* sp. (Leme, 1985).

In a second visit to the same catchment area, on 20 July 1992, a live specimen of *B. occidentalis* was collected, besides 77 shells

probably of the same species, a few live specimens of *M. tuberculata* and *Pomacea* sp. and a large number of empty shells of the two last-mentioned molluscs. On that occasion the water level of the dam was more than a meter below normal.

Figure 2 shows the present geographical distribution of *B. occidentalis* in Brazil. The localities, by state, where this species has been found are listed below:

Acre: Brasiléia, Sena Madureira, Tarauacá (Paraense, 1981).

Amazonas: Tefé (Paraense, 1981).

Mato Grosso: Alto Paraguai, Arenópolis, Cabaçal, Cáceres, Cuiabá, Diamantino, Nortelândia, Nossa Senhora do Livramento, Pontes e Lacerda, Rondonópolis, Rosário do Oeste, Santa Elvira, Várzea Grande (Paraense, 1981); Cachoeirinha, Jaciara, Jauru, Quatro Marcos, Barão de Melgaço, Santo Antônio de Leverger (Paraense, 1983).

Mato Grosso do Sul: Aquidauana, Bela Vista, Camapuã, Campo Grande, Miranda, Rio Brillante (Paraense, 1981); Piraputanga, Ribas do Rio Pardo, Três Lagoas, Porto Esperança (Paraense, 1983).

Minas Gerais: Contagem (here registered).

Paraná: Guaíra (Paraense, 1981).

Rondônia: Ouro Preto do Oeste (Paraense, 1983).

São Paulo: Dracena, Mirante do Paranapanema, Presidente Epitácio, Presidente Prudente, Valparaíso (Paraense, 1981); Alfredo Marcondes, Álvares Machado, Anhumas, Caiabu, Caiuá, Estrela do Norte, Flora Rica, Flórida



Biomphalaria occidentalis from Contagem, Minas Gerais - Fig. 2: shell. Bar = 5 mm.

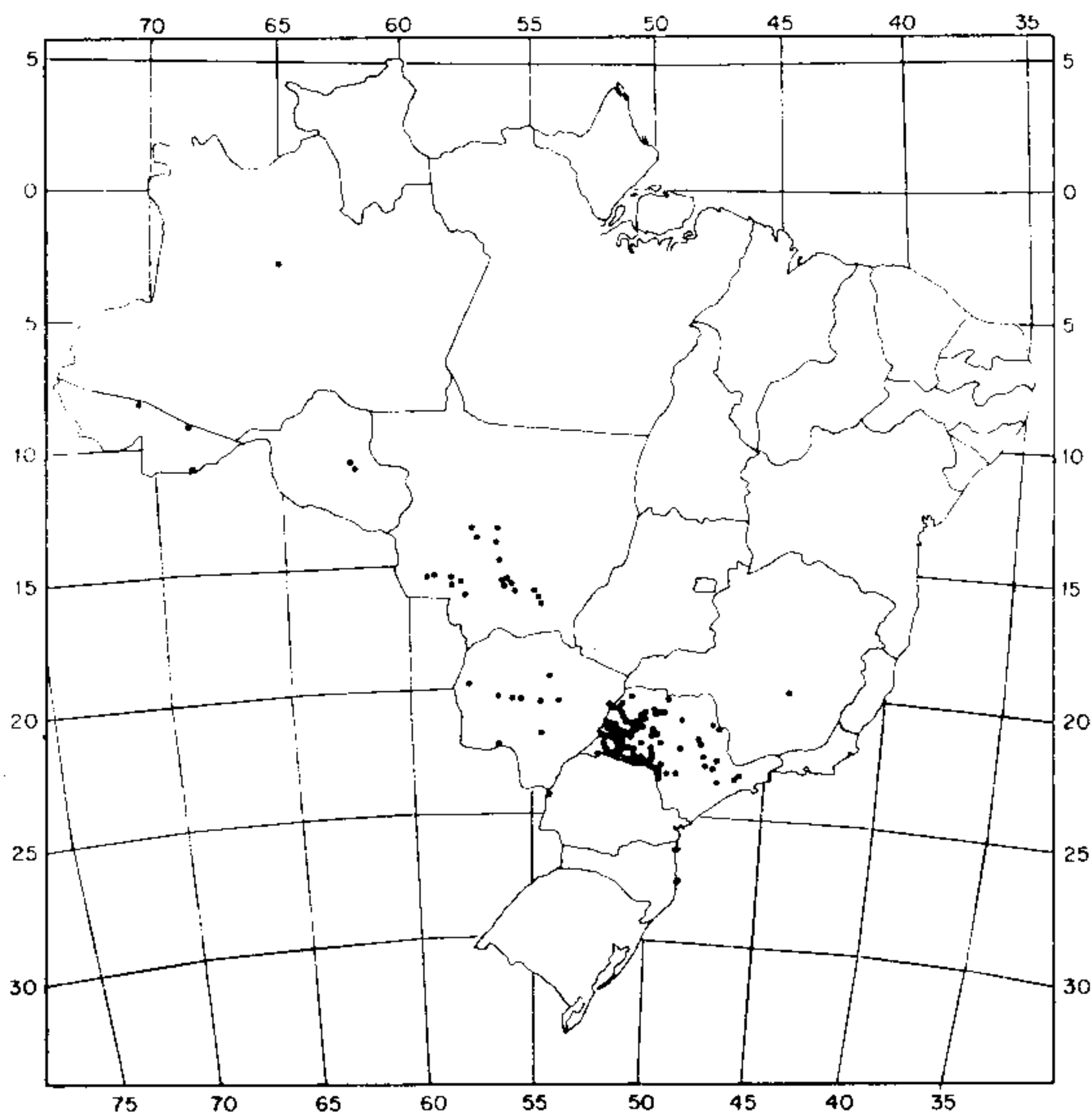


Fig. 3: distribution of populations of *Biomphalaria occidentalis* in Brazil.

Paulista, Iepê, Indiana, Irapuru, Junqueirópolis, Lucélia, Mariópolis, Marabá Paulista, Martinópolis, Monte Castelo, Narandiba, Ouro Verde, Oswaldo Cruz, Panorama, Piquerobi, Pirapozinho, Presidente Bernardes, Presidente Venceslau, Rancharia, Regente Feijó, Santo Expedito, Taciba, Tarabaí, Teodoro Sampaio (Vaz et al., 1983); Boracéia, Pirajuí (Vaz et al., 1985); São Carlos (Vaz et al., 1986); Ibiúna, Itai, Paranapanema (Vaz et al., 1987); Marinópolis, Nova Luzitânia (Vaz et al., undated); Andradina, Araçatuba, Bento de Abreu, Braúna, Buritama, Gabriel Monteiro, Guararapes, Mirandópolis (Vaz, Elmor & Gonçalves, undated); Assis, Cajuru, Campinas, Cândido Mota, Capivari, Castilho, Chavantes, Cruzália, Descalvado, Fartura, Florínea, Gália, Gastão Vidigal, Getulina, Guaiçara, Icém, Igaratá, Indaiatuba, Ipaçu, José Bonifácio, Lins, Maracaí, Marília, Mirassol, Mococa, Monte Aprazível, Neves Paulista, Ocaçu, Ourinhos, Palmital, Penápolis, Pereira Barreto, Piracicaba, Pirangi, Quatá, Quintana, Ribeirão do Sul, Rubiácea, Salmorão, Salto Grande, Sandovalina, Santa Cruz do Rio Pardo, Santa Isabel, Santo Anastácio, São José do Rio Preto, Timburi (Teles, 1989).

According to information provided by Drs Tales Viana and Marília Bouchardet, the fish stocking in 1985 included species from the Paraná River basin, where *B. occidentalis* are found and, according to Seebler (1980) and Leme (1985), in malacological surveys carried out in Várzea das Flores the only *Biomphalaria* found was *B. glabrata*. It is thus suggested that *B. occidentalis* was introduced into the dam on that fish stocking.

In our collecting only a single empty *B. glabrata* shell was found among *B. occidentalis*, suggesting that, at least in the locality studied, the phenomenon of “competitive exclusion” may be occurring between the two species, to the advantage of *B. occidentalis* which could be acting as a control species with regard to *B. glabrata*.

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