

**FIRST RECORD OF MELANOIDES TUBERCULATA (MÜLLER, 1774)
(GASTROPODA: PROSOBRANCHIA: THIARIDAE) IN THE STATE OF
PARAÍBA (BRAZIL) AND ITS POSSIBLE ECOLOGICAL IMPLICATIONS**

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ABSTRACT

This paper relates the first record of *Melanoides tuberculata* (Müller, 1774) in the State of Paraíba, Brazil. The data concerning the distribution of this species in the State showed that its ability to occupy new ecotopes is very high, because it was found in five places with well established populations, from the littoral zone to the "sertão" of the State. Its distribution is probably a consequence of its release by aquarists and of inadvertent introduction into public reservoirs in Northeast Brazil, by means of plants as supplementary food sources for fish.

Keywords: Ecology, Gastropoda, Thiaridae, *Melanoides tuberculata*, first record, State of Paraíba, Brazil.

Descritores: Ecologia, Gastropoda, Thiaridae, *Melanoides tuberculata*, primeira ocorrência, Estado da Paraíba, Brasil.

INTRODUCTION

The thiarid snail *Melanoides tuberculata* (Müller, 1774) and many of its varieties were originally distributed all over the Southeast Asia, Tropical Asia and Africa (MALEK and CHENG, 1974). Actually, they are extensively dispersed in the tropical and subtropical regions of the world (BEDÊ, 1992; POINTIER, 1993).

M. tuberculata is a prolific, parthenogenetic species (POINTIER and GUYARD, 1992; POINTIER et al., 1993b), which has been rapidly disseminated in America. In Venezuela, its introduction began around 1972, where it was spread over the whole country, together with *Thiara granifera* (POINTIER et al., 1994). In Brazil, this snail was found for the first time in Santos-SP around 1967. In 1984, it was discovered in Lago Paranoá, Brasília-DF (VAZ et al., 1986) and in a natural pond near the Fundação Oswaldo Cruz, Rio de Janeiro-RJ (JURBERG and FERREIRA, 1991). Finally, in 1986, it was also found in Lago da Pampulha, Belo Horizonte-MG (CARVALHO, 1986; BEDÊ, 1992).

Up to the moment, the distribution of this snail in Brazil was limited to the West-Central and Southeast regions.

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This paper aims to register the first occurrence of *Melanoides tuberculata* in the State of Paraíba, Northeast Brazil, and to suggest ecological implications resulting from its introduction.

MATERIAL AND METHODS

Sampling was conducted to know the fauna of the freshwater mollusks of the State of Paraíba, between August 1992 and April 1995. Specimens of *Melanoides tuberculata* were found in different sites (Fig. 1), with the aid of a Van Veen sampler, a landing-net, or manually, depending on the environment.

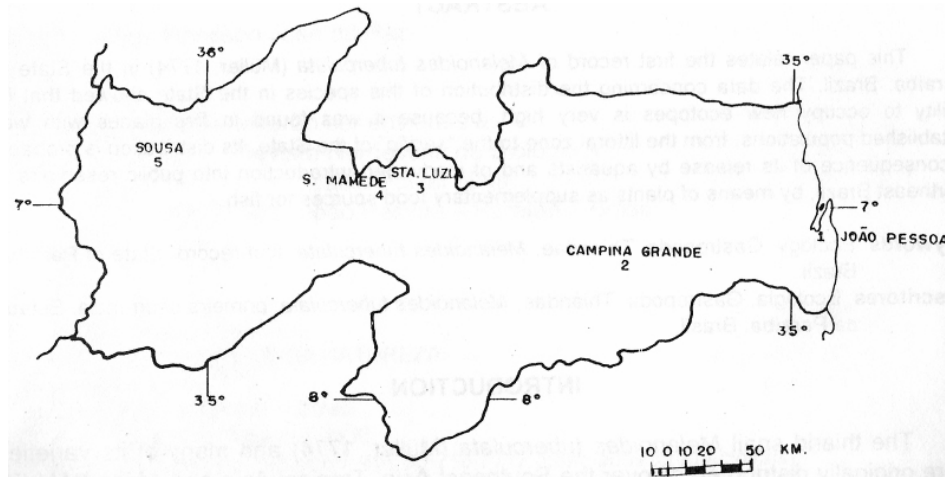


FIGURE 1 – Map of the State of Paraíba, showing the sampling sites. (1, João Pessoa; 2, Campina Grande; 3, Santa Luzia; 4, São Mamede; and 5, Sousa).

The specimens were fixed in formalin 10% and identified in the laboratory according to the literature.

RESULTS AND DISCUSSION

The specimens of *M. tuberculata* (Fig. 2) were captured at five breeding places (Tab. 1), from the littoral to the “sertão”, demonstrating a high potentiality to occupy new ecotopes.

The actual distribution of this thiarid in Paraíba is certainly the consequence of its inadequate manipulation by acuarists and of an inadvertent introduction into public reservoirs in northeast Brazilian, by means of plants as supplementary food sources for fish. As it has been proved that aquatic plants and aquaria of ornamental fishes have an important role in the propagation of *Biomphalaria* species (CORRÊA et al., 1970;

CORRÊA et al., 1980; GUIMARÃES et al., 1990), it is assumed that the same mechanism of dispersion must have occurred in the dissemination of *M. tuberculata*.

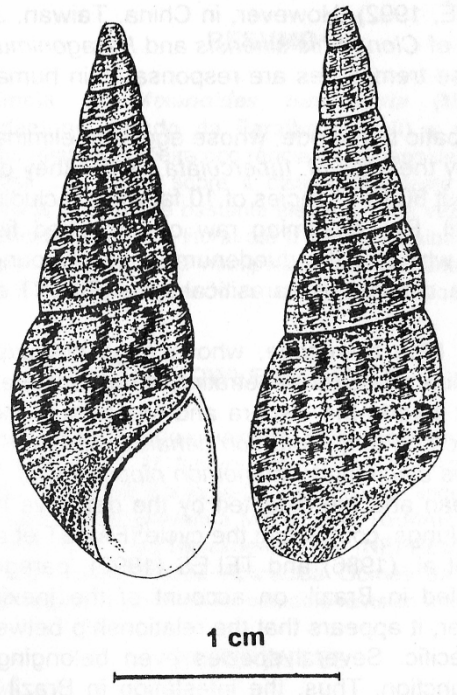


FIGURE 2 – *Melanoides tuberculata* collected in the State of Paraíba, Brazil.

TABLE 1 – *Melanoides tuberculata* collected in different cities of the State of Paraíba.

Cities	Sites	Data	Quantity
João Pessoa	Lagoa do Parque Solon de Lucena	20/03/93, 28/03/95	1532
Campina Grande	Açude Bodocongó	20/04/95	54
Santa Luzia	Açude Santa Luzia	21/04/95	159
São Mamede	Açude São Mamede	21/04/95	3421
Sousa	Açude São Gonçalo	15/08/92, 21/04/95	33

ECOLOGICAL CONSIDERATIONS ABOUT *Melanoides tuberculata*

M. tuberculata has been employed in the Caribbean islands (POINTIER et al., 1992, 1993a; POINTIER and GUYARD, 1992) and Venezuela (POINTIER et al., 1991,

1994), as an agent for the biological control of *Biomphalaria* mollusks, which are intermediate hosts of *Schistosoma mansoni*. This thiarid has a great longevity, ability to maintain high population densities for long periods, competes with another snails for space and food, has a rapid growth, a low mortality rate, and reproduces parthenogenetically (BEDÊ, 1992). However, in China, Taiwan, Japan, and Korea, it is the first intermediate host of *Clonorchis sinensis* and *Paragonimus westermani* (MALEK and CHENG, 1974). These trematodes are responsible in human for serious parasitic diseases.

C. sinensis is an hepatic trematode, whose eggs are eliminated through the feces. Their eggs are ingested by the snail *M. tuberculata*, where they develop into sporocysts that can form cysts in about 80 fish species of 10 families, including Cyprinidae, that are well represented in Brazil. By consuming raw or uncooked fish, the definitive host ingests the metacercaria, which, in the duodenum, become young larvae. These larvae go then to the bile vessels, closing the parasitological cycle (FAUST et al., 1975; VAZ et al., 1986; TELES, 1992).

P. westermani is a lung trematode, whose eggs are expelled by coughing or eliminated by the feces. Miracidia after penetrating *M. tuberculata*, originate raediae and afterwards cercariae, that invade the viscera and muscles of the second intermediate hosts that are freshwater crabs (e.g. *Potamon dehaani*) and, in Korea, some species of shrimps (e.g. *Procambarus clarkii* and *Palanemon nipponensis*). When viable cysts are developed in the crustacean and are ingested by the definitive host, they release new worms that migrate to the lungs, completing the cycle (FAUST et al., 1975).

According to VAZ et al. (1986) and TELES (1992), paragonimiasis has not any chance to become installed in Brazil, on account of the inexistence of the second intermediate hosts. However, it appears that the relationship between *P. westermani* and this host is not very specific. Several species even belonging to distinct orders of Crustacea perform this function. Thus, the infestation in Brazil of crustaceans of the same or of different families as those in Asia, is not improbable.

Coprological examinations performed at the Instituto Adolfo Lutz (Tab. 2), have shown that some immigrants from Asia coming to Brazil were infested by *C. sinensis* (CORRÊA and CORRÊA, 1977). This gives an idea of the seriousness of the introduction of snail intermediate hosts of human-infecting trematodes in any country. With this discovery, the existence of the parasites and of the first intermediate host of

TABLE 2 – Coprologic exams, realized by the Instituto Adolfo Lutz, in 1975, in Portuguese, Japanese, Koreans and Chinese immigrants, to verify the presence of *Clonorchis sinensis*.

Procedence	Exams effected	Positive Exams	%
Portugal	2175	3	0,1
Japan	155	3	2,0
Korea	69	3	4,0
China	34	4	12,0

According to CORRÊA and CORRÊA (1977).

Chinese liver fluke among us was verified. For this reason, before the introduction of any organism in any locality, an evaluation the benefits and risks of this action is needed (VAZ et al., 1986), including the study of the occurrence of other organisms susceptible to infection by parasites.

RESUMO

Primeira ocorrência de *Melanooides tuberculata* (Müller, 1774) (Gastropoda: Prosobranchia: Thiaridae) no Estado da Paraíba (Brasil) e suas possíveis implicações ecológicas. Este trabalho relata a primeira ocorrência de *Melanooides tuberculata* (Müller, 1774) no Estado da Paraíba, Brasil. Os dados sobre a distribuição desta espécie mostraram que sua capacidade de ocupar novos ecótopos é bastante elevada, uma vez que foram encontradas cinco populações bem estabelecidas, desde o litoral até o sertão paraibano. Sua ocorrência no Estado provavelmente está relacionada com sua manipulação inadequada por aquaristas e através de peixamentos de açudes nordestinos, quando da utilização de plantas aquáticas como fonte de alimento para os peixes.

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