

# A re-evaluation of the bilharzia risk in and around the Hartbeespoort Dam

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## Abstract

Recreational facilities provided by the Hartbeespoort Dam and surrounding pleasure resorts are very popular. In most of these activities close contact with water which, at one time or another in the past had harboured bilharzia snails in certain areas, is unavoidable. The last comprehensive freshwater snail survey was done more than 20 years ago. It is imperative that the general public as well as authorities concerned be kept up to date on the bilharzia risk involved. During November 1991 a systematic search of all possible freshwater snail habitats was conducted. At the same time water samples for selected chemical analyses were taken and notes were made of the aquatic vegetation. No bilharzia snails could be found in either the Hartbeespoort Dam or the Crocodile River. In the case of the former water body this could probably be attributed to the complete absence of marginal and aquatic vegetation and in the case of the latter to a very high mineral content of the water. The Magalies River is considered a potential health risk as it yielded the only bilharzia intermediate host snails during the present investigation.

## Introduction

From the results of various earlier snail surveys conducted in the area in question, the presence of *Bulinus africanus* (intermediate host of *Schistosoma haematobium*) in certain places was established. De Meillon et al. (1958) reported this species from the Magalies River and the Crocodile River below the Hartbeespoort Dam wall. Joubert et al. (1983) also collected *B. africanus* from these two localities, but reported this species also from the mouths of two small streams which enter the Hartbeespoort Dam on the eastern side of the mouth of the Magalies River. From all earlier surveys Van Eeden et al. (1964) were the only to record *B. africanus* from the dam proper. However, snail distribution is a dynamic process and considerable changes in both snail abundance and species variety may take place over a short period of time. The last comprehensive survey of this area was conducted nearly two decades ago. Successful efforts in the interim to control the floating water weed *Eichhornia crassipes*, which at one time virtually choked large areas of the open waters of the Hartbeespoort Dam and Crocodile River, altered the suitability of the dam as a potential habitat for freshwater snails considerably. The close association between freshwater snails and aquatic plants is an established fact. Freshwater snails not only utilise aquatic plants as protection from direct sunlight but also as a substrate for depositing their egg masses and to browse on.

The lack of up-to-date information on the occurrence of medically important freshwater snails and the extreme popularity of the recreational facilities of this entire area prompted our survey in November 1991. The fact that most of the visitors to this area indulge in activities such as fishing, diving, swimming and skiing made it all the more urgent to re-evaluate the bilharzia risk in the area concerned.

## Method

A team of six experienced collectors equipped with custom-made snail scoops conducted a systematic search of all possible habitats. Special attention was given to all natural and man-made

water bodies in the Mt. Amanzi Pleasure Resort situated below the dam wall. In the dam and in the mouth of the Crocodile and Magalies River an inflatable rubber boat was used in the survey.

Water samples were taken and the concentrations of Na, K, Ca and Mg were determined with a Varian atomic absorption spectrophotometer (Model 775). The electrical conductivity and pH of the water were also measured. These parameters could play a decisive role in determining the suitability of a specific habitat for colonisation by freshwater snails (Deschiens, 1956; Malek, 1958; Schutte and Frank, 1964; Williams, 1970; Brown, 1980). For the same reason the presence of certain species of aquatic vegetation was carefully recorded.

As the primary aim was to establish the species variety at each locality, no attempt was made to do a quantitative survey. All specimens of bilharzia intermediate host snails were transported live to our laboratory where they were maintained for several weeks and screened for shedding of cercariae at regular intervals.

## Results

The freshwater molluscs found are listed in Table 1. Although numerous empty shells of the invader species, *Physa acuta*, were found on the substratum all over the dam, not a single live specimen was found during the entire survey of the dam. During our survey no marginal or aquatic vegetation could be found in the dam proper.

One specimen of *Lymnaea columella* (intermediate host for the liver fluke *Fasciola hepatica*) was the only freshwater snail species of economic importance collected in the Crocodile River. *Physa acuta*, also known as the sewage snail, was the dominant mollusc species in this river.

An outstanding feature of the Crocodile River below the dam wall was the dense growth of aquatic vegetation consisting *inter alia* of the water hyacinth (*E. crassipes*), parrot's feather (*Myriophyllum aquaticum*), curled pondweed (*Potamogeton crispus*), water fern (*Azolla filiculoides*), water hornwort (*Ceratophyllum demersum*) and duckweed (*Lemna gibba*).

The Magalies River was the only locality that yielded a species variety and composition which could be expected from an undisturbed freshwater habitat in that area (Gear et al., 1980).

Results of the chemical analyses of the water samples are given in Table 2.

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