

# Seasonal study on *Bothriocephalus* as indicator of metal pollution in yellowfish, South Africa

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## Abstract

Eighty largemouth yellowfish, *Labeobarbus kimberleyensis*, were collected between April 2005 and February 2006 with gill nets close to the island (26° 52, 249' S, 28° 10, 249' E) in the Vaal Dam. The fish were killed, weighed and their length determined. Muscle, liver and spinal cord tissues were collected from each fish and the intestines removed and opened to expose *Bothriocephalus acheilognathi*. The tapeworms were collected in glass bottles and frozen. Water and sediment, as well as liver, muscle and tapeworm samples were digested and thereafter metal concentrations of 23 elements (lithium, beryllium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, arsenic, selenium, molybdenum, cadmium, tin, antimony, tellurium, barium, mercury, thallium, lead and uranium) were determined with an ICP-MS. Bioconcentration of metals (selenium, mercury, and lead during autumn; copper, zinc, selenium, cadmium, antimony, thallium and mercury during winter; lithium, zinc, selenium, cadmium and antimony during spring; and zinc during summer) occurred in tapeworms. The highest mean value was recorded in sediment, followed by water, tapeworms and host tissue. A seasonal trend showed that a higher concentration of the metals had accumulated in tapeworms during winter when water levels were at their lowest.

**Keywords:** *Bothriocephalus acheilognathi*, bioaccumulation, microwave digestion, ICP-MS, sediment, water