

## ABSTRACT

There have been several studies on heavy metals in Lake Naivasha. However, none of them has reported the levels of mercury (Hg), arsenic (As), and chromium (Cr). Moreover, there are no studies on the heavy metals' concentrations in the straightfin barb (*Enteromius paludinosus*, Peters 1852), a fish species that hosts a parasite (*Ligula intestinalis*), the latter having been reported to have a high ability to absorb heavy metals from its host. This paper therefore addresses the accumulation of heavy metals, namely arsenic (As), chromium (Cr), lead (Pb), and mercury (Hg) in the tissues of straightfin barb, *Enteromius paludinosus* (Peters 1852) from the mouth of River Malewa in Lake Naivasha, Kenya. A total of 1307 fish were collected during the month of November 2017. Water samples, sediment samples, 25 fish muscle tissues, and its endoparasite, the cestode *Ligula intestinalis*, were isolated, and heavy metal concentrations were determined using the thermal-electron atomic absorption spectrophotometer at the Lake Nakuru Water Quality Testing Laboratory. The concentrations of heavy metals in the sediment were below the lowest effect level in sediment, threshold effect concentration in sediment, severe effect concentration in sediment, and the shale values of sedimentary rocks thus showing no sign of pollution. In the muscle tissues of the fish, As, Cr, Pb, and Hg showed high levels with mean concentrations of 5.0696, 22.0854, 45.2108, and 1.5458 mg/kg ww, respectively. Bioconcentration factors further supported the observation that trace element accumulation was higher in fish compared with sediment and water. The target hazard quotients of As, Cr, Pb, and Hg obtained for both the female and male were  $> 1$  indicating a possible health risk associated with the consumption of *E. paludinosus*. The bioaccumulation factors (BAFs) for *L. intestinalis* were 2.4093, 2.1873, 5.8601, and 5.1395 for As, Cr, Pb, and Hg, respectively, indicating the potential of the cestode in the accumulation of heavy metals from the host; hence, it can be used as an accumulation bioindicator.

**Keywords:** Bioaccumulation factor (BAF); Bioconcentration factor (BCF); Fish parasites; Lake Naivasha; *Ligula intestinalis*; Target hazard quotient (THQ).