Some Aspects of the Ecology of *Barbus amphigramma* (Boulenger, 1908) in Lake Naivasha and River Malewa, Kenya

By:

Grace Mumbi Mutia

B. Sc. University of Nairobi

A Thesis Submitted In Partial Fulfilment for the Award of the Master of Science Degree in Hydrobiology, School of Biological Sciences of the University of Nairobi.

June 2006

ABSTRACT

Some aspects of the ecology of ***Barbus amphigramma*** Boulinger 1908 which included distribution and abundance, effects of physico-chemical parameters on the species, growth parameters, food and feeding habits and reproduction in Lake Naivasha and River Malewa were investigated using standard methods and procedures. The study covered nine months from February to October 2003. There was an overall influence of seasonal long rains in Lake Naivasha and River Malewa on dissolved oxygen, chlorophyll a, pH and zooplankton abundance, which recorded high levels during the months that coincided with the rains. Other parameters such as temperature, conductivity, alkalinity, and secchi depth were highest during the months that coincided with the dry season. *B. amphigramma* dominated the fish species composition throughout the study period. There were significant differences in the abundance of *B. amphigramma* in all the seven sites sampled (ANOVA, $p< 0.05$). The highest relative densities (Indiv/gillnet/hr) were recorded at the Mouth of Malewa River and the Central Landing Beach stations. Lake level fluctuations, water transparency and presence of floating and submerged vegetation had an influence on the distribution and abundance of the species with the most turbid and vegetated stations recording the highest number of fish. The species displayed allometric growth rate while the overall mean relative condition factor (Kn) for *B. amphigramma* was 1.01. Fluctuations in Kn values were observed throughout the study period with low values being recorded in April and August in both females and males respectively. The diet of *B. amphigramma* in the lake consisted of detritus,

Micronecta scutellaris and crustacean copepods while in the river the diet was centred on detritus, ephemeroptera nymphs, simuliidae larvae and chironomid larvae. *B. amphigramma* showed an overall sex ratio of 1.6:1 in favour of the females, which differed significantly from 1:1 (χ^2 = 20.342, p < 0.199, d.f = 8). The mean gonadosomatic index in *B. amphigramma* ranged from 3.71 to 5.15 for females and 2.83 to 4.42 in males. Six maturity stages were identified viz. immature virgins, developing virgins, mature, ripe, running and spent. In addition, histological examinations on oocyte development in *B. amphigramma* showed it to be asynchronous. The percentage occurrence of mature fish in the samples together with the pattern of changes in gonad weight indicated that the fish spawns throughout the year.

The implications from this study are that the distribution of *B. amphigramma* is under the influence of water transparency, lake level fluctuations, vegetation cover and probably other factors not investigated. The species may not have a serious impact on zooplankton densities, benthic organisms and phytoplankton since its feeds mainly on detritus. Its high numbers at the Mouth of Malewa river and reproduction throughout the year suggests that it is possible for a restart of *Barbus* fishery concentrating only on this section of the lake.