

ABSTRACT

In many parts of the world, wild stocks of fish are dwindling especially in Africa where drought, pollution and over-exploitation are some of the causative factors. The continent is not spared other climatic catastrophies such as global warming with its effects on the flora and fauna (both terrestrial and aquatic). This may lead to the manifestation of diseases caused by parasitic organisms, which have been known to co-exist with their hosts. The work reported here attempted to highlight the importance of studying the ecological relationship between parasites and their hosts in their wild environments i.e. the microhabitats (fish) and the macrohabitat (the lake). This work aimed at determining the distribution of four teleostean fishes *Oreochromis leucostictus* (Trewavas), *Micropterus salmoides* (Lacepede), *Tilapia zillii* (Gervais) and *Barbus amphigramma* (Boulenger) as hosts of the parasites, to establish the occurrence and prevalence of helminth parasites in each of the four species and to determine and quantify the relationships between the helminth parasites and the teleostean hosts. The distribution of the four fish species as hosts of the helminth parasites was studied for a period of two years. The occurrence of the helminth parasites, intensity of infection in each species, prevalence of each parasite on each host, differential establishment, seasonal variation in prevalence and intensity of infection and the effects of these parasites on their hosts were determined. The effect of water chemistry on the intensity of infection was established by comparing the main Lake Naivasha which is fresh and the more saline Oloidien Bay. Statistical tests used to establish the relationship between the parasites and their hosts were the chi-square, analysis of variance, split-plot technique and regression analysis. The results showed a significant variation in the monthly distribution of the fish species within the lake ($F_{11,32}=4.07$, $P<0.001$). Fish abundance also varied within the sampling sites with *Oreochromis leucostictus* being the most abundant. Depth was found to be the only single factor influencing the distribution of fish in the lake with fish numbers decreasing with depth ($b=3.04$; $t_{11}=4.15$, $P<0.01$). It was established that there are four helminth parasites whose larval stages infect Lake Naivasha fishes viz: a nematode, *Contraecaecum* sp.; an acanthocephalan *Polyacanthorhynchus kenyensis*, a trematode *Clinostomum* sp and a dilepidid cestode of the genus *Amirthingamia*. A differential establishment of these parasites on the hosts was observed. ($F_{5,2860}=14.044$; $P<0.001$). No significant variation was observed in the monthly occurrence of the parasites ($F_{11,132}=1$, $P>0.05$). Host specificity was also revealed among the parasites with two parasites *Clinostomum* and *Amirthingamia* being very specific on *O. leucostictus* and *T. zillii* respectively ($F_{15,2860}=21.63$; $P<0.001$). A strong relationship between the intensity of infection and the sex of the fish was also revealed ($X^2(1)=64.43$; $P<0.001$). Although the relationship between the age of the fish and the intensity of infection with *Contraecaecum* sp. was not significant ($t_4=0.425$; $P>0.05$), the intensity of infection of *O. leucostictus* with *P. kenyensis* increased with age ($t_4=7.061$; $P>0.01$). These parasites showed no harmful effects on their host from the observation of the relationship between intensity with *Contraecaecum* and the condition factor of the fish ($F_{3,33}=0.02$; $P>0.05$). In conclusion, Lake Naivasha fish species do not harbour any ectoparasites but they are infected by larval stages of four endoparasites.