

HABITAT PREFERENCES, FEEDING HABITS, LENGTH-WEIGHT
RELATIONSHIP AND RELATIVE CONDITION FACTORS OF
JUVENILE TILAPIAS IN LAKE NAIVASHA, KENYA.

BY

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ABSTRACT

Juvenile Oreochromis leucostictus Trewavas and Tilapia zillii Gervais were collected by beach seining from five littoral habitat types in Lakes Naivasha and Oloidien, from July, 1990 to February, 1991. Data on catch were analyzed to determine habitat preference by each fish species. Juvenile O. leucostictus highly preferred sheltered habitat types with hard substratum and covered by thick layers of detritus. Physical (water temperature and turbidity) and chemical (dissolved oxygen, pH, conductivity and total dissolved solutes (TDS)) conditions did not influence habitat preference by the fish. Juvenile T. zillii preferred exposed or partially exposed habitat types with soft sandy or muddy substratum. Water temperature, turbidity and dissolved oxygen did not seem to influence habitat preference by the fish, but pH, conductivity and TDS were important factors influencing habitat preference.

Stomach contents of 668 juvenile O. leucostictus and 191 juvenile T. zillii were analyzed to determine feeding habits and food resource sharing in the five habitat types in Lakes Naivasha and Oloidien. Juvenile O. leucostictus fed chiefly on detritus (percentage proportion (PP) ranged from 39.97 to 59.43%) and algae

(PP ranged from 12.97 to 57.81%) at all habitat types . Animal matter was , however, an important food type (PP ranging from 4.68 to 74.54%) for fish of less than 3.0 cm standard length (SL). Juvenile *T. zillii* fed on a variety of food items: detritus (PP ranged from 0.25 to 47.48%), algae (PP ranged from 4.89 to 25.90%), higher aquatic plant material (PP ranged from 1.67 to 41.26%), crustacea (PP ranged from 1.42 to 3.33%), macrobenthos (PP ranged from 11.75 to 31.42%) and insects (PP ranged from 14.90 to 33.33%). Juvenile *T. zillii* of less than 4.5 cm SL fed more on detrital matter; animal matter became the dominant food type in larger fish size- classes. The two fish species exhibited no significant dietary overlap (Schoener's (1970) niche overlap index=0.45<0.60). Feeding activity patterns in juvenile *O. leucostictus* studied over 24 hours at habitat type 1 showed that feeding activities started shortly after dawn and reached a maximum at around mid-day. Feeding activities remained high throughout daylight hours, but declined considerably at night, reaching a minimum at around mid-night. During the day, juvenile *O. leucostictus* fed mainly on detritus and algae, but at night they also took macrobenthos and other insects.

Length-weight regression coefficients (b) and relative condition factors (kn) were calculated for fish

samples collected from October, 1990 to February, 1991. The regression coefficients and relative condition factors were used to determine variations in growth patterns and condition of fish among the habitat types. Both fish species grew isometrically ($b \approx 3$) at all habitat types, except at Crescent Island site where juvenile *Q. leucostictus* grew allometrically ($b < 3$). Juvenile *Q. leucostictus* in sheltered habitat types, with hard substratum and covered by thick layers of detritus were in 'better' condition (i.e. fatter) than those occurring in exposed habitat types with high pH, conductivity and TDS. Juvenile *T. zillii* in exposed habitat types with soft sandy/muddy or hard substratum and high pH, conductivity and TDS, were in 'better' condition than those occurring in sheltered habitat types.