ECOLOGICAL DIFFERENTIATION AMONG THE PISCIVOROUS HAPLOCHROMINE CICHLIDS OF LAKE VICTORIA (EAST AFRICA)

by

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SUMMARY

Preliminary results of stomach content analysis of piscivorous haplochromine cichlids from the Mwanza Gulf of Lake Victoria indicate that the members of this trophic group are specialized predators. Although able to feed on a range of organisms, the various species have a strong preference for certain food items. Besides specialization on prey species, prey size partitioning plays an important role (especially among the predators of haplochromines). The food specializations are often correlated with habitat restrictions. The diversity of food and habitat preferences are reflected in the morphology of the piscivorous group which also indicate the existence of various predation techniques. The resulting resource partitioning contradicts the prevailing notion that many haplochromine cichlids in Lake Victoria feed on the same food items in a similar way.

SYSTEMATIC NOTES

Until recently the majority of the approximately one hundred nominate cichlid species of Lake Victoria were placed in the genus Haplochromis Hilgendorf. GREENWOOD (1979, 1980) reduced the number of species included within Haplochromis to 5, assigning the remaining species to 16 new or resurrected genera. Being still engaged in a critical analysis of GREENWOOD’S revision of the genus Haplochromis for the piscivorous species, I hesitate to accept the proposed genera at present. Therefore, in this paper I have retained the genus Haplochromis for all species.

To illustrate certain data, only new, undescribed species were available. The English nomen specificum now used to denote these species will be referred to in the eventual formal taxonomic descriptions. A collection of the species mentioned with a cheironime has been deposited in the Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands.

Following GREENWOOD (1974), the Lake Victoria cichlid species resembling Haplochromis or belonging to that genus will collectively be referred to as haplochromines.

Following HOWES (1980), Rastrineobola argentea (Pellegrin) is used instead of Engraulicypris argenteus.

INTRODUCTION

During recent investigations of the haplochromine cichlids from the Mwanza Gulf of Lake Victoria (van Oijen et al., 1981), a large collection of piscivorous species was made. In the research area (van Oijen et al., 1981: fig. 1) 80 different species belonging to this trophic category
were caught. More than half of these are new species. An analysis of the catch data and investigations of the stomach contents revealed a wide ecological differentiation amongst the piscivores. Although far from complete, the analysis of this material has yielded results which seem to contradict certain existing ideas about ecological differentiation of lacustrine cichlids (Fryer & Iles, 1972; Greenwood, 1974; Liem, 1980, 1981).

The large number of cichlid species of the Great African Lakes has long attracted the interest of ichthyologists (Boulenger, 1898; Pellegrin, 1903; Regan, 1920, 1921, 1922; Trewavas, 1933). Yet many recent publications (Brichard, 1978; Eccles & Lewis, 1977, 1978, 1979; Lewis, in prep.; Hoogerhoud & Witte, 1981; Marsh et al., 1981; Witte & Witte-Maas, 1981; van Oijen et al., 1981) indicate that the older estimates of the number of species from the various lakes (Trewavas, 1935; Poll, 1956; Fryer & Iles, 1972; Greenwood, 1974) must now be increased. Therefore the question "how can so many species subsist in the same environment?" grows even more intriguing.

Research in Lake Malawi (Nyassa) showed that species in the same habitat usually have different food preferences. If feeding on the same food items, different species employ different feeding techniques, which often enable them to remove the organisms from places inaccessible to other species (Fryer, 1959; Fryer & Iles, 1972). Only in a very few cases species from the same habitat were found to feed on the same food items in a similar way. Abundance of food was given as an explanation of this phenomenon (Fryer & Iles, op. cit.).

Until now very little information has been available about the food and the feeding habits of Lake Victoria haplochromines. This is the more surprising since many authors have attributed a major role to trophic differentiation in the evolution of the Lake Victoria cichlids (Regan, 1922; Worthington, 1954; Greenwood, 1951, 1959a, 1965, 1973, 1974, 1981; Fryer & Iles, 1972). Greenwood (1974) divided the haplochromine species into a number of trophic categories on the basis of stomach content analysis and morphological characters. Some of these trophic groups were subdivided, e.g. molluscivores into oral shellers, oral crushers and pharyngeal crushers. In this way some 11 groups of species were described greatly differing in food preferences and feeding habits. However, little attention was paid to possible differences between the members of the same trophic (sub)groups. Therefore the remaining impression is that many haplochromine species prey on the same food items. Moreover, the available evidence seems to indicate that habitat restrictions of cichlids in Lake Victoria are much less developed than among the Lake Malawi (Nyassa) cichlids (see Fryer, 1977, in a comment on Greenwood, 1974).