ZOOPLANKTON COMPONENT OF THE DIET OF ORNAMENTAL FISHES (*Hemichromis Bimaculatus and Poecilia reticulata)* IN LIMCA RESERVOIR, JOS, NIGERIA

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ABSTRACT
This study investigated the feeding habits of two ornamental fish species, Hemichromis bimaculatus and Poecilia reticulata, in Limca Reservoir, Jos, Plateau State, Nigeria, by analyzing their stomach contents for zooplankton. The aim was to identify the plankton components ingested by these fish. Stomach content analysis was performed, and plankton were identified to genus level. Fourteen zooplankton taxa were found in H. bimaculatus guts and eleven in P. reticulata. Rotifers and cladocerans were dominant. Conochilus sp, Brachionus angularis, and Daphnia sp showed high percentage occurrence, indicating preference. These species are recommended for mass culture as live feed for ornamental fish.
Keywords: Fish, Stomach, Zooplankton, Preference, Culture

INTRODUCTION

Reservoirs in Jos Plateau harbour many choice cichlids among which are two ornamental fish (*Hemichromis bimaculatus)* also known as Jewelfish or Jewel cichlid is from the Cichilidae family. It is a small ornamental fish that can grow up to 6in or 15cm and *Poecilia reticulata* are popular ornamental fish that are also called Guppies, million fish or Mosquito fish. They are the very attractive, remarkable and amazing form of aquatic animal life. They are popular aquarium fish and are well known to be hardy and survive on plankton. They are omnivores. They can survive on concentrate feeds as well as live food such as plankton (Arimoro and Ofojekwu, 2005). Laboratory examination of the stomach content of fish and other aquatic organisms has been considered a technique to provide information concerning feeding habits of fish, the kinds of organisms that are eaten, the mechanisms that have developed for digestion as well as the trophic relationships of fishes and the ability of the environment support to the growth of the fish (Budihastut, 2013; Buckland, *et al*., 2017). This is very important for fish because they require adequate nutrition in order to grow and survive. The study food and feeding habits of fish is helpful in fishery biology and culture aspects. There is no baseline information on this type of work in the study area. This research aimed at identifying the plankton components ingested by these fish. in the Limca Reservoir in Jos, Plateau state, Nigeria.

MATERIALS AND METHODS

This study was carried out in Limca reservoir, Tolemache Village, Jos North Local Government Area Plateau State. the reservoir is on latitude 8°58′ east and 9°54′ north, and has an elevation of 1,295 m above sea level.The sampling was done bi-weekly in the rainy months of April to September, 2024. Fish net was set over night and checked as early as 5 am.

Zooplankton Enumeration Procedure:

The guts of the fishes were slit open and emptied into a 15 ml sample container and preserved with 10% formalin to form 10 ml solution. Zooplankton enumeration was done using the method described by Zacharia and Abdurahiman (2004). Ample was stirred gently to avoid damage to the zooplankton appendages. 1ml of sample was drawn from the 10 ml concentrate by using the wide mouth pipette This 1ml sample was set on the Sedgewick-Rafter counting cell made of glass or plexiglass rectangle of 50×20×1 sq.mm, this cell holds exactly 1 ml of the sample. A glass coverslip was used to cover the cells which prevented the sample from drying out and disturbances by air currents. This was then viewed under the microscope and zooplankton are counted. The procedure was repeated by taking another drop of sample and counted. The plankton was calculated by following formulae: The total number of planktons in a liter of sampled was calculated using the formula:

$$\text{Number of orgasm per ml} = \frac{\text{Number of organism counted}}{\text{number of replicates}}$$

RESULTS AND DISCUSSION

The result illustrated by Figure 1 shows that 13 zooplankton were found in the gut of *Hemichromis bimaculatus* (Jewelfish) most of which were rotifers. The result showed that *Conochilus* sp had the highest occourrence followed by, *Brachionus angularis and Anuraeopsis fissa.* The result of gut content analysis of *Poecilia reticulata* (Million or Mosquito fish) for zooplankton is shown in Figure 2. The zooplankton mostly seen in the gut is *Conochilus* sp, followed by *Brachionus angularis*, *Ceriodaphnia* sp and *Dapnia* sp. Daphnia sp is absent in the gut of *Hemichromis bimaculatus* but has high occurrence in *Poecilia reticulata.* Copepods were notably absent except for the few nauplii which is a stage of their metamorphosis.

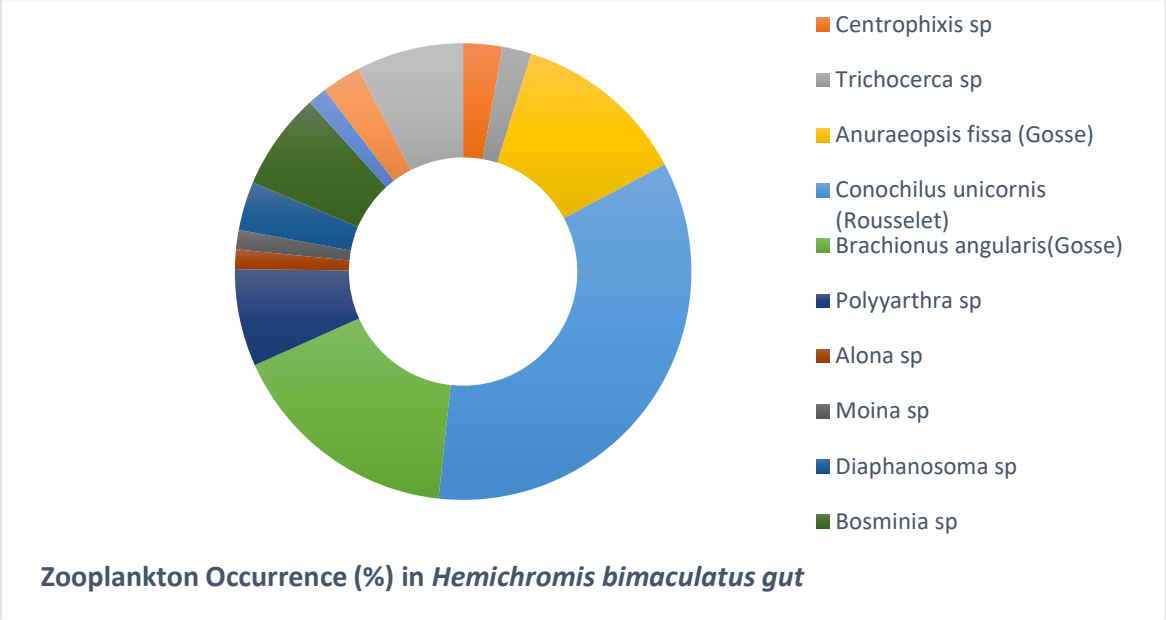

Figure 1: Zooplankton percentage occurrence in the gut of *Hemichromis bimaculatus*

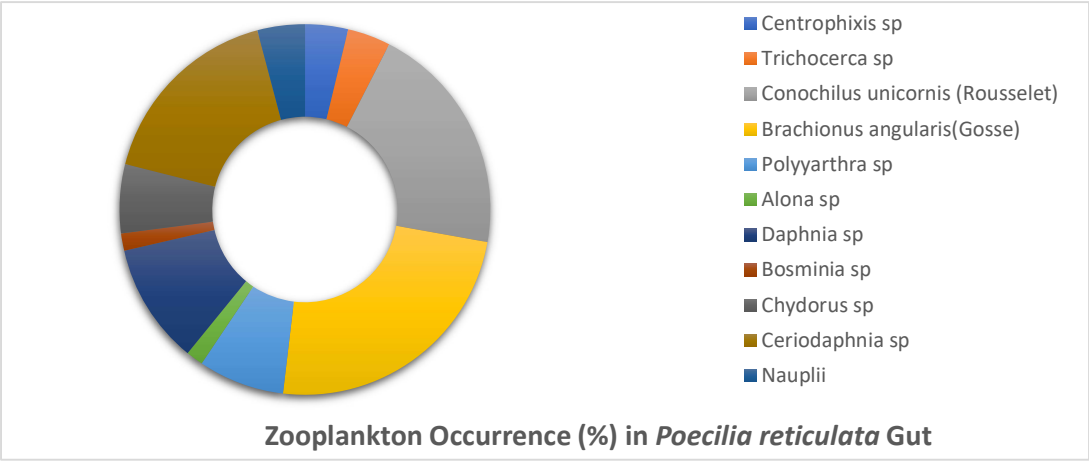

Figure 2: Zooplankton percentage occurrence in the gut of *Poecilia reticulata*

***Platw 1: Hemichromis bimaculus* (Cichlidae)**

Plate 2: Male Guppies (Poecilia reticulata)

Plate 3: Female Guppies (Poecilia reticulata)

Plate 4: Male Guppies (Poecilia reticulata)

The number of zooplankton identified in the gut of the two fishes is high when compared with the work of Budihastut (2013) who discovered only seven plankton in the gut of *Oreochromis niloticus* showed that the two ornamental fishes fed more voraciously on zooplanktonThe high occurrence of some zooplankton in the gut of these fishes more than others shows that the fishes practiced selective voracious feeding on their preferred food substrate. This is evident in the consistently higher numbers of rotifers such as *Conochilus* sp, *Brachionus angularis and Anuraeopsis fissa* found in their guts during this study. These experimental fishes are small-bodied fishes which explains their preference for rotifers above larger zooplankton such as cladocerans and copepods. *Thermocyclops* sp, *Keratella tecta*, *K. choclearis, K. valga* and *Brachionus falcatus* species of zooplankton which were reported by Oyedapo *et al*. (2017) and Oyedapo (2025) as abundant in reservoirs on the Jos Plateau were absent in the gut of these ornamental fishes. These fishes may have avoided this particular group of zooplankton due to the large body size or the spiny structure of their bodies which prevents predation to some extent. Low fish predation leads to the dominance of large cladocerans either through competitive superiority of large species (i.e size-efficiency theory) and/or size-selective predation by macro-predators (Cottenie *et al.*, 2001). The absence of some zooplankton in the fish gut may also be that they have been digested beyond recognition before the fishes were caught. These two ornamental fishes selected almost the same kind of zooplankton species as food. This implies that they can be kept together in polyculture.

CONCLUSION

The two ornamental fish species identified in reservoirs fed voraciously and selectively on zooplankton, particularly rotifers. The gut content analysis revealed 14 zooplankton in the Jewelfish while 11 were found in guppies. *Conochilus* sp, *Brachionus angularis, Daphnia sp and Anuraeopsis fissa* were occurred most frequently. Adult copepods were notably absent. The fishes selected similar zooplankton species as food therefore, it possible for them to be reared in the same tank. These preferred group of zooplankton could be cultured massively and used as supplementary feed for Jewelfish, guppies and larviculture to feed fish fries thereby increasing fish production at a reduced cost.

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