Evaluating the Food and Feeding Habits of Fish

Kamimura Y*

Department of Marine Science, Nagano University, Ueda, Japan

Received: *01-April-2022; Manuscript No: JAEFR-22-62883;* ***Editor assigned:*** *04-April-2022; Pre QC No: JAEFR-22-62883 (PQ);* ***Reviewed:*** *18-April-2022; QC No: JAEFR-22-62883;* ***Revised:*** *25-April-2022; Manuscript No: JAEFR-22-62883(R);* ***Published:*** *02-May-2022; DOI: 10.3153/JAEFR.8.4.002*

Description

Evaluating the food and feeding habits of fish is fundamental in fisheries and conservation biology research. In this study, the diet of exotic Oreochromis niloticus was compared with the 2 most abundant and aquaculture preferred native cichlids of native species in the upper Kabompo River, Zambia. We hypothesized that exotic and native cichlids would show no dietary niche overlap. We analyzed the stomach contents of 114 specimens of the fishes sampled. Fishes were grouped into 3 major feeding groups: microphages, macrophages and carnivores, and omnivores. There was no clear evidence of ontogenetic diet shift of native cichlids, with the exception, which showed ontogenetic diet shifts within the size class. The dietary overlap results indicate interspecific competition between exotic O. niloticus and native O. macrochir, which may have major impacts on food web structure in the upper Kabompo River and may explain population decreases of some native species. Exotic species have become a major threat to many native species and whole ecosystems over the world. Nile tilapia, Oreochromis niloticus, is the most widely distributed exotic fish species in Sub Saharan Africa. In Zambia, it was introduced in the late 1980's by Department of Fisheries for research and development in aquaculture. However, the introduction of O. niloticus poses a major threat to native fishes as it is known to cause trophic cascades with potential impacts on the entire fish community, particularly in highly diverse regions such as the Northwestern Province of Zambia. Partitioning of resources between coexisting species has been suggested as one of the processes responsible for structuring populations and, consequent, communities. Studies conducted showed that, in contrast to terrestrial organisms which partition resources mainly through habitat segregation, for assemblages of fishes and other aquatic animals trophic separation is more important. Partitioning of food resources is the main factor in the development of fish communities in nearly all aquatic habitats. The degree of trophic adaptability of certain fish species may limit feeding preferences when confronted with environmental changes. Changes in re source availability may influence changes in the as selvage of fish species in a community. For instance, direct competition for food resources between exotic and native species may result in diet shifts and affect native species' fitness. In certain cases, native species can also be affected indirectly by exotic species. For example, cichlids may influence a trophic cascade by either decreasing or increasing the availability of nutrients such as phosphorus and nitrogen, which may promote plankton blooms and lead to fluctuation in the dissolved oxygen content of water. Furthermore, Nile tilapia in some cases may increase turbidity through sediment suspension. These suspended solids in water have the capacity to reduce macrophyte survival, which may result in a shortening of the trophic pathways of native species. Moreover, studies by other investigators have appropriate and practical approaches to assessing possible impacts of exotic species on native fishes. The use of stomach content analysis (SCA) to infer feeding strategies and habits of native and exotic fish species within a food web is an effective tool in the conservation of native populations. For example, stomach content analysis of Serrasalmus marginatus and S. maculatus in the upper Parana River in Mexico revealed high trophic niche overlap between the species, which both consume fish fragments, detritus and plankton. SCA is useful for understanding the functional role of organisms in a food chain and is an important tool for elucidating trophic differences between is established in the study area, and decreases in populations of native species have been reported. Understanding the dietary preferences of these species may help explain these decreases and clarify how exotic species impact native species. O. niloticus and native species have generally similar feeding behavior, although O. niloticus are assumed to show somewhat more generalist foraging behaviour, feeding on a greater diversity of food items than native species. Thus, we hypothesized that and native species in upper Kabompo River would show no dietary niche overlap with the two major native species. We used SCA to test our hypothesis, the results of which should provide new insight regarding coexistence of species. The study area lies approximately 60 km from the source of the Kabompo River. The water surface area is approximately, with numerous fish landing sites. The study site was chosen because of its frequent fishing activity

and high fish diversity. The fishery (covering all the native species caught in this study) is also of economic importance to local communities as a livelihood and a source of brood fish for the Aquaculture Breeding Programmed. A total of 3 species were selected for SCA, based on the most abundant fish species caught in the river according to Eloranta. The fishes caught from five aforementioned distinct habitats at different times of the day. Indices used for diet interpretation included; vacuity index is the quantity of unfilled as number of empty stomachs and the gut fullness (GF) is average number of relatively full stomachs investigated on scale of 0 for empty to 4 for fully distended with food and lastly the diet diversity was evaluated according to Hyslop. The frequency of occurrence method was used to determine the percentage of stomachs containing a particular food item relative to the total number of stomachs containing food. The fish were first grouped into 3 major feeding groups: microphages, macrophages and carnivores, and omnivores, and then later grouped into lower taxonomic or functional categories for quantitative comparisons. Diet categories were chlorophytes, cyanophytes, diatoms, microfauna (zooplankton, insects and protozoa), fish, macrophytes, detritus, and unidentified items. The area occupied by each food item in the stomach of a specimen was transformed into a percentage of each food category. Numerical analysis was not used to categorize broader food items because lumping resource states often in- flates niche overlap values, and broader categories generally represent one or more renewable resources.

Acknowledgement

None.

Conflict of interest

The author declares there is no conflict of interest in publishing this article.

References

Choi J

*Corresponding to

Kamimura Y,

Department of Marine,

Nagano University,

Japan

Email: yakami@afrc.go.jp