

Length-weight relationship, trophic niche partitioning between exotic Cichlid (*Oreochromis niloticus*) and selected indigenous fish species in Nagadeepa Maha Wewa, Badulla, Sri Lanka

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Abstract

The introduced species *Oreochromis niloticus* in Sri Lankan reservoirs contributes significantly towards the inland fish production which accounts for over 60 percent of inland fish. However, the existence of *O. niloticus* in Sri Lankan reservoirs is often debated for threatening the indigenous fish fauna excluding the opinion, "*O. niloticus* as a species for filling the vacant niches in Sri Lankan reservoirs". In this context, the present study aims to understand the food and feeding habits of introduced cichlid *O. niloticus* and two indigenous fish species *Wallago attu* and *Dawkinsia singhala* in Nagadeepa Mahawewa, Badulla, Sri Lanka. A total of 91 middle size fish from *Oreochromis niloticus* (n = 38), *Wallago attu* (n = 16) and *Dawkinsia singhala* (n = 37) belongs to three fish species groups were sampled and analyzed for stomach content analysis. The stomach contents were identified and analyzed using the frequency of occurrence methods. The trophic niche breadth was calculated using Levins' measure of the standardized trophic niche breadth and Pianka's index was used to calculate dietary overlap between the species. Length-weight relationship of *W. attu* and *D. Singhala* was also determined. The length-weight relationship of *O. niloticus* and *W. attu* indicated that isometric growth ($b \sim 3$) and the condition factor (K) (*O. niloticus*; 1.89 and *W. attu*; 0.53) indicate the healthiness of both species. Diverse food items ranging from phytoplankton to macrophytes in the fish's stomach were recorded. Food items of the *O. niloticus* and *D. singhala* indicated that the omnivore feeding behaviour while the *W. attu* exhibited carnivore. The standardized niche breadths of the three species were ranging from 0.94-0.18 indicating the highest niche breadth for *O. niloticus* and the lowest for *W. attu*. Pianka's index revealed that, high dietary overlap (1.43) between *O. niloticus* and *D. singhala* and lowest dietary overlap (0.32) between *O. niloticus* and *W. attu*. The higher dietary overlap between *O. niloticus* and *D. singhala* and may be linked to increase the intraspecific competition under resource depletion which is highly unlike in Sri Lankan reservoirs. Investigations through more accurate and advanced methods (i.e., stable isotope analysis) may be important for further delineating the trophic relationship among the species.

Keywords: Condition factor, Feeding ecology, Resource partitioning, Tilapia, Trophic niche breadth

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