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Food-web patterns and diversity in tropical fish communities

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Abstract

The food webs for three Sri Lankan reservoirs, Minneriya (ancient and shallow), Udawalawe (young and shallow) and Victoria (young and deep), were compared. The species richness of the fish communities was highest in Minneriya (30 species), intermediate in Udawalawe (21 species) and lowest in Victoria (18 species). The fish species belonged to 11 families, with Cyprinidae dominating the community in terms of both abundance and species richness. The daily quantity of food consumed per fish species was used to distinguish weak from strong trophic interactions in these food webs. The fish community consumption pattern was characterized by a few strong interactions and many weak ones. The number of major consumers (i.e. contributing >5% of the total fish community consumption) for each reservoir was small and similar for all three reservoirs. *Dawkinsia singhala* and *Amblypharyngodon melettinus* were the two major consumers in all three reservoir food webs. *Puntius chola* was a major consumer in Minneriya and Victoria, although not in Udawalawe, where it fed less on detritus than for the other two food webs. The fish community fed mainly at the bottom of the food web, primarily on algae, macrophytes and detritus in all three reservoirs, with very little piscivory occurring. The average food-web length was measured as the mean trophic index weighted for the consumption rates of the various fish populations that together comprised the fish community. The average food-web length in these three Sri Lankan reservoirs relatively short, compared with most other tropical lake/reservoir food webs in Asia and Africa for which relevant data were available. Furthermore, traditionally unexploited species (*Oreochromis mossambicus*; *O. niloticus*), in contrast to species of commercial fisheries interest, are major role players in the trophic dynamics of reservoir ecosystems. Thus, based on this study, the potential of their exploitation should be considered in the management of reservoir fisheries.

Key words

biotic interactions, fish community, food-web statistics, South Asia, trophic index.