

Population Dynamics of Potential Fish Species for Exploitation in Presently Underdeveloped Fisheries of Some Perennial Reservoirs in Sri Lanka

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Abstract

Fish resources in some perennial reservoirs of Sri Lanka are presently under exploited or unexploited mainly because these reservoirs are located in close proximity to marine fish landing sites or in urban areas where marine fish are readily available. The asymptotic length (L_{∞}), von Bertalanffy growth coefficient (K) and natural mortality coefficient (M) of fish species inhabiting five such reservoirs in the western coastal region in Sri Lanka, namely, Boralasgamuwa (16 ha), Lunuwila (14 ha), Madampe (81 ha), Mahawewa (60 ha) and Mattegoda (4 ha) reservoirs, were evaluated in order to determine the feasibility of their sustainable exploitation. Of the 17 fish species recorded, only three species had L_{∞} values > 15 cm. L_{∞} of two species were < 5 cm. The K values of most of the species were $> 1.0/\text{year}$. Since no fishing is carried out in these reservoirs, the fish are subjected to natural mortality only. The M values of all species other than three species were found to be $> 2.0/\text{year}$. High K and M values of most of the fish indicate that they have high production per biomass (P/B) ratios. Most of the fish species inhabiting these reservoirs could be subjected to heavy fishing mortalities. These species have a high economic value both as ornamental and food fish. The results indicate that there is a high potential to develop capture fisheries in these reservoirs to harvest both food and ornamental fish.

THE inland fish production of Sri Lanka, after a steady decrease from 39 721 mt in 1989 to 12 000 mt in 1994, has increased in the past few years, to reach a level of 27 250 mt in 1997 which is about 11% of the total fish production of the country (NARA 1999). This production has been obtained mainly from man made reservoirs which have a total extent of around 191 382 ha (NARA 1998).

However, fish resources in some perennial reservoirs of Sri Lanka are under exploited or unexploited mainly because these reservoirs are either in close proximity to marine fish landing sites or in urban areas where marine fish are readily available. This study was carried out in five such reservoirs, namely, Boralasgamuwa (16 ha), Lunuwila (14 ha), Madampe (81 ha), Mahawewa (60 ha) and Mattegoda (4 ha) in the western coastal region of Sri Lanka (Figure 1)

with an objective of estimating the asymptotic lengths (L_{∞}), von Bertalanffy growth coefficient (K) and natural mortality rates (M) of the fish species inhabiting these reservoirs, to determine the feasibility of their sustainable utilisation.

Materials and Methods

The fish populations in the Boralasgamuwa, Lunuwila, Madampe, Mahawewa and Mattegoda reservoirs in the western and northwestern provinces of Sri Lanka were sampled in 1992–1993 using a cast-net of 2.0 cm stretched mesh. No fishing is done in these reservoirs so no commercial catch was available for sampling. In each reservoir, sampling was done once a month for 12 months. The fish caught were identified using Munro (1955) and Pethiyagoda (1991) and their total lengths measured to the nearest mm. Length frequency data were analysed using FiSAT version 1.0 software package (Gayanilo et al. 1996). The value for L_{∞} obtained by Powell Wetherall method (Sparre and Venema 1992)

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