

## Biology and population dynamics of kissing gouramy, *Helostoma temminckii*, an exotic fish species, in a semi urban reservoir in Wedamulla, Kelaniya, Sri Lanka

M.W.C.P. Marasinghe<sup>1</sup>

<sup>1</sup>Department of Zoology, University of Kelaniya 11600, Sri Lanka

*Helostoma temminckii* is an exotic fish species that is reported to occur in the wet zone of Sri Lanka. A wild stock of this species present in a semi urban reservoir in Wedamulla, Kelaniya. Present study was carried out to investigate the biological aspects and population dynamics of *H. temminckii* in Wedamulla reservoir. Field sampling was carried out using a cast net (mesh size 1.3 cm) from June 2007 to January 2008 to collect data on length frequency in the population and its biology.

*H. temminckii* in Wedamulla reservoir was found to exhibit isometric growth. In small size classes of *H. temminckii* diatoms, green algae, blue green algae and detritus were the dominant food items. In addition to these food items, plant and animal matter were present in larger size classes of fish. A second order polynomial relationship is evident between the relative gut length and the total length of fish. It indicates the digestive tract of this species is morphologically adapted for ontogenetic variation in feeding. According to the Bray-Curtis similarity analysis and non-metric Multidimensional scaling two distinct clusters were identified corresponding to fishes smaller than 14 cm and larger than 14 cm.

The minimum size at first maturity was found to be 12.3 cm total length for males and 13.0 cm total length for females. The sex ratio was not significantly different from 1:1 ( $\chi^2=0.478$ ;  $p > 0.05$ ). Fecundity varied from 1992 to 8328 ova in fish ranging in total length from 11.9 cm to 20.9 cm which showed a positive curvilinear relationship with total length. Fecundity was linearly related to body weight and gonad weight.

The population dynamics of *H. temminckii* in Wedamulla reservoir was investigated by length-based methods, using FiSAT software package. The asymptotic length and growth constant were found to be 22 cm and 0.40 yr<sup>-1</sup> respectively. The total mortality rate (2.16 yr<sup>-1</sup>) was estimated by means of length converted catch curve method. The natural mortality coefficient obtained through Pauly's empirical model at 27 °C was 1.05 yr<sup>-1</sup>. The fishing mortality coefficient was 1.11 yr<sup>-1</sup> and the exploitation rate (E) was 0.51. The length at first capture (L<sub>c</sub>) determined from the probabilities of capture was 10.8 cm. Two distinct recruitment pulses were evident in the population. Relative yield per recruit (Y/R) analyses performed by incorporating probabilities of capture, indicated that Y/R can be optimized by decreasing L<sub>c</sub> to about 8.8 cm while increasing E up to 0.6.