Abstract

The present investigation was carried out from June 2007 to May 2009 in order to understand the population dynamics covering aspects such as length weight relationship, length at first maturity, total annual fecundity, spawning frequency, peak season of breeding, synchronous or asynchronous spawning, growth parameters, mortality parameters and exploitation rate of *Sepioteuthis lessoniana* from the Jaffna lagoon, Sri Lanka. The 'b' values 2.2205, 2.1137 and 2.396 obtained for male, female and indeterminate respectively indicate that the fish doesn't follow the cube law. Histological analysis of gonads showed male and female were categorized into immature, maturing, fully maturing and matured. High occurrence of spawning stage in squids observed in August 2007, November 2007, April 2008 and October 2008 suggests that the peak spawning period is in the said months even though it spawns throughout the year. Presence of all stages of macroscopic eggs in the same ovaries confirms that it spawns more than once and said to be asynchronous. Fecundity varied from 20 to 852 and a significant correlation was obtained with mantle length. Size at maturity curves indicated male reached maturity at 16 cm mantle length while female reached maturity at 17.0 cm mantle length. The optimized values for K and L_∞ obtained by the ELEFAN I was 0.83 $year^{-1}$ and 31.10 cm. The estimated t_0 value was -0.191. The length-converted catch curve gave a Z value of 3.75 $year^{-1}$. The natural mortality coefficient (M) obtained through Pauly's empirical model was 1.64 $year^{-1}$. The computed instantaneous fishing mortality coefficient (F) is 2.11. The predicted exploitation rate is 0.501. The computed exploitation rate of 0.56 is significantly above the predicted E_{max} express that the stock is slightly overexploited. Thus, the fishing pressure on the stock has to be reduced. More capture should be prohibited by a reasonable decrease in the effort or by modifying the mesh size of the net for *S. lessoniana*. The suggested recommendation would also be either banning the catch of cephalopods during the peak spawning period or imposing restriction on the size of squids during certain months based on the findings in this study.