

Abstract

The socio-economic importance of small-scale fishers cannot be underestimated as it provides essential services to more than 180 million people living in developing countries (Evans and Andrew, 2011). A small tuna fishery, which mainly target Frigate Tuna (*Auxis thazard*), has been operated for last 50-60 years in Dodanduwa, southern Sri Lanka, using ring-nets along with traditional knowledge. These gears are operated by traditional wooden vessels called “Vallam”. The Biological information of *A. thazard* comes from this fishery has not reported before but essential for scientific management of the resource as well as understanding their spatio-temporal distribution in the Indian Ocean. Moreover, analysis of the market chain of this fishery may important in expanding the small tuna industry to gain more profit for small-scale fishers.

Reproductive biological aspects of *A. thazard* was determined by collecting random samples from commercial ring-net landings at Dodanduwa, from April - September 2013, and estimating seasonal variation in sex ratios; Gonadosomatic index (GSI); sexual maturity; and length at 50% maturity (L_{50}) while market chain data were collected through personal interviews, semi-structured questionnaires, direct observations and group discussion with market chain actors.

The length of *A. thazard* was found to be range from 16cm to 46 cm during the study period. The GSI and histological examination suggested the availability of only three maturity stages immature; developing and pre-mature, during the study period. Sex ratio, defined as the proportion of females to the total, suggested around 60% of males in both smaller (15-20 cm) and larger length classes (40-50 cm) while almost similar (~0.5) sex ratios were found in the intermediate length ranges. Synchronous seasonal gametogenesis were found in males and females and drop of %GSI index, indicates a potential spawning seasonality, was reported from June-August. Anyhow, approach to estimate L_{50} revealed the absence of mature individuals in ring-net catches during the study period.

Well established domestic market chain, which has no any extensions for export market, was observed in the *A. thazard* industry. The local market is price oriented with low emphasis on quality. While concerning the increase revenues of the *A. thazard*, it is essential to make structural changes throughout the market chain. Potential expansion opportunities and constrains related to the main actors, namely: producers; auctioneers; commission agents; retailers; and consumers, in the market chain were identified (Fig. 01). If such changes should be implemented on reducing postharvest losses and improving hygienic practices, the

catches can be optimally utilized and further, fishery has a higher potential to enter into export market. It is important to continue the study for a longer period in concluding the reproductive behavior of *A. thazard*.

Key words: Frigate tuna; Value chain; Reproductive biology; GSI; Small scale fishery