

The current status of Negombo Lagoon fishery

H.B.U.G.M. Wimalasiri*, H.A.C.C. Perera and R.A.M. Jayathilaka

National Aquatic Resources Research and Development Agency (NARA), Crow Island, Colombo 15,
Sri Lanka

Sri Lanka has a large number of productive lagoons and Negombo Lagoon is one of the most productive lagoons among them. Several studies have been carried out regarding fisheries in Negombo Lagoon and this study focuses on the current status of Negombo Lagoon fishery. Fisheries data were collected from 10 major lagoon fishery landing sites from February to September 2017. The selected fish landing sites were visited every other week to collect information on fish catch, fishing effort (craft/gear combinations operated on the sampling dates), gear details (mesh size, pieces of nets, days of operation), and species composition of the catch. From the total number of craft operated, 30-60% was sampled at each sampling site. A variety of fishing gear and methods are being used in the Negombo Lagoon and those are operated targeting various types of fish and non fin fish species. These gear and methods are mostly practiced using Non motorized Traditional Boats (NTRB) or without crafts. Cast net, trammel net, stake net, stake net, gill net, scoop net and brush piles were identified as major fishing gear operated in the lagoon. Among these gear Gillnet recorded highest mean catch (10.6 kg/operation). The number of finfish species recorded during the study period was 67; representing 36 families. Among dominant fish varieties, *Mugil cephalus* (flathead mullet) contributes to 35% of the total catch, followed by *Arius* spp (20%), *Chanos chanos* (milkfish) (15%), *Siganus* spp. (Orawa) (10%), *Lates calcarifer* (Modha) (10%), *Etroplus* spp (Koraliya) (7) and *Oreochromis* spp (thilapia) (3%). Among the shrimps, *Penaeus indicus*, *P. semisulcatus* and *Metapenaeus moyebi* were the most abundant species. It is important to identify the long term trends in the fishery in order to identify the impact on fishery with regard to heavy fishing and rapid urban development around Negombo Lagoon and those trends could be used when formulating an effective management plans for the sustainable utilization of the fishery in Negombo Lagoon.

Keywords: Negombo, lagoon, fishery

*Corresponding author – email: udeshikawimalasiri@nara.ac.lk

Stock status and biological aspects of data poor kelee shad, *Hilsa kelee* (Cuvier, 1829) small scale purse-seine fishery off Mannar Peninsula, Sri Lanka

M.I.G.Rathnasuriya*, H.S.S.K. Haputhantri, D.G.T.C. Balawardhana, H.B.U.G.M. Wimalasiri and S.J.W.W.M.M.P.Weerasekera

National Aquatic Resources Research and Development Agency (NARA), Crow Island, Colombo 15, Sri Lanka

Hilsa kelee is one of the key target species in Small Scale Purse Seine Fishery (SSPSF) locally called as “Surrukku del” conduct in shallow coastal waters in Thalaimannar. The *H. kelee* is a clupeid mainly occurs in coastal waters in the tropical region and locally called as “Karattaya”. The SSPSF in the area has continuously increased over the years and the current status of fishery is unknown. The present study was undertaken to study current stock status and some biological aspects of *H. kelee* in SSPSF fishery. Based on the baseline survey results, “Thalaimannar Pier” landing site was identified as main landing site for the data collection. Study was conducted from December, 2016 to November, 2017 at the “Thalaimannar Pier”. During the monthly field survey, randomly selected boats were sampled to collect biological information in relating to Total Length (TL), Fork Length (FL), Total Weight (TW), Somatic Weight (SW), sex, Gonad Weight (GW) and gonadal development stages. Length-Based Spawning Potential Ratio (LBSPR) was assessed for the *H. kelee* fishery by Barefoot Ecologist’s Toolbox. Length-weight relationship was analyzed for combined sex, male and female separately. The Gonado Somatic Index (GSI), length at 50% maturity (L_{50}) and 95% maturity (L_{95}) were analyzed based on the gonadal weight and development stages. A total of 1291 specimens of *H. kelee* were analyzed during the study period. The estimated value of LBSPR was 0.56. The results show that fishery is still in a healthy stage. The specimens measured during the survey varied between 11.4 and 22 (mean=17±2.1 cm) of total length, 9.2 and 20.2 (mean= 14.5±1.8 cm) of fork length, and total weight varied between 17.29 and 119.74 (mean=55.63±21.24 g) and somatic weight varied between 15.36 and 106.92 (mean = 50.46±19.09 g). The length-weight (L-W) relationship obtained for combined sexes showed a positive allometric growth ($W=0.00874 TL^{3.07}$, $R^2=0.95$), L-W relationships obtained for females and males also showed a positive allometric growth: ($W=0.00865 TL^{3.08}$, $R^2=0.95$) and ($W=0.00959 TL^{3.04}$, $R^2=0.95$) respectively. The sex ratio between males and females were 1:1.2 and concluded that there is a significant difference from the theoretical sex ratio i.e., 1:1 ($P<0.05$). The GSI analysis indicated that there are two spawning seasons of *H.kelee*; the main spawning takes place during March-May, followed by a secondary spawning season during July-August. The estimated length at 50% maturity (L_{50}) and 95% maturity (L_{95}) were 18.1 cm and 22 cm respectively. As fishery in healthy state, maintaining the resources at the current level is advisable to obtain more economic benefits for the involved community.

Keywords: purse-seine fishery, *Hilsa kelee*, length-based spawning potential ratio, allometric growth, Gonado Somatic Index

*Corresponding author – email: ishara.ruh@gmail.com

Fisheries and some aspects of reproductive biology of sandbird octopus, *Amphioctopus aegina* (Gray, 1849) in the Northwestern coastal waters of Sri Lanka

S.J.W.W.M.M.P. Weerasekera*, M.I.G. Rathnasuriya, R.P.P.K. Jayasinghe, J.P. Wickramarachchi, S.C.V.U. Senevirathne, D.G.T.C. Balawardhana, H.B.U.G.M. Wimalasiri, A.A.D.G.U. Amarakoon and H.M.W. Bandara

National Aquatic Resources Research and Development Agency (NARA), Crow Island, Colombo 15, Sri Lanka

Exploring unexploited fishery resources with high export potential is beneficial for a country like Sri Lanka. At present, there is no target fishery for octopus in Sri Lanka and they are mainly landed as a by-catch of the trawl fishery. This study aimed to find out the fishing potential of newly introduced fishing gear and to explore some aspects of reproductive biology of *Amphioctopus aegina*. The study was carried out from January to December, 2017 at Pesalai and Pukkulam. Fishing potential was explored using newly introduced fishing trap by means of experimental fishing trials. Mean catch rates were examined under different soaking times in terms of number of days. Catchability of individuals at different depths was tested. Catch and effort data were also obtained from the trawl catches at Pesalai since the particular species is landed as a by-catch in trawl fishery. Variations in Gonado Somatic Index (GSI) of *A. aegina* were assessed to find out reproductive seasonality. Sex ratio and the size at first sexual maturity (L_{50}) were also analyzed. The highest mean catch rate, 58 individuals/100 traps was recorded for 15 days soaking time. It was also noticed that the highest average number of individuals were captured at the depth of 10 m. The peak spawning season reported in October, preceded by July and February, respectively. Male to female sex ratio was 3.8:1, while the lengths (Dorsal Mantle Length) at first sexual maturity (L_{50}) for males and females were 6.2 cm and 5.1 cm, respectively. Catch and effort analysis showed that 10 % of trawl catch represented by octopus, remarkably dominated by *A. aegina*. The study concluded that there is a reasonably high potential for harvesting octopus using the new trap while, it mostly depends on the soaking time. Catch proportion provides an initial evidence for resource availability and potential for developing an octopus fishery aiming an export market. However, a quantitative assessment needs to be carried out to determine the true potential of the resource for sustainable exploitation. Further, the findings on length at sexual maturity and spawning season reveal when and at which length the octopus should not be harvested and therefore it is important for the proper management and conservation of its stock.

Keywords: *Amphioctopus aegina*, GSI, fishing trap, soaking time, Sri Lanka

*Corresponding author – email: madhurapro@gmail.com