

By-catch from the non-mechanized shrimp trawlers operated in the coastal waters, off Negombo, Sri Lanka

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A well-established artisanal shrimp trawl fishery exists in the coastal waters off Negombo, Sri Lanka and this study evaluates the status of by-catch associated with this fishery. Catch and effort data were collected by making fortnightly field visits to Negombo sea street fish landing site from March to November 2014. Standard length of two dominant by-catch species; *Opisthopterus tardoore* and *Kathala axillaris* were measured during field sampling and by-catch samples were collected randomly for further laboratory analysis. Catch per unit effort (CPUE) of shrimps, by-catch and total by-catch production were estimated using catch and effort data. Estimated CPUE of shrimps ranged from 3.76 ± 2.00 to 10.46 ± 4.09 kg/ trawl-day while for by-catch CPUE was from 3.28 ± 1.88 to 5.39 ± 1.93 kg/trawl-day. By-catch CPUE was always lower than the shrimp CPUE except in April when average shrimp to by-catch ratio was 1.48:1.0 registering by-catch CPUE as 4.34 ± 1.39 kg/trawl-day. Estimated total by-catch landing during the study period was 40,274.8 kg. By-catch mainly consists of finfish (80%), crabs (10%), rays (3%) and others mainly including squids and cuttlefish (7%). Fifty one fish species belonging to 17 different families were identified in shrimp trawl by-catch. Growth and mortality rates were estimated separately for *O. tardoore* and *K. axillaris* using FiSAT programme. The values of L_{∞} , K , Z , M and F for *O. tardoore* obtained were 23.0 cm, 0.55 year^{-1} , 4.15 year^{-1} , 1.28 year^{-1} , 2.87 year^{-1} . Respectively for *K. axillaris*, $L_{\infty} = 14.1$ cm, $K = 0.39 \text{ year}^{-1}$, $Z = 1.28 \text{ year}^{-1}$, $M = 1.17 \text{ year}^{-1} = 0.11 \text{ year}^{-1}$. Accordingly the exploitation rate (E) shows that *O. tardoore* stock is over-exploited ($E = 0.69$) while *K. axillaris* is under-exploited ($E = 0.08$). The average daily income per shrimp trawl is around Rs. 3,940.00 from which 8% is generated from by-catch. Fifteen women fish vendors depended on shrimp trawl by-catch in this study site and their average daily income was around Rs. 1,069.00. No discards were reported in shrimp trawl by-catch.

Keywords: By-catch; shrimp trawl; Negombo; *Opisthopterus tardoore*; *Kathala axillaris*; overexploitation