Fisheries independent trawl survey to estimate biomass and density of shrimps and fish in Sri Lankan coastal waters

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Although time series catch and effort data from commercial fisheries are commonly used to assess the status of stocks, independent surveys are also essential. Therefore, a fisheries independent trawl survey was conducted in December 2021 at Kalpitiya shrimp trawl ground (~15 km^2) using a commercial trawler (90 HP) with a trawl net to estimate shrimp biomass. Totally, twenty-five trawl hauls were conducted at randomly selected stations and GPS coordinates and bottom depths were recorded at the start and end points. Species composition, individual weight, length, and maturity stage were noted for all trawling stations. Swept area method was applied to estimate the density and biomass of shrimps and fish using StoX, a software commonly applied for fish biomass estimates of large commercial European fish stocks. Fish were caught as a by-catch in the survey and in total 108 species, comprising 84 fishes, 10 molluscs and 07 shrimp species were recorded. The total biomass of all the species was estimated at 5236 kg (1660 kg of shrimps and 3094 kg of fish by-catch) within trawling ground with a density of 1200 kg NM^{-2}. Furthermore, the densities of shrimps and fish were 380 and 709 kg NM^{-2} respectively. Penaeid shrimps contributed 32% to the total biomass. Among the seven species of shrimps, *Penaeus semisulcatus* (43%) and *P. merguiensis* (36%) were the most dominant and an exotic species *P. vannamei* was also recorded. The presence of 60% of immature *P. semisulcatus* indicated that there might be migratory routes or spawning grounds in this area. In contrast, the majority of mature individuals were found in *P. indicus* and *P. merguiensis* populations. The fish species *Karalla dussumieri* and *Arius maculatus* highly contributed to the by-catch biomasses, 735 kg and 403 kg respectively. Time-series results of these studies are essential in developing sustainable fisheries management strategies.

Keywords: biomass, diversity, independent surveys, shrimps, trawling, Sri Lankan waters,StoX

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