

Ring Nets (Kandan Kose) Fisheries associated with floating objects in the offshore waters of Sri Lanka and their possible impacts on the pelagic Tuna fish stocks

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Abstract

The present study was carried out from January 2012 to December 2013 in Southern Sri Lanka to compare catch composition of a Ring net (Kandan Kose) fishery associated with floating objects with that of drift gillnet/long line catches. Eight hundred eighty (880) Multi Day Fishing (MDF) boats sampled were categorized into three groups; (i) boats with catches only from Ring nets (R) (ii) those from Ring nets plus Long lining (RL), and (iii) those only from Ring nets and drift Gillnets (RG). Catch per boat per trip was estimated for each species from the above three categories. *Decapterus russelli* (Rüppell), *Elagatis bipinnulata*, *Coryphaena hippurus* L. and *Abalistes stellatus* contributed significantly to catches in R and RG boats, which in contrast were insignificant in the catches of RL boats. A total of 17 fish species were encountered in the landings of MDF boats during the sampling period. Juvenile *Katsuwonus pelamis* (16-45 cm total length) and *Thunnus albacares* (15-60 cm total length) were also caught in ring nets. Multivariate statistical analyses revealed that fish catch composition from RL boats was dissimilar to that from R and RG boats. Tuna species were nearly 20% of the total catch of the R/RG/RL boats in the ring net. From that 84.5% are juveniles while others mature stage 15.5% per Ring net boats. It consist most of the tuna juveniles in every MDF boats which operate Ring nets. The totals by catch (non target species) are nearly 26%-27% from the total catch per boat. Due to relatively low operational cost in R boats and high quantities of catch, higher net profits are gained although low-valued species were caught. Vulnerability of fish stocks to overfishing due to aggregation around flotsam is requires further investigation.

Keywords: Kandan Kose ,flotsam, pelagic fishes, Ring net

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Introduction

Pelagic and benthic fishes seek out flotsam, Fish aggregating devises in the sea. The aggregation of fishes around these floating objects is mainly due to enrichment of food resources under the objects and protection from predators(Deudero,2001: Deudero Morales- et al, 1999); Castro, Santiago and Santana-Ortega 2002; Addis, Cau, Massuti, Merella, Sinopoli and Andaloro 2006). Artificial floating structures, generally known as fish aggregation devices or FADs (Higashi 1994; Riera, Grau, Grau, Pastor, Quetglas and Pou 1999), are placed in the sea specifically to concentrate pelagic fish

for capture. It has been also hypothesized that schooling fish species make use of floating devices to increase the frequency of encounters between isolated individuals and other schools in order to form larger groups and thereby improve the survival of the species.

Two tunas, yellow fin *Thunnus albacares* and skipjack *Katsuwonus pelamis*, are the non-target species of most ring net fisheries. In this study by catch is defined as the fraction of the catch that consists of non-target species (also other species of tuna) that are encircled by the fishing gear and are unable to escape. By catch during ring net fishing for tropical tunas may be rather high (Evgeny V. Romanov 2002), and generally depends on fishing tactics.

After introduction of multi-day fishing boats to the Sri Lankan fishing fleet, there has been a new trend of using purse seine (Ring nets or Kandan Kose) to exploit fish resources gathered around flotsam mainly targeted for *Carangidae*, *Coryphaenidae* and *Balistidae*. This method is a cost effective with comparatively low fuel expenditure and labor costs and high catches. However, juvenile tuna species are frequently caught with this fishing method. Therefore, this fishing method is highly criticized by small scale fishermen in the country, because they believe that their tuna catch in coastal fisheries are reduced due to the purse seine fisheries.

Materials and Methods

Investigations were carried out from January 2012 to December 2013 in the fishing harbor in Beruwala, Galle and Tangalle, Dondra. The length data of the fish species caught from the ring net were collected from the landings. Information on the total catch and fishing effort of boats with Ring nets was obtained from log-books. Compare the species compositions of landings in boats with different fishing gear were compared with principal component analysis (PCA) and multi-dimensional scaling (MDS). The mean number of fishing days and mean net income per boat for the landings of three boat categories were compared employing one-way ANOVA. All analyses were carried out using MINITAB (version 14) and PRIMER (version 5) statistical packages.

Results

880 Multi-Day boats present in the harbour during the study period, among 465 boats were only used Ring nets while others are used Ring Net and Long Lines. Figure shows the monthly total catches of each species caught by the Ring nets boats during the year 2012. In the landings of multi-day boats, 15 fish species were encountered during the

sampling period. The small sized tunas (*K. pelamis* and *T. albacores*), which were present in ring net catches were sell at lower prices than large-sized ones. The Ring net fishing associated with flotsam, species such as *Decapterus russelli*, *Elagatis bipinnulata*, *Coryphaena hippurus* L. and *Abalistes stellatus*) were caught in significantly large quantities. It also noted that all *K. pelamis* and *T. albacares* caught in ring nets were juveniles (15-60 cm total length).

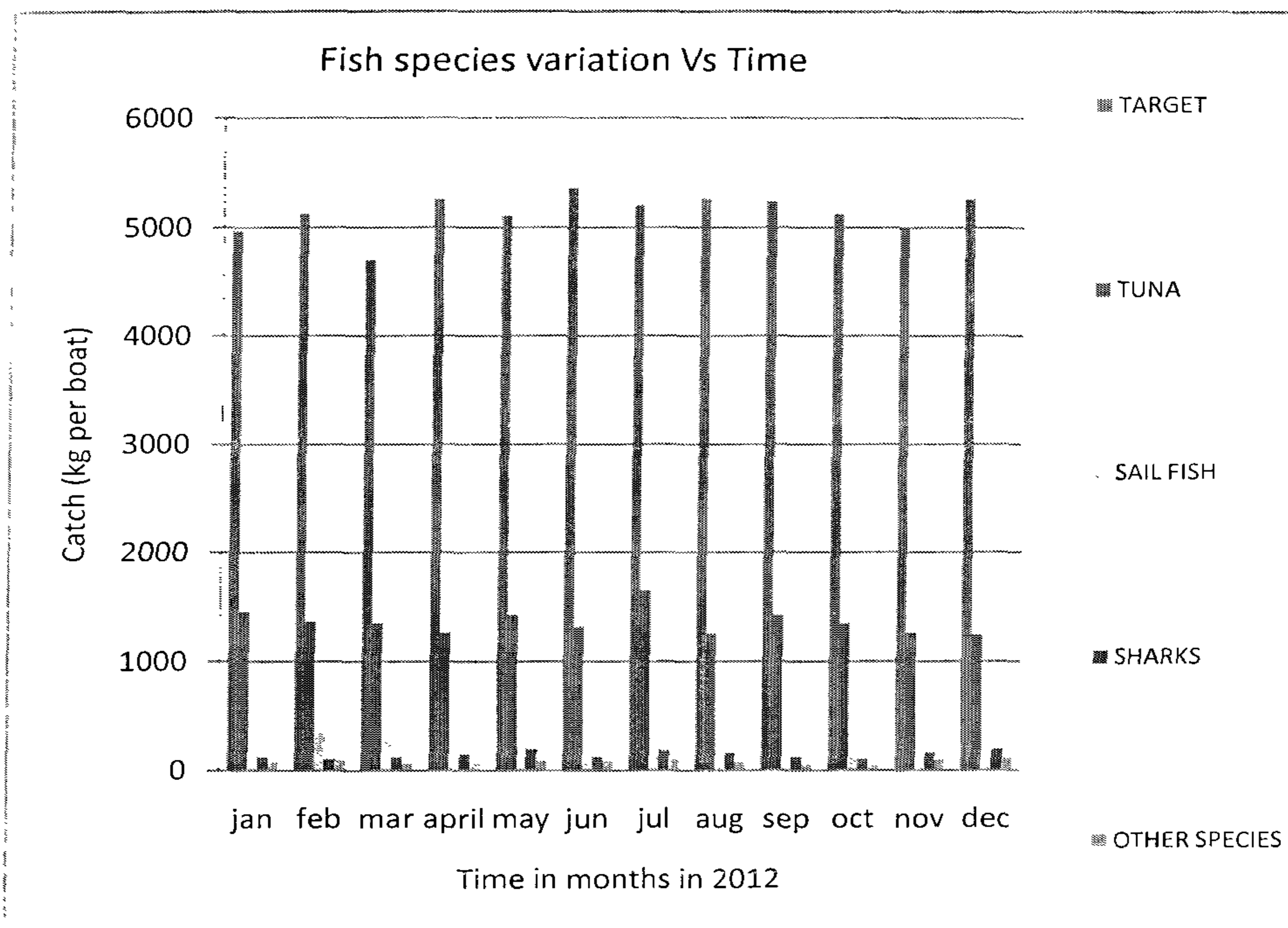


Figure1: Fish species variation during the year 2012, target species are *Carangidae* and *Balastidae*

Discussion and Conclusion

Most of the fish caught by the Kandana Kose are *Balastidae* and *Carangidae* species. 20% of the catches are tuna species. From that 84.5% are juveniles while others mature stage 15.5% per Ring net boats. The by catch (non- target species) are nearly between 26% and 27% from the total catch. Tuna juveniles associated with floating objects in deep sea areas removed by Ring net fishery.

This may be caused to depletion of tuna species in the region and may contribute to the collapse of the coastal fishery. It was found that most of the floating objects are

distributed near the EEZ and these objects may drift towards the Sri Lankan waters. These floating objects bring fish schools towards the Sri Lankan waters and it is helpful for the coastal fishery.

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