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CATCH COMPOSITION OF PURSE-SEINE FISHING ALONG RATNAGIRI COAST OF MAHARASHTRA STATE, INDIA

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ABSTRACT : A study was carried out for the analysis of catch composition of purse-seining along the Ratnagiri coast. The fish catches and other details of the purse-seines operating from Mirkarwada fishing harbor were recorded randomly. The study revealed that, Indian oil sardine and cat fish contributed 28.58 and 24.30 per cent respectively in the total fish landings of purse-seine operated from Mirkarwada fish landing centre along with significant contribution of Indian mackerel (14.77%), lesser sardines (14.41%), horse mackerel (9.50%) and tuna (4.36%). Month-wise catch composition of purse-seine indicated that, the most productive month was April (14.56%) during the study period whereas, January was least productive month (5.15%). Amongst all the species landed by purse-seine at Mirkarwada fishing harbour, landing of Indian mackerel was observed in all the months during fishing season. Other than this species, horse mackerel (except January) and lesser sardines (except September) were also landed throughout the fishing season. Seasonal variation in purse-seine catch composition indicated that 43.32 per cent landing was in the summer season and 37.07 per cent in winter season, while only 19.61 per cent in the months of monsoon.

Key words : Purse-seine, catch composition, Mirkarwada, Ratnagiri, Maharashtra.

INTRODUCTION

Purse-seining is one of the most advanced and efficient fishing methods. It is mainly aimed at catching dense, mobile, pelagic fishes and includes all the elements of searching, hunting down and capture. This method of fishing is mostly used to capture shoaling species such as mackerels, sardines, ribbon fishes, cat fishes, tunas etc. Purse-seining as it is used today originated in the United States in 1920's. In India, purse-seine was first operated in Goa in 1957 (Anon, 1969). Subsequently attempts were made by FAO experts, off Malabar and Mangalore coasts. Purse-seining was carried out on an experimental basis in the sixties by governmental agency like CIFT. In seventies, it spread all over the Kerala, Karnataka and Goan coasts and during 1970's and 1980's purse-seine fishery was developed in the south western states of India *viz*. Kerala and Karnataka. The first purse-seine was operated from Ratnagiri coast in 1983 from Mirkarwada area.

Bal and Rao (1984) reported the abundance of many species like Indian oil sardine, Indian mackerel, cat fishes, seer fishes along Ratnagiri coast during the period August to April months. They stated that purse-seine as effective gear for the fishery of pelagic fishes like sardines and

mackerel along west coast of India. According to Talwar and Kacker (1984), sardine was the most important pelagic resource of the west coast of India mainly from Quilon to Ratnagiri. Similarly Indian mackerel fishing starts from August and ends in the month April whereas, peak season for mackerel along west coast of India was October to December. Likewise cat fish and seer fish are the important resources available and being harvested by purse-seienrs along the coast of Maharashtra. Considering the importance of purse-seine fishing in harvesting commercially important resources along the West coast of India, a study on species-wise and season-wise catch composition of purse-seine landing was undertaken.

MATERIALS AND METHODS

Maharashtra, a coastal state having 720 km long coastline comprising Thane (112 km), Mumbai (80 km), Raigad (240 km), Ratnagiri (167 km) and Sindhudurg (121 km) districts engaged in marine fishing with various types of gears like trawl net, gill net and purse-seine net was selected as study area. Purse-seines operated along Maharashtra coast were 288 in number and out of which 167 were operating from Mirkarwada fishing harbour of Ratnagiri district (Anon, 2008). Almost all purse-seiners

operating along Ratnagiri district landed their catch at Mirkarwada fishing harbour. Therefore, Mirkarwada, a minor fishing harbour situated in Ratnagiri district 2 km away from Ratnagiri at 17º 00' 00" North and 73º 16' 23" East was selected to collect catch statistics of purse-seine operating along Ratnagiri coast. For the data collection, fishing season considered was from 15th August to 31st May as fishing was closed from 1st Jun to the 15th August, considering the peak spawning season of many fish species and rough conditions of sea. Throughout the fishing season weather conditions influenced fishing practices due to adverse weather conditions. Considering all these non-fishing days including Friday as a weekly holiday, total numbers of fishing days were 238 during study period.

There were 167 purse seiners operated from Mirkarwada fishing harbour along Ratnagiri coast during study period and all were landing their catch at Mirkarwada fishing harbour. Those purse seiners were sampled randomly and necessary information required for the research was generated. The information about quantity of catch and value was gathered by inquiry or by actual observations at landing centre.

During the fishing season August to May, purse-seine fishing was carried out from the depth of 10 m up to the 75 m. According to month-wise classification of average depth of operation of purse-seine net, highest average depth of operation of purse-seine was found in the month of January (44.31 m), while it was minimum in the month of August (25.05 m). It was observed that during the month of August, September and October the average depth of operation was 25.05, 28.40 and 31.67 m respectively, while during the months November, December and January, fishing was practiced in the average depth of 37.22, 39.07 and 44.31 m respectively. Again during the summer months average depth of operation reduced to 34.93 m in February, 43.31 m in March, 40.23 m in April and 35.78 m in the month of May. Throughout the fishing season, maximum hauls in a single trip were six in numbers and the average number of hauls in one fishing trip was two.

Average time required for one fishing trip of purse-seiner was 43.88 hours. During the month of August, vessels were going for the fishing and returning back to the harbour within a day with average trip duration16.95 hours, which was shortest in a fishing season whereas it was 56.35 hours during the month December, which was longest time for single fishing trip.

Month-wise catch composition of different species caught was estimated by separating the catch for each month and separate catch composition for every month of fishing season was calculated. Season-wise catch composition of different species caught was estimated by grouping the month catch in a different seasons like monsoon (August, September), winter (October, November, December, January) and summer (February, March, April, May). Then for the each season it was analyzed to estimate its catch composition and month-wise and species-wise variation in catch composition was analysed by applying ANOVA (Snedecor and Cochran, 1967).

RESULTS AND DISCUSSION

During the study period, Indian oil sardine and cat fish contributed 28.58 and 24.30 per cent respectively in the fish catches of purse-seine operated from Mirkarwada minor fishing harbour. Other than these two species, Indian mackerel (14.77%), lesser sardines (14.41%), horse mackerel (9.50%) and tuna (4.36%) also contributed significantly in purse-seine catches. Remaining 4.08 per cent catch was shared by other species like croaker (1.28%), seer fish (1.09%), crevalle (0.60%), trevally (0.35%), barracuda (0.27%) and alligator-gar (0.08%) (Fig. 1).

Species-wise and month-wise catch composition

Month-wise catch composition of purse-seine during the study period indicated that, the most productive month was April with percentage contribution of 14.56 to the overall landings whereas, January was the least productive month with contribution of 5.15 per cent. Percentage share of August in a total landing of entire fishing season was 9.02, while it increased as months progressed from September (10.59%) to October (12.19%). Thereafter, percentage contribution decreased during the month November (10.81%), December (8.93%) and January (5.15%) as fishing season progressed. However, from February onwards once again it increased up to the month April and during the last month of the fishing season *i.e.* May it was 11.66 per cent (Fig. 2). Amongst all the species landed by purse-seiners, landing of Indian mackerel was found during all the months of fishing season. Other than these species, horse mackerel (except January) and lesser sardines (except September) were also landed throughout the fishing season. Month-wise and species-wise variation in catch composition was analysed by applying ANOVA and result indicated that there was no variation in landings between months (P > 0.05) whereas, significant difference in the landings of different species within the month (P < 0.01) was observed. There was no research report to compare with result obtained in the present study.
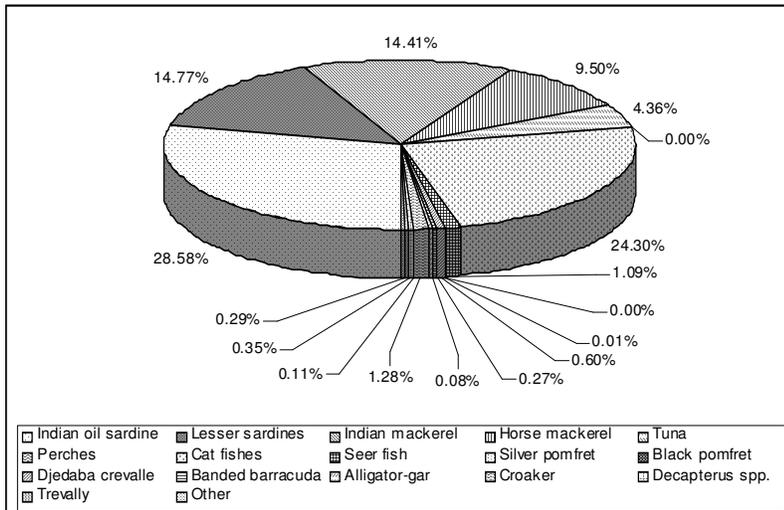
Fig. 1 : Average species-wise catch composition of landings of purse-seiners along Ratnagiri coast.
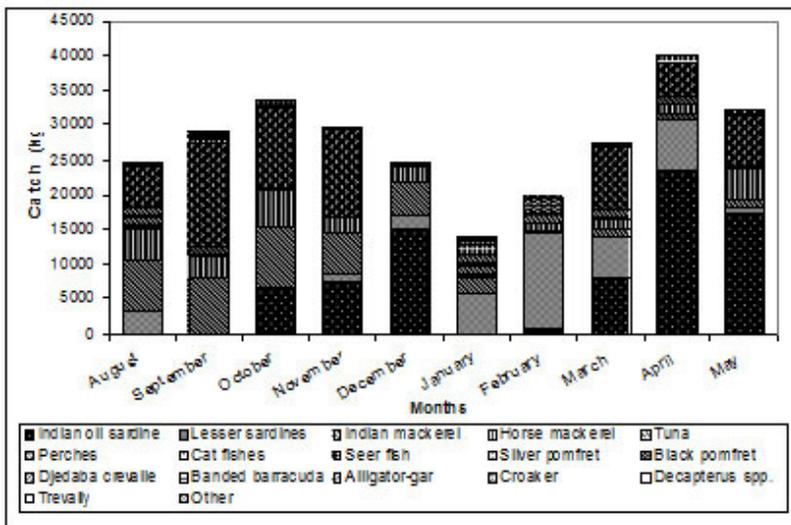

Fig. 2 : Average species-wise and month-wise catch composition of landings (kg) of purse-seiners along Ratnagiri coast.
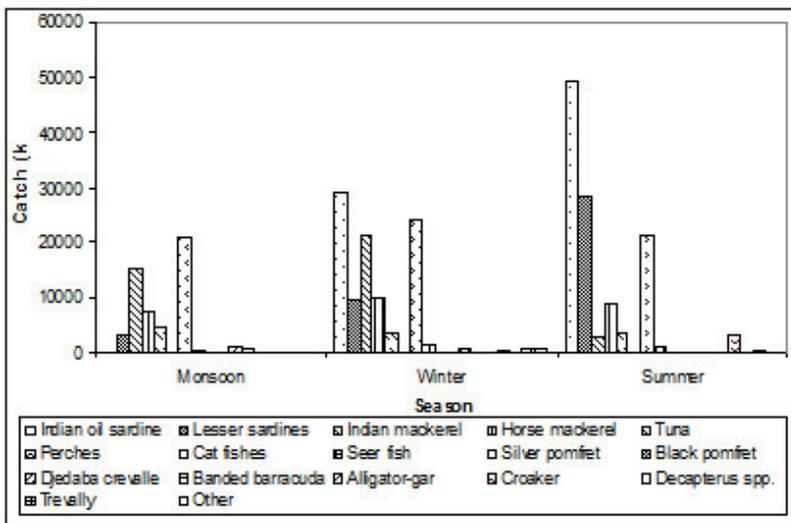

Fig. 3 : Seasonal variation in species-wise catch composition (in kg) of purse-seiners operated along Ratnagiri coast.

Species-wise and season-wise variation in catch composition

Year was divided in to three distinct seasons *viz.* monsoon, summer and winter. South-West monsoon starts in June and lasts up to September, therefore June to September was considered as monsoon season, then winter season from October to January and summer season was from February to May.

Seasonal variation in purse-seine catch composition indicated that 43.32 per cent landing was in the summer season, while it was 37.07 per cent in winter season and only 19.61 per cent in the months of monsoon. In monsoon season, cat fish contributed 39.10 per cent of total monsoon landing, followed by Indian mackerel (28.74%). Indian oil sardine contributed with share of 28.47 per cent in winter, while cat fish (23.84%) and Indian mackerel (20.75%) were also the major contributors in the purse-seine catch of winter season. In summer season, contribution of Indian oil sardine was remarkably high and it was most dominant species amongst the species landed during the months of summer with the percentage of 41.62. Lesser sardines and cat fish contributed 23.52 and 17.99 per cent respectively (Fig. 3). Seasonal variation in catch composition was analysed by applying ANOVA. The result indicated that there was no seasonal variation in fish landing by purse-seiners (P > 0.05) whereas, there was significant difference between landings of different the species within the season (P < 0.01).

Panicker (1985) observed that sardine was the major contributor in the total purse-seine catch along Kerala coast with share of 91.43 per cent whereas, mackerel contributed only 5.71 per cent. Ben-Yami (1994) reported availability and landing of Indian oil sardine, Indian mackerel and small horse mackerel along the Kerala and Kaknataka coast. Lery *et al* (1999) found an average contribution of mackerel and sardine in purse-seine landing of India along Kerala coast was 28.57 and 71.43 per cent, respectively. Thakare (2007) observed that sardine (30.53%), mackerel (27.59%) and

tuna (13.50%) were the major species caught by the purse-seiners during the year 2006-07 along Ratnagiri coast. Results obtained in the present study are in accordance with the results reported by earlier workers.

CONCLUSION

Indian oil sardine, Indian mackerel, lesser sardines, horse mackerel and tuna were the prominent species in purse-seine catches along Ratnagiri coast. In addition to that horse mackerel and tuna also contributed significantly in purse-seine landing during fishing period August to May. April was most productive month whereas, and summer was the most productive season of a year for the purse-seine fishing along the Ratnagiri coast of Maharashtra.

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