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Feeding congregation of ribbonfish, *Trichiurus lepturus* juveniles in oceanic waters and their targeted exploitation by deepsea trawlers along the Tuticorin coast in Gulf of Mannar

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Ribbonfishes supported commercial fishery at Tuticorin prior to nineteen nineties. But reports suggested that their stock and fishery declined considerably thereafter. Their fishery during 2000-2006 was represented by occasional landings of small quantity of ribbonfish by trawls. Average production by trawls at Tuticorin fishing harbour during the period was 250 t. They represent about 0.7% of the total fish catch of the period.

During first week of December 2007, large deepsea trawlers operating for prawns caught huge quantities of ribbonfish juveniles along with prawns from 300 m depth zone about 38-42 km away from shore. Almost all trawlers operated in these grounds

got heavy catch of ribbonfishes (Fig. 1). Catch varied between 10,000 and 20,000 kg/boat based on their



Fig. 1. Heaps of juvenile ribbonfish at Tuticorin Fishing Harbour for auction (each heap weighs 100 kg)

carrying capacity. This trend in ribbonfish catch continued till the middle of April 2008 when trawling was suspended due to annual closure of mechanized fishing. Size of ribbonfish landed by trawls was so small that they were not suitable for domestic consumption. The fish meal traders who were active in the field for procuring the then abundant triggerfish offered Rs. 300/-per quintal for ribbonfish also. The revenue realized by each unit from ribbonfish catch varied between 30,000 to 60,000/- per trip.

Catch of other commercial groups being poor during the year compared to previous years, about 8-12 deepsea trawlers concentrated entirely on this resource. In addition to ribbonfish, other components of the catch were deepsea prawns, crabs, flatfishes, Snake mackerel (*Neoepinnula orientalis*), grenadiers (*Caelorinchus caelorinchus* and *Bathygadus melanobranchus*), *Psenes* sp., pipefishes, balistids and pufferfish (Fig. 2). Juvenile ribbonfish represented about 83 to 98.3% of the catch during the period.



Fig. 2. Close view of deep sea trawl catch showing ribbonfish and other constituents

Fishery

Ribbonfish fishery was supported by single species *Trichiurus lepturus* Linnaeus, 1758. The production by trawls during the five month period from Tuticorin was 5,639 t (Table 1) and it formed about 13% of the total fish landing which is the highest production for this group during the last 15 years. Catch rate of ribbonfish in trawls as a whole varied between 352 and 566 kg/unit effort during this period with an average value of 418 kg/unit effort. If this production trend continues round the year, an annual production of about 12,000 to 14,000t of ribbonfish can be expected.

Size composition and growth

Catch at the beginning of the fishery in December was constituted by 28-39 cm fishes with 31.6 cm as mean length and 33 cm as major mode. In April, catch comprised 35-59 cm fishes with 46.7 cm as mean and 52 cm as major mode. The modal progression shows an average growth of 4.75 cm in length per month. Calculation based on the earlier study indicates that these recruits have its origin from the spawning which might have occurred around July-August.

Biological observations

Entire catch during December was constituted by immature fishes with indeterminate gonads. Sex of the fish could be distinguished by February with gonads at stage II of development. Fishes had shown the sign of maturity by April with nearly 11.87% of them with gonads at stage III of development.

Food was constituted mainly by deep sea prawns, crabs and other fishes. Prawn alone formed nearly 68 to 94.6% of their food followed by crabs and fishes.

Table 1. Landing details of juvenile ribbonfish by trawls at Tuticorin Fisheries Harbour during December 2007- April 2008

Month	Effort (units)	Total fish catch (t)	Ribbon fish (t)	% in total catch	Catch rate (CPUE) (kg)
Dec '07	2465	9,083	868	9.6	352.1
Jan '08	2887	10,421	1,542	14.8	534.1
Feb '08	3428	10,865	987	9.1	324..1
Mar '08	3142	8,796	1,367	15.5	435.1
Apr '08	1544	4,908	875	17.8	566.7
Average	2693	8,815	1128	12.8	418.8

Crabs and other fishes were present almost equally in the gut. Fish component in the gut include ribbonfishes also indicating cannibalism.

Utilization

Entire ribbonfish catch was utilized for fish meal production by the fishmeal industry throughout the period. They were dried under sun for a day and packed in gunny bags and transported to fish meal plants. Later in April, small quantities of large fishes above 50 cm were segregated and auctioned for domestic use.

The study showed that ribbonfishes aggregated in the deepsea grounds for feeding. They were caught accidentally in trawls but after realizing ready demand and good revenue, they were harvested

selectively. This resulted in record high landing of ribbonfish at Tuticorin after several years of low production. The heavy concentration of ribbonfish off Tuticorin waters raised the hope that fishery of this highly sought after fish may revive in the coming years. At the same time, indiscriminate large scale removal of juvenile fishes for nominal price may adversely affect the stock as a whole.

The recent trend of trawl fishery at Tuticorin indicates that there is a definite shift in the composition of catch during this year. Decrease in the catch of commercial groups such as carangids, barracudas, perches, silver bellies and goatfishes were compensated by increase in the catch of ribbonfish, triggerfish, *Stolephorus* spp. and pufferfish.