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Post Box No. 1603, Cochin - 682 018, Kerala, India

WWW.cmfri.org.in

Emergence of triggerfishes (Family: Balistidae) as an alternate lucrative target fishery for trawls along the Tuticorin coast in Gulf of Mannar

E. M. Abdussamad, K. K. Joshi, T. S. Balasubramanian, P. U. Zacharia and K. Jeyabalan
Tuticorin Research Centre of Central Marine Fisheries Research Institute, Tuticorin

Fishes of the family Balistidae are commonly known as trigger fishes. Globally the family is represented by about 40 species belonging to 11 genera. The name triggerfish arose as the second dorsal spine act as a trigger to the first dorsal fin. Locally they are known as 'Kilathi' in Tamil. Though they used to occur in trawl catch of Tuticorin coast from time immemorial, they were thrown back into the sea by fishermen mainly due to lack of market demand and also for want of onboard storage space. Trawlers used to avoid areas of their congregation as they considered it a menace leading to wastage of energy and time.

But the scenario changed by mid-nineties, with decline in catches of commercial groups and increased demand for low value fishes for fishmeal preparation for poultry industry. This prompted the fishers to land whatever they get in the net including triggerfishes. Being available in huge quantities at nominal price, some local traders utilized it as a fishmeal substitute in poultry feed. Feedback from traders indicated that triggerfish substituted feed boosted faster growth in poultry. This and its low cost prompted the traders to opt for this resource, whenever available. Regular monitoring of fishery during 2000-'07 shows that balistids became an important constituent representing about 18.6% of

the trawl catch at Tuticorin (Table 1). Their production fluctuated widely during the period with lowest annual production of 55 t in 2005 and highest of 26,625 t in 2007. Catch rate (CPUE) and contribution to the total fish production in 2007 was 927 kg/unit and 59.6% respectively as against an average value of 16.4 kg/unit and 18.6% for the period. Small triggerfishes congregate around coral reef areas off Tuticorin round the year and enter the trawl catch in huge quantities with the peak during August-December (Table 2).

Contrary to previous years, trawl catch was relatively poor at Tuticorin after the post-ban period in 2007. This, combined with increased operational cost, prompted many trawlers to abstain from fishing. This led to shooting up of the price of both food fishes and trash fishes. As of earlier years triggerfish entered trawl catch by early July to become the major component (59.6%) in the trawl catch at Tuticorin (Fig. 1). Each boat landed about 6,000 to 20,000 kg depending on their carrying capacity (Fig. 2). Huge congregation was reported in waters of 25-35 fathom depth about 12-15 km from Tuticorin fishing harbour towards south-east direction having 4-5 h voyage from the shore. From the beginning of the season, traders offered Rs. 300/-per quintal and the catch was loaded directly to trucks which

Table 1. Estimated catch, effort, CPUE and percentage composition of triggerfishes at Tuticorin Fishing Harbour during the period 2000-2007 by trawlers

Year	Effort (units)	Triggerfish (t)	Total fish catch (t)	CPUE (kg)	Percentage
2000	33765	2126	25166	62.9	8.4
2001	33983	2921	20016	85.9	14.6
2002	25807	1137	24058	44	4.7
2003	30069	3174	28994	105.5	10.9
2004	27646	1801	22633	65.1	7.9
2005	23336	82	15058	3.5	0.5
2006	28235	55	22549	1.9	0.2
2007	28719	26625	44672	927	59.6
Average	28946	4740	25393	16.37	18.6

Table 2. Average catch, effort, CPUE and percentage composition of triggerfishes at Tuticorin Fishing Harbour during 2000-2007 by trawlers.

Month	Effort	Triggerfish (t)	Total fish catch (t)	CPUE (kg)	Percentage
January	1835	60	1142	32.6	5.2
February	1307	32	928	24.4	3.4
March	1109	13	711	12.1	2.7
April	611	35	499	58	7.1
May	476	48	470	101.8	10.3
June	5013	121	4042	24.1	2.9
July	4774	205	3800	42.8	5.3
August	3836	484	3464	126.3	13.9
September	3461	1120	3076	323.5	63.5
October	2960	911	3336	307.8	27.3
November	1352	511	1372	377.8	62.7
December	2212	1199	2555	542	46.9
Total	28946	4740	25393	163.7	18.6

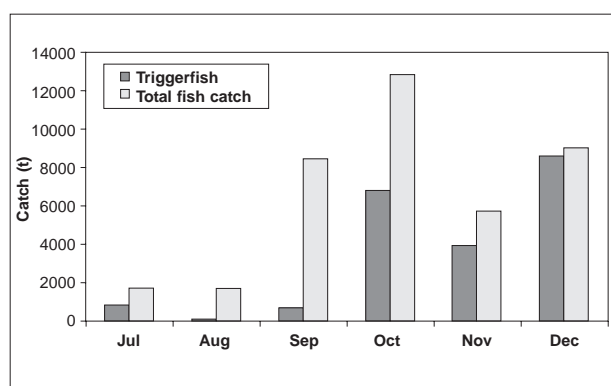


Fig. 1. Triggerfish and total fish catch at Tuticorin Fishing Harbour during July-December 2007

considerably reduced the labour cost (Fig. 3). Later tricycle operators claimed their right to transport the

fishes to auction ground at a rate of Rs. 30/- per quintal. Demand for the resource arose from several



Fig. 2. A boat with deck full of triggerfishes at Tuticorin fishing harbour



Fig. 3. Triggerfish catch loading directly to truck from the boat

traders as far as from Kanyakumari and Nagarcoil districts owing to their low cost, declining availability and increasing price of oil sardine, lesser sardine and other trash fishes. A major share of the catch was taken to Mottagopuram (north of Tuticorin) where triggerfish drying was developed as a small scale industry (Fig. 4). This virtually changed the earlier concept of balistid as a menace to a lucrative commercial resource.



Fig. 4. Triggerfish drying in the drying yards at Mottagopuram and dryfish packed in gunny bags ready for transportation

By seeing the financial benefit, some trawlers ventured directly for balistids as it offered an assured catch and return. Each boat is getting revenue of Rs. 18,000 to 60,000/- per trip. Due to dense congregation of the resource, fishing time is considerably reduced resulting in considerable savings of fuel and time. In due course of time, more efforts were attracted for exploiting this resource. By December, nearly 20-45 boats operated daily exclusively for triggerfish fishery. By January 2008, shoals dissipated and catch started declining

and some boats were diverted for other fishing activities. However several boats continued their operation till April 15, the closing date for mechanized fishing.

Catch was supported predominantly by *Odonus niger* (Ruppell, 1835) (Fig. 5) and small quantities of *Sufflamen fraenatus* (Bloch & Schneider, 1801).



Fig. 5. Redtoothed triggerfish, *Odonus niger* (Ruppell, 1835) the major component of the triggerfish catch (TL = 180 mm)

Size composition and growth of *Odonus niger*

At the beginning of the fishery in July, the catch was constituted by 77-132 mm fishes with 96.1 mm as mean size and 80 mm as major mode. Catch in December was by 105-290 mm fishes with 158.5 mm as mean and 115 as mode. In March, catch was by 140-320 mm fishes with 229.1 mm as mean and 200 as mode. This shows an average growth rate of 16.63 mm growth in length per month.

Biological observations

Sexual maturity of the species was monitored. Catch in July was constituted predominantly by indeterminates. In December-May, catch was supported by fishes with gonad at its second stage of maturity.

Gut content was constituted mainly by coral remains, digested zooplankton, parts of molluscan shells and sponges.

Utilization

Odonus niger, the dominant triggerfish was initially utilized for fishmeal. They were dried under direct

sun in open grounds for a minimum period of 3-4 days. Thereafter, they were packed in gunny bags and transported to fish meal plants.

Later in January some demand arose for larger fishes above 20 cm from southern part of Tamilnadu and Kerala especially Marthandom-Kalaikkavila region for domestic consumption. Large fishes fetched an average rate of Rs. 7-10/- per kg at the landing centre. These fishes were packed in ice and transported to the destination. As per the information provided by the traders, good demand is prevailing for this species, even if other fishes are available in sufficient quantity. At Tuticorin and nearby areas, beheaded and peeled fishes are being sold to some selected restaurants.

Conclusion

The record high production of triggerfish from Tuticorin during the year 2007 can be attributed primarily to the increased and selective effort exerted for exploiting the resource. During earlier years,

triggerfishes were landed only as an accidental catch. Due to increased demand for the resource combined with decline in the availability of other commercial fishes during the year more efforts were being diverted for this resource throughout the period.

The probable explanation for dense congregation of triggerfish is their specific nature of feeding and schooling behaviour. They feed mainly on zooplankton, molluscs, sponges and other associated fauna and the schooling behaviour is directly correlated to its grazing and grabbing nature. Added to this, *Odonus niger* have preference to coral reef habitat for feeding during their younger stages. The coral reefs and sand beds along the coast serve as the feeding ground for them and juveniles migrate to these grounds for feeding. It is also to be noted that trawl catch was constituted exclusively by 8-32 cm fishes, with total absence of small juveniles and mature fishes. This indicates that brood stock population was separate and breeding ground was away from the present fishing grounds.