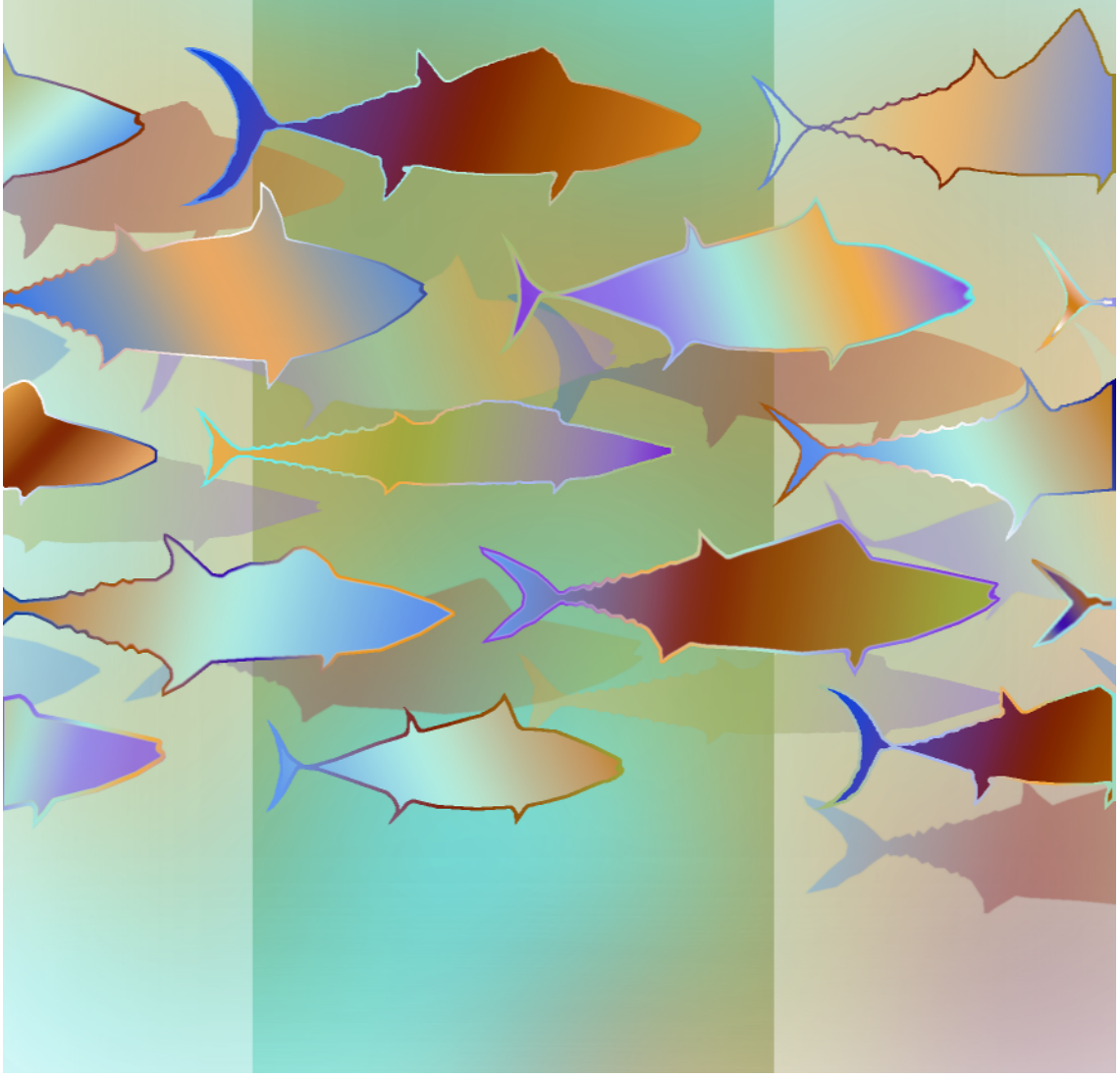
Status of Exploited Marine Fishery Resources of India



STATUS OF EXPLOITED MARINE FISHERY RESOURCES OF INDIA

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Whitefish

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1. Introduction

The whitefish, Lactarius lactarius, which is the only species in the Family Lactariidae has distribution all along the Indian coast. Though small in size, attaining a maximum of 330 mm, it fetches good price due to its good taste and consumer preference. It is also called false trevally and bigjawed jumper and is called katali in Gujarat, saundala in Maharashtra, adameenu in Karnataka, parava or adavu in Kerala, kuthippu or suthumbu in Tamil Nadu and sating in West Bengal. In recent years, the whitefish has caught the special attention of fishery biologists and conservationists since its landings has greatly decreased.

2. Production trends

The estimated annual landings of the whitefish (Fig.1) along the Indian coast increased from 8,898 t in 1961 to 13,912 t in 1973 and further to 25,337 t in 1985 but subsequently decreased to 4,945 t in 2000 (Fig. 2). The resource contributed to 0.2% of the total marine fish production in India during the year 2000.

Fig. 1. Lactarius lactarius

Along the northwest coast (NW) (Gujarat and Maharashtra),

the annual average landings increased from 154 t during 1961-70 to 8,836 t during 1981-90 but declined to 3,075 t during 1991-2000 (Table 1). The Saurashtra coast contri-buted to the landing along the NW coast. Compared to the NW coast, the fluctuations in the landings were moderate along the southwest coast (SW) (Goa, Karnataka and Kerala) and the annual average decadal landings ranged from 1,995 t to 3,652 t.

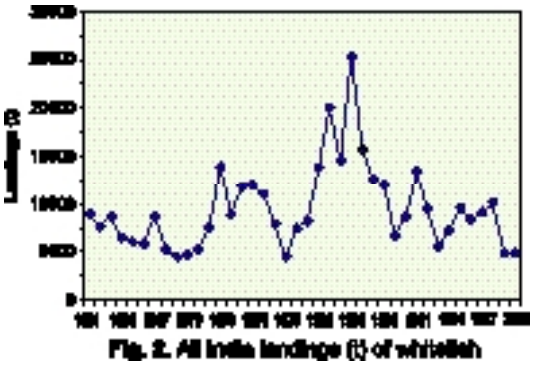

Fig. 2. All India landings (t) of whitefish

Table 1. Annual average decadal landings (t) of the whitefish

Year	Northwest	Southwest	Southeast	Northeast	All India
1961-1970	154	1995	4040	20	6209
1971-1980	3417	3054	2549	18	9038
1981-1990	8836	3652	1247	48	13783
1991-2000	3075	2707	713	150	6645
Average	3871	2852	2138	59	8920
%	43	32	24	1	

Contrary to the NW and SW coasts, the annual average landings of the whitefish decreased consistently and sharply from 4,040 t during 1961-1970 to a mere 713 t during 1991-2000 along the southeast coast (SE) (Tamil Nadu, Pondicherry and Andhra Pradesh) (Table 1). During the corresponding period, the contribution of the SE coast to India's whitefish landings drastically decreased from 65.1% to 10.7%. The whitefish contributed to only a minor fishery along the northeast coast (NE) (Orissa and West Bengal) but the annual average landings increased from 20 t (1961-1970) to 150 t (1991-2000). During 1961-2000, the west coast contributed to 75.4% and the east coast 24.6% of the total whitefish landings in India.

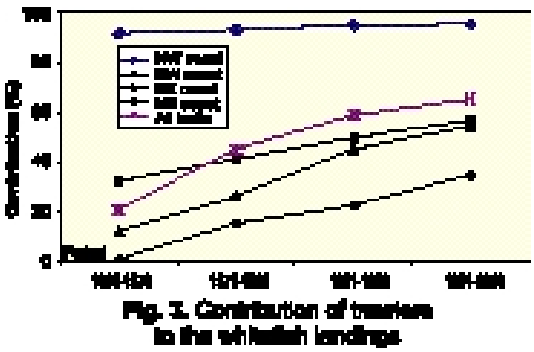

Fig. 3. Contribution of trawlers to the whitefish landings

Gearwise landings

Trawlers and indigenous drift gillnetters were the major gears, which landed the whitefish during 1961-99. With the intensification of trawling, the contribution of this gear to the whitefish landings in India increased from 20.2% during 1961-70 to 65.2% during 1991-99 (Fig. 3). Consequently, the

contribution of the drift gillnetters decreased from 71.6% to 22.0% (Fig. 4). The contribution of the trawlers to the whitefish landings increased in all the four major regions. Nevertheless, the gillnetters continued to contribute to a significant percentage along the east coast. The contribution of the gillnetters was 1.3, 32.0, 45.0 and 64.9% along the NW, SW, SE and NE coasts, respectively during 1991-1999. Dol net (along the NW coast), purse seine, ring seine and bag net (along the SW coast) also contributed to the whitefish landings.

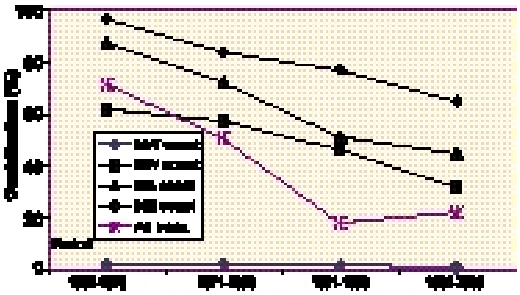

Fig. 4. Contribution of gillnetters to the whitefish landings

Length composition and average length

Analysis of length composition of the whitefish L.lactarius landed by trawlers at Mangalore indicated a length range of 70-230 mm in the fishery during 1992-93. The mean length was observed to gradually decrease from 150 mm in 1992-93 to 138 mm in 1998-99 (Fig. 5).

Contribution of juveniles to the total landings

The length at first maturity of the species is 135 mm. The mean length in the trawl fishery (138 mm off Mangalore during 1998-99) is very close to the length at first maturity, suggesting exploitation of large number of juveniles. In terms of number, 34.6% of the individuals in the fishery at Mangalore were juveniles during 2000-01. In terms of biomass, the juveniles contributed 23% to the total landings of the whitefish.

Utilization of the landings

The whitefish is consumed mostly in fresh condition in the domestic markets. However, a good portion of the landings is salted and dried.

3. Biology

Spawning periods

Maturation in whitefish is a continuous process and the fish may release the eggs in batches over a long period. Fish in different stages of maturity occur over a

number of months, thus suggesting absence of specific periodicity of spawning. Mature females (stages III and IV of ovarian development) have been found to occur over a number of months. However, considering the occurrence of ripe (stages V & VI) and spent (stage VII) fish, it appears that peak spawning is during December-April and during the southwest monsoon months of July-September off Mangalore.

The whitefish is highly fecund. The relative fecundity, depending on the stage of maturation and size of the fish, ranges from 9,000 to 1,04,195 eggs.

Recruitment

L.lactarius is recruited to the trawl fishery at 70 mm TL. Maximum recruitment of juveniles (70-89 mm) was observed in April and October off Mangalore during 1999 and 2000. These two peak recruitments are the result of intense spawning during December-April and July-September.

Food

The whitefish is a carnivore. The food consists of small teleostean fishes, particularly anchovies, and crustaceans, especially Acetes. The variety of organisms it feeds on is limited and there is selectivity in feeding. Acetes occurred in 72% of the juveniles but only in 26.3% of the adults. Fishes and fish remains accounted for 67% in the diet of the adults and only 30.5% in the juveniles. With increase in age, the food preponderance of the fish changes from a crustacean dominated diet to mainly a piscivorous diet.

Growth and lifespan

The whitefish attains 167 mm and 222 mm at the end of the first and second year respectively off Mangalore. The L_{∞} is 250 mm and the lifespan is 2.7 years. The fish attains 67% of its L_{∞} during the first year, indicating fast growth.

4. Stock assessment

Based on the data collected off Mangalore during 1998 and 1999, the fishing and natural mortalities of L.lactarius were estimated as 4.46 and 2.05, respectively. The current exploitation rate is 0.68, which is above the suggested optimum level of 0.50.

5. Management

In the absence of time-series data on the biomass abundance, it is difficult to draw conclusions on the status of the whitefish stock. However, the catch trends indicate decline in the stock, particularly along the SE coast. The whitefish concentrate in 20 to 45 m depth, 30 to 35 m being the optimum, but are capable of inhabiting up to 100 m depth. The depth of concentration of the whitefish is the depth of intense trawling. Irrational bottom trawling is known to severely affect the benthic habitat. Degradation of the benthic habitat and the consequent non-availability of the preferred food items would also have affected the whitefish stock

particularly along the SE coast. Moreover, trawl ban along the coasts of Andhra Pradesh and Tamil Nadu was introduced only in 1999 and 2001, respectively. Seasonal trawl ban, especially during the months of spawning, increase in the cod end mesh size of the trawl from 15 mm to 25 mm are necessary for sustaining the whitefish stocks along the Indian coast.

However, no fishery targets the whitefish and they are by-catch of the trawls. Hence, it may not be possible to implement management measures exclusively for this resource. The management of whitefish stocks, therefore, should be a part of an ecosystem based fisheries management consideration as in the case of several other similar species (see articles on Flatfishes and Goatfishes in this volume).

6. Suggested reading

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