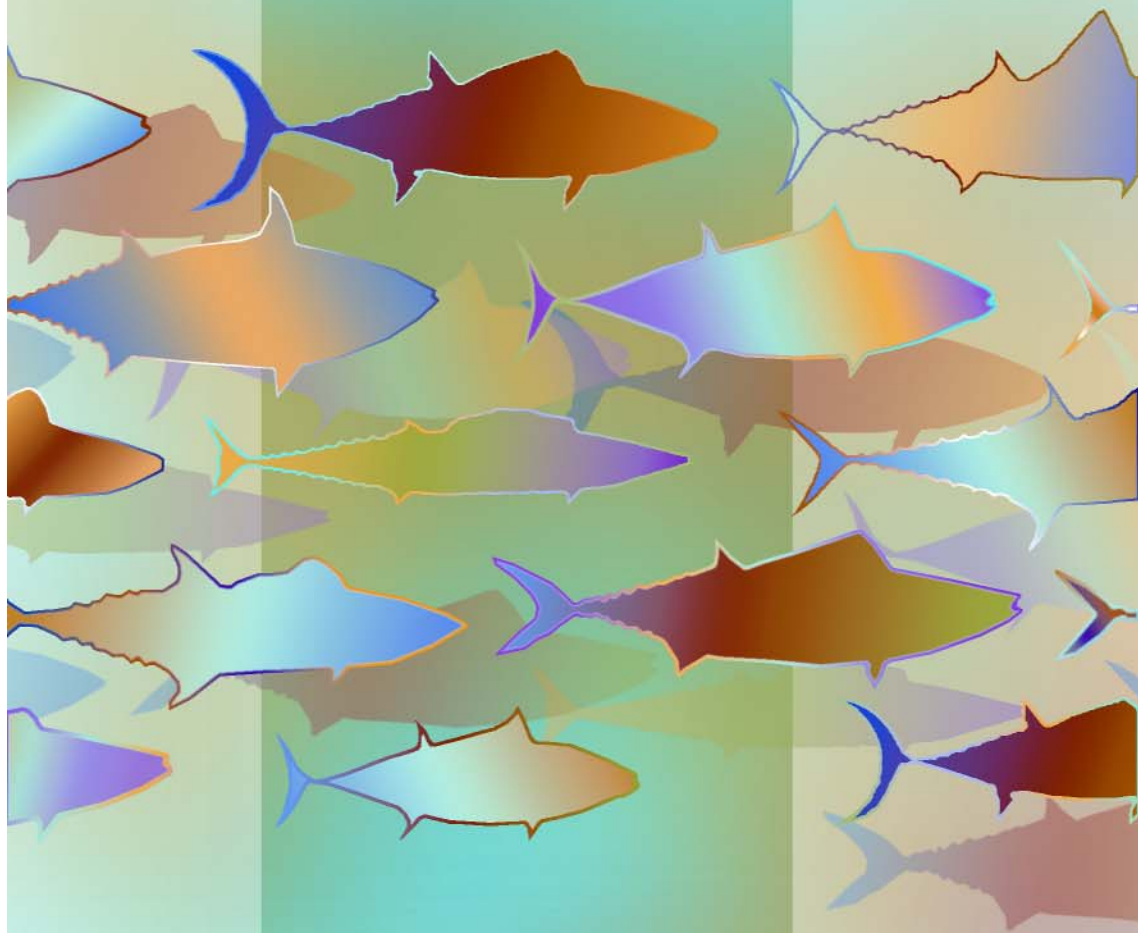


Status of Exploited
Marine Fishery
Resources of India



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RESOURCES OF INDIA**

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Golden Anchovy

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1. Introduction

The golden anchovy, *Coilia dussumieri* (Cuv. and Val.), like Bombay-duck is an endemic resource in Maharashtra and Gujarat along northwest coast of India. It is locally called Mandeli in both these states. It is an important pelagic resource found in association with the Bombay-duck, *Harpadon nehereus* and non-penaeid prawns. Till the advent of trawlers, it was landed mainly by dol net as by-catch along with Bombay-duck. Presently equal quantities or more of the same has been reported to be caught by trawlers. The species exhibits discontinuous distribution and constitutes a fishery in West Bengal and Orissa along with other species *C. ramcarti*. Despite its economic importance, not much work has been done on this resource.

2. Production trends

Maharashtra

The catches in Maharashtra during the last 10 years varied between 7, 921 tonnes (1992) and 19, 591 t (1998) with an average catch of 9, 949 t. The

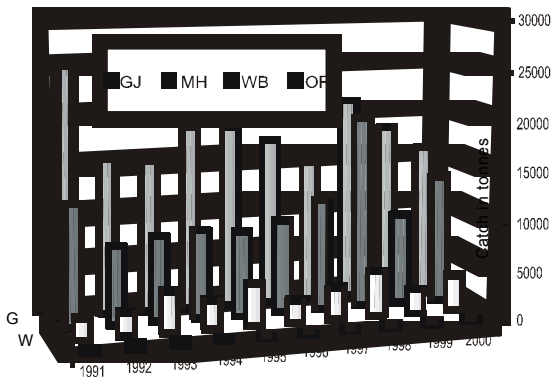
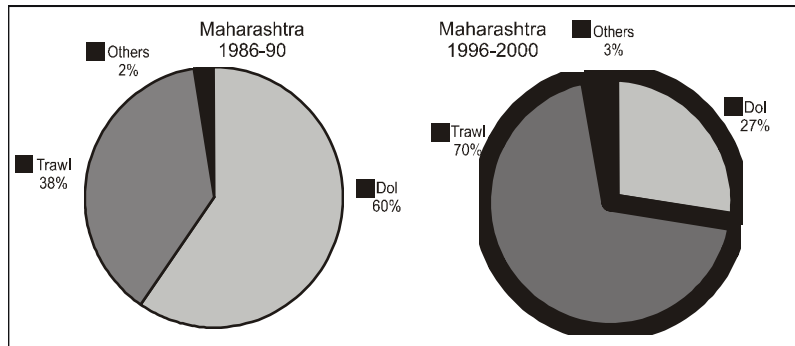


Fig.1. Trends in landings of golden anchovy in Gujarat (GJ), Maharashtra (MH), West Bengal (WB) and Orissa (OR)

occurrence and abundance of the species (Fig. 1) is often found to have some ecological association with Bombay-duck and non-penaeid prawns. The decline in landings of *C. dussumieri* mostly coincided with decline in the catch of Bombay-duck. Gearwise data indicate that prior to 1980 dol net was the sole gear that contributed the entire catch. The incursion of trawlers commenced in 1985 in dol net zone. Since then the contribution of trawl is on the increase. During 1986-90, trawl and dol net contributed 38% and 60% respectively, while during 1996-2000 contribution by the former increased to 70% of the total anchovy catch (Fig.2).



F Gearwise catch of golden anchovy

Time series analysis of the data on the landings of golden anchovy during the last 15 years together with co-occurring species like *H. nehereus* and non-penaeid prawns (Fig. 3) indicated that decline in landings of Bombay-duck coincided with that of *C. dussumieri*. However, the landings of non-penaeid prawns have increased during the same period.

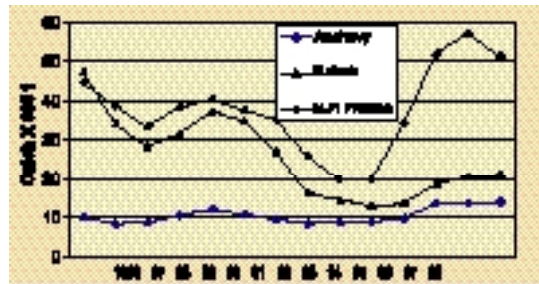


Fig. 3. Trends in production of golden anchovy in relation to Bombay-duck and non-penaeid prawns

Monthly catch rate indicated hardly any peak period of abundance, whereas earlier studies have indicated that the peak period of abundance was during January-April. During 2000-2001, the golden anchovy constituted about 4.6 % of the catch at New Ferry Wharf in trawler, while it formed only 1.4 % during 1990-91 indicating a greater incursion of trawlers into dol net fishing grounds.

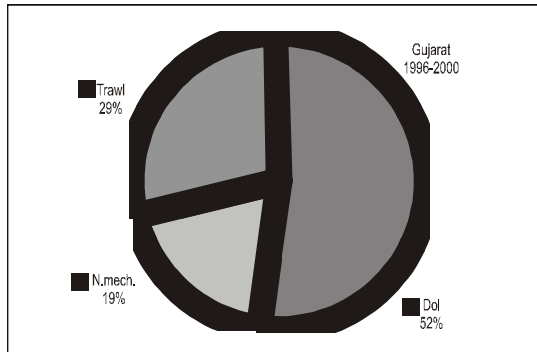
Gujarat

C. dussumieri contributed 14, 501 t (1997) to 25, 306 t (1991) in Gujarat with an average of 16, 323 t during 1991-2000. (Fig.4). Gearwise contribution indicated that dol net contributed 52%, trawl net 29% and non-mechanised gear (mainly dol

net) contributed 19% of the catch (Fig. 4). January-April is reported to be the peak period of abundance.

West Bengal

In West Bengal also the golden anchovy constituted a by-catch in bag net fishery. However, there has been significant increase in the landings by trawls compared to earlier year. The annual contribution during last 10



F Gearwise production of golden anchovy in Gujarat 4

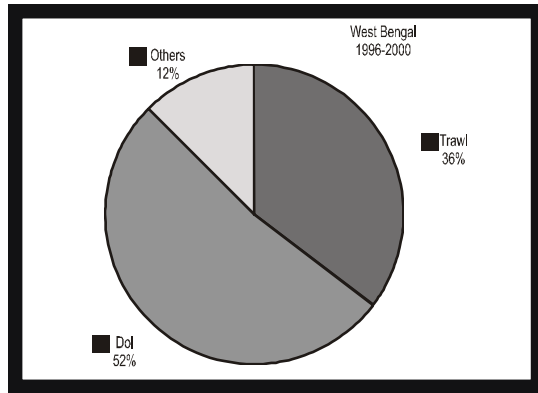


Fig. Gearwise production of golden anchovy in West Bengal

years varied between 2,216 t (1991) to 4,600 t (1998) with an average of 2,912t. Bag net accounted for 52%, trawlers 36% and other gears (Fig. 5.) shared rest of the catch.

Orissa

The annual landings of golden anchovy in this state ranged from 244 t (1999) to 470t (1992) with an average catch of 296 t. Almost the entire catch was landed by trawlers.

3. Biology

Food and feeding

Studies on the food and feeding habits indicated that the species was found to feed mainly on young ones of Acetes spp., copepods, ostracods, amphipods and young fishes and larvae. Copepods, which constituted 97% of the zooplankton formed only 14.7 % in the stomach, whereas ostracods, which formed 1% in the zooplankton samples formed 8.8% in the stomach. Similarly Acetes spp. abundant in zooplankton accounted for 23.7% and fish larvae 3.5% in the stomach. These two items seemed to be the preferred food of the golden anchovy.

Maturity and spawning

Sex ratio in 1999 and 2000 was 1:0.6 and 1:0.8 respectively. Disproportionate sex ratio was observed in many months but their periodicity varied from year to year. The size at first maturity is 160 mm for males and 162.5 mm for females.

Monthly gonadal condition indicated the occurrence of resting and developing gonads. This indicates that spawning takes place away from the present fishing zone. Earlier studies indicated the occurrence of mature specimen throughout the year. Ova diameter studies have revealed that individual fish spawns only once in a year.

Age and growth

Age and growth studies indicated that the species grows to a maximum length of 217 mm. The species has a short life span of only 2 years. It attains 151.6 mm and 196.9 mm at the end of first and second year of its life. However, the effective life span is less than 2 years.

4. Stock assessment

The Maximum Sustainable Yield (MSY) for Maharashtra has been estimated as 14,670 t whereas the average yield during last two years was 11,241 t. The earlier estimate of MSY was 16,395 t. The estimated values of Z and F/Z are given in Table 1.

Table.1. The total mortality coefficient (Z) and F/Z ratio of the golden anchovy during 1996-2000

Year	1996	1997	1998	1999	2000
Z	3.67	4.91	4.17	4.30	6.0
F/Z	0.40	0.55	0.47	0.49	0.63

5. Management

Prior to the introduction of trawling, the golden anchovy occurred as by-catch in the dol net. However, the trawl presently accounted for nearly 70% of the total catch of golden anchovy in Maharashtra. The pattern of abundance of the species closely follows a trend observed in Bombay-duck. The fishery of Bombay-duck begins in September and continues upto May. The catch rates are better during September-January. In tune with the collapse of fishery of Bombay-duck in the nineties the exploitation of golden anchovy has also come down resulting in the fall of dol net contribution to the total catch. Bombay-duck landings have declined, as a result large number of boats remain idle during February-May, which coincides with the actual peak period of abundance of the golden anchovy as well.

However, the encroachment of trawlers particularly those based at New Ferry Wharf to the 40 m depth zone is not a healthy practice. It is likely to create conflicts with artisanal fishermen who probably for many centuries were operating dol net off Bombay-Cambay waters. There are reports of damage to their stakes by these trawlers.

More than 1 lakh fishermen in Maharashtra alone depend upon this gear for their livelihood. Therefore, fishing in the bag net operating areas by these trawlers need to be discouraged.

The encroachment of the Gujarat fishermen for trawling into the dol net fishing grounds off Maharashtra has been a cause of concern for this state. Already there is a move by the Government of Maharashtra to ban this encroachment despite the fact that the New Ferry Warf fishing jetty was constructed in 1985 exclusively for the Gujarat fishermen as a measure to avoid any conflict at that time.

The decline in the catch of Bombay-duck and golden anchovy and increased exploitation by trawlers in the dol net fishing grounds are likely to aggravate the situation further. The conflict between dol net and trawler owners may worsen further as both of them belong to different states.

The management strategies of *C. dussumieri* cannot be considered in isolation. The golden anchovy is one among the many components exploited by the dol net, the other resources being non-penaeid prawns, Bombay-duck, Unicorn cod and juveniles of white pomfrets. In a multi-species fishery it would be rather difficult to suggest optimum mesh size for each species. However, the resource is underexploited and can sustain increased fishing pressure.

6. Suggested reading

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