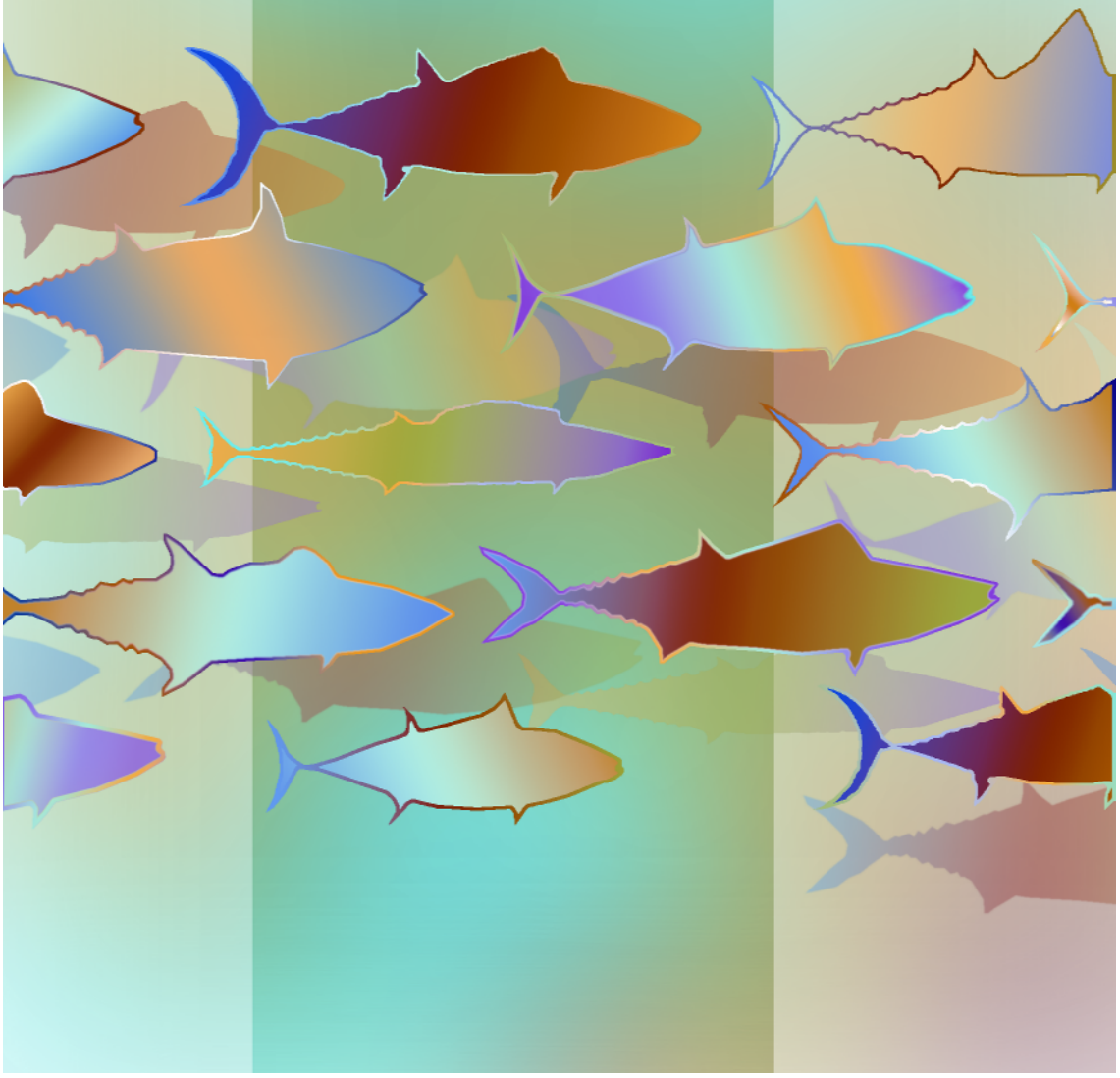
Status of Exploited Marine Fishery Resources of India



STATUS OF EXPLOITED MARINE FISHERY RESOURCES OF INDIA

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Silverbellies

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1. Introduction

The fishes of the family Leiognathidae (Silverbellies, pony fishes and slip mouths) locally called Mullan in Malayalam, Karal in Tamil, Karlu in Telugu belong to an important group of finfishes in the marine fisheries of India. In the year 2000, they formed 1.2% of the total marine fish landings. They are principally shallow water fishes distributed in the 0-40 m depth range and enter the estuaries also.

These fishes are of little demand in the fresh condition, but there is considerable market for sundried fish and for fishmeal and poultry feed. Most of them are small in size, attaining a maximum length of 15 cm; one species L. equulus is known to attain a maximum length of 25 cm. A large volume of work has been carried out on the taxonomy, biology and population dynamics of silverbellies from along the east coast of India.

A concerted effort was made in the early nineties to study the population dynamics of silverbellies of India and the stock sizes of major species were estimated and measures for ensuring sustained yield given. The present account gives brief review of the silverbelly fishery in India including the data generated subsequently.

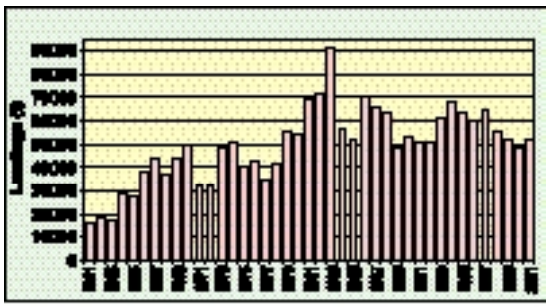


Fig. 1. All India landings of silverbellies during the period 1981-2021

2. Production trends

The silverbellies are exploited by trawl and a variety of artisanal gears like shore seine, boat seine, gillnet, etc. However, about 80% of the landings are contributed by trawl.

The landings (excluding Andamans) have been increasing over the period with about from 15,000t in 1961, the production of silverbellies reached 49,000 t in the year 2000. The annual production showed several peaks and maximum annual landing was about 92,000 t in the year 1983; excepting this year the landings during 1981-2000 did not cross 72,000 t. The pattern of annual landing does not suggest any drastic decline though there are years of heavy to reduced landings during the period of 40 years (Fig. 1).

Distribution

Unlike most of the teleosts, the silverbellies have a peculiar distribution. The landings in Tamil Nadu, particularly southern areas account for 70% of the total national production, followed by Kerala (9.4%), Andhra Pradesh (7.4%) Gujarat (4.4%) and other states (Fig. 2). In southern Tamil Nadu, these fishes are most abundant in the shallow areas of Palk Bay. The introduction of stay-over fishing and extension of fishery to deeper regions did not have any impact on silverbellies landing as happened in the case of other demersal resources.

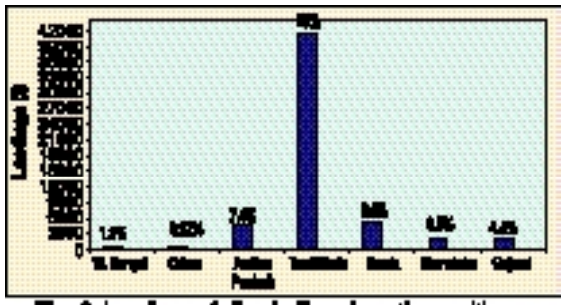


Fig. 2. Landings of silverbellies along the maritime states of India during 1990-2000 (average)

These fishes are known to undertake diurnal vertical migration staying at the bottom at daytime and moving upto surface water during night time.

Species composition

A total of 21 species of silverbellies are known from the seas around India. The data generated on the species composition along different parts of the Indian coast show that distribution of species very from region to region. Almost all the 21 species are known from southern Tamil Nadu, but the dominant species are

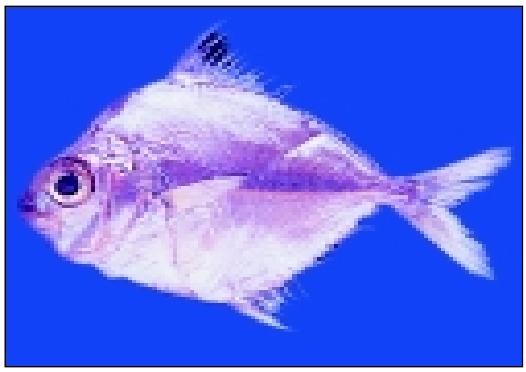


Fig. 3. Leiognathus splendens

Leiognathus dussumieri, L. jonesi, L. splendens (Fig. 3), L. brevirostris (Fig.4) and L. equulus. In the northern Tamil Nadu and along Andhra Pradesh about twelve species are known to contribute to the fishery of which L. bindus, L. splendens and Secutor insidiator (Fig.5) are most dominant accounting for nearly 70-80% of the silverbelly landings. It is interesting to note that these species are also known in the southern Tamil Nadu but they are less abundant in this region. (Fig. 6)

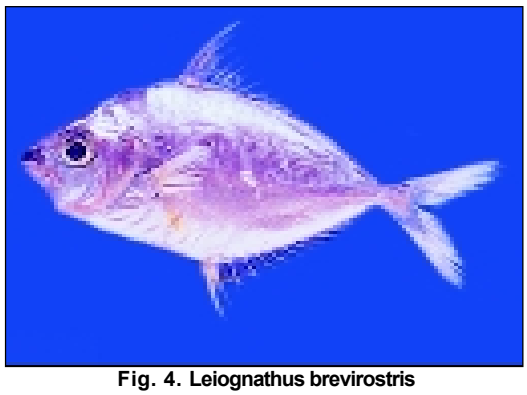


Fig. 4. Leiognathus brevirostris

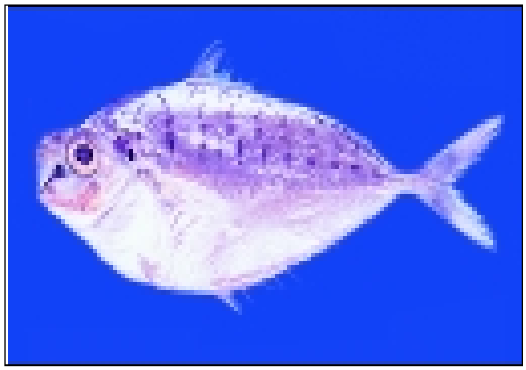


Fig. 5. Secutor insidiator

In Kerala, sixteen species are known to occur in the landings of which four species (L. splendens, L. brevirostris, S. insidiator, G. minuta) contribute to the bulk of the landings. The data on seasonal variation in abundance shows that (Figs. 7, 8) the landings in Andhra Pradesh are more or less the same in different months with peaks in February and December. In Tamil Nadu, August is the period of major abundance though there are fluctuations in landings in different months. In Kerala, March is the peak period of availability of silverbellies and April in Karnataka and December in Gujarat.

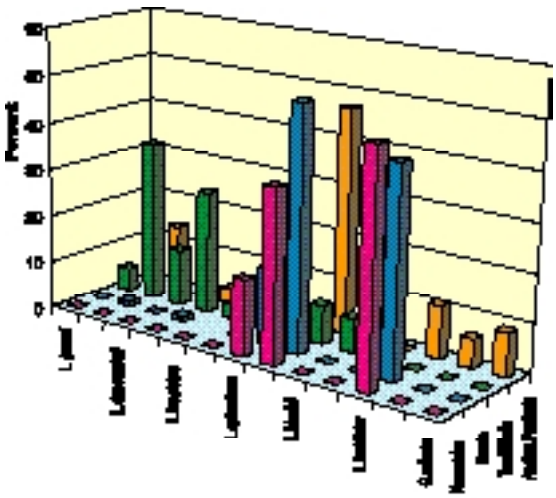
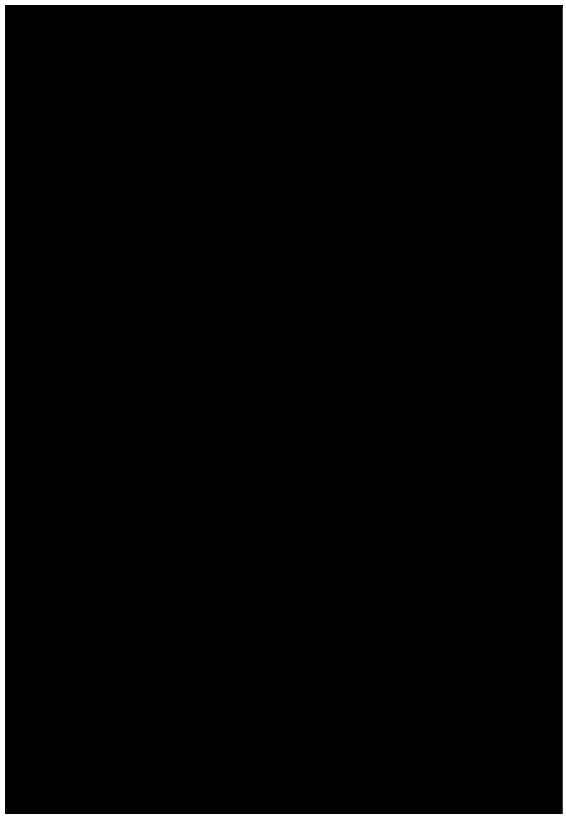


Fig. 6. Percentage composition of important silverbelly species landed in different maritime states during 1999-2001 (average)

3. Biology

L. bindus is fractional spawner spawning almost throughout the year with peak during December-January in



Andhra Pradesh. L. dussumieri is reported to spawn during April-May in the Gulf of Mannar. The spawning period of L. brevirostris in the Palk Bay and Gulf of Mannar is continuous with peak during May-June and October-November. In the case of L. jonesi also the spawning is continuous in Palk Bay and Gulf of Mannar. In L. splendens, off Kerala also the spawning is continuous round the year. In S. insidiator, the spawning period is reported to be March-April and July-November in the sea off Porto Novo and round the year with peak during January-March off Andhra Pradesh.

To summarise the above observations, the silver bellies are fractional spawners spawning throughout the year with one or two peaks of longer duration each year. The length at first maturity ranges from 62 to 100 m with values of majority of the species falling in the range 80-95 mm. These fishes are mainly zooplankton feeders.

4. Management

The silverbellies are relatively short-lived species in comparison to several other in Indian seas. The stock assessment studies using classical models on major species (L. bindus, L. dussumieri, L. jonesi, S. insidiator) revealed conflicting results: the effort is more than that giving MSY in one species where as it is less in the other species in the same fishery. Similarly the cod-end mesh under use is larger than the one that provides MSY in one species whereas it is smaller in another species. Though such conflicting management options on the basis of long-term prediction are not uncommon in several tropical marine fish stocks, (in some cases, within the species between sexes) the management measures should include the monitoring the landings for changes in species composition, changes in the average length, life span in the fishery, length at first maturity and growth.

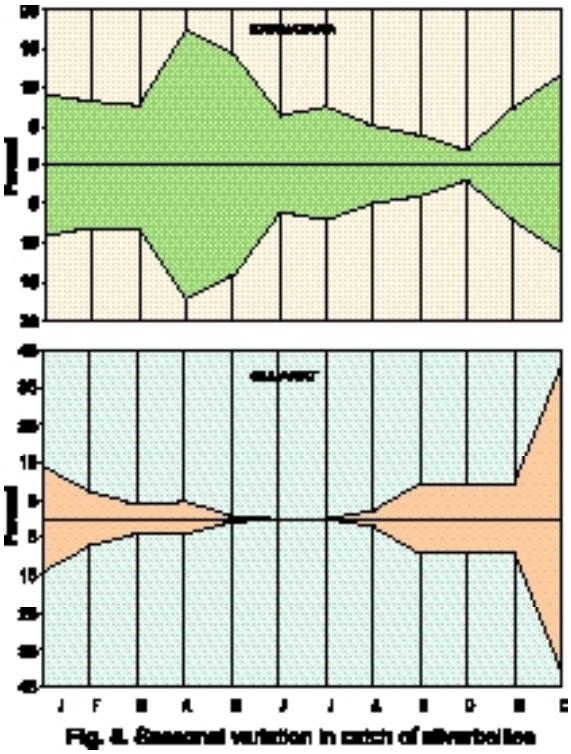


Fig. 4. Seasonal variation in catch of silverbellies

In the case of different species of silverbellies the management should be different in different regions as the species composition and major species contributing to the fishery are variable between the regions. Further, the major component in trawl catch in terms of quantity along the southeast coast being the silverbellies the dependence by the local population on this resource is considerable. Small-scale industries (Palmyra basket, mats, etc.) are developed over a period of time for meeting the requirements of sun-drying the salt-cured silverbellies and transporting them to interior markets in the region and neighbouring states. Strengthening the database of this resource from this region is required to be able to carry out research effectively and arrive at measures for sustaining the landings.

It is also known that southeast coast of India particularly the Palk Bay and Gulf of Mannar, is the richest in terms of marine biodiversity. It is also the richest in terms of silverbelly species diversity; all the 21 species known from India are available only in this region. It is for this reason also it is essential that database on species contributing to the fishery should be developed and maintained for carrying out research and taking suitable and immediate corrective measures to protect the species diversity and assemblages of silverbelly in this region.

The potential yield of silverbellies in the Indian EEZ is estimated as 67,000 t. This includes 28,000 t from Andaman and Nicobar Islands. Thus effectively, in the EEZ of mainland of India, the potential is to the tune of 39,000 t. The annual production trend during 1961-2000 (Fig. 1) clearly shows that from 1966 onwards, the landings were never less than 30,000 t in any year and infact the production showed an increase over the years. It appears that the potential yield estimated by the Working Group is an underestimate for the mainland portion of the country and needs to be revised taking into account the most recent data.

The lifespan of silver bellies in the fishery in the Indian EEZ is very short and most species are only annual crops. Besides, the continuous spawning leads to continuous recruitment. These fishes also constitute the food for several carnivorous demersal fishes. Hence, exploitation of this is not likely to adversely effect the population; what is most important in the case of these fishes is the maintenance of species diversity and their proportions.

5. Suggested reading

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