SOUVENIR

20th Anniversary

Central Marine Fisheries Research Institute

(Government of India)

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THE ORGANISING COMMITTEE C. M. F. R. I. RECREATION CLUB
MANDAPAM CAMP

The Ribbon Fishes

By P. S. B. R. James
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The ribbon-fishes, also called the hair-tails or cutlass fishes elsewhere, occupy an important place among the food fishes of India. They are abundant and cheap and as such are also preferred by poor people. Large fishes are consumed fresh and transported to the interior markets but the smaller ones in excess of the local requirements are usually sun dried on the beach. Their non-fatty nature and robbin-like bodies make them suitable for rapid preservation by sun drying. Thus, during times of glut, large quantities of the cured fish become available which ultimately find their way to interior markets at reasonably low price.

The ribbon-fishes belong to the family Trichiuridae and are represented in Indian waters by four species namely, *Trichiurus lepturus*, *Lepturacanthus savala*, *Eupleurogrammus intermedius* and *E. muticus*, the first named species being the most dominant. All of them are characterised by their ribbon-like body, prominent canine-like teeth, lack of tail fin and the silvery colouration. Ribbon-fishes are essentially marine, also found in the estuaries and occasionally straying above the tidal zone. While *T. lepturus* is found both in the Atlantic and the Indo-pacific, the other three species are essentially Indo-Pacific in distribution.

They are widely distributed along the Indian coast, one or more species contributing to the fishery at any particular place. They are especially abundant along the coasts of Andhra Pradesh, Madras and Kerala States where they are called *Savallu*, *Savalai* and *Vala* respectively in vernacular. The fishery is seasonal, from about July to March, the peak periods of occurrence varying from place to place, year to year and depending ofcourse, on the species concerned. Particulars of the ribbon-fish catches in India during the past six years (1960–1965) are given in Table I.

Table I

Particulars of ribbon-fish catches in India and their percentage in total catch from 1960 to 1965

Year	Total ribbon-fish catch (tonnes)	Percentage of ribbon-fish in total catch
1960	17,467	1.98
1961	19,515	2.85
1962	20,586	3.19
1963	16,452	2.50
1964	25,891	3.01
1965	41,298	5.06

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The maximum size attained by the ribbon-fishes varies according to the species. Reports indicate that *T. lepturus* grows to about 5 ft. in length. Although actual records of such length for this species are not available, fish measuring over a metre are not uncommon in India. Other species appear to attain only smaller lengths than this. *T. lepturus* is known to attain 18, 30, 46 and 54 cm at the end of first to fourth year respectively. The large individuals measuring 100 cm or more must evidently belong to a higher age-group and hence the life span must be more than four years. In contrast to this, *E. intermedius* grows to 21, 33 and 43 cm at the end of first, second and third year respectively. The availability of fish above 43 cm indicates that the life span of this species may be atleast four years. From the sizes recorded so far (*L. savala*, 80.0 cm; *E. muticus*, 58.4 cm) the other two species may also have a life span of atleast four years, if not more, as two of the species studied in detail show identical growth trends and since all the four species were found to have similar habits of life.

The breeding grounds of ribbon-fishes appear to be outside the usual fishing grounds. Ripe fishes, eggs, early embryonic stages and larval forms are not very common in inshore waters. While one of them (*T. lepturus*) is known to spawn only once a year in June, the other three species seem to spawn more than once as mature and spent fish and young ones appear more than once a year. These observations are also supported by the studies on the intra-ovarian eggs of these three species. The size at first maturity for *T. lepturus* is 47–48 cm (three years old) whereas *E. intermedius* begins to spawn for the first time at 30 cm when it is about two years old. As many as 18 thousand eggs are produced by an individual ribbon-fish, the actual number depending on the species and the number of times it spawns. According to available information, the eggs of ribbon-fishes are transparent, pelagic and range in size from 1.70–2.45 mm; newly hatched larval measure from 4.4–6.6 mm. While the sex ratio is not constant throughout the year, atleast in the case of two of the species studied in detail (*T. lepturus* and *E. intermedius*), females appear to be dominant in the commercial catches.

All the four species of ribbon-fishes are highly carnivorous and predominantly piscivorous. They are voracious feeders, feeding both during day and night. The most important items of food include a variety of small fishes (mostly of the anchovy type, e. g., (*Anchoviella*), prawns and shrimps (e. g., *Acetes*). Their predation on other economically important fishes and prawns is noteworthy. Although the ribbon-fishes exhibit some preference for the above items, in their absence they feed on a variety of others which are abundant in the environment. Instance of 'cannibalism' have also been recorded where their own kind are devoured. It is however, difficult to say whether it is intentional or accidental. Fish below 25 cm usually feed on smaller fishes and crustaceans but as they grow, they begin to add to their diet a greater variety of big fishes and prawns. The teeth and other oral structures of ribbon-fishes are suitable to hold the prey, bite and devour the same easily. Cestode and copepod parasites are sometimes found in the body cavity and mouth respectively of large ribbon-fishes.

Ribbon-fishes are essentially shoaling type of fishes, large schools entering the inshore fishing areas, often very close to the shore when enormous quantities of these are

caught in various types of seine nets. Such large scale migrations are common with the predominant species, *T. lepturus* around the peninsula during August to October, the shoals normally composed of spent fish. Once the shoal and its directional movements are detected at one place, fishermen at all the other places keep alert and fish large quantities on the following days. The shoals have been noticed to disappear as quickly as they appear. It is possible that shoaling in this species is related to spawning. It is significant that although more than one species may contribute to the fishery at any one place, in such migrations the shoal consists purely of one species only. The size range of fish on such occasions is limited, from about 50 to 75 cm.

Generally, the ribbon-fish fishery along the Indian coast is mainly supported by *T. lepturus* except at places where it is not common. The commercial size range for this species varies from about 16 to 80 cm, the dominant size groups again differing from place to place and year to year. Therefore, the fishery is contributed to by all the age-groups of the fish. Hence the magnitude of the fishery in any year is dependent on the degree of dominance of one or more of the age-groups in that year. If the higher age-groups are dominant, the catches are expected to be better than in years when lower age groups are dominant. In the case of *E. intermedius* the commercial size range varies from 14 to 35 cm, the fishery contributed to mainly by the first and second year-class fish and partly by the third year-class. As in the above mentioned species, the magnitude of the fishery depends on the dominant age-group during the year. Generally, the other two species, *L. savala* anh *E. mutieus* appear to contribute to the ribbon-fish fishery more substantially in the northern latitudes than in the southern latitudes. The commercial size ranges for these species also seem to be about 25 to 75 cm but more details are necessary as to their biology and actual extent of contribution to the fishery especially the age structure of commercial catches before any thing conclusive can be said about them. At several places where a regular seasonal ribbon-fish fishery exists, during the months of peak catches the ribbon-fish catch may amount to as much as 60 per cent of the total catch and average for the year may reach a maximum of 25 per cent.

The principal gear for these fishes are the seine nets operated from the shore (shore seine—*Karai valai* or *Peria valai* in Tamil) and the boat or catamaran (Pl, I, fig. 1) (boat seine or bag net—*Madi valai* or *Thuri valai* in Tamil). They are occasionally caught in otter trawl nets and in the gill nets. It is only rarely that they are caught on hook and line. The usual depth range varies from three to six metres but are often caught from depths up to 30 metres.

In addition to sun drying (Pl. I, Figs. 7, 8), during seasons of abundance, these fishes are salt cured. The simplest way is to keep the fish for a day in salt solution and then dry them in the sun on the beach. Sometimes salt is sprayed over layers of fish heaped on palmyra leaf mats (Pl. I. fig 2). The heaps are left in that condition for at least four or five hours. Then the heaps are turned, more salt is added and the fish muscle is slit laterally in several longitudinal lines for better penetration of salt and easy preservation. Next day the fishes are washed thoroughly in water kept in cement tanks and then dried in sun (Pl. I, figs. 3, 4). Another way is to keep the salted fish with intermediate layers of salt in rectangular

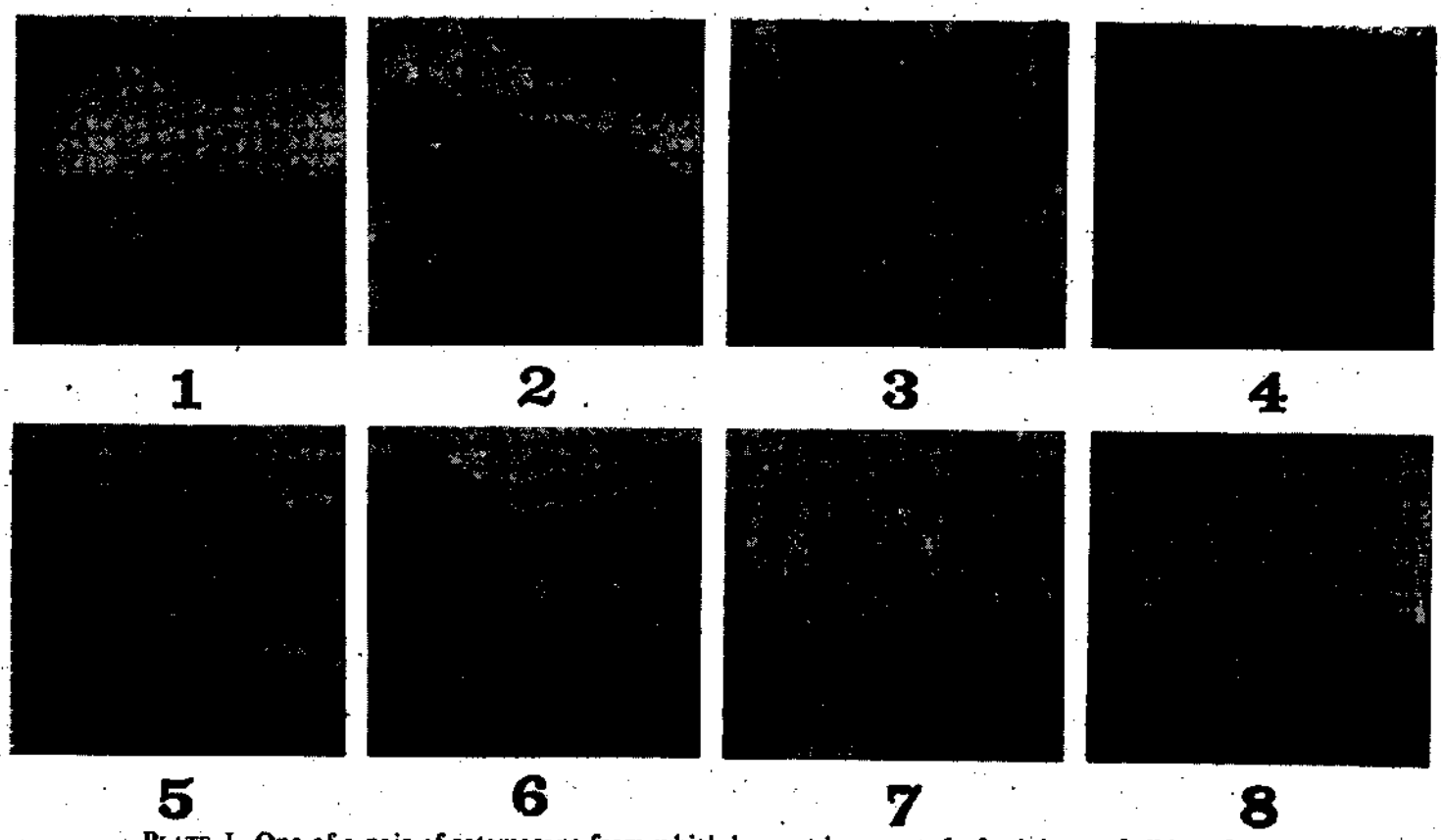

PLATE I. One of a pair of catamarans from which bag net is operated. 2. A heap of ribbon-fishes with intermediate layers of salt during the process of salt curing. 3. and 4. Washing and sun drying the salted ribbon-fishes. 5. and 6. Packing the cured ribbon-fishes. 7. and 8. Sorting of ribbon-fishes and their sun-drying on specially erected wooden frames along the Bombay coast.

cement tanks and press them down with feet. The third day the cured fishes are taken out, washed and packed with alternating layers of salt (Pl. I, figs. 5, 6). This method is employed only when there is a special market for this product.

At various places along the east and west coasts of India (in Andhra Pradesh, Madras and Maharashtra States) ribbon-fishes are also used as an effective bait for bigger fishes especially those caught on hook and line. Seer, tuna, jack, eels, cat fishes and jew fishes are some of the fishes commonly caught with this bait.

Apart from local consumption both in the fresh and cured states, considerable quantities of the cured products are exported to neighbouring countries like Ceylon and Malaysia where they are said to have a good market.