

RASTRELLIGER KANAGURTA (Ruppell)

Its Fishery and Biology

Summary of our Knowledge—Study Programmes

by

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In spite of its small size (it hardly exceeds twenty centimetres) this fish forms the basis of a fishery and an important industry through all the Indo-Pacific region, and for this reason it is worthy of our interest in its biology and movements, because it is a migratory fish.

This short note does not presume to present all known information on this small fish. It is certainly incomplete. Its only aim is to call forth complementary information from different countries of the Indo-Pacific region, for their utilisation in a more developed study of the biology of this fish and a more methodical organisation of its fishery.

POSITION IN NOMENCLATURE

It belongs to the family Scombridae and to the genus *Rastrelliger*, characterised by the absence of vomerine and palatine teeth and by the length of the gill-rakers which protrude into the buccal cavity.

The synonymy of this species is rather obscure, because local races or individuals of different ages have been described under different names by various authors.

In my opinion, although I have not been able to examine the types, it is reasonable to suppose that the following species are synonymous:

<i>Scomber kanagurta</i>	Russell	1803
S. <i>loo</i>	Lesson	1829
S. <i>microlepidotus</i>	Ruppell	1835
S. <i>chryzosonus</i>	Ruppell	1838

Like fish of economic interest, it possesses a large number of vernacular names. Following is a list, still incomplete:

Malaya	Kembung-Palata
Indonesia	Kembung-lelaki
Philippines	Alumahan-lumahan
Siam	Pla-thu
Cambodia	Trey Kamong
Cochinchina	Ca bac ma
Annam	
China	
Japan	Gurukun-Murchji

In this note I shall generally use the Siamese name "Pla-thu", which is most often used in Indo-China.

GEOGRAPHICAL DISTRIBUTION

The area of distribution of this species is very great since it extends throughout the tropical zone of the Indo-Pacific region, giving the widest acceptance to this term, such as was used by Fowler for example in "Fishes of Oceania", that is to say from the Red Sea and East Coast of Africa to the West Coast of America.

However, it seems that nowhere is it the basis of a simple and intense a fishery as on the coasts of Malaya, Siam and Cambodia.

BIOLOGY

Coasts of Cambodia and Siam

The Pla-thu appears on the coast of Cambodia towards the end of October in the neighbourhood of the Bay of Kampong-Som; a month later near Cone Island and Kaskapik. It remains there until February, a period when the females are ripe and ready to spawn.

Neither is its fishery continuous. It disappears after a storm, wind or other causes still little known, to reappear when conditions are again favourable.

Its stomach is generally filled with a greenish pulp, probably formed of microscopic algae.

Pla-thu is also caught on the East coast of Siam, but generally rather later than in Cambodia.

On the West coast of Siam and on the Malayan coast, Pla-thu is also present, but according to Dr. H. M. Smith, for a long time Fisheries Adviser to the Siamese Government, it is a different fish there.

On the other hand, from May to July, in the South-West monsoon, large quantities of young Pla-thou, whose length reaches a maximum of 7 centimetres, are seen on the Siamese coast in the vicinity of Koh-Chang and the Bay of Tung-Yai.

The Indies

According to Day (Fishes of India) the eggs are well developed in March, that is to say at the same time as in the Gulf of Siam and it is caught in abundance on the Malabar coast during the cold season.

Japan

According to Kishinouye, it is common in the neighbourhood of the Ryukyu islands, where small individuals are caught in summer and large ones in winter.

In calm periods, schools of these fish can be observed frisking near the surface in shallow water, feeding actively on small planktonic organisms.

FISHING METHODS

On the coasts of Cambodia and Siam, large quantities of Pla-thu are fished during the winter months (November to February) in fixed traps, established on the muddy bottom in depths varying from four to fifteen metres.

These traps comprise a kidney-shaped enclosure measuring 50 m. at its greatest diameter, formed of fixed fences of stakes driven into the mud. This enclosure, which is the capturing chamber, is preceded by another smaller heart-shaped enclosure, towards which converge rows of stakes reaching several hundred metres in length, and whose free end is directed towards the land.

Schools of Pla-thu and other fish meeting these rows of stakes, follow them out towards the sea and thus enter the capture chamber in which they turn round in circles without succeeding in finding the entrance.

Then they only have to be caught.

A barge with a straight net enters the chamber; one end of the net is fixed to a stake at the side of the entrance, the other end to the front of the barge which makes a complete circuit of the capturing chamber, taking care to pass first across the entrance. During this circuit, the upper rope of the net is maintained on the surface with the aid of floats, whilst the lower rope is kept on the bottom of the water. The fish are thus driven into a more and more reduced space. A running rope is then worked which transforms the straight net into a pocket and the fish are taken on board with the help of scoops. In this way, one trap collects an average of 50 to 80 tons of fish per season.

METHOD OF PREPARATION—ECONOMIC INTEREST

In Cambodia, the remoteness of fishing grounds and the slowness of transport means that the fish cannot be despatched fresh. A few attempts have been made with ice, but without any great success.

The most widespread method of preparation consists of gutting the fish through the gills, leaving it for a few days in a brine of 15 kg. of salt per picul of fish, then letting it dry, preferably in the shade.

Thus prepared, the fish is not much appreciated by Indo-Chinese people, but on the other hand, it is popular for export. Before the war, the Siamese steamer of the Bangkok-Hatien Line came each week into the fishing centres (Kaskapik, Cheko, Ream) and took up the produce in each place. The fish was then re-despatched to Singapore, and from there largely to Java.

During the war, the Siamese steamer, having ceased its service, the Pla-thu was sent directly to Java.

Another method of treatment different from the above, which is much appreciated in Indo-China, consists of arranging the fish in small open-work bamboo baskets and boiling them for a few minutes in large basins of sea-water, supercharged with 5 kg. of salt per 20 litres of water.

Thus prepared, the fish will keep for a fortnight, on condition that it is boiled for a few minutes every two days. It can thus reach the remotest villages in the interior and this method of preparation is tending to become more and more popular.

Finally, a factory was installed a few years ago at Cheko, an important fishing centre and makes pre-

serves of Pla-thu in oil or tomato, similar in flavour to American pilchards.

For dried Pla-thu alone, the export for an average year is estimated at about 3,000 tons.

The demand being always superior to the supply, the production could be greatly increased without risk of sales at a loss.

The simplest solution would obviously be to increase the number of fixed fishing traps, but suitable places being rather limited, the traps would obstruct one another and the yield per trap would diminish.

The construction of such traps also requires expensive materials and a lot of operatives in a region which is poor in these, and indeed numerous fishermen are retreating before the high renting price, and the number of traps has decreased by 50% between 1940 and 1948.

Also this method of ancestral fishery, although in general giving appreciable results, possesses serious inconveniences. In some years, for causes still unknown, schools of Pla-thu do not approach sufficiently near to the coast to be taken in these fish traps and the catch is nil; now a more complete knowledge of the biology of this fish will doubtless permit fishing further afield with suitable equipment.

STUDY PROGRAMMES

The Oceanographic Institute of Indo-China intends to initiate a study on this question whose programme is briefly as follows:

- (1) Determination of the conditions required by these fish in their migration by studying plankton, by analysing the stomach content of the fish, and by observing the temperature and the salinity of surface and deep water.
- (2) Tagging of fish—a certain number of fish would be marked on the coast of Cambodia at the end of the fishing season (February for instance). In this the Indo-Pacific Fisheries Council could be of great practical use, because the recovery of these tagged fish would necessitate some international co-operation. The fish tagged in Cambodia could indeed be caught on the coast of Siam or Malaya, or even in India; it would therefore be necessary to organise sufficient publicity in these different countries for the fishermen reporting a tagged fish, or at least the tag with some information (place and date of capture, length of fish) to be assured of receiving a fairly substantial bonus.
- (3) Research of the schools of fish by generic equipment Asdic etc. and study of the most suitable fishing equipment for their capture.

7

THE PROBLEMS OF FISH STORAGE AND REFRIGERATION IN SOUTH EAST ASIA

by W. B. Braxton, M. Sc.

The objective of this paper is to review the present condition of the South East Asia fishing industry from a technical and economic view-point and to consider the application of the possible steps of refrigeration development in improving the quantity and quality of fish available to the local population. We will draw more heavily on the information available for Malaya for this purpose since this is somewhat typical of the territory. Although the problems of refrigeration, as applied afloat, on land and in transportation to the major consumption centres, must be covered individually in detail, we shall at this stage restrict our study to the proper refriger-

ation developments of the first two steps or the process, namely, handling the catch at sea and at the collection centre.

EXISTING CONDITIONS:

Climatic.

The whole territory of South East Asia has the common problem, typified by Malaya, of year-round high temperature and humidity with certain coastal exposures faced with monsoons which regularly limit fishing activities.