

Observations on the Food and Feeding Habits of the Skipjack Tuna, *Katsuwonus pelamis* (Linnaeus) from Minicoy, Lakshadweep

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Abstract

The food and feeding habits of the skipjack tuna based on the data for the period 1993-96 is given here. Fishes, Cephalopod and crustaceans formed the main food items. Among fishes, *Decapterus* sp. is the dominant species found almost throughout the year. Cephalopod is fully comprised by squid. In prawns, *Thalassocaris* sp. was seen during June-August and *Leptochela* sp. during October-December. But in general empty condition dominated. The feeding habits in relation to the catch is discussed in addition to the comparison of the present observation with the earlier studies from here.

Introduction

In Lakshadweep, the pole and line fishery using livebait contribute about 90% of the total skipjack tuna catch. Since this fishery takes advantage of the biting behaviour of tunas, it is of great importance to know the feeding condition as well as the type of food that it has at the time of catching them. However investigations on the food and feeding habits of skipjack tuna from Lakshadweep are practically absent after the studies by Raju (1962) and Thomas (1962) from Minicoy waters and Varghese and Shanmugham (1983) from Agatti waters. So the present study aim at understanding not only the food and feeding habits but also tries to see how far it relates to the catch. Moreover the study also tries to see whether the present observation agrees with earlier observations from this area.

Materials and Methods

The material for this study was obtained from the pole and line catches from Minicoy during the period (February 1993-November 1996). However material was also obtained from troll catches depending on their availability during the monsoon period *i.e.* June-August when pole and line operation is suspended. In Minicoy, the entrails of tunas are removed in the landing centre itself immediately after their landing. So the degree of distention of the stomach as well as the dominant food items were noted from there itself. For detailed study a few number of stomach from known size groups were taken to the laboratory and analysed by both volumetric and occurrence method. A total of 3321 skipjack ranging in size from 26 to 72 cm FL were examined to understand the degree of distention and dominant food items. For a detailed study 200 numbers of specimens were examined. Those organisms that were not observed among the bait samples, but encountered in the stomach contents in detectable numbers or quantity were considered as natural food. Others found in traces and in few stomachs sporadically were considered as fortuitous entry. For example, some crustacean larvae like alima larvae found in one or two

numbers in some stomachs within a sample of 20 or 25 stomachs.

Results and Discussion

Feeding intensity

It is seen that the percentage of full and gorged condition are very few in almost all the months. Here also if we take those stomachs in which only bait fishes are found as empty, then empty stomachs dominate in almost all the months and in some months only empty stomachs are seen (Fig.1). The monthly average feeding condition assuming stomachs containing baitfishes alone as empty show dominance of empty condition in all the months except June and July. During June to August, only trolling is carried out because of unfavourable weather. Annually about 67% is formed by empty stomachs (Fig. 2). This dominance of empty condition is in agreement with the observations by Raju (1962), Thomas (1962) and Varghese and Shanmugham (1983).

Stomach contents

The natural food consisted of fishes, cephalopods and crustaceans. Besides these, lot of stomachs contained various baitfishes depending on their utilisation. The percentage composition by volume of the stomach contents excluding livebaits show that fishes formed 70%, crustaceans 11% and cephalopod 19% (Fig. 2).

Fishes

The main species of fishes found in the stomachs were *Decapterus* sp., *Trichiurus* sp., *Triacanthus* sp., *Canthigaster* sp., *Cypsilurus* sp., *Tetrodon* sp. and caesionids. Caesionids are a migratory group. Depending on their abundance in and around the lagoon, they are also caught and used as bait. However in this study, it is considered along with baitfishes only even though it is eaten from the sea by skipjack.

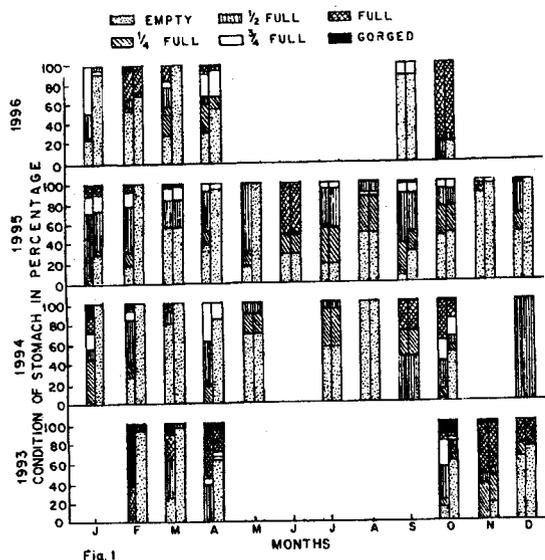


Fig. 1 The monthly feeding condition during different years.

Crustaceans

These are represented by deep sea prawns, *Leptochela* sp. and *Thalassocaris* sp., pelagic crab and juveniles of squilla. The pelagic crab was seen only once or twice during the observation period and their percentage volume was also very less. Like that the juveniles of squilla are sporadically seen that too one or two numbers in one stomach.

Cephalopod

It is constituted by squid alone.

Seasonal variation

Of the above mentioned foods, all are not found in all the months, instead, a definite seasonal variation is found. *Decapterus* sp. and the squids were found in almost all the months throughout the period of observation. *Trichiurus* sp. was observed during October-December in 1993. Juveniles of *Triacanthus* sp. was found during December and that of *Canthigaster* sp. during March and December. *Tetrodon* sp. juvenile was observed during September-November. The flying fish was present during September and October alone.

Among prawns, *Leptochela* sp. was found during October-December, and *Thalassocaris* sp. during June-August. The crab *Charybdis* sp. was seen during October-November and juveniles of squilla during October.

Baitfishes

The sprats (*Spratelloides delicatulus*, *S. gracilis*), apogonids represented chiefly by *Archamia fucata* and caesionids chiefly represented by *Caesio caeruleus* and *Gymnocaesio gymnopterus* are the major species used. However, *Chromis* sp. also used at times when no other bait is available. Of the baits, *S. delicatulus* alone is used throughout

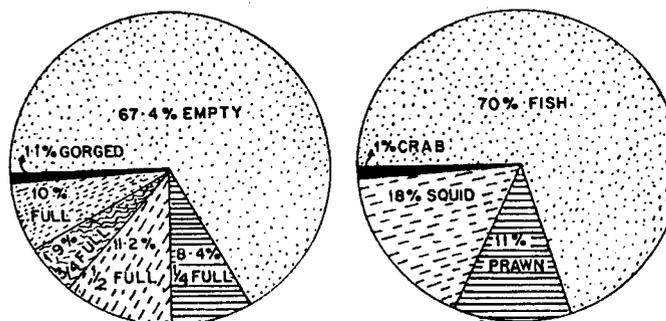


Fig. 2 Average annual feeding intensity and percentage composition by volume of the stomach contents excluding live baits.

the season whereas others are seasonal. Apogonids and *S. gracilis* are used during November to March-April. Caesionids, being a migratory group is caught and used as and when it is available in the lagoon and open sea.

That the food of skipjack is mainly constituted by fishes, crustacean and cephalopods is in agreement with the earlier observations from this area even though there is wide variation in the species composition. The dominant species of fish, viz. *Decapterus* sp. recorded in the present observation has never been recorded earlier. This can perhaps be due to the fact that their observations were based mainly on one year period. So it is likely that they would not have come across this or were very rare in that year as has been observed in the present study here during 1994. *Decapterus* sp. could be recorded only in May though in other years, this was observed in all the months. But their recording of crustacean larvae could only be a fortuitous entry since they were present only by one or two numbers. It was said that 12.9 to 47.8% of the stomachs were displaying only less than 0.5 cc by volume. But such stomachs have to be considered as empty because during the present observation, the average volume of a stomach during different days sample ranged from 6 to 162 ml.

Suyehiro (1938) observed that the skipjack which had fed recently did not bite as well as those that were hungry and skipjack feeding on pelagic forms responded to chum better than those feeding on inshore forms. But in the present observation, the natural food contained in the stomachs of majority of skipjack were almost intact indicating clearly that they were fed only recently or the tuna must have been feeding on them at the time of fishing. This disproves beyond doubt the observation that the skipjack which fed recently do not bite. According to Raju (1962), fast swimmers like squid and carangids were seen to contribute a much higher proportion of

the food of only large sized fish (about 70 cm FL) which were only very poorly represented in the fishery. During the present observation also, these large sized tunas were only poorly represented. However, the carangid, *Decapterus* sp. and squid were found to be the dominant food of the tunas of sizes less than 70 cm FL also.

Different combinations of food including bait fish found in the stomach: Though the tuna stomach contained different natural foods, interestingly the baitfishes other than caesionids were rarely seen along with natural food. If at all any baitfish was found, it was only one or two numbers. At the same time, the stomachs without the, natural food contained baitfishes in substantial numbers. This was the case throughout the period of observation. This implies that skipjack though bite any fish that is thrown, it does show a preference or selection if it has already fed on a prey from the wild.

No. of fishes caught in a boat in relation to the stomach condition and contents: No major difference is discernible in the number of fishes caught with respect to stomach condition. However it is seen that the number of fishes obtained from a shoal associated with floats is much more than from other shoals and interestingly the stomachs of these fishes are invariably empty also. According to Suyehiro (1938), the resident population living in shallow and coastal waters where abundant food is available, eat almost anything and can always find food in contrast to the migratory skipjack swimming in the open ocean or deep coastal waters. From the present study even though we cannot specifically distinguish between the resident and migratory fishes, chances of tunas associated with floats to be migratory are high as the stomachs of these tunas are invariably empty and they always show a feeding frenzy when the livebait fishes are thrown from the boat.

At present, we do not know the seasonal availability and abundance of forage organisms in and around Minicoy or Lakshadweep waters. Moreover we also do not know the exact time of the catching of tuna also. Such studies are imperative to understand the feeding regions and feeding periodicity, if any. This will also throw some light on the non-availability of tuna shoals in and around this area in certain months.

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