

REVIEW OF POLE AND LINE FISHERY AND LIVEBAIT FISHES IN LAKSHWADEEP AND THEIR RELEVANCE TO TUNA TAGGING

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INTRODUCTION

With the increase in fishing pressure on the yellowfin tuna and skipjack resources in the Indian Ocean since the mid-eighties the exploitation of juvenile yellowfin tuna in surface schools is a matter of particular concern. There is an organized tuna fishery in Lakshadweep islands where catches are taken mostly by small-scale pole and line boats. Bait-fish is abundantly available in the coral reefs and lagoons along the island group. In the coastal areas of mainland India, though there is no targeted fishery for tunas, skipjack and young yellowfin are landed in gillnet fishery. A small-scale tuna tagging programme is proposed from the pole and line fishery around Lakshadweep group of islands. The tagging programme will enable to refine estimates of growth of juvenile yellowfin tuna and also that of larger yellowfin and skipjack tuna. In India a number of studies have been conducted on the live bait fishes used in pole and line fishing. The paper presents a reviewed brief of skipjack tuna fishery and the live baitfishes.

TUNA FISHERIES IN INDIA

The annual catch of yellowfin tuna and skipjack tuna from the artisanal and mechanized boat fishery in India is given below:

| | (Unit: tonnes) | | | | | | |
|-------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Year | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| Skipjack | 6603 | 6293 | 6748 | 7347 | 6135 | 5790 | 5985 |
| Yellowfin | 5081 | 5554 | 3802 | 4106 | 4436 | 1977 | 2153 |

It is seen that the skipjack and yellowfin tuna accounts for about 60% and 40% respectively.

The exploratory longline surveys conducted by FSI in the Indian EEZ during the period from 1994 to 2002 have recorded the following catches of yellowfin tuna and skipjack tuna in the Arabian Sea.

| Year | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|-----------|-------|-------|-------|------|------|------|------|------|-------|
| Skipjack | 79 | 41 | 43 | 52 | 28 | 4 | 8 | 27 | 98 |
| Yellowfin | 31424 | 28654 | 10506 | 3639 | 6013 | 5389 | 1253 | 9330 | 18681 |

The contribution of yellowfin tuna in longline survey is varied from 22 to 44% whereas skipjack tuna catches were very low.

POLE AND LINE FISHING PRACTICES

The pole and line fishing in Lakshadweep group of islands is conducted from mechanized boats of size 25-34 feet length having 10-40 BHP engine. A bait tank in front of engine room of size 1.6 X 0.8 m having water circulatory features is fitted. Livebaits are collected from lagoons and reef areas around the Islands. The fishing areas are upto 5 km during monsoon periods and 20-25 km during non-monsoon periods.

LIVE BAIT FISHES

Pillai, *et. al.*, (2002) surveyed distribution of tuna live bait from 14 lagoons in the Lakshadweep Islands. Species-wise occurrence of bait-fishes and their percentage composition and length range is given below:

| Species | Total length range (mm) | Mode (mm) | % |
|----------------------------------|-------------------------|-----------|------|
| DUSSUMIERIDAE | | | |
| <i>Spratelloides delicanthus</i> | 12-51 | 17 | 14.3 |
| <i>S. gracilis</i> | 28-60 | 48 | 2.3 |

| POMACENTRIDAE | | | |
|------------------------------------|--------|----|------|
| <i>Chromis caeruleus</i> | 12-62 | 37 | 16.9 |
| <i>C. nigrurus</i> | - | - | 0.3 |
| <i>Pomacentrus pavo</i> | - | - | 0.1 |
| <i>L. tapeinosoma</i> | - | - | - |
| CAESIONIDAE | | | |
| <i>Caesio caeruleus</i> | 24-103 | 51 | 13.6 |
| <i>Pterocaesio chrysozona</i> | 30-74 | 42 | 22.8 |
| <i>P. pisang</i> | 44-57 | 46 | 0.7 |
| <i>P. tile</i> | 30-98 | 80 | 2.9 |
| <i>Gymnoaesio gymnopterus</i> | - | - | 0.1 |
| APOGONIDAE | | | |
| <i>Apogon sangiensis</i> | 26-59 | 37 | 1.1 |
| <i>A. leptacanthus</i> | 24-62 | 40 | 8.4 |
| <i>Archamia fucata</i> | 45-75 | 47 | 0.1 |
| <i>Rhabdamia gracilis</i> | 29-58 | 54 | 0.4 |
| <i>Ostorhynchys apogonides</i> | 23-56 | 39 | 7.3 |
| <i>O. quadrifasciatus</i> | - | - | 0.1 |
| <i>Paramia quinquilineata</i> | 45-49 | 46 | 0.1 |
| EMMELICHTHYDAE | | | |
| <i>Dipterygonotus leucogrammic</i> | 30-64 | 52 | 1.1 |
| Others | - | - | 7.3 |

Caesionids formed the bulk of the catch (40%) followed by Apogonids (18%), Sprats (17%), Pomacentrids (16%) and Emmelichthids(1%). Sprats were dominated by *Spratelloides delicathus* followed by *S. gracilis* and *Pomacentrus pavo*.

BAITFISH SUITABILITY

Gopakumar, *et.al.*, (1991) studied the population characteristics of tuna live baits in Lakshadweep islands. Based on the desirable characteristics they have suggested that some of the

species can be characterised into good baitfish. From the overall picture of the evaluation of the characteristics of baitfish, *S. delicanthus*, *S. gracilis*, *R. gracilis*, *C. caeruleus*, *C. striatus*, *P. chrysozona*, *G. gymnopterus* and *L. tapeinosoma* can be categorized as the best species of live baits. The high initial mortality of the sprats, especially of *S. delicanthus* at the time of capture and handling is a negative aspect of its suitability. The Apogonid, *R. gracilis* even though is excellent baitfish, the availability of it all through the fishing season in the islands has to be ascertained.

OPTIONS FOR LIVEBAIT

Gopakumar, (1991) evaluated the tuna live bait scarcity problem in Lakshadweep and suggested that the fishermen of different islands other than Minicoy need training for the rational exploitation of live bait fishes other than the currently fished *S. delicanthus*. Exploitation of the species belonging to Pomacentridae, Apogonidae, Caesionidae and Atherinidae in addition to Sprats, which is being practiced at Minicoy can reduce the bait fish scarcity at Agatti, Bangaram, Perumul Par, Suheli Par and Bitra.

DISCUSSION

Pilot Project for tuna tagging in the Indian seas are also proposed for skipjack tuna and yellowfin tuna caught from pole and line fishing method around Lakshadweep Islands with advantage of catching juvenile yellowfin tuna and adult skipjack tuna. The survey by Pillai, *et al.*, (2002) gives a comprehensive picture of total length and percentage composition of the baitfishes whereas Gopakumar, *et al.*, (1991) studies suggests baitfishes, *S. delicanthus*, *S. gracilis*, *R. gracilis*, *C. caeruleus*, *C. striatus*, *P. chrysozona*, *G. gymnopterus* and *L. tapeinosoma* are available in the lagoons in the Lakshadweep Islands. Gopakumar, *et al.*, (1991) suggestion of exploitation of the species belonging to Pomacentridae, Apogonidae, Caesionidae and Atherinidae in addition to Sprats. All these studies will facilitate target number of species tagging programme in Minicoy Islands and also other than Minicoy Islands.

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