BIONOMICS OF THE FLYING FISH HIRUNDICHTHYS COROMANDELENSIS HORNELL

by

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A B S T R A C T

The surface water temperature in the coastal waters around Trincomalee increases from inshore waters to off-shore waters and the salinity shows a corresponding declining trend, throughout the year. The temperature reaches a peak in April/May and in November. During the flying fish fishing season, May, June and July, the temperature in the fishing ground shows a declining trend with a corresponding increase in salinity. Extinction coefficient and plankton production were very low during the fishing season. However, these tend to increase towards the end of the fishing season. The rainfall in this coastal belt was the least during this period with a very heavy north easterly wind.

The commercial fishery for flying fish in Ceylon depends on the species Hirundichthys coromandelensis Hornell. The length of the fish entering the fishery ranges from 17 to 25 cm. The frequency distribution was unimodal. There was no indication of a shift in the model length from one year to another. Sex ratios showed that males were predominant among relatively smaller fish and that females were predominant among relatively larger fish. The diameter of shed eggs ranged from 1.45 to 2.10 mm and the frequency distribution was unimodal. The length of the ovary increases with the length of the body in a linear manner. Fecundity ranged between 4900 and 11800; however, the amoung of eggs shed at a time ranged between 2500 and 5000. Stratification of intra-ovarian egg diameter according to weeks and according to length of fish, showed

eggs in 4 stages of maturity and indicated a time interval between two successive spawning periods. The spawning during the main spawning season appears to be contributed to mainly by females over 20 cm in length and these fish more into the spawning area continuously throughout the season without any peak period within the season. The studies on swimming behaviour of this fish indicated that the highest concentration of fish is near the surface and it declines with increase in depth. The spawning activity of this fish tends to reach a peak between 1 p.m. and 4 p.m. of the day. In the spawning ground this fish tends to approach the lure in aggregates of varying numbers. The average flying distance estimated for this species was about 50 m, though occasionally a distance of 150 - 200 m. was attained.

The comme cial fishery for this species is limited to about 350 square miles, extending from about 5 to about 15 miles from shore and 35 miles in the north-south direction off Trincomalee. Since 1967 this fishery has been conducted entirely by a fleet of mechanised boats (E.26 type). During the major part of the season 40 - 50 boats may fish per day with 6 to 8 hours of active fishing. The total number of fishing operations conducted in 1969, 1970 and 1971 were estimated as 1158, 1161, and 1223, respectively. The catch per unit effort may be poor during the first few days and the last few days. The catch per unit effort reached a maximum of 57 baskets (One basket of fish equals nearly 500 fish or 70 lbs.) during this period of investigation.

The day-to-day fluctuations in the catch per unit effort was noticed and were due to size of gear, wind, time of fishing, distance from shore, predators, number of fishing hours, combined fishery and oceanographic factors. Trial fishing conducted using synthetic fibres as lures showed the they are less efficient than natural shrubs. Night fishing conducted using diesel oil lamps indicated the possibility of utilising powerful electric lamps to exploit this fish commercially.

Bait trials carried out with flying fish as bait in trolling lines indicated the suitability of this fish as a bait fish for Tuna (Thunnus albacares), Sier (Scomberomorus sp.) and Sharks (Carcharhinus sp.) in trolling lines. Bait trials carried out in tuna longlines along with Saury (Colalabies saira) showed its suitability as a bait fish for tuna long lining.

The cost of operation for this fishery per day may be about Rs.25.00 and the income per fisherman per day varied between Rs.4.00 and Rs.140.00 with a monthly income range between Rs.750.00 and Rs.850 00.

The studies on the distribution of this fish showed that it is mainly along the western boundary of the Bay of Bengal during the spawning season, with the highest concentration close to the east coasts of India and Ceylon. The investigation into the annual variation in the catch and catch per unit effort indicated an increase in the effort and a slight decline in the catch per unit effort. The production rate is 0.5 tons/square mile. Total

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