SOME ASPECTS OF THE LIFE HISTORY OF THE IAO, PRANESUS INSULARUM INSULARUM, AN HAWAIIAN ATHERINID

A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

IN OCEANOGRAPHY

DECEMBER 1969

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INTRODUCTION

Live bait fish are used in the pole-and-line fishing method employed by the local skipjack tuna (Euthynnus pelamis) industry (June, 1951 b), the most important fishery in the state of Hawaii (Lyles, 1963-1968). Because of the chronic and costly shortage of bait fish (King and Wilson, 1957) attempts have been made to introduce other catch methods to the industry. These efforts have failed (Matsumoto, 1952; Murphy and Niska, 1953; Tester, et. al., 1954; Shomura, 1963). Therefore much time and money have been spent in attempts to alleviate the problems involving bait fish.

Nehu (Stolephorus purpureus) has comprised over 90% of the bait fish used in Hawaii since 1951 (Appendix A), and therefore has to date been the most extensively studied local bait fish. Past works, by subject, include: Distribution--Welsh (1949), June (1951 a and b), Tester (1951), Au (1965); Abundance--Bachmann (1963); Fecundity--Tester (1955); Embryology--Yamashita (1951); Larval Development--Yamashita (1951), Tester and Hiatt (1952); Feeding--Hiatt (1947 and 1951), Burdick (1969); Mortality in Bait Wells--Brock and Takata (1955); Oxygen Requirement--Pritchard (1955).

Currently research is still being conducted with nehu. Although mortality in the bait wells has been reduced (Brock and Takata, 1955) it has not been considered feasible as yet to rear nehu artificially (Hida, et. al., 1962).

In other efforts to solve the bait fish problem new bait species have been introduced to Hawaii. Tilapia mossambica is the most studied

of these. Research was initiated by a report by Brock and Takata in 1955. After fifteen years of work and much expense, however, this species has proven to be a poor substitute for nehu (Shomura, 1964, and Yuen, in press). The Marquesan sardine (Harengula vittata) (Murphy, 1960) and the threadfin shad (Dorosoma petenense) (Hida and Thompson, 1962) have also been imported to Hawaiian waters as prospective bait fish, but these species have not yet been studied in depth.

While the scientific community continues to investigate various aspects of nehu and to import new bait species to alleviate the bait fish problem in the tuna industry, iao, (Pranesus insularum insularum) (Atherinidae), a fish that for years has been successfully used in the Hawaiian tuna fishery, has been little studied. Although the industry has long been dependent upon iao to supplement nehu catches (Mr. Tamotsu Shimizu, Hawaii Division of Fish and Game, personal communication), and although the iao is known to be hardy and well-behaved in the bait wells and in the field (Smith and Schaefer, 1949) in contrast to nehu which is "...notoriously subject to mortality from handling" (Nakamura, 1965), only one extended study has been made on iao, a laboratory oxygen requirement study by Pritchard (1955). The only other studies concerning iao have been limited or incidental in nature (Jordan and Evermann, 1902; Schultz, 1948; Eckels, 1949; Smith and Schaefer, 1949; June, 1951 a and b; Schultz and collaborators, 1953). The life history of iao is not well known.

Iao seem to be at least equal in acceptability as a bait fish to all bait fish previously studied. The limiting factors that have precluded the use of iao may be the problems of availability (Mr. Eugene

Nakamura, Bureau of Commercial Fisheries, personal communication) and possible prejudice on the part of the fishermen. The bait fish problem in the tuna industry may be at least alleviated if iao availability could be predicted or stabilized in the field or if this species could be artificially cultured. This, however, demands full knowledge of the life history of iao. The present study describes some aspects of the iao life history.