Oceanic Institute & Tungkang Marine Laboratory

Cooperative Program on Milkfish Research

TML Activities

Progress Report

April 22, 1985

INTRODUCTION

Milkfish is one of the most important cultured fish in Taiwan. Both the traditional and modern improved methods of culture request a large number of fry for pond stocking. Besides gathering from coastal areas in Taiwan, fingerlings and juvenile fish are imported from the Philippines and/or Indonesia to meet the demand. The fluctuating supply of fry causes uncertainty in the milkfish industry. Hence, a more reliable source of fry is urgently needed to be developed.

Cases of reproduction of milkfish in captivity in Taiwan and other countries show the potential of the successful domestication of milkfish. In order to pursue reliable methods for artificial propagation of milkfish, research with international cooperation is necessary.

Tungkang Marine Laboratory (TML) has joined the cooperative program on research of milkfish reproduction, which is sponsored by the United States Agency for International Development (US AID) and organized by the Oceanic Institute (OI).

The research activities in TML include: the ecosystem study of milkfish maturation ponds, testosterone feeds experiment, hormone implantation experiment and the collection of specimens for the racial study conducted by the researchers at OI.

ECOSYSTEM STUDY OF MILKFISH MATURATION PONDS

Objective

Since wild spawners are rarely caught in Taiwan, spawners are usually obtained from culture ponds. The characteristics of milkfish maturation ponds may therefore provide information on requirements of environmental factors for the maturation of milkfish. The physical and biological parameters of the milkfish broodstock ponds at TML are recorded on a continuous basis throughout an entire year.

Activities

Two 200 m^2 concrete ponds (B_1 and B_2) are each stocked with 30 8-year-old milkfish since November 20, 1984. B_1 is bottomed with mud while B_2 is remained as concrete. Prescribed diet with a crude protein content of 42.0% is fed to the fish every day. Water quality is monitored every 5 days. The parameters considered include temperature, salinity, Secchi disc transparency, pH, dissolved Oxygen (DO), Chemical Oxygen Demand (COD), NH_4-N, NO_2-N, PO_4-P, chlorophyll a and redox for mud-bottomed B_1.

Data from November 20, 1984 to February 27, 1985 are analysed by comparing chlorophyll a with several other parameters. Chlorophyll a is found to be directly proportional to PO_4-P and inversely proportional to transparency in B_1, but not in B_2. No significant relationship is found between chlorophyll a and NH_4-N or pH.

Further data collection will be conducted for a year, and the validity of the above observations will be determined. Analysis of the data at the end of the year will show more information concerning the ecosystem of the maturation ponds.

TESTOSTERONE FEEDS EXPERIMENT

Objective

The effectiveness of testosterone administered in the feeds to mature adult male fish has been demonstrated on mullet and milkfish in experiments conducted by the researchers in OI.

Adult male milkfish that have demonstrated maturity in previous year are chosen in this experiment to determine the effectiveness of testosterone diet on maturation.

Activities

Two 8.4 m diameter round concrete tanks (R_3 and R_8) are stocked with male adult milkfish from a previous hormone experment in 1980. The age of the fish range from 8 to 10 years. Five males in R_3 are fed with testosterone in their diet and four males in R_8 are used as control. The feeding has begun at April 16, 1985.

Status of the gonad maturation of the fish will be checked regularly in the future.

HORMONE IMPLANTATION

Objective

To test the effects of hormone implantation on adult male milkfish maturation in two different environments.

Activities

Experimental design is at its preparation stage.

SPECIMENS COLLECTION FOR RACIAL STUDY

Objective

Wild milkfish are collected and transported to OI for racial study. The population structure of milkfish in the Taiwan area can therefore be determined.

Activities

Seventy adult milkfish have already been collected and transported frozen to OI.

Collection of fry representing the peaks of the two recruitment periods has not yet begun as the first recruitment period is in late Spring. Collection will be performed when the time has come.

POND CONSTRUCTIONS

Concrete ponds are constructed to replace the facilities being occupied by the present experiments.

Four 10x10x2 m deep ponds are under construction and are estimated to be finished at May 1985.