INDUCED SPAWNING AND LARVAL REARING OF MILKFISH

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Milkfish constitutes a major product of aquaculture in Indonesia, Taiwan and the Philippines. The only source of fry for stocking in ponds and pens is the coastal waters during the spawning season; consequently, the supply is irregular and inadequate. The need to have a dependable source of seed cannot be overemphasized.

Induced Spawning

In the Philippines, early attempts to induce the sabalo to spawn in captivity by hormone injection failed (Angeles, 1968; Inland Fisheries Project Technical Report No. 5, 1974; Delmendo & Angeles, 1975). Liao and Chan (1976) were successful in inducing gonadal maturation in male milkfish reared for the past six years in concrete tanks. In 1976, at SEAFDEC and at the Oceanic Institute, injection of the semi-purified salmon gonadotropic hormones (SG-G100) to female sabalos resulted in the release of hydrated eggs (Nash & Kuo, 1976; Vanstone et al., 1976); the eggs, however, were not fertilized. In 1977, adult milkfish were induced to ovulate in captivity by injecting them with a mixture of acetone-dried pituitary gland of salmon (ADSP) and human chorionic gonadotropin (HCG) and the eggs were successfully artificially fertilized (Vanstone et al., 1977). In 1978, Juario et al. attempted to induce ovulation in sabalos by injecting them with either ADSP alone or a micture of ADSP and HCG. Results reveal that all fishes except those having eggs with a mean diameter smaller than 0.60 mm or those that are badly injured responded to the hormone injection of either ADSP alone or a combination of ADSP and HCG; ovarian eggs were found to be undergoing hydration. Better results were obtained when ADSP was used in combination with HCG.

From the results, it is evident that response of fishes to hormone injection is very much affected by their physical condition during acclimatization. Safe capture, handling and transport of spawners are essential to the success of induced spawning. Recently, Liao and Chan (1979) were successful in inducing maturation and ovulation of milkfish reared in concrete tanks for 5 to 6 years. They used either ADSP or acetone-dried mullet pituitary (ADMP) with either Puberogen or HCG. But the eggs leased were not fertilized.

A summary of the hormones used to induce spawning in newly captured adult milkfish is presented in Table 1.

Larval Rearing

Earlier attempts to rear newly hatched milkfish larvae failed. Of the several thousands of eggs that were artificially fertilized, only a few fingerlings survived (Vanstone et al., 1977) and in another experiment only 2 larvae survived for 6 days (Chaudhuri et al., 1977). In 1978, Liao et al. obtained a total of 2,859 fry from the 13,400 larvae that were originally stocked in experimental tanks. The highest survival rate obtained from different experimental groups was 46.8 percent; the lowest was 8.8 percent.

The better survival is attributed to the larval rearing technique used which is as follows:

> Green water consisting mainly of marine chlorella is added to the 400-l and 1 ton larval rearing tanks on Day 1. Fertilized eggs and larvae of oysters are given as food from Day 2-7; rotifers from Day 2-21. Copepods and brine shrimp nauplii are given from Day 14-21. One-third of the water in the rearing tanks is changed whenever necessary. The light green color of the water is maintained throughout the rearing period.

Results of the 1978 larval rearing experiments at SEAFDEC further indicate that milkfish larvae could be reared successfully until Day 14 by giving rotifers alone as food. The density of the rotifer, however, should be between 50-200 organisms/cc or more.

Table 1
Hormones used to induce spawning in wild adult milkfish

Hormones Used	Total Dose/Fish	Remarks	Reference
HCG (Ayerst)	10,000 IU	Fish did not spawn	Anon., 1974
SG-G100	30-60 mg	Hydrated eggs released but unfertilized	Vanstone et al., 1976
SG-G100	50 mg	Eggs hydrated and fish partially ovulated	Nash & Kuo, 1976
ADSP+HCG (Ayerst)	150-240 mg ADSP+ 8,000-16,000 IU HCG	Hydrated eggs were stripped & fertilized	Vanstone et al., 1977
ADSP	150-720 mg	Ovarian eggs undergoing hydration, all experimental fish died	Juario et al., 1978
ADSP+HCG (Ayerst)	84-360 mg ADSP+ 7,000-17,000 IU HCG	Two fish died with eggs undergoing hydration; two fish ovulated, eggs were stripped & fertilized	Juario et al., 1978
CPH+HCG (Ayerst)	12.5-50 mg CPH+ 1,250-20,000 IU HCG	Most of the injected fish died but ovarian eggs were undergoing hydration; 4 out of 27 had eggs w/c were almost completely hydrated	Kuo, 1978 (unpublished)

HCG - human chorionic gonadotropin
SG-G100 - partially purified salmon gonadotropic hormone
ADSP - acetone-dried pituitary gland of salmon
CPH - carp pituitary homogenate

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