

SOME ADVANCES ON TILAPIA CULTURE IN THE PHILIPPINES

Romeo D. Fortes
UP College of Fisheries
Leganes, Iloilo

SOME ADVANCES ON TILAPIA CULTURE IN THE PHILIPPINES

Romeo D. Fortes

Introduction

Since the publication of "Philippines Recommends for Tilapia 1976" by the Philippine Council for Agriculture and Resources Research (PCARR), more efforts have been directed towards developing new technologies for the culture of tilapia in both fresh and brackishwater systems. New culture systems were developed and new species were introduced. Tilapia aurea from Israel and the red or golden tilapia from Taiwan (claimed to be a mutant of T. nilotica) have been added to the list of available tilapia species in the country (the other species being T. mossambica, T. nilotica and T. zillii). No doubt, tilapia has risen into major importance as pond fish in the country, and even in the world. Attempts to evolve management procedures for its efficient culture, and re-examination of desirable species for culture, have been made.

Recent Advances

1. Brackishwater

Tilapia research at the U.P. Brackishwater Aquaculture Center in the last 4 years has been focused solely on Tilapia mossambica since many studies have yet to be done on this species, not only to develop means to increase its production but also to offer solutions to the problems it has caused in many fishponds. This is not to say, however, that work will not be done on other species in the country. BAC has started acclimating some 60 pieces of T. nilotica in its ponds in preparation for its 1979 research projects.

Work on T. mossambica at BAC is aimed at generating new technologies for its maximum utilization as a culture species.

Production of Fry and Fingerlings

The increasing demand for tilapia fry and fingerlings has opened up avenues for research on tilapia culture. Researchers at BAC developed outdoor hatcheries and techniques for the mass production of fry and fingerlings of T. mossambica. One such technique involves the use of small ponds provided with concrete trenches and collecting pits. Known number of female tilapia were held in these ponds, with the male introduced at the appropriate time and at the correct sex ratio, then allowed to spawn. After spawning, sexes are again separated. This method of separation of sexes before and after spawning increased the production of fry significantly even at higher salinities.

When tarpon was used as a biological control for tilapia reproduction in a milkfish-mixed sexes tilapia combination, an increase in total production was attained at 1:6:10 ratio (tarpon-milkfish-tilapia). Higher production was also obtained in a polyculture of milkfish and all-male tilapia at 1:2 stocking ratio.

Biological Control

The use of biological means as a management technique in controlling excessive reproduction of tilapia in ponds has been applied. Researchers at BAC developed a biological control method that proved effective in reducing to the minimum the number of unsatisfactory-size tilapia from ponds. Tenpounder and tarpon were found to be effective in thinning down undesirable-size fish when added at the proper time, size and ratio.

Supplemental Feeds

Several agricultural by-products were tested as feeds for tilapia. The response of tilapia, in terms of production, was highest where ipil-ipil leaves were fed. A mixture of distillery wastes and rice mill sweepings also showed encouraging results. A conversion factor of 2.5 to 2.6 was obtained. Tilapia was also found to use piggery wastes efficiently as feed.

2. Freshwater

Refinement of methods and techniques for the culture of tilapia in freshwater system has also been a continuing process. Work done at the Central Luzon State University Freshwater Aquaculture Center (FAC) at Muñoz, Nueva Ecija and in other government agencies have increased significantly. However, only a few of these can be presented because most of the data have not yet been made available.

Production of fry and fingerlings

Methods in producing fry and fingerlings described in the "Philippines Recommends for Tilapia 1976" and modifications of these techniques have made seed production progress a little bit. In the simple hatchery project of the Bureau of Fisheries and Aquatic Resources at Region VI, Molo, Iloilo City, for instance, the use of hapas supplemented by cages and a few concrete tanks plus a stable supply of water, allowed extension workers to produce several thousands of T. nilotica fry. From this project, at least 10,000 fingerlings were distributed to no less than 25 agencies and individuals in the province of Iloilo. With interest in tilapia obviously regained, refined hatchery techniques need to be generated.

Feeds for Tilapia

Practical rations for tilapia have been studied at the FAC. Of the various feedstuffs screened, ration containing rice bran and fish meal gave the best conversion efficiency. Ration containing copra meal, fish meal and mulberry leaf meal also gave acceptable weight increment for Tilapia nilotica. The same ingredients (rice bran and fish meal) at approximately 1:3.3 ratio was fed to Nile Tilapia stocked in cages at 250/M³ and a conversion factor of 2.02 was obtained with survival rates of from 98% to 100%. Such studies should be contained because of the need of the industry for such information. For example, fish cages in some lakes in Laguna have been reported to produce up to 15 tons of tilapia per cage (20x25x2.5 m) in 6 months, fed only with rice bran. Fish in cages require the necessary nutrients which rice bran cannot provide. Protein requirement for tilapia (T. mossambica) was reported to be within 29% to 38% crude protein. It is therefore necessary to develop feed for tilapia particularly those that are raised in cages. Furthermore, design and installation of cages need further investigation.

Pond Culture

Increasing pond production per unit area without necessarily increasing labor and material inputs, except stocking density of fish, has been attained in one study at the FAC. A significantly high net production of T. nilotica was achieved by raising the stocking density by 100% (10,000/ha to 20,000/ha).

References

Published Reports

- Cruz, E.M. and I.L. Laudencia, 1978. Screening of feedstuffs as ingredients in the rations of Nile tilapia. *Kalikasan: The Philippine Journal of Biology*, 7(2), pp. 159-164.
- Cruz, E.M. and I.L. Laudencia, 1978. Protein requirements of Tilapia mossambica fingerlings. *Kalikasan: The Philippine Journal of Biology*, 6(2). pp. 177-182.
- Guerrero, R.D. 1976. Culture of Tilapia nilotica at two densities with fertilization and supplemental feeding. *Fisheries Research Journal of the Philippines*, 1(1), pp. 39-43.
- Inland Fisheries Projects, 1976A. The culture of tilapia in brackish-water ponds using tenpounder to control reproduction. In: *Inland Fish. Proj. Tech. Rept. No. 9, First Half CY 1976*. NSDB Proj. No. 7103 Ag. UPCF, Diliman, Q.C. pp. 31-50.
- Inland Fisheries Project, 1976B. Culture of tilapia in brackishwater ponds using tarpon to control reproduction (I). In: *Inland Fish. Proj. Tech. Rept. No. 10, Second Half CY 1976*, NSDB Proj. No. 7103 Ag. UPCF, Diliman, Q.C. pp. 41-51.
- Tilapia Committee, 1976. *The Philippines Recommends for Tilapia, 1976*. Philippine Council for Agriculture and Resources Research, Los Baños, Laguna.

Unpublished Reports

- Aspray, R.T. Report of the on-going Tilapia nilotica propagation proj. BFAR VI, DFO, Molo, Iloilo City, Aug. 4, 1978.
- Camacho, A.S. and E.S. Tubongbanua. Use of agricultural by-products for fish production, Summary of Project Accomplishment, NSDB-UPS Project No. 7804 Ag. (1978).
- Camacho, A.S. and V.L. Corne. Studies on the relative response of Tilapia mossambica to some agricultural by-product as feeds (completed research project, Inland Fisheries Project, Brackish-water Aquaculture Center (1977)).

Dureza, L.A. and C.L. Gempis. Mass production of Tilapia mossambica fingerlings in Ponds (BAC Project No. 7801, Monthly Report June, 1978).

Dureza, L.A. and C.L. Gempis. Influence of selected factors on the number of Tilapia mossambica fry produced in nylon net enclosures in brackishwater ponds (NSDB-UPS Project 7807 Ag. Monthly Report, June, 1978).

Fortes, R.D. Evaluation of tenpounder and tarpon as biological controls for tilapia reproduction in brackishwater ponds (Doctoral Dissertation Draft, Auburn University).

Fortes, R.D. and T.U. Abalos. Culture of tilapia in brackishwater ponds using tarpon to control reproduction Trial II (Completed Research NSDB-UP Inland Fisheries Project, BAC).

Fortes, R.D. and V.L. Corne. Study on the mixed culture of milkfish and tilapia with tarpon as a biological control for tilapia reproduction (Completed Research, NSDB-UP Inland Fisheries Project, BAC).

Guerrero, R.D. Cage culture of Tilapia nilotica (A summary, College of Inland Fisheries, CLSU, N.E.).