

TILAPIA CONSIDERED AS A PREDATOR IN MILKFISH PONDS

IN KIRIBATI

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(1) Introduction

Tilapia was first brought into Kiribati from Fiji in the early 1960 by the Agricultural Division by which time the Fisheries is not yet started. The aim behind this is to provide cheap protein to the people of Kiribati whereby natural ponds are to be stocked with this fish and whenever you feel like eating or during rough weathers fish is always available. However it was found out later on that the fish is now becoming a predator in milfish ponds and some people don't like the taste.

(2) Breeding Habits

There are at least 20 species of fish belonging to the genus Tilapia but can be divided into three groups according to the manner in which they hatch their eggs:

- a. Substrat breeders: They build their nests on the bottom, lay their eggs in the nest and then guard them throughout the entire hatching period.
- b. Paternal mouth - breeders: Their reproduction is similar to the substrat breeders, but the males are the ones which collect the eggs immediately following spawning and hatches the eggs in their mouth.
- c. Maternal Mouth - breeders: Their reproduction is similar to the second type, but the female is the one which hatches the eggs in her mouth.

The additional group of Tilapia which has something in common with the above three groups is called Sarotherodon galileus which after fertilisation both male and female hatch them in their mouths.

Tilapia mossambica (Peters) is the species we are having in Kiribati which belongs to the third group. The manner in which they spawn is quite interesting to observe and also creates a problem. That is prior to spawning the males choose the spawning area and from the moment the site is located it begins to display aggressiveness and strong territorialism by attacks and chasing off of every fish which comes near the spawning site. In general, the area of possession is located at a depth of less than one meter and this is the reason why *Tilapia* nests are scattered on the margins of the ponds. The aggressiveness and control over territory of the male increase over time. Their colour changes from greyfish to black and the edge of the back fin becomes reddish. After finding a female which is ready to spawn, the male does not chase her away but tries to bring her to the spawning area by movements of his body and fins. At this time, the male begins to dig spawning nests. Near the time of spawning, both the male and female are active in building the nest. The building of the nest may continue from a few hours to a few days, depending upon the condition of both members of the couple.

During the period of courtship the genital papilla (opening where eggs or milt is released) of both male and female begin to swell. At a certain moment the female passes above the nest while her belly is pressing on the nest bottom and she emits a line of eggs. The male follows her movements and passes immediately after her above the eggs with his papilla also pressed on the nest bottom. He emits a cloud of sperm which can be seen clearly in clean water. Immediately afterwards the female returns and collects the eggs in her mouth, while at the same time collecting the sperm emitted by the male. The process repeats itself until the female has laid all her eggs and collected them in her mouth. The laying may continue for up to two hours if there is no interruption and the amount of egg laid depends on the size of the female. A female whose weight reaches 500 grams is capable of laying about 1500 eggs.

Immediately after the laying, the female leaves the nest with her mouth full of eggs and the male is then free to court another female in the same nest. From this moment onwards the female keeps the eggs in her mouth until they are hatched into fry, (young fish). Usually she keeps her young in her mouth until the time that they are capable of looking for their own food when the yolk sac is absorbed, (parental-care). Whenever the female mother smells danger after releasing them to the water environment she can immediately suck them back into her mouth. During this period the female does not eat anything which can last for more than a week.

(3) Disadvantages of Tilapia and Methods of Eradicating

Since Tilapia is capable of looking after her young and can breed frequently even at a small size (9cm and 20g weight), it can quickly establish itself in the pond and its large population consisting of various sizes can easily exploit all the food resources available in the pond. The obvious disadvantage is that its population can not be controlled for culturing purposes, and can become a predator to other species.

Trials have been done in some countries for eradicating predator fish in ponds. Derris powder (rotenone content usually 5%) is a common fish poison widely used. A dosage of 1ppm (same as 1.4 lbs of the powder per acre - foot of water) is enough to kill fish. The powder can be applied in powder, paste or in emulsifiable form. Derris does not readily penetrate the depth of 20 - 25 feet therefore an inverted funnel or a centrifugal pump can be used. For 50 - 60 ft or more, satisfactory results are obtained when burlap bags of rotenone paste are weighed and towed. Fish usually died few minutes or several hours after the derris application depending upon the dosage, due to the suffocation caused when the capillaries in the gills shrink to a diameter which does not permit the passage of oxygen-bearing red blood cells i.e. circulation in the region of gills is cut off which is the main supply of oxygenated blood. Fresh poison fish can be eaten by man and animal without any effect. No harm has been reported when treated water is drunk by man.

(4) Advantages of Tilapia

In many countries like Indonesia, Israel, South Africa, India, Philippines tilapia is cultured in ponds for food fish. Tilapia can attain a good growth only when mono-sex culture is used whereby only males are cultured. This can be achieved when fry of tilapia are fed with methyltestosterone (male hormone) and 98% of fry become all males and a weight of 50 grams after 90 days is reached.

Since tilapia is not accepted as food fish in Kiribati, it can be utilised for other purposes like:

- 1) fish meal to be mixed with copra cake for feeding fish.
- 2) sun-dried, grinded and used as chicken feed.
- 3) raw or sun-dried, grinded and used as pig feed.
- 4) to be used as pond fertilizer, or mixed with soil for planting.

(5) What is now being done in Fisheries Division about Tilapia

Since the outbreak of tilapia in milkfish ponds is now a problem faced by Kiribati, ways and methods of eradicating is now being conducted at the Temaikau fish farm to determine the effectiveness of derris powder (rotenone content 7.5%) suitable for our environment. The most simple method we practice is by building nursery ponds (which is very easy to control from tilapia) and allow the milkfish fry to grow for at least 4 weeks after which time we release them into big rearing ponds. Tilapia would not be bothered to eat milkfish with a total length of 50 cm. The other method we use is by continuously netting our ponds with a small mesh seine net and use the tilapia as a mixture for feed to milkfish. We have found tilapia to be having a good oily taste when reared in brackish water ponds.

6) Conclusions

When considering tilapia eradication on the outer islands these must be considered.

- 1) the people should be willing to bury the dead fishes or burn to prevent bad health.

- 2) Cost of eradication (i.e. Approximately 5 kg is needed per hect price of dorris powder is \$2.50 per kilo).
- 3) Since most natural ponds are undrainable it is going to take few months before the effect of poison disappears by which time it is fit for stocking milkfish.
- 4) It is very difficult to eradicate all tilapia in Kiribati unless the existing ones in the lagoon can also be poisoned. But this is quite impossible. The population however can only be reduced.