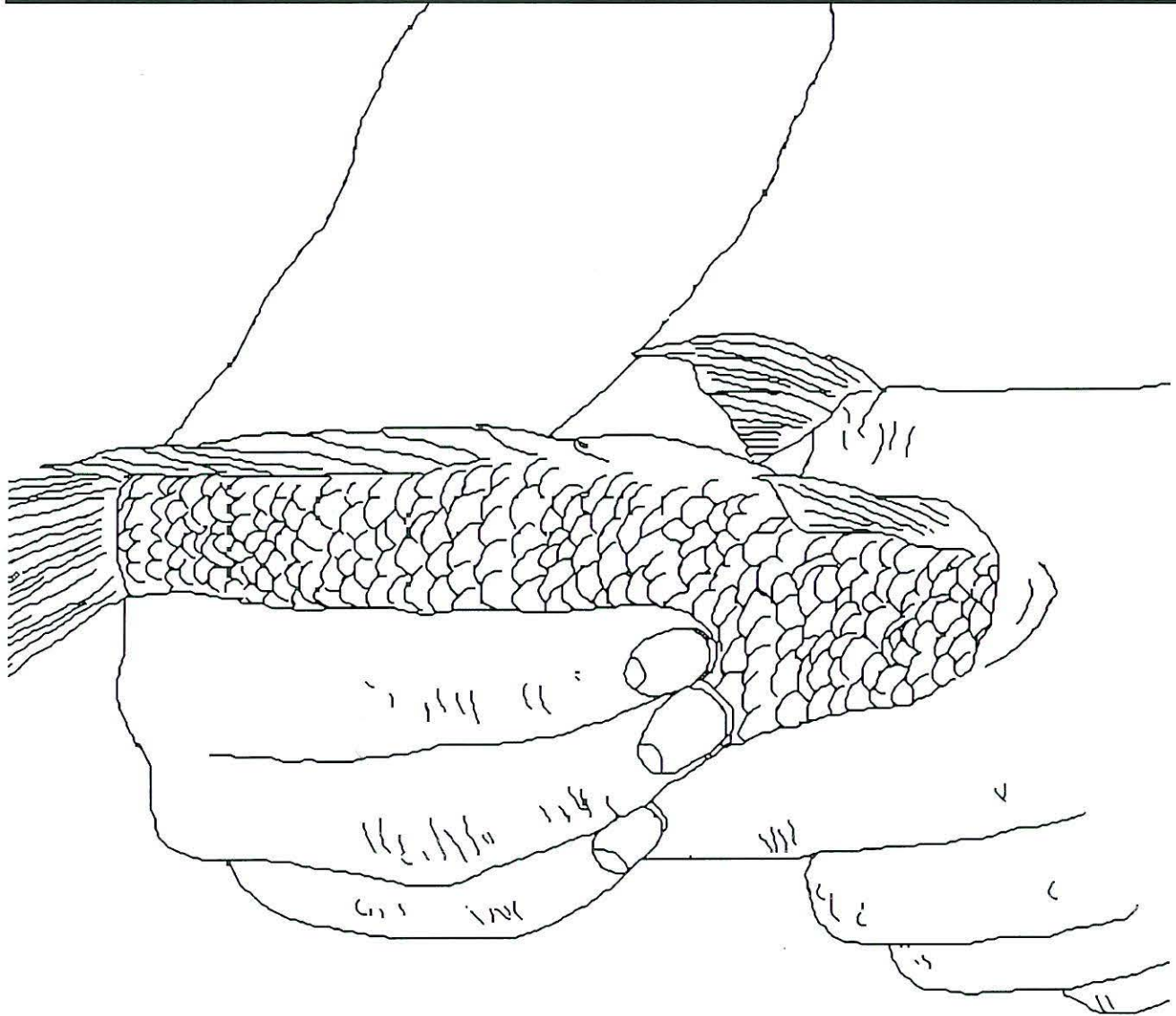

WATER HARVESTING AND AQUACULTURE
FOR RURAL DEVELOPMENT

CULTURE OF HAND-SELECTED
MALE TILAPIA



INTERNATIONAL CENTER FOR AQUACULTURE
AND AQUATIC ENVIRONMENTS

INTRODUCTION

A major problem of pond-cultured tilapia is excessive reproduction, and subsequent stunting of fish due to overcrowding. To combat this problem a pond may be stocked with all-male fish. This technique is called monosex culture and is used when large fish are required by the market. Males are preferred because they grow almost twice as fast as females. The result is more protein and profit for the farmer.

PROCEDURE FOR MANUAL SEPARATION OF SEXES

A farmer can readily distinguish male and female tilapia with practice. When tilapia reach about 10 cm in length (about 20 g) the sexes are distinguished by inspecting the genital papillae on the fish's underside (Figure 1).

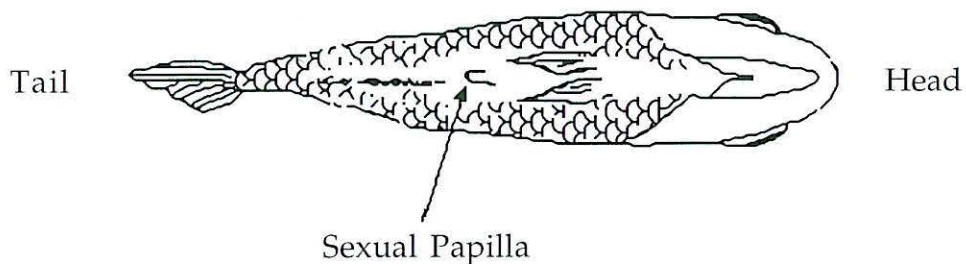


Figure 1: Ventral view of a tilapia.

Experienced workers can manually separate by sex about 2000 fish per day with an accuracy of 80 to 90%. Therefore, some reproduction will always occur. The method is tedious, stresses fish and is not 100% effective. However, production of manually sexed tilapia fingerlings for grow-out to market size can be accomplished by farmers with few financial resources and little fish culture experience. The procedure is illustrated in Figures 2 and 3.



Figure 2: A farmer examining and sorting tilapia by sex.

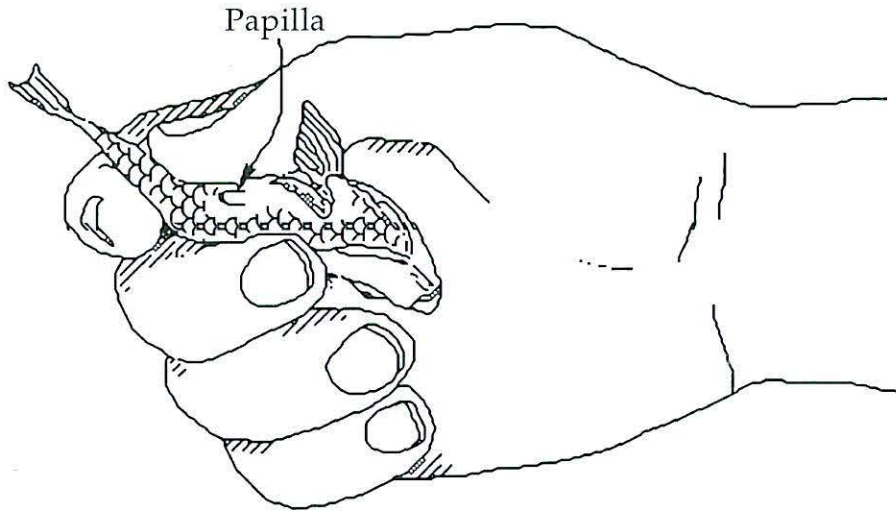


Figure 3: Small fish may be held in one hand and examined. Large fish, like that on the cover page, are held with two hands.

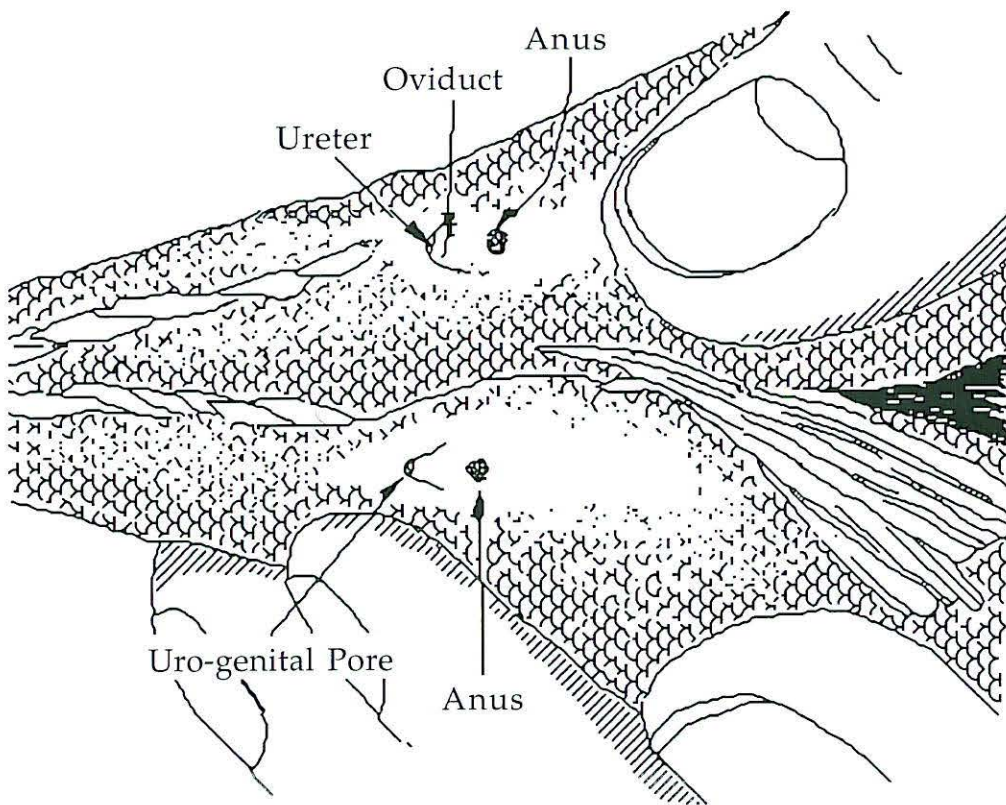


Figure 4: This close-up shows a female (top) and male (bottom) tilapia together. Note that the female has two openings in the papilla for passage of urine and eggs, while the male has only one opening for urine and sperm passage.

PROCEDURE FOR CULTURE OF MALE TILAPIA IN PONDS

1. Stock 1 to 3 g tilapia fingerlings in a prepared nursery pond at a density of 10 fish per square meter of pond surface area. See the manual "Production of 1-gram Mixed-Sex *Oreochromis niloticus* Fingerlings in Earthen Ponds" in this series for details on production of 1 to 3 g tilapia.
2. Culture the fingerlings for about 60 days with high rates of fertilization and/or supplemental feeding until they reach 20 to 40 g.
3. Slowly drain the nursery pond and partial harvest the tilapia fingerlings as the water level recedes. Separation of males and females can be made easier by applying dye (India ink, indigo, camwood, etc.) to the papilla with a soft brush or cotton swab to outline the male and female openings. Place males and females in separate containers. Do not stress the fish by overstocking the containers.
4. Manual sexing should be done early in the morning so fish will not be stressed by high water temperatures. A supply of freshwater to renew water in the holding containers will assist in keeping fish alive. Do not feed the fish 48 hours prior to sexing to reduce stress. Stop fertilizing the nursery pond one week prior to draining it.
5. Stock males in prepared grow-out ponds at densities of 1 to 2 fish per square meter. Culture these fish for 2 to 4 months using fertilizers and feeds. Fish whose sex can not be determined should not be stocked. Reproduction by females stocked inadvertently can be controlled by stocking a few carnivorous fish to eat the tilapia off-spring.
6. Females may be used as brood stock, eaten, sold, fed to livestock or preserved by drying, salting or smoking.
7. Since reproduction resulting from mis-sexed or wild fish commonly occurs in monosex tilapia grow-out ponds, predators can be used to control reproduction when the grow-out

cycle is greater than 4 months and the desired size of market fish is larger than 200 g. See the manual "Introduction to Polyculture of Fish" in this series for further details on the number and kinds of predators to stock.

NOTE: Male tilapia can also be stocked into cages and rice paddies.

GLOSSARY OF TERMS

monosex culture - culture of all-male fish for market.

oviduct - a tube serving as the passage for eggs from the ovary.

papilla - a small fleshy appendage which projects from the underside of a fish and through which a female passes eggs and urine and a male passes sperm and urine.

uro-genital pore - an opening for passage of urine and sperm outside the body.

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