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1993

# Classification of tilapias in aquaculture

Aquaculture Department, Southeast Asian Fisheries Development Center

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Southeast Asian Fisheries Development Center, Aquaculture Department (1993). Classification of tilapias in aquaculture. Aqua Farm News, 11(3), 3.

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# Classification of tilapias in aquaculture

The tilapias (Family Cichlidae) used in aquaculture belong to three genera: *Tilapia*, *Sarotherodon*, and *Oreochromis*. The genera are distinguished by their reproductive behavior.

## Reproductive behavior of tilapias

<b>Substrate spawners</b>	<b>Paternal/biparental mouth brooder</b>	<b>Maternal mouth brooder</b>
<i>Tilapia</i> : <i>T. zillii</i> , <i>T. rendalli</i> <i>T. sparmanii</i>	<i>Sarotherodon</i> : <i>S. galilaeus</i> <i>S. melanotheron</i>	<i>Oreochromis</i> : <i>O. niloticus</i> , <i>O. aureus</i> <i>O. hornorum</i> , <i>O. mossambicus</i> <i>O. spilurus</i> , <i>O. macrochir</i>
<b>Broodfish morphology</b>	Little dimorphism and color differences between sexes.	Dimorphism between sexes. Males generally larger, with conspicuous breeding colors, enlarged jaws, and modified papillae.
Little or no dimorphism between sexes; both sexes exhibit breeding colors. Long period of pair-bonding; species monogamous at least for one brood.	Monogamy at least for one brood.	
<b>Spawning site</b>	Shallow water. Substrate variable, muddy sand and pebbles. Nests in common spawning grounds.	Shallow water, depth variable 0.15-8 m. Substrate variable, mud, sand and pebbles. Nests in common spawning sites.
Shallow water about 50 cm deep. Substrate variable, pebbles and sand preferred. Nests solitary.		
<b>Territorial behavior and nest building</b>	Territory established by both sexes of courting pair.	Male solely sets up and defends territory, and is visited by ripe females.
Territory set up by both sexes and defended by both after pair bonding.		
<b>Spawning</b>	Courtship lasting several hours to few days precedes spawning. Up to 1500 greenish-brown 1.5-2.0 x 2.0-3.5 mm non-adhesive eggs shed in batches in a shallow nest. Eggs show vestigial adhesive layer. After all eggs are laid and fertilized, both parents or the males only pick up eggs for mouth brooding.	Courtship lasts several hours. Up to 2000 non-adhesive 1-2 mm x 1.5-3 mm eggs shed in batches in shallow nest. After fertilization, each batch is picked up into the mouth by the female. Females may also snap up semen directly from genital papillae. This behavior prominent in species that have genital papillae modified into tassels to attract females.
Long courtship lasting several days may precede spawning. Up to 7000-8000 yolky, olive green, 1-1.5 x 1-2 mm adhesive eggs laid on pre-cleaned substrate. Male passes over eggs to fertilize them.		
<b>Brood care</b>	Parents stay close to each other. Eggs and fry brooded in mouth until ready for release. Brood may not be collected once released. Fry are 7-9 mm at first feeding, and have well-developed fins. Fry survival high.	Female solely involved in brood care. After spawning, female leaves nest to rear her clutch in safety. Extended period of care during which fry seek shelter in mother's mouth. Fry brooded until free-swimming. First feeders are already good swimmers. Fry survival high.
Both parents guard, protect, aerate the brood, and help move clutch to different nest sites. Fry at first feeding are 4-6 mm and show feeble swimming ability. Fry survival relatively low.		

Source: K Rana. 1988 *Reproductive biology and hatchery rearing of tilapia eggs and fry*, p. 397-406. In: JF Muir and RJ Roberts (eds.). **Recent Advances in Aquaculture**, Vol. 3.