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**Aquaculture Department**

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1992

# Ornamental fish breeding

Aquaculture Department, Southeast Asian Fisheries Development Center

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Southeast Asian Fisheries Development Center, Aquaculture Department (1992). Ornamental fish breeding. Aqua Farm News, 10(1), 11-13.

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<http://hdl.handle.net/10862/2585>

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and keeps the water clean. Most filters are connected to an electrically operated air pump which produces a stream of air that pushes water through the filter. Trap-type filters pass the water through a sponge material which removes particles and some impurities. On the other hand, the undergravel filter sucks wastes into the gravel at the bottom of the tank. Filters also provide water circulation that helps disperse harmful gases.

Before setting up the aquarium, the tank should be washed inside and out with luke-warm salty water and then rinsed thoroughly. The tank should be placed in its permanent location on a level, strong surface near an electrical outlet and located away from direct sunlight to prevent the formation of algae.

The gravel or sand should be rinsed thoroughly then boiled to kill the bacteria. Cool the gravel or white sand before putting into the tank in a layer 5 cm in front and 10 cm at the back to support the filter, and other decorations like rocks and plants. Undergravel filters should be placed in the tank before the gravel is added.

Water used for the tank should be "aged" for at least 12 h.

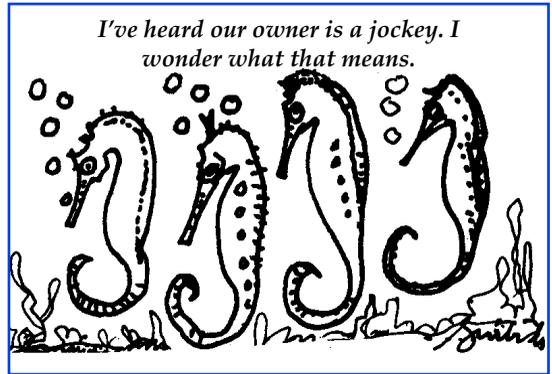
It is best to fill the tank with water a little at a time and to watch for leaks that might show up. Plants that root in the gravel, rock, driftwood, or aquarium decorations should be placed in the tank when it is about two-thirds full. These makes the aquarium more attractive but uncrowded with plants and decorations. Remember, the fishes should have enough room to swim around.

Just before the tank is completely filled, install the filter or aerator. Lastly, dissolve a capsule of antibiotic in the aquarium (250 mg for 80 l) to disinfect the water. The antibiotic should be placed everytime water is changed and new fish is added.

The water will be cloudy at first due to unsettled particles of dirt but this will clear up within 12 h.



Source: *Starting a home aquarium*, Malaya, 1 November 1988.



## Ornamental Fish Breeding

There are probably several thousand species of fish suitable for the tropical aquarium. About 600 are known to aquarists. There is a great variety of fishes; some are rare and expensive, while others are too large to rear in an aquarium. It is advisable to start with the common, attractive, easily bred, and less expensive species, before attempting the more challenging ones.

### Goldfish

"Lionhead oranda" goldfish are the most popular variety of goldfish (*Carassius auratus*). They have short, round bodies, double tail and anal fins, and a broad head covered with a bumpy, fleshy hood.

Goldfish mature at the age of about one year. Size is usually not a good measure of sexual maturity. A male that is ready to spawn usually has tubercles or "pearl organs." The tubercles commonly appear on the operculum and first ray of the pectoral fin and feel rough to the touch. The female's body becomes rounded with a firm belly. Live food, such as *Tubifex* worms and blood worms, is excellent for conditioning goldfish for breeding.

Goldfish spawn easily and the fry are among the most hardy and easy to raise. A

ratio of two male fish to one female is used. Aquatic plants such as water hyacinth with long dense roots can be used as spawning substrate. Spawning takes place with a sudden change in temperature. Goldfish normally spawn shortly after dawn.

Spawning is usually accompanied by much splashing with several eager males pursuing a ripe female. The males fertilize the eggs immediately by spraying milt over them. A good sized female will lay 5000-6000 eggs per spawn. The eggs are adhesive, about 1 - mm dia. They will hatch in about 24 h. Due to the strong egg-eating tendencies of the adults, these should be removed.

The water containing the fertilized eggs should then be treated lightly with methylene blue (one drop of 1% methylene blue per liter of water) and relatively strong aeration introduced. The aeration will not only ensure a plentiful supply of oxygen in the water, but will also tend to keep small particles of food moving, thus encouraging the fry to eat. The live food given is *Moina*.

## Dwarf gourami

The dwarf gourami, *Colisa lalia*, is hardy, adaptable, peaceful, easy to breed, and an ideal fish for beginners. Dwarf gourami males in breeding condition rival the most colorful of reef fishes. They are banded in red and blue-green of the most intense iridescence imaginable. The throat and belly are also bright blue-green. A number of new color variations of this fish have recently appeared in the market.

To condition gourami for breeding, the sexes are kept separate for 3-4 wk and fed live food. When ripe, females will have extremely bulging abdomens and the colors of the males will be more intense. Each pair is placed in a 12-l tank with floating plants. After a period of acclimation, the male begins his courtship, with outspread fins and intensified coloration. Soon afterwards, he begins to build the bubble nest. While he is building the nest, the male drives the female away every time she approaches. Eventually, the nest may reach 6-8 cm dia. and 1-2 cm thick.

Once the nest is completed, the male will entice the female beneath it by extending

his fins and displaying his colors. When the female approaches, the spawning embrace begins. The male nudges the female gently into position, wrapping his body tightly around her. There may be a few "false starts" before the pair attains the correct position. A few dozen eggs are expelled beneath the nest and fertilized by the male. The mate picks them up and places them in the foamy nest of bubbles at the surface.

The pair will then sink to the bottom and separate. Soon, they are beneath the nest again, and the embrace is repeated. This cycle will continue until the female's supply of eggs is exhausted. About 1000-2000 eggs will be produced. When spawning is completed, the female should be removed, as the male may begin to attack her as he defends the nest.

The eggs hatch in about a day. After 3 days, the fry are free-swimming. The male is removed as he may eat the fry.

The first food for the fry should be live *Brachionus* sp. After 2 wk, the fry will be large enough to take sifted *Moina*. Growth is typically slow, but most fry will reach 1-cm length in a month if given sufficient food. Frequent partial water changes (about 25%) and a bigger tank are also needed.



## Angelfish

The angelfish, *Pterophyllum scalare*, originated in the Amazon basin in South America. It is relatively easy to breed and produces a substantial number of eggs and fry. It tolerates a comparatively wide range of water quality conditions and displays pronounced parental care.

It is best to keep the breeding pair in a tank 60-cm long, 30-cm wide, and 30-cm deep. Readiness for spawning is indicated by vigorous cleaning of the aquarium glass. When the fish is ready for spawning, the female's breeding tube descends from the urogenital pore. The male's breeding tube descends on the actual day the spawning will take place.

The female then passes over the cleaned portion of the glass a few times with her genital papilla almost touching it. The eggs are deposited in this manner in a dozen or so strings, with the male following behind fertilizing them. After each string of eggs is laid, the female will circle around and get into position for placing the next string, usually in close proximity to the last. Again, the male fertilizes them. Spawning lasts 2-3 h.

The number of eggs deposited varies according to the size of the female parent and her age. Usually, between 300-1200 eggs are laid per spawning. After spawning, the parents will "fan" the eggs with their fins, creating currents of water that flow over them, carrying off the carbon dioxide that is released in respiration and providing an abundant supply of oxygen. The parents will defend the eggs from intruders and will remove any eggs attacked by fungus. The eggs will hatch 2 days later. Within this time, one or both of the parents may select another spot to clean and, soon after hatching, move the fry to this clean, new spot.

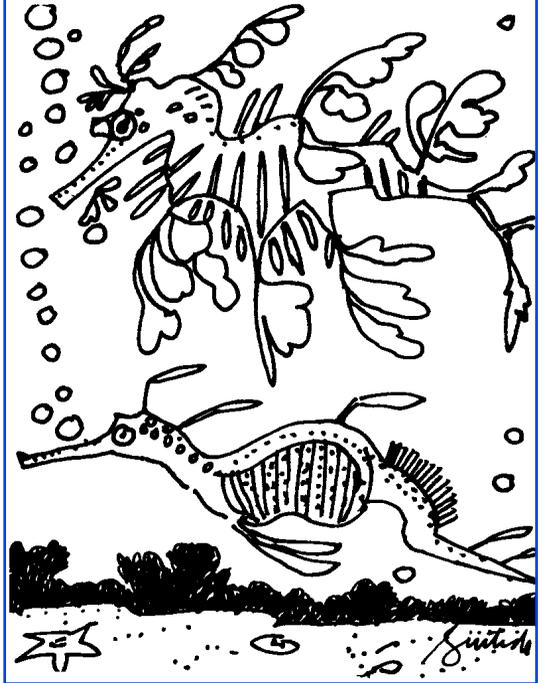
After 7-9 days, the fry become free-swimming and start to look for food. They can be fed with the live cladoceran, *Moina micrura*. Once the young are about one month old, they should be transferred to a large aquarium as additional space would ensure normal, steady growth. The fry are then fed floating pelleted feed.

## Rearing the fry

There are three basic important requirements for successful rearing of the fry, namely:

**Sufficient space.** A 1 m<sup>3</sup> tank can hold about 1000 newly hatched fry. However, once the fry are about 1-cm long, they should have more space to grow and half the number must be transferred to another tank.

*I wonder whether we're included in the list of exotic tropical fishes ... We can provide enough foliage in an aquarium, you know ...*



**Clean, fresh water.** For the first few weeks, just siphon off the dirt twice weekly; then top up with the same amount of water. When the fry are about a month old, the tank needs to be siphoned every alternate day.

**Suitable and sufficient food.** The amount and type of food to be given depends on the size of the fry. During the first two weeks, the fry can be fed with *Brachionus* sp. A half teaspoonful of drained *Brachionus* per day will be enough. At about 2 wk, the fry can start to take sifted *Moina* given twice a day.

With proper selection and conditioning of broodstock and provision of suitable spawning substrates, there is no reason why these popular aquarium fish cannot be bred successfully. By observing the three basic principles of providing suitable and sufficient food, ample space and good, clean water, the average hobbyist should soon have many beautiful fish to enjoy and share with friends.

Source: *Ornamental fish breeding* by Wong Chee Chye, *Infofish International* 5/91.