

Breeding of Egg Layers

By

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CUTM

GOLDFISH

SCIENTIFIC CLASSIFICATION

Order: Cypriniformes

Family: Cyprinidae

Genus: *Carassius*

Species: *Carassius auratus*

Common name: Gold Fish

VARIANTS

- Selective breeding over centuries has produced several color variations, some of them far removed from the “golden” color of the originally domesticated fish

❖ **The main varieties are**

- Calico Veli tail, Comet, Black Moor, Bubble eye, Lionhead, Ranchu, Oranda, Pearl Scale, Ryukin, Panda, fantail, Shubukin (calico), Tosakin, Orange Fantail, Black Fantail, Pompon, Celestial, Telescope, etc

HABITAT

- ❖ Goldfish natively live in ponds, and other slow or still moving bodies of water in depth up to 20 m (65ft). Their native climate is subtropical. And they live in freshwater with
 - ✓ pH: 6.0 - 8.0
 - ✓ Water hardness of 5.0 – 19.0 dGH, and
 - ✓ Temperature: 40 to 106°F (4 to 41°C)
- ❖ Although they will not survive long at the higher temperatures. While it is true that goldfish can survive in a fairly wide temperature range, the optimal range for indoor fish is 68 to 75°F (20 to 23°C)

FEEDING HABIT

- They are omnivorous and feed on plants, small animals in the natural environment
- In captive it feed on variety of feeds such as flakes, pellets and live feeds including daphnia, artemia, tubifex and blood worms

BREEDING

Selection of male and female

- They are capable of breeding when they are a year old, but they are in their prime during their third year
- Under normal circumstances, it is impossible to tell their sex until they have grown to 8cm
- Before start to breed them it is first necessary to ascertain their gender. However this can only be done accurately when they are in a spawning condition
- Males will get “nuptial tubercles” on their head, body, and fins when in breeding condition. These tubercles appear as hard white pimples, about the size of a pinhead. A fish bearing these bearing these tubercles is always a male
- In the case of females, their abdomens swollen with mature eggs

Conditioning of brooders

- ✓ For best results keep males and females separated before breeding and feed them well with tubifex worms
- ✓ When the breeders are well conditioned and ready for breeding prepare an aquarium with good quality water

Setting up the breeding tank

- ✓ Since goldfish scatter sticky eggs haphazardly over the aquarium, it should be well stocked with aquarium plants or spawning mops
- ✓ Good aeration is also required in the tank. Goldfish will breed at any temperature between 10-26°C, although about 20°C is the optimum
- ✓ It is important to remember that it is the change in temperature not the actual temperature, which triggers spawning activity

Spawning

- The ratio recommended is 1:1 and a slightly higher ratio of males to females also increases chances of breeding; mostly three males to two females
- The fish will start to spawn early in the morning, and will generally carry on until midday
- The colour of the fish looks brighter than before and the male will start to chase the female at random
- The chase will intensify with the male getting aggressive and pushing against the female goldfish till she ejects her eggs
- As eggs were out the male, they will fertilize them by depositing milt over the eggs. The eggs adhere to the first thing they touch as they settle
- Infertile eggs are sticky too, but they turn white in a few hours and begin to decay
- The fertilized eggs are about 1.5 mm in diameter and are amber – coloured when first laid
- Spawning is usually large, from about 500 to 2000 eggs, depending upon the size and condition of the female
- The parents should be removed immediately after spawning, which usually lasts about 3 hours
- Ten drops of 1% Methylene Blue should be added to each 10 litres of well-aerated aquarium water to prevent fungal infection

Hatching of eggs

- Eggs will generally hatch in from 4-7 days, depending on the water temperature (warmer temperature shorter incubation period)
- When the fry first emerge, it will have a full yolk sac, and they are translucent
- They will feed for 3-4 days on the attached yolk sac. It is important not to feed the fry until they have consumed the yolk
- During this time it is normal that they will sink to the bottom of the tank, and they should be left undisturbed. During this period they are absorbing the yolk sac and developing an air bladder
- Once the air bladder has developed, they will begin swimming at various levels of the aquarium and are ready for food
- The spawning mops can be removed by turning them slowly upside down and gently shaking to make sure that no fry are still attached
- The best diet at this stage is infusoria (2 times a day). Then later feed them with newly hatched artemia nauplii, daphnia and care must be taken not to overfeed them

Angel fish

SCIENTIFIC CLASSIFICATION

Order: Perciformes

Family: Cichlidae

Genus: *Pterophyllum*

Species: *Pterophyllum scalare*

- ❖ Common name: Angel fish
- ❖ Origin: South America
- ❖ Adult Size: 14cm
- ❖ Lifespan: 8-10 years
- ❖ Tank Level: middle
- ❖ Breeding: Egg layer

Acceptable water conditions

- ✓ pH : 6.0 – 8.0
- ✓ Hardness : 5-13dGH
- ✓ Temperature : 24-30°C
- ✓ Fecundity : 100-1000 eggs

❑ Varieties

Golden, Silver, Koi, Smoky, Pearly Gold, Black Lace, Zebra, Marble, Blushing, Blue Blushing, Veil tail

- ❖ Angelfish are laterally compressed or look like a disc on edge with long fins coming out of the top and bottom and have 2 ‘feelers’ in front of the anal or bottom fin. The tail is vertically oriented and may be from scoop shovel shape to long and relatively narrow depending on the variety

❑ Sexual dimorphism

- When spawning is about to occur genital papillae will appear in pairs
- These look like little nipple-like projections and are called ovipositors means “egg-placer(s)”
- The female’s ovipositor is larger and more blunt than the male’s which is slender and more pointed
- These protuberances which appear at the vent are used respectively for depositing eggs and fertilizing them

❑ Feeding

- Angelfish can survive on flake food alone, but they Live foods such as Adult Brine Shrimp, Black Worms, Mosquito larvae, finely chopped earthworms and Guppy fry are accepted with enthusiasm and should be include regularly
- Frozen and dried foods are also acceptable

□ Breeding

Selection of breeding pairs

- The best way of selecting the breeding pairs was look for angels that were paring from a thankful of young angels
- Selected only those with straight top and bottom fins and perfect ‘feelers’ without any bowing or bends in them
- They should be strong, robust and active. Angelfish that are active feeders will grow quickly, and have a high rate of egg production in the females
- Angelfish pairs form long-term relationships where each individual will protect the other from threats and potential suitors
- Upon the death or removal of one of the mated pair, a total refusal of the other mate to pair up with any other angelfish was reported

Conditioning

- ❖ Once the potential breeders are selected condition them by feeding well with good selection of live foods, they will grow and get ready quickly, it reaches sexual maturity at the age of six to twelve months or more

Tank set up

- The glass tanks were thoroughly cleaned with fresh water and then with fresh water and then with potassium permanganate solution
- When the pair is ready to spawn, they need an appropriate medium upon which to lay the eggs, for this a piece of slate leaned up against and it is also easy to remove the entire spawn
- This medium can be a broad-leaf plant in the aquarium or a length of pipe, or even the glass sides of the aquarium also
- The female will deposit a line of eggs on the spawning substrate

Spawning

- Once the tank is ready introduce the male and female Spawners. The pair will selected a spawning site and thoroughly clean it about two or three days before actual spawning takes place
- When the cleanliness of the spawning site finally meets the approval of the parent fish, the female will make a few test runs
- She will pull her ventral fins or feelers close to the lower sides of her abdomen and her anal fin will be situated so that her entire lower line is relatively straight
- Her ovipositor will then be able to make full contact with the slate. The male will then make a few practice runs too before the actual spawning takes place
- When spawning actually takes place, the female will pass over the site and eggs are deposited which adhere to the surface
- The male then moves in and scoots along over the string of eggs just laid and fertilizes them, his fins taking the same position as the females so he can press closely to insure a higher fertilization rate

- The male and female Angelfish will take turns making passes over the spawning site until several hundred or more eggs have been laid, depending on the size and condition of the female prior to spawning
- The parent will hover closely over the spawn and fan continuously with their pectoral fins to create a circulation of water over and around the eggs
- Some unfertilized eggs will turn white in a matter of hours and will be removed by the parents
- Remove the eggs after spawning, by transferring the slate with the spawn to another clean tank with fresh water
- Put 3 drops of 10% Methylene Blue to prevent the eggs being attacked by fungus

Hatching and rearing

- Hatching occurs in about 36 to 48 hours depending on the temperature
- There is a period after hatching and before free swimming when the fry will stick together
- At this time increase the aeration so that all the fry will have access to sufficient oxygen
- After about 3-5 days when they are free swimming, introduce infusoria or rotifer for the first 2 days and after that provide with newly hatched brine shrimp for the fry to eat

Zebra fish

SYSTEMATIC CLASSIFICATION

Order: Cypriniformes

Family: Cyprinidae

Genus: *Danio*

Species: *Danio rerio*

- **Other Names:** Zebra danio
- **Origin:** Eastern India
- **Adult Size:** 6.4cm
- **Lifespan:** 5years
- **Tank Level:** all levels
- **Breeding:** Egg layer
- **Fecundity:** 300:500 eggs
- **pH :** 6.2-7.5
- **Hardness:** 5-12 dGH
- **Temperature:** 22-27 °C

❑ Varieties

- ❖ Golden, Sandy, Longfin, Leopard and transgenio Zebrafish under trade name Glofish
- ❖ Zebra fishes are long and slender has the classic fish shape Five uniformly, pigmented, horizontal stripes on the side of the body, all extending onto the end of caudal fin rays. Anal fin distinctively striped. Lateral line absent

❑ Sexual dimorphism

- ❖ Males are very slim and the females when ready to breed are very heavy

➤ Feeding

- Feed on worms and small crustaceans, also on insect larvae. Live foods preferable, will eat flakes and frozen foods

□ Breeding

Conditioning the brooders

- Separate the male and female for several days and condition them by providing live food like tubifex worms 3 or 4 times a day before putting in for breeding.

Tank set up

- The glass tanks were thoroughly cleaned with fresh water and allow the tank to dry up so that all microbes can be killed then again wash with potassium permanganate solution @ 1ppm
- Fill tank with filtered water. Spawning mops, which are nylon wires and stone were also cleaned and disinfected with KMnO_4
- After that spawning mops were spread to the bottom of the tank weighted with stone to prevent the spawners from eating the eggs after releasing to compensate for the energy lose during spawning
- Zebra fish were egg layer scattered fish so eggs will scatter to the nylon wire

Spawning

- Once in the breeding tank is properly conditioned, introduce the fishes
- Two males and one female works best, if the fish is put in the spawning tank in the evening it would spawn the next morning
- During the mating process the male chases the female for a while and in that process the eggs are dropped by the female and the males fertilize them as they drop
- The dropped eggs will fall in between the spawning mop and there by it prevents the eggs from breeders
- The spawning will be completed in an hour or so and the females will noticeably look thin and streamlined due to dropping their eggs
- Now remove the breeders out of the tank and place them back into the conditioning tank
- Put 5ml per gallon of methylene blue to prevent the eggs being attacked by fungus

Hatching and rearing

- It will take about 2-3 days of the fry to hatch out and another 2-3 days for the fry to become free swimming after yolk sac absorption
- When they start free swimming they will find there way through the spawning mop and provide them with microscopic live organisms or Infusoria
- When they started free spawning mops were remove to prevent from any obstruction in swimming
- In about 10 days old times they will be ready to eat live or frozen baby brine shrimp and fine flake food