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CARE OF GOLDFISH

HISTORY-

Though now found in almost every country in the world, in captivity and out, the goldfish, Carassius auratus, originated in eastern China as a red mutation of a normally greenish-silvery fish closely related to and generally resembling the carp. With the carp and many other smaller freshwater fishes including the "barbs" so well-known to tropical fish hobbyists, the goldfish belongs to the great family Cyprinidae which, oddly enough, is found much more abundantly in the Northern Hemisphere than in the Southern.

Xanthic, or orange, color mutations occasionally occur among a variety of wild fishes including the carp itself, but as in the case of albinos, or pure white fishes, these do not often live to reproduce their kind under natural conditions, since their conspicuous appearance makes them easy targets for predators. In captivity, on the other hand, goldfishes have been bred for many centuries and, by taking advantage of certain additional mutations of a hereditary character, the breeders have produced a number of odd and colorful varieties, including some with odd scales, double tails and fins, no scales at all, or with certain fins missing altogether, shortened backbones, and enlarged eyes.

Though known in the Orient for centuries, the goldfish is a comparatively recent arrival to the western world. In the sixteenth century this fish reached Japan from China, and it has been the Japanese who were mainly responsible for producing the various exotic varieties of Carassius auratus that we find today. Two hundred years later, in the middle of the seventeenth century, the first goldfishes were brought to England, where they were an immediate sensation, not only because of their bright color, but also because of their extreme hardiness, being able to live in very small containers of water without discomfort. The goldfish did not reach America until the latter half of the nineteenth century, but once established, this fish attained a popularity unequaled in the pet world, both in the home or as an ornamental inhabitant of outdoor fish ponds. Some of the better-known of the many existing varieties of the goldfish are briefly described below:

FANTAIL.

This fish has an elongated flowing tail fin and usually a long dorsal, or back, fin as well. This character frequently exists along with other modifications of body or fin structure and color.

SHUBUNKIN or CALICO.

This is a scaleless fish with a variegated skin color which gives it its name. Specimens with considerable blue included among the colors are most sought after.

MOOR.

This name applies to any melanistic (all-black) goldfish.

PEARL SCALE.

The pearl scale is one of the most recent goldfish mutations. In the adult the scales are hard, convex, and thick, giving the fish a "pebbled" appearance. It is considered to be one of the most beautiful of all goldfish varieties.

LIONHEAD.

The young lionhead is much like an ordinary goldfish, except that it has a double tail and lacks the dorsal fin, but in the adult the head and face are covered with a lumpy, raspberry-like thickening of the skin, making this variety a most unfish-like fish.

ORANDA.

The oranda is similar to the lionhead, but has a dorsal fin and the tail is long and flowing. It is also more colorful and the lumpy overgrowth of the head skin is more confined to the top of the head.

TELESCOPE.

In this form the eyes are enlarged and bulge outward from the head. Telescope moors (black telescopes) are considered to be the finest variety of this fish.

CELESTIAL.

The celestial is a telescope goldfish with the eyes directed permanently upward. It receives its name from its permanently "stargazing" appearance.

CARE-

The Fish and Wildlife Service is concerned with the propagation of food and game fishes only. It does not rear or distribute any ornamental fishes. Magazines devoted to aquarium fishes and related subjects contain advertisements of dealers in goldfish, tropical fish, aquatic plants, and aquarium accessories. Most cities and many larger towns have pet shops or stores where goldfish and supplies may be purchased.

The Aquarium.--The typical fish bowl, because of its narrow neck and restricted water volume, is less preferable to a straight-sided aquarium for keeping goldfish in a healthy contented condition. The small surface area in such a container will sometimes not permit the absorption of sufficient oxygen for the well-being of the fish. A rectangular aquarium, with straight glass sides, is preferable from the viewer's standpoint as well.

A small aquarium cannot support many fish. The number of fish that can be kept in a healthy condition will depend on the volume of water in the aquarium and its shape, the water temperature, and the size of fish. It is usually recommended that one gallon of water be allowed for each inch of fish, the tail being omitted from the measurement. A 5-gallon tank is capable of maintaining two goldfish, each 2 inches long. An aquarium 24 inches long, 12 inches wide, and 15 inches high, with a capacity of 18 gallons will accommodate eight 2-inch fish. When larger aquaria are used, the number of fishes may be increased proportionately. If the fish are larger, their number should be correspondingly reduced. The maintenance of goldfish under conditions less favorable than these is usually possible only by making frequent water changes.

If the water becomes fouled from overcrowding or overfeeding (shown by milky water and the fish continually gulping at the surface for air), the fish should be removed, the aquarium thoroughly cleaned, and the water renewed. Chlorinated water supplied to most cities for household consumption should be avoided unless it is allowed to stand for at least 12 hours before being used. A water supply from wells which are not highly mineralized and suitable for domestic use is satisfactory for goldfish, as is water from most streams and ponds. The temperature of the water in an indoor aquarium may easily range from 50° to 80° F. in winter and from 65° to 90° in summer. When placing an aquarium in the home, a location should be selected where the water will not be subject to extreme changes of temperature; and for goldfish a temperature range from 55° to 70° F. is preferred. An aquarium which is placed in the sunlight will soon develop algae or green plant life. This can be avoided only by reducing the light reaching the tank.

The bottom of the aquarium should be covered with clean sand and gravel to a depth of about 1 inch. Washed sand and pebbles that are free from soil and humus are best. The bottom can be planted with aquatic plants, preferably along the back of the tank so as to permit free movement of the fish in front. Aquarium plants draw most of their nourishment from the water and require merely an anchorage in the aquarium.

Plants.--Among the more common plants for a home aquarium are Anacharis, Cabomba, Vallisneria, and Sagittaria. The first two plants are widely sold in pet shops and are usually placed loosely in the aquarium. The other plants with well-developed roots must be planted in the sand. Though plants are not essential to the health of the goldfish, they add much to the beauty and enjoyment of the aquarium.

Food.--Most aquarium fishes desire a variety of foods. Whatever foods are given, it should be borne in mind that a certain balance of vegetable, animal, and mineral foods seems necessary for the proper health and growth of the fish. Packaged dried foods can be obtained, and their use recommended to the amateur aquarist. Oatmeal, dog meal, and dried whole-wheat bread are often fed to goldfish in outdoor pools where clarity of the water is not required. Most baby-food cereals are excellent for goldfish. The fish may be fed sparingly every day in summer and every other day in winter. It is most important that the fish not be overfed but are given daily only what they can readily eat at the time of feeding. Excess food allowed to remain in the water will soon pollute it and lower the oxygen content, often killing the fish before help arrives. A pinch of food daily should be sufficient for two small goldfish.

Disease.--Illness of goldfish becomes apparent in many ways. Often the fins are bloodshot, and the dorsal or top fin droops. The affected fish is apt to rest listlessly on the bottom, and fungus (a white cottony growth) may appear on the body. Fish lice about the size of the head of a pin sometimes occur on the fins or body of the fish. Where only one fish is ill, the cause may be attributed to overfeeding or some individual weakness; but if a number are ill, it is an indication that something may be radically wrong, perhaps with the food or the water, oxygen supply, or temperature. When a fish shows signs of disease, it should be removed from the aquarium and placed in a separate tank.

For overfeeding and resultant constipation (indicated by listlessness and a swollen belly), dissolve one tablespoon of Epsom

salts in a gallon of water and allow the fish to remain in the solution for 1 to 2 hours. Then let the fish rest for a day in a weaker solution of Epsom salts with a little common salt added. Constipation may often be corrected by the use of fresh food such as chopped earthworms or raw liver.

Goldfish are subject to many ailments, only several of which are mentioned here. For fungus, a salt solution is often effective. The fish should be placed in a solution of table or rock salt (not iodized) in the proportion of 3 level teaspoons to 1 gallon of water. The fish should be allowed to remain in this salt bath for several days. A stronger treatment calls for $\frac{3}{4}$ pound of salt to 1 gallon of water for 30 minutes or until the fish show signs of distress.

For fish lice, $\frac{1}{2}$ grain of potassium permanganate (supplied by a druggist) to 1 gallon of water is effective. Treatment usually requires 15 to 20 minutes. Tanks and pools containing infected fish should be disinfected by applying $\frac{3}{4}$ grain of potassium permanganate to 1 gallon of water for 30 minutes. Plants can be cared for in this manner for 10 minutes, but both plants and pools must be thoroughly washed in clear water after chemical application. Small aquariums may be disinfected by using one teaspoon of alum to one quart of water.

New fishes should be isolated for a week before being placed in an aquarium or pool and, if they show signs of fungus or lice, should be given the appropriate treatment for several weeks in succession. This isolation period is especially important in order not to introduce disease or parasites into garden pools.

Rearing Young Goldfish.--(Pond or home aquarium) Goldfish usually begin breeding in their second year. The female deposits the spawn on the leaves and roots of aquatic plants. As the vegetation becomes covered, sprigs of it bearing the eggs should be removed and placed in a suitable receptacle, which may consist of enameled pans or tubs. The vessel containing the eggs should be kept in a well-lighted place where they will receive direct sunlight for a short time each day.

Attached to each little fish at birth is a yolk sac which provides it with nourishment for about 3 days. After the yolk sac is absorbed, the young fish subsist on the microscopic organisms found in the water. These infusoria are too small to be seen with the unaided eye. Preparations for the production of infusoria can be purchased from dealers in aquarium supplies. Powdered egg yolk well mixed with water is also a good substitute for natural foods for baby fish.

During the early stages of their existence, goldfish should be fed six to eight times a day, only a small quantity of food being given at each feeding. After the first month, the fish may be fed on boiled and strained oatmeal, and other fine cooked cereals. The number of feedings may be decreased gradually until one meal a day is being given at the end of 3 months. Adding green water from outdoor pools is recommended for indoor tanks.

Suggestions.--1. Don't overcrowd. In the aquarium allow a gallon of water for every inch of fish, not counting the tail. Use a rectangular aquarium rather than a glass bowl.

2. Don't change the water too often unless polluted; once every 3 months should be sufficient. Occasionally, dip out a gallon or so and replace with fresh water of the same temperature. Such water should be allowed to "age" in the room for 24 hours before being poured into the aquarium. Avoid chlorinated water.

3. Never shift fish to water that is warmer or colder than that in the aquarium. The best temperature for goldfish is between 55° and 70° F.

4. Don't overfeed. Never place more food in the aquarium than can be consumed by the fish in about 20 minutes. Feed only once daily or, better, three times a week.

5. When the fish suck in air at the surface, it is a sign that they require more oxygen. Electric-air pumps help restore oxygen to an overcrowded tank.

6. If you use city water, check up on the chemicals being put in it. Chlorine is deadly to goldfish. A fish injured by chlorine can never be restored to health.

7. At spawning time, remove all snails from the pool or aquarium. They eat the fish eggs, as do the parent fish. You may never have baby goldfish without water plants in the pool or aquarium.

8. The simplest remedy for a sick goldfish is a mild salt bath for several days together with fresh food such as chopped earthworms.

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