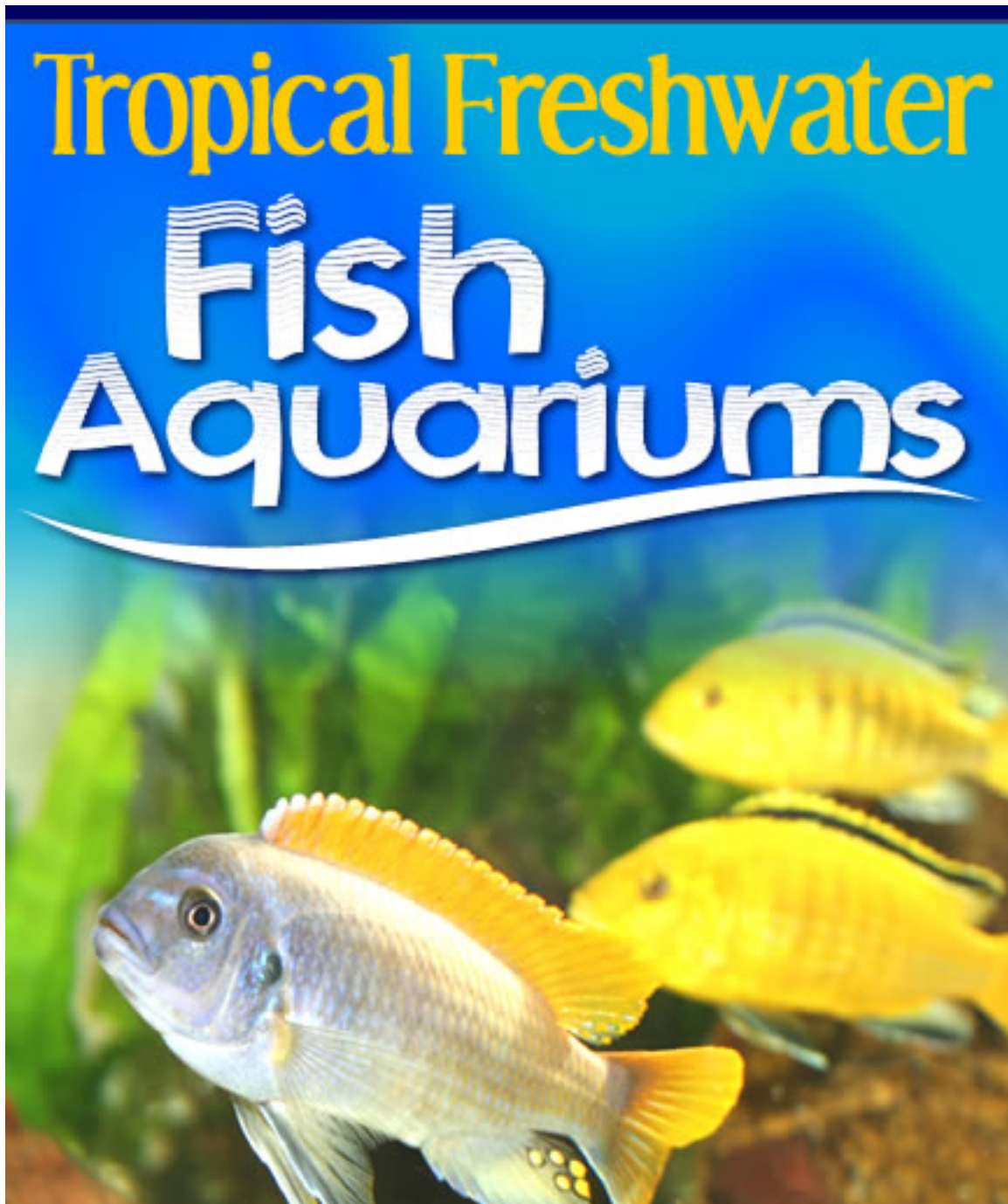




Tropical Freshwater Fish Aquariums

By David Illes



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About the Author

David Illes set up his first aquarium when someone suggested that watching the colorful, lively fish might help him to unwind and relax.

As the number and variety of his fish grew, friends became interested and began asking him questions or even wanted him to help them set up their own tanks.

Now, David has compiled this book based on his own experience and the questions from those people who he has helped introduce to the fascinating hobby of freshwater tropical fish aquariums.

He said, "I'm not an expert, just a hobbyist that has got a lot of enjoyment from my fish."

"I hope that readers will find all the information they need about the types of fish and how to care for them in my book."

Part-I: Introduction

1. Tropical Freshwater Fish Aquariums - An Overview

Tropical freshwater fish aquariums offer an extensive collection of freshwater aquatic organisms, small animals and plants for aesthetic or research purposes.



Freshwater aquariums could contain either tropical or cold-water specimens. It is best not to mix them because of their different temperature requirements.

Aquariums may be made of acrylic glass, transparent glass or plastic.



Keeping fish in aquariums or similar enclosures has been a source of entertainment and pleasure for humankind since time immemorial. The

Egyptians and the Chinese started the practice. Slowly, aquarium culture spread from the East to the West.

Initially, people kept locally available fish in aquariums. Later, in the nineteenth century, Westerners started importing tropical species and created something similar to the fish's original environment in their aquariums to help them survive longer.

Originally, there was no efficient means of warming tropical freshwater aquariums and people used open flames to heat water. This was very dangerous.

Their filters were noisy and water conditioners were absent.

Dietary deficiencies were rampant due to insufficient knowledge. Mortality rates were high during transportation. Captive breeding was almost nonexistent.

This meant maintaining a tropical freshwater aquarium was a hobby of the rich.

However, with the passing of centuries, there have been considerable improvements in aquarium technology and awareness.

Most tropical breeds are still bred in Asia while a few are bred in Florida. Captive breeding helps in easy availability of fish that are less expensive and have less parasites.

This makes tropical freshwater aquariums a hobby that many more people can enjoy.

Maintaining a tropical freshwater aquarium presently brings huge enlightenment and relaxation to people of all ages and circumstances. Many shy away from maintaining aquariums, thinking it to be a costly and time-consuming hobby, which is far from true.

Fish keeping does not take much of your time. An aquarium adds to the décor of your room.

Increased environmental awareness and relative ease of maintaining a tropical freshwater fish aquarium is attracting many to the hobby. Tropical freshwater fish aquariums require warm temperature levels around 24 to 27°C.

Aquariums require plastic or live plants, a thermometer, lighting accessories, filtration apparatuses, a fish net, water conditioner, heater, gravel with cleaner, fish food, aquarium stand or base,

canopy or hood as an aquarium cover, water quality testing kits, and air pumps or air stones.

Large aquariums have value that is more aesthetic and prove more enjoyable as you can house many varieties of fish. An all-glass aquarium is beneficial because it is resistant to discoloring and scratching.

Indoor aquariums should be placed away from direct sunlight and temperature changes as excessive sunlight is harmful to fish and causes rapid growth of undesirable algae.

Taller aquariums offer more circulation of air. Similarly, a larger surface area provides better in-tank oxygenation. It additionally offers wider scope for creation of many different aquatic themes. Large and tall aquariums offer a better water world. Overall cost also proves advantageous and affordable. You can accumulate different species over a period of time.

Maintaining a tropical freshwater fish aquarium is not very difficult if you ensure the tank goes through the nitrogen cycle thoroughly. Tank cycling is an important aspect of the tropical freshwater fish aquarium. This helps set up a good bacteria bed for maintenance of good and healthy water in your aquarium. This proves conducive for the health of your fish within. The number of fish in your aquarium should be proportionate to the size of the aquarium. Regular maintenance of the tropical fish aquarium can ensure good health of all your fish.

Part-II : Understanding Fish keeping

2. What is Fish keeping?



Origins of Fish keeping

Fish keeping traces its origins back to medieval and prehistoric ages.

At that time, carp pools were a common feature. Fish raised in such pools proved to be an alternative for meat on specific abstinence days. Although these pools catered primarily for consumption purposes, some fish keepers among them kept brightly colored and attractive species for decorative and ornamental purposes. Notable breeds among them are koi, carp and goldfish. These benefited through selective breeding. Similar cases are true regarding saltwater fish.

Types of Fish keeping

Fish keeping has three broad classifications. These are freshwater, brackish, and marine or saltwater fish keeping. Freshwater fish keeping proves to be the most popular. It consists of having a variety of freshwater species that include guppies, goldfish, and

angelfish. Some aquarists prefer keeping a single variety of fish while others prefer keeping many different varieties of fish together. The main benefit of keeping single-variety fish is the ease of breeding them in captivity.



Brackish water fish keeping involves a combination of freshwater and saltwater elements. Fish kept in such aquariums are normally from habitats with varying degrees of salinity as in estuaries and mangroves. These fish cannot survive in freshwater aquarium surroundings. Monos, gobies, freshwater soles, scats, and a few puffer fish are happy in such an environment. This form of fish keeping is not very popular and few fish keepers are aware of it.

Marine or saltwater fish keeping is the forte of experienced fish keepers. These fish are expensive and normally cannot live at room temperature. It is essential to maintain chilled water conditions as available in unheated basements or through the use of artificial chilling agents. Attractive coral reef adds to the beauty of such aquariums.

Some fish keepers highlight aquatic plants through their aquariums. They concentrate on different water plants while fish is kept at a minimum. This aquarium is the popular 'Dutch Aquarium'.

3. Basic Fish Anatomy

Basic anatomy of a fish can teach various characteristics to aquarists, as these normally are according to their habitat. Different species sport different characteristics.



Fish anatomy centers on:

Body Shape

This determines the normal living environment of fish. This fish can live better in moving waters while the tall and laterally compressed species adapt better to slow-moving waters. Fish living on water surfaces have a flat back with an upturned mouth. Fish living at sea or on water bottoms have flat bellies with different swim bladders that allow them to hop instead of swimming at the bottom.

Head

The location of the fish's mouth indicates its feeding habits. A normal fish mouth is terminal and it feeds mid-water. Surface feeding fish have an upturned mouth for feeding on insects. Bottom feeding fish have special tactile organs and barbells for locating food within muddy waters. Some also have a suction cup to pull in small invertebrates. Omnivorous fish have small mouths while predatory fish have large mouths.

Fins

The fins of the fish help them move. Fish with forked fins are regular fast-swimmers while those with rounded fins can move fast. Fish

bred in aquariums have long, drawn out fins. Anal fins help stabilize movements while swimming.

Body Color

The body color of a fish denotes its health. Some fish can alter their colors while some change colors at night. Colors receive additional enhancement during the spawning period. Favorable water conditions, a choice of a variety of foods, and compatibility with mates within an aquarium bring out the best colors in fish.

Gills

Gills are the main respiratory organ of fish. Gills are sometimes useful for trapping prey within the mouth cavity. Freshwater fish excrete water through their gills to maintain body salt concentration.

Swim Bladder

The swim bladder in fish contains air and allows fish to swim without sinking or floating. This allows fish to sleep in mid-water. Some species have a special swim bladder, which take in oxygen and help in breathing.

Lateral Line

The lateral line located under the scales consists of a series of fluid-filled ducts to pick up vibrations from the water. These vibrations indicate to fish about predators, presence of food, and allow easier navigation.

4. Water Chemistry and Quality

Fish in aquariums require the water environment to be the same as in their natural habitat in order to survive. It is essential to recreate a similar environment within the aquarium to provide a stable water body. Tropical freshwater fish live in natural lakes, ponds, and rivers. These water bodies counteract changes due to their large water volume. Therefore, the fish keeper needs thorough knowledge of water chemistry and quality to ensure healthy living and breeding of fish in aquarium. Important factors center on water hardness, water pH, and the nitrogen cycle.



Water Hardness

Water hardness is according to the presence of dissolved minerals especially calcium and magnesium in the water. Water hardness is according to the amount of calcium carbonate. A few dissolved minerals in the water make it soft water while many dissolved minerals make it hard water. Excessively soft water in an aquarium can cause problems for fish. Calcium carbonate proves to be a natural buffer and provides natural buoyancy to fish. Soft water has low calcium carbonate content and could cause the fall in pH content. This proves detrimental to fish in aquariums.

Changing Water Hardness to Suit Fish

You can change the water hardness in different ways to suit your fish. Ion exchange resins, filtering water through peat moss and reverse osmosis system, or boiling water for a long time can reduce water hardness substantially and make it soft. Filtering water through dolomite or crushed coral can increase hardness.

Water pH

The scale that measures alkalinity or acidity of any substance is the pH scale. The scale ranges between 0 and 14 with 0 being the most acidic and 14 being the most alkaline. Water has a neutral pH of 7.0 with an equal ratio of H⁺ ions to OH⁻ ions. Therefore, water with a pH below 7.0 is acidic as it has more H⁺ ions than OH⁻ ions. Water with a pH above 7.0 is alkaline as it has more OH⁻ ions than H⁺ ions.

Freshwater fish thrive best in water with 5.0-9.0 pH, although most have a greater preference for water with little acidic content, as with water having slightly acidic to neutral pH of 6-7.5.

Maintaining the pH Content in Your Aquarium

Adding bicarbonate, phosphate, and other buffers to tap water can help maintain the necessary pH levels in an aquarium. Decaying plant material within the aquarium can lower the necessary pH levels and increase the level of ammonium.

Adding baking soda or removing organic build-up can change pH content of the aquarium water favorably. If pH content is very high, use phosphate-based chemicals available at fish aquarium shops. However, phosphate can increase algae growth. Softening of water is essential before you undertake any treatment for changing pH levels.

Nitrogen Cycle

Fish excretion causes rotting of food and deterioration of plants. Bacteria can break down nitrogen compounds present in fish waste into nitrate, which is easily absorbed by plants. You can otherwise remove this through gravel siphoning. This conversion process of changing fish waste into NO_3 is nitrification.

Nitrifying bacteria are not present when you set up your aquarium. Starting with a few sturdy fish can begin the process. Although initially ammonia levels could be very toxic, soon with development of *Nitrosomonas* bacteria these levels start dropping. Ammonia breaks into nitrite and later into nitrate, which is least toxic. Algae and plants absorb these nitrates.

Maintaining such normal nitrate levels is essential for the health of your fish in the aquarium. Overstocking, overfeeding, and improper water changes can cause disturbances in nitrate levels. Restoring them early can prove beneficial.

5. The Biological Cycle or Nitrogen Cycle

Biological cycle is a natural

process that starts functioning in your aquarium within four to six weeks. The biological cycle consists of beneficial bacteria

breaking toxic organic compounds

into lesser toxic compounds. Thereafter, it is possible to manipulate toxic levels in aquarium water through weekly water changes.

Starting of the biological cycle takes place when you add a few hardy fish into your aquarium. These have bacteria within their digestive tract, which then enter water in the aquarium. These bacteria are Nitrosomonas and Nitrobacter. They require continuous oxygen for survival, which is available through air pumps or power heads. Adding gravel from an established tank can accelerate the biological cycle. Stress Zyme® can also improve the biological cycle.

Water testing kits are available that test ammonia, nitrite, and nitrate levels in the aquarium. Testing every couple of days can show the start of the biological cycle. While changing the water weekly, it is essential to change around ten to twenty percent of the aquarium water. This ensures maintenance of necessary nitrite and nitrate levels.

Ammonia as available through fish respiration, decomposition of organic wastes, through fish feces and food particles starts the biological cycle. Once the nitrogen cycle settles and maintains the necessary nitrite and nitrate levels, you can add new fish. It is safe



to add two or three fish every couple of weeks until you reach the ideal population density for your freshwater aquarium.

Part-III: Equipment and Supplies

6. Aquarium Furnishings

You need to add aquarium furnishings to beautify the underwater environment as well as to provide a breeding ground for some fish. Here are some materials that are suitable for use in an aquarium.



Gravel

When adding gravel, select a good quality like basalt or quartz gravel that does not dissolve and change the composition of the water. The gravel serves as a filter and a support for aquatic plants and provides a safe haven for fish to feed and breed. If you add plants, first create a gravel base of at least three inches, interspersed with laterite. Clean the gravel thoroughly with water before placing it in the aquarium. You may use gravel cleaner available at good aquarium supply shops to clean the gravel inside the aquarium.

Wood

Some fish varieties feed on wood, besides using it for procreation. Use only bogwood as other varieties decay in water. Since wood adds to the acidity of the water, do not use it in aquariums housing fish that live in alkaline water.

Rocks

You may add rocks like sandstone, lava, or granite to decorate the aquarium. The rocks should be free of calciferous constituents and not add to the hardness of the water. Use Styrofoam to anchor the

rock structures so that they remain steady when fish pass through them.

7. Aquarium Accessories

You need to use proper lighting and heating equipment as well as filters to maintain the ambient environment of the aquarium. Here is a description of the essential accessories and equipment.

Lights



This is very important if the aquarium houses plants, in which case the aquarium should get just ten to twelve hours of light.

Fluorescent lights are the best as they consume less power and provide suitable lighting for plants. Install a reflector on the hood to improve the lighting and change the lamps every six months. You can use a timer that switches off the lights after twelve hours.

Thermometer

You need a thermometer to monitor the temperature of the water. You can choose from glass, or electronic thermometers. The latter are the most accurate, but also slightly expensive.

Air Pump

An air pump creates a disturbance necessary for aerating the surface. The pump usually powers the air stones that operate the under gravel filters, sponge filters and box filters, but can be noisy at times.

Heater

This is necessary to maintain the temperature of the water. A glass immersion heater is the best as it gives a proper reading and remains on even if the water level drops. It is advisable to encase the heater in a mesh to avoid injuring the fish. Preferably, place the heater in the filter to heat the incoming water. Using the thermostat set the temperature to the optimum and it unplugs the heater when cleaning the tank, to avoid injury. You can also heat the tank using heaters with electronic thermostats or with under gravel heaters

Filtering

You need a filter to clean the tank water of waste material and particles. You can employ mechanical filtration using a strainer, chemical filtration using additives like peat, or biological filtration using nitrifying bacteria. A good filter must achieve oxygenation, create water current for the fish, and be able to filter the large amount of water in the tank. You can choose from an under gravel filter, box filter, internal filter, external filter and power head filters.

Sundry Equipment

Besides these, you need a bucket, a hose, and a net while cleaning the tank.

Testing Kits

You need kits to monitor the hardness periodically, pH of the water and the levels of ammonia and nitrates in the water.

Decorative Items

You can decorate the aquarium with rocks, gravel, and slate. Ensure that these materials do not dissolve in the water and give off calciferous ingredients. You can use bogwood or mopani depending

on the type of fish in the aquarium, since wood increases the alkalinity of the water.

Remember to buy good quality accessories and equipment from a reputed aquarium supplies shop for optimum results and healthy fish.

8. Aquarium Stand

When you set up an aquarium, you need to get a stand for it as part of the purchase or separately. They range from cheap wooden stands to intricate metal ones, to fit your budget and taste. Your stand should be strong enough for the weight of a full tank with proper bolts in place.



Wooden stand

A simple wooden stand just has a functional frame to hold the aquarium. You can add a dash of varnish or paint it to match your room’s décor. Alternately, you can design your own aquarium stand and get it made as a cabinet. A cabinet also serves the purpose of holding the cleaning and feeding supplies of the aquarium.

Metal stand

If opting for a metal stand, ensure the bolts are securely in place. You can choose from basic rectangular stands to minutely carved wrought iron stands, depending on your liking.

Placing the Stand

Position the selected stand so that it remains steady. You may add a layer of coolite between the stand and the aquarium for proper weight distribution.

Place the stand against the wall so that it hides the power cords. Avoid adjusting the position of the stand when full, as you may drop it.

Part-IV: Setting Up Your Aquarium

9. Planning Your Aquarium

Planning and maintaining an aquarium requires proper knowledge about fish keeping, fish tanks, and essential supplies for fish maintenance. An aquarium at home enhances



the beauty of your room and house. Although there are many fish keeping theories, gaining knowledge through books and the Internet can help you plan and set up a freshwater aquarium.

Basic Steps

Before planning to start with a fish aquarium at home, you need to decide on type of fish you want to keep, freshwater or saltwater. Maintaining freshwater fish in your aquarium can prove easier.

Basic essentials include:

- Aquarium Tank
- Aquarium Stand
- Filter
- Aquarium hood or canopy
- Gravel
- Proper lighting arrangements
- Thermometer
- Heater
- Nets and cleaning equipment

- Decorations, although a vanity item

Size of Aquarium Tank

An aquarium tank should be large enough to contain a minimum of thirty gallons of water. Small tanks do not prove beneficial as small changes in water chemistry can cause substantial effects on fish. Water chemistry changes do not affect the water of large tanks as easily. Different fish grow to different sizes. Your aquarium tank should be able to support all growing fish. Lack of sufficient space could cause bigger fish to eat smaller ones.

Location of Aquarium Tank:

Keep your aquarium in such a position that allows perfect viewing of fish from all parts of the room. Place your aquarium away from direct sunlight, cold winds, air-conditioners, heaters, or loud and vibrating objects. These could cause wide changes in water temperature levels and prove detrimental to the health of the fish in the aquarium. Keeping an aquarium close to a water supply can make it easy for changing water and similar maintenance work.

Shape and Material of Your Aquarium Tank

Aquarium tanks are available in different shapes and are of many different materials. Rectangular glass tanks are cheapest. You can choose from hexagonal, bow-front, or corner aquariums. Acrylic aquariums prove more ornamental than glass aquariums. These tanks prove more difficult to clean and maintain than glass aquariums, as they scratch easily and require greater support. Initially, purchasing a less deep glass aquarium is best as it supports easy cleaning and handling.

Aquarium Stand

Use a specially made aquarium stand, as it can hold an aquarium well in place. Aquariums are considerably heavy and using improper stands can prove dangerous and cause unnecessary mess all around. Your aquarium stand should be stable and sturdy, well capable of holding the weight of your aquarium. Normally, aquarium shops sell tanks and stands together as a kit. These offer necessary support in proportion to the weight of the tank.

Filter

Aquarium filters could be a power filter, canister filter, or under-gravel filter. Aquarium filtration could be mechanical, chemical, and biological, although all three are essential. A power filter is easily accessible as it is behind the tank. A canister filter is normally underneath the tank and therefore remains hidden except for hoses. An under-gravel filter provides only mechanical filtration and therefore proves insufficient to maintain the cleanliness of your aquarium.

Aquarium Lighting

Lighting in your aquarium adds to the ecological quotient, especially so if your aquarium has many live plants. Lighting should be appropriate. Excessive lighting could accelerate algae growth. This increases maintenance work and proves to be an unattractive sight within your aquarium. Further, your lighting should not generate too much heat, as it could cause serious changes in water temperatures. Lighting in aquariums could be through fluorescent or incandescent. Most prefer fluorescent lighting, as it does not generate much heat, is more affordable, and can emit different spectrums of light.

Aquarium Heater

This heater prevents fluctuations in water temperatures. Maintaining an aquarium heater can ensure steady water temperature that is most suitable for fish in your aquarium.

Species Compatibility

Fish in your aquarium need to live in harmony. There are specific species that remain perfectly compatible with one another. Choosing such compatible species can promote healthy living of fish. Oscars and growing cichlids are aggressive varieties. Allowing them to grow up together can prove beneficial while housing them. Live-bearers, bristle nose catfish, and rainbow fish get well together and do not possess any aggressive nature. Cardinal tetras yearn for their own kind. If you choose to accommodate them, it is necessary to have quite a number of them together.

10. Selecting the Aquarium Tank

The choice of the aquarium tank depends on your budget, space available for housing the aquarium and to some extent, the type of fish you want to keep. Contrary to popular belief, large tanks are easier to



maintain, provide greater surface area for waste disposal, and help maintain a stable environment for the fish. Place the tank in a location away from direct sunlight as this promotes algae growth. Keep it away from direct heating or cooling as this affects the temperature of the water. However, place it near electrical plugs for plugging in the heater and lights for the aquarium.

Cost

The price depends on the size of the tank and its constituent material. Glass tanks are the cheapest compared to Plexiglas or acrylic tanks. Smaller tanks up to 55 gallons are easily available and easy on the pocket. Ensure that the glass tank has smooth edges or get them smoothed before installing it in the home.

Shape of the Aquarium

You may choose to buy a rectangular tank as it has the maximum surface area for aeration and is easy to maintain. A hexagonal tank is small with less space for the fish to swim and is difficult to clean. Deeper tanks can hold fewer fish compared to shallow rectangular tanks.

Material to Make the Aquarium

Glass aquariums are very popular and widely available. The only drawback is that they are heavy to carry when filled with water. Check them for breakage before buying a piece. Plexiglas tanks are light, easy to carry and come in different shapes. They hardly suffer breakage, but are a little expensive compared to glass tanks. They are clearer than glass tanks, but develop scratches very easily. Therefore, you must clean them with soft pads only. Ensure that you get a cover with the tank you buy. The cover helps prevent evaporation and safeguards the fish.

Choosing a Stand

After choosing the aquarium tank, select a proper stand that will support the weight of the aquarium. You can choose from metal and wood stands that complement the décor of your room. Some stands come with cabinets to house the aquarium supplies, or else you can order a customized stand for your aquarium to your liking.

11. Site Selection for Your Aquarium

You must choose a proper site for your aquarium, a place from where it is visible and adds to the décor of your room. Select a site with ample light and fresh air, but away from the heating source of the room. Moreover, the site must be easily accessible for the proper feeding of the fish and for cleaning the aquarium. In case the aquarium is on a raised floor, it must be at right angles to the floor for proper weight distribution.



If you are redecorating the room, place the aquarium after the painting, since the paint smell may be harmful to the fish. Since the aquarium is very heavy, ensure that you place it on a cabinet strong enough to hold about a hundred kilograms of weight. Avoid shifting a full aquarium, as there are full chances of dropping it.

12. How to Set Up the Aquarium

Buy the aquarium tank of the desired size from a suitable aquarium supplies shop.

Preparing the Tank

Install the tank at the desired location. Next, wash the tank thoroughly with water and dry it. Fix some background paper on the back of the tank. Attach heating cables carefully to the tank. Position plates at different



levels if you want to create terraced gravel. Fix rocks to Styrofoam bases on the tank floor and place some bogwood pieces to beautify the tank.

Adding the Gravel

If using plants, add some base substrate purchased from a proper shop. Wash the gravel thoroughly, using a sieve and bucket. Use gravel from an existing tank if possible, as it contains nitrifying bacteria. Put a filter in the tank and a heater. Also, put in a thermometer to monitor the tank temperature.

Adding water

Slowly fill the tank with water at about 20-22°C, using a pipe. Direct the water on a rock, so as not to disturb the gravel. Put in some water conditioner and start putting plants in when the tank is half-full. Put tall plants at the back and smaller plants in the front of the tank. Vallisneria, and Hygrophila are sturdy plants that you can put

in the beginning, while take care to put delicate plants like Cryptocoryne after some months.

Testing

Put in the lighting and plug in the heater once the tank is full. Keep checking the temperature periodically and adjust the heater temperature to the optimum level. Ensure that the pH and the water hardness are suitable for the fish variety you will introduce in the tank. If not, add the suitable chemicals to modify the pH and the water hardness.

Adding the Fish

Add fish like robust tetras and barbs in the tank when the temperature, pH, and hardness are optimum. Let the bag float in the tank water before letting out the fish gradually. Slowly net the fish from the bag and introduce them in to the tank. Cover the aquarium. You can add new fish after the cycling gradually, at night so that there are no problems between the old and new occupants of the fish tank.

Cycling the Tank

It takes about three to six weeks to cycle a tank. Initially examine the water condition at least two to three times a week. You can speed up the process by adding gravel or nitrifying bacteria culture to the tank. The levels of ammonia and nitrates rise in the water after some days so change half the water in the tank after a week and the balance every third day for the first three weeks.

13. Adding the Water

Clean the aquarium with fresh and clean water without using any kind of detergent. Once properly cleaned, fill the aquarium with water. If the fish tank does not have a floating base, place polystyrene tiles underneath to stop the bottom and the sand from coming into contact.



Use a fresh bucket to add water to the aquarium to make sure that no pollutant goes along with the water. Add an adequate amount of tap water conditioner and maintain the water temperature to about 25° C or 76° F. Pour the water in such a way that you do not disturb the gravel.

Most people prefer to put live plants in the aquarium and if you are among them, wash the plants properly to get rid of unwanted pests that may harm the fish. Make sure you do not damage the roots in the process. Artificial plants also look seemingly natural and you can even put them in along with your sensitive aquatic creatures.

Biological culture facilitates filter maturation, so you can add it to the water or directly to the filter. Keep the condensation covers appropriately, fit the fluorescent tube into the hood and place the hood such that it remains on top of the aquarium. Monitor the temperature and other conditions and leave the water to settle down for 24 hours

14. Preparing Your Aquarium for Fish



You should attune yourself to the various needs of the fish before keeping them in the aquarium. For that, keep the filters, aquarium, and other equipment running as you would have kept it along with the fish. Make sure you also turn off the light switch regularly.

It is important to maintain the water temperature of the aquarium. You should check the temperature after every 24 hours and adjust the heater as required.



While fish waste has high ammonia content, fish cannot survive in water containing ammonia. Beneficial bacteria

present in the water convert ammonia into nitrite and then into nitrate for the fish in the aquarium.

Beneficial bacteria clean the waste produced by fish. Thus, you should wait for a week or two to let these bacteria grow and multiply before keeping the fish in the aquarium. Check the ammonia, nitrite, nitrate, and pH content of water.

Monitoring the pH content of the aquarium water is equally important. You should check it after every three to four days. The pH content should be around pH 6.5 to pH 7.5 for the survival of a tolerant species. When you make sure all the requirements of these sensitive creatures is well provided for, introduce them to their new abode.

Use your test kits according to their instructions within this minimum period, to ensure you have correct readings before introducing any fish.

You should also check your water's pH every three or four days to ensure it is remaining stable. For a tolerant species community aquarium, you should have a reading of pH 6.5 to pH 7.5.

15. Adding the Fish

It is very important to make sure that everything right from pH balance to the growth of beneficial bacteria is suitable enough for the fish to survive before you put them in the aquarium. Initially, introduce comparatively tougher species of fish in the tank.



The excreta produced by the fishes would help in multiplication of beneficial bacteria in the aquarium.



Acclimatize the fish before putting them in the aquarium water.

Directly placing them straight from the bag into the water may shock the aquatic animals and leave them susceptible to diseases. It is good to place the closed bag into the aquarium for about 15 minutes

before the temperature equalizes. Add a cupful of aquarium water to the bag and after a few minutes gently let the small bunch move into the aquarium.

Monitor the ammonia and nitrite content of water for a few days. It is natural that the nitrite level would rise but make sure it also comes under control within a short time span. This will ensure healthy levels of bacterial growth in the water. When the levels

remain satisfactory and stable you can add another bunch of colorful fish to your aquarium.

Remember not to overcrowd the aquarium more than its capacity. A freshwater aquarium can accommodate fish according to its size. Multiply the length and breadth of the aquarium in inches and divide it by 12. The resultant number would tell you how many fish you can maintain in the aquarium.

A small quantity of food once a day, is enough to keep the fish going. Do not feed your fish excessively as it may increase the waste product concentration in the aquarium to unmanageable limits. It can harm the fish. If you still face a problem with the water inside, you can replace 20% to 30% and add fresh water to it. Do not go beyond this percentage as it can prove fatal for the fish.

Part-V: Popular Tropical Freshwater Fish Species

16. Popular Tropical Freshwater Fish



Catfish

There are more than 2000 species of catfish with differences in pattern, body shape, and scale configuration. These are found both in saltwater and freshwater. These develop a sucker mouth to attach to stones and rocks. They are avid algae eaters and therefore prove beneficial for fish keepers in keeping the aquarium clean.

Pleco

This sucker mouth variety of catfish proves a perfect fit for aquariums. Numerous rows of teeth within their sucker mouth allow them to pull out plant leaves from the aquarium floor. They feed on other dried food, worms, and plant matter. These being nocturnal in nature would need many dark spaces within the aquarium to feel at home.

Upside-Down Catfish *Synodontis nigriventris*

This catfish variety proves to be a great choice for a community aquarium, as it is a bottom feeder and nocturnal. Although they do not have scales, their beautiful colors ranging from gray, golden-brown, and black have unique markings that make them attractive in an aquarium.

This catfish is genetically inclined for swimming upside-down, although it would come out to enjoy food at the surface. It eats all types of food like insect larvae, frozen bloodworm, live food, and flakes.

Anabantids or Labyrinth Fishes

Anabantids or Labyrinth fishes are a special variety of fish that require atmospheric air to supplement their air supply available through their gills for survival. These fish originally lived in muddy waters lacking in oxygen. They adapted through development of an additional breathing organ, labyrinth. This fish often come to the water's surface in an aquarium to gulp fresh air supplies.

Giant Gourami

This fish grows to around thirteen centimeters and is found in varied colors. The predominant color is green-brown with a red eye. The main characteristics are pelvic fins that help in probing around and remain the most suitable for a community aquarium.

Cichlids

Cichlids are a very distinctive species with precise features. Males are more colorful than females. These fish are present in all types of climate. By nature, they are very ferocious and predatory in nature. However, their interesting breeding habits and range of body colors

make them very popular amongst aquarists. Their ferocious nature makes them mark territories even in aquariums. Provide them sufficient caves and rocks in aquariums. Place plants within pots and use other guards to secure normal aquarium fittings, as they could pull out plants and other fittings.

American Cichlids

Most of these species are territorial especially during breeding. They have a ferocious nature and therefore require a spacious aquarium with lots of sand, gravel, caves, and rockscape. These thrive on live foods, although you can also feed different vegetable matter. Their huge appetite and feeding habits necessitate frequent partial water changes.

Firemouth Cichlid

This fish is very colorful with a bright red belly and throat, speckled blue scales and grey-colored body with black spots. It is best to keep this species with others of its kind as it could otherwise eat other smaller fish. Although they love live food the best, they also survive on good quality dried food.

Angel fish

This fish was once the pride of any aquarist and was aptly named as 'King of the Aquarium', though not so presently. There are different varieties of Angelfish according to their colors and fins. There are many crossbreeds, which is the main cause for absence of the original Angelfish.

Angelfish eat fish that fit into their mouth, although they have a small mouth. Fry of live-bearers are at risk if they are in the same aquariums. It is best to accommodate angelfish with a non-cichlid

species. Otherwise, they should remain within a smaller aquarium with members of their own species.

Discus Fish

Discus fish are the most desirable variety of aquarium fish among different Cichlids. They are presently described as King of aquarium fishes. These fish change body color with environmental changes. Color changes are evident through changes in diet and water chemistry. Babies do not provide any indication of what color they would develop in adulthood.

Lake Malawi Cichlids

The Great Rift Valley of East Africa has many lakes, which are the major source of tropical fish, especially Cichlids. Two important lakes of this region are Lake Malawi (presently Lake Nyasa) and Lake Tanganyika. Water in these lakes is hard and alkaline. These cichlids are excellent spawners and require a lot of space around rocks and caves. They eat prepared food, vegetable material, and algae.

Lake Tanganyika Cichlids

This lake houses more than 150 species of Cichlids. Most of these fish are rock dwellers with many preferring sandy substrates and some as free-swimmers in open waters. Favorites Cichlids of fish keepers include *Tropheus moorii*, *Boulengerochromis microlepis* being the largest, and *Julidochromis* among others.

African Non-Lake Cichlids

These species survive well in water with normal hardness and neutral pH content. They survive on freeze-dried live foods and prepared food. Species that are popular among aquarists include

Kribensis, P. taeniatus, Jewel Cichlids, Egyptian Mouthbrooder, and others. Some of them are aggressive in nature.

Characins

Different species of Characins include Piranhas, Headstanders, Silver Dollars, Hatchet fishes, Pencil fishes, and African Tetras.

Characteristic features of these fish include their prominent and large teeth. In many fish, teeth are too large and cause extreme discomfort in closing the mouth. However, their petite size, calm nature, and attractive colors make them favorites of every aquarist. These fish are essentially shoaling fish. Therefore, housing a shoal of a single species with ample free-swimming space in the middle can be an ideal setting within an aquarium. Although they are carnivorous by nature, they eat all kinds of food.

Live-bearers

Live-bearers are not any specific fish species. These fish carry growing embryos within their body until fry stage. Thereafter, they release well-developed young ones into the water. These young ones are well capable of fending and taking care of themselves. There are different live bearing species. Some require a single male fertilization to deliver many broods while some require fertilization for every brood. Popular live-bearers include guppies, swordtails, platies, and mollies.

Guppies

Guppies are very popular aquarium fish. These peaceful fish are soft and freshwater inhabitants. This omnivorous fish can subsist on many live foods and different insects. They require many small feeds. With guppies in your aquarium, you should drop food in

regularly, as other fish would gobble all the food before guppies come up for their second fill.

Popular guppies of aquarists include Golden Lacetail in yellow color, Golden Guppy in bright yellow, Red Guppy, and Blue Guppy. Attractive body colors prove to be the main attractions of such fish among aquarists.

Mollies

Mollies are extremely adaptable fish that inhabit different types of streams and rivers in their original habitat. Hence, they can survive varying saline content in water, although they do well with frequent water changes. Hardened water with higher pH content provides necessary calcium to mollies in aquarium water. Having many corals can ensure sufficient calcium in the water.

However, it is essential to keep nitrite and nitrate levels at the bare minimum and without any trace of ammonia in aquarium waters for successful mollies habitation. These fish survive on minute organisms growing on plants with regular feeds of live or frozen alternative food.

Platies

Platies are often among the first fish that aquarists introduce into their aquariums. You can see them in various color hues in aquariums, although they do not depict such color strains in the open. They prefer minimum water movements and love to have enough swimming space. Effective filtration can offer excellent water conditions for their existence.

Swordtails

Swordtails are favorites of every aquarist. These live in warm waters of rivers and streams with lot of flora cover. Although swordtails adapt excellently to prevalent conditions within an aquarium, it is best to have water with temperatures between 24°-27°C and pH content of 7 to 7.5. These fish cannot bear varying levels of nitrate and therefore regular water checking is essential to maintain water quality. These fish are present in many bright colors like red, green, gold, yellow, and albino and present many different fin forms.

Killifishes

These small and colorful fish are present across all water bodies of the globe, although they are predominant across America and Africa. Their small size helps them jump to great heights. Further, their height and body swiftness allows them to be good catchers of food on the move. These fish require soft acid water. It is best not to include these fish in community aquariums or those of novice aquarists due to their strict requirement about water quality and their aggressive nature.

Cyprinids

Cyprinids constitute the largest family of freshwater fish. Cyprinids are normally divided into two main groups with Danios, Rasboras, and Minnows in one group and the other consisting of Barbs. Danios are hardy fish and best suited for beginner aquarists. These peaceful fish are omnivorous and best suited for housing in aquariums. Barbs are quick moving fish and sport bright colors. These shoal fishes love being with fish of their own species and kind. Their bright colors and swift movements make them an attractive sight within any aquarium.

Loaches

Loaches are timid fish and prefer coming out in the darkness of night. You can use either floating plants or reduced lighting in aquariums to offer a favorable environment. They eat live and prepared foods and normally look for food at aquarium bottoms. Although their body length is around twelve inches in the wild, they grow to only six inches within aquariums.

Few varieties of loaches like *Botia helodes* and *Botia lohachata* are very aggressive. It is best to keep these species alone in aquariums.



17. Selecting Your Tropical Freshwater Fish

There are many different varieties of tropical freshwater fish. You need to select a suitable species for your aquarium.



Consider these important factors before selecting:

Tank Capacity



Different tanks have different capacities. Fish within your tank should have sufficient space for easy movement. They should not come in the way of one another. Normal space allocation is one inch of fish per gallon of water. A ten-gallon tank can house ten 1" fish or five 2" fish. This ensures sufficient supply of oxygen to all fish within your aquarium. You should be aware of the size your baby fish would grow into while purchasing them. Your tank should be able to accommodate such full-grown species.

Community or Species Tank

A community tank has a mixture of many different species of fish like Barbs, Tetras, Clown Fish, Dainos, and Corydoras. A species tank contains a single species of fish like Discus or Cichlids. These fish remain in harmony in the company of their species and therefore are best suited for species tanks.

Educate Yourself

Gather all possible information about the different varieties of fish you purchase or intend purchasing. You should know their eating habits, living habits, their nature, whether gentle or aggressive, their spawning habits, and everything else. You can read relevant books or go through information available on the Internet.

Purchasing Fish

While setting your aquarium, treat your tank initially through proper water cleaning and treatment. Allow water to reach necessary levels with ideal pH content and proper air circulation. This could take around four weeks. It is essential to purchase fish from your local shop. This avoids any long journeys for your fish. Further, you can find easy help if any trouble crops up anytime.

Selecting Your Fish

Fish selection is an important job. You should select compatible species to prevent any aggressive behavior within your aquarium later. Fish could belong to different categories like aggressive fish, docile fish, active fish, and similar others. Choosing species that get along well together is most essential.

18. Buying Your Fish



Purchasing fish for your aquarium requires focusing on certain basic principles:

Assess fish lengths of adult fish and purchase according to the size of your aquarium.

Select from a wide variety of fish so that your aquarium houses fish swimming at different water levels. Similarly, choose from fast swimmers, slow movers, paired fish, peaceful fish, active fish, and solitary fish.



Choose healthy fish with bright colors and erect fins. Fish rubbing against rocks and with sunken bellies indicates the presence of disease.

Purchase compatible species of fish for harmonious living.

If any fish in the fish tank of an aquarium shop seems thin and diseased, avoid purchasing anything as all fish could carry prevalent disease.

Purchase fish from local or nearby aquarium shops to avoid long travels.

Handle fish gently. Place polythene plastic bag containing fish within a polystyrene lined box to retain heat.

Do not pour out fish immediately into aquarium water. Dim the room lights and switch off aquarium lights. Allow the open

polythene bag containing the fish to float over aquarium water for around twenty minutes. Natural mixing of water allows even spread of water temperatures and prevents shock.

Fish feel out of place in new surroundings and hide behind plants. Leave them alone for few hours to acclimatize to new surroundings. Drop a few food morsels later at a clear spot in the aquarium tank. Remove uneaten food after a reasonable time to prevent decay of food particles.

Part-VI: Plant and Non-Fish Species

19. Selection of Plants for Your Aquarium



An aquarium that is well planted is attractive and comes with other benefits too. However, there are certain things you need to keep in mind before you plant them.

Water plants convert carbon dioxide to oxygen through the process of photosynthesis, and light is very essential for this process, therefore, be sure that your aquarium is illuminated.

Most of the aquatic plants do not rely on their roots to extract nutrients from the water. They do so with the help of their leaves. On the other hand, there are aquatic plants that use both roots and leaves to extract nutrients from the water. These plants are best for the aquariums.

Plants are divided into two groups. Some need calcium and others do not. **Calciphilious** plants are the plants that require hard water and calcium all the time. **Calcifugous** plants are those that require slightly acidic water and soft water. Be careful not to place both types of plants in one aquarium.

A few examples of Calciphilious plants are Elodea, Vallisneria (fast growing), Myriophyllum, and Sagittaria (fast growing).

A few examples of Calcifugous plants are Cryptocoryne, Cabomba, Marsilea, and Echinodorus.

It is advised that you select calcifugous plants for your aquarium.

Tips when Planting Aquatic Plants

- 1)** Cut the damaged or leaves that are turning brown.
- 2)** Trim the roots a little. This will stimulate fresh root shoots.
- 3)** Place lead weights or stones to hold the plants until the roots are firmly placed.
- 4)** Group the plants on the rear or the sides of the tank, so that the front is free for swimming.
- 5)** Plant 2 or 3 plants of different species, rather than buying one species from various plants.
- 6)** Give your plants enough room and set the right environment to grow. If your plants lack growth, this means the water is hard.
- 7)** You may also use artificial plants for your aquarium, they look equally good, and however, with natural plants you will get the benefit of producing oxygen.

20. Care of Live Aquarium Plants

1. Photosynthesis

Through photosynthesis, plants convert the carbon dioxide from the water to oxygen. Light is very essential for this process, so see to it that there is enough light in your aquarium.

Plants use the carbon dioxide released by the fish and water to produce oxygen and energy.

2. Substrate

Plants grow best in fine gravel with added base fertilizer. Though base fertilizer is not required, however, it is better if you use it. You may use laterite, that is rich in iron and you may use fertilizers that are manufactured for aquatic plants.

3. Lighting

Strong lighting is one of the most important ingredients for a good aquarium. A two to three watt bulb is sufficient for one-gallon of water. Fluorescent bulbs have been suggested of late as good for planted tanks. Nevertheless, in tanks that are twenty inches deep are not strong enough for illuminating. Here, you may also use a mercury vapor lamp.



4. Water

Be sure the water for your aquarium is clean and clear. Also clear the debris so there is no interference with the light. The hardness of the water can range from 4-12 pH. However, be sure of the plant species and the kind of water they require.

5. Nutrients

Both macro and micronutrients are required by the plants to grow. Nitrates, sulfates, and phosphates are macronutrients and they are required in large quantities. On the other hand, copper, manganese, boron, calcium, and zinc are micronutrients. These are required in low quantity by the plants. These nutrients are essential for good plant growth. The deficiency of these make the plants suffer.

6. Fertilizing

Fertilizers are not essential because of the macronutrients that are available in the tank. You may use trace elements instead.

7. Carbon dioxide

Carbon dioxide is required by plants for photosynthesis. Carbon dioxide is mostly available in the tank as the fish release it continuously. If your aquarium is heavily planted and has few fish, or in case the water you use is hard, then carbon dioxide fertilizers may be necessary.

8. Plants to Avoid

You must avoid certain plants for your tank and they are Brazilian Sword, Aglaonema, Cherry Hedge, Green Hedge, Palms, and Mondo Grass. These plants do not grow for long and pollute the water unnecessarily.

21. Non-Fish Species

Your aquarium may also house other animals that are not fish.

These include:



Invertebrates

Snails are among the most common invertebrates kept in aquariums. These require water to be free of copper, well-aerated, with pH content more than seven.

Apple Snails

These resemble apples and have many colors. They breathe at the water surface and could move out of the aquarium tank if there is no proper cover. They thrive on flake foods and decaying matter and nibble at plants if there is insufficient food.

Ramshorn Snails

These snails are shell-shaped and grow to around two centimeters. They eat algae. Overfeeding could cause them to multiply rapidly.

Malaysian or Trumpet snails

These snails have a spiral shell and bear live young. They do not harm plants.

Mystery Snails

These snails grow to two centimeters and feed on plant matter, algae, and other excess food available in the aquarium. They thrive best in water temperatures of 24°C.

Blue Marron

These creatures get along best with large non-aggressive fish especially if a movable portion of claw is removed. They feed on decaying matter and any edibles as available in the aquarium. They thrive best in water with temperatures around 15 to 22°C and pH content between 7.2 and 8.5.

Penguin Shrimp

Ideally, shrimp within ten centimeters of length are best suited for living in aquariums. They combine well with fish swimming at upper levels. They reproduce live young ones and normally females drop young ones in covered and hidden places.

Red-clawed Crab

This species feeds on plant matter and dry food. It prefers hard and alkaline freshwater. Use a tight-fitting aquarium cover to prevent them from crawling outside.

Vertebrates

African Water Frog

These grow to eight centimeters and live peacefully with a gentle fish species. They eat any food that reaches substrate levels and do not compete for food. They prefer eating at dusk. Feeding them after switching off all lights is best.

African Clawed Frog

These frogs grow from eight to thirteen centimeters in length. They thrive best in water with pH content ranging between 6.5 and 8 with temperatures between 24 to 29°C.

Part-VII: Feeding Your Fish

22. Feeding Your Tropical Freshwater Fish

You must know what your fish eat and give them nutritious food containing vitamins and trace elements.

Some fish are carnivores, some herbivores, and there are also omnivores that eat both types of food.

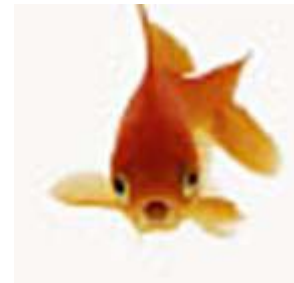


Limnivores are mud-eaters.

You must never over-feed the fish, as the remaining food is undigested and adds to the debris on the floor of the tank. Over time, this decays and can cause disease in the fish.

Feeding excessive fat can result in liver problems, so avoid this.

You can choose from dry flakes and liquid food. Dry food is easy to store and retains the vitamins until the expiry date. Moreover, it gives balanced nutrition and you can choose from a variety of excellent quality dry foods. Most importantly there is little danger of contamination and parasites with dry foods. You can choose from pellets, sticks, flakes, wafers and granules and feed the fish different combinations, depending on their liking.



Food for Different Fish

Carnivores like live food like smaller fish and insects. They have a large stomach and a short digestive system. You can feed them the

flakes or live feed a few times a week. You can feed herbivores vegetables, flakes and plant waste. They have a small stomach and a large digestive tract and need regular feeding.

You can give omnivores flake, vegetables, and live foods.

Limnivores also have a large digestive tract and a small stomach and need constant feeding. You can give them the pellets and algae.

Dry Foods for Different Fish

Dry food contains fats, proteins, fiber, carbohydrates, calcium, phosphorus, and vitamins in the required proportions. Food for omnivores must contain at least 35% protein, 3% fat, and 3-8% fiber. The flake you feed carnivores must contain 45% protein, 3-6% fat, and 2-4% fiber. You must give herbivores a good quality wafer containing at least 15% protein, 1-3% fat, and 5-10% fiber. Largely dry foods work well for most types of fish and have a proven safety record.

Living Food for Fish

Purchase live food from a reliable supplies shop to avoid contamination. Alternately, cultivate cultures of worms at home to feed the fish. Some popular live feeds are bloodworms and tubifex worms. Avoid feeding excessive tubifex worms as they contain albumen. Another popular feed is daphnia as the fish love to catch them, though they have very little nutritional value. Earthworms are suitable for large fish, but clean them thoroughly with freshwater and cut them into pieces before feeding.

Vegetables

Some fish like carp feed only on algae. You can give them partially boiled spinach or lettuce leaves, fresh peas or cucumber, besides the dried foods mentioned above.

Other Foods

Some fish like Cichlids, need pieces of meat or fish in their diet. You can feed natural fish to the aquarium fish provided it is washed properly. Always feed saltwater fish to freshwater fish and vice versa, to avoid external contagion.

Food for Fry

You can feed fry infusoria developed from cultures of animal and vegetable matter. You can easily develop a steady supply of cultures for your fry.

You can breed brine shrimps from eggs available at an aquatic supplies shop. Keep them in a dry area so that they hatch properly. Clean them with freshwater before feeding them to the fish.

It is possible to cultivate micro worms on a culture of oatmeal easily. You can get a starter culture from a shop and start breeding micro worms. When the worms appear after a few days, you can feed them directly to the fish. You can have a steady supply of micro worms with three containers.

Feeding While You are on Vacation

Install an automatic feeder and check it before you leave for a holiday. Alternately, ask a friend to feed the fish and clean the aquarium while you are away. If going away for a week, change the water and feed the fish. If you intend a longer vacation, it is

advisable to hire someone to maintain the aquarium where it will be constantly monitored and looked after.

Part-VIII: Tropical Freshwater Fish Health and Disease Control

23. Being Prepared for Disease



Fish in your aquarium can fall ill for a number of reasons. To recognize the signs of illness it is imperative that you are familiar with the normal behavior of the fish. You must know their healthy appearance, feeding times, and levels of activity. You must have a hospital tank ready to isolate the ill fish, so that it does not affect the other fish in the aquarium.

Checking the Cause of Illness

First, observe the fish to note any change in usual behavior or activity. Next, check the pH, ammonia and nitrate levels, and oxygen saturation of the water in the tank. If these levels are correct, check for smoke, or paint fumes that can cause toxicity in the water. Also, ensure that the filter, heater, and pump are operating at the optimum level. Make corrections as needed to ensure optimum surroundings for the fish.



Creating a Hospital Tank

Select a tank of about thirty-eight liters and fill it with de-chlorinated water.

Fill two large buckets of about ten liters with water similar to that in the tank.

Next, move the fish to the first bucket using a net. Gradually add salt in the proper proportion to the water for ten minutes.

Then shift the fish to the next bucket and let it stay there for about forty-five minutes. After twenty minutes, add salt in the same proportion to the water in the bucket holding the fish.

Now, move the fish to the hospital tank and change the water daily. Check the fish for parasites and give the proper medication after consulting a good fish vet.

Shift the fish to the main tank only after it recovers completely.

24. Signs of Fish Disease

As an aquarist, you must be familiar with the signs of healthy fish to detect any signs of disease. Healthy fish have a healthy color, clear eyes and straight fins. They are very active and flee when you tap the tank.



Signs of Sickness in Fish

A sick fish will be lethargic and the skin may have ungainly spots indicating skin infection. A fish that darts towards the surface may be suffocating, indicating a lack of oxygen in the tank water. The fish has an unhealthy pallor and may develop abdominal cysts.

Problems Caused by the Aquatic Habitat

Changes in the Oxygen Level

Fish jumping towards the surface is an obvious sign of lack of oxygen in the tank water. The fish has increased breathing and the gills open as they try to take in oxygen from the surface. You must immediately oxygenate the water by changing it partially to clean out the debris and accumulated waste. Also remove algae that inspire oxygen and reduce the number of fish as this leads to congestion in the tank and a lack of oxygen. Maintain the water temperature at optimum as oxygen saturation reduces with rise in temperature.

Some fish may develop protruding eyes and bubbles below the skin, leading to a blockage of blood vessels, and gills resulting in death. This occurs due to excess oxygen in the water and is rare. To prevent this avoid placing the aquarium in direct sunlight as this

leads to algae growth, resulting in excessive oxygen in the tank water.

Changes in pH Levels

Fish thrive in pH between 6 to 8 and any change in the pH causes distress to the fish. A low pH results in acidosis, and rapid breathing, while a higher than optimum pH results in damage to the skin and gills. You can overcome this problem by slowly changing the water in the tank and examining the pH levels weekly.

Changes in Temperature

Fish go into shock due to sudden temperature changes and stay still at the bottom of the tank. Very high temperatures can lead to breathing problems. Hence, try to maintain optimum temperature by conducting regular checks.

Improper Diet

Feeding the fish excessively can result in blood in the fecal matter and swollen intestines. So give a balanced feed that helps the fish build immunity and fight disease.

Poisons

Avoid spraying paints, aerosols and insect killers in the room where you keep the fish, as they are extremely sensitive to these products. These products dissolve in the water and can poison the fish.

Other Problems

Soap, metals and chlorine are lethal when dissolved in water. Fish develop blood patches on the skin and become restless when exposed to these substances, so avoid exposing fish to these items, to ensure their good health.

25. Diagnosing Fish Disease

Fish in distress refrain from eating, may have breathing difficulty and will stay aloof from the others. They give the same response to illness, irrespective of the cause, either environmental or physical. Hence, it is up to the aquarist to probe further and determine the exact cause of the illness.



Collecting Information for Diagnosis

First count the number of fish in the tank and see if there is adequate filtration. Inquire if there was any treatment conducted recently leading to changes in the tank environment. See if you notice any changes in the activity levels of the fish over the past few weeks. Check if the illness has spread to more than one fish. If yes, it indicates a contagious condition. If the illness affects fish suddenly, it can imply poor water quality or poisoning. If the problems persist for a few days, it indicates a chronic condition due to parasites or bacteria.

Physical Examination of the Fish

Check the rate of respiration of the fish in the water and look out for cysts or patches on the skin.

Conducting Tests on the Environment

Test the tank water for levels of ammonia, nitrites, nitrates and phosphates. Check the oxygen levels, the temperature and the pH of the water. Any change in these levels can lead to toxicity, harming the fish.

Checking the Equipment

See if there is proper filtration to isolate pollution problems. Remove accumulated waste and algae growth, as they can be lethal for the fish.

Examining Fish out of the Water

Conduct a physical exam outside the water to check for parasites, condition of the skin and gills, as well as color of the eyes and mouth.

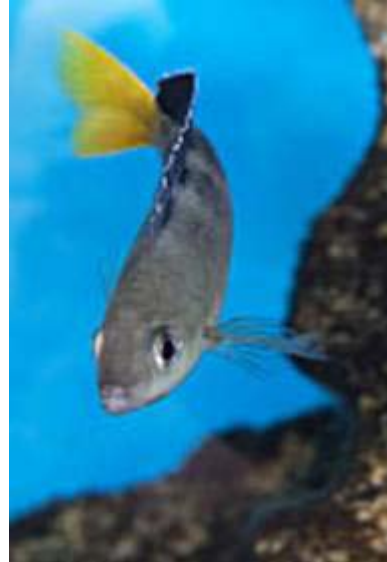
Taking Samples

Scrape a small amount of mucus carefully from behind the operculum and the dorsal fin and examine it for parasites. Examine the fecal sample for internal parasites. You can conduct a gill biopsy to determine its condition and to rule out parasites.

This step by step approach can help pinpoint the real cause of disease, and show what remedial action to take.

26. Why, When and How Fish Get Parasites

Fish are susceptible to attacks by parasites, which do not survive in natural surroundings. However in the closed confines of a tank they have a high survival rate. They find ready hosts and can spread from one fish to another.



Types of Parasites

Fish are prone to attacks by two main types of parasites. **Ectoparasites**

attack the external surface of the body and are visible to the naked eye. **Endoparasites** affect the skin tissues and organs and are visible only under a microscope. Fish affected by Endoparasites are sluggish.

Some worms enter the intestines and may emerge from the anus.

Natural Defense against Parasites

Fish have a natural mucous layer that they shed continuously, making it difficult for parasites to find a footing. This sheath secretes natural substances like immunoglobins and lysozyme that destroy the parasites.

However, if the surrounding water is dirty or toxic, fish lose their natural immunity and can fall prey to parasitic attacks. Bigger parasites like anchor worms or fish lice can get a grip despite the mucus layer.

Infections due to Ectoparasites

A parasite affliction in large numbers destroys the integument due to persistent attachment on the fish. This can result in bacterial infection in the gills that can develop in to breathing problems. Persistent action of Ectoparasites results in ulceration of the body and excessive mucus production.

Detecting a Parasite Infection

A fish in distress will itch and rub against the tank. The body indicates signs of redness and swelling especially at the bottom of the dorsal fin. The fish has difficulty breathing and is generally inactive. However these are general symptoms of illness, so you need to take mucus and gill samples to detect the parasitic infection.

There may be more than one type of parasite, and you need to identify the current stage in the life cycle of the parasite. Hence you need different treatments for an effective cure.

27. Fish Disease Control - Methods of Treatment

Diseases can affect your fish anytime. It is essential to have certain basic knowledge about different treatment methods to fight common diseases and infections. Yet, always consult your vet before administering any medication or treatment method. Follow your vet’s advice strictly.



Treatment Methods

Hospital Tank

The very first step in treatment of diseased fish is to isolate them in a separate tank, usually called a ‘hospital’ tank, so that infection does not spread to the healthy fish in your aquarium.

While transporting fish from aquarium to hospital tank, ensure the water temperature in the hospital tank is the same as that of aquarium. This reduces stress.

The hospital tank should have no live plants or substrate. Instead, you can make up for their absence with plastic plants and upturned flowerpots. Lighting should be dim or, preferably, keep the hospital tank in a semi-dark room.

Provide a reliable heater covered with plastic mesh to prevent heater burns. Some medications could reduce oxygen content of water, so use air stones to maintain the necessary supply of free oxygen.

A sponge filter or internal box filter is best for use in a hospital tank since it does not use carbon or other chemicals for filtration. Such chemicals reduce or negate effects of medications in use for treating sick fish. Refrain from using any strong power filter as water disturbances can worsen the condition of ailing fish.

Once your fish is completely cured, transport it back to the aquarium. Thereafter, disinfect your hospital tank with potassium permanganate or dilute hydrochloric acid. Allow the chemical to stand for two or three days and then clean the tank thoroughly.

Restore biological filtration after disinfection so that your hospital tank is ready for treating the next sick fish.

Heat Therapy

This therapy is best for use in clean tanks with an extensive supply of oxygen. Heat therapy treatment involves raising water temperature to kill parasites. Such increase in water temperature should be gradual, preferably an increase of 1°C each hour until the necessary temperature is obtained. Regular monitoring of fish condition is essential throughout heat therapy treatment. If you notice any side effects, discontinue treatment immediately.

Over the Counter Medications

Aquatic stores stock ready medications for a variety of fish diseases with prescribed method of usage. You can purchase and use these premixed and reliable medications for suitable treatment. Some common medications include **Chloramine** and **Acridavine** for fungal diseases, tail-rot, white spot, and as an effective disinfectant, **Formalin** for use in medicated fish baths, **Chloromycetin** for bacterial and viral diseases, **Mercurochrome** and **Potassium Permanganate** for treatment of skin diseases.

Baths

Short salt or chemical baths are a viable treatment method for curing your fish of diseases. Add necessary medications or chemicals like Formalin to water in a bucket.

The concentration of chemicals or salt and length of the fish bath depends on the specific ailment. Such baths prove beneficial for treating various disorders in fish.

28. Using Antibiotics to Control Fish Disease



Most fish diseases are due to bacteria. Bacteria are minute organisms and few of these bacterial species cause serious diseases. Such species could be gram-positive or gram-negative. Gram-negative bacteria like *Cytophaga*, *Pseudomonas*, *Aeromonas*, *Flavobacterium*, and *Vibrio* cause a variety of bacterial diseases like fin rot, ulcers, bacterial gill disease, chronic abscesses, and acute septicemia.

Bacteria can multiply into many millions within twenty-four hours. Bacteria contain toxins and produce extra cellular enzymes that harm healthy fish cells. They completely destroy the defense system of fish and therefore, immediate treatment is necessary to combat bacterial infections in fish.

The best treatment option for combating bacterial infections is through use of antibiotics. Antibiotics are chemicals that restrict or destroy bacterial growth. Antibiotics could be broad or narrow. Broad spectrum antibiotics prove effective against a wide range of diseases. Narrow spectrum antibiotics concentrate on specific bacterial infections and control it.

Common effective antibiotics include **amoxycillin** and **ampicillin**, **Nitrofurans** like **nitrofurazone** and **nifurpirinol** or **oxytetracycline** for use in bath treatments, and various **sulfonamide** antibiotics.

Antibiotics provide relief by:

- Destructing bacterial cytoplasmic membrane
- Restricting protein or nucleic acid synthesis and
- Preventing synthesis of bacterial cell-wall components

Conduction of antibiotic sensitivity tests and bacterial identification tests help confirm specific bacteria and use them for immediate and effective treatment.

29. Medicated Foods to Combat Disease

You can administer antibiotics for treating bacterial infections in fish through injections, baths, and medicated food. Medicated fish food is best for treatment of internal parasites. It reduces stress, as there is less or no handling of fish during treatment. Fish could require topical treatment in severe lesion cases.



Ready-made medicated fish food includes oxolinic acid-treated food. Bacteria show great resistance to such food. You should therefore use medicated food as prescribed by your vet.

Sometimes, a vet advises application of antibiotics to normal pelleted food.

You should be careful about the dosage to be applied, prevent antibiotics being washed away in water, and make it palatable for your fish.

Use of fish or vegetable oils can prevent any washing off of antibiotics and retain its palatability at the same time.

Preparation of pelleted medicated food requires it to be proportional to the weight of the fish.

Heat a little vegetable or fish oil and stir required amount of antibiotics.

Mix it evenly with the fish food.

Cool and divide food into equal pellets. Store it in a cool place and feed fish according to specific instructions of your vet.

Starving fish for twenty-four hours before starting treatment could prove effective. However, use of medicated food is not a very effective way of combating bacterial infections in fish. This is especially true if affected fish are few in number.

Use of medicated food proves to be the most practical if affected fish are huge in number and there are difficulties in catching them.

30. Malachite Green and Formalin as an Anti-Parasite Treatment



Malachite Green and Formalin are effective treatment options for various parasitic infections in fish. Although they are normally used together, they can also be used separately. They prove effective against gill flukes, white spots, skin flukes, Costia, Chilodonella, and Trichodina. Malachite Green

and Formalin treatment has low filter toxicity and presents a high success rate amongst most parasitic infections.

Malachite Green is a powerful anti-fungal agent. It can prove useful as a prophylactic treatment to protect fish-eggs from infection or treat Saprolegnia present on fish. In most fungal fish infections, the main cause is bacterial infection and fungal infection is a result of



such bacterial infection. Therefore, it is essential to treat the bacterial infection for Malachite to take effect on fungus.

Individually, Malachite green and Formalin are toxic poisons. Formalin is a powerful disinfectant beneficial for killing microorganisms and can also be used as a preservative for biological specimens. It reacts with nucleic acids and cell proteins and causes serious alterations in their cell structure and functions.

Malachite green and Formalin together have a greater effect on parasitic developments in fish. Turning off UV lamps during treatment can produce favorable results. Similarly, turning off the filter system for a few hours during treatment procedures can yield effective results. Formalin proves toxic in soft acidic water and can remove oxygen fast. Continuous aeration is therefore very essential. Malachite Green is toxic at high temperatures and in water with low pH levels.

31. Using Salt to Prevent and Treat Freshwater Fish Disease

Humble table salt is an effective treatment for a number of fish diseases. Using salt clears the gills, heals body ulcers, and kills parasites like **costia** and **Ectoparasites** like fluke and can limit the intake of nitrites.



However, you cannot use salt for fish without scales. Avoid adding salt if you have plants in the tank as it harms them in the long-term. Common table salt that is non-iodized is suitable to treat some freshwater fish diseases.

Treatment of Fish Disease

Make a 3% salt solution for a dip, to remove parasites from the fish. For this, dissolve four teaspoons of salt in one gallon of water and put the fish in this for a maximum of half an hour. The salt solution reverses the osmotic gradient and water flows out of the parasite, dehydrating the life out of it.

To remove nitrite poisoning you can make a bath of 1% salt solution that lasts for three weeks. Add three teaspoons of salt for every gallon of water and mix it with some amount of water from the tank. Then gradually add this salt solution to the tank and change a quarter of the water each week.

You can use a less concentrated salt solution to relieve stress. This salt solution decreases the osmotic difference and water flows into the fish giving it relief.

A salt solution again changes the osmotic gradient and reduces water entry in to the fish skin, alleviating the distress caused by bacterial ulcers.

Remember that salt should mix completely in the water to prevent burning the fish. Oxygenate the water and remove the fish immediately if it shows signs of stress.

32. Be Careful While Treating Fish Disease



Fish are very sensitive beings and can die due to overexposure to chemicals. As an aquarist you must be careful in selecting the right dose of medication when treating fish disease. The dose must be just right to kill the parasites without

harming the fish. Any miscalculation in the dosage can kill the fish. Avoid a blanket approach to treatment by subjecting the fish to several medications, hopeful that one will work. This can cause stress and harm the fish more than anything.

Ensure that the medication works in the given pH and hardness of the aquarium tank. Several medications lose their effectiveness on reacting with waste and algae. If it fails, try another treatment. Hence go for appropriate diagnosis, give the medicine in the right dose and then follow up to check the success of the treatment.

Precautions While Treating Fish Disease

Take the following precautions when treating fish disease, to ensure their quick recovery. Make sure that the added medication does not reduce the oxygen saturation of the water. Switch off ultraviolet lights as the radiation can change the chemical composition of the medicine. Keep the tank away from strong sunlight for the same reason.

Observe the behavior of the fish under treatment and stop treatment immediately if you notice distress. Cover the tank with a net to stop the fish from jumping out.

Part-IX: Aquarium Maintenance

33. Aquarium Maintenance



Regular maintenance of the aquarium is the key to retaining the aquatic creatures health. There are a few tasks that you have to do regularly such as checking air pumps operation, feeding the fish, checking water temperature, etc., for their healthy maintenance.

When you get habituated of these new denizens, you would also be able to understand their behavior. It is important to monitor the behavior pattern of fish because they are sensitive animals and even a minor change may prove fatal for them. Removing debris from the tank is yet another important task as it may contaminate the water if you do not take adequate care.

For thorough cleaning of the aquarium you are required to do a number of things. The first among them is to turn off all the electrical appliances of the tank.

Water quality should be tested weekly and if required you can partially change the water. Freshwater helps in diluting the pollutants produced by fish excreta and left out food materials. Some plants may need slight pruning every few days.

Clean the condensation tray every week to ensure proper maintenance. Cleaning the filters and the aquarium in a few weeks

is good enough for the fish. Make sure you also remove the unwanted algae deposition periodically.

Remove the pebbles from the aquarium to clean the gravel. Use gravel cleaner as it helps in cleaning the water without clouding it. Periodic gravel cleaning is required for keeping the under-gravel filtration system in working order.

Use old aquarium water for washing internal filter sponges. Chlorine, present in the tap water may destroy the beneficial bacteria settled on the filter. Wash the filter sponges only to get rid of the clogging debris.

De-chlorinate the fresh water before refilling the tank and adjust the water temperature such that it is equal to the temperature of the aquarium water. Thus, maintain a regular cleaning routine to keep the fish healthy and in good shape.

34. Cleaning Your Freshwater Fish Aquarium

You need to clean the aquarium regularly to keep its inhabitants healthy. Factors such as heavy fish loads and overfeeding contribute greatly in making the water unfit for the fish.



You should clean the aquarium and add freshwater to it after every few weeks depending on the fish load.

Before you start cleaning the aquarium, turn off all electrical appliances connected to it. This reduces any risk of an electric shock. Clean the algae deposition on the aquarium glass through a scrubber or magnet. Do not leave any dead leaf or a dying branch in the water. Trim the plant proportionately if you notice an excessive growth.

Sometimes, even salts or minerals deposit on the edges of the tank wall. You can remove such depositions through a scrubber. Vinegar also is effective in removing stubborn deposits, but make sure no remains of the chemical are left in the aquarium.

Change the aquarium water from 15-40% depending upon the level of dirt it contains. If you have not changed the water for a long time do not add a high percentage of freshwater into it. If done so, the fish may not acclimatize themselves to the sudden change.

Part-X: Breeding Tropical Freshwater Fish

35. Breeding Techniques for Tropical Freshwater Fish

To breed fish in your aquarium, acquaint yourself with the different species suitable for breeding and learn how to simulate natural conditions for spawning in the aquarium.

Classify the Gender

First, learn to identify the gender of the fish. Some species have distinct differences while other species have fine distinctions between the sexes. In the latter type, you can detect the gender only by the size of the genitalia during spawning times.



Choosing a Pair

Select a good pair of the same species for spawning so that the progeny produced is attractive. Avoid hybrids and unhealthy fish as the offspring may be deformed and may not survive.

Classification of Fish Based on Method of Reproduction

Five Types of Egg bearers.

- 1) Egg scatterers lay a large number of small eggs on plants or the substrate and do not take care of them. They might even consume them.
- 2) Egg depositors lay a small number of larger eggs on the substrate. Some species like catfish care for the eggs while a few like Killifish abandon them. Among those who care for

eggs, some lay eggs in a cave while others lay them in the open.

- 3) Egg buriers like Killifish lay eggs in the dry mud yearly at maturity. The parents die and the eggs hatch with the first drops of rain.
- 4) Some species breed fry in the mouth. A few ovophiles like cichlids lay eggs in the mud and the mother then sucks them up. They are fertilized externally and hatch in the mother’s mouth.
- 5) A few **larvophiles**, like eartheaters, deposit eggs on the substrate and then keep the larvae in their mouth. Once the fry are big enough, the mother releases them.

A few species like labyrinth fish build nests out of bubbles and look after the fry there.

Other fish bear live young. **Ovoviviparous** species the eggs hatch inside the female and in **viviparous** fish the female gives birth to a live fish.

Prepare Fish for Spawning

The next step is to feed the fish high quality food like insects, and brine shrimp that prepares them for spawning. You can also stimulate rain-like conditions to initiate spawning.

Creating the Spawning Tank

It is advisable to have a separate tank to ensure the good health and survival of the fry. The tank should have water at an optimum temperature, a heater and a slow moving filter that does not harm the eggs. You should modify the tank with substrate, cavities or plants, depending on the breeding habits of the fish as described

above. It is best to remove the eggs to this tank to ensure their survival. For species that care for their young, shift the parents and the eggs to the spawning tank for best results.

Taking Care of the Fry

You can rear the fry in the same spawning tank and feed them infusoria. Cover the tank with black paper to protect the fry from developing fungal infections. As they grow you can feed them daphnia, dry flakes and micro worms. Change a quarter of the water daily and feed the fry several times a day for optimum growth.

36. Food for the Offspring



Fish offspring need a nutritious diet so that they grow up healthy. You also need to feed them more frequently compared to adult fish. You can feed the offspring live food or frozen live food thawed properly. Daphnia, micro worm, brine shrimp, and earthworms are some of the live feed that you can give to the offspring. You can feed the herbivores blanched spinach or lettuce leaves. To avoid contamination of the aquarium tank, it is best to feed the offspring live food cultured in the home. Always clean the tank periodically of any uneaten food to avoid its decomposition. Most importantly, buy food for the offspring from a reputed aquatic supplies shop.

Here is some live food that you can produce as cultures yourself. You can start by feeding the offspring infusoria of organisms obtained from decomposing animal or vegetable matter. It is easy to make infusoria by keeping some vegetable in a jar of tank water. The airborne spores germinate within no time and you can directly feed them to the offspring.

After this you feed the offspring brine shrimp. To hatch brine shrimp buy their eggs from a shop and place them in a bottle half-full of tap water. Add some salt to it and put a small amount of eggs in to it. The eggs hatch in airtight conditions after a day and a half. Use a pipe to draw the newly hatched brine shrimp, wash them and then feed them to the fry.

Another good feed is micro worms. Take some porridge and add a culture of micro worms that you get from a shop or from a friend. Cover it and keep it in a warm place and you will have worms coming out of the container after some days. Clean them and feed it to the offspring. Gradually start the fry on dry food, along with the live feed. Ultimately you can feed the offspring an optimum combination of dry and live food, depending on your judgment.

Part-XI: Care during Vacations

37. Vacations and Your Freshwater Tropical Aquarium Fish

If you are going on a vacation but the worry of your colorful, sensitive fish is not letting you rest in peace, you should take a sigh of relief as numerous new facilities have come up to help you.



Seashell vacation feeders are designed like a white seashell and are very helpful in feeding the fish for 10 to 14 days. Battery operated feeders are also available on the market. You can set these handy feeders for two feeding times. These feeders supply enough flake food that could sustain the fish for over a week. You can also go without making proper feeding arrangement for the fish if you are going for a vacation of 2 to 3 days.

If you are going for a week or longer make sure that you change the aquarium water up to 20%. Changing the water a day before you leave is enough to keep the pollution level to a tolerable limit. Adjust the other functions so that these dependent creatures may not face any problem while you are away. Once they adapt themselves to the tank life it will be hardly a matter of concern for you even if you are not there for a few days, to take care of them.

Part-XII: Aquarium F.A.Qs

38. Aquarium Frequently Asked Questions

How many fish can an aquarium tank hold?

Normally, we emphasize an inch of fish per gallon of water. However, this alone is not sufficient to calculate the number of fish that proves best for an aquarium tank. Various variables like the dimension of the aquarium tank, type of fish you intend keeping, number of live plants within, and similar features play a huge role. Live plants consume nitrate and it is possible to accommodate more small fish in such an aquarium tank.



What water is best for an aquarium tank?

Plain tap water is best for an aquarium tank. You can use water conditioner to remove chlorine present in water. Check pH content of the water by using a pH kit. Fish adapt best with pH levels ranging between six and eight.

How often is it necessary to clean my aquarium?

Frequency of aquarium cleaning depends on the type and size of the aquarium, number of fish within, filtration equipment in use, and cleaning procedures. One popular cleaning technique is to change ten percent of the water every week.

In aquarium tanks with an under gravel filter, bare-bottoms, or with gravel at the bottom, vacuuming out accumulated debris while changing the water is essential. You must change and clean filters every fortnight. However, never clean biological filter media, as it supports the beneficial bacteria population within the aquarium. If there is any clogging in the biological filter media, flushing with a bucket of aquarium water is best. Algae removal can be according to necessity. Refrain from excessive cleaning, as your hand or other cleaning equipment resemble predators and cause stress to fish.

How do I remove white deposits on aquarium tank and filters?

White deposits on the aquarium tank and filters are calcium carbonate. These are alkaline in nature and treating them with lime juice is best. White vinegar is also a good option. However, do not use any chemicals, as these could harm your fish if they come in contact with aquarium water.

How to detect pregnancy in fish?

Livebearer varieties of fish like platies, guppies, and swordtails produce babies. Females of these species develop a heavier abdomen with a dark spot at the base. This proves to be an indication. In other varieties of fish, females lay eggs and males fertilize them later.

How to protect young Fish?

Normally, parent fish and other fish in the aquarium eat fry. Therefore, use a special plastic rearing chamber or a breeding net to keep fry separate from other fish in the aquarium. You can hang this in the aquarium. Adding many live plants or fine-leaved plastic plants can provide many hiding places for fry.

How often should I feed fish?

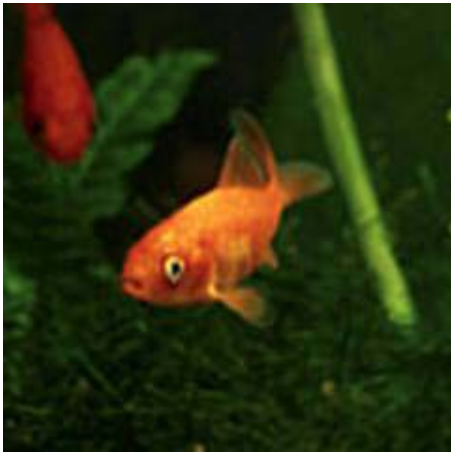
Fish need food every day or on alternate days. The amount of food should be the equivalent to the amount they can eat in two minutes. The stomach of fish is very small, just the size of its eye. Notice the amount of food your fish really consumes as sometimes it will keep gobbling food and thereafter spit it in the water. Food leftover in water rots and causes many diseases.

Is it necessary to have an aquarium heater and thermometer?

An aquarium heater is a thermostat and regulates water temperatures when necessary. Fish cannot tolerate temperature fluctuations in their water. The heater maintains controlled temperature and ensures suitable water conditions for fish to live without any stress. An aquarium thermometer in your tank can indicate if your heater is working properly.

Part-XIII: Glossary

39. Freshwater Fish Aquarium Glossary



Acidity: Amount of hydrogen ions in water determines its acidity

Aeration: Presence and circulation of air

Air pumps: Provide continuous supply of water

Algae: Most common plant present in an aquarium. Different chemical

treatments, scrappers, and brushes help in its removal.

Alkaline: Amount of hydroxide ions in water determines its alkalinity.

Ammonia: Chemical compound containing hydrogen and nitrogen and among the first compounds present in an aquarium

Aerobic: Availability of oxygen for existence

Anaerobic: Living without oxygen, situation most commonly associated with harmful bacteria

Beneficial Bacteria: Useful bacteria in aquarium aiding conversion of ammonia to Nitrite



Biological filtration: Breaking down of toxic compounds like Nitrogenous toxins

Brackish waters: Freshwater with small percentage of salt

Bubble Nest: Nest commonly used by anabantids, suspended by a weave of tiny air bubbles forming protective covering for eggs and newborns or just hatched

Buffer: Substance used for counteracting water changes

Canister Filter: Filter containing filter media like polyester, filter floss, or carbon.

Carbon: Activated medium in aquarium that helps break substances dissolved in water

Carbon dioxide: Byproduct from respiration, essential for maintaining live plants in aquarium

Chlorine: Toxic element in aquarium water, can be removed through water conditioners

Cloudy water: Rapid growth of algae spores and bacteria due to nitrogen cycle makes aquarium water turn cloudy and foggy

dGH: Abbreviation for degree of hardness of water

Diseases: Ailments that affect fish in aquariums like white spot, fin-rot, Dropsy, and fungus

Drip loop: Prevents water from going into electrical outlets

External filters: Filters located outside the aquarium tank

Filtration: Process of removing waste materials from aquarium water.

Filter medium: Helps trap suspended waste in aquarium water

Fishless Cycle: Use of liquid ammonia in a new aquarium in place of few hardy fish

Freshwater: Water without any salt content

Fry: Baby fish

Flakes: Fish food

Gravel: Basic bedding material for aquariums

Gonopodium: Modified and elongated anal fin in male livebearers for fertilizing female fish

Heater: Helps maintain suitable water temperature

Impeller: Equipment for pumping water through filtration system.

Internal filter: Filter placed within aquarium

Killifishes: Fish that live for a year only

Labyrinth fish: Anabantoid Fish

Live-bearers: Fish that deliver live young ones instead of laying eggs and later fertilizing and hatching

Medication: Medicines to cure fish ailments

Mechanical filtration: System of trapping fish waste present in aquarium water

Milt: Sperm

Nitrate: Toxin generated through nitrogen cycle in aquarium

Nitrite: Compound generated during nitrogen cycle

Peat: Moss for softening water and reducing pH content

Phosphates: Byproduct of decaying matter in aquarium water

pH: Determines acidity or alkalinity of water

Plants: Live or plastic plants in use in aquarium

Power filters: Filter with high water flow rate

Substrate: Gravel and sand used to prepare aquarium bottom

Stress: Trauma or strain for fish

Water: Main constituent of an aquarium

Water hardness: Shows extent of presence of calcium and magnesium in water

Water-turnover: Rate of flow of water through specific filters

Zeolite: Ammonia removing substance

