# BHARATHIDASAN UNIVERSITY

Tiruchirappalli- 620024,
Tamil Nadu, India.

## Programme: M.Sc., Marine Biotechnology

**Course Title : Marine Biotechnology**

**Course Code: 21EC3a**

## Unit-II

## Introduction to Ornamental Fish Culture

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# INTRODUCTION

Ornamental fishes are attractive colourful fishes of various characteristics, which are kept at homes in confined space of an aquarium or a garden pool for fun and fancy. Introduction Ornamental fishes are also called **"Aquarium fishes''**

**(or)**

Ornamental fish culture is the culture of attractive, colourful fishes of various characteristics, which are reared in a confined aquatic system.

The culture of ornamental fishes is called as aquariculture.

Ornamental fishes are also called **"Aquarium fishes''**.

Farmers and hobbyists mainly grow it, Therefore they are also known as living jewels.

# ORIGIN OF KEEPING ORNAMENTAL FISHES AT HOME

Originated with keeping of gold fish in glass bowls in china.

World first aquarium started in England in 1853.

In India this hobby of keeping ornamental fishes bloomed with the opening of the Tarapore aquarium in Mumbai in 1951.

## WHY SHOULD WE KEEP THEM?

Ornamental fish give pleasure to the eyes and relaxation to mind.

Develops a sense of attachment with nature.  Ornamental fishes add to the beauty of the home and surroundings.

## AQUARIUM SET-UP

Proper site selection **(convenient water source, electricity, water drains, etc.)**

Need GFCI - Ground Fault Circuit Interupter electrical outlets

Strong supports and tank cushion

Add water, then substrate and filter • Aeration and heater

Accessories **(covers and lights)**

## Plants of the aquarium

Rooted plants **a.) Vallisneria b.) Sagittaria**

Cuttings **a.) Fanwort b.) Hygrophila c.) Limnophila**

Floating plants **a.) Lemna b.) Riccia c.) Salvinia**

# MAINTENANCE

## The place and the stand

Select the place where the temperature is the most stable during the whole year.

Another aspect is the aquarium stand.

Usually a marine aquarium is very heavy because of the amount of the water.

The stand has to be strong.

## Feeding

The general rule is to feed small amounts frequently.

Balanced food which consists of proteins, fat, vitamins, minerals and carbohydrates.

Most aquarium fish are fed on industrial food, which has the form of flakes or granules.

But you should feed them with natural food also.

**Natural food:** It covers plants, protozoa, gnathostoma, coelenterates, larvae of mosquitoes and crustacean , shrimps, flies, coelenterates etc.

Homemade food: minced meat, leafy vegetables, lightly boiled and minced.

Fish shouldn’t be fed on the same diet for long periods.

## Factors Involved

**-Temperature**

**-Lightning**

**-Salinity**

**-pH**

## Factors Involved

Temperature stress is one of the leading killers of aquarium animals.

Ideal range for a freshwater tank = 77 to 83F.

Ideal range for a saltwater tank= 76 to 82F.

At the Summer you need a chiller and during the Winter you need a heater.

## Lighting

If aquarium doesn't get sunlight then artificial lights are used.

If you use normal wolfram bulbs, the water could overheat.

The light should be in the form of long fluorescent tube.

## Salinity

Salinity is a measure of the total amount of dissolved salts in seawater.

Measured in parts per thousand **(ppt)**.

The average salinity of the ocean is around 34 to 37 ppt.

Refractometers and hydrometers can be used to estimate salinity in marine systems.

## pH

1) **pH level in saltwater systems**= 7.6 - 8.4.

The normal trend for pH in a tank is more acidic.

These acids come from several sources, the primary ones being

excess carbon dioxide **(CO2)** from respiration
nitric acid from biological filtration **(nitrification)**
organic acids from metabolic wastes.

2) The optimum pH for a freshwater community tank

pH value between 6.5 to 8.0 .

In checking the pH of the local supply water, either let a cup of tap water stand for a day or two or simply check the aquarium water itself a few days after setup.

It is still valuable to check the pH periodically!

## Components

**Filtration system**

**Artificial lighting system**

**Heater or chiller**

## Filtration system

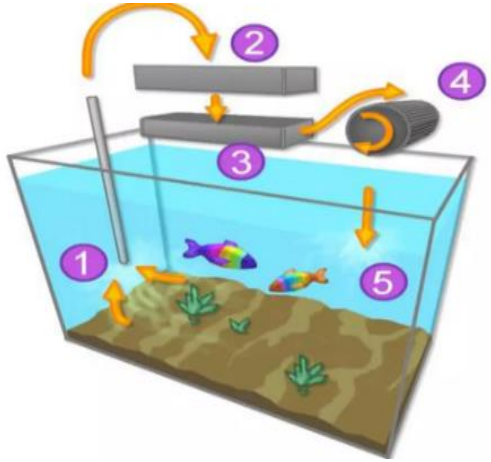
Purpose- To clean the water of debris and suspended particles, remove ammonia and nitrites and aerate the water.

Working- Most aquarium filters are divided into three sections

**i) Biological**
**ii) Mechanical**
**iii) Chemical.**

Filtration system in a typical aquarium

1 intake
2 mechanical filtration
3 chemical filtration
4 biological filtration medium
5 outflow to tank



## 1) Biological

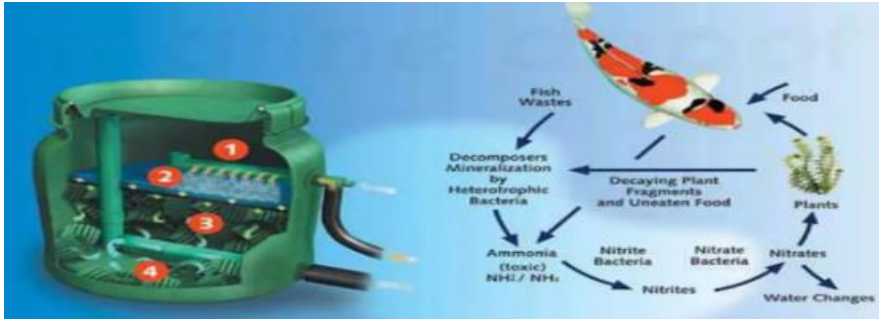
An aquarium filter is a breeding ground for two main types of bacteria.

The first type of bacteria breaks down the potentially very poisonous ammonia that fish produce into less harmful nitrites, and then a

second type of bacteria breaks down the nitrites into even less harmful nitrates.

Uses bacteria to convert ammonia to nitrite and then to nitrate

Crawfish and snails help keep tank clean



## 2) Mechanical

Removes large suspended particles of debris from the water

## 3) Chemical

The purpose of this is to remove medications and heavy metal traces from the water.

Some aquarists use air pumps or water pumps to increase water circulation and supply adequate gas exchange at the water surface.

Chemicals include ozone, ultraviolet light, activated charcoal, and special chemicals

## Benefits of an Aquarium

Sit back and relax.

Reduces stress and lowers blood pressure.

Reduces the experience of pain.

Alzheimer's and aquariums……..

## SPECIES SELECTION FACTORS

Temperature – tropical versus temperate

Salinity – freshwater, brackish, or saltwater

Reproduction – livebearers versus egg-layers

Size – size of fish needs to match tank

Feeding habits – carnivores, herbivores, or omnivores

Behaviour – some species are aggressive

Physical appearance – some species are “fancy” **(unusual color, shape, etc.)**

# GOLD FISH

**Scientific Name:** *Carassius auratus*

**Attainable Size:** 59 cms

**Origin:** Central Asia, China and Japan.

**Environment:** Fresh water Water

**pH:** 7.5 to 8.5

**Temperature:** 17 to 28°C

**Company:** Can be kept with other large nonaggressive species if aquarium is large enough to accommodate

**Aquarium:** As it grows big, it requires a large aquarium. A well planted aquarium is preferred. It is a bottom dweller.

**Feed:** Omnivorous, accept dry food, likes to eat small insects and also like vegetable food. Gold fish feeds on a large variety of food

**Breeding:** Gold fish breeds easily in garden ponds and also in spacious aquariums with plenty of oxygen and feathery leaves. A substrate spawner is necessary as the parents eat their own eggs. It is preferred to remove the parents after spawning.

# MOLLY FISH

**Scientific Name:** *Mollienisia lapipinna*

**Environment:** Fresh and brackish water

**Attainable Size:** 4 inches to 5inches

**pH:** 7.0 to 7.5

**Origin:** Mexico, Gulf coast respectively.

**Temperature:** 70 to 80°F

**Company:** Mollies require plenty of space and react badly to over crowding,

**Aquarium:** Aquarium should be so placed as it receives a lot of sunlight. It should be large, well lighted and thickly planted.

**Feed:** Although Mollies prefer vegetarian foods, it exhibits omnivorous food habit.

**Breeding:** Mollies are live bearer.

## ANGEL FISH

**Scientific Name:** *Pterophillum scalare*

**Attainable Size:** 6 inches

**Environment:** Fresh water Water

**pH:** 6.5-6.9

**Origin:** It originates from the slow flowing rivers and streams of South America Feed:

**Feed:** It accepts most prepared food

eg. Flaked food, black worm, chopped earth worm and several dried food.

# KOI CARP

**Scientific Name:** *Cyprinus carpio*

**Environment:** Fresh and brackish Water

**Attainable Size:** 48 inches

**pH:** 7. 0 -7.5

**Temperature:** 3 -32°C

**Feed:** All kinds of food.

**Company:** Can be kept with most large nonaggressive species

**Aquarium:** Requires a very large aquarium with a lot of space to swim on the surface. Areas with plants are appreciated if your aquarium can support both plants and open area.

**Breeding:** Females are rounder in spawning condition. Move eggs to a separate aquarium since parents eat them.

# SIAMESE FIGHTER FISH

**Scientific Name:** *Betta splendens*

**Attainable Size:** up to 75 mm

**Origin:** Myanmar, Thailand, Cambodia and indeed entire South East Asia

**pH:** 6.5-7.5

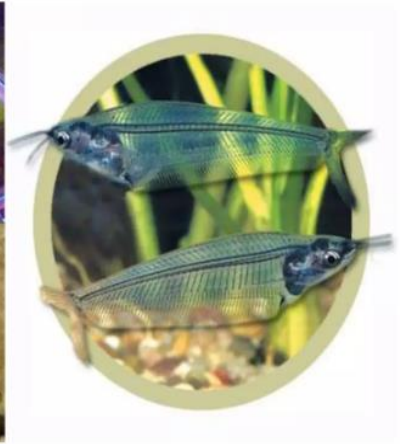
**Temperature:** 24-29°C

**Company:** Usually aggressive to other male mates, can be kept with other species

**Feed:** Omnivorous. Small live and dried food, flake food and chopped earthworm

## EASY-TO-GROW SPECIES

## MEDIUM-CARE SPECIES



## DIFFICULT-TO-GROW SPECIES

## ORNAMENTAL AQUACROPS

Multimillion dollar industry

Primarily for recreational purposes

Also for education and research

Two main areas are fish keeping and commercial production

Fish keeping is caring for ornamental fish species as a hobby

Commercial producers breed and market organisms for the fish keepers

## World trade of ornamental fish

According to OATA Statistics 2015 the value of import in European countries was € 78.2 million in 2015.

UK is the largest market of the ornamental fishes, importing 27.8% of total fish import in European countries.

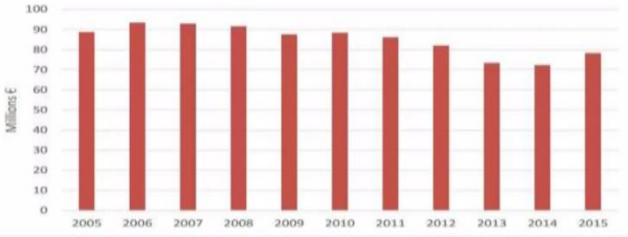



**Figure 1. Total value of freshwater and marine ornamental fish imports into the EU between 200 and 2015 (in million €)**

## Advantages

Can be additional source of income.

They can provide opportunities for saving certain species from extinction e.g. Skiffia francesae

## Limitations

Require skilled person.

Some species are too large and require much space.

Small aquarium are hard to maintain.

**References:**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# THANK YOU