

## Laboratory Procedures in Disease Diagnosis For Aquarium Fishes



### Fishery

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### ABSTRACT

*In the present paper the various methods have been discussed in short for diagnosis of aquaria fishes. In the case of aquarium fish it may not be possible or desirable to provide more than one specimen for disease diagnosis, and in most cases specimens was submitted alive, with the aim of seeking a cure. Samples need to be taken from the fish for examination for possible viral and bacterial agents and to examine for changes in the tissue and organs using histological techniques. Only fish that were alive at the time of arrival at the laboratory would usually undergo full post mortem examination, although fish dead on arrival had been used for partial sampling.*

### 1. Introduction

The health status of fish kept in a range of managed systems, e.g. farms or aquaria can be monitored by studying the behavior of the fish. If there were fish showing unusual signs, a few moribund fish should be sacrificed and examined on site for gross abnormalities. However, in situations where each fish is of high monetary value, such as Discus, or of sentimental value, such as pet gold fish, then sacrificial sampling may not be desirable [1].

With a little experience, it is often possible to recognize clinical signs of disease and consult expert advice where appropriate. If an infectious agent is causing the disease, it is important to isolate and identify it as quickly as possible. There were some rapid diagnostic tests available that can be used to identify certain fish pathogens. In the case of aquarium systems, the often low monetary value of the stock means that a veterinary surgeon or other fish health expert was often not consulted. Instead, many aquarists attempt to make their own diagnosis, often incorrectly, sometimes resorting to unorthodox medication as the basis for treatment.

If the sampling and post mortem examination was made in the laboratory, there were several advantages of site investigations: the pathologist can discuss the background of the problem with the farmer, husbandry personnel, fishery owner, aquarium keeper or aquarist and establish if there were any problems with water quality and husbandry that might be associated with disease. Records of fish movements onto and off the site can also be scrutinized. In addition, the samples can immediately be obtained from the diseased fish and where appropriate samples dispatched by to laboratories. There were however, several disadvantages associated with examination on site. Sites, facilities and weather conditions were not always favorable for post mortem examination and sampling, and the lack of sterile conditions may increase the chances of the samples becoming contaminated [2].

In the present paper, selected samples of live fish were sent to the laboratory for examination, either using a pathogenic fish were placing them in water filled polythene bags. For the latter method the fish bags were one-third filled with water. The other two-thirds of the bag were filled with pure oxygen. Maximum transport time depends on water temperature and the ratio between biomass, water volume and oxygen. As a rule, transport time should be no more than a few hours and the biomass should not exceed one-third of the water volume.

### 2. Materials and methods:

#### 2.1 Submitting a sample to the Laboratory

##### 1.1 Submitting a sample to the Laboratory:-

When submitted a sample to a laboratory there are several things that could be done to ensure the best possible service. Firstly, the actual samples submitted for the post mortem examination (see plate 1.1 to 1.4) should be obtained during the mortality, and be representative of the diseased or moribund fish showing systems. It is always preferable that we should view the fish actually on site.

We had deal with post mortem examinations using a set of procedures and protocols. After an initial visual examination for gross disease symptoms a thorough inspection for possible parasites and fungal pathogens was made. Most parasites could be identified to genus level with a reasonable compound microscope and knowledge of the key features for identification.



Plate 1.1(A): Post mortem examination of infected gold fish  
[*carassius auratus*]



Plate 1.2(B): Post mortem examination of infected fish white molly  
[*poecilia sphenops*]

#### 1.2 Initial examination:-

In situations where on-site examination of the fish was not possible or practicable then analysis were be carried out in the laboratory. Prior to dissection, and abnormalities observed on body surface [see plate 1.5,1.6,1.7]. The condition of the sample and characteristics of the mortality were assessed, in order to determine the extent of sampling necessary. If specimens within the sampled population were showed classical signs of bacterial infection, and this was considered to be directly responsible for the mortality, bacteriology samples only were taken. If initial diagnosis proves inconclusive, a full post mortem examination was conducted, and a decision made during a second assessment on which fish samples to process further. This was hoped, prevent unnecessary time and expense being spent processing

samples that were of little help in the diagnosis.

### 1.3 Euthanasia:-

There was overwhelming evidence to suggest that fish were capable of experiencing pain and stress, and hence the method of killing must be humane.

### Discussion:

In present primary findings the following diseases were prominently find out. These were further made sure by using systematic tools and technology. These diseases are as follows taking the primary symptoms in mind.

### Columnaris:

Ornamental fishes were shows white marks or patches on the body of the fish or around its mouth are the first obvious signs of Columnaris. These patches appear like threads, especially in the vicinity of the mouth. Hence, this is often confused with another disease called "Mouth Fungus". Columnaris disease is caused by bacteria [3], and is mostly a direct result of poor water quality.[ 4] Sometimes, the shock of being introduced to the new aquarium leads to Columnaris disease in newly imported fish. Anti-bacterial medications will be enough if the disease is discovered and treated at its early stages. The disease will however invade the internal organs during the later stages and antibiotics are then required to cure it.

### Gill Disease

Gill disease make the fish appear to be swimming in a great hurry, but it does not move at all. The fins flap very fast, and the fish gasp for breath at the surface, or lie listless at the bottom. The gills become swollen and discolored. Bacteria, fungi and parasites in water can cause gill disease [5-6]. The first step in the treatment is therefore an immediate improvement in water quality.



Plate 1.3 (C) : sick gold fish (*carrasius auratus*) showed nodules on head



Plate 1.4(D) : sick gold fish (*carrasius auratus*) showing lethargic behaviour

### Dropsy :

The common physical characteristic of this disease is a hollow or swollen abdomen. The fish's scales may stand out in these swollen areas. It is easy to mistake such fish for pregnant females. The fish appear listless and lose appetite. Viruses as well as bacteria can cause dropsy [7-8]. Bad water or infected food is things that can lead to dropsy out brakes in your aquarium. Once the damage reaches the kidney, the condition becomes almost incurable. The disease must therefore be caught early if you should be able to save your fish. This disease is unfortunately very difficult to cure even if discovered early.

### Fin-rot:

As the name suggests, fin rot causes the fins to turn opaque and they may even become blood-streaked. The erosion of the fin may continue till it reaches the base of the fin. At this point, the fish dies. The bacteria that cause this generally do not affect healthy fish. When fish are stressed, or when the fins have already been damaged due to excessive fin nipping, then the disease takes root. Commercially available anti-bacterial medicines have to be used to treat the fish. [9]

### Fungal Infections:

The spores of fungus are always present within the aquarium, and can become infectious when the fish already have damaged gills or skin Fungal infections are typically secondary infections. White, cottony growth on the body of the fish is the main physical symptom Anti-fungal medicines are usually the best option to fight the infection. Most of the anti-fungal medications available on the market also fight bacteria, thus providing double protection [10].

### Pop-Eye:

The name suggests the physical symptom. The fish's eye starts to enlarge and looks almost as if it is ready to pop out of the body. The cause could be bacteria. Too much dissolved oxygen in the water may also lead to this condition. There is no universal cure. Isolate the fish, and treat it with general anti-bacterial medicine.

### Cloudy Eye:

The eye becomes cloudy almost to the point of whiteness and the fish lose vision. The causes behind this disease can vary. An increase in parasites in the aquarium is the most common cause but severe stress [11] old age, or malnutrition can all lead to this condition. Treating this condition requires an investigation of water quality. Once the water quality is high enough, the fish will usually recover by them selves within 1-2 weeks. Thus, it is advisable to wait for 1-2 weeks before administering antibiotics.

### Swim Bladder Disease:

This mostly affects fish that have a globoid body shape. A loss of buoyancy is one of the first indications. The fish stays at the bottom of the aquarium, unable to rise, or float at the surface only. This is due to the fact that the swim bladder is what helps the fish to remain buoyant. Any damage to this membrane causes this disease. There is considerable debate about the cause of this disease and the best way to cure it.

### Fish Lice:

Small, white lice are apparent on the body of the fish and the fish rub themselves against the hard surfaces in the aquarium. Red spots or sores develop. The best way to treat fish lice is to remove the lice using a set of tweezers [12]. Siphon the substrate daily to get rid of eggs. If the infestation is heavy, medication will be needed.

### 1.4 Detailed external examination:-

Fish should be placed on a dissecting board and the external surfaces thoroughly examined especially the fins and fin bases, noting any lesions, gross abnormalities and visible parasites along with lethargic behaviour. A skin scrapes is taken from the anterior dorsal surface of the flanks ventral to the pectoral fin.

These skin scrapes were in some cases nutritional deficiency

leads to deform body organs examined as described above [see plate 1.8]. Other sample sites should include the posterior side of fin bases and the edges of any lesions/abrasions present. It was also useful.

### 1.5 External bacteriology sampling:-

The presence of any lesions was necessitating. The bacterial swab was taken, when numerous lesions were found, the smallest one showed typical characteristics was chosen for swabbing. To reduce numbers of environmental background bacteria, any lesion swabbed was liberally flooded with 70% industrial methylated spirit (IMS) and dried in air. An incision was then made with a sterile scalpel across the lesion, cutting to the outside of the lesion into healthy flesh. A swab was then drawn across the resultant cut, from the inside of the lesion out into healthy tissue, rolling the head of the swab. The swab was then placed in a sterile container and any bacteria it contains were increased in number by swabbing on Petri dishes containing an appropriate culture medium.



Plate 1.7 :Fin rotting and scale loss in gold fish[*carrasius auratus*]



Plate 1.5(E) : Abnormalities found on body surface and drop like sign at belly in gold fish (*carrasius auratus*)



Plate 1.8 : Hiding behaviour were found in gold fish[*carrasius auratus*]



Plate 1.6(F) : Abnormal swimming and deformities found in muscles

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