

The common diseases of freshwater ornamental fishes and the treatments applied by local fish owners in Puerto Princesa City, Palawan, Philippines

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Supplementary Information

The 39 diseases with external symptoms used during the survey.

Diseases with external symptoms	Symptoms
1. Anchor worm	Anchor worms are an external parasite of tropical fish which look like white cotton threads 1/8 to 1 inch long hanging off the body or fins of a fish. The short white threads move with the current, which distinguishes them from any other disease such as ich.
2. Black death	The fish will exhibit slime coat syndrome, where the mucus on the skin of the fish becomes thick and sloughs off. The fish will become reclusive, huddling in a dark corner of the tank.
3. Black spot disease	The term "Black Spot" refers to the formation of black pigmented patches in the muscle and skin around which the parasite lives. Infested fish exhibit black, slightly raised nodules in the skin which are often less than 1 mm in diameter (the size of a grain of salt).
4. Black stripe syndrome	Sometimes the coloration is black on the head with one or two black vertical stripes on the body over the natural coloration. At other times only the head turns black. Sometimes only the tail turns black and half of the head.
5. Bloat	Generally, for cichlids, caused by intestinal obstruction, lower down on fish, If any food is taken in the mouth it is spat back out again and In advanced cases, the belly swells and you get bloat.
6. Camallanus worms	<i>Camallanus cotti</i> worms are among the most commonly encountered internal parasites for aquarium fish and may infect a wide range of fish species.
7. Chilodenella	This protozoan parasite produces similar symptoms to ick, such as labored breathing, gasping at the surface, clamped fins, heavy mucous secretion, and scratching on objects in the aquarium.
8. Costia	High mucus production leads to the coating of skin, ulcers, bristling of scales, swaying and clamped fins, and scraping.
9. Dermocystidium	It causes large clear blisters to appear on the body of the fish. Some of the blisters appear to have white worms inside them.

Diseases with external symptoms	Symptoms
10. Dropsy	In dropsy the abdominal cavity becomes swollen because an organ or organs inside of it becomes swollen, non-cichlids, higher up on fish. Largely a disease of fish that are not cichlids. It is especially prevalent in inbred balloon platies, bettas, and fancy goldfish, indicating a genetic component. Note that sometimes some breeds of fancy goldfish get what appears to be dropsy, but it is just the way they are built. They live for many years like that.
11. Duck Lips	Duck lips can rapidly progress to erosion of the lips and ultimately the death of the fish in only a few days if one has one of the more aggressive forms of the disease.
12. Epistylis	Appears as many small white fluffy growths on the external surfaces of fish, with varying rough sizes, translucent gray-white, and common in the eyes of the fish including the fins.
13. Fish louse	It looks like a small one-millimeter-long grain of rice or white barley.
14. Fish Tuberculosis (TB)	Mycobacteriosis (fish TB) is a slow-onset internal bacterial disease commonly referred to as “wasting disease”. It causes emaciation in fish and a “hollow belly”. The head looks too big for the body in many fish with it. In some fish it causes a wasting of flesh and muscle tissues in the top half of the body, leading to a knife-backed or “razorback” appearance. A hollow in the forehead directly above the eyes is common in Mycobacteriosis.
15. Flukes	Produce twitching and flashing as the fish is irritated by the skin flukes. The fish rubs against things in the aquarium and the substrate. Often the skin gets small red dots, that looks almost like a pink cast to it. And often the skin has a lot of excess mucus.
16. Hollow belly	If most of the fish in an aquarium has a “hollow belly” this is generally due to a lack of enough food. If only a few fish have a “hollow belly” the number of possible pathogens is in the hundreds.
17. Hole in the Head of HITH	It appears as holes and opens pitted wounds around a fish’s head and along the lateral line as if something is slowly eroding the flesh. Many call this a disease but since it is caused by a great many environmental conditions and pathogens (i.e. a multifactorial etiology), so it is more properly called a syndrome.
18. Lymphocytes	Fish commonly get a white to pink cauliflower-like growth on their bodies. The disease is often referred to as “Cauliflower Disease”.
19. Mbuna or lymphocytes duck lips	Note there is a pink growth on the front of the anal fin
20. Mouth rot	A patch of white stuff on a fish’s lips. As the disease advances it produces toxins that erode the lips of the fish. Advanced cases get very ugly and the fish can’t eat.
21. Neon tetra disease	Restlessness, fish begins to lose coloration, with the white area of the belly expanding and/or white appearing along the spine. Sometimes the white areas become lumpy. The blue color line along the fish goes from a straight line to an “S” shape as the spine distorts due to muscle wasting. The tail takes a slight downward turn. Fish has difficulty swimming with its head down and with a lot of “twitching”.
22. Pine cone dropsy	In advanced cases of dropsy, the fish’s scales stick out from the body in a “pine cone” effect.
23. Popped eyes	In “Popeye” the fish’s eyes bulge out.

Diseases with external symptoms	Symptoms
24. Red Blotch or Hemorrhagic Septicemia	Most blood red blotches on the fins or skin of tropical fish are blood under the skin or hemorrhagic septicemia ("Red Pest"), an internal bacterial disease.
25. Red gill	Bacteria can invade the gills and cause "gill disease". The gills become red and inflamed, there can be spots of red at the base of the pectoral fins and a thin papery look is found on the gill plate due to mucus. The fish hangs in the water and "pants" in obvious distress. This is a serious disease. The swelling, lack of distinct gill structure ("mashed" appearance), and red hemorrhagic areas (aneurysms) next to white necrotic (dead) gill tissue cause the gills to look like raw hamburger meat.
26. Red Mouth	This disease is most common in pond fish and rare in aquariums. It is occasionally seen in goldfish.
27. Saddleback	Flat, fuzzy, velvety white patches on the body of a fish are often seen. This is typically in a "saddle" shape on the back, thus the term "saddleback".
28. Saprolegnia	The most common presentation of Saprolegnia infection is trailing white streamers of white filaments. Alternatively, it presents as a secondary infection with a mix of bacterial and fungal species in a white very cottony structure. If you look very closely at the cottony growth you will typically see little balls at the end of each filament sticking out.
29. Scaly Skin	This condition is generally due to the local water municipality super chlorinating. Since chlorine has also hit the gills, the fish need to be treated by heavy aeration. Dropping the temperature also helps.
30. Skin Ulcer	Ulcers usually show up as raw opened areas on the skin. They often have reddened edges and may be associated with other symptoms of systemic infection or disease.
31. Slime coat syndromes	Slime coat syndrome is when the mucus on a fish is produced in such amounts that it sloughs off the fish and gives a ragged appearance to the fish. The fish will have subdued colors due to the thick mucus.
32. Spinal deformities	There are two distinct types of spinal deformities. One is where the back is severely and often quite randomly distorted in several directions.
33. Swim bladder disease	A fish with swim bladder disorder will sink to the bottom or float to the top of the aquarium. They will have difficulty staying upright and may often be found floating upside down.
34. Tail and Fin rot	The tail and Fin of a fish start eroding. Typically, the eroding fins will have white edges. If white edges aren't present it could be fin nipping and aggression which has caused the problem.
35. Tetrahymena	Tetrahymena also commonly attacks the eyes and causes pop-eye and white eye (note ich doesn't typically attack the eyes). Tetrahymena can also present as white spots somewhat like ich in appearance. But the Tetrahymena spots are gray, not ceiling white like ich. Tetrahymena spots are also irregular in appearance while ich is a very round constant shape. Sometimes Tetrahymena invades the external tissues of the fish and causes them to have translucent white patches with raised scales (epidermal necrosis). The patches commonly occur on the forehead of the fish above the eyes or just in front of the dorsal fin.
36. Velvet	<i>Piscinoodinium pillulare</i> , or <i>P. oodinium</i> , a dinoflagellate alga is a very small parasite that looks like patches of yellowish to golden fine spots on the fish.

Diseases with external symptoms	Symptoms
37. White eyes	If one eye is white it is typically a minor bacterial eye infection caused by the fish scrapping its eye or from an attack by another fish. If it is in both eyes it is coming from a more serious bacterial infection inside the fish and will kill the fish rapidly.
38. White-spot or Ich	Ich has very well-defined, very white spots only the size of a grain of salt, no larger. Ich also occurs over the entire body of the fish (except the eyes) very uniformly. It never occurs in patches.
39. White string poop	In "stringy white poop" the feces will stick to the fish and trail behind it in thin clear or white threads with brown patches. Stringy clear or white poop CAN be mucus from severely infected intestines. Most of the time it means nothing. White poop or clear poop in fish is like diarrhea in humans. It is common and generally not a cause for concern.