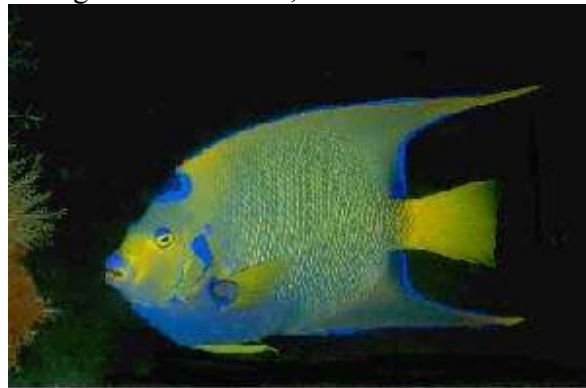


Diseases of Fish:Part 2

by John *Shawn* Prescott

In the first article, I attempted to contrast the major differences between fish that live in a "natural state" and those kept by man, either in Aquariums, or in Aquacultural situations.

It appears that at least one person, felt somehow that I was in some way against keeping fish for pleasure, and in case there are others who might have felt likewise, I should take this opportunity to say unequivocally, that I have enjoyed keeping Aquarium fish, for well over half a century, and took up what is now my profession, because of my abiding interest in them, and which has thankfully never waned.



Queen Angels of similar size will be stressed if more than one is kept. They may even fight to the death

It is essential in my view to understand the "norms" of fish in the wild, as a precursor, to being able to be take the required steps to minimize the problems of disease that so often break out when fish are kept by man, in Aquariums or otherwise.

Later on in this series, I will deal with the specifics of disease, but before doing so, I would like to point out some of the similarities, as well as the major differences, between fish as kept in Aquaculture, and those which we keep in the Aquarium. This with especial regard to the influence the differences have upon disease for us Hobbyists.

In Aquaculture it is normal to rear just one species in raceways, cages or tanks. Occasionally farmers practice Polyculture (the keeping of 2 or more species side by side), but this is not common, even when it is the practice, it is seldom more than 2 species.

It is a rare Aquarist that keeps only one or two species, in his or her Aquarium.

For the Aquaculturist, this means of course he has a much higher risk if disease should break out, as many pathogens, whether parasitical or bacterial in Nature, often have a preference for a species, which can under circumstances which are favourable then spread very quickly. Contrarily the Aquarium usually has many species which mean that some diseases at least will not spread as fast, and give the Aquarist a chance to get the problem under control.

Because of the enhanced risk, good Aquaculture practice, require the fish farmer, to pay constant attention to water quality, disinfection procedures, and the continuous observation of his stock, as any lapse can bring about serious losses, which after all are his livelihood. For this good reason today more and more farms are employing trained Biologists to manage the farms, and try to keep the risk of disease under control.

Today many more Aquarists, also pay close attention, but as it is a Hobby and not a source of revenue, for nearly all of us, the degree of close observation as well as the amount of control equipment is often much less than on a professional farm.

Another difference in many but not all farms, is that in cage culture, or such things as Trout culture, in some areas, the water body is constantly changing, taking away pollution, and renewing the quality of the water. There are of course farms that work on closed systems, but even here it is typical to make up some 2% or more of new water daily. This prevents the accumulation of undesirable "metabolites" which are most often Nitrates, Phosphates, Proteins, and more. This cleansing of the water body in Aquaculture is vital, as any diminution of the water quality, can very quickly give rise to stress, which can quickly help bring latent parasites, viruses, or bacteria, into a chronic state of infection.

Many Aquarists do of course also change water, many do not do so, or if they do it is infrequent, and anyway, even the best of us, do not do so daily. This means that we must rely on more sophisticated control methods, such as Protein skimmers, Ozone generators, UV purification, Biofilters, and much more in the form of water additives etc. For those of you who have taken the trouble to understand the reasons for such technology, and can measure the effects, this can and does yield some excellent results, such as wonderful Reef Aquariums, as well as beautiful planted fresh water Aquariums.

Regretfully, poor advice, sometimes at the dealer level, lack of time, or inadequate understanding of the often quite complex interactions, can lead to heavy losses of fish, and too often to the "retirement" of otherwise keen Hobbyists, who feel that our pastime is too difficult.

The purpose of my articles is to try in some small way, to show that this need not be so.

You have already heard me refer to STRESS several times as possibly the single greatest cause of fish developing disease, & before proceeding to the more specific details of disease, I would like to give a real example of something that I did with my team some years ago in the UK, which I think emphasizes this point very well.

At that time I had an Aquaculture consultancy business in the UK, but also ran our own Labs, and had adjacent to the premises a fairly large Aquarium store.

We observed the following phenomena, many times over. Typically we would receive our shipments of fish on a Thursday, so that we would be well stocked for the heavy weekend trade. We had several beautiful show tanks from which we normally never sold, & whenever we got an especially nice specimen, or something that was different we would place this fish in one of the show tanks as an attraction. I would point out that these tanks were set up for long periods of time, were maintained as professionally as possible, as they were our "Advertisement" tanks, and we often did not add a fish for several weeks.

I would mention that I am talking about Marines in the example which follows.

We made the observation that the following day after adding the "new" fish, that one or more of the "old" fish would have broken out with signs of "white spot" *Cryptocaryon irritans*, whilst the newly introduced fish was quite all right, showing no signs of any problem. This was contrary at that time to what we somehow expected. Also it occurred so often, that we began to develop a new theory at that time as to the cause.

In our Lab, we proceeded to do skin scrapings of the unfortunate fish, and very quickly we found encysted spores of the parasite which were obviously lying dormant and doing no harm. It should be noted that by definition a parasite has a vested interest in its hosts well being, as any change in that status, which may affect the fish, can also have undesirable effects on the parasite.

Having proven to our satisfaction the almost ubiquitous presence of this common parasite, we then proceeded to rationalize the outbreaks I referred to as follows:-

Fish as most Aquarists have observed are very territorial, they also quickly get to know an Aquarium, and also the other inhabitants, many species will stake out a place of their own, especially Clown fish and other Damselfish, but also many others. When a new specimen is introduced, many fish become agitated, they feel that the newcomer, will take their favourite spot in the tank, compete for available food, or "steal away" perhaps their friends.

Such alarm can often be seen in school if we can recall when a new and challenging new face appears, especially if he or she is handsome, strong, aggressive, or clever



Porkfish are happiest and with the least stress when they can school together

We manifest this emotion sometimes by feelings of jealousy, or counter aggression, or displays of bravado, which may not even be natural to us. Should there be a major challenge such as occurs many times, when a bully appears, adrenaline courses through our bodies to help us cope with the stress.

My team and I, became convinced that something very similar was happening when we introduced the new fish, to those who had "rights of occupation". Some form of chemical messenger undoubtedly ran through the veins of the resident fish, and this would "wake up" the dormant parasite who would translate this message in such a manner as to say to itself, that perhaps my host will not be around much longer, something is the matter, and this **STRESS** messenger would cause the parasite to immediately go into the reproductive phase and burrow out of the epidermal wall of the resident fish, giving rise to the typical "white spot" markings.

Although such a theory is hard to prove, pragmatically we were able to almost do so, as once armed with this conception, we always added the new fish afterwards in subdued light after having changed a couple of hours before some of the rocks in the tanks and other such position markers. We also left the lights out with the tank covered for a day or so. We did not eliminate the problem, but the number of times it happened afterwards was a small fraction of what had been an almost invariable occurrence before our experiment.

The lesson to be learned is that many things can cause stress, and that we should always seek to lessen this by understanding the underlying reason, and that if we do, we can greatly minimize the problems that all too often occur.

Therefore I hope you will bear with me when as I proceed in this series, you will find I will return frequently to the matter of good husbandry, which is effect the practice of avoidance of stress, as far as the art of Aquarium keeping allows.

Some rules which are worth repeating for those who may not know, or have perhaps forgotten or become careless, all of which will reduce stress & therefore the eventual possibility of disease.

1. When buying fish from your local dealer, try & ensure that the specimen you select, has been in his establishment for a least a week, & see it is feeding. Perhaps pay a deposit on the understanding you may change to another fish, should it not have been there long enough, assuming you really want it. The ask the dealer to keep it a few more days, & ensure you may chose another fish if it does not "measure up" Most good dealers will assist as they want you as a customer.
2. When taking a fish home, ensure that the clear plastic bag is covered by an opaque cover of some kind. Nothing will scare a fish more than being trapped in a clear bag, from which it cannot escape, & seeing all the strange sights to which it is then subject
3. Ensure that you equalize the water temperature, as well any pH differences SLOWLY, over at least half an hour, by the slow addition to the bag of the tank water, & floating the bag first to balance the temperatures.
4. Add the fish in as subdued a light as possible, and DO NOT turn on the lights for the rest of the day, to view the fish, which although a natural inclination, should be resisted in the interest of longevity for your new fish, and even the old ones.
5. Ensure in both fresh & salt tanks, large numbers of hiding places, so that the fish can find a new "home" and feel secure from any perceived enemies.
6. Avoid tapping the glass, to try & bring the newcomer out from any hiding place, when it has adjusted it will display itself to your content.
7. Ensure if necessary with the advice from your dealer, if the new specimen(s) you are considering, are compatible with those you already have. Some fish are naturally antagonistic to others, whilst in Salt water, two similarly sized Angelfish of the same species will often fight to the death.
8. Do not overstock the holding capacity of your tank, crowding will induce stress very frequently, & can cause a total wipe out in some circumstances.
9. If you have burrowing fishes, such as Kuhli loach in fresh water, wrasses or some gobies in salt, ensure that the type of gravel you are using is suitable, as some are sharp & can quickly cause abrasions which will lead rapidly to the demise of the fish, & perhaps spread to others.
10. Avoid putting on lights in a darkened room, suddenl, as this unnatural shock can cause many fishes to jump out of the tanks, Swordtails are great at doing this. Either only illuminate from a room which is already lit, and if you can try to attach to your lighting system some form of Rheostat control which will bring the lights on and off SLOWLY, just as the sun comes up and goes down in nature.

The practice of these basic rules, and no doubt others, will help towards the goal of keeping fish more in harmony, with the natural condition, and this is one as I pointed out last month, that has less virulent diseases, that can occur in Aquaculture and the Aquarium for the reasons I gave .

In the next article I will begin the process of looking at the various ways that disease can manifest itself, and begin the long process of trying to understand the many potential problems, and how we can address at least some of them.

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