

Diseases in Nature Part 9.



These excellent shrimp are typical when all goes well

This article will depart from the usual format, and relate an interesting project about Shrimp Farming, mainly in S.E.Asia., and the problems which arise of disease which have enormous economic consequences. It was compiled when I was working some years ago, for the very well known firm Monsanto as a consultant. I believe the facts and observations I made at that time, could be of great interest to many Hobbyists.

. I therefore propose I hope with your understanding, to take a slightly different approach to the subject of disease in this article, based on the above to try to show the reader how some of the things we observed on this trip, relate to the all important question of disease etc, in the Aquarium industry, which at first sight might appear to very far removed from the area of shrimp culture etc.

One of the reasons, we looked at the shrimp industry in S.E.Asia, was because it is plagued with disease problems that in Thailand account for overall some 40% losses of production (=Wipe outs), of the farmed stock. These losses are in value around \$2 billion at today's prices. In other countries, such as Malaysia, & Indonesia,



Samples from the pond are taken twice daily, to check on growth & to see if any disease is showing

which we also looked at, the percentages are even worse, though as the production is not as large a Thailand, the losses in dollars are not as substantial.

The principal culprits for these losses are viruses, the worst of which is called would you believe “white spot” due to it’s characteristic marking on the shrimp in the early stages before leading to mortality, which happens very



A bowl of Post Larval shrimp at day 15

quickly once it has taken hold. Another important virus is “yellowhead”, the name is again descriptive , also there are other bacterial diseases, which are often encountered.

When one examines the typical ponds, in which the shrimp are reared, one is struck, by the lack of information, as to the quality of the water. Although most farms take regular readings of pH , Temperature, DO(dissolved Oxygen, & Salinity) it is rare for other measurements to be taken.

Yet the farmers inform us that they cannot get the shrimp to grow to as large a size as they would like, and after some 150 days at the outside, they must take down the ponds to sell the shrimp, as otherwise they may lose them.

Looking at the ponds one can see vast amounts of Protein floating over the waters, the colour of the ponds, also would lead one to believe that very high levels of Nitrate are there, mostly due one suspects to overfeeding which causes the inevitable processes of nitrification. Those of you who keep Reef Aquariums, will be very familiar with such problems.



Shrimp ponds are fed 5 times daily by hand as shown in this photo

Any Hobbyist who attempts to breed Discus fish or other sensitive fish also find that high levels of Nitrate are very inhibitory to fish, even more so to Invertebrates to which shrimp belong.

It is hardly surprising therefore to hear in so many places that they cannot keep the shrimp for too long, to get the extra size etc, that would bring them a great deal of extra money, (a 40 count shrimp, i.e. 40 per Kilo) which is typical after 150 days rearing from the PL (post Larvae) stage, can bring the farmer some \$9/Kg. However a 30 count shrimp, which would need another 20 or so days to grow, if they could do so, would fetch some \$14-15/Kg. As the typical pond when it does not have a wipe out due to disease, can grow some 6 tonnes (Metric) per Hectare, per crop, the difference to the farmer is a major amount of money, even after one allows for the cost of extra food electricity etc.

Now as a said at the outset of this series of articles STRESS is probably the most important factor in the creation of conditions that invariably lead to disease, so that in these countries where so



There are nearly 1000 Shrimp hatcheries in Thailand, and they utilize an important part of the world's supply of Artemia eggs

much money is to be made by the production of good quality shrimp, which is to a large extent a sellers market, it is amazing to find, that so many important measurements are not been taken on a regular basis, and nor are various potential interventions, been tried to see if important improvements can be made. Many of these techniques and interventions, are well known to advanced Hobbyists here in the UK, and elsewhere.

We in the Hobby, when we have expensive Aquariums, with many valued specimens, almost invariably measure on a regular basis such parameters, as Ammonia, Nitrite, Nitrate, Phosphate, and more. We are familiar with the many options for filtration, as well as Protein skimming, UV sterilization, Ozone as a reduction and purification agent, Ammonia towers, and more. For the most part we know the principles as to why we do these things, along with the impact that lack of good water quality can have on the results we expect for our prized Fish etc.

Yet all of this is done, for most of us, as a Hobby. Admittedly in one of the world's most advanced nations technologically. It is still amazing to me, that where you have an Industry that employ's so many thousands of people, makes a most important contribution to the economy of the countries involved, as well as being a most important hard currency earner, yet fundamental measurements and interventions, are not made and recorded.

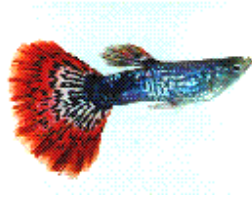
I mention all of this, so that you the reader may grasp, just how important all these criteria are. When you ask both the farmers, who often were simple rice farmers before taking up shrimp farming, and also when we asked some of the more educated persons working with the farmers, the reasons why the shrimp died, or would not grow etc, very few specific answers were available.

In order to try and solve any problem, one must first have all the relevant information (sometimes the irrelevant information also). When the considerable number of water quality parameters (some 16 or more), are observed over a large number of ponds for a couple of years, it is virtually certain, that some aspects of the water quality will correlate with the commencement of disease, or the lack of growth. Imagine what would happen to your fish etc, if you never bothered to take any readings of the water quality, nor had any filtration, protein skimming, or any way to kill of pathogens. I am sure you will agree that not too many Aquariums, would have the fine displays that are today becoming the norm throughout Europe, the USA. and many other parts of the world.

Anyway, I hope that this short dissertation will make you be even more aware, of how at a practical level the application of good water management practices can have a really important result to pay of handsomely whether this is for the home Hobbyist or for a shrimp farmer. To finally prove this point, we were with a Thai company, run by Europeans, which has got a couple of farms of it's own. This company, by applying the kind of modern techniques that I have been mentioning, has had dramatically better results than the average Thai farmer. This fact takes the discussion away from the theoretical to the practical, as they have demonstrated (in dollar terms) that good water quality and management makes a real difference and that this is expressed in large numbers of dollars, in the end result.

I do hope therefore that this article will inspire you all to be aware, that poor water quality does make a difference, that no other factor is as likely to bring about any of the many forms of disease that can strike. Therefore take measurements, intervene to improve the water quality, keep records etc, and the chances are very good, that disease either will not strike or if it does, it can be much more easily brought under control.

At the end of this extensive trip to the shrimp farms of Asia, we finished up in Singapore, where fortuitously I was able to take a few days to visit the now world famous Aquarama show which was taking place at the time we arrived. This show is the only major trade show and exhibition that is devoted ONLY to the tropical and ornamental fish hobby.



Red Snakeskin Guppies from this strain, won first in the Guppy show at Aquarama

Since its inception in 1989, Aquarama has become a major fixture in the industry calendar, and each show has resulted in more exhibitors as well as ever growing numbers of visitors. The show is unique in that all the major shows in the USA and Europe are Pet shows, with a strong representation for Tropical fish, whereas Aquarama is a show specifically for Tropical Fish and Ornamentals including of course Goldfish, Koi, and marines.

An attractive feature of this event, is that each time a really interesting fish competition is held, for most of the interesting species of Fresh water Tropicals. As Singapore is probably the largest producer in the world of so many species, along with the back up from a world class University, the entries would make one's mouth water. To my mind the categories for most interesting fish displayed were



This variety of Cobalt Discus at Aquarama was a real show stopper.

Guppies, also many of the Discus, also as some of the Arowana's (now bred by several farms, even though they must all get CITES certificates), were the most interesting.

All the major European producers were represented in force, such as Eheim, Sicee, Tropica (plants from Denmark), Aqua Medic, and many many others. Leading American companies such as Instant Ocean, Forty Fathoms, Aquarium Pharmaceuticals, etc had booths, and of course dozens of Singaporean companies, which were principally fish exporters.

In conjunction with the event every second year, they have an excellent series of Scientific lectures by invited speakers, from Universities etc, in many parts of the world. This year was no exception, & among the most interesting lecturers was Dr. Blom from the Netherlands, as well as Dr. Peter Burgess from the UK.

The presentations were divided just as are more august forums, into areas of interest, and this year dealt with

1. The emerging Asian market.
2. Ornamental Fish Production Technology
3. Health & Welfare management.
4. Conservation & sustainable resource management.

5. Demonstration workshops.

We also had time to visit a few farms. Whilst the farms are often quite simple in their layout and methodology, their productivity is enormous, the people that run them, are exceptionally friendly and hospitable. I am posting some photos for readers to get an idea of what is involved.

As is germane to these articles, disease, is always a consideration for these breeders, even more so for the exporters, as overall it is generally agreed that about 20% of the fish that are shipped, either arrive DOA (dead on arrival) or do so within a few days after being received by the importer. This is something that the Singaporean Government, through its arm of the PPD (primary production dept), is now with some more progressive exporters, trying to do something about. They have recently instituted a set of protocols which all members joining the scheme must follow, and as is so typical in this dynamic country, the protocols are being policed, so that no "cowboys" can make claims if they do not follow the scientifically worked out methods to prepare for shipment, which have been proven to reduce losses by an important amount.

One thing becomes very evident in Singapore, and in the writer's view at least must play no small part in the reason why Singapore has become so predominant in Ornamental fish culture; even though today the standard of living is higher than in the USA, thus they can no longer rely upon cheap labour to succeed. Therefore the degree to which all the breeders & exporters are ready to cooperate with each other, as well as with the Government agencies, and the National University, makes enormous efficiency a necessity. This very close cooperation, as well as a top rated national airline, plus an airport that is consistently rated for the last 15 or more years, as the finest in the world, gives Singapore products, transport, varieties, and a lot more, that have enabled them to become the force in our industry, that is now world famous.

Many other countries especially Malaysia, Thailand, etc, now seek to supplant them, but it will take a long time, for them to play catch up, as the educational standards in Singapore have been rated year after year in Maths and Science, the highest in the world. This approach to whatever they do, will stand them in good stead to resist the competition that they will face in the years ahead.



Guppies are raised in concrete tanks with net lining as shown in the photo taken at a leading Guppy farm

Anyway, I do hope that this departure from my normal topic, will be of some interest, I will in the next article to revert to dealing with specific problems, which will probably begin with some of the bacterial diseases, as most of the important parasites have now had an airing, although we could continue for a couple of month's more, with some of the less common ones.

As I get frequent inquiries for advice from readers, could you please try to keep your questions to the point as much as possible, and especially give as many signs(symptoms) as possible so that I can help you. I regret that time does not allow me to get into answering questions on Aquarium filtration as well as many other subjects, so I do hope those of you, will understand this. John *Shawn* Prescott . john@aquarium-gardening.com