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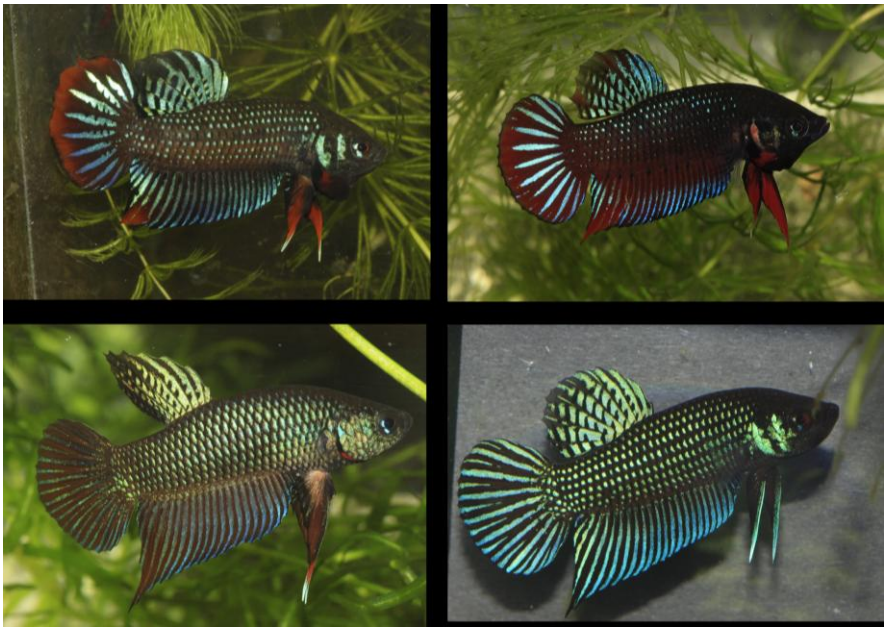

Newsletter No. 168 April 2012

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SALTWATER FIGHTING FISH OR "IS IT TOO LATE FOR SPECIES MAHACHAI"? "

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www.mahachai-tours.com

Top right: splendens top left;imbellis bottom left, B. smaragdina from Nong Khai, Lao border near Vietian **bottom right:** B. sp. "Mahachai" Samut Sakhorn (Same orientation front cover).

Introduction

We have been working a long time on this article. The concept was repeatedly changed. But when writing about Siamese fighting fish in brackish water, then B. sp. "Mahachai" must be mentioned. And just this year comes some movement in what have been in recent years, the somewhat muted discussions about the species status of this member of the *Betta splendens*-group.

Thai scientists have tried to prove the species status of B. sp. "Mahachai" . They work, in good traditional way "dja dja" (slowly, slowly, take it easy). However, in the case of this fish, „reo reo“ is required (fast, fast), if it is to have a future, because its habitat, the Nipa palm swamp is disappearing, and increasingly rapidly so. The fish needs a "strong" name (I think to myself) - "*Betta siamensis*" could be appropriate. Only then would it have a chance to enjoy safe and long-term protection. The Hong Kong paradise fish, *Macropodus hongkonggensis*, is a good example.

B. sp. "Mahachai" certainly represents a good species but is not the only member of this species group from the

brackish water but this is new to most people and so we looked for Siamese fighting fish in the entire coastal area of the Gulf of Thailand and the Andaman Sea. We were successful.

Pla Kat Song Nam

Siamese fighting fish are known not only known in Thailand, their maintenance and breeding presents few major difficulties. No great new information is to be expected. But in large parts of Southeast Asia, its area of distribution, little is known about its habitats, populations and distribution boundaries.

In the case of Siamese fighting fish *Betta imbellis* and probable descendant B. sp. "Mahachai", brackish water fish in the broader sense, the entire *B. Splendens* group has surprised me over and over again in the last ten years. Visiting the Nippa palm swamps south of Bangkok showed the Siamese fighting fish, (the name in this article applies to all types of Betta splendens group) to be much more variable in their habitat requirements than previously thought, is. Nevertheless, from some Thai friends came the saying-"You can find ‘ lug Pla Kat Thung‘ (Biting Fisch from the field) in each Song Nam (brackish water) - something of a surprise.

The relationship

The Siamese fighting fish B. sp. "Mahachai" created quite a stir in expert circles a few years ago . These fish that drew the interest of the "experts" were known as B. sp. "Mahachai", named after the government district located south of Bangkok:- Mahachai / Province Samut Sakhorn. These Siamese fighting fish live in the Nipa palm swamp, whose main characteristic is to have permanent areas of brackish water . All other species and populations of the species group were previously considered intolerant of this type of water, and accounts of *B.splendens* from water with higher mineral levels were ignored. Thus B. sp. "Mahachai" was a sensation, but also based on a fallacy. One, in my opinion premature, false assumption is that the B. sp. "Mahachai" looks similar to and is therefore closely related to B. smaragdina“, which it has been previously shown occurs in eastern Thailand and Laos with no direct connection to the habitat in the south and the Nipa palm swamp. From a biological point of view ‚similar to‘ and ‚related to‘ are not automatic conclusions

To add to these justifiable doubts, to shed light on this assumption and kick this problem from a different direction, came my friend, the aquarist, Martin Hallmann, well known on the fish scene as a specialist in bubble- nest-building Betta. He looked closely at the similarities between B. sp. "Mahachai" and *B.imbellis*. In particular, the gill cover of both fish differs from that of *B. smaragdina* by the possession of two vertical strips of glossy scales .

From then on, I examined the brackish marsh areas in which Nippa palm often grows to find *B.imbellis* and soon had success. The statement of the Thai rural population, the assumption that the Siamese fighting fish lives in salt water regularly. was then fully confirmed.

B. imbellis "Nam Song" young males, a true wild form of imbellis

Nipa palm swamp-a complex, interesting biotope

The Nipa palm-*Nypa fruticans*, is characterized by a high salt tolerance and colonizes the mouth of the river deltas and estuaries in the tropics of Southeast Asia. Only the mangrove forest vegetation community surpasses it in salt tolerance. Systematically Nipa palm is quite isolated and forms a monotypic subfamily within the palms. It is considered a sister species to all other types of palm trees. Nipa palm are traditionally used in Southeast Asia. In the south of Thailand, for example, the smoking of tobacco is never without "Nipa palm paper‘.

The vegetation composition in the estuaries of big rivers in South east Asia is as follows. Facing the sea are the mangrove forests which may be exposed by the tides. Next the fresh waters of a river combine near marshes, which are occupied almost exclusively with the Nipa palms. Sometimes they are exposed to the tide so strong that the water level drops, to reveal the periodically dry swamps. The tide flows through other areas of the swamp, so even at low water, there is brackish water. Closer to the sweetwater zone and to freshwater swamps grow large *Acrostichum aureum* - a fern that is salt tolerant . These are followed by the great swamps of the alluvial plains, possessing their own forms of vegetation.

Nypa palm swamp in Pattani, the first *B. imbellis* "Song Nam" were found there

The constant water-carrying part of the Nipa palm swamp is a complex habitat with extremely high biodiversity. Here there is a whole range of interesting creatures outside the scope of this article. Normally freshwater fish exist here and for hobbyists there are such species as *Trichopsis vittata*, the croaking Gourami, *Dermogenys siamensis*, the Siamese halfbeaks , killifish, *Aplocheilus panchax*, *Trichopodus trichopterus*-3 spot Gourami and *Boraras urophthalmoides*-mosquito fish which can live here in high population density. Small freshwater tolerant gobies of high biodiversity value, *Brachygobius* spp. -must should be emphasised. There are masses of the smallest water creatures, including small crustaceans and larvae of different groups that form a

wonderful food source, but also indicate the low pollution level and biological value of the swamp.

Nypa palm swamps are always found near the river mouths in the sea, this finding even larger contiguous areas of Trang / South Thailand

Habitats in the "south"

Basically, uniform populations of *B.imbellis*, all occur in the still biologically intact Nipa palm swamps along the coastline of Peninsular Malaya. Interestingly, it is in the provinces of Surat Thani and Chumpong on Gulf of Thailand that the habitats of the species *B. splendens* (from north) meet the *B. imbellis* (Southern race).

B. splendens wild form of Surat Thani from the border area with B. imbellis.

This results in in a big gap between the provinces and Petchabhuri and Chumpong in the overall picture of the habitat and other significant Nipa palm swamp and brackish marshes on the Gulf of Thailand. On the one hand, the foothills of the Tenasserim mountains in Prachuap Kiri Kan Province move too close to the coast line to allow sufficiently large river systems to form the Nipa palm swamps and on the other, the coastline itself is too narrow and rocky.

The first brackish water marshes, partly Nipa palm and partly overgrown with the fern *Acrostichum aureum* are located in the estuarine deltas of the large river systems Sawii and Lang Suan. Extensive Nipa palm swamps establish themselves again on the entire coastline of the province of Surat Thani.

Betta imbellis - a tolerant fish

B.imbellis freshwater from Nakhon Sri Thammarat adult males, adult of normal type

Living in these habitats are (mainly) populations of the species *B. imbellis* , which is sometimes called the southern race of the Siamese fighting fish. Its homogeneous appearance should be emphasised in a vast area of distribution in Peninsular Malaya and Sumatra (and possibly Cambodia). There are some seemingly more greenish color varieties/populations, otherwise the irridescent scales of this fish (as seen in side view in the aquarium) appear more

blue. The relatively sharply defined red crescent in the tail fins vary in size depending on individuals, but the pattern can be detected in all populations .

Until recently *B.imbellis* was regarded as the typical black and soft water Siamese fighting fish as in fact in fact were most labyrinth fish . Peat swamps, where the water can drop to pH 5.0 can be inhabited and this is observed mainly in the peat swamps in West Malaysia. In another habitat *B.imbellis* were living in freshwater with the confusing water parameters: pH value of 8 to 8.5, with a conductance of only 20 µ / S. Only in freshwater with a high acid-binding capacity, ie high carbonate hardness, have I not yet found *B.imbellis*,

Then came the surprising discovery in Pattani in southern Thailand. In a residual Nipa palm swamp habitat (again) with a detectable salinity(taste test) I caught plenty of *B imbellis*. The population is similar to the normal type of *B. imbellis* or does not differ in principle. After over one year observation of this biotope (change of rainy and dry period) it should be noted that this marsh does have variations in salinity, but it never fully ‚sweetens out'. *B. imbellis* and their foam nests are always found.

Then appropriate habitats have been studied around Peninsular Malaya with the same result. The fact that *B.imbellis* also occur in Nipa palm swamps near the Andaman Sea in the west of the peninsula is interesting. I regularly find Brackish water *B.imbellis* in the vast Nipa palm swamps around Nakhon Sri Thammarat - eastern southern Thailand.

Habitat of the *Betta splendens* group, the basins between the palm trees must always carry water

Habitats in the north

To further characterise the the particular habitat of B. sp. "Mahachai", we must find out exactly where the fish occurs. The specific habitat of Nipa palm swamp , which this member of the *B. splendens* group requires to increase, is very limited. There are only the delta mouths and and estuaries of the larger river systems, which have enough water for the whole year. In the Gulf of Thailand there are not so many. In the northern part of the gulf, also known as the bay of Bangkok that are only four systems in question, which were investigated by us : - the Mae Nam Chao

Phraya system (Samut Prakan), - the Mae Nam Tha Chin River system (Samut Sakhorn), - the Mae Nam Klong system (Samut Songkram). B.sp. Mahachai are known from these systems. Another system that has produced populations of B.sp.Mahachai is the Mae Nam Bang Pakong system (Chauchonsao, Chonbhuri), which drains the famous Khao Yai mountain range, lying north..

The Mae Nam Prasa system (Chontabhuri), directly draining into the Gulf of Thailand could have produced significant Nipa palm swamps. We haven't been able to investigate this yet, nor are there any populations known to us.

In the southern parts of Samut Songkram and adjoining Petchabhuri (western coastline of the Bay of Bangkok and the Gulf of Thailand), no more brackish water habitats of the Siamese fighting fish were found. Destruction of nature has occcured, not just by big factories but by shrimp farming, also the fish farming industry. The salt from the vast natural landscape areas has been devoured by industry and there is no more biological balance. Thus, it is no longer possible to find out whether there were habitats for brackish water fighting fish. It is not likely , because the draining of the areas: Prachan Mae Nam, Mae Nam and the Petbhuri means there is just too little water to allow significant brackish water Nipa palm marshes .

Populations of B. sp. "Mahachai"

Large wild caught males of B. sp. Mahachai, not directly from Mahachai but about 30 km from Samut Sakhorn, rounded tail fin.

It seems that this form of Siamese fighting fish has just been established in these areas in the Bay of Bangkok. The entire appearance in these four separate areas is relatively uniform and differs greatly from all the other four types of this species group. It seems as if B. sp. "Mahachai" exhibits features from all other forms and "has not invented anything new," evolutionary. Its salt tolerance is emphasized, however, this claim of habitat is shared with *B.imbellis*. The only difference - B.sp."Mahachai" is never found in salt-free water.

To what extent B.sp."Mahachai" reproductuction is influenced by the rainy season and thus responds to sweetening of the waters, I can not judge. Thai experts claim that they have observed that *B. imbellis* in brackish water builds foam nests in the swamp in any season. Experiments with B.sp."Mahachai" in the aquarium allow the same conclusion. In freshwater, as well as in salty water, these fish breed alike. The logical tendency to giant foam nests can be observed in the brackish water in the aquarium - you can even get

the entire surface of the aquarium "plastered" .

The slight differences in physical characteristics in the various biotopes are interesting . B. sp "Mahachai" Samut Sakhorn - Ban Krathum Bean have always pallid tail fins, slightly drawn out in the middle. The Nakhon Songkram animals typically have rounded caudal fin margins.

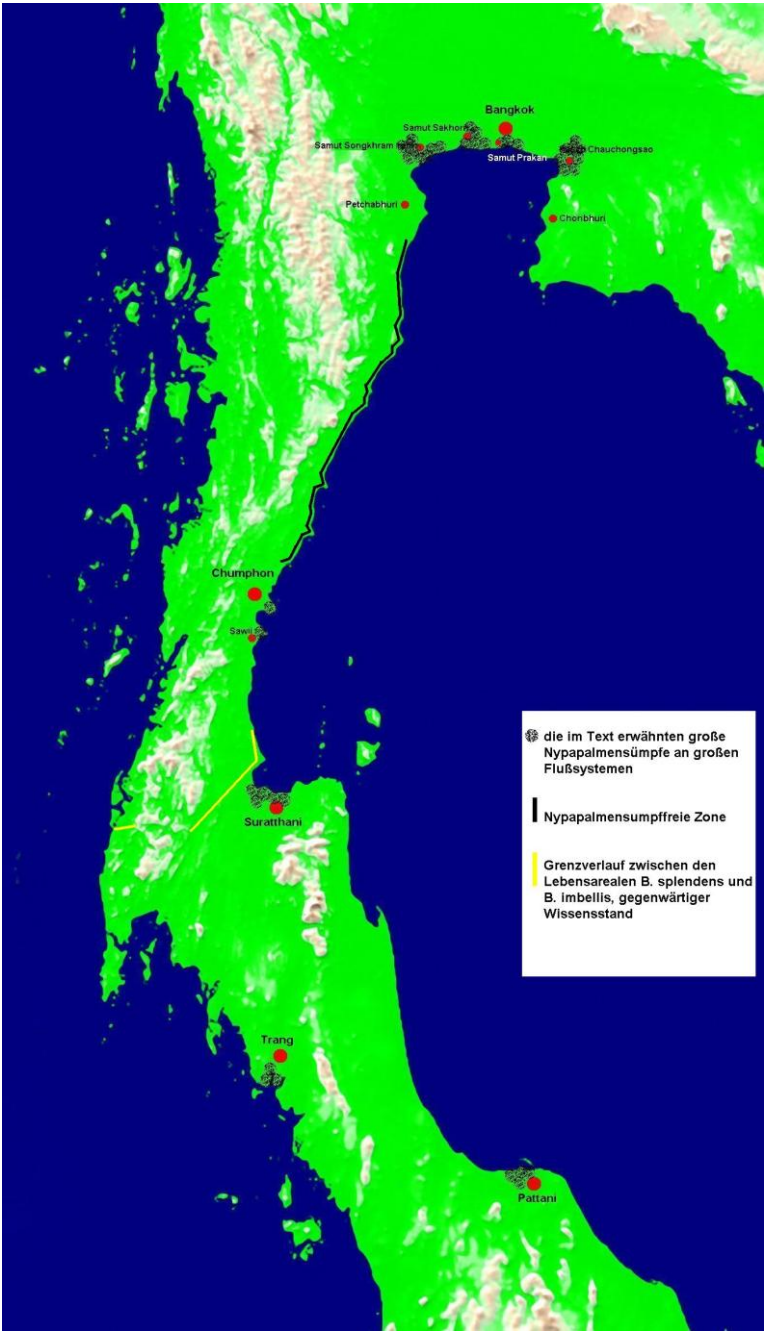
B. sp. "Mahachai" by Ban .. "TT" showing palid tail

Something more distinguishes B. sp. "Mahachai" of Phet Riew. These Siamese fighting fish are getting harder and harder to find, because their habitat has shrunk to vanishingly small areas. So I could get no healthy fish for photo purposes.

Interaction between Betta splendens and imbellis - back to the south

Natural populations of *B. splendens* have so far been detected as far south as the northern main arms of the Mae Nam Tapi on the coastline of the province of Surat Thani. *B. imbellis* pushes itself northward along the coast line like a wedge. It is in the brackish water marshes of the Nipa palm . Interestingly, *B. splendens* does not always avoid these habitats, but occurs only where there is no inland population of *B.imbellis; B.splendens*, are also to be found in brackish water, and is the case at Chumpong and Sawii. Whether these populations are of natural origin, represent isolated *B. splendens*, or hybrids of natural populations and isolated animals is currently not understood. It turns out, however, among the offspring, which have an almost one hundred percent natural appearance of *B. splendens*, that there is a tendency sometimes to resemble *B.imbellis*. *B. splendens* would therefore also appear to occur in brackish water and even reproduce and able to build up populations. What is interesting about this fact, is that we now have a second species of the *B.splendens* group from brackish water. It is even concievable that there is natural hybridization between *B. splendens* and *B. imbellis*. Similar animals have already been found at Siam Rep in Cambodia.

B. sp. Mahachai "Bet Riew" about 50% hybrid, the muscular form, and especially the saddle nose are typical of *B. splendens*, the green shed luster look a lot like sp. Mahachai out even though the two species may also have points in the tail fin which are typical of "sp. Mahachai "


Bangkok
Samut Sakhon
Samut Songkhram
Samut Prakan
Chauchongsao
Petchabhuri
Chonburi
Chumphon
Surat Thani
Surat Thani
Trang
Pattani
die im Text erwähnten große Nypapalmensümpfe an großen Flußsystemen
Nypapalmensumpffreie Zone
Grenzverlauf zwischen den Lebensarealen B. splendens und B. imbellis, gegenwärtiger Wissensstand

B. sp. "Mahachai" a good species?

A parallel may be drawn with habitats in the north to Bangkok where in rainy periods there may be overlap of habitats of *B. splendens* and B. sp. "Mahachai" populations by flushing. They live sympatrically periodically, but there is no mixing .- It is really amazing that the form has not been superceded by *B.splendens*, when mixed with this very uniform population, if it migrates directly into the habitat of B. sp. "Mahachai" I have netted this area countless times and only once found a B.sp."Mahachai" - female with red gill cover strips - a feature of *B. splendens* .

After basic considerations, the only conclusion possible is that in the case of the population of B. sp. "Mahachai" the "natural test of sympatry“ applies. This means that nature has the ability, through naturally occurring or non-occurring hybridization, to allow similar populations to live sympatrically with each other and for us to examine whether these populations form a genetically open or closed breeding population, i.e. a local population or a species. The evolution and morphology indicate that B. sp. "Mahachai" is a separate species, and on the basis of their habitat and morphology (eg body markings) is closely related to *B.imbellis*.

Discussions on the "type" B. sp. "Mahachai"

In modern times, genetic analyses are often used for the determination of species. These tests have developed well technically in recent years,. Genetic analysis are important and give many clues in terms of relationships. If the biologists and scientists with hands-on experience in observations in the "field" and additional traditional morphological methods rule, this combination is ideal.

At the moment, a Thai team is working on the determination of B.sp."Mahachai", as well as a revision of of the entire B. splendens species group. The team probably has very good experience in genetic analysis and designed equipment in carrying this out. It is good that Thai scientists are currently working on a solution to the difficult subject of Siamese fighting fish. Since the Siamese fighting fish is closely associated with the Thai tradition and in the past with the Kingdom of Siam, I expect the Thai people to excel. They have an extensive, you could already assume, intuitive, knowledge, and always have access to extensive collections made from the different populations and species that form the species group in Thailand and neighboring countries. However, The time to determine the facts about B. sp. "Mahachai" is limited, because.....

The last few years

... more and more habitats have vanished, especially lowlands. This is a sensitive habitat and Nipa palm swamp is not very large area ecosystem. In fact, the Nipa palm swamp habitat, along the coastline of the Gulf of Thailand, in its complexity of habitat, (similar to the adjoining peat swamps in Malaysia), is at massive risk. In Greater Bangkok, which includes includes all regional provinces along the northern coastline of

the Gulf of Thailand: Chonbhuri in the east to Petchabhuri in the west, the dwindling natural habitat gives way to large-scale development. The already initially very limited habitat for these Siamese fighting fish, is now only very rarely to be found intact. Thus, today, there are no longer many populations of B. sp. "Mahachai" that once probably populated the entire coastlinr of the bay named as Bangkok.

B. sp. "Mahachai" will not survive the next 10 years, unfortunately. Related populations can not pick up, thus disappears the possibility to find out more about these beautiful populations . We are only at the beginning of our knowledge. A small chance for some populations of B. sp. "Mahachai" lies with the Thai scientists. They should work with "veteran" morphologists and give these fish the initially proposed name, even if we "only" have one population there. Please "reo reo" not "dja dja"!

DISEASES OF ANABANTOIDS

Dr Peter Burgess, Consultant to Mars Fishcare

(Notes to supplement the April 2012 AAGB lecture)

Viral infections

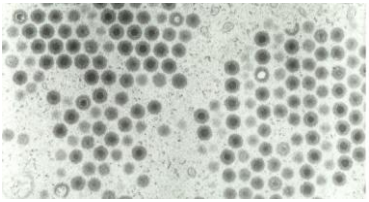
Probably all fish are prone to viral infections, however some viruses seem to be very specific in their choice of fish host. For example, an unidentified iridovirus has been associated with disease and deaths in farmed *Trichogaster trichopterus* and possibly *T. leeri* also. This virus is thought not to affect any other species of fish. With this virus, the affected gouramis darken, hang at the surface, and develop dropsy (= manifesting as bloating, scale lifting).

Some viral infections are fairly easy to diagnose based on outward symptoms, such as with lymphocystis disease, discussed below. However, the only way to positively identify a viral infection is to examine affected fish

tissue under an electron microscope (pictured below). This piece of apparatus is extremely expensive (it costs more than a Ferrari sports car!) and very complex to operate, so don't expect your local vet to possess one. It's no wonder that we know little about viral problems in ornamental fish and I suspect viral infections account for more "mystery" fish deaths than we might realise.

Lymphocystis

Lymphocystis is an iridovirus that affects "advanced" fishes such as anabantoids, cichlids, glass-fishes and the like. It manifests as small pink-white lumps on the skin and fins. Sometimes the lumps coalesce to form cauliflower-like growths – hence lymphocystis is also known as cauliflower disease. Although generally harmless, it is unsightly and its presence often indicates that the affected fish is stressed for some reason.



Picture: Rows of Lymphocystis virus particles (each a black dot) – viewed under an electron microsocope. (Picture credit: Roy Moate, Plymouth University)

As yet, there are no chemical cures for any viral infection of fish, and the only course of action is to provide the fish with optimal environmental conditions and a good diet, in the hope that its immune system will ultimately overpower the virus. Never attempt to surgically remove these viral growths- you will do more harm than good!

Bacterial problems

Bacteria cause a wide range of diseases in fish, and are generally responsible for conditions such as skin ulcers, fin-rot, and mouth "fungus". Many of these skin and fin infections are relatively easy to treat using remedies from the aquatics store. Naturally, I recommend Melafix (also sold as Medi-Bacter) as it deals with a range of common bacterial infections and also speeds up healing; fast skin healing is important as open wounds and other breaches to the skin will render the fish vulnerable to

further infections and, if the wounds are extensive, can also make the skin become "leaky" - so the poor fish has to use more energy to maintain its salt-water balance (osmoregulatory balance).

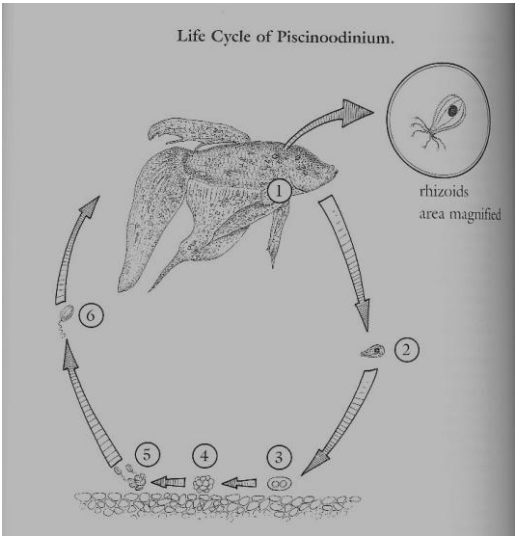
Mycobacteria

More problematic are the so-called "systemic" bacterial infections – i.e. those that spread throughout the fish's body or blood system. Of these, mycobacterial infections appear to be fairly common in gouramis (I have seen many cases in farm-bred dwarf gouramis) and certain other fish (eg farm-bred livebearers). Seen under a high-power (x 1000) microscope, mycobacteria are long rod-like organisms. These bacteria reproduce very slowly and are sometimes called "acid fast bacilli" (AFB) because of their histological staining features. There are numerous species of mycobacteria, some are harmless, while others cause disease in humans and other animals, including fish. The fish-pathogenic mycobacteria enter their host via the mouth – for example as a result of the fish foraging on the corpses or faeces of an infected fish. Once inside the fish, the mycobacteria are prone to attack by the fish's immune system, and some become imprisioned – ultimately being walled-off inside a "granuloma" that is formed by the fish's immune cells. Granulomas are a feature of mycobacterial infections and appear as small, pale nodules within the internal organs (eg kidneys, liver) of affected fish. External signs of a mycobacteria infection are varied and include skin ulceration, skin bruising, stringy faeces, and gradual loss of weight. Chronically affected fish become very emaciated, hence mycobacteriosis is sometimes referred to as "wasting disease". Unfortunately, it is extremely difficult to treat mycobacterial infections. This is partly because the mycobacteria affect internal organs, making it difficult for conventional bath treatments to penetrate the fish's tissues and reach the mycobacteria within – especially if the bacteria are walled off inside a granuloma. Mycobacteria also have thick, waxy cell walls that are resistant to chemical attack. Antibiotics offer only limited hope, as mycobacteria are resistant to many antibiotics commonly used to treat fish. If the affected fish is very valuable, then it might be worth trying a combination of antibiotics (eg. doxycycline, minocycline) from the vet. Regrettably, the only viable alternative it to euthanase affected fish or to permanently isolate (quarantine) infected stock. Never breed from mycobacteria-infected fish as the bacteria are capable of passing from one generation to the next via the fish's eggs. (This is known as "vertical transmission" and has been demonstrated under laboratory conditions with mycobacteria-infected *Betta splendens* – the eggs becoming infected with mycobacteria while inside the infected female fish).

Velvet disease

This parasitic infection is caused by a single-celled protozoan, *Piscinoodinium pillulare*. (Note: the popular name "*Oodinium"* is incorrect and should be dropped from the aquarium literature. *Oodinium* is in fact a genus of parasites of marine inverts!).

Velvet disease is quite common in some anabantoids and can be a real problem when rearing fish. It manifests as tiny spots on the fish's skin and fins. Each spot is a single parasite that appears green-yellow under bright light. The novice might confuse velvet with whitespot ("ich"), but differential diagnosis lies in the size and colour of the spots. Size-wise, velvet parasites reach only ~0.15mm diameter, whereas mature whitespot parasites may reach ten times that size: 1.5 mm. Seen with the naked eye, a heavy infection of velvet looks more like a dusting over the fish, whereas ich appears as numerous sugar-grain-sized spots. As for colour, the spots of velvet are yellow-green when viewed under bright light, whereas those of whitespot are white-grey. Velvet is generally easy to eliminate using one of the anti-velvet cures on the market. (Having said that, during a previous talk that I gave on diseases, some AAGB members said they experienced difficulties in preventing and eliminating velvet from fry aquariums.) For added effect, keep the aquarium in total darkness for 7



Life-cycle of the FW velvet parasite.
© P.Burgess
From: Bailey & Burgess. *Fishlopaedia.* Ringpress Books.

1.Parasitic stage (trophant) attached to the skin of the fish. The penetrating root-like rhizoids are used to anchor the parasite to its host.
2.Trophant leaves fish
3.Reproductive stage (Tomont or cyst)
4.Cyst begins to divide
5.Cyst releases up to 256 infective stages
6.Infective stage (dinospore) swims in the water in search of fish to infect

days. This darkness trick works because velvet parasites obtain some of their energy by photosynthesis (that's why they appear yellow-green, just like plants). If denied light, the parasites will weaken and probably die. But don't rely on darkness alone to combat velvet – it is much safer to combine darkness with a course of velvet cure. (Incidentally, this darkness technique won't work on marine velvet. This is because the

marine velvet parasite - a different species, *Amyloodinium ocellatum*- does not photosynthesise).

Returning to the problem of velvet disease outbreaks in fry aquariums, these occur because velvet parasites are already present in the aquarium or fish room. These parasites cannot be introduced via tap-water or via frozen or dried foods. Even wild-caught live foods, such as *Daphnia* or "Tubifex", are highly unlikely to carry velvet as this parasite is principally a warm-water inhabitant. Bear in mind that the free-swimming stages of velvet are microscopic and can easily be passed from tank to tank via contaminated wet hands or via droplet spray or aerosol. If velvet is a recurrent problem when rearing fish, then think about moving the fry tanks well away from the main aquariums, to reduce the chances of spreading this disease around the fish room. Also bear in mind that velvet can "tick over" at very low (hence sometimes undetectable) levels in your adult fish - especially in fish that have acquired partial immunity to this parasite, arising from a previous exposure to velvet. These partly immune fish can harbour just a few velvet parasites that you may not detect, and the parasite levels are so low that these fish show few or no outward symptoms. Your fry, on the other hand, will not possess acquired immunity to velvet and this may explain situations where you experience full-blown velvet disease in the fry tanks but not in your adult stocks.

Fungal problems

These are caused by *Saprolegnia* fungi and various other water moulds. Fungus rarely attacks uninjured, non-stressed fish, so if your anabantoids develop fungus then you should investigate why fungus was able to take hold in the first place. Possibilities are overcrowding, poor water conditions, post-transportation stress, low water temperature, or skin injuries such as caused by skin parasites or fighting. There are various ways to treat fungus, such as using salt, but we know that many anabantoids are not highly salt-tolerant. Other treatments include 2-phenoxyethanol which is the active ingredient in some fungus remedies sold for aquarium use.

The herbal-based remedy, Pimafix (also sold as Medi-Fungus) is a science-based fungus cure with a high safety margin and is tolerated well by anabantoids. Pimafix was developed by Aquarium Pharmaceuticals Inc. in the USA (who also developed Melafix) so look out for it in the shops.

Diseases of wild anabantoids

Many AAGB members keep wild-caught anabantoids so its relevant to mention that wild fish are likely to carry a greater variety of pathogens and parasites than aquarium-bred stocks.

We know that some fish parasites are only able to complete their life-cycle under wild (or outdoor conditions), examples being the digenean flukes that have incredibly complex and fascinating life-cycles. Some of these fluke species must sequentially infect a fish-eating bird, then an aquatic snail, and then a fish in order to complete each generation. Given that most of us do not keep seagulls or cormorants in our homes (though nothing surprises me when it comes to AAGB members!), then clearly these parasites cannot transmit from fish to fish within the confines of an aquarium.

Examples of multi-host digeneans are those that cause "black-spot" in anabantoids and other fish – each black spot being a juvenile fluke embedded in the fish's skin. Some of you may have encountered farm-bred pink kissing gouramis infected with larval digenean flukes. The body of a juvenile pink kisser is partly translucent when the fish are examined with a strong light source behind it, enabling you to see the tiny maggot-shaped flukes embedded within the fish's tissues.

Further reading:

The Interpet manual of fish health. 2nd edition (2002). By Andrews, Exell and Carrington.
This is a superb book, with lots of pictures and clear life-cycle diagrams to help you identify and understand fish parasites and pathogens. A 3rd edition, in soft-cover, is now available.

The new illustrated guide to fish diseases. By Gerald Basleer.
Over 1000 pictures showing disease symptoms and close-ups of fish parasites. There is a small section devoted to diseases of anabantoids. You won't find this book in many aquatic stores but it can be obtained via Amazon.

For a general introduction to fish diseases, I may as well plug my own book (!) which is very good value at under five pounds:

Common fish ailments (2002). By Peter Burgess. Published by Ringpress (a division of Interpet Publishing).

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