

AQUARIST AND PONDKEEPER

The magazine for every fishkeeper ~ since 1924

FEBRUARY 2001 \$2.50

Rare Breeds

Searching for endangered species in Brazil

- *Betta Falx, Brichardi Cichlids, Fish Nutrition*
- *A&P guide to choosing the right Goldfish*
- *The latest news & your questions answered*



Cichlid varieties



History of Koi



Carpet surfing with Firefish



MARINE · PONDS · PLANTS · AMPHIBIANS
TROPICAL · DISCUS · COLDWATER · KOI

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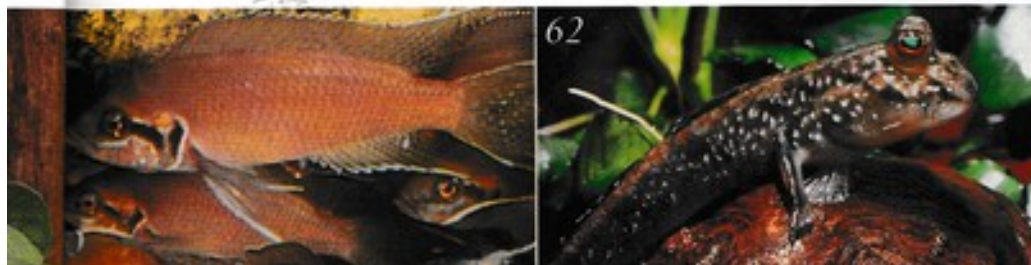
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COVER PICTURES

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Small photos left to right:
M.P. & C. Piedraie
M.P. & C. Piedraie
Max Gibbs

Welcome to another action packed A&P!

Hopefully by now the waters will have started to recede and at least some parts of the UK will be dry land again! Several of the shop visits featured in this month's magazine were undertaken in what can only be described as horrendous conditions. Sadly, though, difficult driving conditions are only a small part of the problem. Many pond keepers will have found their pets floating off into the muddy yonder as a tidal wave of flood water engulfed both their homes and their fish's ponds. Such a loss must be heart rending to everybody concerned. Not only is your home wrecked for the foreseeable future but so is your garden and pond. The insurance will pay for most things but few companies will pay out for dead fish under any circumstances.

Looking at this month's magazine I think there is something for everyone.

Dave Garratt has certainly come up with a stunningly beautiful marine fish and Andrew Caine has the final part of his *Starting with Marines* series. On the coldwater front, Roy Osment has the history of Koi, we have six of the best Fancy Goldfish and Bernice Brewster delivers another slice of Koi World. Not to be left out, tropical fishkeepers can Creak at the Moon with Dave Marshall, check out some Cichlids with Dick Mills, and Paul Skinner starts a new series on fish that may not be the best community fish but are well worth keeping. Finally, I have put pen to paper (alright, fingers to keyboard) to give you a little taster of what went on out in Brazil with a film crew.

Until next month,

Derek Lambert
Editor



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NEXT ISSUE

Tropical

Old Four eyes. The history and life style of this fascinating livebearer is described by Peter Capon.

Dick Mills is back with a beginners' feature on Gouramis.



Coldwater

Lance Jepson has some pointers for buying healthy Koi.



Aquarium technology

Andrew Caine starts a new series on Filtration.

Marines

Dave Garratt is back with another marine fish feature.



UP THE Amazon

DEREK LAMBERT TRAVELS TO BRAZIL WITH A CAMERA CREW AND ASSORTED 'FISH PEOPLE' TO MAKE A TELEVISION PROGRAMME. WHILE STILL MANY MONTHS AWAY, HERE IS A SNIPPET OF WHAT WENT ON AND THE FISH THEY CAUGHT.



We all met up at Heathrow Airport. Five film crew members, three anglers and five aquarists. A very motley crew if you ask me and, at the time, I didn't do the maths but it made a party of 13. I already knew Kathy Jinkings and David Sands, but the other two aquarists were unknown to me. John Chalmers owns Hobby Fish aquarium shop and Colin Plowright is a friend of his who is a regular in John's shop.

Along with all these people were about 40 pieces of assorted luggage. Each one had to be checked in before we could move on through security and head for the plane. The whole process took forever and we only just made it on the plane to Rio in time. Eventually, after a stop over in Rio, we arrived in Manaus. Here we were met by Miguel (the owner of

Amazon Nut Safari company) who took us to our boats.

If I had had my camera out when we pulled up at the river bank where our boats were moored, I could have had the best picture of the whole trip. No, not of the boats, but of the Director's (Norman's) face. It was an absolute picture of complete disbelief! When he found out the smaller boat was the film crew's he was even less impressed. Norman likes his comforts and it was obvious there would be few of those on this trip.

First fish and famous people

The other eight of us piled into our boat, the Iguana, and took up residence in various bunks. David Sands managed to grab the double cabin upstairs which

soon became home to a large number of boxes belonging to the film crew. A few minutes later I was dipping my net in the sewage that passed for the river at this point. Out came some very pretty wild Guppies. My net was wet and I had my first fish of the trip - I was happy.

Later Miguel introduced us to the crew and pointed out a plaque and bell given to him by Jacques Cousteau after he had travelled on this boat. Above David's bed was a hand-carved plaque with Evelyn Axelrod's name on it. Dr Herbert Axelrod and his wife had also travelled on this boat on several occasions.

First filming

That night we chugged across to the other side of the Rio Negro and moored in a pleasant spot. At first light we went

to the main dock next to the fish market. This was to be our first *venue* for filming and our last chance to stock up on goodies for the next few weeks. The fish market was certainly interesting. Pacu, Arowana, Shovelnose Catfish, Peacock Bass and Prochilodus were on display and would all be eaten by us over the coming weeks.

Our next port of call was Miguel's lodge way upstream of Manaus. This comprised of several buildings with rooms we could use instead of our bunk beds. At the beginning of the trip only Norman made use of these but on our return we almost had to work out a rota for who was going to sleep in them this time.

We arrived too late to do any fishing but first thing next morning Kathy and I dragged out some nets to see what we could find. First out were some Lamp eyes (*Lampisphyllum pygmaeus*), Pencil fish (*Nannobrycon ufaesciatus* and *Nannostomus beckfordii*), Festivum cichlids, and one of my favourite fish, *Copella nattereri*; at least it was until this trip. Despite being rare in the trade, this fish is a real weed fish in the Rio Negro and I was soon fed-up with catching them.

The Pencilfish lived close to where plant roots were hanging into the water, the Lampeyes were right at the surface in open water and the Cichlids tended to hang about close to large fallen tree trunks. These could be enticed in to take bread but the large ones were far too canny to get close enough to be caught by hand net.

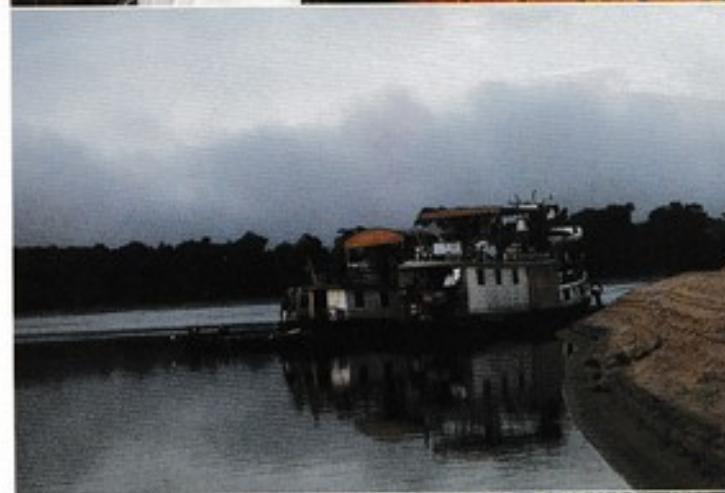
Later that day Kathy and I headed out in a small canoe to do some more fishing. We found a shallow creek piled high with leaf litter and lots of fish tucked into it. Here we caught several *Apistogrammas*, and saw some larger cichlids which were far too quick for us to catch. Lampeyes were everywhere (another weed fish), and a large shrimp. A few weeks later we returned to the same spot only to find the river level had fallen so far, there was no water left. =>

main pic left: Zebra Pleco may be extinct in the wild due to over-fishing.

top right: Don Juan, our chef, rings Jacques Cousteau's bell for dinner.

middle right: Our boats had little in the way of luxury.

bottom right: Some of the 'motley' crew on this trip.



COURTESY: BERNARDO SEIFERT (ARROWHEAD), MANAUS, BRAZIL



Fascinating island

→ From Miquel's lodge we travelled upstream for many hours before mooring at an island in the middle of Rio Negro. Here we caught several species of tetra swimming in the open water but little else during that day. One interesting sight was the large holes used by Plecs as nesting sites when the river is running high. At this time of the year the water level had dropped over 20' leaving many of the holes high and dry.

On our way back we again stopped at this location but this time we were night fishing. With torches firmly strapped to our heads, we searched among the large boulders along the island's shoreline. These had come alive with loricatorids and proved a wonderful source of *Peckoltia*. Stingrays were also found in the shallow water along the sandbanks and large *Pimelodus blochi* were caught on rod and line. Handling a baby Stingray has to be one of the highspots of the trip for me. They are the royalty of the livebearer world, as far as I am concerned, and it was to hold one of these that I really wanted most on this trip.

Barcellos and Project Piabla

As we pulled into Barcellos, nearly two weeks into the trip, we could see a number of small boats moored along the shore. These are fishing boats belonging to the families who actually catch fish for the ornamental trade. They live on these boats nearly all the time and travel out from Barcellos in search of fish. They work for one of several firms that purchase their catch and the fish are then shipped down to Manaus. Friday is the day when all the boats come in and thousands of fish can be seen in the packing station. Of course we arrived on a Tuesday!

Still there was Project Piabla to visit. Hopefully, Professor Ning Labbish Chao would be present to talk about this important project and would be able to bring me up to date on why Zebra Plecs (*Hypancistrus zebra*) had apparently become almost extinct in the Rio Xingu. It has always been Prof. Chao's position that no over-fishing was occurring. Sadly, he had de-camped to Boston suddenly when he heard we would be visiting. →

top left: Duda hunting for Snowflake Bristlenose.
middle left: One of the ornamental fish collector's boats. Whole families live on these.
bottom left: Peacock Bass - almost too good to eat.

FISH SAFARI

⇒ Sometimes film crews can be a distinct problem!

Maguari Creek

Coming back from Barcellos, we anchored at the mouth of Maguari creek. This shallow creek leads into a large lake area and proved difficult to negotiate. With the anglers defeated by big logs blocking the way it was left to the aquarists to fish the lake bank. Here we found a huge number of fish and a good range of species. Lamp eyes, *Apistogramma* sp., *Nannostomus eques*, *Geophagus* sp., *Amblydoras hancocki*, Glowlight tetras, Silver hatchets, Pike cichlids, X-ray tetras, Black piranha, Serpae tetras and finally a small Redtail catfish.

At this point Oliver and Dudu flew in to join us. They were to be our guides for the rest of the trip for they have boundless knowledge of the fish of this area. With them on board we had a much better chance of finding even more fish.

The next day we returned up the creek again, this time disturbing a huge shoal of Hatchets that literally flew away skimming a few inches above the water's surface while making a buzzing noise. This is a fish that actually flaps its fins to fly through the air. Many flying fish just use their large fins to glide.

A creek further on

Travelling on from the first lake, we headed down a smaller creek at the other end. Here we found a suitable fishing site and set to work. This time the haul included: *Rivulus* sp. Needlefish, *Apistogramma* cf. *pulcher*, *Farlowella* (Whiptail catfish), *Nannostomus unifasciatus*, *Amblydoras hancocki*, *Gymnotus* cf. *garapo* (Striped knife-fish), *Crenicichla* sp. (Pike cichlid), *Gymnotus* sp. *Moenkhausia* sp. and a *Hemigrammus* sp.

The *Rivulus* were really strange. It was almost easier to collect them from the riverbank than in the water. Whenever anything threatens them in water they simply jump out onto the ground. Here they lie quietly for a few minutes ⇒

top right: *Apistogramma* sp. collected at a Rio Branco habitat.

middle right: The largest fish was caught by our deck hand! One of the anglers lent him his rod and Sebastian hooked this Pacu.

bottom right: Snowflake Bristlenose. We caught a whole family of these.



→ to allow the danger to move away and then flip themselves about until they land back in the water and swim off. However, they make sure they always stay close to the river bank.

Final foray

My final foray into this area was with Oliver, the anglers and Dudu. Dudu dropped Oliver and I on the lake shore while he went off with the anglers to try and find a good place for large Peacock Bass. So far our anglers had caught reasonable numbers of Piranha and other fish but only a few small Peacock Bass, which was what they were really on the trip for.

It was only after the boat had moved well away that we noticed the foot prints of a large Caiman. Throughout the next few hours fishing both of us kept a wary eye open for this creature, while at the same time catching fish. Most notable at this location was our first Corydoras.

With just the two of us fishing quietly, the forest came alive with noises. Monkeys and parrots mostly; but even the sound of insects could clearly be heard. With every plopping sound we both looked up and checked that our large Caiman had not turned up for a tasty meal – namely us!

Eventually Dudu returned and we headed back to the boat. As we travelled along the creek again, suddenly Dudu grabbed a net, jumped out of the canoe into waist deep water, and started catching fish. We were in the middle of a

shoal of hundreds of Corydoras like those we had been catching earlier.

Rio Branco

So far we had been in tributaries of the Rio Negro but finally we moved into a whitewater river – the Rio Branco. This type of water is less acidic and is home to an even wider range of species. We had several locations to visit here but one of the best was a lake shore habitat not far from the main river. Here we caught two different species of *Apistogramma* (*Apistogramma gephyra* and *Apistogramma hippolytae*). A wider range of small tetras were also in evidence including *Pyrrhulina brevis* and a different Pencilfish that no-one could identify at the time.

Our anglers also had a good catch with two different Peacock Bass species (*Cichla temensis* and *Cichla intermedia*) who were stupid enough to grab a plastic lure with hooks attached. Still, they are very pretty fish and it seemed such a shame to kill them. However, the dinner table beckoned and with no refrigeration, apart from ice held in polystyrene boxes (most of which was by this time coldish water), the meat was becoming far less appealing than fresh fish. Sadly, Kathy is allergic to fish and had now become a vegetarian living on bananas, rice and whatever fruit she could find.

Other cichlids that we caught (not destined for the pot I hasten to add) were *Acaronia nassa*, *Mesonauta festiva*, *Laetacara thayeri* and *Acarides heckelii*.

Certainly an interesting haul for just one location.

Wonderful creek

One of the most memorable creeks we visited was a whitewater creek that is really part of the Rio Branco but now drains into the Rio Negro. The water, however, is whitewater and distinctly colder than the Rio Negro.

Here we found large pieces of wood ideal for Catfish of all kinds to live in or on. I have always been a fan of black fish with white spots and the Snowflake Bristlenose in particular. A large tangle of bogwood was home to a whole family of them. Mum and Dad were much larger than the rest but we also caught three different sizes of youngsters. Beautiful fish and one I still dream of owning.

Snorkling here was also a joy because I had a chance to see Pencilfish feeding between the cracks in the bark. With their tiny pointed mouths they could pick morsels out of cracks far too small for most other fish. Tetras of all kinds swam in huge shoals and we found many, many catfish. This was probably Kathy's heaven.

Finally we had to return to Manaus and head home to reality. We visited an exporter before leaving just to see where the fish would be held before being shipped all over the world, but really all of us wanted to jump on the plane as soon as possible. A month away, even if I am in an aquarist's paradise, is far too long for me to be away from my fish room! ■



Jump for JOY



DAVE GARRATT'S REGULAR MARINE FISH
FEATURE MOVES ON TO FIREFISH.

The Firefish are very common inhabitants of dealers' tanks throughout the country and I cannot remember a time when this was not the case. They can be regarded as one of the staples of the marine hobby as they are always available at a reasonable price. In fact with the boom in reef tanks and fish and invertebrate communities their popularity has increased.

A classification nightmare

Classification has been somewhat of a problem with these fish. At one time considered to be Blennies, they were then moved to the Gobies where they became universally known as Fire Gobies. Until 1986 they were still called Fire Gobies in many texts such as the one by Debelius (ref #1). Indeed, a quick search on the Internet will give up-to-date articles still using the terminology of Fire Gobies. However, according to Dakin (ref #2) both Hoese in 1986 and Birdsong in 1988 assigned these fish to a different Family, the Microdesmids, a Family of 36 eel-like species that goes by the unflattering

left: *N. magnifica* is the commonest species, being found throughout the Indo-Pacific from as far afield as the Barrier Reef to the East African coast.

below: *N. decora* does not have quite the same striking height on the dorsal spine as *N. magnifica* but more than compensates with its stunning coloration.

common name of Wormfish. Some Internet articles use the term Wormfish but the common name of Fire Gobies remains.

So is that all clear? Probably not, but then again classification rarely is. The subject is always open to much debate and disagreement but these are the very things that drive scientific study. While not too important to the hobby, classification is very important to the bigger picture. Whatever name we use does not make one iota of difference to the requirements and behaviour of these beautiful fish. I assume the bright red colours of the commonest aquarium species, *N. magnifica*, gave rise to the Fire Goby name.

Natural habitat

Firefish belong to the Genus *Nemateleotris* and in the hobby are usually limited to three species:

N. magnifica or Common Firefish, *N. decora* the Purple Firefish, and the rare and very expensive *N. helfrichi*.

All species have slender or worm-like bodies and possess an elongated first dorsal fin ray. The elongated spine is longer in *N. magnifica* than either of the other species. They are found hovering in small shoals close to a coral head that offers plenty of scope for boltholes.

The hovering is effected seemingly with very little fin movement, the specialised swim bladder of the fish allowing such stationary behaviour. However, if threatened they show a fair turn of pace in finding their bolthole and entering tail first.

Firefish feed by hovering in the water current waiting for planktonic foods in the form of small crustaceans and fish larvae. They do not actively seek food and will not stray to take food that is not in the current, neither will they take food from the bottom. They are known to scatter floating eggs (pelagic) but the sexes are indistinguishable and they have not been raised in captivity. They reach no more than 3" on the reef and are slightly smaller in captivity.

Aquarium requirements

As noted earlier, Firefish have become even more popular with the advent of reef tanks, mainly because of their complete compatibility with invertebrates. They will cause no harm whatsoever to any you may have in your tank and they are also very peaceful towards other fish.

The major issues to be considered are their timid nature and bullying, their jumping ability, how many to keep and their need for high water quality.

Safe havens and bullies

Firefish are very shy, retiring and peaceful fish, hence the first objective must be to provide them with plenty of intricate rockwork to enable them to select and use a bolthole at the first sign of a perceived threat. However, they should rarely need to seek out their safe retreat because they are too timid to be kept with aggressive or even boisterous fish. There are many instances of hobbyists losing →



FIREFISH

→ timid fish, such as Firefish, because of bullying from tank-mates. The bullying does not need to be overtly physical; the mere threat of constant harassment would be sufficient to cause the decline of a Firefish. Therefore the choice of suitable tank-mates will be crucial to your success with these fish.

Carpet Surfing

There are countless tales from despondent hobbyists detailing the Firefish's enthusiasm for a habit known as 'carpet surfing'. This involves seeking out and then jumping through the smallest possible gap in your cover glasses to take a walk across the carpet. Now Firefish do not seem to understand that they cannot exist out of water and many perish in an attempt to disprove this fact. I have no idea why this should be or how they manage to seek out such small gaps, but make no mistake they will. If the carpet is not their final resting place then the top of the coverglass will be. Nothing is worse than finding a dried out husk under the glare of the aquarium lights. This situation provides a major problem for the reef aquarist who does not use cover glasses because of the light loss involved.

Feeding

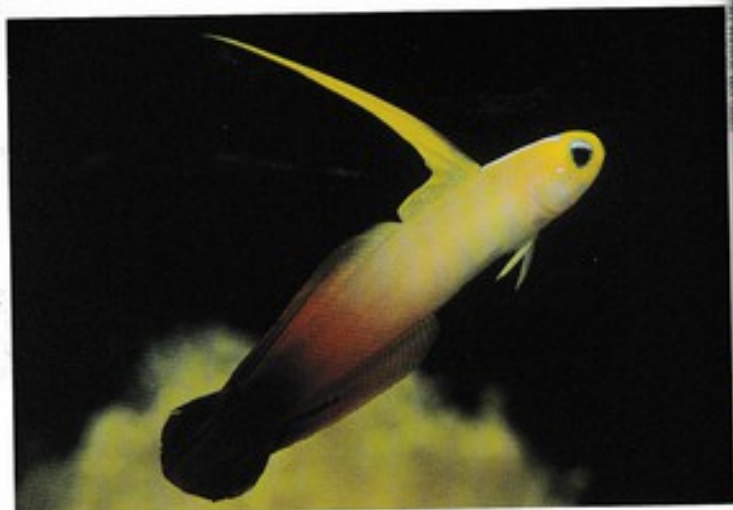
Provided that food of a small enough particle size is used, feeding should not present any problems. Many foods can be offered and the like of Brine shrimp, Mysis, lobster eggs, squid, mussel and even marine flake will all be readily accepted.

Single or not

Opinion is very much divided as to whether Firefish can be kept as a small group in the artificial confines of an aquarium. Many aquarists insist a small group will eventually find a dominant pair, who will then mercilessly chase and harass the others until they are the only Firefish still breathing. Others insist they have kept a small group in a suitably large tank and I have seen a report of a group of four showing schooling tendencies in a 180 gallon tank. However, 180 gallons is a sizeable obstacle for most hobbyists and the majority do seem to just keep a single specimen.

Hardiness

The Firefish cannot tolerate the abuse and stress caused through poor tank maintenance and poor water quality.



above: *N. helvrichi*. is a rare but very beautiful fish, well worth the extra you will have to pay for it.

They require the sort of water quality that can only be obtained through attention to detail and regular water changes. Having said that, they are not beyond the realms of the beginner. Commonsense suggests their hovering lifestyle and feeding preference means they appreciate good water flow in the aquarium, and they will often position themselves in a strong current formed from a pump outlet. They can tolerate the high light levels of the invertebrate tank but will require the darker recesses of their boltholes.

Available species

N. magnifica is the most common species, being found throughout the Indo-Pacific from as far afield as the Barrier Reef to the East African coast. Not surprisingly, it is the commonest aquarium species and also the cheapest. The front of the body is a pearly cream that gives way to a red coloration that intensifies along the body until by the time it reaches the caudal fin it is a fiery red, the red also extends to the dorsal and anal fins.

Although *N. decora* does not have quite the same striking height on the dorsal spine as *N. magnifica* this species more than compensates with its stunning coloration. The front of the body is a deeper colour tending towards a light olive green, but it is the finnage that imparts the real beauty to this fish. The dorsal spine and dorsal, anal and caudal fins are a vivid iridescent deep purple. The effect is even more striking when seen under actinic lighting.

N. decora is an Indo-Pacific species

but is not as common as *N. magnifica* and consequently it attracts a much higher price.

N. helvrichi has a beautiful pink/violet coloured body with a small area of yellow around the mouth and eyes. The fish is rare, with distribution limited to the Central Pacific, and it is only found at depths below 100 feet. Such distribution and habitat make for a species that is very rare within the hobby, and so it attracts a very high price, I saw one recently on the Internet priced at \$250.

Conclusions

Firefish are extremely attractive fish and while two of the species detailed here could be termed expensive, the common species *N. magnifica* is much more reasonably priced and is still a very handsome, striking fish. They are ideal for a reef set-up or a peaceful mixed community – indeed they must have peaceful tank-mates to thrive. Their life style demands they have rocky retreats and water currents. Firefish are within the capabilities of beginners providing the conditions outlined are adhered to. Finally, they jump... ■

References

1. *Fishes for the Invertebrate Aquarium* by Helmut Debelius, pages 114-122. Publisher: Kernan (1986).
2. *The Book of the Marine Aquarium* by Nick Dakin, page 224. Publisher: Salamander Books/Interpet (1992).

Common ground



ROY OSMINT DELVES INTO THE FISH ARCHIVES WITH A LOOK AT THE LINK BETWEEN COMMON CARP AND THE MODERN-DAY KOI.

In many ways Koi represent the very essence of the orient! Ogon, Kohaku, Sanke, Showa, words that are immediately evocative of the East – unmistakably Japanese. To the dedicated enthusiast such names mean everything, to the admiring non-*afficionado* they simply add to the overall mystique and fascination.

Koi, or Nishikigoi, as they are more properly known, are fishes of truly outstanding beauty. It is little wonder that these magnificent creatures have the ability to set the pulses racing with their powerful grace of movement, precise intricate patterning and breathtakingly dazzling colours. They are the pride and passion of those who keep them and the admiration and envy of those who do not.

There is little about modern Koi that can legitimately be described as natural for they are definitely the product of genetic manipulation since Koi originate from the Common Carp *Cyprinus carpio*.

Discounting for a moment the obvious pattern and coloration differences the most evident physical difference that sets Koi apart from their Goldfish cousins is the presence of two pairs of barbels protruding from above the upper lip. Koi have the potential, in favourable conditions, to grow to comparatively huge sizes, up to 1 metre (3') in length and have been known to live in excess of 50 years. Compare this to the smaller Goldfish which in perfect conditions are unlikely to survive much more than half this age.



Incredible or not, that is certainly how it started. In fact credit must go to a strange chance mutation – and of course man's ingenuity.

In the beginning

Niigata Prefecture, a harsh mountainous region in Japan was, towards the middle of the nineteenth century, home to numerous peasant farmers who struggled to eke out a meagre living growing rice for themselves and their families.

Swamp rice, the usual and best variety, requires to be cultivated with its roots totally immersed in water and, given the necessary conditions, it provides a good yield per plant.

The farmers of Niigata, like generations before them, also, in many cases, kept and bred the black/brown coloured Carp (Magoi). These would be housed in specially constructed terraced ponds located on upland slopes, directly above the paddy fields. In this way the fish were provided with a readily available high protein food source, while the water from the ponds drained down into the rice fields contributing significantly to their vital irrigation and fertilisation.

Niigata winters, though not especially long, could be extremely severe. The passes of the surrounding mountains would often become blocked and the area effectively isolated from the outside world. The farmers, therefore, had to prepare.

With this in mind, towards the end of the summer many of the Carp would be captured, killed and preserved in salt. Thus providing an 'on tap' nutritious food supply to sustain them through the harsh months ahead. Some fish, of course, had to be retained for future use as next season's breeding stock. In many cases crude indoor ponds would be fashioned where the best specimens would be overwintered.

Genetic variation

Throughout the natural world there occurs from time to time curious and largely unexplained genetic differences. Individual offspring may sometimes possess a characteristic

that the parents and other offspring do not possess. In the harsh and uncompromising natural environment such mutants are normally unlikely to survive long enough to pass on the modification to their own young, unless the adaptation proves to be of positive benefit to survival of the species in their particular habitat.

It was while engaged in breeding their Carp that the Niigata farmers began to notice that occasionally a young fish would grow to display minor colour irregularities. Nothing too significant, perhaps the odd scale showing a subtle reddish hue. Or a hint of blue or white contrasting the brownish/black →

far left: Koi are mutations of the Common Carp.
left: Doitsu Hikarimoyo.

below: Kin Bekko.



Significance to mankind

Carp, mainly in the past, have been significant as a high protein food source and were often maintained and bred in specially constructed ponds or moats and harvested for the table as and when required.

In more recent times they have, of course, become the much prized quarry of dedicated specimen hunting anglers who will often invest large sums of money and enormous amounts of time in the patient endeavour of outsmarting the crafty Carp and experiencing the thrill of hooking a big one.

The origins of the splendidly coloured and patterned Koi Carp which today cruise majestically through 'gin clear' waters, can be traced to the comparatively dowdy blackish/brown specimens that once inhabited the murky depths of the early food holding ponds.

It seems quite incredible to suggest that creatures with such stunning elegance and beauty could have emerged as some form of mistake – a freak of nature! But

→ appearance of the rest of the body. At first, little notice was taken of such irregularities. After all, the odd tinted scale made no difference whatever when the time came for the fish to be cooked and presented to the dinner table.

Eventually, however, one or two of the farmers became fascinated with certain of these colour abnormalities and grew the mutants to maturity. They began to wonder what would be the outcome if two fishes, each possessing some different scale colour variation, were mated, what strange colour characteristics would the offspring exhibit.

Experimentation

The farmers began to look out for any strange colour mutations among their Carp stock and to compare them with any their neighbours might have found. By conducting selective interbreeding experiments with the deviants it was discovered that fishes of bright coloration could eventually be produced. Slowly, fish of ever more varying colour strains and patterns developed. To start with it was little more than a fascinating pastime for the farmers, an interesting talking point that brought a little colour and excitement into their humble lives.

During the summer months, however, traders would often travel through the mountains to conduct business with the rice farmers. Some, intrigued by the unusually coloured fishes they saw, wanted to show them to their own families or perhaps sell them on at a profit in other towns and villages. They offered to purchase some. The commercialisation of Koi Carp had begun.

With the sudden realisation that the fish might present a lucrative commercial opportunity, more and more farmers began to develop their own ornamental Carp - Nishikigoi (Nishiki being a Japanese word for coloured or brocaded cloth). Specialist breeders began to emerge developing fishes of ever more vibrant colour and intricate pattern. Through careful selective breeding programmes over many generations certain standard Koi varieties slowly became recognised and established

Slowly expanding market

Demand for these lovely fishes began to grow. Though for many years this expanding market was, in the main, confined to Japan. It was not really until the late 1940s that the rest of the world started to show any sort of interest in Koi. Development of this interest was

relatively slow. As circumstances gradually improved in the post war years more and more people had an opportunity to see examples of Koi in all their glory. It was in the early 1960s, however, that things really started to take off world-wide, courtesy largely of the polyethylene bag. This revolutionised the method by which Koi could be transported making it an altogether safer and more convenient procedure. It also, of course, had the effect of bringing down air freight charges through the weight differentials. This saving could be passed on to the Koi buying public.

Modern Koi

These days Koi are readily available everywhere in forms to suit every preference and pocket. These range from individual specimens costing thousands of pounds, at one extreme, for fish that exhibit absolute excellence of recognised line, colour and pattern demanded by the true devotee, to those that can be obtained for little more than the cost of a couple of pints of beer at the other.

Everyone can enjoy the mystery, grace and grandeur of these lovely fishes. It is not necessary to understand the complexities of their finer points, as seen through the eyes of the specialist. It does not necessarily matter that you are unable to identify a show stopper from an also ran, in order to appreciate their beauty. You do not even have to keep them. Numerous opportunities exist in public water gardens and retail outlets right across the country to marvel at Koi in ideal circumstances.

It is from such visits that the initial spark of enthusiasm to become a Koi keeper is often ignited. But a word of caution here. Maintaining these fish in perfect conditions is a specialised and costly business requiring much research



above: Kachibeni Kohaku.

and planning. Simply introducing a few Koi into an existing well balanced water garden system is not the answer.

Many countries across the world now produce fine quality Koi, but when it comes to sheer perfection as judged by the connoisseur keeper, the top Japanese breeders are still regarded as producers of fish that are 'head and shoulders' above all others.

Those original humble rice farmers of Niigata could never in their wildest dreams have imagined that their chance freakish discovery and subsequent experimentation would lay the foundations for what would eventually become a worldwide multi-million pound fishkeeping phenomenon. ■

Blue Ring Octopus

Hapalochlaena lunulata SIZE 4"

AQUARIST
AND PONDKEEPER
GALLERY

PHOTO: MAX GIBBS



a few
water

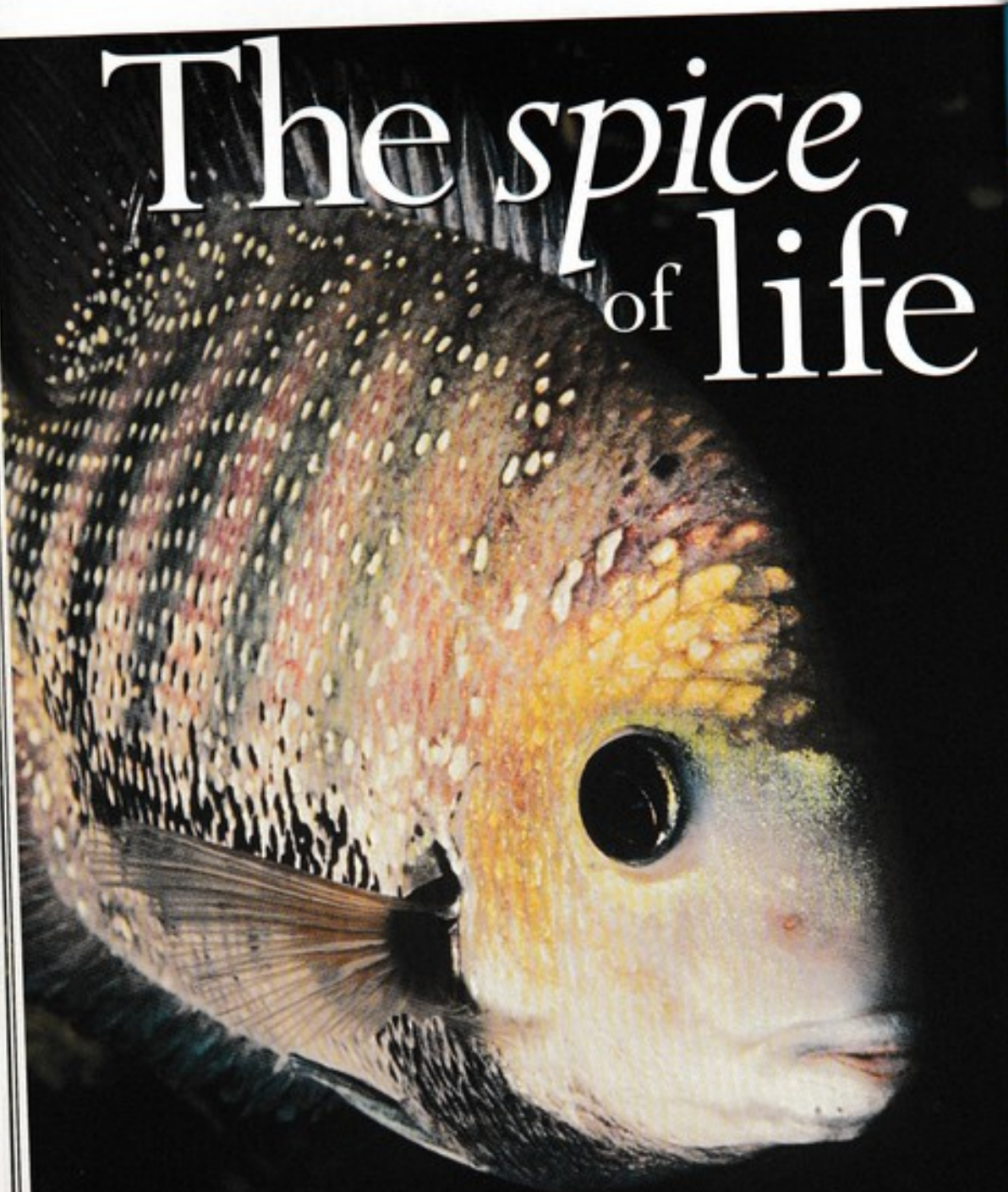
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The *spice* of life



CONTINUING HIS SERIES ON COMMON AQUARIUM FISH,
DICK MILLS MOVES ON TO THE MANY VARIETIES OF CICHLID.



far left: Silver Chromides are one of only three Asian species and prefers brackish water.

left: Marbled Angelfish are one of many man-made colour forms.

below: *Apistogramma nijsseni* are a recent introduction to the aquarium hobby. This is a male.

How would you describe Cichlids? Great big ugly brutes who wreak havoc on any furnished tank? Gentle creatures of a strong family disposition, taking care of the kids? Slow-moving, beautifully-coloured 'Kings of the Aquarium'? Secretive, shy fish who will one day surprise you with a few dozen youngsters? All the previous descriptions may well be true, depending on which species you have in your aquarium, so it's up to you to choose which style of Cichlid is for you, although it is pretty true to say that whatever type you choose you will grow to love it as perhaps only its own mother could.

Found worldwide

Cichlids are found practically worldwide, occupying varying water conditions ranging from jungle streams to vast lakes. Central and South America and Africa provide the majority of species, with Asia having to be content with just three – and that from a single genus as well. Due to its geographical isolation, no endemic Cichlids are found in Australasia.

Many authorities consider the Cichlid to be among the more highly-evolved species of fish and this is reflected in their breeding methods. Spawning is not an opportunistic occasion as with the almost promiscuous egg-laying species. Cichlids exercise a great amount of

parental care both in pre-spawning preparation and especially in the aftercare of the resultant fry. Even within this overall context of happy families, there are digressions – some brave it out, spawning on an open site in full view (and in constant danger from) other species; others take to the security of a cave, laying their eggs on the ceiling; the poor female mouthbrooder is landed with the responsibility of hatching the fertilised eggs in her throat cavity (for nearly a month) during which time she takes no food. As all the fascination of these activities can be seen by you from the comfort of your own armchair – who could ask for a better aquarium subject than Cichlids?

Which species?

For starters, in a non-aggressive way, the Sheepshead Acara, *Laetacara curviceps* is a modest-sized, peaceful fish with attractive facial markings resembling a smile. This South American species won't be concerned about rearranging your planting scheme but will spawn for you without too much trouble. Other peaceful, albeit slightly larger Cichlids of similar disposition are the Firemouth, *Thorichthys meseki*, and the Keyhole Cichlid, *Cichlasoma macrura*.

The genus *Apistogramma* has many beautiful species, with *A. agassizii* and *A. cacatuoides* two excellent examples of

long-standing aquarium favourites; more modern-day discoveries such as, *A. nijsseni*, *A. hongkongi* and *A. macmasteri* prove that there are yet plenty more discoveries to come. As for the ever-popular Ram, Gold and Long-finned varieties included, well the only thing that's happened to this fish is that it's had several generic name changes (what Cichlid hasn't, you may well ask?) Including *Papiliochromis* and the current *Microgeophagus* along the way since its original placement in *Apistogramma*.

Rival to marines

Hands up all those fishkeepers who think you can't hold a candle to marines for colour? All you've got to do is take a tip from the marine scuba divers but take a trip below the waters of any of the African Rift Valley Lakes; taking a mouthful of water here won't taste salt but the colours of the fish in the shallow waters around the shoreline will surely make you think of a coral reef. →





→ Lakes Malawi and Tanganyika are teeming with the most vibrantly-coloured fish. Algae-browsing Mbuna are mouthbrooders whilst the almost secretive shell-dwelling *Neolamprologus* are obviously the equivalent of our city-dwellers. Another species now placed in this genus forms a nuclear family – Brichardi Cichlids, *Neolamprologus brichardi*, was the sensation of the year nearly 30 years ago and that was before they discovered the yellow species! *Julidochromis*, are sleek cylindrical fish which also prefer to breed in flowerpots or caves and might well be described as the equivalent of the South American *Crenicara* or the West African *Pelvicachromis*.

Aquarium king

A feature of some Cichlid care is the initial dependence of the fry from some species on obtaining primary food from the skin-covering mucus of their parents' bodies. The most well-known example of this is with the Discus, *Symphysodon* species. Usually described as the 'king of the Aquarium' this saucer-shaped fish is the epitome of stateliness as it glides sedately around the aquarium. To get the best from this fish you need to devote your life to its needs – for all the years of its existence there has not been a short-cut found yet to keeping this fish successfully without true dedication on the part of its owner.

Maintaining the optimum water quality is of paramount importance requiring both specialist filtration and expert knowledge. This fish should not be subjected to the hustle and bustle of the community aquarium, it deserves an aquatic palace of its own. Commercial breeding has done two great services for this species: foremost, it has allowed the numbers of wild-caught fish to be diminished and, secondly, there has been a flood of aquarium-developed strains

released on to the market which will stimulate a continual market for this superb fish. Like marriage, Discus-keeping is not to be entered into lightly.

Highly recognisable

The Angelfish, *Pterophyllum scalare*, is one of those fishes equally recognisable to people outside of the hobby. Like the Discus it is a laterally-compressed fish, rather 'taller' than it is long, and its vertical black markings on a silver body camouflage it perfectly as it glides between the stems of aquatic plants.

However, once again, selective aquarium breeding programmes have produced several 'unnatural' strains – Blacks, Half-Blacks, Marbled, Gold, Turquoise, Ghost, Red Headed and so on; but that's only the colour strains. When you stop to consider the other formats too – Veiltail and Lace finnage too, the permutations should permit you to produce almost an unlimited number of desirable fish!

The Altum Angelfish, *Paltum*, is a much 'taller' fish (although wild caught *P. Scalare* are almost a match for it). This infrequent import can be easily recognised by the definite 'notch' in the head profile just above the snout. So far, it has resisted (has anybody actually tried?) any attempts to produce either commercially-raised, fish farmed numbers or any of the aforementioned colour strains.

Don't forget Chromides

No survey of Cichlids would be complete without an appearance from Asia's one and only genus, *Etoplus*. Fortunately, the burden

left: Oscars are one of the more popular large Cichlids. They need a large aquarium with excellent filtration.

below: Ornate Julies (*Julidochromis ornatus*) are slender Cichlids that prefer to breed in flowerpots.

of existence is not put upon one species as there are three – *Etoplus canarensis*, *E. maculatus* and *E. surratensis*. Of these, it is the latter two which are the best known as aquarium subjects, the remaining species hardly ever being imported.

The Orange Chromide, *E. maculatus*, is a delightful fish generally yellow-orange in colour with a body-covering peppering of red dots and dark spot midway along its flanks, although according to its mood it can display several dark vertical bars. Quite suitable for the planted aquarium, the Orange Chromide also provides its fry with 'home-made' food from its body mucus.

The Silver Chromide, *E. surratensis*, is much more at home in brackish waters as it is found under estuarine conditions in its natural habitat. It should not be kept in a planted aquarium for it finds vegetable matter very much to its liking; in the light of preferring brackish waters, the addition of some salt (natural sea-salt, not the cooking 'block' variety) is beneficial; this would, of course, set back any growing aquatic plants (if they are not eaten first!) so the provision of plastic replicas is quite in order to make this fish feel at home.

All of the above species can be accommodated in a reasonably-sized domestic aquarium fitted with the normal filtration systems. For the larger, heavy-eating, high waste-producing species such as Oscars, Jaguars and other heavyweights, correspondingly larger living quarters will be needed together with adequate filtration systems. However, Cichlids are always fascinating, regardless of shape or size! ■



M.P. & C. PEDON

Koi auction cancelled

DISCOUNT KOI SUPPLIES' PLANS FOR ITS FIRST KOI AUCTION HAD TO BE PUT ON HOLD...



● The last traces of smoke damage that caused so many problems.

WITH THE WETTEST autumn on record, it seems ironic that it was a fire that scuppered Discount Koi Supplies' first Koi auction. When the manager (Darren) was called to the building in the early hours of the morning, he found the fire brigade already at work next door. As he opened his shop's door, smoke billowed out leaving him black from head to foot!

Luckily the fire was limited to the warehouse next door to Discount Koi Supplies' premises, so it was only smoke that did the damage. Sadly that was enough to force the



● An empty shop when it should be full of people waiting for the start of the Koi auction.

cancellation of their auction at the very last minute and all the Koi in their holding tanks had to be moved to Darren's Koi pond. That just left the fish Andy (the owner) was



● Two of the beautiful Koi that would have been on sale.

buying in Japan specifically for the auction. A frantic phone call to Japan stopped Andy making most of the planned purchases just in time. Some fish, however, had already been selected and came to England. With major cleaning still going on at the Lincoln shop, these fish have been housed in Kent until everything is ready for them. Darren had a few photographs of the fish, so we can see the quality of what would have been on offer at this auction.

Koi Discount Supplies are re-scheduling the auction for March or early April. Meanwhile the shop is

up and running again for dry goods. Phone first to check on availability of live fish on 01522 569941. ■



● These fish (Sanke & Kohaku) are 45" long and have the most amazing skin quality.

Festival of Fishkeeping and Autumn Gardening Weekend



● Chas Raggie (centre) receiving the 'FBAS Supreme Final' sponsored by Interpet award from FBAS Chairman Joe Nethersell (right) and Judge Alan Stevens. Chas also took the Hagen Trophy of Excellence.

The Hagen Masters Open Show Trophies. ●



Trade Talk

THIS MONTH'S CLUTCH
OF NEW PRODUCTS AND
TRADE INFORMATION.

Aquazoo website wins major award



THE FISHKEEPING WEBSITE run by Aquazoo has fought off hundreds of large, well-known companies to win the E-Business Excellence Design Award, run by top computer magazine Computer Weekly. The presenter John Humphries presented the prestigious trophy to Tony Verinder of Aquazoo during a glibby award ceremony at the Intercontinental Hotel in London's Park Lane.

The sponsors of the prestigious Design Section were particularly impressed with the Aquazoo site. The site's directory format designed with great use of graphics and colour were all part of making

Aquazoo No.1. Special mention was made of the unique Aquatest aquarium water-testing programme available on the site. Aquatest was invented to give fishkeepers the ability to improve their techniques either via the Internet or by visiting a participating local retailer who runs the program in their store. The Aquatest system is a major attribute of the Aquazoo site – innovative, educational and greatly beneficial to both fish and fishkeepers. Retailers across the UK who run Aquatest in their stores are detailed on the site.

Tony Verinder inventor of Aquatest and owner of Aquazoo said afterwards: "This is fantastic

for the aquatic industry and small businesses alike to win through to the number one spot, beating companies with huge budgets at their disposal. I'm also pleased for the fish, who can often get such a bad deal. The quicker people understand that good water quality and correct feeding equals happy, contented, long living fish the better fishkeepers we will all become."

You can see the award-winning website at www.aquazoo.co.uk and contact the company on 020 8665 0026, email: aquazoo@aol.com.

TMC launches new Clear Stream pond filter



Clear Stream



TROPICAL MARINE

CENTRE'S new Clear Stream Pressurised Pond Filter will be available from January 2001.

Two sizes will be available: the Clear Stream 600 for ponds up to 600 imp. gallons (2700 litres) with a maximum flow rate of 300 imp. gallons (1350 litres) per hour; and the Clear Stream 1200 for ponds up to 1200 imp. gallons (5400 litres) with a maximum flow rate of 600 imp. gallons (2700 litres) per hour.

Clear Stream Filters offer effective mechanical and biological filtration in one compact unit ensuring a naturally healthy environment for the pond's inhabitants.

Unlike most external pond filters, Clear Stream Filters are designed to be fitted in line, between the pond pump and the pond or water feature. Conventional pond filter boxes require a gravity water return to the pond and must be installed above the water level. Clear Stream Filters may be conveniently and unobtrusively fitted at levels lower than the pond water level or at the base of a waterfall or water feature, but should not be sited more than 2m below the pond or water feature.

Clear Stream Filters offer several advantages:

- Pressurised filters. Units can be conveniently positioned below the level of water delivery.
- Compact and discreet design. Can be partially buried in the ground for minimal visual impact.
- Large diameter inlet and outlet ports. Suitable for use with low

pressure/low wattage pumps.

- Hose connections are at the side of the unit, allowing supply and return pipes to be easily hidden.
 - Versatile, multi stage hoses, to take all common sizes of hose.
 - Servicing/maintenance can be carried out without having to disturb pipework.
 - Ready to use – all media and connections included.
 - Complete and effective filtration with mechanical sponge filter and biological media.
 - Easy to remove filter media bag, for easy cleaning.
 - Canister design, incorporating unique filter bag, means alternative filter media can be used to suit user's specific requirements.
 - Lid tool supplied ensures lid is quick and easy to remove, even with wet hands.
 - All spare parts and replacement filter media are readily available.
 - Multiple units can be linked together to increase filtration capacity.
 - Two-year manufacturer's guarantee.
- A combined UV/filter will be available later in the year.
- For further information contact Jayne Robb, Tropical Marine Centre, Solesbridge Lane, Chorleywood, Herts WD3 5SX. Tel: 01923 284151. Fax: 01923 285840.

Club News

DAVID FORD REPORTS ON THE SAIF FESTIVAL

THE ANNUAL SCOTTISH aquarists International Fishkeeping Festival was hosted this year by Muirfield AS at the splendid venue of New Town Hall, Bonnyrigg, Cumbernauld. Now a one-day event, The Federation of Scottish Aquarist Societies arranged an auction while over 200 entries were being judged.

The winner of the Tropical Scottish Supreme Championship was a *Pseudotropheus lombardoi* owned by Jack Irish of the FSAS. This splendid fish is a yellow male (the female is blue) that Jack owned as a small fry. The Lake Malawi fish grew rapidly and soon started killing off any other fish in the aquarium, so it became an

isolated pet. Brought to the Scottish Show in 1998, it also won the Championship but was rested in 1999.

The Coldwater Scottish Supreme Champion was a Rainbow Dace *Notropis lutrensis* owned by Gavin Cowan of Solway AS. Best in Show was a Glass Harlequin (*Trigonostigma hengeli*) owned by Ricky Angus of Dundee AS.

Dr David Ford presented the prizes, who was in turn presented with a retirement present from the FSAS. This was an original water colour of Stoer Bay (North of Ullapool) by artist John J Irish, better known as Jack, who had just received the Scottish Championship award from David.



• Male *Neolamprologus labropi* are bright yellow

Publicise club events, special occasions, and information about your club in your page of A&P.

Send details to The Editor, A&P, TRMG Magazines Ltd, Winchester Court, 1 Forum Place, Hatfield, Herts AL10 0RN.

Diary dates

FEBRUARY'S SHOW, AUCTION AND CLUB MEETING DATES.

Thurs 1st

Fri 2nd

Sat 3rd

Sun 4th

Mon 5th

Tues 6th Gloucester FC Club meeting
Contact 01453 824810
Southend & Leigh Club meeting
Contact 01702 305740

Wed 7th Corby & DAS Club meeting
Contact 01536 761736
Oasis Fish Club (Sunderland)
Contact 0191 3841433
Hounslow Club meeting
Contact 01784 259230
Merseyside Aquarist Society
Contact 0151 201 6085

Thurs 8th Telford & DAS Club meeting
Contact 01902 372945

Fri 9th

Sat 10th

Sun 11th Yorkshire Cichlid Group meeting in Wakefield
Contact Phil Oldridge on 01924 367086 or
Phil Lowe on 01302 880512 for more details.

Mon 12th Ilford & D A&P Society meeting
Contact 020 8550 7329

Tues 13th

Wed 14th

Thurs 15th March Aquarist & Pondkeeper on sale
Bristol Tropical Fish Club meeting
Contact 0117 973 2145

Fri 16th

Sat 17th

Sun 18th Oasis Fish Club Auction in
Monkwearmouth, Sunderland
Contact 0191 384 1433 for more details.

Mon 19th Thorpe & DAS Club meeting
Contact 01953 606394

Tues 20th Southend & Leigh Club meeting
Contact 01702 305740

Wed 21st Merseyside Aquarist Society
Contact 0151 201 6085

Thurs 22nd

Fri 23rd

Sat 24th

Sun 25th

Mon 26th

Tues 27th Lincoln & DAS Club meeting
Contact 01522 703620

Wed 28th

Thurs 29th

Fri 30th

Sat 31st

Major Dates in 2001

February 18

Catfish Study Group Convention at Lowton Civic Hall.
Lecturer Erwin Schrand from Germany. Contact Pete on
01204 332200 for more details.

Federation Contacts

AofA	Ian & Rhona Walker	01252 668747
FBAS	Paul Corbett	01983 721246
FNAS	Arny Chadwick	0161 652 6207
FSAS	James Sheekey	01475 704219
USA	John Reid	01738 634689
YAAS	Terry Nelson	01724 289736

Copy for A&P's Diary Dates

Copy for Diary Dates should be sent to: Aquarist & Pondkeeper, Winchester Court, 1 Forum Place, Hatfield,
Herts AL10 0RN. Tel: 01673 885352 or fax 01707 278555. Copy deadline four weeks before publication date.



Share your news, views and experiences through the A&P Postbag. Have you built a new pond, installed a new aquarium or revamped an existing set-up? Then send us the photographs and tell us how you did it. Every month the star letter wins a fantastic prize worth £25 – all for the price of a 27p stamp...

star letter

New club organisation aims to stop the rot

Dear Fish Enthusiasts,
The gradual but relentless erosion of the organised hobby throughout the world needs to be halted and reversed. This is the sole premise behind the formation of IFOCAS, The International Federation of Online Clubs and Aquatic Societies.

IFOCAS has been established simultaneously in three continents as a pro-active pressure group catering for the requirements of clubs worldwide. It is not only able to offer practical support in all areas of club activity and publicity, but also assists clubs to get out on to the World Wide Web and collect the thousands of potential new members who are newcomers to the hobby and presently only use the Internet as their means of communication.

Aquatic web services, help, and enquiry sites on the web receive an estimated one million enquiries per annum. There are presently less than 30 clubs worldwide with an active presence on the web – all are thriving. (There are at least 30 clubs in the UK alone dying through lack of new members).

All of the most important and active web enquiry sites have joined IFOCAS – all feel that they have huge traffic volumes that could be of great assistance to existing clubs. A question asked very frequently to all is "Where in

my area can I get help and advice?"

IFOCAS is therefore in a prime position to act as the conduit in redirecting these hundreds of potential new club members into their local clubs and societies.

IFOCAS has one aim – to support and encourage fishkeeping and the active promotion of this aim, through assistance, communication and education. Our website is online in the following languages: English, French, German, Spanish, Italian and Portuguese. Other languages will be used as required.

Website: www.i-focas.ic24.net



In praise of Gallery photographs

e-mail: ifocass@ic24.net

Dear A&P,

I love the Gallery photographs and in particular the at-a-glance information symbols. They are so simple and easy to read. My local shop does not display any information about the fish they are selling, so I have to keep asking how big fish grow to and if they are suitable for my community tank. It would be so much easier if they labelled all the tanks with just a little basic information. I have mentioned this to the owner who says he never has enough time to write out labels for all his tanks.

Pat Grey, York.

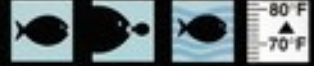
From readers' letters we know the Gallery photographs are a very popular part of the magazine. Several readers have asked if it would be possible for us to produce a binder for them which we are looking into at the moment. Hopefully we should have something sorted in the coming months.



Black-eared Piranha

Serrasalmus notatus SIZE 12"

AQUARIST
AND PONDKEEPER
GALLERY
PHOTO: MAX GIBBS



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AQUARIST
AND PONDKEEPER
GALLERY

Commercial Diets

FOOD IS VITALLY IMPORTANT TO BOTH YOUR HEALTH AND THAT OF YOUR FISH. HERE WE EXPLAIN THE SCIENCE BEHIND FISH NUTRITION.

Fish nutrition is of paramount importance to the aquarist and a matter of life and death to the fish themselves. Think about it: what personal and routine interaction do you have with your fish? Feeding them! What determines the quality of their water, the rate of their growth, the colours of their skin, the health and indeed happiness of their lives? It is the food that you supply. You nurture through nutrition.

Nutritional values

Look on the back of any pot of a fish food and you will see a list of essential ingredients that research has shown ornamental fishes need to survive. The values are given in percentages or so-called international units (IU) per given weight of food (in kilograms). The IU refers to that weight of a vitamin that is effective in the diet, rather than how much it weighs on a scale. Only certain vitamins need to be listed by EU law – these are the ones that are dangerous in excess as well as in deficiency, hence the need to give a value that Trading Standard Officers can check. In some cases, other ingredients are listed – including trace elements such as Selenium or Cobalt, which would be present anyway since such metals are found in all foodstuffs. This is done to impress!

The list is quoted under the heading 'analysis' because the 'ingredients' list is also required by EU law. This shows the raw materials used to prepare the flake, granule, stick, pellet, frozen or freeze-dried form of the fish food. That same law defines the food used, hence the terms 'derivatives of vegetable origin' and 'cereals' – where the manufacturer probably uses mushy peas and mixed wheat and oat flour!

It is interesting to read and perhaps compare the ingredients and analysis lists of commercial fish foods, but do take the values with a pinch of salt! They are written to meet specific EU laws, including the 'Best Before Date'. Since

left: Red Platies are omnivores well able to eat all kinds of food. Here they are feeding on a tablet food stuck to the front glass.

foodstuffs deteriorate, particularly vitamin content, the quoted values must have a time quoted within which the listed values are guaranteed. For vitamins, this is 18 months. That is why fish foods have a Best Before date stamped on the label or pot somewhere, which is 18 months from the date of manufacture. Note that it is only 'Best Before' and not a 'Use By' date since the food is still edible and nutritious, but the vitamin content is no longer 'in guarantee'. Providing the food is properly packed (sealed pot, not a polybag or cardboard box) it will have a shelf-life of several years.

The three most common nutritional contents listed on the pot labels are Protein, Fats and Vitamins.

Protein

Protein is the building blocks of life forms and is always the first item in any fish food ingredients list because it has the highest concentration in their natural diets. This applies to the omnivores (digest anything edible), the carnivores (predatory fish) and the herbivores (plant eaters – they have enzymes that digest plant protein and so need vegetable matter in their diet). Most fishes' natural diet (insects, worms, other fish, algae) is very rich in protein so the metabolism of fish uses this food component as an energy source, as well as for growth and repair.

The problem for aquarists and pondkeepers is that in using protein for energy the excreted material is pure ammonia, which pollutes the fish's water giving stress at low levels, gill damage and skin irritation at medium levels and death at high levels.

In the flowing rivers, lakes and oceans the dilution of ammonia is so great that



PROTEIN → Ingestion → AMINO ACIDS → digestion + O₂ (Oxygen) = Energy + NH₄⁺ (ammonia)



above: Moray eels are typical carnivores.

the fact the fish are swimming in their own toilet is not a problem. In the confines of the aquarium, pond, or worst of all, a bowl, it is a killer. That is why protein must be restricted to those levels that fish need for growth and repair. This means the fish then use carbohydrate as an energy source. The advantage is that the by-products are only Carbon dioxide and water itself, that is, non-polluting.

Fish nutrition studies have shown that the adult fish needs only 40% protein, although fry will need to be higher, 47% is ideal. Foods over 55% will supply the fish with proteinaceous energy and subsequent ammonia problems. Fish farmers use foods over 55% - up to 80% protein is available - for rapid growth of Salmonids for the table. However, they also supply running water to flush away the ammonia (and consequential nitrites) that form - something aquarists cannot do. Fish food advertising once claimed 'protein-rich' or 'the World's highest protein food' but such claims are rare now because it is known that too much is as damaging as too little.

Fats

Carbon chemistry is fundamental to life (as we know it). Carbon has four valencies, arms to which 1, 2, 3 or 4 other atoms can attach (bonding). If all four arms are bonded completely and separately, the Carbon is said to be 'saturated', but if double or even treble bonds are present, the Carbon is said to be 'unsaturated'. This is where the names 'saturated fats' and 'unsaturated fats' originate - see any advertisement for margarine.

One basic difference in Carbon chemistry when saturated is that the compound has a higher melting point. This is because a Carbon atom with all four valencies bonded - the arms outstretched - has a crystalline structure and can pack together to give a solid form (the ultimate is the diamond).

Unsaturated Carbon compounds have less rigid structures; the double and treble bonds give a kink in their molecular shape

and so cannot pack together so well. This gives a liquid that only solidifies at very low temperatures. At normal temperatures the so-called hard fats (butter, lard) are solid and are mainly composed of saturated Carbon, whereas unsaturated fats are liquid (cod liver oil, cooking oils).

Nature exploits this solid-liquid behaviour in fat storage. In humans (and other hot-blooded animals) fat is stored in adipose tissue (under the skin) and since this is about 37°C (or 98.4°F) a liquid oil would be a problem, but at that temperature hard fats are a soft solid, ideal for movement and protection. If fish stored the same kind of fats, they would be as hard as a candle because even tropical fishes are over 10°C cooler than their owners.

Hence fish store fats as oils made from unsaturated Carbon compounds, which remain liquid even at 0°C, which is important to that endangered species, Cod, swimming in Icelandic waters.

Differences

Coldwater species of fish have shorter chain lengths and more double bonds, obviously to give a more oily texture at lower temperatures. There is even a difference between Tropical Freshwater and Tropical Marine fishes - the latter have more fats of the (so-called) Omega 6 type than Freshwater fishes. It is not yet understood why, but obviously this needs to be taken into account when designing a recipe for Coral fishes.

Hence, never feed the hard fats of our diet to your fish. The fish will try to store the fat in the liver where it will be visible as a hard lump rather than the fluid globule it should be. The fats could also be converted to phospholipids (fats used in body structure) with structural complications for the fish, especially coldwater species.

This means feeding kitchen scraps should not include burgers, hams, sausages, red meats, especially fatty ones, and many of the boxed convenience foods. Any scraps must be Omega-rich such as fish meat, shellfish or at least low fat foods such as white meat.

Vitamins

Vitamin deficiency will give symptoms that resemble diseases or infestation problems. The aquarist who feeds his/her fish with any diet that does not contain the correct level of a particular vitamin will see symptoms such as fin rot or bloot and assume a disease is present. Treatment is then given with chemicals

such as Methylene Blue, Malachite Green, Acriflavine or even worse, antibiotics. These just add to the distress of the fish and give a downward spiral that can lead to death.

Other aquarists prepare their own foods and, recognising that fish need a range of vitamins, grind-up multivitamin tablets or add liquid vitamin solutions. There are two problems with this DIY dieting: the fish need different levels of each vitamin than humans (and more of them too) and hypervitaminosis can occur.

Cod liver oil is often used as a binding agent for food mixes, which is very rich in vitamin A. If this is also added in the multivitamin mix, the over dosing will give a classic symptom such as fin rot. The aquarist will certainly turn to fin rot remedies (which are antimicrobial) and never suspect that the basic cause was their DIY fish food.

Conclusions

Fish have the ability to eat continuously, digest what they need and excrete the rest - this means that you can give anything edible to your fish. However, to ensure complete nutrition you do need to include a commercial diet from a reputable company where years of research means you will be supplying the correct level of nutrients and the essential trace elements fish need. You can even feed the fish exclusively on a commercial diet, especially the complete nutrient flake foods. For variety, feed granules, pellets, freeze-dried or frozen. Avoid feeding scraps from your table - that junk food is not good for you but deadly to your fish. ■

below: Plant eaters, like this Bristlenose, have enzymes that digest plant protein and so need vegetable matter in their diet.





Croaking

DAVID MARSHALL INTRODUCES A RARE MOUTHBROODING BETTA.

In 1846 Cuvier and Valenciennes named what appeared to be a small tooth carp-like fish, collected in Java as *Panchoax pictum*. Fifty years later Bleeker recognised the same fish as an anabantoid (fish with a labyrinth organ) and, making it the type specimen of his new Betta genus, named it *Betta trifasciata*. With two very different names for one fish the rules of nomenclature were brought into play and this resulted in *Betta picta* (Painted Betta) becoming the accepted name for this fish which took its place in the anabantoids.

Sometime later what appeared to be a second population of *Betta picta* emerged from the swamp forests of the Langkat and Medan areas of Sumatra

Utara and the Jambi Province of Sumatra. Scientists would treat this fish as a distinct species giving it the name of *Betta rubra* before they changed their minds and declared this a synonym as they believed it to be a colour variant of *Betta picta*.

Almost 140 years after its discovery, tropical fish collectors and enthusiasts began to take an interest in *Betta picta* and these fish arrived in Europe as 'Javan' and 'Sumatran' variants. This would remain the case for over a decade before the scientific community decided to make a U-turn having found enough differences between the two variants to classify the Sumatran variant as a distinct species under the new name of *Betta falx*.

Characteristics

Falx is a latin word for Scythe and relates to the curved margins of the anal and caudal fins of a displaying male.

At first glance no difference is apparent between *Betta falx* and *Betta picta* as both have the typical Betta body shape, a pair of feelers located below the mouth and can reach a maximum body size of 6cm. They share the same colour pattern of a light brown body transversed with three darker bands and immature males and females of both species look identical.

There is a very vague possibility that there could be hybrid stock in the hobby but, thankfully, most of the fish seen in aquaria derive from the stocks of



ALL PHOTOS: KEVIN WEBB

at the moon

responsible anabantoid enthusiasts who have kept the two species apart.

Croaking at the moon

There is one characteristic that makes *Betta falx* stand out from other members of this genus and this is the ability of the male, given the right situation, to produce very audible croaking noises. This is not unknown in the anabantoid world (members of the *Trichopsis* genus are thought to be able to croak). I had not, however, heard of this in a *Betta* species until, by chance, I accidentally created the right conditions.

top left: *Betta falx* male from Sumatra.

top right: *Betta falx* females show a pronounced spotted or flecked pattern in the anal fin area which is absent in female *B. picta*.

Several years ago a good friend presented me with two pairs of *B. falx* which were housed in a tank with Blue Delta Guppies. This tank was situated on a kitchen shelf partly illuminated by moonlight filtering in through the window.

On one such night a mini chorus of croaks was heard coming from the

vicinity of the kitchen. Upon investigation the two male falx were found bathed in the moonlight merrily croaking at their intended mates. This happened on several occasions but I was never able to fully determine exactly how the croaks were produced, as the slightest disturbance made them abandon this activity.

Aquarium care

A tank 60x30x30cm (24"x12"x 12") is ideal for keeping *B. falx*, easily housing a group of two males to four females. Males tolerate each other's company and very few territorial problems occur with these fish.

Although the home waters of *B. falx* are acidic, pH to 6.5, aquarium stock are not fussy in this respect and, avoiding extremes, will live and breed just as well in alkaline conditions. Keep the temperature between 26-28°C (74-78°F). =>

Three Golden rules for keeping anabantoids

- Keep a close watch for signs of velvet disease.
- Leave a 2.5cm (1") gap between the water surface and condensation shield.
- Cover with a tight fitting lid as these fish may disappear due to 'leaps of fancy'.

BETTA FALX

How to tell them apart

Female *Betta falx* show a pronounced spotted or flecked pattern in the anal fin area which is absent in female *B. picta*.

In *Betta falx* males, the dark brown to brick red colour is much more solid. The anal and caudal bands are red in *B. falx* but blue in *B. picta*.

The mouth patch of *B. picta* is turquoise but white in *B. falx*. Male *B. falx* have distinct transverse dorsal bands which are absent in *B. picta*.



above: *Betta picta* male from Java.

left: *Betta falx* male brooding eggs in his throat pouch.



⇒ Furnish the tank with small pieces of bogwood and various sized aquatic plants. All standard aquarium foods are eagerly accepted by this species.

Breeding

Whether you are an experienced or beginning aquarist, *Betta falx* is an ideal introduction to the joys and disappointments of breeding anabantoids.

No special breeding set-up is required as a mature pair (these fish are mature at six months of age) will readily spawn in a community tank needing no special feeding or coaxing to do so. There is no pair bonding and a ripe female will spawn with a willing male, produce eggs again and a few days later spawn with the next male that comes her way.

Prior to spawning a female ripe with eggs approaches her prospective mate and coaxes him into displaying. If he is ready to breed he signals by quivering his fins. A convenient spawning area just above the bottom of the tank is found and the male now takes control. The pair entwines head to tail, the female turns upside down and releases eggs on to the caudal fin of her mate from where they

fall on to the anal fin and are orally collected by the female who then spits them into the male's mouth.

The male takes charge of orally incubating the eggs. At this stage luck plays a large part in what happens next. Success does not depend on the egg carrying experience of the male or his age but on sheer good luck. With luck, the male will now carry the eggs, in his extended mouth pouch, for a few days before either releasing them to their fate or becoming a model father mouthing them for between 11 and 14 days, at which time he releases the tiny fry.

To save fry from a full term carrying father, catch him at day 10 and place him in a small aquarium in shallow water. Make sure the aquarium has a tight fitting cover but with small air holes punched in it.

Saving and rearing the fry

There is no guarantee of how many fry he will have carried and this can vary from as low as 10 to as high as 160. When the male is about to release his fry (which he does in small groups), he becomes very agitated. As fry are released he uses his

caudal fin to knock them away from his body. Do not panic - this is not a malicious act. In the wild this is done to disperse the fry into surrounding cover. The male has no further part to play in protecting the fry so, when you think he has released all the fry remove him to another small tank and pamper him with good quality foods for over a week before returning him to his female.

Transfer the fry to a small tank for growing on. They will immediately take newly hatched Brine shrimp and this is their sole diet for the first few weeks. Growth of the fry is uneven but cannibalism very rare. One of the main threats to the usually very hardy fry is velvet disease. Check their health by watching their eyes. When something is wrong their eyes go so dark that they resemble chocolate buttons. The other killer is cold air getting on to the water surface as their labyrinth organ begins to develop. A tight fitting cover prevents this problem.

Finally, please note that once *Betta falx* begin to spawn only separation of the sexes will stop them! ■

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Special thanks to Kevin Webb for numerous conversations on this and other *Betta* species.

Paradise Fish

Macropodus chinensis SIZE 3"

AQUARIST
AND PONDKEEPER
GALLERY

PHOTO: M.P.A.C. PIEDROER



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ANDREW CAINE WINDS UP HIS BEGINNING WITH MARINES SERIES AS OUR NEW MARINE FISHKEEPER BUYS HIS FIRST FISH AND CLEAN-UP CREW.

Keep Marines, yes, me!

So my friend, it's into the local aquatic shop we go, I know you have checked it out previously, and I must admit I was quite impressed when we bought your equipment from here. As we look around in the marine livestock section all looks well, nice clean holding tanks, no dead animals or stressed fish.

We said that we wanted a watchman goby as our first inhabitant, so let's look around for one. Hey where are you off to, running down the fish house like a madman?

Well I am a bit excited. It's my first fish, and after all I am only looking for our goby and there seems to be none.

Oh dear, Mr Impatient again. Do you realise you have passed two gobies already? When looking for fish the one

thing you do not do is glance at a tank and then walk past. Anyone who has a good aquarium full of unusual species normally takes their time in shops. Not only do they take time looking at the fish they want, they look at any rocks there may be to see if anything is hiding underneath or round the back. Spend time in a shop, don't take the kids, wife or anyone if they are not interested in the aquarium as they will only put pressure on you to hurry and you might miss a gem - like you have just done.

What do you mean? All that is in that tank is a broken plant pot, and you tell me there is a fish in there?

Exactly. A broken pot always tells me that we have a goby-selling tank, so if you look in there you will see a lovely little beast.

He is a *Sigilgobius biocellatus* to many people, but to us we know him as a twin spot goby. He is not that rare in the aquatic trade, however, but it is not often that you see one for sale as they are snapped up quite quickly - and quite rightly so.

Yes there he is. I see what you mean - only small but I must admit he is a little beauty. OK so if I get him I will have to sacrifice my watchman, but I think it is a worthwhile swap. I know that you told me not to deviate from my stocking plan but I think the fish is so outstanding. It will be OK to break this rule as long as I do not exceed the stocking limit.

Now you are getting the drift, my friend, so let's go and reserve this little beast and look for some more of animals.

ALL PHOTOS: MAI QUINN



More than fish

What? More fish? I thought we would be only buying one.

That's correct, only one fish, but we will need to start the stocking of the clean-up crew. As you now have a fish you will have to feed, this means uneaten food and waste going into the system. So we will want a couple of shrimps and something to keep the algae at bay, for it is sure to arrive. The best cleaners are *Lysmata amboinensis*, the common cleaner shrimp. I say the best as, unlike most shrimps, they do not mind being on show, so you will see them in your aquarium. In fact, I will bet you a tenner that they take up residence under the overhang you created in the rock work.

The shrimps sound great, but I don't really want snails and hermit crabs to eat any algae. I want my good lady to enjoy the tank (I am already planning a bigger one) and I know that crabs and snails are not high on her list. I have read a few books and think I will get a couple of urchins.

Great, brilliant. Urchins are fantastic animals, as long as you do not overstock and do the research on the species - you want an algal grazer. They possess a totally moveable jaw that allows them to cut algae from all the little nooks and crannies over the rock work. How right you are. They are much more appealing to most people than snails.

I have seen a few over here. This one is stunning, but I am not sure what it eats.

Bingo, you have chosen my favourite species, *Mespilia globulus* or the sphere urchin. Most importantly it has short spines that will do little harm, and bright blue bands around the body make this a beauty of an algal grazer.

So let's get some live brine shrimp, as this will cut down on waste, and frozen lance fish for the shrimps, make our purchases and hot tail back to the ranch.

Into the tank

Right mate. I suppose we float the bag for 20 minutes then let them loose?

A lot of people do that but we won't. We will float the bags for 15 minutes, and then add a cupfull of tank water, another cupfull 10 minutes later, another one 10 minutes after that, and then 10 minutes later we let them go. We add tank water as the salt content (plus more) from the shop water may be different from your tank water and salt shock can kill. This still is not ideal. In a perfect world we would have hospital and quarantine tanks for this job. But we have not the money for this kind of practice so it is straight into the main tank this time. OK let them go.

Wow I never thought that in my wildest dreams I would have a marine aquarium, I know that I am still on the bottom of a steep learning curve, but

with good advise, books and of course Aquarist & Pondkeeper every month I should be OK. However, I do expect pitfalls and the odd problem but at least I have started correctly.

Before I go I would just like to give you one last tip. When you do your water change do a full five-gallon bucket as it is easier. After you have heated it and injected air for 24 hours, check the specific gravity to make sure all is OK. Take the waste water out of the aquarium by scooping out water from the surface with a pint pot, not siphoning from midway down. Doing this will take five minutes and rid your system of many toxins that would still remain if you siphoned.

If you need any help at any time you know where I am. Congratulations on all you have done and good luck my friend. ■



above left: This Watchman goby was on the original stocking plan but the more beautiful Twin spot goby replaced it.

above centre: Twin spot gobies (*Signigobius biocellatus*) are very popular and are snapped up almost as soon as they go on sale.

above right: Another change to the original stocking list was this Sphere urchin (*Mespilia globulus*) instead of snails to eat any algae.

Six of the

With the coldwater season rapidly approaching, many shops are filling up with goldfish of all shapes and sizes. Selecting some for your pond can be a bit of a minefield since not all types are suitable for outdoor ponds all year round. You can, however, still have some of the more exotic types in your pond until the autumn when you will need to net them out and overwinter them indoors.



Bristol Shubunkin

This variety is probably the most significant achievement of our UK goldfish breeders. They were originally developed around the Bristol area, hence their name, but breeders all over the UK are now working with them.

While most fancy goldfish are not suitable for a pond all year round, this hardy fish is. If you want to keep it in an indoor aquarium then this needs to be fairly large (at least 4') as they will grow to over 6" long.



Comet

Apart from Common goldfish, Comets are probably the most popular pond fish in the UK. They are basically an elongated Common goldfish with extended finnage. Coloration is normally solid gold although fish with large white areas on them are often seen for sale.

Despite their elongated finnage and rather exotic appearance, these fish are tough as old boots and will cope well with being in a pond all year round.



Oranda

Orandas are basically the same as a Lionhead but with longer finnage and a dorsal fin. They are probably the most common twintail goldfish available through the trade and are justly popular. The tails can be fairly short or long and flowing depending upon the specific type. The long finned form seems to be most common.

This is a slow moving fish that can easily fall victim to birds, cats and other pond-side predators. For these reasons it is probably best kept in an aquarium all the time.

best

OF THE HUNDREDS OF GOLDFISH VARIETIES, HERE IS OUR SELECTION FOR HOME AQUARIA OR PONDS.



Veiltail

Veiltails have been very popular among UK Goldfish for over 50 years. In many ways they have formed the backbone of fancy goldfish breeding in this country and many breeders continue to work with them today. They come in all the normal goldfish colours but this gold form is probably most often seen in the trade. One of the main features of this strain is the extended caudal finnage which should only have a slight fork along its trailing edges.

With such long and delicate finnage it is not a good idea to keep these in an outdoor pond.



Panda Moor

This is a recent introduction and one that has been an instant hit. The contrast between the white body and black eyes and fins is quite remarkable. It is a fairly hardy variety and could probably cope with being in a pond during the summer months. However, with this sort of coloration it would be lost in most ponds.

Best kept in an indoor aquarium where it can be fully appreciated.



Lionhead

Lionhead Goldfish are considered members of the 'royal family' of goldfish in China and Japan. They are certainly very popular throughout the rest of the world and sell well in the UK. One factor to look for when buying is the contour of the back. This should be smooth without any sudden dips or holes. They come in the full range of goldfish colours but gold with a red hood is commonest in the trade.

This variety can be kept in ponds during the summer months but should be taken indoors from the end of October onwards.

Underwater gardens

PAT LAMBERT HELPS YOU TO CHOOSE PLANTS FOR YOUR FIRST FURNISHED TANK.

You will find many articles about furnishing tanks to imitate the wild. These are called Biotope tanks in which fishes, rocks and plants are all supposed to come from the same part of the world. We are told that fish settle best in tanks that most closely resemble the conditions in their natural habitat. In theory this seems wonderful but, having visited many of the wild habitats of the fishes that I keep, the theory is sometimes very far from the reality.

Many of my wild swordtails came from rivers with almost no aquatic plants in them. Conversely, one of the habitats I visited in Jamaica was very densely planted. If you planted as intensively in your aquarium you would never see a fish.

In the wild you often have swathes of the same kind of plant stretching into the distance, so really what we create in a furnished aquaria is very artificial, but some of these can be truly beautiful. Brian Walsh of Darwen fish club is very



A nicely planted aquarium with short 'Crypts' in the foreground and Straight Vallis plus Ambulia at the rear.

Here are some notes I have made at some of these habitats. At Lago de Camecuaru in Mexico I found the most beautiful *Skiffia multipunctata* (a Goodeid livebearer) in a sewage ditch. The ditch water ran directly from the public toilets and I saw a dead rat on the bank. I certainly wouldn't want to re-create that habitat! When I returned home with the fishes they thrived in normal tank conditions. The fish from fast flowing rivers that I visited in Chiapas would be killed by being smashed against the aquarium glass if a tank filter was that powerful.

talented in this way. Some of his tanks are usually displayed at the British Aquarist Festival. The Dutch are particularly good at creating underwater gardens with the plants being almost more important than the fish in many cases.

You really need to take a commonsense approach to all this when you set up your first planted tank. Choose plants of varying heights, texture and colour tones. The fish won't notice if the plants come from Asia or the Americas or anywhere else for that matter, providing they are true aquatic plants, and it certainly won't affect their well being. ■

Easier Plants for the beginner

- *Vallisneria spiralis* Straight Vallis is a tall, undemanding plant. You can easily cover the back of the tank without it being too costly.
- *Vallisneria tortifolia* Twisted Vallis adds variety and is just as easy to grow.
- *Cryptocoryne beckettii*, *Cryptocoryne balansae* are easy 'crypts'. Some *Cryptocorynes* are difficult but 'crypts' have interesting leaves and textures.
- *Echinodorus tenellus* The low growing Pygmy Chain Sword will soon carpet the foreground of the aquarium. Hairgrass is another plant that grows in tufts.
- Amazon sword plants are large plants that grow well (you don't need more than two in a 24"x12"x12" tank).
- *Ludwigia* sp. are quite attractive and easy to grow.
- *Riccia* is a good floating plant if you want some baby livebearers to survive in your community tank.

Hints on planting

- Look for plants with a good root system.
- Select plants that are half grown rather than overgrown plants.
- Always buy a group of one type of plant (they look better planted in groups).
- Always thoroughly clean any new plants to make sure they are free from snails and eggs.
- Carefully push the plant into the gravel and heap gravel around the roots. Plant firmly otherwise they will soon float up to the top.
- Plant in groups but allow for water and light to reach the stems. Roots should not be packed together.
- Tallest plants should go at the back.
- Above all, make sure you have the correct lighting for plants.

Product reviews

A&P GIVES ROWAPHOS ITS FINAL PRODUCT REVIEW.



If you want your tank to look this good, use Rowaphos.



ROWAphos



*Sichere Phosphatentfernung
aus Süß- und Meerwasser*

ROWA

Rowaphos has been used to remove phosphate from both marine and freshwater aquariums on the continent for the past four-and-a-half years. It has only just recently been made available to aquarists in the UK.

Phosphates are present in every living cell. Therefore when cellular decay occurs within a closed system such as your aquarium, phosphates are released and over a period of time can accumulate to relatively high levels. Phosphates can also enter your aquarium if you use tap water when performing water changes.

Harmful

Quite simply, high phosphate levels can be detrimental to the physiology of your aquarium stock. If you have a marine aquarium with corals in, phosphate levels of above 0.5ppm can be detrimental. Phosphate levels of 0.1ppm will allow algal growth, resulting in that lovely algal bloom in your tank. So it follows that if we remove all the phosphates from the water, in theory, we should not have unsightly algal growth in our aquarium.

To test this, I set up six 45"x15"x15" marine aquariums. Each was identical and lit with one marine white lamp, filtered by

a single sand filter, 10kg of cured live rock on a bed of coral gravel. These ran with a specific gravity of 1.024 at 78°F. Now here is the interesting bit – we removed the foam core of an internal filter and placed at the bottom activated carbon pellets, followed by a layer of filter floss, 100ml of Rowaphos, covered this with filter floss, replaced the power head and put the filter in the tank. We then did the biggest no-no in marine fish keeping, and filled all the tanks with 'shock horror' – tap water with a known phosphate level of 3ppm. This was to see how quickly we observed an algal bloom. The theory behind this was if phosphates were not removed, we would see an algal bloom within seven days. If the phosphates were removed, we would see no algal bloom.

Ten blue damsels were added on day 5 and each tank was given the same quantity of marine flake once per day. Any fish waste or uneaten food would leach phosphates to the water; no water changes were performed at all for 6 weeks.

The results

We observed no algal blooms for 34 days. On day 35 we observed a slight brown discoloration over the coral gravel

indicating the beginnings of an algal bloom. This occurred on the same day in all six tanks. We then tested the water for phosphates and found a reading of 0.2ppm. We then deduced that the Rowaphos had removed the initial phosphate load. Also it had removed any phosphate build-up from our activities, until the Rowaphos was saturated.

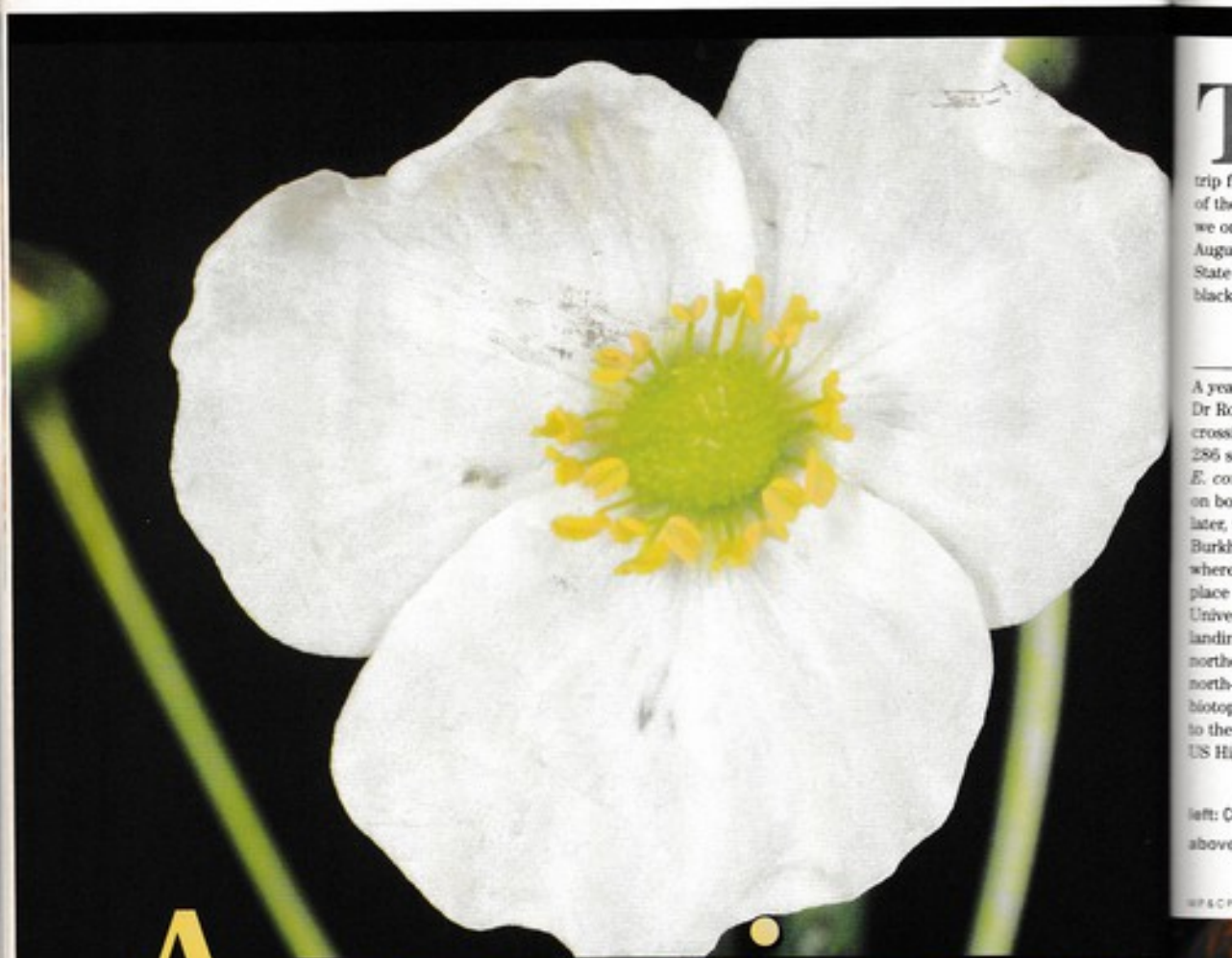
We then replaced the Rowaphos with new, 24 hours later phosphate levels within all six aquariums were below detectable levels from a standard phosphate test kit. At the time of writing, three days after the Rowaphos replacement, the discoloration of the coral gravel is now dying back due to the algae being starved of an essential compound, phosphate.

A&P's Star Rating

An excellent product that does what it says and wins our Gold Star award. ■

Manufacturer information

D&D Aquarium Solutions, 11-17
Fowler Rd, Hainault Ind. Est., Ilford,
Essex IG6 3UT. Tel: 020 8501 2492.



Aquarium Plants from the USA

ARIE DE GRAAF TAKES US TO
SOME WILD HABITATS OF THE
RADICANS AMAZON SWORD
ECHINODORUS CORDIFOLIUS.

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SPACE

The localities of *Echinodorus cordifolius* are seldom found in Florida. However, my wife, daughter Saskia and I made a trip from Orlando to Pensacola in search of these interesting plants. On that trip we only found it in one location on 15 August. This was in the Manatee Springs State Park on the Suwannee River backwater river, at the landing stage.

Next year

A year later when collecting with Dr Robert K Godfrey, 21 miles from the crossing of Highway 90 and County Road 296 south from City Sneads, *E. cordifolius* was again found, this time on both sides of the road. A few days later, when collecting with Dr James R Buchhalter, we found two more localities where *E. cordifolius* was found. The first place was located at the campus of the University of West Florida, at the wooden landing stage of Thompson's Bay at the northern end of the old Fish Camp Road north-west of Building 58. The second locality was located in the backwater area to the west of the Escambia River, west of US Highway 29 via Bluff Springs Road. ■

with: Close-up of the *E. cordifolius* flower.

above right: Backwater area of the Escambia River, Pensacola.



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A&P Fact File

Radican Swords *E. cordifolius* in the aquarium

This is a strong and vigorous plant that grows well in an aquarium. You can control the growth rate by potting plants singly if space is limited.

The large, heart shaped, blunt ended leaves grow up to 25cm (10") long and 15cm (6") wide. If these reach up to the surface it is a good idea to remove the floating leaves. This encourages strong submerged plant growth.

The large, white flowers are supported by a strong stem and are carried above the water's surface. Adventitious plants form on the flower stem and can be used to propagate this species when large enough.

below left: *E. cordifolius* showing leaf shape and emerged flower.

below centre: Close-up of *E. cordifolius* ripe fruit.

below right: *E. cordifolius* 'Harbich' variety. This popular mutation is a short stemmed plant with egg-shaped leaves.



Koi World

**BERNICE BREWSTER
SPLASHES IN WITH
SOME MORE KOI NEWS.**

Let's spare a thought for those unfortunate people whose homes have been repeatedly flooded throughout the last six months and especially if they have a pond in the garden. The life of koi and most other ornamental fish will be short lived once they have escaped into the wild, as they are naïve and easy prey to pike, brown trout, herons, cormorant and foxes.

Beating blanket weed

Moving swiftly on to other matters – blanket weed. It isn't usually a problem at this time of the year but one for the



above: Fool's water cress (*Apium nodiflorum*) starts growing early in the year, which is why it is good at controlling outbreaks of algae.

summer when it's choking the filter and blocking the pump. All the rain we've had will have washed soil and nutrients into the water which will help to promote the growth of this nuisance algae.

Blanket weed is sneaky in that it begins growing early in the year to outcompete the other aquatic plant life, although water cress (*Rorippa* species) and fool's water cress (*Apium nodiflorum*) also grow early in the year, which is why they are quite good at controlling outbreaks of

algae. So, for those of us plagued with blanket weed through the summer months, the late winter and early spring is a good time to think about controlling its growth, before it becomes its usual perennial nuisance.

Range of treatments

There are a range of treatments on the market. Some are natural, such as barley straw pouches, while others are chemical algicides. Barley straw relies on natural breakdown by bacteria and fungi to release an 'algae inhibiting factor' but it takes several weeks for this to be produced. The algae inhibiting factor is only produced in the presence of well oxygenated water. As this factor is produced as a by product of the decaying blanket weed, where barley straw is used, it is important to routinely monitor the water quality. When using any chemical to control the growth of blanket weed, always be sure to follow the manufacturer's directions carefully.

Spring really is just around the corner and I just can't wait for some sunshine!

Koi society meetings & events

The British Koi-Keepers' Society

Birmingham and West Midlands:
Alan Smith – 01214 223889
Central: Christine Green – 0121 360 6601
Cheshire & District:
Keith Grainger – 01782 773592
Chilten: Bill Hone – 01582 841108
Crouch Valley: Brenda Scott – 01375 642321
East Pennine: Betty Koerner – 0114 234 1151
Essex: Margaret Spurr – 01702 292766
Ireland: Trevor Geary – 01247 466885
Isle of Wight: Mike Siddons – 01983 527520
Kennet Valley: Terry Speight – 01488 686294
Lea Valley & Harlow:
Michael Rumm – 0208 524 3681
Leicestershire Koi:
Les Hadfield – 0116 223 7670
London: J Caray – 020 8657 9036
Lower Thames Side: Val Radley – 01702 529675
Manchester & District:
Sue Ennis – 0161 480 5821
Middlesex & Surrey Border:
Jim Freeston – 020 8641 2696
Mid Lincoln: Val Gilbert – 01673 858354
Mid Staffs: Val Stokes – 01543 278359
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North Herts & District: B Blows – 01767 261135
North Wales: E Parry – 01492 580303
Plymouth & District:
Sandra Crocker – 01752 210118
Potteries & District:
Tina Burgess – 01782 617526
Scottish: J McCorry – 01259 750484

South East: Mick Wright – 01634 718943
South Hants: T Clark – 01489 573374
South Wales: Christine Warcroft – 01443 207279
Suffolk & North Essex: Alan Carter – 01206 666011
West Wales: Basil Evans – 01554 772190
Worthing & District: K Martin – 01273 220818
Yorkshire Section:
Andrea Thornton – 01924 275749

Independent Koi Clubs

Birmingham & West Midlands Koi Club:
Alan Smith – 0121 422 3896
Black Country Koi Society:
Tony Bowcott – 01384 395299
Bristol & West Koi Club:
Lary Lerway – 01454 896207
Cambridgeshire Koi Club:
Graham Hagger – 01487 711129
Dorset Koi Keepers: Alison Allen – 01202 875437
East Coast Koi Club: Alan Wright – 01502 587116
East Midlands Koi Club:
Richard Jones – 01283 224975
Eastbourne & District Pondkeeping Club:
Brian Dale – 01323 731369
East Yorkshire Koi Society: Steve Mattinson – 01964 527863
Chris Hill – 01482 346777
Fylde & District Koi Club:
Chris Ingledew – 01772 635581
Heart of England Koi Society:
Paul Stacey – 01203 674821
Merseyside: Syl Bennett – 01942 204948
Midland Koi Association:
Keith Hansons 01527 545230
Nishikigi Association: Neal Keen – 01202 713600
North East Koi Club: Jean Hope – 0161 416 5794
North Lines Koi Club: Ken Bush – 01472 883377
North of England ZNA Chapter:
Yvonne Muse – 0114 289 1437
North Wales Koi Society: Keith Parry (Chairman) – 01492 580303 / Rachel Wilkinson (Secretary) – 01407 741846
Northern Koi Club (ZNA Friendship Club):
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Norwich Koi Club: Jenny Allen – 01603 452932
Nottingham & District Koi Keepers:
Shirley Hind – 0115 981 0923
Oxfordshire Koi Club:
Kevin Newton – 01865 874008
Scottish Koi Club: Marc Raeburn – 01236 731908
South Devon Koi Club: Stan Moring – 01803 843109 /
Christine Brackstone – 01803 833472
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York & District Koi & Pond Fish Club:
Andy Hudson – 01904 340185
Yorkshire Koi Society:
Rita Thomson – 01723 864867

Copy for Koi World

Copy for Koi World should be sent to: Aquarist & Pondkeeper, Winchester Court, 1 Forum Place, Hatfield, Herts AL10 0RN. Tel: 01673 885352 or fax 01707 276555. Copy deadline four weeks before publication date.

The Ultimate Challenge

TONY SAULT'S GUIDE TO BREEDING WILD DISCUS

Many Cichlid keepers move on to Discus for the challenge of not only successfully keeping them but breeding them. Many succeed and are content with that. In my opinion a greater challenge is to breed the wild Discus. In this article I will try to set out a step-by-step guide of tips to help you try the ultimate challenge.

The breeding tank

This needs to be at least 36"x18"x18" (approximately 45 gallons), to accommodate a breeding pair. This can be either a bare tank or a furnished one. In a bare tank the following items are required: combined heater/stat of about 250 watts, sponge filter, air driven or internal power filter with sponge inserts, minimal lighting (a soft fluorescent light is adequate), and a spawning cone.

In a furnished tank the heater, filter and lighting can be the same, plus a thin layer of sand or gravel as a substrate and a choice of spawning medium. This can be either a thick piece of slate, placed vertically at the opposite end of the tank to the filter, or a large piece of bogwood with a high vertical side, again at the opposite end of the tank to the filter. Plants should conceal the spawning medium and, for the wild fish, provide an alternative spawning site.

Preparing the water

Water quality is very important if success is to be achieved with breeding Discus and with wild Discus it is paramount. They originate from the Amazon region of South America so you can be certain that they will not respond with eagerness to our local tap water.

Firstly, obtain an analysis of your tap water from your local supplier. The results of this analysis will determine the equipment you will need. If you are lucky enough to have soft, low pH, nitrate-free water, you must be piping it in from the Amazon and you will only need to purify the water. My tap water parameters are as follows: GH 12, KH 4, pH 7.9 with a nitrate content of 25ppm variable. I not only need to purify the water but soften it as well. An R.O. unit softens the water and a Metalex MM 80 purifies it. I mix the two together with a ratio of 60% R.O. to 40% purified. This gives me pure water with parameters of 4 GH, less than 1 KH, nil nitrate and a pH of 7.0. The pH can then be lowered to the correct level by using a pH adjuster, aquarium peat in a filter or, as I do, by using Orthophosphoric acid. More on the pH later.

The tank can now be matured and I am still a big believer in using fish to mature the filtration. Set the tank at a temperature of 82°F. A small shoal of

above right: Wild *Symphysodon aequifasciatus aequifasciatus*, Royal Green variety.

bottom right: Wild Heckel Discus installed in planted tank. The central area is kept clear for feeding the fish and the spawning medium is tucked away in a corner for privacy.



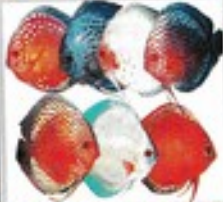


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DISCUS POOL

→ Corydoras can now be placed in the tank and fed on flake until the tank is mature (usually 4-6 weeks from the installation of the catfish). Start to test for Nitrite after the cats have been in the tank for a couple of days. When you have seen the nitrite on the colour chart go from clear to pink to red and back to clear again the Discus can be introduced and not before.

Selecting the Discus

It's very rare to be offered a breeding pair of wild Discus, so there are usually two ways of obtaining a pair:

- By purchasing six small ones and growing them on until they are sexually mature. (This is not common because few importers bring in small wild Discus)
- By purchasing six young adults or a smaller number of adults.

If the young adults come straight from the importer it's important to find out how long they have been in the country. Discus that have been quarantined for long enough and have started feeding make it easier than having to quarantine them yourself to get them 'clean' and feeding.

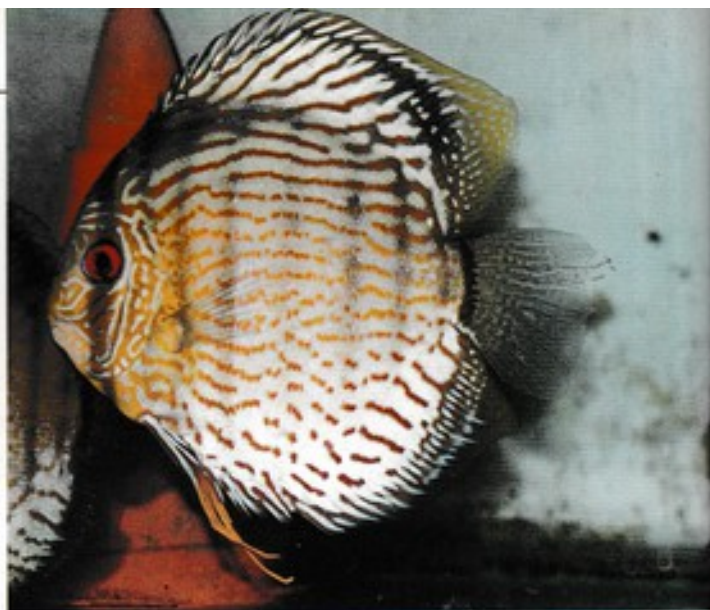
A lot of exporters in South America starve the fish for a period of time before they are exported so that they do not foul the water they are transported in. Fully quarantined fish will cost you a little more but are certainly worth it.

When purchasing your stock, find out the conditions they are being kept in and what they are feeding on. Adjust your pH to suit. The wild fish should be introduced very gradually to your prepared tank. Float the bag in the tank for at least two hours with the lights dimmed or turned off. Add a teacup of tank water to each bag at 15 minute intervals; this will gradually equal the conditions in the bag and the tank. After two hours the Discus can be released.

The more care that is taken at this traumatic time for the fish, the quicker they will recover. Try to tempt the Discus with a little food the next day but they may not feed. Coax them with a little frozen Bloodworm or a little live Whiteworm - this usually does the trick.

Settling in

Once the fish have begun to feed, condition them by offering extra feeds of frozen Bloodworm and Whiteworm. You will also find that they will take small live earthworms. Now you need to be patient and watch for signs of pair forming. Look for two fish that display to each other or a simple acknowledging bow as two fish swim past each other.



above: Wild Royal Green, selected for its shape and quality as future breeding stock.

These are the first signs of a bond forming. When this has happened several times, remove the other Discus to another tank as you can now be reasonably certain that you have your pair.

Test and record your conditions as they were important in forming a pair and you can always re-create them if you need to. Your pH should be 6.8, GH 4°, KH nil, and temperature 82°F.

Spawning condition

There are a number of ways in which you can try to make the fish spawn. The following methods have often worked for me.

For several days give the Discus extra feeds of frozen Bloodworm, live Whiteworm and small red Earthworms. Then raise the temperature to 86°F, at the same time gradually lower the pH. The easiest way to do this quickly is by adding water of a lower pH and higher temperature. You can add a filter containing peat. Aquarium peat has had a lot of the tannins and acid removed but will still work slowly. I have used Irish peat moss but it really works very fast. I once lowered the pH from 7.0 to 5.0 in as many minutes using Irish peat moss.

Even though the fish were unharmed they did not look too pleased.

right: Bare spawning tank with spawning cone on the right and the internal power filter positioned at the opposite end.

Whatever the method, you may have to lower the pH more than you ever expected. Don't worry; some of the wild Discus I have bred did not 'switch on' until the pH was 5.3.

Whenever they spawn always record the exact conditions so that you can repeat them next time. The addition of Black water extract worked with some fish but not others. Some of them exhibited symptoms associated with a parasitic infection as they itched and flicked.

Whichever way you choose, the object is to re-create what happens in the Amazon system during the breeding season, when the rivers are flooded with soft, acidic water and food is plentiful. If your water quality is good enough, spawning usually follows.

Over the years I have been lucky enough to breed most of the wild Discus except one. Heckel to Heckel is in my opinion, the hardest of all Discus to breed.

Every year I have tried with new stock and every year I have failed. This is my ultimate challenge. ■



Pearl Danio

(*Brachydanio albolineatus*)



BY IGGY TAVARES PHD

The Pearl Danio, *Brachydanio albolineatus*, is a small Cyprinid that has quite a large distribution extending from India to Malaysia and even into Indonesia. This blue coloured fish with a gold coloured belly has a narrow pink mid-body stripe that only exists in the posterior part of the body. Silver spangles embellish the back of the Pearl Danio which, together with the yellowish coloured fins, make for a desirable fish. Males reach a size of 2" but females do get a little bigger. In the wild, Pearl Danios are found in shoals, something to remember when setting up an aquarium for this fish.

Pearl Danios make a nice addition to any peaceful community tank. They obviously look best when kept in a shoal in a planted aquarium where they are always on the move. Keeping them in a shoal seems to give them purpose and added beauty. They are peaceful fish that will not harm plants, hence choice of other inhabitants is vast and could include other small Danio and Rasbora species. I tend to keep fish from one locality together but small tetras would also go

well with the Pearl Danio. Although Pearl Danios will tolerate temperatures as low as 70°F, in a community tank, taking the other inhabitants into account, it will adjust to temperatures between 75° and 80°F. Pearl Danios eagerly take flake food but occasional offerings of live *Daphnia* or frozen Bloodworm go down a treat, especially as Pearl Danios feed on small crustaceans in the wild.

Mature, well fed Pearl Danios spawn regularly in the community aquarium but nothing comes of this because all the residents of the aquarium quickly eat the eggs. In a small breeding aquarium containing rainwater, provision has to be made to prevent egg eating. This could be natural in the form of a bed of Java Moss, or artificial in the form of a plastic grid suspended over the bottom of the tank. Females filled with roe and males added to the spawning tank at night should spawn at first light and need to be removed. Eggs take two days to hatch and it is another three or four days before the fry are free swimming. Fry need minuscule food, infusoria for example, before moving on to larger foods. Within

a few months you should have a huge shoal of Pearl Danios.

Blue coloured fish are not too common in the hobby, so the beautiful Pearl Danio makes a colourful, yet peaceful, addition to the aquarium. ■

CV

Family:	Cyprinidae
Species:	<i>Brachydanio albolineatus</i>
Origins:	India, Malaysia, Indonesia
Aquarium type:	36" community tank
Feeding position:	Top and mid-water
Size:	5cm (2")
Temperature:	75-80°F
Diet:	Flake, live <i>Daphnia</i> and Bloodworm

Safe. Keeping

BOB AND VAL DAVIES
ARE UP TO LETTER Q FOR
QUARANTINE IN THEIR
A-Z ON AMPHIBIANS...

Fishkeepers will be familiar with this subject and we have all probably bought fish and added them to an otherwise healthy tank only to be later faced with the rapid spread of white spot or other diseases brought in by the newcomer which might have looked perfectly healthy in the shop.

Quarantine essential

A quarantine period applies to any animal whether fish, reptile, amphibian or bird. An apparently health specimen could be carrying some organism to which it is

immune but to which members of the existing collection may have no immunity. The newcomer may also be developing some disease owing to its immune system having become depressed by the stress of capture and transportation. Stress can be induced by various factors such as unsuitable temperature, too much handling, incorrect humidity, lack of food, overcrowding and lack of hiding places. One of the first symptoms of sickness, whether stress induced or not, is refusal to feed. Since most amphibians are nocturnal feeders the first inkling the owner has is when live foods are left



ALL PHOTOS: BOB & VAL DAVIES

A&P fact file

Lighting is crucial

Fluorescent tubes of different spectrums are available to amphibian keepers and choosing which one to light your aquarium can be vital to your charges well being. Several companies produce tubes which are suitable for this purpose. Arcadia have recently added the Natural Sunlight Lamp to their range and these are an excellent choice for amphibians. They simulate the full UV spectrum of natural sunlight and will keep your amphibians healthy and happy. Natural sunlight lamps are designed to replicate sunlight and help show off the natural colours of your pets. The UVA and the UVB are also lower than in reptile lamps so they will not harm amphibians. At all costs you must avoid the use of strong UVB sources such as sunlamps for amphibians.

uneaten and begin to accumulate. Commonsense dictates that introducing a potential hazard into a thriving group of healthy creatures is asking for trouble.

Choosing a healthy specimen can sometimes be difficult, particularly for the inexperienced. During the day most amphibians are hiding and unless there are external symptoms could quite easily be considered suitable for purchase. External symptoms include emaciation or unusual swelling. Specimens with open, weeping sores on any part of the body, fungus or any skin growths should also be avoided.

Nine months

Since many people recommend a quarantine period of nine months for amphibians it is probably advisable to buy a group at one time and quarantine these together. Initially amphibians can be placed in a plastic aquarium with a ventilated lid on a substrate of damp paper towel with one or more hiding places (plastic lids, plant pots and the like) provided. This simple set-up allows

main picture, left: This specimen of Rain frog (*Scaphiophryne pustulosa*) died from bacterial infection three days after purchase. Note the abnormal swelling.

left: Overcrowding during import was the probable cause of death of these *Hyperolius marmoratus* and their companions.

Breeding your first amphibian

While some enthusiasts are content just to keep their chosen species, others become interested in breeding them. Breeding amphibians is quite a complex area: they have developed a range of breeding modes some of which are quite fascinating. Anurans (frogs and toads) have developed more breeding strategies than any other vertebrates; some species need water, others lay eggs on land in moist areas near water. Clutch sizes vary from one egg to several thousands. Eggs can be laid singly, in clumps or in strings and, finally, although most amphibians lay eggs, a few are livebearers.

Sexing amphibians

Sexing amphibians is not always easy. Few species of anurans are sexually dichromatic (males and females are different colours). As a rough guide, in many species mature females are larger and plumper than males. Males may have a vocal sac under the chin; in some species this is a different colour and so more easily seen. In species that breed in water the male may develop areas of rough skins (often referred to as nuptial pads)

on fingers, palms, limbs or chest according to species. These enable him to maintain a grip on the female.

In contrast to anurans, male newts and salamanders are more easily sexed especially during the breeding season. Some males are more colourful than the drab females and this becomes intensified prior to and during courtship. The cloaca (vent) may also become swollen at this time. In certain salamander species, where the sexes are similar, the swollen cloaca may be the only means of sexing. Females are usually stouter than males with more rounded bodies. Some species of newt develop a dorsal crest which disappears after breeding. Observation of behaviour can assist in sexing. (calling by males in frogs and toads, rubbing or head-butting in salamanders and tail waving in aquatic newts). Amplexus is common in anurans, some aquatic newts and salamanders. Newts which do not use amplexus rely on scent which they waft towards the female by vibrating the tail.

More information on breeding in next month's issue.



Sand frogs can be sexed by looking at the throat – the grey area denotes a male.

for initial inspection and observation for the first few days. This facilitates faecal inspection for intestinal worms as well as monitoring feeding and checking for damage to the limbs. An intermediate setup, fairly simple in nature, is also needed before the animals are placed in a more elaborately furnished, permanent vivarium. If placed in the latter and

disease becomes apparent the whole setup could be contaminated and the substrate and furnishings discarded and the tank sterilised – this can be a mammoth task in some cases. During the quarantine period the contents of a single setup can be completely renewed periodically which often prevents any buildup of bacterial diseases. ■

Aquarium Coolers

ANDREW CAINE ANSWERS THE QUESTION "WHY DO YOU NEED A COOLER?"



Marine aquaria should be run at 79°F, with anything above 80°F potentially harmful and 84°F plus possibly deadly. Every summer our houses heat up and so do our aquariums. So to keep our beloved beasts alive we must find a way of cooling the water at least during the summer - enter **The chiller**.

How does it work?

Most people would say that it cools aquarium water and they are not wrong. However, there is a much more important role and that is it allows us to have constant temperature stability within our aquarium. Achieving this is much more important in the long term because virtually every water parameter is governed by temperature.

Chillers work by passing water from the aquarium through the chiller and back into the aquarium. A probe monitors the aquarium temperature and when this increases over a pre-set figure, the chiller is automatically turned on. This then cools water passing through it thus cooler water returns to the aquarium. The insides of a chiller resemble that of either a fridge cooling mechanism or one of a car radiator.

Not all chillers are the same

A couple of pointers to be aware of are; if you have a marine aquarium you must purchase a marine grade chiller; all chillers cost money but the least expensive ones can only chill to room temperature as they chill via air being forced through the radiator. So if you are trying to chill an aquarium in the summer in a conservatory with a temperature of 90°, it cannot be done. This type of chiller has to be located in a cool area 365 days a year which often involves drilling holes through brickwork to allow the piping from the aquarium to the chiller. The more expensive chillers work on the same basis as a fridge.

Therefore, the chilling capacity is normally greater and has the added benefit of being able to be located in the same room as the aquarium. Prices range from around £350 to well over £2000 for the home aquarium. Since a 6'x2'x2' reef aquarium can easily have over £5000 worth of live stock a chiller is well worth the investment. ■

above left: Teco Micro Cooler...

above right: ... and Teco RA2000 Aquarium Cooler, both from Tropical Marine Centres.

below: Coolers such as Aqua Medic's SK-line series are designed for aquaria up to 1850 gallons depending upon the model.



For further details on aquarium coolers contact suppliers Aqua Medic (0845 090 3500) and Tropical Marine Centre (01923 284151).

Not the best community fish

but...

PAUL SKINNER DECIDES TO TAKE THE SPECIES TANK APPROACH TO KEEPING BRICHARDI CICHLIDS.

This occasional series of articles is intended, hopefully, to inspire you to take a closer look at some of the species that are kept in community tanks from time to time and to consider another approach to their care. By giving the species that we keep the most natural conditions that we can, their behaviour should mirror that in the wild more closely and we can learn more about the fish concerned. The pleasure that we get from keeping these fish is also increased as we notice more and more details of their everyday lives.

This was certainly the case when I was keeping a mixture of Rift Lake species in a large show tank situated in my office. One of the fish that I put into this community tank was the Brichardi Cichlid *Neolamprologus brichardi*. These fish appeared to be very shy in this tank and it started me thinking about how I could improve their conditions. I knew that they were from Lake Tanganyika in East Africa but I knew precious little else

about them. This meant that I had to research using as many books as possible and, in addition, I would ask other aquarists who I knew were interested in Rift Lake Cichlids. My approach to buying fish has radically changed these days and I now find out as much as possible about a species before purchasing.

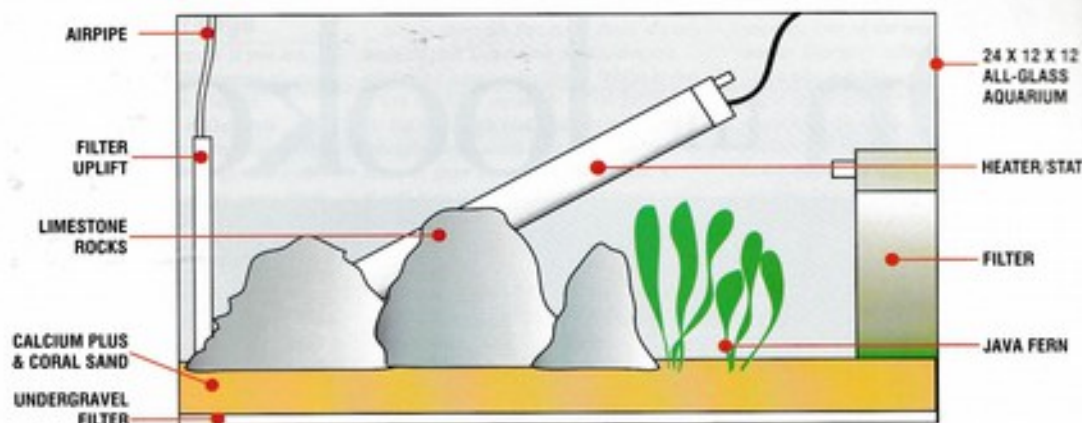
Making notes

Brichardi Cichlids are pretty fish that are suitable for the beginner. They are likely to give a great deal of pleasure because they often spawn readily and successfully. It is reported to be a cave breeder and both parents help with the brood care. The parent fish do not bother their older offspring and they simply continue raising their next brood, without driving off the previous batches. This is known as stratified breeding where youngsters of several age groups grow up in close proximity to one another. Indeed, the older youngsters help with the brood care of the younger siblings.

They are a quietly attractive Cichlid with a background colour of creamy-brown, becoming paler on the stomach area. There is a dark line that runs from the upper lip, through the eye, to the front gill cover. The gill cover also has a bright yellow spot and a brown/black vertical blotch down the anterior edge. The mouth and gill area is covered with light blue, wavy lines, one of which runs through the top of the eye. The pectoral fins are clear but all other fins are coloured with brown and light blue spots. These fins also have extensions and are edged in light blue. The extensions on the caudal fin give it a lyre tail shape. All of this combines to make a most pleasing little fish without being gaudily coloured. The males are much slimmer than their mates and have longer finnage.

top: *Neolamprologus brichardi*.

right: *Neolamprologus brichardi* pair. The upper fish is a male.



Lake Tanganyika has both sandy and rocky zones. On rocky coasts rough waves favour oxygen saturation, which eliminates carbon dioxide and prevents plant colonisation. Only a film of yellow-green algae *Cladophora* spp. and tiny animal life called Aufwuchs cover the rocky substrate. Fish obtain their food from these simple plants and the planktonic animals that live on them.

Setting up a species tank

Armed with this information, I decided to set up an aquarium based on the special requirements of these fascinating fish. I decided that a 24"x12"x12" tank would be suitable and would become the new home for my pair currently housed in the office aquarium.

The fish settled quickly into their new home and were much more confident in the absence of other fish. They dug a pit under a piece of rock in the left-hand corner of the tank; limestone was chosen as Lake Tanganyika is found in a limestone area and it is smoother than tufa rock, which would probably be too rough to provide a suitable spawning

Tank set-up

Water conditions:	Hard, pH 8, temperature 76°F
Tank:	24"x12"x12" all-glass aquarium
Substrate:	Calcium-plus and Coral sand
Filtration:	Undergravel and a Fluval 2 power filter
Rocks:	Limestone
Plants:	Java fern
Food:	Flake, frozen Bloodworm and Brine shrimp
The Fish:	One 3" male and one 2.75" female (transferred from office aquarium)

substrate. The fish fed well and the female noticeably put on weight as she filled with eggs. Water changes were carried out at a rate of 30% each week using hard (South Staffs) tap water treated with a dechlorinator.



First spawning

During the third week the fish spawned on the lower part of the rock. The fry hatched three days later and were free-swimming after a further three days. There were about 20 youngsters being shepherded by both of the parents. No special fry food was added to the tank but the flake food was crushed before feeding.

After about three more weeks the fry were approximately 7mm in length and the parents spawned again. Instead of driving the brood away or killing and eating them, like most Cichlids that I had bred previously, the parents continued to allow them to swim in and around the pit. This behaviour continued until finally there were fry from several different batches swimming together with the parents in perfect peace. The older youngsters took turns in looking after both eggs and younger fry making a most touching scene.

Unfortunately, at this point I moved house and the experiment had to be abandoned but I would have been interested to see how long this peaceful coexistence would have continued. Would there have been a point, as the youngsters matured, at which the family group broke down? Would the young then establish further colonies in other parts of the tank? Maybe this article will encourage readers to try keeping this fish themselves and perhaps inform us of their findings. ■

Brichardi Cichlid

Neolamprologus brichardi

Distribution:	Lake Tanganyika, East Africa
Size:	4"
Temperature:	71-82°F
pH:	7.5-8.5
GH:	10-20°dH

On the lookout



M.F.C. PREDON

*Why are you so late?
It wasn't planned, it just happened!
Fish bags again?
Just a few, I couldn't resist.**

That was how it went when I finally arrived home last Monday. I really hadn't planned to go so far but sometimes the lure of finding something new or different sends me on long drives all over the country. Being editor of *A&P* I can claim it is all part of the job, but I used to do it when fish keeping was a hobby so it doesn't wash with my family. Bags of fish just prove that I have been enjoying myself far too much again.

Aquatic habitat

So, just where had I ended up on this trip? Simply put, I have found myself another paradise! The Aquatic Habitat was started by Rob Wilden's parents in 1974. Since then Rob has taken over and is now the sole owner. He and his staff have a passion for fish which shines out from every well maintained aquarium.

IN OUR MONTHLY LOOK AT UNUSUAL FISH AND THE SHOPS THAT SELL THEM, DEREK LAMBERT HAS BEEN OUT AND ABOUT DODGING FLOODS TO FIND SOME NEW FISH FOR HIS COLLECTION.

They have never advertised the fact they have a huge range of rare and unusual fish. In fact, they say they would rather surprise people with what they have, than make claims that they might not always be able to live up to. All very laudable, but everybody really should add this shop to the list of places to visit for something different.

Just how different? Well, almost the first tank I looked in had *Rasbora azevroidi* in it. For those of you who have never seen this fish (that includes me up until that moment) the males are a brilliant blue across the back and upper sides with the bottom half of their body bright red. A black flash in the anal fin completes

what must be one of the most beautiful *Rasboras*. The female are an overall reddish colour. At barely 1" full grown, this is a little gem you need to be careful who you house it with. Of course you could keep them with *Cheta dardibourjouri* or *Rasbora mernk* two beautiful little fish also in stock at this shop.

Fancy something really exotic? What about Pipefish or Mudskippers? Too specialised? Well what about some of the most beautiful *Apistogramma pandurani* I have ever seen? I think you are beginning to get the idea now. We are talking about what must be one of the best selections of high quality fish for sale in the UK.

Excellent range

Plants are also in good supply. If you are lucky you will find up to 50 species of true aquatics on sale at Aquatic Habitat.

They also do a full range of Dennerle equipment to help you grow them properly.

Another big plus is the range of books they have on sale. Not just the usual large publishers, but several others who are often overlooked because they have to be ordered in specially and to do that you need to know the books exist.

Quarantine room

One area many shops fall down in is quarantining. Aquatic Habitat have an upstairs quarantining room where 50 tanks are devoted to acclimatising new arrivals. All fish remain here for at least a week before being moved into the display tanks.

One idea which I found really helpful was the date of import on all the tanks. Using this I could see that some fish had been in the shop over a month and looked to have fully recovered from the stress of their journey. The labelling of size, temperament and care of each species was also very good and would be tremendously useful to beginners as well.

What did I buy? Well *Rasbora alzevaldi* and some *Rasbora mehar* this time, but I could have done some really serious damage to my bank balance if I had the tanks ready. All in all, this is an excellent shop and one I will return to time and again.

Wharf Aquatics

Another very wet day and another shop! Wharf Aquatics was started in 1986 by Wayne Swift. Since then it has moved twice to larger premises and plans are afoot to extend the current premises again this year.

Wharf Aquatics is well known for its rare and exotic fish. I visited it when they said they were low on stock. If this was 'low on stock' I can't imagine what it would be like at its peak!

main pic left: For something really exotic, why not try some Mudskippers?

top right: The Aquatic Habitat has a great selection of books for sale.

bottom right: If you are lucky you may find upwards of 50 species of plant for sale.

centre right: Just a small selection of the 250 tanks at Wharf Aquatics. This photograph was taken shortly after they opened the new shop 31/2 years ago.

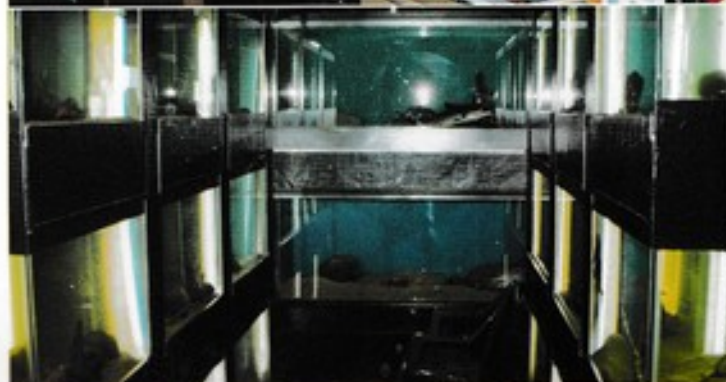
As you enter the fish room there are two large display tanks. One is an L-shaped affair with a nice selection of fish in it, but it was the huge aquarium (1500 gallons) on the left which really caught my eye. Inhabited by a small Redtail, which has room to grow into a sizeable Redtail, it shows how this sort of big fish needs to be kept if it is to be happy.

The range of large fish species was astounding in Wharf Aquatics. These tended to centre on Catfish and Cichlids, although other types were also

present. One of the most unusual fish was an Electric Catfish (star of our *Fishy Tales* this month).

For those without a very large aquarium, the range of more manageable Catfish and Cichlids was also very good. Other groups of fish were also well represented, with some rather nice Characins including a *Anostomus ternstroemi* which was well up to show size.

Once again I came away with fish. This time a lovely trio of *Neotampulobrycon signatus*. ■



Fish in Notts!



Lambley Aquatics is tucked away behind Floralands Garden Centre.

The day, like so many recently, was cold and wet. With huge areas of the country flooded, or on the verge of being flooded, it was an intrepid A&P team that set out to visit Lambley Aquatics, situated near Nottingham. Approaching from Lincoln we had to negotiate flooded roads and detour miles out of our way before finally reaching Floralands Garden Centre. Now came the hard part – finding Lambley Aquatics! In fact this shop is

tucked away right at the back of the Garden Centre so it is a good idea to park as close to the bottom of the car park as you can. Then follow the path alongside the last greenhouse and you come to Lambley Aquatics entrance. It is sign-posted, so you can't really go wrong.

Paul Webster has owned the shop for about 2½ years now, although he has been a keen aquarist for 20 years. The tropical side has been completely revamped and looks bright and modern.

Baby aquariums raise their ugly head

While discussing the subject of the torture chambers for fish, we mentioned the rip-off price of £20. Paul was horrified since he does a complete 10 litre coldwater set-up for only £21.95. The price includes the tank, pump, filter, lid, gravel, ornament and food. Ignoring the cruelty to fish the baby aquariums represent, they also have to be one of the biggest cons going as far as price is concerned.

A&P PAYS A VISIT TO LAMBLEY AQUATICS.

There are 75 tanks holding a good range of fish and a nice display of aquarium plants. No marines are on sale yet (plans are in place to expand into this area) but the main display aquarium is given over to a baby Leopard Shark (really Paul's pet) and there was another smaller marine set-up holding Percula Clowns. These were bred by John Smith who works in the shop.

Looking around the coldwater side, the range of products on offer was good and competitively priced. Outside there was a nice selection of ornaments and water features but since we were there in the middle of the winter, no fish were present. This whole area is scheduled for a revamp later this year.

This is a good down-to-earth shop where beginners can obtain good quality advice and find everything they need for successful fishkeeping. ■



Paul's coldwater beginners' set-up – complete for the princely sum of £21.95.

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Close encounters

JOHN DAWES AND HIS
FISH ADVENTURES
AROUND THE GLOBE

of the fish kind



Some time ago, I returned from Sri Lanka after a hugely successful trip during which, among other things, I was involved in a *Malpulutta kretseri* collecting expedition for a captive breeding project. As always, I brought back a 'brainful' of new experiences and countless pictures of some of the many interesting and unusual places, creatures and plants I encountered in my travels.

One of the most amazing things I came across took me, in a split second, right across the world to an almost-identical situation that I had experienced some years previously during one of my visits to the Rio Negro (and which I reported on in the first instalment of Encounters in November last year).

Take a look at the accompanying photograph. The gentleman in question is MW Dharmadhasa, my guide on this particular collecting trip (during which we collected, among many other species, the beautiful *Rasbora vaterifloris* and, as mentioned above, the rare *Malpulutta kretseri*).

I spotted him flicking his middle finger on the water surface, just before we were due to leave this collecting site. When I asked him, via my interpreter, what he was doing, his answer was: 'I'm calling the fish...' and, true enough, he scooped up his net and there, in the middle, was an assorted collection of tiny fish, including *Rasboras*.

To say that I was amazed would be a huge understatement. I explained to him

right: Dharmadhasa 'calling' fish into his net.



JOHN DAWES



top: Cardinal tetras are 'called' to the net in Rio Negro.

right: *Rasbora heterotis* were 'called' to the net in Sri Lanka.

bottom right: Toadfish have very attractive faces...

that the last time I had seen anyone calling fish in exactly the same way was half a world away in the middle of the Amazon. Dharmadhasa just smiled and said: 'What's so surprising about that? It's logical... if you want to call fish out, you just flick your finger on the surface of the water.'

He said this as if it was the most obvious thing in the world, and I suppose he's right, except that to know just how logical or obvious this technique is one needs to have a vast body of knowledge about wild fish and their habits and many years of experience collecting them. Both my Amazonian guide, Sara, and Dharmadhasa fit this description perfectly. In Dharmadhasa's case, he's been collecting fish for the same Sri Lankan exporter, Lumbini Aquaria Wayamba Ltd, for over 37 years!

Beautiful Red Sea Toads

They say that beauty is in the eye of the beholder. Certainly, when it comes to fish, no one can argue with this statement.

For example, to me, the fish that this item relates to is absolutely beautiful. Yet, I've shown these slides during my lectures to fish clubs and some members of the audience have actually found them quite repulsive and ugly. What do you think?

The fish in question, which I photographed during a visit to the Red Sea, is a Toadfish or Frogfish (*Riekertia* sp.) of the family Batrachoididae.



Toadfishes are bottom dwellers that are found in tropical and warm temperate seas. In common with many other bottom-dwelling species, their body shape clearly indicates that they are not built for speed. Indeed, I had to wait for half an hour before this particular specimen turned to face the camera. These unusual, well-camouflaged fish have no scales on the body, but carry some interesting 'adornments' around the head and - most interestingly - along their chins. Armed with a huge mouth, it's quite obvious what they eat... and it's clearly not algae!

Since Toadfish are not active fish, some aquarists might find them a little on the boring side. Also, with those large, almost-human, eyes staring out from the aquarium, it's easy to be fooled into

thinking that they are quite harmless. Not so! Any fish that is small enough to be swallowed, will be swallowed by a hungry *Riekertia*, given half a chance.

With regard to their names, I'm not too sure if this is because some species can generate a croaking sound (some can also generate light), or because the head looks like that of toad or frog. Either way, since I love keeping and breeding both frogs and toads in my ponds, I suppose that's why I find these unusual fish so attractive.

Riekertia are only rarely seen in the hobby, so if you've got a liking for unusual fish, keep a lookout for them or, better still, ask your retailer to try to obtain some specimens for you - and then, write in and tell me about your experiences. ■



Skunk Botia

(*Botia morleti*)



BY IGGY TAVARES PHD

The Skunk Botia, *Botia morleti*, gets its unfortunate common name from the single black stripe that runs along its back, which ends in a black band around the caudal peduncle. The skunk Botia is an attractive pink overlaid with a yellowish-green hue, which accounts for its popularity. Its small mouth is surrounded by short barbels that help it to locate its food. They have two retractable spines on either side of the head near the eye that can be extended from their grooves and deter predators from swallowing them. The Skunk Botia, which can reach a size of 4", is a long-lived species if properly cared for. There are no distinguishing features between male and female, except that a mature female when filled with roe would be expected to be more rotund. The Skunk Botia is a native of Thailand, where they occupy many rivers systems and are found in large shoals.

In the aquarium, Skunk Botia tend to be territorial, warning off other Skunks by making a clicking noise. In spite of this, I am for keeping four or five equal-sized Skunk Botia in a 3' community tank containing mid-sized danios and barbs. The tank should be well planted and

decorated with bogwood, which will provide caves for the Skunk Botia and also well demarcated territories for them to defend. Such a set-up is always more interesting than keeping a single Botia that quietly goes about feeding itself. With lots of caves, no harm should come to individual Skunk Botia.

Although water in Thailand is soft but neutral, Skunk Botia adept easily to most clean water kept around 25°C. In the wild, Skunk Botia feed primarily on worms and bottom feeding crustaceans. In the aquarium, they will eat all fish food that reaches the bottom but prepared foods should sometimes be supplemented by live worms.

Having recently visited Thailand, I learnt that a large number of fish are collected from the wild for the aquarium industry. The exporters tend to acclimatise the fish in large tanks for a few weeks, feeding and medicating them as necessary before selling them on. Skunk Botia are not farm bred but collected from the wild.

Four or five Skunk Botia live up the bottom reaches of a community aquarium and, although nocturnal, are fairly active in the daytime, especially at feeding time. ■

CV

Family:	Cobitidae
Species:	<i>Botia morleti</i>
Origins:	Thailand
Aquarium type:	36" tank
Feeding position:	Bottom feeder
Size:	5cm (2")
Temperature:	75-80°F
Diet:	Flake, sinking food tablets, and live worms



ASK &P



HAVING PROBLEMS?
THEN LET OUR PANEL OF EXPERTS
COME UP WITH THE ANSWERS...

Every query receives a personal answer and in addition, we will publish a selection of the most interesting questions and responses each month. Please indicate clearly on the top left hand corner of your envelope which department you wish your query to go to. All letters must be accompanied by an S.A.E. and addressed to: Ask A&P, Aquarist & Pondkeeper, TRMG Ltd, Winchester Court, 1 Forum Place, Hatfield, Herts AL10 0RN.

A&P's EXPERTS



Koi & Ponds

Bernice Brewster is very well qualified to answer your questions on Koi and Ponds. She has a Bachelor of Science (Hons) London, Biological Sciences - incorporating Marine Biology, Animal Physiology and Vertebrate (back-boned animals) Anatomy. She worked for 10 years as Fish Biologist at the Natural History Museum, London, and spent four years as Fish Biologist with Koi (UK) Ltd, working on pathology and husbandry of ornamental carp (koi). In 1998 she formed Finspiration (Wholesale) Ltd in conjunction with Lorraine Hubbard and Neil Black, specialising in the farming and sale of coldwater ornamental species of fish.



Marines

Andrew Caine has had a life-long interest in marine life and has been keeping marine aquariums for 15 years. He attained an honours degree in marine biology from Bangor University, and wrote and taught his own night school course in the same subject. He started Aqua-World installing reef aquariums throughout the UK, and now has a little corner aquarist shop in Warrington, where he can be found hiding behind the plastic plants!



Anabantoids

David Armitage is an MAFF biologist based near York. He's been keeping fish for over 35 years and has specialised in labyrinth fishes, particularly the African species. For the last 20 years he has edited AAGB's Labyrinth newsletter, which he still does today. Over the last ten years he's visited the habitats of many of his labyrinth fish in Asia and Africa. In his small village he is known simply as 'Fish'!



Goldfish

Stephen J Smith will be very well known to long term A&P readers. For many years he wrote a column entitled *Coldwater Jottings* in this magazine and it is with great pleasure that we welcome him back as our Goldfish expert. Stephen has a lifetime of fishkeeping experience behind him and has been a prolific aquatic writer as well as an active speaker and a Goldfish competition judge in the UK, Singapore and in the USA, where he now resides.



Our other experts

Kathy Jinkings
Cattfish

Lance Jepson
Health

Andy Gabbutt
Killifish

Ben Helm
Equipment &
Technical advice

Sonia Guinane
& Dave Tourle
Cichlids

Pete Liptrot
Barbs, Characins,
Rasboras and
Oddballs

Derek Lambert
Livebearers,
Rainbows
& Breeding fish



Sonia Guinane & Dave Tourle



Ben Helm



Peter Liptrot



Derek Lambert



Marine

From the 'horses mouth

Q I hope you can settle an argument I have been having with one of my local club members. He says Seahorses are egglayers not livebearers. Since I have actually bred Seahorses, I know they give birth to fully formed baby 'ponies', so must be livebearers. Perhaps your written answer will convince him that I am right and he is wrong.

John Mead, Surrey

A I am sorry to have to disagree with you, but Seahorses are classed as egg-layers by scientists. The fact the eggs and fry are held in a pouch until they are born does not mean they are livebearers. The problem is the pouch is classed as external to the body and internal fertilisation of the eggs is a vital characteristic of livebearing.

Derek Lambert.

Tropical

Foxed by this one

Q A couple of months ago I purchased my first ever tropical tank (in fact, my first ever fish tank). The aquarium I purchased was an established tank with a variety of fishes most of which I have identified and learned about. However, I have a rather large 'Siamese Silver flying fox' for which I can find no information whatsoever. I would be very grateful if you could tell me about this fish so that I can have a better understanding of his needs as he is simply my pride and joy.

As I am a new collector of tropical fish I wonder if you could advise me on a book that could help me regarding the many different fish and their nature and life span.

Mark Hamilton

right: Despite giving 'birth' just like livebearers, Seahorses are classified as egglayers.

A First, let me deal with your query about a book. In my view, the best general aquarium books on the market are the Baensch Atlases that should be available from any good local aquatic retailer. There is a series of these books and they contain a wealth of information about all the fish you are likely to see. The initial price may be a bit off-putting if you were to

buy the whole set at once, but I would start with #1 in the series at least.

Now, on to your Siamese Silver Flying Fox. This fish is almost certainly *Crossocheilus siamensis* which in some books will still be listed as *Epalzeorhynchus siamensis*. It reaches a length of around 14cm, is probably a preferable aquarium fish to the more

commonly seen Flying Fox (*E. kullopterus*) in that it is a more peaceful fish, and is much better at ridding the aquarium of undesirable forms of algae. Indeed, it is thought by many to be the best of all commonly available fish for removing unwanted algae. They are even reported to eat planarian flatworms unlike most other fish. =>





UNDALE/ARND BRONKHORST

left: Siamese Flying Fox, *Crossocheilus siamensis*, is thought by many to be the best of all commonly available fish for removing unwanted algae.

usually found in fast flowing water or river estuaries.

Once the youngsters reach about 2" males start to become sexually mature. This is when all the colour develops as well as a small hump on their head. They now stake out a small territory, usually centered on a rock or tree root, and set about enticing a mate to spawn.

Up to 3000 tiny eggs are laid which the male guards for the next 10-14 hours until they hatch. The fry are tiny (about 1mm) and swim up into the water column. Feeding them in captivity has proven to be impossible (at least for those aquarists who I know have been lucky enough to have them spawn) so far. This is also the case with other Gudgeon and Goby species that produce huge numbers of very small eggs.

Despite this problem, Empire Gudgeon or Carp Gudgeon as they are also known in Australia, make excellent aquarium fish well worth seeking out.

Derek Lambert. ■

⇒ As the name suggests, they come from Thailand (formerly Siam) but are apparently found elsewhere in South East Asia. They are fairly tolerant of different water parameters, as long as extremes are avoided and the water is kept clean by good aquarium maintenance. As you have probably found out they accept most good quality aquarium foods, and if your tank has not much algae for it to graze on I would consider using some of the vegetable-based foods on the market as a supplement.

You do not mention the size of your new aquarium, but be sure you have the space before introducing any more fish, especially of this species. Just because it is less aggressive than some others doesn't mean an established individual won't resent the presence of another.

If you have a local aquarium society consider taking up membership, as the collective knowledge found in most societies will surely help you in the future.

Pete Liptrot.

Tropical

Readily available?

Q The Empire Gudgeon, *Hypseleotris compressa* (Krefft, 1864), from Australia and New Guinea looks

right: *Mogunnda mogunnda* breed in a similar fashion to Empire Gudgeon but the fry are larger and can be reared on newly-hatched Brine shrimp.

astoundingly bright and beautiful in photographs. Is this species readily available and how long is it likely to live?

John Abbott, Devon.

A The Empire Gudgeon comes in through the trade from time to time. Some months ago a wholesaler imported some so it is possible one of your local shops may have them or be able to order them in for you.

This is a very hardy fish that grows to about 4". It is a peaceful species that would make a perfect inmate for a community aquarium and in common with most Gudgeon

will live for four to five years in the aquarium (much less in nature). The coloration you see in photographs is actually more intense in life but only mature males have the red. Females and immature males are mainly brownish with dusky scale margins becoming silvery or whitish on the belly.

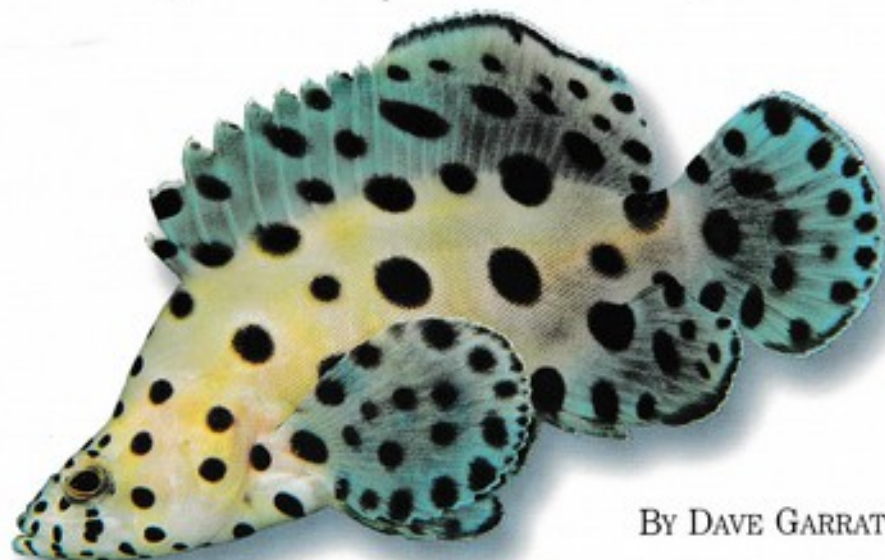
They are widespread in coastal drainage systems around the northern two-thirds of Australia and are also found in southern central New Guinea. It is most common in flowing streams where it lives in areas with plenty of plant growth or near roots and branches of submerged trees. Juveniles are



BRONKHORST/ARND BRONKHORST

Polka Dot Grouper

(*Cromileptis altivelis*)



BY DAVE GARRATT

The Polka Dot reflects the changing face of the marine hobby over the last 20 years or so. When I made the transition from freshwater to marines in 1977 the Polka Dot (or Panther) was a very common and popular fish. It was usually available as a small 2" juvenile specimen or as a much larger adult fish measuring 6" or more. I am sure many of these larger fish must have been returned by hobbyists who suddenly became concerned with the growth rate of their cute little fish.

Back in the '70s the hobby was very much fish dominated, with aquariums set up as fish only tanks and no real attempt to produce a more natural looking community. Today, with the advent of mixed fish/invertebrate communities and reef tanks, the species is far less common. Nevertheless, for an aquarist with a large tank it does offer something out of the ordinary and its endearing looks may well lead it from the realms of a mere fish to that of a family pet. Groupers are generally shy and retiring and will spend an inordinate amount of time in their bolt-hole. The Polka Dot, however, is a livelier prospect and will spend more time swimming around the tank.

Like all of the Groupers it is a predator and will require meat based fare such as

mussels, shrimp and squid. Ensure you purchase a specimen that is taking frozen commercial food, otherwise it may be necessary to entice the fish off live food by dropping food past the entrance of its lair, or waving it just in front of its mouth if it is swimming in open water.

Being predators Groupers will consider anything small enough to be swallowed as fair game, and promptly eat it! A plus point for the Polka Dot is that it has a relatively small mouth and hence is theoretically the least dangerous of the Family. It cannot be trusted with Crustaceans and it is probably best to avoid invertebrates altogether unless they are of the larger variety. The Polka Dot illustrates the distinction between predation and aggression, as despite their predatory nature, they are peaceful and will mix well with large species (anything it cannot swallow).

It is a fish that is suitable for the beginner and should be trouble free providing water quality is good, and the tank is large enough to accommodate the startling growth rate. It is important to realise that frequent water changes, efficient skimming and effective mechanical filtration will be necessary to contain the messy eating habits and large amount of waste produced by a fish such as this. The Polka Dot is not overtly

susceptible to any particular diseases and is a hardy fish that can reward the aquarist with the pleasure of seeing it grow to maturity and have a long life-span in captivity. ■

CV

Family:	Serranidae
Species:	<i>Chromileptis altivelis</i>
Origins:	Indo-Pacific
Feeding nature:	Predator
Aquarium feeding:	Meat based - mussels, cockles, whole shrimp (including live)
Size:	20" in the wild and can easily reach 10" in captivity
Compatibility:	Not with its own kind or anything small enough to be swallowed.
Difficulty:	Easy fish to suit beginner



Parasite PROBLEM

SOME LETTERS RAISE ISSUES WHICH NEED A FULLER EXPLANATION THAN SPACE ALLOWS IN OUR ASK A&P SECTION. THIS WAS CERTAINLY THE CASE WITH MRS CONWAY'S RECENT LETTER, SO HERE IS BOTH THE ORIGINAL LETTER AND LANCE JEPSON'S REPLY IN FULL.



The tank has been set up for five weeks now and I have lightly stocked it slowly over a four-week period with Zebra Danios, Platies, two Corydoras, a Plec and a couple of Dwarf Gouramis. All was well to begin with and then the 'itch' started.

It starts with one fish rubbing itself against items in the tank and spreads to all of them. They all begin to look increasingly unhappy and I can only assume that it is due to microscopic parasites, since the water is regularly tested for Ammonia, Nitrite and Nitrate, there being a very minimal reading of Nitrate. I also carry out weekly water changes of 15% using a water additive to neutralise chlorine and the like, and also a water safe product to add beneficial bacteria. Some fish seem more prone to this than others, the Platies and Gouramis being the most sensitive.

I am using Sterazin at the moment as I have used it successfully in the past, although it's a messy and unpleasant treatment and a lot of fish don't tolerate it well. I would much rather use a UV unit but have read that these kill the larger parasites only.

When most fish are captive bred why can't this problem be irradiated before they reach the dealers' tanks. Please help!

Lance's reply

The commonest causes of the 'itching' that you describe are either water quality problems or microscopic external parasites. You say that ammonia, nitrite and nitrate levels are acceptable and that you use a dechlorinator with each water change so it is unlikely that water quality will be the issue here. What is far more likely is that your fish have a low-grade problem with external parasites.

These external parasites graze upon the skin surface, or cause damage in a similar way. This triggers the itchiness that you describe with affected fish clamping or flicking their fins, or rubbing against objects in the aquarium. In extreme cases the fish may stop feeding. The skins of affected fish often look greyish because

of excess mucus secreted by the fishes' skin in an effort to dislodge the parasites. This mucus also contains antibodies that may be of use. The damage that these parasites cause can allow secondary bacterial infections to enter the fish, triggering ulcers and septicaemias.

The microscopic external parasites that we are most concerned with fall into two groups - flukes and protozoa.

● Flukes are tiny flatworms that live primarily either on the skin (*Gyrodactylus* skin flukes) or gills (*Dactylogyrus* gill flukes). *Gyrodactylus* are live-bearing and numbers can very rapidly build up to significant levels. This does also make them susceptible to treatments, as all stages of the life cycle are vulnerable. Gill flukes on the other hand are egg-laying. The egg stage is resistant to treatment and so medication must be repeated every two weeks for several doses.

● Protozoa are single celled parasites. The 'usual suspects' are White Spot (*Ichthyophthirius multifiliis*), Velvet Disease (*Oodinium*), *Ichthyobodo* (*Costia*), *Trichodina* and *Tetrahymena*.

Your point that these fish are captive bred is a good one. Theoretically it should be easy to eliminate these parasites in captive fish. However, the way I see it is that most of these fish are commercially produced in pond culture in tropical areas such as Singapore and Malaysia, or subtropical areas such as Florida. This pond culture means that parasite eradication is extremely difficult as there can be a constant influx of infective material such as local amphibians, floods, water birds and so on. In addition effective, repetitive medication may incur significant financial penalties on those trying this, which could be exploited by less caring opposition.

The situation with livebearers in particular does annoy me. Most of these are cultured in salt or brackish water ponds to specifically reduce parasitic problems. They develop only minimal immunity in these conditions because they are not exposed to a 'normal' parasitic load. Shortly before export they are converted to freshwater which leaves them especially vulnerable to parasitic infestation at a time

when they are stressed and vulnerable. This is the fish that you buy.

Quarantining is probably the best way of stopping these problems getting into established collections. Treating with the proprietary anti-external parasite medications whilst in quarantine will help to reduce numbers, although they may not eradicate the parasites completely. UV will kill even the tiniest parasites - it even has an effect on viruses but only kills pathogens if they pass close to the UV bulb i.e. if they are drawn into the UV unit. Parasites on the fish, plants or on the gravel will not be affected. Ozone again is very effective, but the pathogens need to be exposed to the ozone, which is usually delivered in a separate tube or unit through which aquarium water is drawn.

For life cycles and more information, please look out for our 'Fiscian' slot, and in addition I would also direct you towards two books -

- *Color Guide of Tropical Fish Diseases* - Basslear G. 1983, Basslear Biofish, Stationstraat 130, B-2235 Westmeerbeek, Belgium. ISBN 90-03-98085-3.
- *The Interpret Manual of Fish Health* - Andrews, Excell and Carrington 1988, Salamander Books Ltd, 52 Bedford Row, London, WC1R 4LR. ISBN 0-86101-368-9. ■

left main pic: A healthy Dwarf Gourami, sadly these are particularly prone to this problem.

left: Mrs Conway's Platies seem one of the more vulnerable species.

bottom right: Cultivated livebearers like these Guppies are often cultured in brackish water which leaves them open to infection when returned to freshwater.



Bolt from the blue

GRANT WEIR WITH A SHOCKING TALE ABOUT HARRIET, THE ELECTRIC CATFISH...

In an area of the rain forest that is steeped in tradition, supernatural beliefs, superstition and fetishes, some species of Nigerian rain forest tropical fish are the subject of considerable folk lore and none more so than the electric catfish *Malapterurus electricus*.

Cure for fevers

In the far east and north of the country, the mystical fish is believed to cure fevers. In days past, fever stricken babies were immersed in a partly water filled tin or enamel basin together with the fish. The subsequent 'fishy shock' possibly killed as often as it cured. In other areas, the fish is eaten as an aphrodisiac. There are also riverside villages that hold it in such high esteem that they keep it captive, to bring good luck to the entire household. No other variety of fish is given the same pet treatment.

Very, very occasionally, fishermen catch the albino version. When this happens in our Oluwa river, superstition dictates that the fisherman must catch a mate and return both, unharmed, to the same spot where the albino was caught. Until he does so, his fish catches, generally, will be poor. No Oluwa river fisherman keeps or eats the albino version.

In the wild, an electric catfish can grow to over 80cm (32") in length. The electric organs, which are used to stun prey or act

as a protection against predators, are located in the muscles beneath the fatty skin and run the full length of the body. The muscular body tissues form electroplates, with the tail of the fish

being positive and the head negative. Small fish are only capable of tiny shocks, but a 15cm (6") fish will give a shock similar in severity to that from a 45 amp car battery.



Only eats sand!

We obtained most of our supplies of electric catfish from fishermen who fish our local river and top up our stocks from villages and towns over 80 miles to the west of us, notably the fishing village of Ologbun. Practically every household in Ologbun – the village boasts neither electricity nor running water – keeps a fish captive to bring good luck. The fish is kept in a bowl which is a small, fire blackened, well used and crumbling, clay cooking pot. The water in the pot is changed two to three times a week and, with each water change, a handful of white sand is added. The villagers firmly believe that the fish only eats sand. This belief adds considerably to its mystique. In reality the fish must sift through the sand for minute crustaceans. This Spartan diet prevents the fish from growing fat and killing itself by overeating – arguably the biggest killer of captive tropical aquarium fish. The electric catfish is a true glutton and will gorge itself to death in captivity if given the slightest encouragement to do so.

The average life span of an electric catfish in Ologbun, even in very cramped conditions, is over six months. The task of looking after the fish is invariably given to the youngest member of the family, usually a male child, who quickly builds up such a rapport that he can gently lift the fish out of its pot on the flat palm of his hand. The fish appears happy to lie there, immobile, for at least a few seconds. The children always crowd around us with their fishy pets and plead to us in unison: "mek u tuch um!" Each of them tries to be first to push their little pots into our hands. On the only occasion that we politely accepted the invitation and touched a fish, we received a

substantial electric shock from a 10cm (4") long fish. Our 'stunned' look was enough to send the juvenile population of Ologbun into convulsions of quite uncontrollable laughter. Despite their obvious poverty, mirrored by their dusty surroundings, each Ologbun child, or even adult, is very quick to break into genuine and spontaneous laughter.

Rare albino

It was on a fish-collecting visit around Ologbun, a few years ago, that our friend and representative in the area, Chief Balogun, proudly presented us with an albino electric catfish. The fish had been caught in a home-made, split cane basket, by the chief's sister as she sieved through stream-side mud to catch spiny eels, *Mustacembelus sp.*, the main soup ingredient for her extended family. The chief's sister would not accept any money for the fish. The chief explained that the village's superstitions did not allow her to profit financially from the sale.

We were ecstatic! We gave our benefactor an expensive, automatic ladies' watch. Although she still does not know how to tell the time, she proudly wears the watch on each and every special occasion.

Once back at our fish centre, we installed the rare albino in a 200 litre (50 gallon) ground tank next to two tanks each containing an albino *Clarias* catfish that we had just bought. Soon after the albino electric catfish arrived at our fish centre, one of the two *Clarias* disappeared overnight. We decided that the thief was actually after our rare albino so we hurriedly shipped it with a consignment of live rain forest tropicals destined for an expanding aquarium centre near Welwyn, Hertfordshire, England.

Popular attraction

We asked the centre to sell the rare fish for us but the aquarium centre was quick to see the potential of this rarity and they christened her 'Harriet'. Although electric catfish can be kept with larger aquarium fish, they afforded Harriet celebrity status and accommodated her in a large aquarium of her very own.

The centre had an open house each weekend. Many visitors came primarily to see Harriet. Her 'party piece' was to rise to the tank surface and suck feeder guppies from the fingers of the attendant on duty without shocking them. As rare Harriet's fame spread, more and more curious visitors flocked to the centre. Harriet obviously ever eager to show off her feeding routine, happily consumed fish after fish.

Three months of glutinous eating proved to be the end of Harriet and we received an obituary telex one day followed by a photograph in the mail confirming that Harriet had eaten herself into eternity.

We hope that she died happy and did not wish that she had stayed behind in the rain forest of Ologbun, feeding exclusively off white sand and being held up in the humid rain forest air, on special occasions, by tiny, loving fingers! ■

Ann Weir's cartoons have been a lively accompaniment to her husband's fishy tales. We hope to publish their article on the butterfly fish in the near future which will feature some of Ann's lovely drawings.

FISHTALES BY TOKES & SCHOFIELD

