
Tropical Fish
JANUARY 2007
THE UK'S ONLY DEDICATED TROPICAL & MARINE FISH MAGAZINE
LUNAR LIGHTING
MOODS TO SUIT EVERY TIDE
BLOOD BATH
WHAT THE 'RED-STUFF' MEANS TO OUR FISH
THE ANGEL IN DISGUISE
LOOKS CAN BE DECEIVING
GREEN, AMBER OR RED
WHICH FISH IS SAFE TO FOLLOW?
WIN
A LUNAR LAMP FROM MIDLAND REEFS
PLUS
ALL ABOUT - THE PIRANHA; SHOW REPORT - DISCUS IN DUISBURG; DISCUS PROFILE - PERFECT PARAMETERS; BRACKISH - SAILFIN MOLLY; MARINE SPECIAL - THE COPPERBAND BUTTERFLY; ALTERNATIVE COMMUNITIES - THE FAR EASTERN SET-UP; HOW TO... MOVE YOUR FISH SAFELY; AND MUCH MORE...
FREESTYLE
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ISSUE 71

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From the editor

Happy New Year!

Greetings to 2007, and welcome to another fantastic filled year for you, the *Tropical Fish* reader and enthusiast.

With all the Christmas and New Year celebrations over and done with for another year, the *Tropical Fish* team are looking forward to a bright 2007 with some new additions to the magazine.

Already this month we have two new series starting off, in hopes that we can cover even more ground for you and increase your knowledge and love for the hobby. Our Tetra expert Rupert Bridges is getting technical with a new fish biology series, we have Dave Garratt, with a new look series to profiling the difficulty in keeping different marine species, and Tim Hayes illuminates it all this month by looking at marine lighting, and offering you the chance to give your own tank a touch of lunar, (turn to page 54 to find out more).

So, enjoy the first issue of 2007, keep going with those New Year resolutions and we'll see you next month!

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Credits

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The Filter

All the best news, reviews and information from the fish keeping world

RED SEA MAX

Interpet launches Red Sea MAX, a new award winning concept in marine aquariums

Interpet are pleased to announce the launch of the MAX, a fully-featured, plug-and-play reef aquarium.

The Red Sea MAX has been designed to broaden the appeal and accessibility of reef keeping. Providing you with a hassle-free, cost effective entry to the hobby and ensuring a higher chance of long-term success. In doing so, it includes all the components required to grow and maintain a reef in a single tank, highlights of the 130-litre Red Sea MAX include an 8mm rounded-corner glass tank, 110 watts of T5 reef spec lighting, professional 1,200 lph turbo protein skimmer, 10 times-per-hour circulation and a unique integrated power control centre that connects to the mains through a single cord.

Other features of note are the 24-hour programmable lighting timer, moon-glow LED night lights and multiple access panels for easy maintenance.

"The MAX represents a watershed in terms of design, performance and usability," commented Red Sea CEO Eli Nissenberg. "It allows you to enjoy the hobby and focus on growing a beautiful, vibrant reef instead of being constantly preoccupied with hardware. We've taken care of that side of things." Recalling the company's 15 years of aquatics expertise, Nissenberg describes the Red Sea MAX as: "The purest expression to date of our customer-driven design philosophy."

To top it all Red Sea MAX won the coveted New Product Awards at Glee, the number one event for the international garden, pet and leisure industry. The expert Judge said of MAX: "Red Sea has thought about this product very carefully. Red Sea MAX is designed to make reef keeping easy. It is great for the beginner but still has all you need for the expert. I think that the tank stand is very stylish and would look good in any home. As a one-plug marine aquarium, which includes a skimmer and T5 lighting. Its quite outstanding."

For more information, contact your local retailer www.redseafish.com

ESHA COMPETITION WINNERS

Congratulations to the winners of our November 2006 eSHa competition. Each lucky winner will receive an eSHa Aqua Quick Test, eSHa-2000 and eSHa-Optima (Fish Health Booster).

So, well done to Paul Woodman from Worcester; R Wade from Kent; Harold Pullan from Leeds; Ian Tomlinson from Lancs; Mr Barker from Norfolk; Mr and Mrs Verrall from Dorset; Andrew Forbes from Peterhead; Mr R Lamb from Middlesex; Mr R Dew from Wiltshire; Ms Weiner from Hull; Steve Reid from the Wirral; Miss Bright from London; Paul Meekins from Weston-Super-Mare; Neil Pickup from Worthing; Alan Stacey from Portland; Miss Sheldon from Lincoln and Len Dorking from Liverpool.

I hope you all enjoy your prizes and many thanks to eSHa for donating the products.

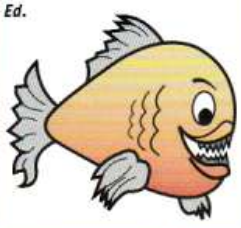
Ed.

PETE PIRANHA

Well done to Miss Bright from London who correctly spotted Pete hiding on the contents page of our November 2006 issue. Right next to me!

Enjoy your year's subscription to the magazine.

Ed.



Fishkeeping Encyclopedia A-Z

Zebrafish
Another common name for the Zebra danio, *Danio rerio*. The name 'zebrafish' is often used in scientific circles where the fish is used extensively for the study of biology, genetics, and human disease amongst other things. Zebrafish are particularly useful for study since they breed quickly and produce transparent fry, are hardy, and mutants with human disease-like features are easily created.

Zeolite
A resin media, which is used to remove ammonia and other harmful substances. Zeolite is an excellent filtration media for small tanks and as an emergency media to remove sudden rises in pollutants. Although very effective at removing ammonia, zeolite quickly reaches its maximum holding capacity. At this point zeolite can be 'recharged' by soaking in a salt solution overnight. Once recharged zeolite can be returned to the aquarium filter where it will continue removing chemicals and pollutants.

Zoonosis
An infectious disease caused by a Mycobacterium which can be transmitted by animals, including fish, to humans. In humans the disease is characterised by inflamed, irritated, or otherwise damaged skin, usually around the fingers, hands, and forearms to varying degrees. The disease is often given the name 'fish keeper's granuloma' or in the hobby is sometimes referred to as 'fish keeper's fingers'. The disease is not serious but can be unsightly and irritating, and requires treatment with antibiotics.

Zooplankton
A variety of tiny organisms that live suspended in the water and feed on other tiny organisms and algae. Zooplankton are an important food source for corals and other larger organisms in marine aquariums.

Zooxanthellae
A group of unicellular algae (called dinoflagellates), which live in symbiosis with many invertebrate animals including many corals, molluscs, and sponges. Zooxanthellae produce food sources for the host animal as a result of photosynthesis, and in some cases provide material for the building of coral skeletons (coral growth). The use of photosynthetic zooxanthellae is the reason why many corals require intense light for long-term health.

View more detailed entries and the rest of the Encyclopedia at www.thinkfish.co.uk/encyclopedia

www.thinkfish.co.uk

FISH MAKE THE CATWALK AND THIS TIME BIG AND VIBRANT IS BEAUTIFUL!

It has been one year since New Era Aquaculture Ltd launched their debut diets for Tropical Marine Fishes, revolutionising the design, manufacture and even application of feeds for the marine hobbyist and indeed - aquaria.

Last year saw the blue wave and sleek black packaging shake the industry as the market took stock of the latest player to carve a niche onto the retailers' shelves. Many thought it was just a fad, but with over 200 specialist marine stores now stocking New Era's technical feeding products, a year on, the New Era Brand has now been elevated to 'la mode' status on the grapevine!

However, it's not just about the chic packaging, feedback from retailers and their customers have proven that New Era's 'Technical Feeding Strategy', a strategy that uses three different blends of flake in rotation, has had a marked improvement on the welfare and vitality of their fish.

Chris Aslet from Reef Ranch, Leeds says: "New Era has taken the guess work out of the hobby. If you choose a New Era product you can rest assured that these will out-perform all other similar products on the market. Many hobbyists wish to provide the very best for their 'animals'; with a New Era product you are doing just that!"

The introduction of New Era's Marine Liposome Sprays has brought 'hi-tech' innovation to fish keeping: their fresh approach now means that nutritional enhancements can be incorporated into the feeding routine of the frozen food enthusiast.

New Era's lipid technology acts as a carrier and binding agent that enables the nutrients to adhere to thawing food and enhance its nutritional value without leaching into the tank water. The value of the product being consumed and therefore not lost in filtration! A product already on the cutting edge of aquatic innovation, it too can be used in rotation with two other lipid formulas to support the fishes' immune system - a handy three-part-set.

MARIN

At the leading edge of Marin equipment and additives, Fauna Marin bring you a range of additives aimed at dramatically reducing organic load (including nitrates) within tanks, a special range of coral feed including special polymers that allow the feeding of corals such as dendronephthya and Sea fans, T5 light tubes with five phosphor technology, wet iron hydroxide based phosphate removers, T5 light pendants with built in control of tube temperature, a special bath which aids cellular repair of clams, corals and fish, probiotic fish feeds, high purity balling method salts and trace elements, needle wheel skimmers, calcium reactors, zeolith reactors and more.

View the website www.faunamarin.de or www.itcaquatics.co.uk or call 01279 321884, 07717711792.

NEW PRODUCTS FROM WATERLIFE

Octozin

Waterlife has spent most of its years developing 'world firsts' and Octozin is a prime example of one of these achievements. Octozin is the only over the counter product in the aquatic market for flagellated protozoa. It will destroy hole-in-the-head (heximita), malawi bloat, spironucleus, trypanoplasma etc. Another unique feature of this Waterlife medication is that it is tabletised, making dosage simple and easy.

Due to the ever-increasing popularity of Octozin, Waterlife has introduced a mid-range product. (80 tablets) which treats - 600-litres/133-gallons. This is ideally suited for medium sized aquariums and represents excellent value at just £11.99 RRP. Octozin is also available in 21 tablet and 200 tablet sizes.

pH 7.2 Buffer

pH can be a major issue for fish keepers. Waterlife has for some time produced two popular buffers, 6.5 Buffer and an 8.3 Buffer product to replicate those desired water conditions. After a lengthy consultation period with the trade, a requirement for a new product was hi-lighted. The new pH 7.2 Buffer produces neutral to slightly alkaline water conditions suitable for most community species. It is an easy to use powder treatment that is completely safe - i.e. No matter how much 7.2 Buffer you add to the water it will not lower the pH below 7.2

AQ3 DAZZLES WITH NEW LIGHTING

Interpet has launched a new lamp specifically designed for Aq3 aquariums. The new 15-watt Compact Moonlight Lamp is the ideal choice for night viewing, making it a welcome extension for those who wish to enjoy their aquarium through the evening and night. By adding the Moonlight lamp you'll add a new dimension to the aquarium and can enjoy the activities of shy and nocturnal fish and invertebrates.

The 15-watt Moonlight lamp is an exciting new addition to the Aq3 complete aquarium which contains the highest quality components including the award winning PF Filter, Deltatherm heater and a complete new aquarium start up kit. All Aq3 aquariums are supplied with two Tropical lamps as standard. As they have separate switches it is easy to replace one lamp with the Moonlight lamp to offer a variation on lighting effects.

The Moonlight lamp also reflects the advances made recently to Interpet's new T8 fluorescent lighting range. Clearly indicating the lamp suitability (Goldfish, Tropical, Moonlight and Marine), provides the easiest selection available. **The 15-watt Moonlight Lamp retails at £9.99 and is available at all good aquatic centres.**

Keep it Clean!

Interpet Aquarium Filtration

The user-friendly and effective way to keep your aquarium healthy and clean.

Visit your local retailer to see the comprehensive range of quality Interpet products

INTERPET

All you need to succeed

Angelic appearance

Peter Hiscock explains that while the term 'angelfish' may apply well to this fishes appearance, it may not be so true for its nature

Peter Hiscock

The angelfish is one of the most popular aquarium fish in the hobby, and is known by almost all fish keepers. Ideally suited to larger, moderately planted aquariums, angelfish can become prized specimens in the right environment. The name 'angelfish' relates to the fishes appearance rather than its nature, as being part of the cichlid family, its behaviour is sometimes far from angelic.

Species

Angelfish are part of the cichlid family, although they appear very different from a 'typical' cichlid, if there is such a thing. The genus name of the angelfish, 'Pterophyllum', roughly translated from the Greek language, means 'winged leaf', relating to its tall, laterally compressed shape, and gliding motion. There are three distinct species; *P. scalare*, *P. altum*, and *P. leopoldi*. The most common of these is *P. scalare*, which can be found in a wide range of captive bred forms, and is the focus of this article, although captive bred specimens are most likely an indistinct cross between species. *P. altum*, or the Altum angel, which is a taller fish, and the largest species, growing up to 25cm tall (including fins) and 18cm long. Altum angels make stunning specimen fish, although it is not uncommon to see normal angels sold as altums, so be wary when purchasing. *P. leopoldi* are very rarely seen for sale and in contrast to altums, are more elongated, and if you are used to seeing normal angelfish they can look oddly stretched.

Variations

Angelfish in the wild have a silvery-brown base colour with dark brown to black vertical stripes, which provides decent camouflage for hiding amongst vertical roots and driftwood at the edges of waterways. Depending on the area of collection, slight variations of colour and patterning can be seen, but the basic appearance is the same. Most fish available in the hobby are captive bred, although more wild specimens have appeared in recent years. There are a large variety of captive bred colour forms now available, including marbled, pearlscale, half-black, black, leopard, gold (yellow), albino, and koi, which have black and gold markings on a white body. In addition to these, there are also veil-tail forms and crosses of all the varieties. As with many fish however, in my own opinion, the wild-type variety looks best, and is usually less likely to develop health problems, and more likely to breed successfully.

Natural habitat

Angelfish originate from the

Photos by author

Areas of tall plants are welcomed by young angelfish

An adult Veiltail koi angel makes quite an impressive specimen for larger tanks

Amazon River basin in South America and prefer the slower moving sections of water, where they hide amongst the roots and driftwood to ambush small prey, which are mainly small fish and surface insects. Whilst many angelfish are found in these open areas, some are also found in heavily vegetated pools and flooded regions during the flood season.

Aquarium conditions

Although angelfish are often recommended for planted aquariums, in the wild adults are usually found in areas with little vegetation and only the young fish, which form shoals, stick close to vegetated areas for protection. Re-creating roots and driftwood in a vertical fashion, using the majority of the aquariums height, creates an ideal environment, but if this is not possible, tall plants make a perfect substitution. Whilst sometimes referred to as a soft-water fish, natural conditions vary and angelfish can be kept in water with a pH ranging from six to eight. Hardness should ideally be between five to 15 dGH, and whilst angelfish can adapt to harder water, breeding may become more difficult. Angelfish also have a wider temperature range than some tropical fish, and can be kept anywhere between 24 to 30°C (75-86°F)

Feeding

Angelfish are natural predators, but they will become lazy if given a regular supply of food, so they will not usually harass smaller fish that they have been raised with. It is not wise however, to introduce small fish to an aquarium containing adult angels, since any unfamiliar fish small enough to eat will be quickly devoured. Whilst angelfish are not fussy eaters, and will readily eat dried foods, the addition of small meaty foods such as rich frozen or live foods like bloodworm will help to maintain ideal health, and even encourage spawning.

Behaviour

Angelfish are part of the cichlid family of fish, and the aggressive and territorial tendencies that are seen in most cichlids can also be seen in the angelfish. Under normal circumstances, aggression is directed towards other angels, and other fish are ignored unless a pair of angelfish are breeding, in which case they will defend a small area around the spawning site against all oncomers. When keeping angelfish it is best to have either an established pair, or a larger group of at least six fish, so that aggression is spread out and reduced to small bouts between individuals, rather than continual bullying of a weaker fish. From a group, several pairs may emerge, and whilst even two fish in a pair may have an occasional bout, they are very loyal and will even defend their partners from attack. Unfortunately, it is virtually impossible to sex angelfish unless they are about to spawn, so it is not possible to select a ratio of males and females from a young group.

Breeding

Angelfish are relatively easy to breed, they form monogamous pairs, and are very good parents. Whilst the last sentence is true for the species, things tend to get a bit different with captive bred specimens, which are well known for loosing their natural breeding instincts. Mistakes made by captive bred individuals include unfertilised eggs, eating the eggs by accident (the parents clean and move the eggs with their mouths), lack of defence, and predation of the fry. In many cases, captive bred specimens simply need a bit of practice before their instinctive parenting skills return, and may be capable of raising a successful brood after a few failures.

Once a pair has formed, the two fish will select and defend a spawning site. Ideally, the fish will choose a large, flat leaf, or a suitable piece of wood to lay their eggs. A good parent will continually attend the eggs, fan them using the fins to provide oxygen, remove diseased or infertile eggs, and clean the eggs in their mouth before returning them to the spawning site. Care continues to the young, which are continually moved around the spawning site until they are free-swimming, usually after about a week, and defended for a short period after until they become too lively and swim away from the parents.

If your angelfish are not great parents, or you wish to have a greater control over the development of fry, it is relatively easy to remove the eggs after ▶

spawning and transfer them (attached to whatever object they were laid on) to a hatching/raising tank. In this separate tank they should be placed near a gentle flow of water (e.g. from a low powered air pump) to provide oxygen, and any eggs which turn white should be carefully removed with tweezers, since these will be infertile and may become covered with fungus, which could spread to other eggs and fry. The young survive on their egg sacs for several days so will not need to be fed until they are free swimming. Liquid fry foods, and very small baby brineshrimp make good starter foods, progressing onto larger foods and crushed flake as the fry grow.

FISH FACT FILE

Common name: Altum angel

Latin name: *Pterophyllum altum*

Family: Cichlidae (cichlids), subfamily: Cichlasomatinae

Environment: Benthopelagic; non-migratory; freshwater pH 4.8 to 6.2; dH one to five

Climate: Tropical 27 to 31°C

Distribution: South America: Amazon River basin, in the upper Negro River drainage; Orinoco River basin, in tributaries of the upper Orinoco River (Inirida and Atabapo rivers) to Puerto Ayacucho.

Breeding: Relatively easy to breed; form monogamous pairs; are very good parents; may have some difficulty with captive bred specimens on first attempts

Angelfish in a community

Since angelfish can easily grow to reach 15cm, and are natural predators, tiny fish are not good tank mates, but most medium sized and peaceful fish will mix well with angels. As mentioned earlier, aggression in angelfish is normally directed towards other angels, but in case of spawning activity, it is wise to make sure the aquarium has plenty of space, and that tank mates do not include any overly delicate fish of a similar shape. A single pair of angelfish can be kept in an aquarium measuring 75cm (two and a half feet) long, providing the aquarium is tall (45 to 60cm) and very lightly stocked. Otherwise, a 120cm (four-feet) long aquarium is a minimum size for two adult pairs to allow sufficient space in case of spawning. Angels are hardy species, but I have experienced many fish keepers who have had losses when introducing angels to new aquariums, so avoid introducing the fish to aquariums less than two or three months old. Otherwise, the angelfish is a fish full of character and should make a good addition to any reasonably sized community aquarium. FW

This Mottled angel has more patterning on the fins than most specimens

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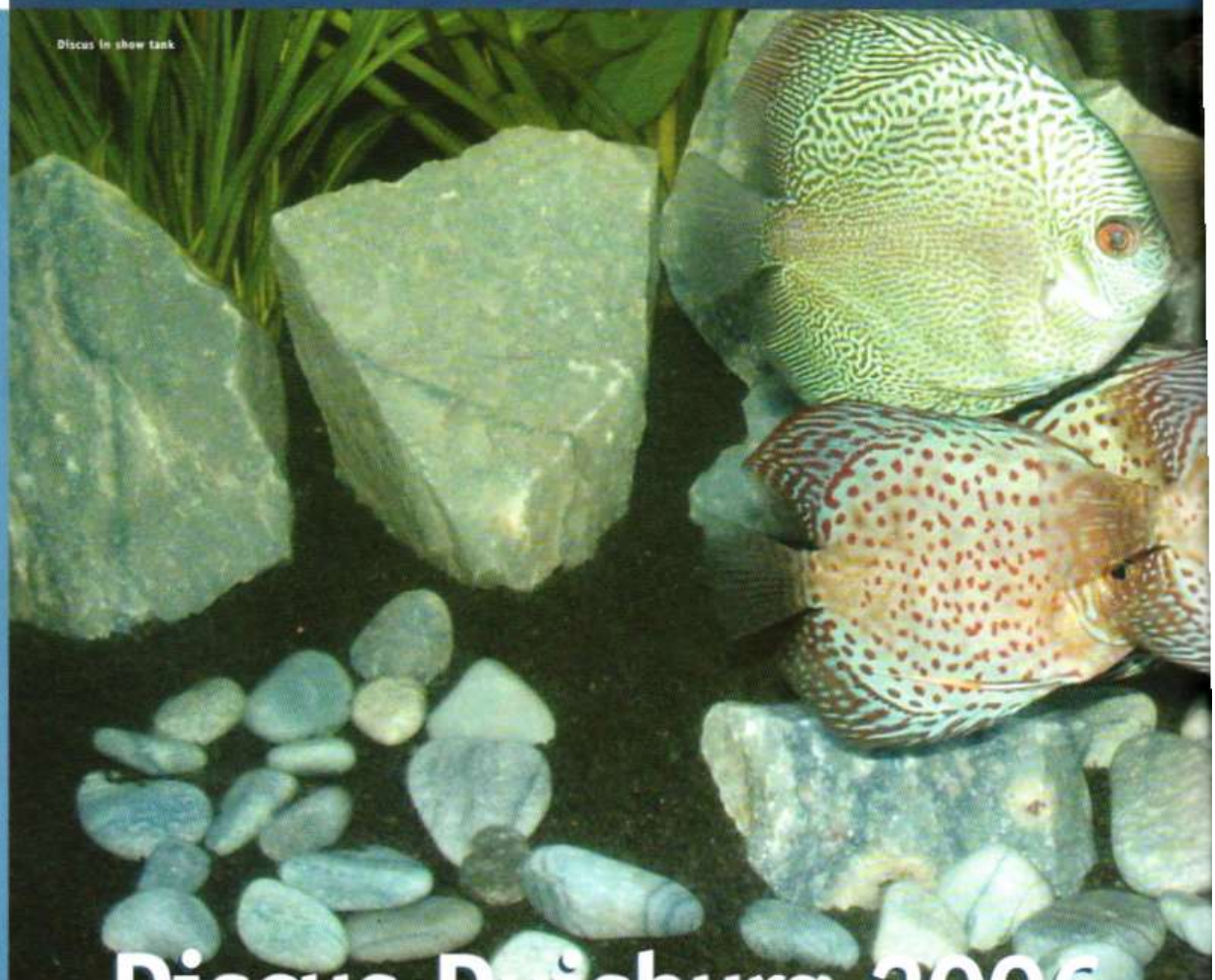


Discus in show tank

Discus Duisburg 2006

As Iggy Tavares indulges his stay in Germany to attend Discus Duisburg 2006, he reports back to *Tropical Fish* on the success of this year and some of the new changes making the show even more enjoyable

Iggy Tavares

The third Discus Championship at Duisburg I attended this year has changed a lot from 2002 when the only fish in the hall were discus. This time there were other fish from discus to Dwarf cichlids, but also tetras and livebearers. Most of the bug fish companies were there from Tetra to Sera, as well as a host of smaller German companies selling all sorts of items for fish keeping, from aquariums to fish food. There were many companies selling books, including Bede, the largest in Germany. Heiko Bleher had a huge stand selling his discus books, including his latest book - 'Bleher's Discus' that I recently reviewed. Many companies were also selling high quality plants. Another oddity was that this show also featured a *Betta splendens* Championship that included some beautiful Siamese fighters, and strains not previously seen in England.

Discus at the show

And so we come to the discus in the championship. There was a record number of discus, 350 in all that were entered in the following 13 classes. The 'Wild' class, which consisted of Heckel, Brown, Blue, Green and Wild caught breeds. The 'Breeded' forms consisted of Striped turquoise; Solid turquoise; Red turquoise, Red, Open Class, Snakeskin, Pigeon Blood and Red Spotted. Discus entered in the show were mainly from Germany, including several German companies which included Stendker Diskuszucht and Discus Hans, but entries also came from other European countries including Italy, Poland and even Israel. Asian breeders came from Malaysia, Singapore, China and Taiwan with Fish King Discus boasting four discus entries.

The judges

The judges, led by Bernd Degen, were Jeffrey Chin Siong Tan (Malaysia), Johnny Yip (Hong Kong), Annie De Maesschalck (Belgium), Kuo Yun Kuan (Taiwan), Peter Thode (USA), Vlado Bydzowsky (Czech Republic) and Mr. Sebastiano Solano (Italy). While Jack Wattley did not partake in the official judging, he selected one discus in the show that he found particularly attractive. The public who attended


Jack Watley


Paul Lucas dreaming


Dinner with Heiko Bleher

were also given the opportunity to select their favourite discus, while those who did not were able to attend the show: 'Choose an Internet favourite'.

Competition was fierce and came as a real surprise that the best discus entered belonged to a breeder from Taiwan, Yi Si-Yang, who took first place in the Best Breeded Form with a red spotted discus, who unfortunately was unable to attend the show and had sent the discus with a friend. Tony Tan of Malaysia who won the UKDA show last year came second, just 0.7 points behind. There were many Taiwanese breeders with entries in the show including Chen of Fish King Discus, who was a previous winner of the Duisburg Discus Championship in 2002 and who I recently profiled in *Tropical Fish*.

This year Chen's wild brown discus took first place in its class, but the winner in the Best Wild Form was Michel Stiemer from the Netherlands with a Heckel discus. The Internet People's Choice was won by a Blue Diamond discus owned by Cheng Wen-Chin from Taiwan. The Most superior Discus chosen by Public attending the show was Heiko Graetz from Germany with a red Marlboro type discus, who also won the Most Superior Discus chosen by Jack Wattley, with a white coloured Pigeon blood discus. Overall the Taiwanese entries did receive a large number of prizes and they celebrated their wins by unfurling a Taiwanese Flag.

Lectures to attend

There were lots of lectures at the Duisburg show to suit everyone. While most of them were in German, Jack Watley's talk on successful discus breeding in the USA was in English translated into German by Bernd Degen. Heiko who gave a wonderful talk on discus classification, wild locations and more, spoke consecutively in German and English.

Other discus lectures included Horst Köhler: avoid problems by buying discus, Patriz Hilsenbeck: avoid problems healthy discus, Bernd Degen: lotsa fun with discus Friedhelm Schulten: breeding and raising discus, Heiko Bleher: discus food in nature and dieter Untergasser: parasite free discus. There were ▶

Taiwanese champions

lectures on other fish with the pick of the bunch being Ingol Seidel: L-numbers in the discus aquarium, Andreas Spreinat: underwater observation in Lake Malawi and Ernst Sosna: Panama - a country with many contrasts.

Meeting friends

One of the highlights of attending shows for me is meeting fish keeping friends from the UK and from aboard, as well as famous fish personalities. From the UK, there was Paul and Angie Lucas of Discus South, Simon and Debbie Wolstencroft, Bob Grainger, Mick Mills, Ray Chadwick, Tony Vaughn and the Arnolds (Chris, with parents Graham and Ann). At the end of the show many of the discus were up for auction. As it happens there were not too many people buying discus on Tuesday, the last afternoon of the show. The Arnolds, who had travelled to Duisburg by car, did very well here securing 19 large show class discus from Stendecker, some for as little as 40 to 50 euros each.

We have formed a great friendship with the Dutchmen, Walter Soestbergen and Fons van der Hart of Discus Holland. Many a happy hour was spent at the hotel bar late into the night having a good time. It was good to meet up with Chen Huan-Kai and his wife Sophia and their friend Rosey of Fish King Discus at their huge stand to chat while enjoying cups of Taiwanese tea. This was a good meeting place to meet several of the Asian breeders. We also enjoyed a lovely Chinese meal together on the second night and I did use chopsticks!

I was able to renew my friendship with the famous discus personalities - Jack Watley, Bernd Degen and Heiko Bleher. Jack Watley is just a font of knowledge and I always enjoy chatting with him. We talked a little about the Herbert Axelrod and his recent misfortunes. We both decided that in spite of everything, we both had a high regard for Herbert in view of all the he has done putting the tropical fish hobby on the map so to speak, over several decades. Heiko Bleher and Natasha were kind enough to invite Paul and Angie Lucas and myself to dinner at a Thai restaurant, which turned out to be a wonderful choice. Having Heiko to ourselves for three hours was a great opportunity to learn about some of his experiences while collecting fish in far flung parts of the world including the 614 trips to the Amazon alone.

Added extras

As usual, I managed to find time to shoot 2,000 plus images at the show with my trusty digital camera. This meant charging up three sets of batteries every night and also downloading the cards to CDs on a stand-alone CD writer, as I did not take my computer with me.

Travelling to Duisburg Discus

The visit to the Championship cost about £270 (air flight and hotel with breakfast for two nights, but lunch dinner and drinks were extra - £120 needed!) I always enjoy the Duisburg Discus Championship, but this time it was particularly memorable. FW

Plecs for sale

Taiwanese champions

lectures on other fish with the pick of the bunch being Ingol Seidel: L-numbers in the discus aquarium, Andreas Spreinat: underwater observation in Lake Malawi and Ernst Sosna: Panama - a country with many contrasts.

Meeting friends

One of the highlights of attending shows for me is meeting fish keeping friends from the UK and from aboard, as well as famous fish personalities. From the UK, there was Paul and Angie Lucas of Discus South, Simon and Debbie Wolstencroft, Bob Grainger, Mick Mills, Ray Chadwick, Tony Vaughn and the Arnolds (Chris, with parents Graham and Ann). At the end of the show many of the discus were up for auction. As it happens there were not too many people buying discus on Tuesday, the last afternoon of the show. The Arnolds, who had travelled to Duisburg by car, did very well here securing 19 large show class discus from Stendecker, some for as little as 40 to 50 euros each.

We have formed a great friendship with the Dutchmen, Walter Soestbergen and Fons van der Hart of Discus Holland. Many a happy hour was spent at the hotel bar late into the night having a good time. It was good to meet up with Chen Huan-Kai and his wife Sophia and their friend Rosey of Fish King Discus at their huge stand to chat while enjoying cups of Taiwanese tea. This was a good meeting place to meet several of the Asian breeders. We also enjoyed a lovely Chinese meal together on the second night and I did use chopsticks!

I was able to renew my friendship with the famous discus personalities - Jack Watley, Bernd Degen and Heiko Bleher. Jack Watley is just a font of knowledge and I always enjoy chatting with him. We talked a little about the Herbert Axelrod and his recent misfortunes. We both decided that in spite of everything, we both had a high regard for Herbert in view of all the he has done putting the tropical fish hobby on the map so to speak, over several decades. Heiko Bleher and Natasha were kind enough to invite Paul and Angie Lucas and myself to dinner at a Thai restaurant, which turned out to be a wonderful choice. Having Heiko to ourselves for three hours was a great opportunity to learn about some of his experiences while collecting fish in far flung parts of the world including the 614 trips to the Amazon alone.

Added extras

As usual, I managed to find time to shoot 2,000 plus images at the show with my trusty digital camera. This meant charging up three sets of batteries every night and also downloading the cards to CDs on a stand-alone CD writer, as I did not take my computer with me.

Travelling to Duisburg Discus

The visit to the Championship cost about £270 (air flight and hotel with breakfast for two nights, but lunch dinner and drinks were extra - £120 needed!) I always enjoy the Duisburg Discus Championship, but this time it was particularly memorable. FM

Pleco for sale

Perfect parameters

Keeping discus, or any fish, begins with the correct water parameters. With this in mind Chris Ingham explains the importance of the correct water conditions and how best to achieve them

Chris Ingham

A visit from a customer today has prompted me to write this article, so Mark from Plymouth, this one's for you. But, I seem to be explaining this subject every single day to many others as well, so I thought it was worth covering this issue.

The main problem seems to be understanding correct water conditions or parameters of the water needed to support our aquatic life. To all who understand the nitrogen cycle, and already understand the importance of this subject, please bare with me (and it doesn't hurt to keep up to date anyway). To those who don't, please take note.

Our fish are kept in a closed system, this means a glass box of

Photos by author

in a specialised manner, according to the species of fish that are kept.

The nitrogen cycle

The principle of biological filtration is to build up in sufficient numbers a colony of friendly bacteria to break down the waste (ammonia) from the fish into less harmful nitrite and then nitrate, this is known as the nitrification and de-nitrification

This is why a good, adequate filter is needed for any aquarium, not just discus, although some fish are more resistant to it than

pH and GH

pH is measured on a scale of one to 14 and seven is deemed as neutral. Below neutral is acidic and above seven is alkaline. For discus keeping the best perimeter is 6.5, but baby discus will benefit from higher levels up to seven. This is another area where a lot of confusion and conflict has broken out. Discus being easier to keep than most people think, will in

fact accept quite a wide range of PH value. Some customers of mine keep their discus at 5.8 with no problems, while others at 7.2. It's true that 6.5 has been the best PH value I have found to hatch discus eggs in the past and this has been accepted by many hobbyists as the best reading of PH for general discus keeping. Sometimes you may need to adjust your PH up or down. Be very careful when using buffers, many can contain phosphates ▶

TOP TIPS

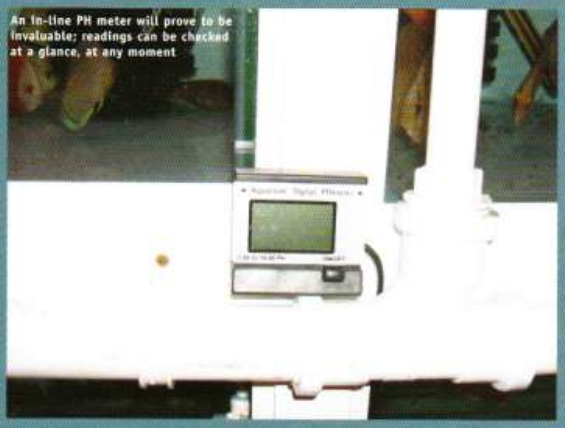
Trickle towers are the best form of filtering water for aquatic use because they will house millions of oxygen rich anaerobic bacteria

Be careful when using chemicals, overdosing can wipe out the friendly bacteria in a filter system and cause massive problems with your fish

which will do no favours for your discus.

The best one I have found is made by API and they make a PH buffer that is for up and down and contains no phosphates. A good accurate way of measuring PH is with a digital meter, these are by far more accurate than liquid test kits as recent test have proved.

GH is the general hardness of the water. The more dissolved minerals and salts in the water, the harder the water will be, giving a higher reading of GH. When measuring GH any readings under 10 is deemed as soft water and fine for keeping discus in, although my perfect figure is three. Above 10 and that is classed as hard water. Again discus can be kept in a GH from nearly zero, to as high as 18 or 19 (but don't expect them to breed at this end of the scale). As with the PH testing, digital meters are a lot more accurate than liquid test kits and are very cheap to buy these days.



An in-line PH meter will prove to be invaluable; readings can be checked at a glance, at any moment

Summary

So, there we have it, a good understanding of what the water parameters need to be for successful discus keeping. I could go deeper into this subject, but these are the basics that need to be adhered to for now. Those of you that venture into breeding will need to learn all about osmosis and the concept with water hardness. It is well worth understanding the nitrogen cycle and how it works. Your fish will be very grateful too. FIN

DID YOU KNOW?

If discus do a mad dash about the tank, do an ammonia test. High levels of ammonia can burn the gills of the fish and make them literally jump out of a tank to get away from the pain

Plenty of aeration will do wonders not only for your fish, but the filter system will greatly benefit from it too

If plenty of oxygen is present in the water anaerobic bacteria will form. This is the most efficient bacteria to break down ammonia

Left: Digital thermometers are much more accurate than the stick-on crystal types

Right: This product kills two birds with one stone. It keeps the glass clean and gives you an update on water temperature at the same time

THE SALT CELLAR

Your monthly guide to marine fish keeping

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A risk assessment

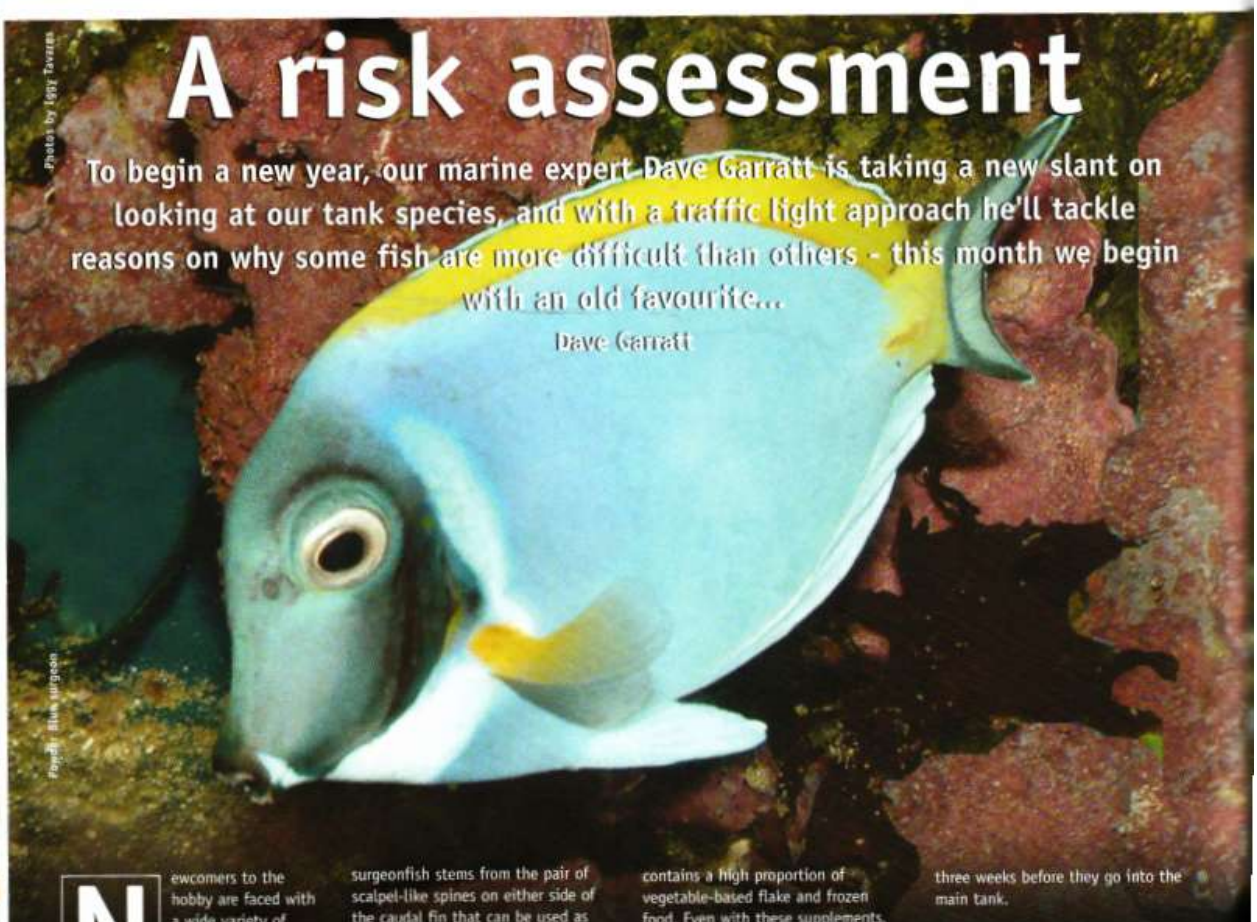

Photo by Iggy Tavares

Purple Blue surgeon

To begin a new year, our marine expert Dave Garratt is taking a new slant on looking at our tank species, and with a traffic light approach he'll tackle reasons on why some fish are more difficult than others - this month we begin with an old favourite...

Dave Garratt

Newcomers to the hobby are faced with a wide variety of choice when it comes to stocking their marine fish tanks. Some fish will be so stunning that despite the best advice of a good dealer they will be purchased regardless, especially if there are similar, but hardy, species within the family. In a series of articles I will aim to look at related fish and see why they may offer widely differing chances of success for the hobbyist. I will select some aquarium favourites and look at an easy, medium and difficult choice for each group, or if you like a risk assessment based on green, amber and red. Starting with real aquarium favourites: surgeons and tangs.

The Acanthuridae family (surgeons and tangs)

The surgeons and tangs belong to the Acanthuridae family, the family being characterised by laterally compressed oval bodies and long dorsal fins. The popular name of surgeonfish stems from the pair of scalpel-like spines on either side of the caudal fin that can be used as sharp and formidable weapons for defence or attack.

Whilst they have a wide distribution throughout the world's coral reefs most of the aquarium fish come from the Indo-Pacific region. Occasionally a highly prized (and highly priced) Red Sea specimen such the Emperor tang will be seen. Many of the species are shoaling fish, but it is usually only large public aquaria that could ever have the space to see such behaviour in captivity. For most hobbyists limited space means they are more likely to fight over territory. The entire family are herbivores, constantly grazing on algae, but they also show omnivorous tendencies and will quite readily take small crustaceans and worms.

Herbivores

The herbivorous nature of the surgeons and tangs is responsible for the constant browsing seen in captivity and it is essential to cater for this need by ensuring the diet contains a high proportion of vegetable-based flake and frozen food. Even with these supplements, fresh vegetable matter would be a good idea to keep your fish in peak condition. Fresh greens can be provided with blanched lettuce, achieved by plunging the lettuce into boiling water to break down its indigestible cellulose. Another way to ensure a supply of fresh greens is to provide sufficient good quality lighting to encourage a lush algae growth in your tank. A final word of warning, only use lettuce from a reliable source, free from any chemical sprays or additives.

A word of caution

Unfortunately all surgeons and tangs are prone to parasitic diseases, in particular *Amyloodinium ocellatum* and *Cryptocaryon irritans*, the treatment of which requires copper-based treatments that are poisonous to invertebrates. Unless you have access to a separate treatment tank it would be wise to house these fish in a fish only system or ensure you can quarantine and observe them for three weeks before they go into the main tank.

Green: Go with the Regal tang (*Paracanthus hepatus*)

An Indo-Pacific species, with a reputation as 'the most vivid blue in the Ocean'. They are very common within the marine hobby with a reasonable price tag adding to their popularity. They are often available as small two-inch specimens and will grow to attain four or five-inches in captivity.

The vibrant blue body colour has an abstract black pattern and is contrasted by a bright yellow caudal fin. The blue is at its peak in young fish but does fade slightly as the fish ages. As a constant browser and active swimmer the regal will require plenty of swimming space, with a four-foot, well aquascaped tank with lots of crevices being ideal.

The species is perhaps the easiest of all the tangs. For starters they are very easy to feed, immediately adapting to a captive omnivorous diet that should not give you any problems, providing you follow the general

Dave Garratt

Saltfin tang

guidelines already mentioned.

An unusually pleasant nature

Whilst the Regal tang is as susceptible to skin parasites as its close relatives, the good news is that it does not share the very aggressive tendencies of many of these relatives. I have already mentioned the pair of scalpel-like spines either side of the caudal fin, capable of being used as formidable weapons of defence or attack. Unfortunately in captivity many surgeons opt for the latter. However, the Regal is much better behaved than its brothers in arms, except when faced with its own species. One other species, the Lipstick tang (*Naso lituratus*) is another of the very few tangs to display a peaceful nature in captivity.

With care over choice of fish, and attention to their herbivorous diet, they will provide the beginner with a cheap, cheerful, colourful, active and (skin parasites aside), hardy fish with the added bonus of that rare commodity; a peaceful nature.

Amber: A cautious approach for the Powder Blue surgeon (*Acanthurus leucosternon*)

The eye catching colours and active nature make this fish a firm favourite, offering a striking contrast of powder blue, yellow, white and black. The species reaches a size of eight-inches in its Indo-Pacific habitat, but in captivity five-inches would be considered a large specimen. Being a bold grazer and so displaying constant activity a suitably sized tank is a must. Whilst regarded as a relatively hardy specimen it could not be considered on a par with the Regal tang in this aspect. Good aquarium husbandry and perfect water quality are a must.

Although increasingly recognised as a problem, many sources of advice open to a beginner fail to mention the aggressive nature of some of the surgeon and tangs. ▶

FISH FACT FILE

Common name: Lipstick tang
Latin name: *Naso lituratus*
Family: Acanthuridae
Environment: Reef associated; depth range 0 to 90m
Climate: Tropical 24 to 26°C; 35°N to 30°S
Distribution: Pacific Ocean: Honshu, Japan south to the Great Barrier Reef and New Caledonia and east to the Hawaiian Islands, French Polynesia, and Pitcairn. Eastern Pacific: Clipperton Island. Once regarded a wide-ranging Indo-Pacific species, the Indian Ocean population is now recognised as a separate species

This is precisely why I would rate this fish as amber: for caution. Do not underestimate the aggression and vindictive bullying you will encounter with the Powder Blue. Once the Powder Blue is established then almost any similar sized fish you attempt to add to the tank will be targeted. Most beginners will be aware of aggression from obvious sources such as triggers, but may overlook the surgeons, if unsure do not be tempted, I can personally vouch for the damage a surgeon can inflict.

You can take steps to help avoid the worst cases, the first being not to keep two species of the same genus e.g. two Acanthurus such as the Powder Blue (*A.leucosternon*) and a Powder Brown or Gold rim (*A.glaucoparesis*). Do not keep similar sized and shaped fish for example a Powder Blue would probably take exception to any other similar sized tang or an unrelated fish such as an angel.

The Powder Brown (*A.glaucoparelus*) has less striking colouration but is nevertheless, a handsome fish that is similar in all respects to the Powder Blue; unfortunately this includes the aggressive nature.

Some Genera of surgeons do contain less aggressive fish, as already seen with the Regal tang. Another none aggressive tang would be the Lipstick tang (*Naso lituratus*) but unfortunately they are shy, docile fish that cannot be considered as hardy specimens, having a particularly difficult time settling into captivity. The hardiness and chances of success with these fish may be related to their origin, with Red Sea species having a better chance of survival than ones from the Indo-Pacific region, collection and handling methods could have a large influence in this matter.

Finally if you want to keep a known aggressive species either buy a very small juvenile or make it the last addition to your tank.

Red: Do not proceed with the Achilles tang (*Acanthurus achilles*) A strikingly distinctive fish from a family seemingly well endowed with such beauties. The dark brown, or almost black body is sharply contrasted by a vivid orange tear-drop shaped area surrounding the caudal peduncle, the orange colour also being reflected in the caudal fin, and the fins being edged with white.

The achilles is found in Hawaiian waters extending southwards and westwards, but is not found in the Philippines or Indian Ocean. The fish reaches around 10-inches in its native environment. They are found in the shallower surge waters of the reef and it is suggested that they need high levels of oxygen when in captivity.

Before you succumb to any move to buy this fish - think again! This species just does not cope well in captivity and should only be considered (if at all) by the most experienced of aquarists. Reasons as to why it fares so badly are unclear, although stress associated with the journey from the reef to the tank is probably the crucial issue. To have any chance of success the fish must arrive at the dealers in A1 condition to stand any hope of survival in captivity. FM

FISH FACT FILE

Common name: Regal tang
Latin name: *Paracanthus hepatus*
Family: Acanthuridae
Environment: Reef associated
Climate: Tropical 75-82°F
Distribution: Indo-Pacific
Biology: Grow to attain four or five-inches in captivity

Yellow tang

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Donning a spectacular dorsal

A superb introduction into brackish systems and an excellent stepping-stone towards full marine, Tim Haywood profiles the Sailfin molly...

Tim Haywood

I have often been asked: "I would love to set up and keep a brackish water aquarium, but my stockist never seems to keep any suitable species". Oh, how wrong these people are, nearly every aquatic outlet will at some time be holding one of the most rewarding and spectacular brackish water fish that anyone wishing to begin in this hobby can keep.

The fish I am talking about is the Sailfin molly, or *Molliensia velifera*. Retailers enjoy stocking these chaps as they are relatively cheap, always put on a good show and through gritted teeth I say, survive in the general community tank. To see them truly thrive though and to reward their owner with an unsurpassed display of form and movement, then a brackish water set-up is required.

In the wild

Many of the fishes kept by brackish water aquarists are to be found in the East, Sailfins however, are found in the coastal regions of Yucatan and Mexico. Though they are now bred in huge numbers commercially, the ease of breeding is also something that any prospective keeper of Sailfins may enjoy also.

Appearance

Of course, the most spectacular feature of Sailfins is that truly magnificent dorsal fin. Males kept in the correct water conditions will happily spend their time parading themselves in front of fellow rivals and in turn give the aquarist a show that is a joy to see. The dorsal of a mature, healthy male can be over twice the height of the depth of body and given correct lighting, can shimmer with greens and blues that need to be seen to be truly appreciated.

Sailfins are tough little fish, but resilience should not be used as an excuse not to try to recreate ideal water conditions or a suitable environment for them to live in. The most often overlooked aspect is the potential large adult size. An active, sociable, thickset fish, reaching over six-inches in length obviously requires large quarters. Young Sailfins are often imported at a little under two-inches in length. These may also be seen being housed with smaller species like Black mollies and have tricked many an unwary aquarist into thinking that Sailfins will also remain quite

Photos by Iggy Tavares

Albino Sailfin molly pair

A White Sailfin molly

small. For that wonderful dorsal fin to develop correctly, the aquarist should view a four-foot aquarium as the smallest size to begin with. It is the constant displaying and the ability to stretch their legs that has been found the best way for their fins to remain tidy and grow.

How to purchase

A trio of Sailfins should be the minimum number kept, ideally two trios. It will be found that many aquatic outlets sell them only as pairs; I am not completely in favour of this practice. At the time of breeding, a lone female may be chased quite considerably within the confines of the aquarium. By simply having a second female present, his pursuing is halved, as it is not easy to chase two at the same time, giving one of the ladies time to get their breath back before he comes around again!

If they are displayed as being sold in pairs, the customer should still gently ask if a trio is okay to purchase. The request is seldom met with disdain, more an interest as to why a trio is required. Buying in this manner is ultimately for the well-being of the fish and if the customer is refused, then he has been given the opportunity to consider whether the retailer also has the fish's welfare as paramount.

In true livebearer form the males anal fin has modified into that superb structure, the gonopodium. Being quite a large fish, this adaptation can be seen quite clearly, and the males also seem quite happy to show theirs off!

When first purchasing Sailfin mollies, make sure that the males are bringing their gonopodiums forward and are also keen on chasing the ladies. Buy the largest fish that can be afforded and only those that appear in good health. Disregard any that appear too slim or those with cloudy eyes. Definitely do not purchase any that simply hang in the water, just moving slightly forwards and backwards, this behaviour is often an indication of the shimmies, a shock condition induced by too low a temperature, poor handling, or incorrect water parameters.

Ones to avoid

Sometimes a heavily gravid female may be seen in a dealer's tank, though tempting to buy, these should be avoided. The stress of relocating a pregnant female to a new home aquarium possibly could result not only in the young being born dead, but also the death of the female. Anyway, it is far more fun choosing stock to breed from and knowing that the fish's management has been done with care, not being reduced by cutting corners.

Tank set-up

The actual layout of the aquarium can take many forms, as long as free-swimming space is incorporated and has a good flow of water. Often Sailfins are included in systems mimicking full marine. Personally, I feel that they look a little out of place as their colour, although beautiful, doesn't have that 'painted' look that so many marine fish possess. The middle ground seems best, bogwood and a few salt hardy plants, coupled with a bright fine substrate and crisp lighting works well. If external filtration is used then the substrate could be a fine layer of coral sand, rippled to mimic the estuarine home where sailfins are naturally found.

The water needs to be a little warmer than a general community tank; 80 to 82°F is good. Hardness levels should also be at the higher end, and the pH never allowed to dip below seven. Salt levels should vary with routine water changes; it is unwise though to maintain them in full freshwater for any length of time. An S.G. reading of 1.005 up to 1.015 is okay. Their resilience has also made them popular with marine aquarists who have often used Sailfins to seed full marine aquariums, with salt level readings up to 1.025.

Now, if the water quality is maintained and the fish have plenty of swimming space then breeding will hopefully occur. ▶

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Captivating copperband

Having a healthy, well fed Copperband butterfly fish in your marine tank is the dream of many a marine fish keeper, which the Patel brothers actually achieved in their first six months of setting up their marine aquarium

Iggy Tavares

Butterfly fish are more difficult to maintain than angelfish in marine aquariums because of their more specialised feeding habits and are definitely not a beginners fish. So, how did the Patel brothers achieve this difficult feat?

The tank and its inhabitants

Their marine aquarium (1,170cm x 580cm x 750cm, length by width by height, 100-gallons approx) was made to measure to fit into a chimneybreast alcove. When first set-up, the equipment consisted of outside canister filters (Eheim 3228 Thermo wet/dry filter, Eheim 2226 filter) and a UV sterilisation unit (Vecton UV15) fitted under the tank, with a protein skimmer (Berlin Classic 25/250 gallon, Red Sea) fitted alongside the tank. Because of the limited space above the tank the lighting units consisting of five metre-long tubes (three daylight tubes and two marine blue tubes). The tank contained salt water (Kent marine salt: specific gravity: 1.020 - 1.024, pH: 8.0 to 8.3, temperature: 27 to 28°C) with coral sand on the floor of the tank.

Starting with just three pieces of living rock initially, this was quickly built up with a second large addition so that the live rock occupied about a third of the aquarium. Early algae problems, possibly due to high phosphates levels, were resolved over a few months and from then on things in this aquarium went well. The first fish were easy to keep, Blue damsels (*Chrysiptera cyanea*), but the second additions which came from someone giving up the hobby included a pair of Clown fish (*Amphiprion clarki*), Goby fish (*Cryptocentrus leptocephalus*), one Yellow tang (*Zebrasoma flavescens*) and one small Snowflake Moray eel (*Echidna nebulosa*). A few weeks later more fish additions included a Cleaner wrasse (*Labroides dimidiatus*), Lipstick tang (*Naso lituratus*) and Copperband butterfly fish (*Chelmon rostratus*). Invertebrates included Finger Leather coral (*Lobophytum sp.*) and Toadstool coral, Mushroom anemones (*Discosoma sp.*), Colonial anemones (*Palythoa sp. Zoanthus sp.*) and a Magnificent Sea anemone (*Heteractis magnifica*). Other invertebrates consisted of starfish, some fancy shrimp, Yellow sea cucumber and some sea urchins. Water conditions were closely monitored with weekly testing for ammonia, nitrites and phosphates and did not deteriorate, helped by weekly partial water changes of 10% to keep everything stable.

Choice of fish were somewhat out of the hands of the Patel brothers as they elected to buy stock from a hobbyist giving up marine fish keeping, saving quite a lot of money this way. There were some potential problem fish in the group such as the Moray eel and also potentially difficult to keep fish such as the Cleaner wrasse and the Copperband butterfly fish. They were lucky with their purchase of the Copperband butterfly fish, which was a large, beautiful, healthy specimen that had adjusted well to life in an aquarium, before they acquired it. This large Copperband butterfly fish held its own and had no trouble from any of the other fish such as the large Lipstick or the Yellow tang.

Alive with the sound of feeding

All these three fish spent their time grazing or looking for food morsels among the rocks, corals and anemones. The Copperband butterfly fish was always on the go, poking its long snout into every nook and cranny. Feeding the fish and invertebrates was done once a day in the morning. Foods consisted of chopped up frozen mussels and cockles, frozen brine shrimp and dry food (*Sera Granumarin*). The whole tank came alive at feeding time. The eel would suddenly appear from its hiding place and was able to consume large pieces of mussel in no time. The Clown fish would snatch the mussel or cockle pieces, placing them out of reach in their anemones to eat at leisure later on. All the other fish, including the tangs and the apparently difficult to feed Copperband butterfly greedily ate the offered foods. Even the wrasse ate well and thrived.

About a year later, disaster struck this beautiful marine aquarium with the addition of two Sea apples. These were continuously hounded by Hermit crabs that nibbled at their tentacles, forcing them higher and higher up the aquarium. Unfortunately, when they were being removed, one of the Sea apples exploded releasing its toxins into the water. In spite of water changes and the use of charcoal in the filter there were losses that included only the large fish including the beautiful Copperband that survived for a whole day lying on the sand, but immediate losses of the Lipstick tang and the Yellow tang. Surprisingly most of the other fish and all the invertebrates survived the poison.


Young Copperband butterfly

Loss of the Copperband butterfly was a devastating blow, particularly as they had looked after it well for a year. Some weeks later a small Copperband butterfly fish was purchased. This fish was ever so cute and healthy looking and appeared to be a perfect replicate of the previous fish, but in miniature. It was always on the go in the aquarium, flitting from one coral or anemone to another picking morsels of food from everywhere. The one big disappointment was that it would not eat any of the foods that the Patels offered the other fish and which was readily taken by the previous Copperband butterfly fish. This was rather worrying, since there are not really enough natural foods in an aquarium to sustain fish even when they are the size of the small Copperband butterfly. The hope was that this little fish would copy the other fish in the aquarium and join the feeding frenzy that ensued at feeding time. Unfortunately, it never did and sadly perished some four to five weeks later.

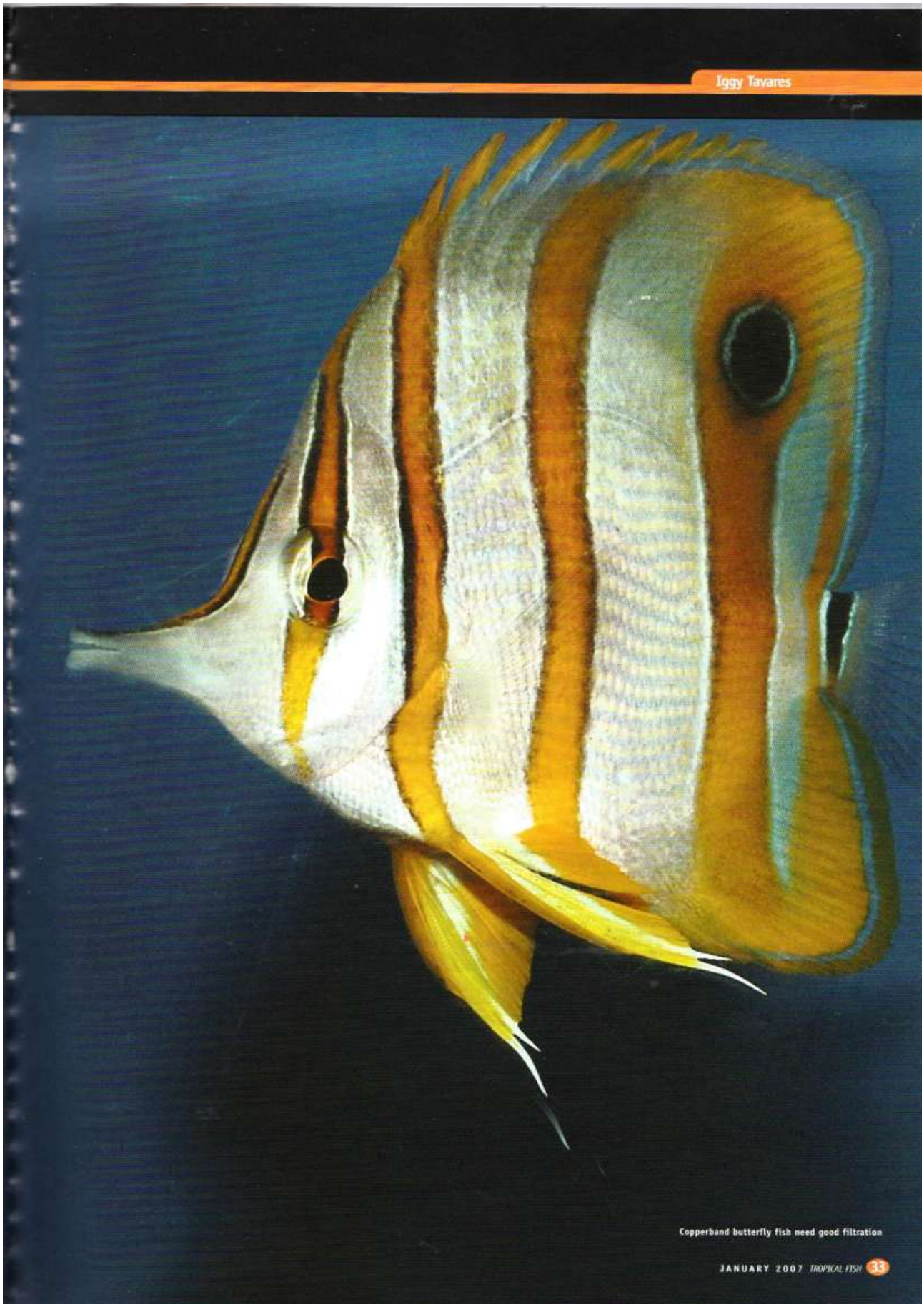
Looking at the Copperband butterfly fish

The Copperband butterflyfish, *Chelmon rostratus* was described by Linnaeus in 1758. Previous names have included Chaelmo rostratus, *Chaetodon rostratus, Chelmo rostratus, Chaetodon enceladus, Chelmon rostratus marginalis* and *Chelmon lol.* The Copperband butterflyfish is a beautiful, deep bodied fish that can grow to 20cm TL. Its long snout and four copper coloured vertical bands over a silvery white body, gives it a very distinctive appearance. The dorsal, anal and pelvic fins are also largely copper coloured. In addition, the Copperband butterflyfish has a large black eye spot with a pale blue margin at the base of its dorsal fin. A similar looking fish is the Margined coralfish, *Chelmon marginalis* which is sometimes mistaken for the Copperband butterfly. This is understandable since the two species are so similar and only in maturity does *C. marginalis* lose the black eye-spot in the dorsal fin and also the central band on its body.

Another similar looking fish, which is bit darker in colour and occasionally available in London, is *Chelmon muelleri*. The Copperband butterfly fish is found in the Western Pacific, that includes the reefs around the archipelago from the Adaman Islands, the Philippines and Indonesia all the way to Ryukyu Islands and the Great Barrier Reef in Australia. Here they tend to inhabit rocky shores and coral reefs and are usually found at depths of just one metre to 25 meters.

In the wild

In the wild, the Copperband butterfly fish usually occurs singly accept during the breeding period. They feed on benthic invertebrates, which they search out among the rocks and corals making good use of their long ▸



Copperband butterfly fish need good filtration

snouts. Individuals do tend to maintain the same territory for just a few months. In the aquarium though, Copperband butterfly fish might take to nipping open brain corals and other large polyp Stony corals, as well as clams and feather dusters. They might disturb zoanthids and other encrusting polyps in their search for copepods.

In the wild, Copperband butterfly fish pair up to spawn. Eggs and sperm are released into the water current, where they take their chances among the plankton. Surviving fertilised eggs develop into larva that undergo metamorphosis before changing into juveniles that can migrate to the reef bed.

Conclusions

Copperband butterfly fish are usually perceived as difficult fish to keep alive in an aquarium, as many will not feed on any of the foods that other marine fish take readily. All Copperband butterfly fish are wild and their acclimatisation to aquarium life does depend in part to whether they were damaged during capture by cyanide, an unfortunate method of capture practiced in some parts of the world. Never buy a Copperband butterfly when you first see it at the fish shop. It is important to carefully observe the fish to make sure that it is completely healthy, not emaciated and is swimming and acting well. Ask to see the fish feeding before making any purchase of difficult fish.

FISH FACT FILE

Common name: Copperband butterfly fish

Latin name: *Chelmon rostratus*

Family: Chaetodontidae (Butterflyfishes)

Environment: Reef-associated; non-migratory; marine; depth range one to 25m

Climate: Tropical

Distribution: Western Pacific: Andaman Sea to Ryukyu Islands and Australia

Biology: A common species found singly and in pairs along rocky shores and coral reefs; also in estuaries and silty inner reefs

One way to induce Copperband butterfly fish to feed in the aquarium is to offer live foods until it is acclimatised to feeding in the aquarium. This could be live brine or other small shrimp. Another suggestion is to offer live clam or mussel that have had their shells broken open. Most fish, including difficult to feed fish, find it hard to resist this type of food.

The Copperband butterfly fish is generally considered reef safe, particularly if the tank is inhabited with soft corals and small-polyped Stony corals. If not enough suitable foods are offered, some Copperband butterfly fish may nip at large-polyped stony corals, certain soft corals and zoanthids. Some individuals might even eat Glass anemones (*Aiptasia sp.*) if they are present in the aquarium, which is a bonus.

The Copperband butterfly fish is a stunningly beautiful fish that can adapt to life in the aquarium. The marine tank should be large and have an abundance of live rock that will provide some natural live foods. Water conditions need to be pristine for the well being of butterfly fish. Great care should be taken when selecting a Copperband butterfly fish for the marine aquarium and only healthy fish that you personally see feeding should be purchased. Only one Copperband butterfly fish can be maintained per aquarium. FM

Butterfly fish feeding on mussel

Marine World Classified

Razor Jaws

With jaws pound for pound more powerful than any other aquatic animal and equipped with numerous razor-sharp interlocking triangular teeth capable of slicing through flesh and sinew with horrifying ease, it is hardly surprising that the piranha has gained a reputation for being one of the world's most fearsome predators

Roy Osmint

It is this same reputation that numerous fiction writers and moviemakers have seized upon over the years to help nourish their respective audiences seemingly insatiable appetites for blood-letting and violent death. Although both genre have undoubtedly produced many a nail biting adventure situation, an almost inevitable consequence of merging fact and fiction in this way is that some exaggerations and distortions are likely to have been applied to the fish's true nature and disposition. Perhaps giving it a worse press than is warranted!

Of course, the stories that we have all heard about shoals of piranha attacking large mammals and within a matter of minutes rending all traces of flesh from their bones, are undoubtedly not without foundation. But to balance this, it would also be true to say that generations of native Indians have regularly bathed in piranha infested reaches of the Amazon and Orinoco rivers without coming to any real harm. These people are well aware that the fish are unlikely to attack so long as they are well fed.

Starving piranha are dangerous piranha

If, as does happen, a shoal becomes trapped in an area of drying out floodplain for example, they are likely to ruthlessly attack anything that enters the water. Piranha will also often attack if desperate, alarmed or cornered. The same Indians that swim confidently in their waters have to be extremely careful when handling them, for they are considered very good eating and their teeth make excellent cutting tools. Many a careless fisherman has received a very nasty wound from a captured piranha. Stories of lost fingers and toes are not uncommon!

When a mass piranha attack does occur it is fearsome. Frequently a single prominent member of the shoal will move forward drawing back its lips to reveal a set of razor-sharp teeth that come together in a scissor-like bite, slicing into the victim's flesh. The sight and smell of blood is the trigger for the rest. They move in on the kill, bodies violently thrashing and jerking as they cut and tear in a

Photos by Jiggy Soares

Young piranha shoal

Roy Osmint

frantic effort to obtain a share. The water explodes into boiling turbulence. Before long it is over, the writhing bodies disperse and the foaming water returns to its former state. All that is left as evidence of this recent savagery is perhaps the bones of the luckless victim.

There are, in fact, some 30 species of piranha found in South American waters, but not all are ferocious predators. Some are exclusively fruit eaters, whilst others are parasitic - solitary hunters that consume the flesh and fin of other aquatic creatures. The dentition of the various species are perfectly adapted and designed to their own particular dietary preference.

Only four or five forms are regarded as potentially dangerous. These associate in large numbers and are sensitively attracted to blood in the water as well as, in some circumstances, movement. This situation will frequently trigger a feeding frenzy.

Of the various species found in Amazonia it is the Red Bellied piranha (*Serrasalmus nattereri* or more recently *Pygocentrus nattereri*) that is probably most frequently seen and the one with the more formidable reputation.

Colouration and form

The Red Bellied piranha is a very stocky fish with an extremely laterally compressed body shape. It reaches on average a length of some 25cm, but individual specimens can often be much larger or smaller than this depending on a variety of local circumstances. Broad based anal and dorsal fins are set well back on the arced body. As in general with characins, the family to which piranha are closely connected, an adipose fin is present.

Colouration of this fish tends to vary to some extent with both age and geographical origin, but is typically bluish grey on the back, with flanks of brown to olive embellished with numerous glistening spots. It is the belly and throat areas that give the fish its popular name. These being a wonderfully contrasting orange/red. It is this vivid colouration together with blunt head and under slung bulldog style jaws that significantly add to the creature's menacing appearance.

Regime of dominance

It must, of course, be said that this is not a subject for the average tropical aquarist. In fact, it is probably true to say that adult specimens are unsuitable for anything other than the largest aquaria. Even then attempts at keeping them are likely to be doomed to failure unless the keeper has a proper understanding and appreciation of the fish and its unique nature and requirements.

Of course, not all dealers offer piranha for sale, after all these are not exactly 'bread and butter' fish. Those that do, apart form real specialist outlets, will sometimes display a relatively small tank containing numerous small juvenile specimens which, on the face of it, may appear to be living in contentment and harmony. But take a closer look! This will often reveal the start of a rather different story. In many cases individual fish are likely to be already showing signs of injury. Open wounds where small lumps of flesh have been removed from the body. Missing fins, or perhaps the absence of an occasional eye.

It might be noticed that such injuries are predominantly apparent on the smaller members of the group, indicating clearly that even at this young age a regime of dominance is emerging - the stronger upon the weaker, the larger upon the smaller! As with most fish species, no matter how well fed, not all juveniles will develop at the same rate. Once a size discrepancy becomes apparent the larger predatory piranha will start to take advantage of the situation. Especially when housed in cramped conditions.

As time goes on, the weaker members of the community will eventually be killed off and eaten. But the process does not stop here; development imbalance continues to occur with the same ruthless methods of determining dominance being applied.

Eventually, if left to their own ▶

Starving piranha can be dangerous

devices, it is perfectly possible for the original tank of juveniles to be gradually reduced to one very large and powerful fish. All others having in turn been consumed.

In the aquarium

It is perfectly possible in a large aquarium to successfully maintain a small shoal of Red Bellied piranha in reasonable harmony, always assuming that conditions within the tank are entirely favourable. This will only be achieved where the fish themselves have come to terms with their environment and feel comfortable and secure. Each fish must have its own space and be aware of its individual security zone. The best chance of achieving this lies in acquiring a small number of juvenile specimens and growing them on together. In this way a natural hierarchy should hopefully develop within the group, each individual knowing and accepting its place in the overall community structure. Any fish not fitting in to this pecking order is likely to be destroyed.

Water chemistry is not generally critical, although the closer you can imitate the conditions of the natural habitat, the better. Water quality, however is crucial. These carnivores produce large quantities of high protein waste, and frequent partial water changes coupled with extremely efficient filtration should be considered essential. A good water flow is also desirable. The fish will become rapidly stressed if water quality is allowed to deteriorate.

The tank should be imaginatively furnished using interesting shaped bogwood and suitable rock, designed to provide hiding places. Plants must be of robust nature. Amazon swords and the like are normally suitable. Artificial alternatives can also be used to good effect.

Feeding

Although it is frequently assumed that Red Bellied piranha must have a regular diet of live food, in reality this is not necessarily so. Clearly, meat is essential but this can be served dead or alive. Pieces of meat or fish will normally be readily accepted and is the most convenient and civilised option. Good quality carnivore flake will also often be taken, but should only be used as a supplement. The secret of successful feeding is maintaining a steady supply without, of course, over doing it. Any excess will rapidly affect water quality. Balance is the key. Remember, a hungry piranha is dangerous and it will bite - even the hand that feeds it! It is said that the teeth are so sharp that the victim often feels no pain. Fortunately, I have no personal experience as to the authenticity or otherwise of this claim!

Conclusion

Keeping Red Bellied piranha is a considerable challenge and should only be attempted by those seriously interested and in a position to provide completely suitable accommodation. Also, only after thorough background research. There is a tendency for some to attempt to keep them for curiosity value, through a fascination stimulated by the subject's fearful reputation. This alone is not a good reason and such attempts are almost certain to end in disaster. FIN

FISH FACT FILE

Common name: Red Bellied piranha

Latin name: *Serrasalmus nattereri*

Family: Serrasalmidae

Environment: Freshwater

Climate: Tropical

Distribution: Amazon basin

Temperament: Aggressive

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Chris Ingham
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Discus specialist

Peter Hiscock
An expert on freshwater fish

Rupert Bridges
An expert on fish diseases and health

Will Red-tailed black and Silver sharks mix?
Photos by Iggy Tavares

STAR Question Sharks ahoy!

Dear *Tropical Fish*,
I have been considering some new species for my tropical set-up, but I need some advice as to whether the species I want will mix okay.

I want to add a Red-tailed black shark and some Silver sharks. I've heard and read that the Red-tailed black sharks can sometimes be aggressive towards other species, especially if they are of similar size or colour. So, do you think the Silver shark would be too similar in size? Or could it be possible to buy some baby Red-tailed sharks and some older Silver sharks so they are bigger?

I also have some rainbowfish, platys and gouramis in the tank so would both the shark species fair well with these too?

I would appreciate some advice.
Thanks
Emma - Northampton

A Dear Emma,
Red-tailed black sharks do become aggressive with increasing age and resent other fish coming into what they consider their territory. Silver sharks are constantly on the move and can, given the right space and food, develop into big fish. They also look fabulous when kept in reasonable numbers.

It would be quite possible to buy dissimilar sized fishes, with perhaps the Silver sharks having a faster growth rate of the two. Whilst the rainbowfish might fare best with your choice of 'sharks' , smaller platies and 'quieter' gouramies might find them unsettling.
Hope this helps?
Dick Mills

Q A home from home

Dear *Tropical Fish*,
I've been into fish keeping, mostly marines, for a good five years now, and I had to sacrifice my freshwater tank a few years ago to make space for a reef set-up. My interest in the hobby and passion has become a lot more intense over the last few years, and I have really missed keeping freshwater, as there are so many beautiful species of fish available.

My answer to this is to create a fish-house. I have a garage and a shed outside and I am considering using one of them for my fish. The only problem I have, is how to go about getting started. Would it be possible to keep the fish in a shed, or would it be better in a concrete built garage - or are neither suitable?

Before I get any more serious about the idea I wanted to ask some more advice on whether it's going to be possible.
I look forward to your thoughts.
Kind regards
Mr Holliday - via email

A Dear Mr Holliday,
Both a garage and a shed can be converted into a fish-house, but the most important factor is making either construction as 'heat loss proof' as possible. Obviously a garage may have quite large gaps around the door and any windows may well need double-glazing to reduce even more heat losses.

Lining the walls of either building with sheets of thick polystyrene will conserve heat. Heating can be by placing heaters in individual tanks, or you can 'space heat' the whole fish house with either electricity (thermostatically controlled fan heaters), by conventional central heating or even paraffin heaters.

As far a lighting the tanks is concerned, again you can fit hoods and fluorescent tubes to each individual tank, or use a conventional fluorescent lighting in the ceiling or replace all (or part) the roof (of the shed) with clear polycarbonate triple-walled sheeting and make use of natural daylight. Sometimes daylight is more difficult to regulate and excessive algae may grow during summer months.

If the garage adjoins the house, then there will not be so much of a cold journey to make during wintertime to tend to the fish as there might be with a shed located further away from the house.

Again, with a garage, it may be possible to extend the house's central heating system into it without too much upheaval and the electrical supply will also be easier to install against having to run protected electric supply cables down to a more emote shed.
Good luck!
Dick Mills

Star Q&A

The Star question each month will receive a 40g tub of Medi Flake from Dorset Discus. Medi-Food were developed to cater for the ornamental fish industry to help maintain resistance against fish diseases and parasite infestations. Medi-Food contains ingredients, which we incorporate, where it acts to deter harmful bacteria, protoza and fungal pathogens, and assists the bodies natural ability to repel such pathogens. For more information contact Dorset Discus at Unit 4, The Old Timber Yard, West Bay, Bridport, Dorset, DT6 4EL. *Please include daytime telephone number or e-mail address.*

Tetra invvests heavily in constantly improving their products. Photo courtesy of Tetra

Quality or quantity

Dear *Tropical Fish*,

I have recently had a dilemma over fish food - flakes to be precise. Now, I keep a healthy 200-litre freshwater community set-up and although from time to time I feed my fish some greenery and live foods, their staple diet is flake food.

Now, when I was at my local retailer buying in some more flake food I was looking for a different brand, as I know that even fish can get bored of the same thing, and I came across some Tetra crisps and flakes.

These Tetra products claim to be very good and when I asked the retailer they seemed to agree that Tetra products were in fact a good quality product. So, I wanted to ask Rupert Bridges, as I know he writes for you, just exactly what makes their foods better, and justify the fact that their product was almost double the price of most other flakes. And what are crisps?

I would appreciate it if you could pass this question on to Tetra.

Kind regards

Mr. Macclesfield from Brighton

Dear Mr Macclesfield,

Thank-you for your questions regarding Tetra's foods; it's always encouraging to hear that someone is taking care over the diet they choose for their fish.

Firstly, in response to your enquiry about what makes a good fish food, this is of course a lengthy topic and not one that can easily be covered in this answer. However, some important areas that impact quality are the nutrient balance of the food (i.e. levels of proteins, oils, carbohydrates, vitamins, minerals etc); the quality of ingredients used to supply these nutrients; the manufacturing processes used to turn them into a finished product; and the protection afforded by the packaging it comes in. Each one of these areas will add a certain amount of cost to the product, depending on how good you want it to be. The benefit of a good quality food, and the reason why Tetra invests in constantly improving its products, is improved fish condition and reduced water pollution.

Another area that adds cost to a product is research and development. Without this critical function, it is not possible to find the best formulas for a diet, or to confirm whether or not they deliver real benefits. For this reason, Tetra invests more into researching ornamental fish foods than any other company in the industry.

The Crisp products that were recommended by your retailer, TetraPro and TetraMin Crisps, are a new type of floating food, developed and patented by Tetra. As you may know, Tetra was the first company to develop a complete flake food over 50 years ago. Since then we, along with many other companies, have strived to improve the quality of the flaked products on the market. However, there are some fundamental limitations to flaking; in particular the high temperatures (135°C+) needed to produce them. Crisps are produced using a process called extrusion, similar to that used for making sticks and granules. However, it is done at a low temperature (75°C) to preserve more of the food's vitamin content. The combination of extrusion and low temperatures results in a product that has a better nutritional profile, and that is more digestible compared to flakes. This means the fish receive more nutrition per quantity of food fed, and less solid and dissolved waste is produced (which helps control algae and improve overall water quality).

I hope this answers your questions, and that you will be encouraged to give Crisps a go, to see the benefits for yourself.

Kind regards,

Rupert Bridges

Filtering out the best

Dear *Tropical Fish*,

I am just setting up my first ever tank - it's a very exciting prospect, but I'm taking it a step at a time to make sure I get everything just right.

I have already purchased the tank itself, it measures 100cm wide by 90cm high and 80cm deep, so it's quite large, I'm not sure how much water this will hold (I don't know how to do the maths). Anyhow, I'm at a bit of a dilemma over the filtration methods.

I've been researching some different options, those being mechanical, biological and chemical. But I get very confused when I read the technical information and so I wondered if you could help by explaining to me in layman's terms the process of each, and which may be suitable for me.

I haven't even filled the tank with water yet - so I may even come back with more questions, but I wanted this one answered, as I don't want to waste time or money with the wrong system.

Hope you can help?

Thanks

Arthur Marks - Yorks

Dear Arthur,

Well done for taking things step by step - by ensuring you get it right now, you will make looking after your aquarium much easier in the long run.

Biological filtration is the removal of ammonia and nitrite from the water by specific species of bacteria. It is essential, because both of these are toxic to fish. Every filter is designed to operate biologically, and will contain some form of biological media where these bacteria can grow in large numbers. This may be a sponge in an internal filter, or separate specialised media in an external filter for example. Given time, these bacteria will naturally colonise the biological media, however you need to stock the aquarium slowly to avoid over-burdening them. There are products available for speeding this process up, and I would suggest that you ask your aquatics outlet which one they recommend.

Mechanical filtration is the physical trapping of solid waste in the filter. In internal filters, this is often done by a sponge that also functions biologically. In externals it is usually done by separate media. If the filter contains combined mechanical/biological media, you will need to wash it carefully in aquarium water to clean it (to avoid killing the bacteria). If the media is separate, you can thoroughly clean mechanical media under the tap, or even replace it.

Chemical filtration is a bit of a catch-all term used to describe the use of various different materials. The most commonly used is activated carbon, which works by adsorption (the collection of small particles onto its high surface area). Its primary use is to remove odours and colours from the water, thereby maintaining its 'sparkle'. In addition to carbon there are other chemical filtration media designed to remove substances including phosphates, nitrates, and ammonia from aquarium water.

Getting down to the basics, you must have biological and mechanical filtration for an aquarium. An internal filter will do a reasonable job for you, however, given the size of your aquarium I would strongly recommend an external filter instead. These are much more effective, easier to maintain (provided you get a good brand), and can hold more media. In an external you will have separate biological and mechanical media, as well as space to add chemical filtration. Personally I'd recommend activated carbon, unless you are opting for a very specialised set-up (e.g. a Blackwater system). Other chemical media can always be added if required. To make life even easier, most good externals come with all the media included, which means you don't even have to worry about what to put in them.

A final tip - unless you are going for a lightly stocked/heavily planted aquarium, make sure you also use a good air pump. The value of additional aeration cannot be understated, and will improve the health of the fish as well as the effectiveness of the biological part of the filter.

Kind regards,

Rupert Bridges

Star letter

The star letter each month will receive a Phillips 100g Tropical Flake (RRP £5.19) and Phillips Aquatabs (RRP £3.49). So why not drop us a line here at *Tropical Fish* and tell us your fish stories and news. Send all your letters to: *Tropical Fish* - Fish Forum, Freestyle Publications, Alexander House, Long Road, Tower Park, Poole, Dorset, BH12 4NZ. Alternatively you can **fax us on: 01202 733969 or hayward_maria@hotmail.com**

Botia striata

Tiger barb

Further East

Carrying on from last month, Anton Cass looks at more species to be included in the Far Eastern community set-up

Anton Cass

One group of fishes that made an appearance in the previous account are extremely prominent in this region. They are also probably one group of fishes that could be classed as being extremely common in the aquarium trade. These are the barbs; a group of fishes that possesses residents that appear to be genetically non-related they are so extremely different. One of these species has also been responsible for the entire group being branded as vindictive fin nippers, the *Barb tetrazona* or Tiger barb.

Barbs - the tiger

This fish could be a candidate for those who have animals that have featured in the 'incorrectly kept' section of this series. In the wrong company, usually long finned slow moving fishes, the lively Tiger barb is certainly a nuisance as indeed are many of its genus, especially the species reaching around three-inches. Such fishes include Rosy barbs or *Barbus conchonius* (although this species has been reported to reach up to six-inches it is much smaller in the aquarium) and Black Ruby barbs, *Barbus nigrofasciatus*, just two more examples of beautiful fishes kept incorrectly. All these fishes are best kept in a group with themselves as company.

Labeos/sharks

There a few larger and more robust fishes that can withstand their boisterous actions and an ideal natural community can be created in this way. Perfect in this aspect are another group that were also present with the barbs in the African community, although they were bypassed for primarily being too large. Here there are smaller representatives that can look after themselves. These are the labeos or sharks as they are known. Before preceding any further, for those who may think otherwise these fishes have no relationship or connection with the marine namesakes. The reason for the name shark is the triangular shaped dorsal fin which obviously invoked imagination. The fishes in question are closely related to the barbs themselves, all belonging to the family Cyprinidae or carp like fishes. The primary difference between the two groups is a much better adaptation at bottom feeding as indicated by the under-slung mouth.

The marine versions are in fact in an order of their own known as Elasmobranchs or the sharks, skates and rays. These animals have a cartilage skeleton, a very rudimentary gill structure (many sharks do not sleep and if they become stationary they will drown as they rely on water being taken in through the mouth through motion to breathe) and have denticles (teeth) instead of scales. The labeos are members of the Teleost fishes, i.e. they have a bony skeleton and are able to breathe whilst stationary and of course are true scaly fishes. These are just a few of the differences between two radically different orders.

How to house them

Labeos can be very aggressive especially to others of the same species even other species in their own genus, so that gives two options to maintain them. The first is singly so they can do no damage to anything, the barbs being too quick, or in small groups. In fact this latter technique is ideal and it shows similarity between the two groups of fishes, which are probably descended from a small group of common ancestors. In essence we are combining two species of carp like fishes that have progressed along differing evolutionary paths, an ideal combination for a natural community.

In previous accounts we have discussed the threat syndrome and reasoned that the most likely source is to be ones own species as competition for food etc will be greater. On a one against one the stronger will eventually prevail; to the demise of the other.

Consequently the greater the number the less chance there will be of one fish becoming totally dominant. Never put two labeos together, a group of six will work especially with a group of boisterous barbs.

Red Tailed Black shark

With regard to species, the one that is the most common and perhaps the most visually obvious is the *Labeo bicolour* or Red Tailed Black shark. Seen almost everywhere at a small size this fish cannot be mistaken for anything else. Jet black with a crimson red tail this has to▸

FISH FACT FILE

Common name: Botia kubotai
Latin name: *Botia kubotai*
Family: Cobitidae (loaches)
Subfamily: Botiinae
Environment: Benthopelagic; freshwater
Climate: Tropical
Distribution: Asia: Myanmar

Botia kubotai

be one of nature's most striking fishes. It can attain a length of around four to five-inches (10-12cm) although it is rare to see specimens of this size. A single individual can and will hide most of the time, but a group will move in unison foraging along the bottom of the aquarium.

Other options include the Red finned or Ruby shark, reportedly less aggressive, with its greyish body and red fins and the Epalzeorhynchus or Flying foxes, the kalopterus or the siamensis which have a reputation for devouring the very annoying beard algae that often blights the aquarist. Not quite as spectacular as the labeos they are none the less worth considering.

Checker/Chequered and Cherry barb

Returning to our main project there are some species of barb that will perfectly compliment our danios, rasboras and other smaller more delicate surface feeders. Two species in particular are ideal. The first one is the Checker or Chequered barb scientifically known as *Barbus* (formerly *Puntius* or *Capoeta*) *oligolepis*. This delightful little fish has a golden body colour with scales adorned with black giving it the chequered appearance. Males, as usual are more brightly coloured, their dorsal, anal, tail and pelvic fins being a deep orange with a black edge. Not over exuberant a small shoal is a perfect accompaniment to the higher swimming smaller species. In a similar vein the Cherry barb, *Barbus titteya* is worth considering in this role. The males are especially striking, as when in condition their colouration is deep red.

Five banded barb

Another fish to perhaps consider for those wanting something a little different, or those who wish to have a vertically striped barb but cannot accommodate the Tiger barb, is the *Barbus pentazona* or Five banded barb. Similar in size to the Checker barb this species is characterised by a golden brown body colour with five vertical black stripes and red fins. It is often mistaken for the Tiger barb, but it does not have the same boisterous bad habits. The males again are extremely attractive developing a deep reddish hue.

The reason for the name shark is the triangular shaped dorsal fin which obviously invoked imagination

Botias

The lack of bottom feeding species is apparent as is obvious when compared with a stream system in South America. Numerous catfishes fill this role, but in the Far Eastern system they are uncommon to say the least. The labeos and the barbs do help to accommodate in this area, as they are primarily bottom feeding in their natural habitat, although any opportunity for a meal will not be passed up. Another group or genus has also developed to fill the void, these being the loaches, especially the botias.

This genus has one interesting characteristic, which is a spine concealed in a socket below the eye. This is primarily a defensive mechanism although it can also be used for more offensive purposes. This spine is very sharp and can injure other fishes although this is rare. It is more often used to prevent the fish from being devoured by a predator as it is erected once any threat is posed, usually when inside another fish's mouth. Quite often death by choking has been the demise of many predatory fishes when attempting to devour a small botia. It should also be noted that this does not do the botia a lot of good, so avoid keeping these with fishes that could consider them a meal. Also major problems can occur when these fishes are caught in a net as the spines often become entangled causing a lot of stress both to the fish and the aquarist.

Clown loach

The most commonly kept member of this genus is the Clown loach or *Botia macracantha*. Most often seen as juveniles these fishes possess an orange body colour transversed vertically with broad black green bands. Fins and tail are red making them a striking animal. This fish is sold by the thousand and is extremely popular but it does have its drawbacks. Firstly it is a long lived species that loses colour as it attains a larger size, which in this case means in excess of 30cm (one foot). I have seen specimens preserved in museums measuring 15-inches and very void of colour although much of this must be attributed to the fact that they were dead. More likely to be a problem with this and many other botias is the fact that the scales are very fine, arguably non existent forming

what appears to be a skin. This leaves the fish susceptible to parasitic and bacterial diseases, which unless detected in their early stages are very difficult to cure. In fact some cures cannot be used on this type of fish (check the instructions carefully) and even when the disease apparently has been eliminated it can reappear when the individuals are subject to any stress. Despite this however, this species and indeed others, are worth keeping.

Avoid larger members of the genus such as *Botia beardmorei, B. modesta (rubripinnis)* or Red tail blue botia, *B robusta* and *B supercillarius*. These are larger species and can be very aggressive, even predatory if the opportunity arises. An ideal species is the Chain link botia or *Botia sidthimunki*. A smaller fish at around five to six centimetres it is strikingly marked with two horizontal lines over which pass numerous vertical ones producing a striking two-colour contrast. A similar species is *Botia kubotai*, although this species can reach three-inches. Look out also for *Botia nigrolineata* which has two horizontal broad stripes from nose to tail, similar to *B sidthimunki*, but lacks the cross barring and the stunning *Botia striata* which may grow a little large at 10cm for some, but is beautifully marked with a series of irregular creamy white vertical bands over a base colour of blue/black. Again, check out the species in question and do not panic buy. The wrong fish could cause devastation and this is a very varied and large genus.

Fishes to avoid

Fishes to avoid in this section would be most of the Leptobotia due to their size and Weather loaches (Misgurnus) for the same reason, and a lot prefer cooler water. Some species of Weather loaches are now requiring a licence to keep them as they could survive in British waters.

Another fish, which I would omit although they would fare reasonably well in this set-up are the Pangio or Kuhli loaches. The main reason for omission besides the fact that they are so difficult to catch, is that they bury themselves and are virtually never seen. There seems little point in keeping anything that cannot be observed, although some would disagree.

Bottom dwelling substitutes

One species that many use as a substitute for the Loricarids or plecs from South America is the Sucking Loach (Gyrinocheilus aymonieri) The fish does possess a sucker style under slung mouth and is adapted to graze on algae, but it can be very boisterous and has a recorded size of around 22cm (11-inches). Many aquarists agree that the fish becomes lazy in the aquarium preferring to wait for food rather than actively work for it and that the younger specimens are far better to control algae. As it becomes larger it does develop strong territorial instincts often harassing other tank mates, which make it unsuitable for any community set-up. It is now available in a gold form, which is a cultivated version in addition to the standard or wild form. ▶

FISH FACT FILE

Common name: Clown loach
Latin name: *Botia macracantha*
Family: Cobitidae (loaches) Subfamily: Botiinae
Environment: Demersal; freshwater; pH range five to eight; dH range five to 12
Climate: Tropical 25 to 30°C; 5°N to 5°S
Distribution: Asia: Indonesia (Sumatra and Borneo)
Biology: Feeds on worms, crustaceans and plant matter

Botia modesta

For those who wish to add something to provide an individual touch certain other species could be considered.

Anabantoids

In previous accounts the Dwarf cichlids and killifishes have provided this aspect from each of the respective locations. Neither exist here, but certain species of anabantoids such as gouramis and Siamese fighting fishes may be utilised providing the plant cover offers a lot of refuge and there is not too much activity. For the purist this may not be an option as many of these species inhabit very still water i.e. heavily planted rivers, ditches and rice fields, but nonetheless could be included.

Again size will restrict the choice, but the Honey gourami is any ideal choice. At first this is not an attractive fish being merely a small beige coloured animal. Once in spawning condition the male becomes a honey brown, with a jet black throat and yellow dorsal fin. In the right conditions he may be observed building his bubble nest to hold the eggs after spawning. The Liquorice gouramis (Parosphrenemus) are a group of fishes that could also be considered by the more experienced aquarist as whilst they could survive, their needs are perhaps best catered for in a species tank.

There are now numerous species including the *P harveyi, deissneri, nagyi linkei* and *ornaticauda*. All are stunning little fishes which require a very quiet set-up and would probably flourish with some of the boraras or other tiny fishes, but a copious amount of plant growth will be required to get the best out of them due to their shy nature. In addition, availability of these little fishes is very limited, so a specialist society is possibly the only place to obtain them. An alternative would be either the Sparking gourami, *Trichopsis vittata* which reaches approximately 6.5cm, or the smaller (three-centimetre) Croaking gourami, *Trichopsis pumila* (it does croak when removed from the water and during courtship) both similar shaped fishes to the Liquorice gouramis, but a little less delicate and both exhibit a beautiful iridescent colour pattern. They are also likely to be more readily available than the Liquorice gouramis.

Spike tailed paradise fishes

Two other similar looking species although less often seen are the Spike tailed paradise fishes, *Pseudosphronemus cupanus* and *Pseudosphronemus dayi*. Both are retiring species but do make appearances and the subtle pastel colouration of the fins becomes apparent when then settled. They are reasonable sized fishes and enjoy a tranquil existence in a well planted set-up. Obviously the more robust barbs would not be ideal companions. Do not confuse these species with the more common and beautiful Paradise fish, *Macropodus opercularis*. This was one of first 'tropical fishes, to be introduced to Europe probably only preceded by the goldfish. It has the ability to survive cooler water, so it is often seen in unheated indoor aquariums and it will thrive in small containers, due to the presence of the labyrinth, an organ possessed by anabantoids, which enables them to breathe atmospheric air. A stunningly beautiful fish, the males especially having long flowing tail extensions and a vibrant blue red body colouration, it is none the less aggressive being able to stand up to many species especially its own kind.

Next month... the final part of this community looks at Siamese fighting fish, Silver sharks and rainbow fishes

FISH FACT FILE

Common name: Five banded barb
Latin name: *Pentazona barb*
Family: Cyprinidae (minnows or carps)
Environment: Benthopelagic; freshwater; pH range five to six; dH range five to 12
Climate: Tropical 26 to 29°C
Distribution: Asia: Malay Peninsula to Sumatra, Indonesia

Clown loach

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Introduce fish to your aquarium

This month's 'How to...' looks at the correct ways to acclimate new fish in your home tank

Peter Hiscock

Acclimation is the process of introducing fish into a new environment with minimal disturbance or sudden change from their existing environment. The most common situation where correct acclimation is required is when purchasing and transporting fish from an aquarium retailer and introducing the fish to your aquarium. In the case of purchasing new fish, the initial acclimation is carried out as soon as you arrive home with the fish, and is normally completed within half an hour, although the fish themselves may take a few weeks to fully adjust to a new aquarium.

Why do fish need to be acclimatised?

Water has many properties such as hardness (amount of dissolved minerals), pH (acidity or alkalinity), salinity (salt content), and temperature which fish will become used to in the particular body of water they live in. Because a fishes body functions are directly linked to the water around them, a sudden change in any of these water conditions will result in physiological stress to the fish. In cases of strong differences of conditions, this can result in a weakening of the immune system causing disease and even death.

Photos by the author

Checking conditions

To acclimate fish correctly, the first step is to ensure that your aquarium conditions are similar to those from the aquarium the fish are to be obtained from. In most cases, the majority of fish in an aquarium retailer will be kept in pH and hardness conditions similar to those of the tap water supply in the surrounding region. Fishes with particular needs such as soft or hard water loving fish and brackish fish may, (and should) be kept on separate systems by a retailer with the correct water parameters. In these cases you will have to adjust your aquarium conditions to match the needs of the fish and the retailers aquarium. Check your aquariums pH and hardness with a test kit, or get your retailer to test your water to see if it sufficiently matches the retailer's water conditions.

Acclimatising new fish

When you purchase your fish they should be placed in strong bags which will have either rounded corners, or will be 'double-bagged' so that corners are folded up - this is to prevent fish getting stuck during transport. Bags should be filled with roughly a quarter water and three quarters air, since fish will run out of oxygen before water! Bags should then be placed inside either a dark bag or most commonly a brown paper bag, this is to block out excess light and visible movement so that the fish remain calm whilst they are transported. If you have a long distance to cover before the fish reach their destination then it is wise to advise your retailer who may take extra measures when packing your fish, such as providing a polystyrene box to minimise heat loss or gain.

Once home the first thing to do is turn off the lights in the aquarium, since bright light may disturb the new fish. The bags containing your fish can then be removed from any outer packaging and floated in the aquarium. If

MYTH BUSTER

"Carrying out maintenance on the aquarium when new fish are added will help reduce increases in waste"

Maintenance such as water changes, gravel cleans, and filter cleans, are essential parts of good aquarium care, but they are also disruptive to the aquarium environment. New fish need time to settle with as little disruption as possible, so it is best to introduce new fish a few days after maintenance and a week before any further maintenance.

Peter Hiscock

they have travelled for more than 20 minutes then open the bags, rolling the sides down to create a floating rim, to allow air in. After about 15-20 minutes the temperature of the water in the bag should have equalised to that of the aquarium water. The fish can now be gently released from the bag by slowly tipping into the aquarium. Finally, leave the aquarium lights off for another few hours or for the rest of the day. In most cases the new fish will not need to be fed and may be unwilling to feed, although you can feed the existing fish to divert their attentions away from the new fish.

Acclimating fish from significantly different water conditions

Whilst some fish have a preference for brackish, hard, or soft water, a retailer may keep these fish in significantly different conditions. Reasons for this vary, but in most cases it is to provide local fish keepers with fish that are used to the local water conditions. This is not a reflection on the retailer's ability to provide correct water conditions, as many fish will live quite happily in water conditions outside of those found in their natural environment. If however, you are keeping a soft water aquarium in a hard water area, you may find that your retailer keeps some soft water fish, such as many tetras, in the local hard water. If the difference in hardness or pH is quite significant (around 10dGH or a pH difference of +/-1), then you may need to set up an acclimatisation aquarium. The new fish can be placed in the acclimatisation aquarium with water conditions similar to your retailers and then those conditions can be slowly changed over a few weeks to match those of your aquarium. FIN

Floating is essential to equalise temperatures and avoid sudden shocks

MYTH BUSTER

"Adding tank water to the bag of new fish every few minutes will help acclimatise them"

If you are acclimatising freshwater fish (not marine or brackish) the only parameter that can be equalised in a short period of time is temperature, which is best done by floating the fish for 15-20 minutes. Fish may take days or even weeks to fully adjust to changes in pH, hardness and water pollutants, so mixing will not help, and may even further stress the fish during their temperature acclimation. Mixing is only required when there are differences in salinity, such as with brackish or marine fish, or when acclimation is done over a longer period.

TOP TIPS

- Turn the tank lights off when acclimating fish, and for several hours afterwards
- Check and count your new fish every day for a week after introduction, in case of losses
- Tell your retailer if you are travelling for more than 20 minutes before they catch your fish
- Make a note of the names of all the fish you buy, this will allow you to check if any future purchases are compatible
- Do not purchase fish for a few weeks if you have had health problems in your tank or have used treatments
- Try to minimise stress to new fish by avoiding noises, sudden changes in room lights, or attentions of children
- If you have to travel a long distance from your retailer, obtain a polystyrene box or insulated container to transport fish
- Never introduce too many fish at one time; aquariums less than three months old should have no more than six new fish a week
- Large fish, and catfish over a few inches long, should always be bagged individually to avoid damaging each other
- Avoid purchasing fish during heat waves, or if your aquarium has heat fluctuations

Club scene

News from societies around the country

The 'Club Scene' pages are here to keep you up to date with the latest news and events from around the UK. If your club or society is not featured on these pages and you would like them to be, just send your details to the usual address, (bottom of the page) or email hayward_maria@hotmail.com - let's all keep in touch!

***NEW Basingstoke and District Aquarist Society**
contact Chris Ralph
theralphs@chrisralph.wanadoo.co.uk 07747 640929
Meetings are held at the Kempshott Village Hall, Pack Lane, Basingstoke.

Corby and District Aquarist Society
President: David A Page -
Tel/Fax: 01536 790932 email:
www.david.a.page@btinternet.com
Chairman: Roy Bryan - Tel: 01536 724803
www.cadas.org.uk
Meetings held at the Stephenson Way Community Centre, Stephenson Way, Corby, Northamptonshire on the First Wednesday of each month, starting at 8pm. Most months a second meeting will be held, the time and place will be announced when details are established.

Catfish Study group (UK)
Chairman: Ian Fuller - Email: ian@corycats.com.
Tel: 07976 814387
Visit: http://www.Catfishstudygroup.org
The home of Corydoradinae Catfish:
http://www.corydoras.myby.co.uk
All meetings held at St Elizabeth's Church Hall, Aspull. With the exception of the September and November meetings, there will be a limited fish and plant only auction held at the end of each meeting (30-45 minutes). Lots to be pre-booked through the auction manager. Anyone may attend these auctions, but only paid up members may enter lots.

Southend, Leigh and District Aquarist Soc.
Hon. Secretary: Chris Cheswright - Email:
cheswright@blueyonder.co.uk
President: Rob Reader - Email:
robreader@hotmail.com
Meetings held at St. Andrews Church Hall, Southview Drive, Westcliff on Sea, Essex.
On the first and third Tuesday of each month, starting at 8.30pm promptly.

Strood & District Aquarist Society
www.stroodaquarist.co.uk
Hon. President and Secretary: Peter Cottle
Vice President: C Cheswright
Vice President: R C Mills
Chairman: Ken Biggs
We meet on the 2nd and 4th Tuesday of each month at Crispin & Crispinanus, 8 London Road, Strood, Rochester, Kent. ME2 3HT.
Tel: 01634 719912

Preston & District Aquarist Society
Chairman: Steve Spencer
Treasurer: Phil Kay
Secretary: Sherri Byers - Tel: 01772 321743 Email:
SHERRI_BYERS@HOTMAIL.COM

Ilford & District Aquarist and Pond Keepers Society
President and membership secretary: Len Smith - Tel: 0208 5507329
Chairman: Mike Shadrack - Tel: 0208 5297173 www.ilfordaquarists.co.uk
The society meets on the second Monday of the month at The Library Rooms, Spratt Hall Road, Wanstead. E11 at 7.30pm

Gloucestershire Fish Keeping Club
Club Secretary: Judy Mitchell -
Tel: 01452 526491
We meet on the first Tuesday of every month at Wotton Hall Club, Barnwood Road, Gloucester.

The Goldfish Society of Great Britain
PRO: Michael Pepper - Tel: 01903 815734
email: pepper@fishnflowers.freeserve.co.uk

Caer Urfa Aquatic Society
Meet every other Tuesday at 8pm at the Marsden Inn, Prince Edward Rd East, South Sheilds. NE34 7JS.
Contact: **Brian Ramsbottom**, Club Secretary on 0191 4821930
email: bramsbottom7@aol.com

Bristol Tropical Fish Club (BTFC)
Meet every third Thursday at the BAWA Pavilion, Southmead Road, at 8pm. For
more information contact **John Williams on webmaster@bristoltropicalfishclub.org.uk**
www.bristoltropicalfishclub.org.uk

Thorpe and District Aquarist Society
Meet on the third Monday of the month at 7.45pm at the Norfolk Dumpling, Norwich. For more information contact **J Bedingfield on 01953 605394.**

Robin Hood Aquarists
Meet on the second Monday of the month at 8pm at the Highbank Community Centre, Farnborough Road, Clifton, Nottingham.
For more information contact **Matt Talbot on 01159 893708.**

Kirkcaldy Aquarist Society
Meet every Monday at 8pm at 19-21 Junction Road, Kirkcaldy, Fife. For more information contact **Joe Graham on 01592 782964 or John Reid 01738 634689.**

Dunstable and District Aquarist Society
Meet on the second Wednesday of every month at 8pm at the Village Hall in Slip End near Luton. For further details **visit www.ddas.co.uk or email info@ddas.co.uk.**

Telford and District Aquarist Society
Meet on the second Wednesday of every month at Hollinswood, Telford, Shropshire. For more information contact **Richard Armstrong on 01952 616410.**

Greenock and District Aquarist Society
Meet every second and fourth Tuesday of the month (except July) at Crawfordburn Community Centre, Bawhirley Road, Greenock.

Greater Manchester Cichlid Society
Meet on the last Tuesday of every month at Littleborough Conservative Club, Peel Street, Littleborough. For more information contact **Bob Barnes 01204 707375 or Alan Waterfield 01706 849355. Email: water@meadowside300300.wanadoo.co.uk**

York and District Aquarist Society
Meet on the second Tuesday of every month at the Clarence Garden Hotel, Haxby Road, York at 8pm. For more information contact **Keiron Corbett on 07767 698331.**

The MMAS (Midland Marine Aquarist Society)
Meet on the third Tuesday of every month at 8pm at The City Tavern Public House, Bishopgate Street, off Broad Street, Birmingham city centre. For more information contact **Warren McKenzie on 0121 3594469 or Ian Moore on 0121 449 3246.**

Tongham Aquarists
Meet every third Wednesday of the month at 8.30pm at the Mytchett Community Centre. For more information contact **Andy Pearce on 01252 25686.**

Hounslow Club
General Secretary: Wendy Aburrow.
Tel: 020 8890 6933 or visit
http://myweb.tiscali.co.uk/hounslowfish
Meetings begin at 8pm and are held on alternate Wednesday evenings at: St Stephens Church Hall, Parkside Road, Hounslow, Middlesex. Parkside Road can be found on the left as you leave Hounslow, heading south west on the A314.

Ryedale Aquarist Society
Open Show, Sunday 29th April 2007, Pickering Centre of Askham Bryan College
Meet on the first Wednesday of every month 7.30pm at the Bay Horse Hotel,
Market Place, Pickering, North Yorkshire.
For more information contact **David Marshall on 01751 472715 or visit www.ryedaleaquaristsociety.co.uk**

Merseyside Aquarist Society
Interested in fish keeping? Then why not come along and join us at our society. The Society meets on the second and fourth Mondays of every month at 8.15pm at The Cricketers, Long Lane, Wavertree. For more information contact **Gordon Kehoe on 0151 220 0212 or Gill Ravenscroft on 0151 480 2101.**
Diary dates 2007
Auction - Please contact Gordon Kehoe for details

Portsmouth Aquarist Society
Meet on the first and third Wednesday of every month at 8pm at Portsmouth Community Centre, Mallins road, Buckland.
For more information contact **Gill Utting on 02392 525739.**

Kings Lynn Aquarists Society
Meet every second Thursday of the month at Workers Club, Church Street, Kings Lynn, Norfolk.
For more information contact
Mike Laws on 01553 763743
or Bob Usher on 01553 769522.

Yorkshire Cichlid Group
Meet every second Friday of the month at St Anne's Church Hall, Wrenthorpe. For more information contact **Phil Oldridge on 01924 367086.**

North West Cichlid Group
Meet on the first Friday of every month at 8pm at the British Legion, Liverpool Road, Skemersdale, Lancs. For more information contact **Dennis Leach on 01942 707593.**

North West Cichlid Society
Auction - 6th Nov 2005 at 1pm. Auctioning cichlids, catfish and dry goods, at Larinford Labour Club, Ormskirk Road, Larinsford
For further details or to book a lot contact:
Malcolm on 01744 884710

***NEW Southern Counties Catfish Rescue Society (SCCRS)** contact Sue Bungay-Perrin on 0207 231 2317 or Daphne Layley via email thelayleys@tesco.net
Meetings are held at the Kempshott Village Hall, Pack Lane, Basingstoke.

West Cornwall Fish Keepers
Meet on the second and fourth Friday of every month at 8pm at Camborne Community Centre. For more information contact **Alan on 01736 79485.**

Aberdeen Fishkeeping Club
Meet on the second Tuesday of every month at 7.30pm in Murdos Lounge function room, Anderson Drive, Aberdeen. Contact **Dave Gamble on 01224 826517**

Oldham and District Aquarist Society
Secretary: Mick Wright -
Tel: 0161 281 3725 or
email mopipcas@hotmail.com
Meet every third Monday at 8pm at North Chadderton Conservative Club, Victoria St, Chadderton, Oldham.

Newport & District Aquarist Club
A new club for the South of Wales - please come and join us. Contact **Dean or Kim Reed on 01633 277177 or email Deanreed@ntlworld.com**

Other associations
Association of Aquarists contact is Sue Bungay-Perrin on 0207 231 2317 or Chris Ralph via email theralphsster@gmail.com

The BKA (British Killifish Association)
This association has been running for over 40 years. They produce a monthly newsletter. Membership is £17 per year, available from Cliff Griffiths on 01527 523635. Email: cliff.1@tiscali.co.uk
Visit: www.bka.org.uk/index.php

The FBAS (Federation of British Aquatic Societies)
http://www.fbas.co.uk/Societies.html
Founded in 1938 and has over 140 societies affiliated as members. Membership of local societies helps fish keepers solve any problems and keep in regular contact with other aquarists.

The FNAS (The Federation of Northern Aquarium Societies)
http://www.fnas.org.uk/

The A of A (Association of Aquarium Societies) Contact **Chris Ralph**
Scalesntails@btinternet.com

The YAAS (The Yorkshire Association of Aquarium Societies)
Chairman: **Steve Jones**
derekj388@aol.com

The FSAS (The Federation of Scottish aquarium Societies)
Contact
davidmillerFSAS@hotmail.com

Cichlid City - www.cichlidcity.co.uk

British Cichlid Association
PO: Craig Wade. cwade025@aol.com
SAE for information, £3 for sample publications. Send to: BCA Dept TF, 70 Morton Street, Middleton, Manchester. M24 6AY.

Federation of Scottish Aquarists Society
Secretary: **Jenn Bennett**
1 Nairn Quadrant, Wishaw, Lanarkshire. ML2 7YU

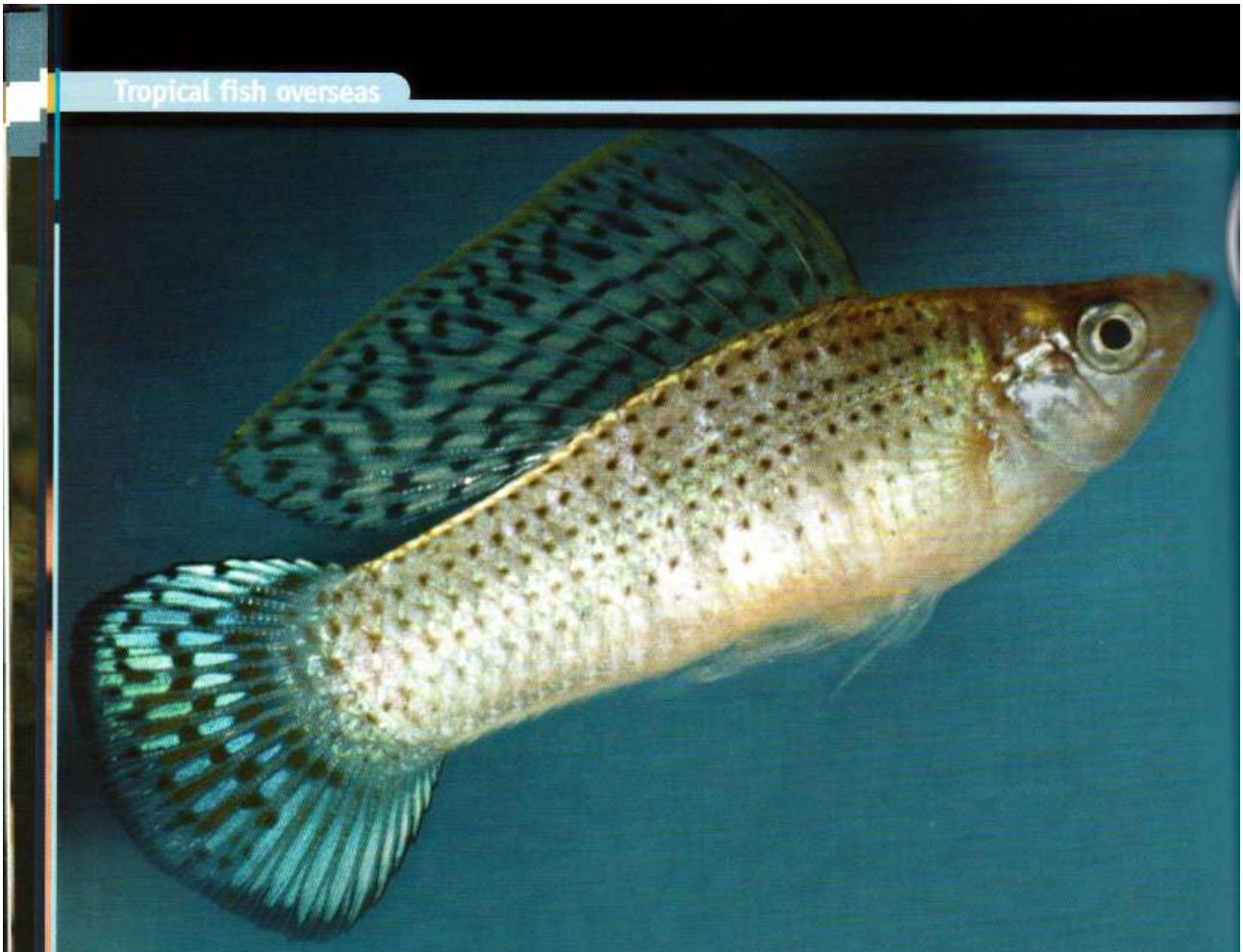
If any information on this page is incorrect or needs amending please contact *Tropical Fish* on 01202 735090 or email hayward_maria@hotmail.com Write to: *Tropical Fish* - Club Scene, Freestyle Publications, Alexander House, Ling Road, Tower Park, Poole, Dorset. BH12 4NZ. Thank you.
PLEASE SEND IN YOUR DIARY DATES NOW FOR THE SEPTEMBER 2006 ISSUE!

KEEP UPDATED!
The Club Scene pages are updated every month, which means that diary dates are deleted as they take place. To keep your club up to date, please send in your diary dates now for the September 2006 issue.
Thanks. Ed.

WE WANT TO HEAR FROM YOU!

If you would like to add your club to the List, or shout about something great, send in the information and some pictures (if you've got any) to: Club Scene, *Tropical Fish*, Freestyle Publications, Alexander House, Ling Road, Tower Park, Poole, Dorset, BH12 4NZ, fax: 01202 733969, or e-mail: hayward_maria@hotmail.com - All entries are FREE OF CHARGE.


KEY TO SOCIETY LOCATIONS
IF YOU WOULD LIKE YOUR SOCIETY TO BE ON THE MAP, LET US KNOW
Aberdeen FK Club
Kirkcaldy A.S
Greenock and District A.S
Federation of Scottish A.S
Caer Urfa A.S
Ryedale A.S
York and District A.S
Oldham & District A.S
Preston & District A.S
Northwest Cichild Group
Catfish Study group
Merseyside A.S
British Cichlid Association
British Killifish Association
Yorkshire Cichlid Group
Greater Manchester Cichlid society
Robin Hood A.S
Corby and District A.S
Kings Lynn A.S
Telford and District A.S
MMAS
Thorpe and District A.S
Dunstable and District A.S
Gloucestershire FK Club
Newport & District A.C
Bristol Tropical Fish Club
Ilford & District A.S
Southend, Leigh and District A.S
The Goldfish Society of GB
Strood & District A.S
Hounslow Club
West Cornwall FK
SCCRS
Basingstoke & District AS
Tongham Aquarists
Portsmouth A.S



The saltier water, the larger the Sailfin

Ronny Lundkvist looks at what makes a large and healthy Sailfin, and where they are abundant in the wild

Ronny Lundkvist

The Sailfin molly, *Poecilia latipinna*, was described as early as in 1821 from New Orleans by Lesueur. It is found in fresh, brackish and salt water. It ranges from Wilmington in North Carolina, down to the Yucata´n peninsula in Mexico.

The male can attain nine to 10cm and the female 10 to 12cm. However, when collecting you seldom find specimens larger than five centimetres, at least in freshwater habitats. Most of them are tiny.

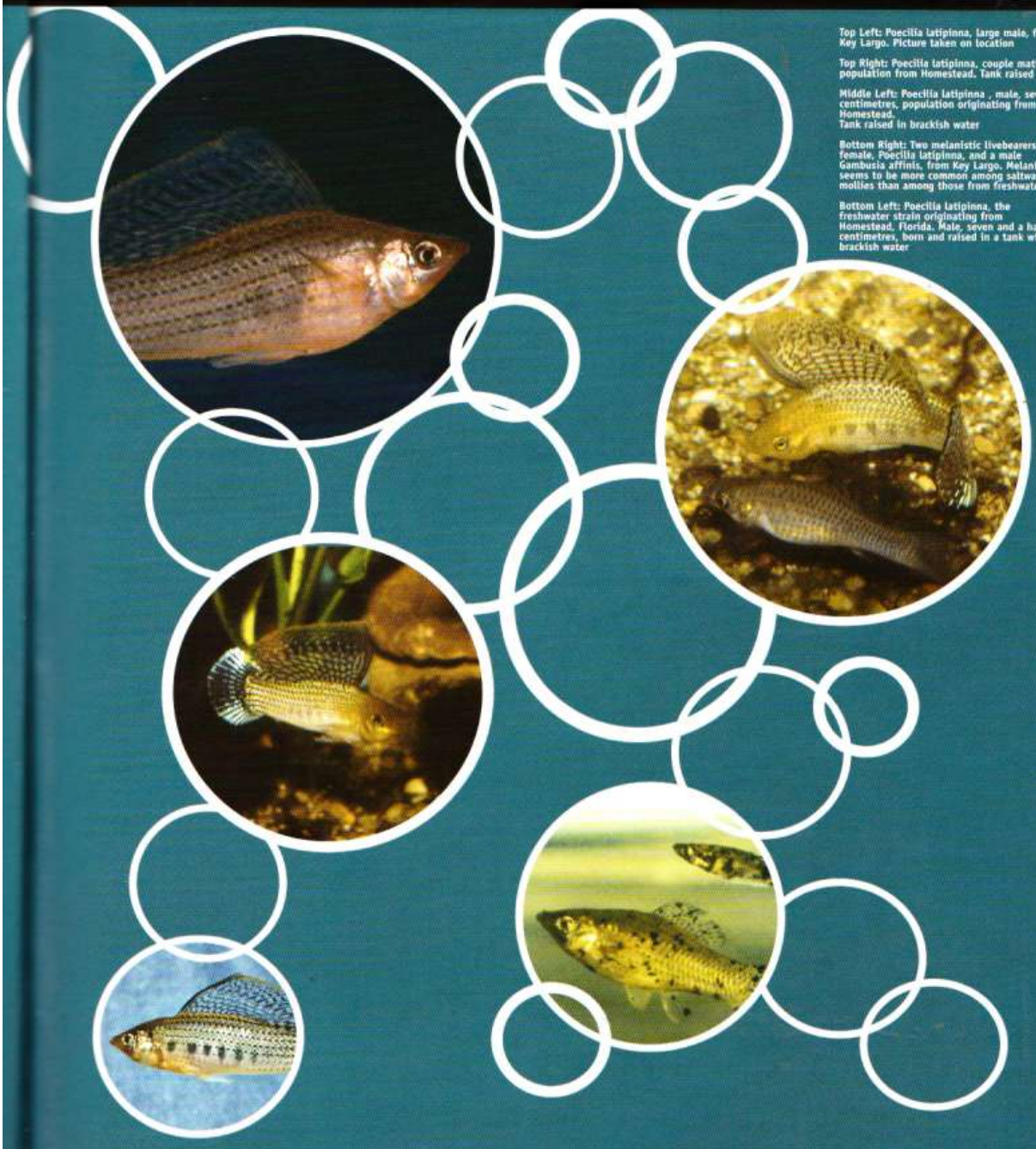
When looking for Sailfins in freshwater habitats in October 1987 on the outskirts of Wilmington I didn´t find any. Later I had been told that you probably only find them in habitats where there is a measurable amount of salinity in that area. This may be due to the low winter temperatures in the freshwater habitas on the location. Habitats connected to the comparatively warm seawater seem to be preferred in that part of the country.

Find them in Florida

If you are looking for really beautiful and large specimens, you should go to the Florida Keys. The mollies are distributed all the way from Key West to Key Largo, where they live in saltwater lagoons and saltwater ponds. They also enter the sea and thrive along the mangrove-lined shores.

The saltwater strains are in

Ronny Lundkvist



Top Left: Poecilia latipinna, large male, from Key Largo. Picture taken on location

Top Right: Poecilia latipinna, couple mating, population from Homestead. Tank raised

Middle Left: Poecilia latipinna , male, seven centimetres, population originating from Homestead.
Tank raised in brackish water

Bottom Right: Two melanistic livebearers. A female, Poecilia latipinna, and a male Gambusia affinis, from Key Largo. Melanism seems to be more common among saltwater mollies than among those from freshwater

Bottom Left: Poecilia latipinna, the freshwater strain originating from Homestead, Florida. Male, seven and a half centimetres, born and raised in a tank with brackish water

general larger than those found in freshwater. However, when collecting in March 1990 at Key Largo I found to my surprise fully developed males measuring barely three to three and a half centimetres without conspicuous colouration, together with large, brightly coloured specimens. The conditions were very favourable to the species; salinity 1028, probably due to high evaporation, and 27°C in the water. In a scientific report (Evolution, 1990, pp. 143-156) I later read that the size of the males is genetically conditioned. Within a population some males are to develop early, others late. Variation in adult size is almost completely determined by variation in size at maturity. Later maturation is tightly genetically correlated with larger size.

Rasing a healthy Sailfin

The freshwater races prefer hard, alkaline water. However, in pure freshwater, especially at low temperatures, they are susceptible to fungus and white spots. In order to prevent these diseases create their own favorite habitat: a large tank with a constant temperature of 27 to 28°C, add one level teaspoonful of salt (the kind you use in saltwater tanks) to every 10 litres of water, change one third of the water every second week and feed them with mainly green stuff. Plant the tank with for example, *Cryptocoryne ciliata* that stands brackish water. Thus you will offer the best of conditions to get healthy and large Sailfins.

Fish by moon light

This month Fish Scientific is offering Tropical Fish readers the chance of winning one of their lunar simulation lamps. There are eight of these hi-tech low energy lamps, with a retail value of over £300, up for grabs - so that means there'll be eight lucky winners!

The successful winners of this month's competition will receive either a MoonBright PRO (RRP £44.99) or a Mini-MoonBright (RRP £34.99), depending on the size needed for their aquarium.

These lamps are made in the UK using high quality LEDs. The use of LEDs results in a very safe, low voltage lamp, with a correspondingly low power consumption. The more powerful lamp, the MoonBright PRO, has a power consumption of less than three watts!

About the MoonBright

The Mini-MoonBright is a single LED unit designed for use with tanks of up to 45cm deep. The MoonBright PRO is a six LED cluster and is intended for use with aquaria deeper than 45cms. Either of these lights when used over a reef aquarium will show off fluorescence in corals and allow you to observe the natural night time behaviour of your animals.

Don't think that this is a product purely for the reef aquarium. A moon light will enhance any aquarium, allowing you to see your fish 'in a whole new light'.

Aside from the benefits of giving your fishes a more naturally lit environment and giving you a more aesthetic night time aquarium, a moon light also has an important role to play in the maintenance of some of the more skittish species of fish. Some easily frightened fish species may panic when subjected to an abrupt change from light to dark at the end of the day. By adding a moon light, that comes on shortly before the main aquarium lights are extinguished, the stress of the transition from day to night can be much reduced.

A Mini-Moon Bright add on LED kit is also available from Fish Scientific. This consists of an additional LED plus an adaptor to allow you to run an extra MoonBright off of one transformer, catering for the longer aquarium.

As it says on the Fish Scientific packaging, "... ever wondered what happens when the lights go out?" Well now's your chance to find out.

The distributor for Fish Scientific is Midland Reefs; a company run by *Tropical Fish* contributor Tim Hayes that's dedicated to supplying UK aquarists with some of the best marine products available, from both Europe and the USA. In addition to Fish Scientific their range includes Coral magazine, BLV Ushio metal halide bulbs, top quality nutrition products in the form of PE Mysis, CyclopEeze FreezerBar, Phytoplankton, and Dainichi fish food, plus much more besides.

For further information regarding Fish Scientific products see www.fishscientific.co.uk or contact Midland Reefs. Tel: 0870 066 3474 or 01543 684621 for sales or technical information.

E-mail:
sales@midlandreefs.co.uk
www.midlandreefs.co.uk

How to enter

To be in with a chance of winning a Fish Scientific Moon Light ,just answer this question on the entry form: Don't forget to tell us whether you'd like your prize to be a Mini-MoonBright or a MoonBright PRO. Then send your completed entry form to the usual address by 20th January 2007. *Good luck!*

What is the average period of the lunar cycle?

Mini-MoonBright ☐ MoonBright PRO ☐ *Please tick one*

Name: .....

Address: .....

.....

Postcode: .....

Tel (inc. STD code): .....

Email: .....

Please send entries into Tropical Fish Magazine, 'Midland Reefs' competition, Everyday Publications, Almanack House, Ling Road, Tower Park, Poole, Dorset BH12 4NZ. CLOSING DATE: 22nd Jan 2007

Chris Ralph

Typically triangular

Photo by author

This month we meet the triangular catfish from South America that was named in honour of Mr Cochu

Chris Ralph

Scientific name - *Corydoras cochui* - Myers & Weitzman, 1954.

Synonyms - There are no synonyms for *Corydoras cochui*.

Common name - Pygmy catfish, C022, Barredtail corydoras, Cochu's catfish.

Family - *Corydoras cochui* belongs to the family Callichthyidae from South America namely Brazil; Upper Araguaia River basin. This catfish is documented as occurring in the Rio Araguaia, Santa Maria Nova and State of Goyaz (Goiaz).

Sub-Family - Callichthyinae.

Size - 35mm SL (standard length - this is the measurement of the fish from the tip of the snout to the base of the caudal peduncle).

Body - The body of *Corydoras cochui* is described as being slender with a rounded snout, although it does still have the typical triangular appearance which makes this family distinct.

Colour - The base colour of the body and head is described as being light brown. There are four dark coloured blotches along the flanks of this catfish, one below the dorsal fin, one between the dorsal and adipose fin, one below the adipose fin and one on the caudal peduncle. There is a dark streak along the back of the fish which extends backwards from below the dorsal fin spine, ending in a dark spot on the upper edge of the caudal peduncle. The top of the head is described as being dark which continues to below the eye. The upper and anterior portion of the opercle is described as being dark in colour. The caudal fin is described as having five narrow irregular dark coloured cross bands. The base of the anal fin has a dark coloured spot extending into the body. The ventral fin is described as being clear. The pectoral fin rays have a few dark coloured scattered spots, whilst the dorsal fin rays have a scattering of dark coloured spots which form two irregular rows. The dorsal and pectoral fin spines are described as having a narrow dark line along them.

Remarks - *Corydoras cochui* is best described as being one of the dwarf or pygmy species of Corydoras catfish. This particular species is not commonly available, but is well worth looking out for and is ideal for smaller aquariums. The catfish depicted in this feature have been incorrectly shown as *Corydoras habrosus* in the last couple of years.

Water parameters - *Corydoras cochui* prefer to be kept in water which has a pH in the range of six to7.2, and hardness in the range of two to 25°dGH. This catfish is ideally suited to temperatures in the range of 23 to 26°C or 73 to 79°F.

Feeding - As with all the other catfish that I have had the pleasure to keep over the years, *Corydoras cochui* readily accepts a mixed and varied diet which includes granular foods, frozen bloodworm and good quality flake to name but a few.

Aquarium size - I would suggest a minimum size of 24 x 15 x 12-inches for a small shoal of these catfish, with plenty of hiding places amongst bogwood and rocks. The ideal aquarium substrate to use with these catfish is aquarium sand such as BD Aquarium Sand. As with all other species of fish, water quality and general husbandry is very important, and I would recommend that a minimum of 25% water is changed on a weekly basis.

Compatibility - Wherever possible I would recommend that the aquarist keep these catfish in a community aquarium in small groups of six or more, but as the absolute minimum I would suggest three specimens assuming that they are available in these numbers. In their natural habitat *Corydoras cochui* would be found in relatively large shoals.

Sexual differences - The males tend to be more slender than the females.

Breeding - There are documented reports of aquarium spawnings of *Corydoras cochui*, adopting the typical 'T shape' breeding clinch. The spawning activity follows on from a period of conditioning with foods such as daphnia and bloodworm, and a partial water change using cooler water.

Etymology - Cory meaning helmeted, doras meaning leathery skin (helmeted doras) cuirass. Cochui named in honour of Mr Fred Cochu.

GLOSSARY OF TERMS

Caudal is defined as the tail fin. **Pectoral fins** are defined as paired lateral fins. **Dorsal fin** is defined as the medial fin on top of the back. **Adipose** is defined as a second dorsal fin which in the case of Corydoras consists of fatty tissue with a single spine supporting a thin membrane. **Dorsal** is defined as being top or above. **Ventral** is defined as bottom, below or underneath. **Opercle** is defined as the large bone forming the gill cover. **Caudal peduncle** is defined as the usually narrowing posterior part of the body between the anal and caudal fins.

The Think Tank

The monthly guide to advanced fish keeping

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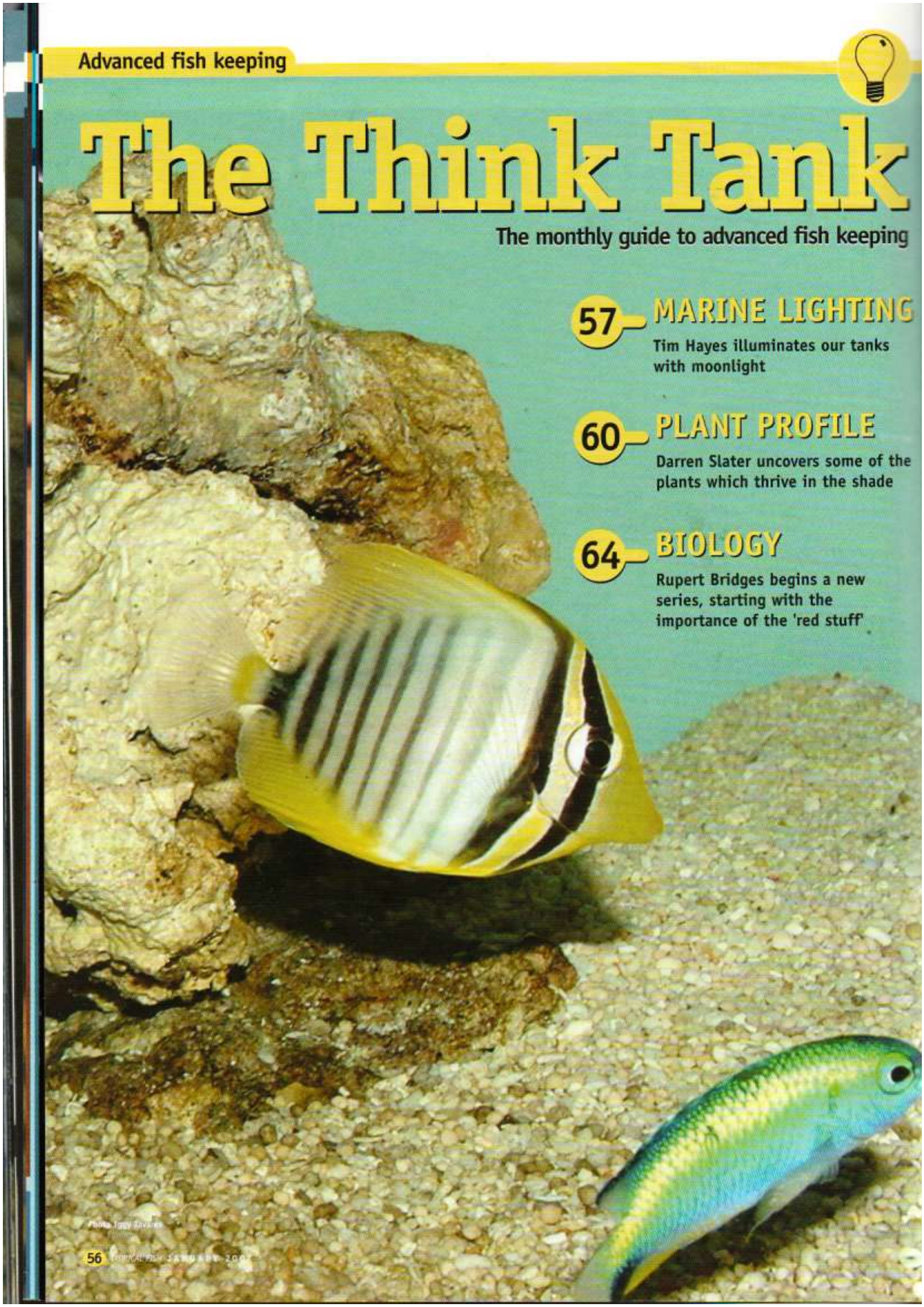


Tim Hayes

Fish by moonlight

Something that's often ignored in our captive reefs is the effect of lighting the aquarium at night. In the wild fishes and invertebrates are fully exposed to the lunar cycle, being subject both to tidal effects and to a regularly changing amount of light from the moon at night

Tim Hayes

Photos by author

Moon-phases. Photo copyright Antonio Cidadao

The moon has a significant effect on the biological rhythms of many species of marine organisms. The gravitational pull exerted on the earth by the moon is the primary cause of tides, which normally reach their maximum at the time of the new and full moon. Many marine organisms synchronise their spawning to these high tides, yet some species choose either the new or the full moon, which has the implication that the amount of moonlight present also has an influence on spawning behaviour. Out of the new and full moon phases, one usually has higher tides than the other and it appears that many species select the phase with the higher tide as a means to increase the distribution of their offspring.

Incidentally, high tide is not constant to any one particular phase of the moon; every seven months it switches between the new and the full moon phase. This results in what's known as the fourteen month 'syzygy inequality cycle' (SIC).

Organisms living in or beside the sea have adapted to these cycles. Studies of Fiddler crabs have shown that even when kept under constant light and temperature, the animals are still most active at the times when the tide would be out. A similar internal 'circa lunar'clock is thought to exist within many animals, synchronous with the moon and tides, working in conjunction with the animal's 24 hour circadian clock.

What is the lunar cycle?

The moon shines by reflected sunlight. Over the course of roughly a calendar month, as the relative positions of the earth, moon, and sun changes, the moon goes through a number of different phases where the size of the illuminated portion goes from zero to complete. At new moon the illuminated portion faces away from earth, so the moon appears to be invisible. As the days after the new moon proceed, the waxing crescent moon appears above the western horizon after sunset, with more of the surface being illuminated each night as it gradually rises higher above the horizon.

First quarter is reached about a week after new moon; this is when one half of the moon appears to be illuminated. Following first quarter, the illuminated surface continues to increase until around two weeks after the new moon, when it reaches full moon; this is the time of one hundred percent surface illumination when the moon is at its brightest. After full moon the process is reversed, with less of the surface being illuminated each night, going through last quarter when again half the surface is illuminated, until about two weeks later the cycle is complete, back to new moon and no reflected light.

The lunar cycle, moon phases, repeats with an average period of 29.5 days (also called a synodic period) this period can vary by up to plus or minus seven hours.

The phases of the moon are caused by the relative positions of the moon and sun in the sky. The new moon occurs when the sun and moon appear to be quite close together in the sky. Full moon occurs when the sun and moon are at nearly opposite positions in the sky, explaining why a full moon rises about the time of sunset, and sets about the time of sunrise for most places on earth. First and last quarters occur when the sun and moon are about 90 degrees apart in the sky. These two 'half moon' phases are so named because they occur when the moon is, respectively, one quarter and three quarters of the way around its orbit from new moon.

Association with spawning in fish and invertebrates

The lunar cycle is often linked to sexual reproduction in corals, particularly that of stony corals. Although the full moon is often considered to be the key trigger for spawning there are a number of other variables such as tidal action, water temperature, and seasonal differences in day and night length that may be of equal or greater importance depending on species. Corals can be split by mode of reproduction into broadcast spawners and brooders. It's the broadcast spawners that are responsible for the spectacular mass spawnings that occur on the Great Barrier Reef.

One of the most famous examples of fish spawning behaviour synchronised with the lunar cycle is that of the *Leuresthes tenuis*, the Californian grunion. These fish spawn on the sandy beaches of southern California at night after the highest tides and after both the new and full moon from March to August. The fish deposit their eggs at the high tide mark where they remain seven to eight centimetres below the sand until they hatch out around 14 days later at the next spring tide when the larvae are swept out to sea.

(A spring tide is the extra high tide that occurs around the new and full moons when, relative to earth, the sun and moon are approximately in a straight line and their gravitational fields pull in the same direction.)

Palola viridis, the Samoan Palolo worm (a polychaete worm similar to Bristle worms), reproduces by shedding its egg bearing tail (epitoke) in a highly synchronised release that has annual, lunar, daily and tidal rhythm components. In Samoa this happens just once a year at the time of the November full moon, the tail end of the worm breaks off and swims to the surface to shed eggs and sperm in an event lasting just a few hours. Afterwards the head ends (atokes) regenerate, eventually producing new epitokes, ready for the next years spawning.

Moonlight changing animal behaviour

Many marine organisms move up and down in the sea depending on the level of moonlight in order to keep their light levels constant. Shrimps for example, will migrate from estuaries and rivers at night during the time 'new moon' when it's dark. Losses due to predation during this period are fewer than if the migration was timed around the full moon. Some nocturnal animals will come out on a well-lit night to hunt, while others will stay hidden to avoid predators.

It can be argued that the tides have a greater influence on fish feeding habits than moon light itself, and this may be true of shallow water areas where the higher tides allow fish to feed in places that are not always accessible to them, or in areas were tide induced currents are very strong. But, it should be kept in mind that the majority of the ocean habitat is well below the surface at even the lowest of tides, so other effects of the lunar cycle, such as moon light, may have more affect on deeper foraging fish.

The lunar influence on the reef aquarium

Although the reef aquarium is separate from the sea it will still be subject to the same gravitational effects caused by the moon. As our aquaria are so small, don't expect to see signs of tidal activity unless, of course, you decide to create that activity yourself. Many of the animals we keep appear to be influenced by the lunar cycle, whether through an internal circa lunar clock or by somehow being sensitive to gravitational effects. It's quite possible that the gravitational pull exerted by the sun and moon are sensed by the fish through their highly sensitive lateral lines and built-in sensory systems.

We can give the residents of our reefs a far more natural existence by the addition of a light simulating the lunar cycle. At present, to accurately control a light to imitate the changing levels of light over the course of the lunar cycle is a pricey undertaking involving the purchase of an aquarium computer of some sort. If you're good with electronics you may be able to DIY a solution to the problem yourself, possible avenues include complex chip programming, the use of mechanical or electronic timers, or the use of multiple bulbs - a quick internet search will take you to a number of sites describing home brewed solutions.

If you have the patience, you could manually change the length of time your moonlight is lit each night, but for most of us a more simplified approach is needed. Unfortunately there are few 30-day timers readily available. One solution is to use a seven day programmable timer, you'll need to reprogram every seven days and, over time, you'll need to re-synchronise with the actual lunar cycle as otherwise the one and a half day difference between the timer and the heavens will accumulate, putting your reef more and more out of synch.

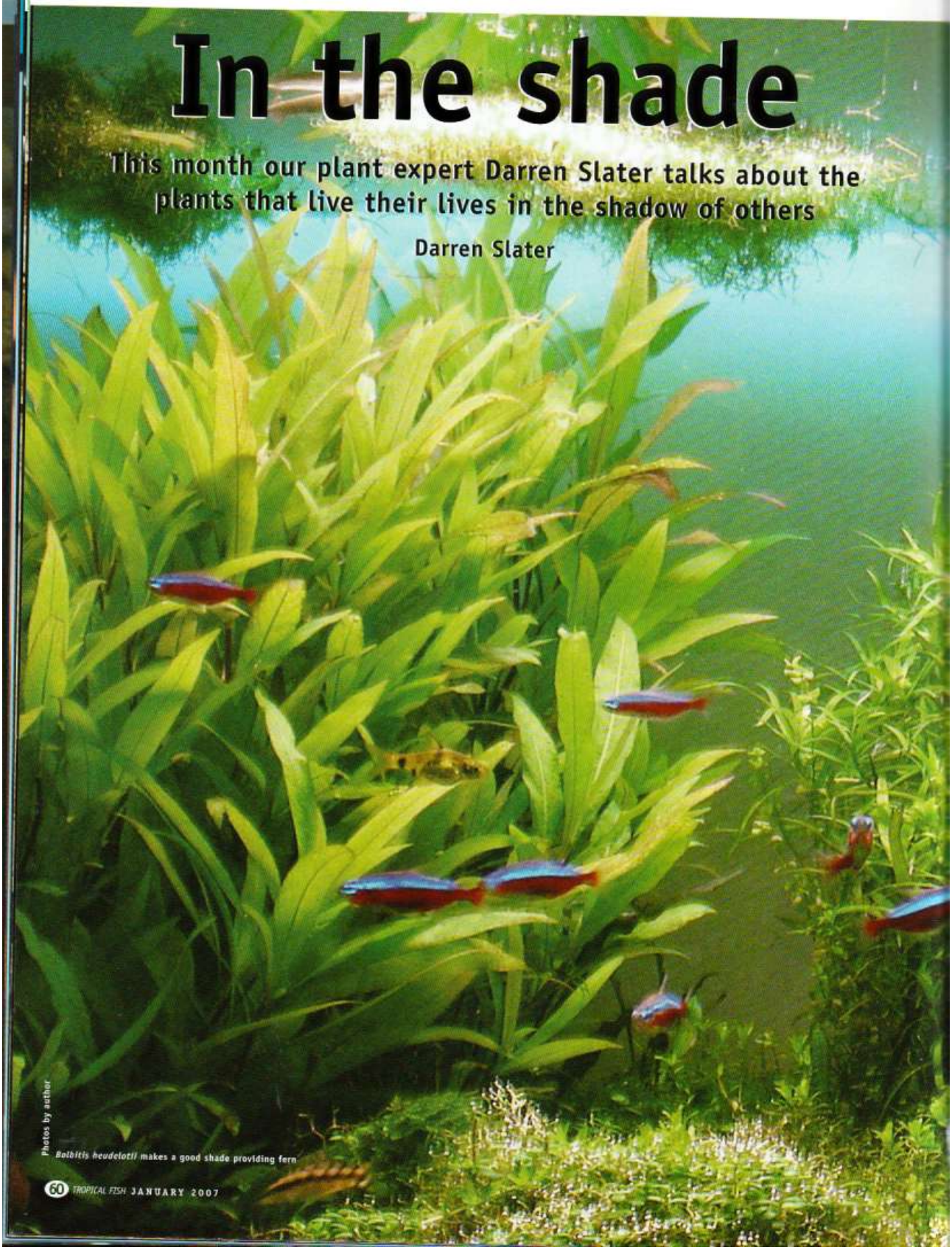
How can we replicate the lunar cycle?

For practical purposes you can treat the cycle as being 30 days long. I've included a table based on the work of US aquarist Steve Tyree. This table

In the shade

This month our plant expert Darren Slater talks about the plants that live their lives in the shadow of others

Darren Slater



Photos by author

Bolbitis heudelotii makes a good shade providing fern

Darren Slater

As in nature, shaded areas of both the terrestrial and aquatic worlds can be found bursting with the growth of low light loving plants. In the natural aquatic world there are many such plants that grow well without the need to be exposed to full sunlight, these plant species are quite at home growing under filtered light conditions, though the growth rate is not as fast as it is with those that have the requirement of full light exposure.

Within the planted aquarium, areas of shade are usually created with or without intension. The use of large features such as driftwood or rock works, are often placed in such ways that an area of shade is created. Along with the use of features to gain this natural contrast of light balance tall growing, broad-leaved plants have a tendency to cast a shadow on the lower depths of the aquarium.

The perfect shade creators

The perfect medium for creating shaded areas in the planted aquarium is the use of certain plants which can be grown on wood or rock features. These plants are usually happier growing with their rhizomes and roots exposed and free from any substrate, and to grow them at their best and get a fast coverage over the chosen wood or rock feature their access to the energy of light is of some importance.

An ideal specie of plant for such a position is that of *Microsorum pteropus* or commonly known as Java fern. This is undoubtedly one of the most popular and commonly chosen aquatic plant species chosen by aquarium folk around the world.

It's one of those aquarium plants that always, usually ends up in most peoples aquariums, whether they are into the aquatic plant side of the hobby or not.

Microsorum pteropus

This plant can be found growing throughout Asia with differing regional characteristics to the shape of its leaves. It can be found naturally growing in both submersed and immersed conditions, with its creeping rhizomes gripping around wood and rocks.

Microsorum pteropus is a very tough specie of plant, and is able to grow well in many different conditions and climates. It is able to grow under both very low to high levels of light. The temperature poses no problem and is chosen by cool water fish keepers through to those who collect higher temperature species of fish such as discus. Java fern is also extremely adaptable to varying water parameters, and grows well in very soft water right through to harder conditions.

The rhizome and leaves are very tough and are believed to contain a very mild toxin which has a bitter taste, so it is generally left alone by those fish species whom usually favour eating your aquatic plants. As *Microsorum pteropus* prefers to be grown over wood or rock rather than buried into any substrate, it can be simply placed along with the medium it is affixed to anywhere in the aquarium.

Purchasing Java fern

Java fern can be purchased in several ways, from loose rhizome runners, potted in rock wool and already tied to driftwood or pieces of rock. When buying Java fern loose, it gives you the great opportunity to affix it to your chosen feature and without the time consuming removal and usually delicate operation of rock wool removal.

Tying down *Microsorum pteropus* couldn't be a simpler affair. Place the thick rhizome where you want to start the plant off from onto your chosen feature, then, simply using a length of fishing line, loop it around the rhizome and the feature, pull it just tight enough to hold firmly in position, then tie off with a knot and cut away any unused line. For rhizome runners longer than two leaves, this should be repeated at a couple of intervals to ensure the rhizome doesn't trail off the feature.

The growth rate of Java fern is fairly slow, and often appears to be doing nothing, not dieing or growing. Depending upon the environmental conditions you are providing, it generally will surprise you in a couple to six months from its addition to your aquarium. Once its has established and is growing well the rhizomes tend to spread out in all directions, forming dense growth. The tightly packed leaves provide much shade to the lower areas beneath.

Care of Microsorum pteropus

High light and CO_2: In the high light aquarium Java fern does extremely well, producing a bright and rich green colouration. The addition of carbon dioxide is also extremely beneficial and the growth rate is a little faster than in those aquariums without CO_2 injection.

Fertilisers: The addition of liquid feeds is ideal as Microsorum pteropus feeds directly from the water column.

Propagation: Taking rhizome cuttings and retying to another position or another feature can carry this out, or naturally this plant will produce new plantlets on the underneath of mature leaves. These can be grown on a little on the mother leaf before removing and tying on elsewhere.

Water parameters: Soft to hard water, with a pH between five and eight.

Temperature: 18°C but will tolerate lower to 30°C.

Substrate: Rock and wood.

Other good 'tie on' shade providers

There are a few species of Microsorum available these include:

Microsorum pteropus 'narrow' - a narrow more slender leaf form.

Microsorum pteropus 'windelov' - named after the plant collector and founder of Tropica aquarium plants.

Holger Windelov. This specie has attractive branching leaf tips.

Microsorum pteropus 'undulate' - larger and wavy leaves originally from Southern Thailand.

Bolbitis heudelotii - very attractive creeping aquatic fern from Africa.

Into the shade

Probably the most popular low light aquatic plants come from the genus cryptocoryne. This is a large genus of plants and contains 60 or so different species, along with many variants of species, and are all found to originate throughout tropical Asia. They come in all different sizes, leaf shapes and ▶

Anubias specie in the shade

colours, with many having the adaptability to grow in differing environments, particularly levels of light.

For many of the species of cryptocoryne, lower temperatures are also not a problem, and like *Microsorum pteropus* some of these cryptocorynes can be grown well in the cooler water aquariums. Many cryptocorynes are also able to grow in harder water parameters, especially many of those originating from Sri Lanka.

A low light crypt

Cryptocoryne wendtii comes in both a green leaved and brown leaved form, as well as a variegated form known as *cryptocoryne wendtii 'mi Oya'*. *C.wendtii* has been one of the more popular crypts chosen over the past few years. It is easy to grow in both hard and soft water conditions being one of the Sri Lanken members of the family, and is not fussy when it comes to light levels. These species of crypt once settled are fairly fast growing, reaching a maximum height of around 25 to 30cm making them suitable for small, medium and large aquariums.

It propagates readily by sending out running rhizomes, on which many new plants are formed. These baby crypto plants can be cut from the main runner and replanted where you want it kept, as a form of preventing the crypt from encroaching into other plants territories. The one main problem you may experience from this specie of cryptocoryne is that of the so-called cryptocoryne disease, when the plant is first introduced into its new home.

Close up of Cryptocoryne x wellisii

Cryptocoryne disease

Cryptocoryne disease or crypt melt, as it is known, is a result of stress that certain species of cryptocoryne go through when placed in a new and different environment. The start of this melt down begins at the tips of the leaves and works downwards, as if the plant is rotting away. To prevent the melt down continuing down to the rhizome, the affected leaves should be removed. If all leaves are eventually removed, do not despair as it will only be a matter of weeks before the first

Darren Slater

signs of new shoots are shown. Many people make the easy mistake of thinking that the plant has been lost entirely and up root the specimen and throw it away.

There are many species of cryptocoryne that will tolerate the low light levels in the shade. Species such as: *C. pontederiifolia, C.cordata, C. becketii, C. walkeri* to name just a few that are available to us hobbyists.

There are those cryptocorynes of course that will not do so well in very shady areas. These tend to grow better in medium filtered to high light levels. Cryptocoryne species such as *C. x willisii (nevillii)* and *C. tonkinensis* are best suited to those medium shaded areas.

Cryptocoryne sp under medium filtered light

Cryptocoryne x willisii

For many years *Cryptocoryne x willisii* has and still is being called *C. nevillii*. Though they are both very similar in appearance it is thought that the infamous *C. nevillii* does exist only in the wild and is a very rare find indeed. It is also believed not to have been used in the aquarium, or cultivated for the hobby. The common name for this specie of cryptocoryne is of a simpler affair being called Dwarf crypt and from this common name it gives you the good indication that this specie will not grow into a monster, making a good plant for the foreground of the aquarium.

In low light or very shaded areas *C willisii* sometimes has a tendency to grow a little shorter and curl or lay on the substrate and when grown under medium to high light areas this wonderful Dwarf crypt stands upright. It is a great little plant to be grown under small branches of driftwood or seasoned hardwoods such as beach.

This specie of cryptocoryne has fairly tough leaves, which have an elliptical to lanceolate shape and over time, reach an average height of between five and 10cm; though they have been known to reach 20cm. The propagation of this plant is much the same as all species of cryptocoryne, by simple cuttings from the running rhizomes.

Requirements

Light: Low, medium to high
Substrate: Fine and nutrient rich for best results.
CO_2: Beneficial
Temperature: 20 to 30°C
pH: Five to eight - another crypt specie from Sri Lanka
Growth rate: The growth rate is slow even in high light conditions; group planting is advised for carpeting effect.

Summary

There are many more species of aquatic plants out there to choose from that are all at home in the shade. Species such as those from the ever-popular genus of Anubias, and some of the species belonging to the Hygrophila genus. FW

Red-blooded fish

Rupert Bridges from Tetra begins a new series for our new year looking more in depth at our fish and explaining some fish biology, this month we begin with blood...

Rupert Bridges

It may not seem like the most obvious topic for an article, but the blood of fish plays a pivotal role in many processes that are vital for health and condition. These include oxygen transport, maintenance of the salt/water balance, nutrient transport, the immune system, and removal of waste products. In this article we will look at some of the components of fish blood and what their significance is.

Circulatory system

Unlike mammals (and humans), fish have a single circulatory system. In other words, blood is pumped from the heart to the gills, and then straight on to the rest of the body. Oxygenated blood leaving the gills is delivered to the various parts of the body, where its oxygen is removed for respiration. The resultant deoxygenated blood is then returned to the heart to be pumped to the gills and re-oxygenated again.

Blood

On average, fish contain around two to four millilitres of blood per 100g of bodyweight (compared to around six in humans), although this can vary depending on the species in question. The blood itself is made up of red and white blood cells, platelets (or thrombocytes), along with plasma that carries proteins, waste products, and various other dissolved substances. By acting as a carrier for many important substances, the blood plays a key role in maintaining health.

Red blood cells

Red blood cells, or 'erythrocytes', are responsible for transporting oxygen around the body. They contain a pigment called haemoglobin which binds the oxygen that diffuses into the blood across the gills. Although a small amount of oxygen can be carried dissolved in the blood, the presence of haemoglobin increases oxygen carrying capacity significantly (from around 0.5 to 0.9ml/100ml blood to five to 16ml/100ml blood). The number of red blood cells in the blood is related to the physiology of the species in question, and its environment. Fish with larger red blood cells also tend to have fewer per unit of blood. For example, sharks and rays have less than 0.5million per mm3, whereas some active marine fish have four to six million per mm3. The percentage of the blood that is made up of red blood cells is referred to as the 'haematocrit'. Humans have a haematocrit of around 47%, whilst most fish have one of around 20 to 30%.

The ability of haemoglobin to carry oxygen depends on the concentration of hydrogen ions (H^+) in the blood; in other words the pH level. The lower the pH, the less oxygen they can carry. Because tissues in the body are constantly respiring, they are releasing carbon dioxide (CO_2) into the blood which decreases its pH. When the red blood cells arrive at the tissues, the lower pH causes haemoglobin to offload its oxygen. This can then diffuse into the tissues that need it.

...ion content and pH of ... essential to the ... conditions of fish such as this Dwarf gourami

The blood pH remains low as it carries CO_2 back to the gills. Here it diffuses back out into the water, facilitated by an enzyme called carbonic anhydrase. The pH rises once more and oxygen can again be picked up and taken back to the body's tissues. The effect of the blood's pH on its ability to carry oxygen is known as the Bohr effect, and it is essential for supplying oxygen and removing carbon dioxide.

White blood cells

White blood cells, or 'leukocytes', constitute an important part of the immune system. There are four main types of white blood cell - thrombocytes (or 'platelets', which are involved in blood clotting), granulocytes, lymphocytes, and monocytes. The granulocytes and monocytes are an important part of the non-specific immune system; a fish's primary means of destroying any pathogens (disease-causing organisms) that enter the body. For example, monocytes are carried in the blood to the site of an infection and turned into macrophages - white blood cells capable of engulfing and destroying bacteria. Lymphocytes are important for the specific immune response, and as such are involved in producing antibodies against pathogens and developing immunity against certain diseases. A healthy fish may have a white blood cell count of around 20 to 50,000 per mm3 of blood.

Ions

The blood contains a number of ions (charged atoms), which are important for a variety of physiological processes, as well as maintaining a stable blood pH. The most significant of these are sodium (Na^+) and (Cl^-), with smaller quantities of other ions such as calcium, potassium and magnesium. It is common to express the concentration of the blood in milliosmoles (mOsm) per litre of blood (termed 'osmolarity'). It is beyond the scope of the article to explain these units in depth. However, the total osmolarity of fish blood is around 250 to 300mOsm.

The important point is that the osmolarity of soft freshwater is around 1mOsm; considerably lower than the fish's blood. This means that ions are continually trying to diffuse out of the blood and into the surrounding water, whilst water is trying to diffuse in. Consequently, fish have mechanisms for preventing ion loss and actively taking them up from the environment, as well as getting rid of excess water. These processes are linked to pH regulation, in that Na^+ ions are exchanged for H^+ (hydrogen ions), and HCO_3^- (bicarbonate) is exchanged for Cl^- ions. A decrease in blood pH (caused by an increase in H^+ ions) can therefore be corrected by increasing the intake of Na^+ ions in exchange for getting rid of H^+ ions, and decreasing the intake of Cl^- ions to retain more HCO_3^-. The extent to which ion and pH regulation are linked is the subject of much on-going research, as its not clear if this happens in all species. Ultimately, the ion content and pH of the blood is essential to the health and condition of fish. Gill damage, stress, or inappropriate water quality can all disturb this process and lead to suboptimal blood chemistry.

Glucose

Blood glucose provides a readily available source of energy for fish, and its levels can indicate general condition. Blood glucose levels tend to rise if fish are stressed, in order to provide extra energy. On the other hand, liver damage or prolonged starvation will decrease levels. For ▶

Blood glucose levels can indicate general condition

Elevated bile in the blood can indicate poor nutrition or other causes of liver problems

Blood glucose provides a readily available source of energy for fish

Blood plays a key role in maintaining health for fish like this discus

Photos by Iggy Tavares

example, according to one study a normal value for carp may be in the region of 40mg/100ml blood, whereas long-term starvation (at 20°C) will see levels fall to 23mg/100ml. On the other hand, a stressful event will cause levels to rise; e.g. in carp exposed to a sudden temperature increase (12 to 22°C) levels rose to 83mg/100mL.

Proteins

The plasma carries two main types of protein; albumin and globulins. These proteins are involved in the immune response, preventing pH changes, and maintaining the blood's osmolarity. The level of blood proteins can indicate the condition of the fish. This is because under normal conditions blood proteins are manufactured at roughly the same rate at which they are decomposed. If the blood protein level falls, a deficiency in dietary protein supply may be to blame. This in turn will leave the fish more vulnerable to infection. A carp in good condition will have a total blood protein level of over 3.5g/100ml blood, whereas one in poor condition will have less than 2.8g/100mL. Feeding a good quality food and avoiding long periods of starvation is important for maintaining blood protein levels.

Bilirubin

Bilirubin is a by-product of the breakdown of haemoglobin (from old red blood cells). The liver normally removes it from the blood and sends it to the gall bladder to be secreted into the intestine as bile (which aids fat digestion). If the liver is damaged for any reason, bile levels may increase. Therefore, elevated bile in the blood can indicate poor nutrition or other causes of liver problems.

Using blood chemistry information

It is clear that the blood has a wide range of important functions, but what is the relevance of this to us? Unlike human and animal medicine, blood parameters are not routinely used to diagnose fish condition or disease. It's therefore unlikely that you will ever need to apply these measures to your own fish. However, scientists and some manufacturers use knowledge of blood chemistry to improve the quality of the products and advice available to us. For example, certain ingredients in fish foods can stimulate white blood cells to work more effectively. It's therefore possible to evaluate these 'immunostimulants' by studying their effect on white blood cell activity. In addition, measurements of certain blood parameters can give valuable information as to the quality of nutrition supplied by a fish food. When coupled with more traditional measures of performance (growth, waste production etc), a much more complete idea of the quality of a diet can be gained. So, although it may not be something we have to directly worry about, a good understanding of blood chemistry will influence the development of some of the products we use to care for our fish. FIN

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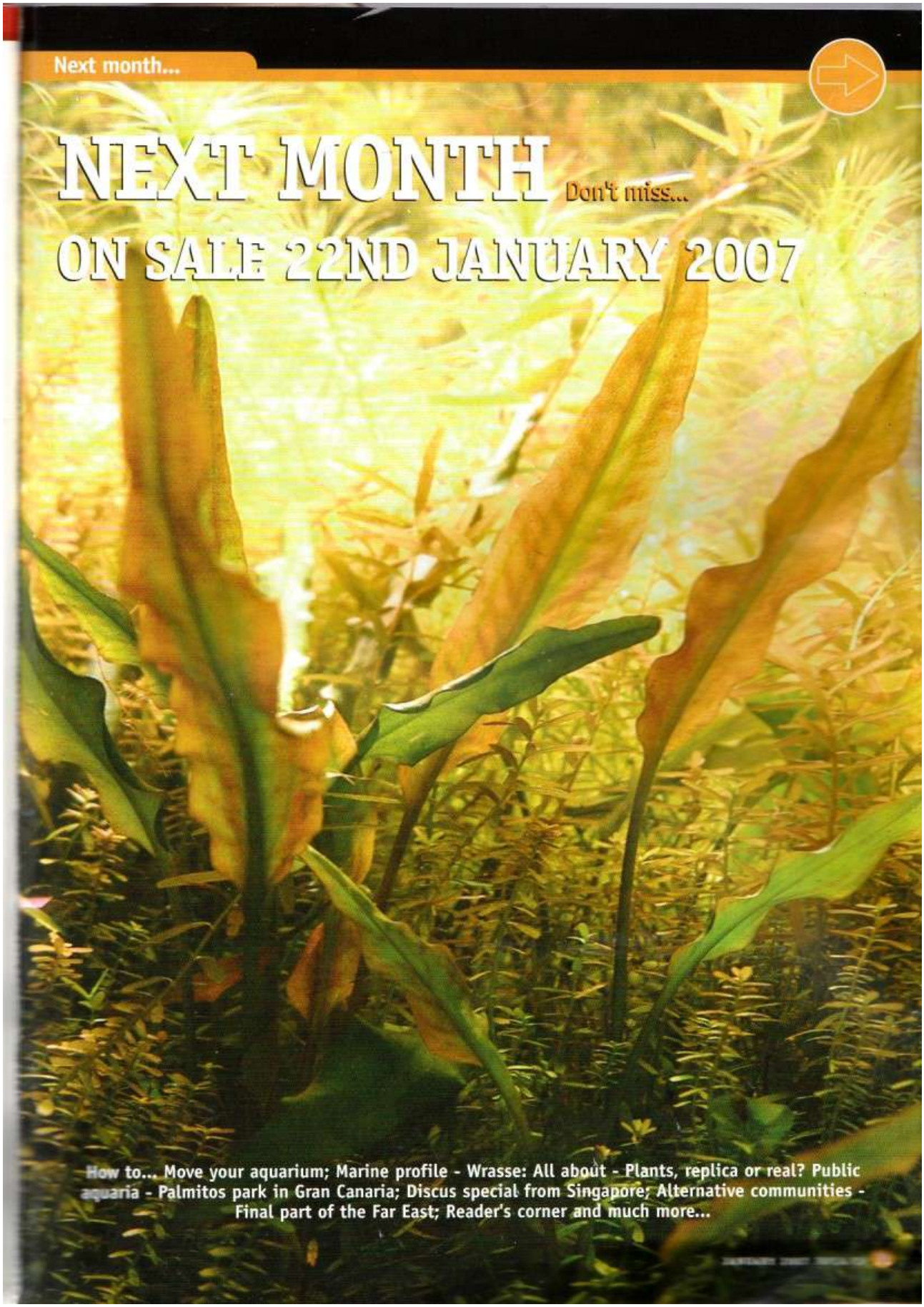

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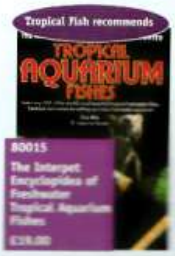

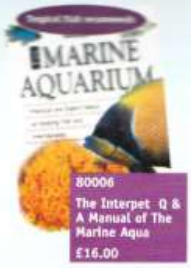

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Nick Fletcher

Message in a bottle

Nick Fletcher reinvents the fish tank, but all he gets for his efforts is a right mouthful...

I don't believe in guardian angels, but Muses - those supernatural beings (usually female, young and attractive) that inspire people to write great prose or poetry - are another matter. They definitely exist. I'm not claiming my own literary outpourings are in the same class, or even on the same planet. But many a time, when I've been sitting in front of a blank PC screen searching for inspiration for this column, something pops up out of the blue to give me an idea.

The latest Muse

So it was that, my latest Muse, a lass I hadn't seen for at least 20 years, phoned me out of the blue the other night and asked my advice on her latest project. An indoor pond.

Despite all the technological advances in our hobby, the fundamentals remain the same - a glass (or acrylic) rectangle (or square, or hexagon) with heater, filter and pump - a self-contained life support system for fish. Except that a few visionary folk like to shift the envelope, run a new flag up the pole, as the bossman would say.

Steph (that's not her real name) has had an indoor conservatory pond for some years to house her bigger fish, mainly those with whiskers, from South America. It's not very deep, only 22ins, because Steph is only a little lady, five foot nothing in her pop-socks, and she needs to don her waders in order to water the fine display of rainforest plants on the far side of her creation. There are, I hasten to add, no piranha or candiru in residence.

The conservatory is heated to an eye-watering 76°F, but Steph has had to add four 300W heater/stats to the pond to maintain the same ambient water temperature. "They seem to be on all the time," she told me plaintively, "and the electricity bill is horrendous." Anyway, she's had this great idea. Her little piece of the Amazon is currently being enlarged, and she wants to bleed off a pipework grid from the central heating to run under the pond floor. Would this be feasible? I was speechless, and nonplussed. My only experience of substrate heating was with a small fish tank many years ago. I followed the instructions to the letter, installing the heating mat under the base glass, but despite the sensor in the water I came down the next day to boiled gourami and fricasseed firemouths. Stripping down the tank and starting again was a real chore - just imagine what would happen if a heated indoor pond played up in the same way?

I had visions of Steph boarding out her catfish in the bath while she took a jack hammer to the concrete floor, and I told her my fears. But she's probably going ahead with the project anyway, and good luck to her.

> The first barb to go up the tube was the victim of an over-enthusiastic suck, and ended up briefly in my mouth

Feeling like Lazlo

My own inventiveness in respect of tropical fish pales into insignificance beside Steph's, but there was one project I am still quite proud of. In fact, looking at today's BiOrbs, I feel rather like the Hungarian guy Lazlo, who invented the Biro and didn't properly patent the idea. There was this big, ancient glass carboy at an auction, and it was such a satisfying object that I bid a fiver for it and took it home without any real idea of what I would do with it. "You could always keep goldfish in it," said Number One daughter. I put my thinking cap on and soon there was a hollow central column in the carboy, made of varnished bamboo, weighted down and concealing a heater/stat and an air-driven sponge filter. I had a few Golden barbs that were causing mayhem in my community tank, so out they came and in they went.

Soon, I was the proud owner of probably the largest Golden barbs in the western hemisphere - they loved it in there. I even introduced a few plants, which got light from an Anglepoise lamp positioned nearby. The whole set-up looked a treat. Come to think of it, the barbs were probably not as big as I thought. Fill any globe with water and it turns into a super magnifying glass. Cleaning algae from the inside of my creation required some ingenuity. The neck of this great big bottle was narrow, so I rigged up a scraper pad on a bendy wire stem and somehow managed the job. Anyone who has used a glass carboy as a bottle garden will know that it's possible to perform quite intricate tasks, such as pruning and transplanting, with similar gadgets - though I'm reminded of the tale of the gynaecologist who stood outside to paint his living room through the letterbox!

Lifers in the carboy

However, there was one great drawback to my invention. BiOrbs and suchlike have a lid, my carboy didn't. And I realised that my fast-growing Golden barbs had become 'lifers' - no way could I get a net down the neck of the bottle to catch them.

Necessity, though, is the mother of invention. I couldn't net them, but I could maybe suck them out of their prison with a suitably large-diameter length of tubing. To entice the fish within range of the business end, I lashed some freeze-dried krill around it and waited for them to home in on the food. You can probably guess the rest. Those stage magicians who purport to swallow live goldfish are actually using cunningly-trimmed pieces of carrot, but the first barb to go up the tube was the victim of an over-enthusiastic suck, and ended up briefly in my mouth. I'm pleased to say we both survived the experience, but I still can't look at a BiOrb today without a smile. Do you own one? You don't know you're born! FIN

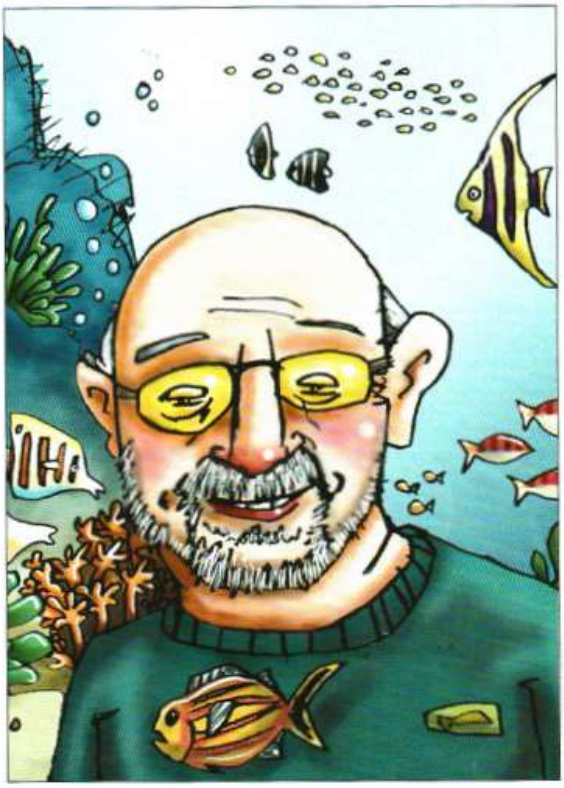

Illustration by Edwin Marney