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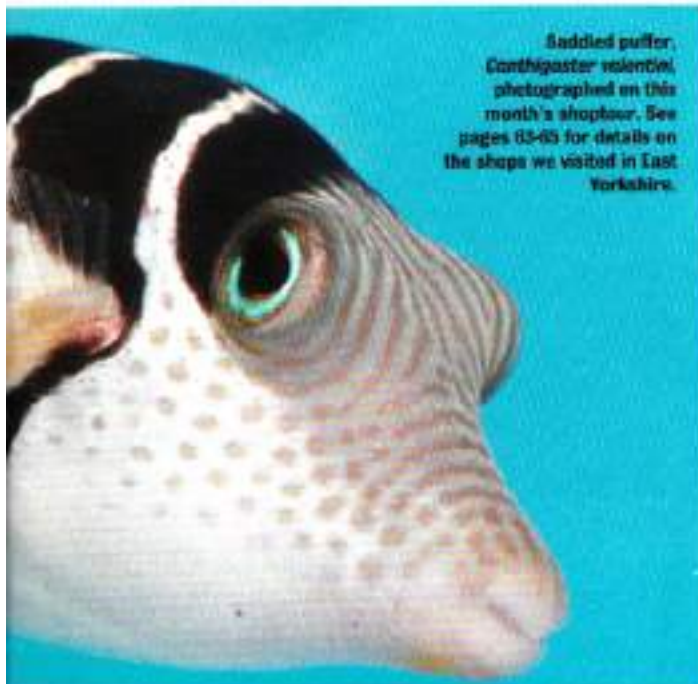
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Sam Hayward



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Perfect gram



Illustration: Scott Michael

Looking for the ideal fish for your reef tank? Scott W. Michael explains why grammas and reef basslets make such excellent choices.



mas

CLOCKWISE FROM MAIN
PAGE, TOP LEFT:
Liporopsoma rubrum;
Gramma malaccana;
Two new species:
Yellowtail reef basslet;
Reynolds Reef basslet.

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There's a vast array of amazing fishes available in the marine hobby. But unfortunately, many of these are ill-suited to smaller and medium-sized aquariums, or are difficult to keep for other reasons. Here we'll take a look at grammas and reef basslets – both ideally adapted to living in confined spaces, and beautiful, too.

Grammas

If you are looking for a fish that is not only lovely to look at but durable and relatively congenial to its tankmates, then the grammas are for you. These fishes (family Grammatidae, genus *Gramma*) readily adapt to captive life and can be housed in small to large aquariums.

The two that are most common in the trade are the Royal gramma, *Gramma loreto*, and Blackcap basslet, *G. melacara*. These two are found in shallows as well as at great depths, though *G. melacara* is found more often in deeper water.

The Brazilian gramma, *G. brasilensis*, is sporadically imported from Brazil, while the rare Dusky gramma, *G. linki*, is a deepwater, less colourful form. Even more uncommon are the *Lpogramma* spp. These tend to be more delicate, cryptic fishes that reside in deep reef habitats. Because it is costly and potentially dangerous

to collect them, they command high prices. I would only recommend the *Lpogramma* spp. to the more advanced fishkeepers.

The Royal gramma is ubiquitous in the aquarium trade – and for good reason. It is not only beautiful, but also durable. Even though they are hardy, they do have some special care requirements.

Royal grammas appreciate lots of hiding places in which they can quickly dart into if threatened. They are best kept with passive fishes rather than overly antagonistic species (eg. large damselfishes, some hawkfishes, triggerfishes).

If you choose to house them with fish that are potentially aggressive, the gramma should be the first residents. If they are the recipients of harsh treatment from tankmates, they will hide constantly or cower in an upper corner of the aquarium.

Royal grammas will viciously defend a preferred hiding place from intrusion. They will threaten conspecifics and other fishes by swimming towards them with their mouths open wide.

When aggression escalates between two Royal grammas, they may lock jaws, head shake or nip at each other's fins and bodies. When this happens, it is important to separate them before permanent damage occurs – I have seen individuals severely injure the skeletal elements of the jaws during these ritualised battles.

However, it is possible to keep more than

one gramma in the same tank. For instance, several juveniles can be kept in aquariums as small as the standard 114 l / 25 gal., but if you want to keep more than one adult, you should put them in an aquarium of 208 l / 45 gal. or larger.

If you want to keep a group of grammas, ideally it should comprise one medium-sized or large individual and two or more smaller specimens (the latter is dependent on how large the aquarium is).

The only difference between the sexes is size. On average, males are larger than females and attain a greater length. Therefore by placing one larger fish and several small fish in an aquarium, you are increasing the chances that you will acquire one male and several females.

If you have a smaller aquarium (less than 114 l / 25 gal.), you should keep only one gramma, or possibly a known male-female pair.

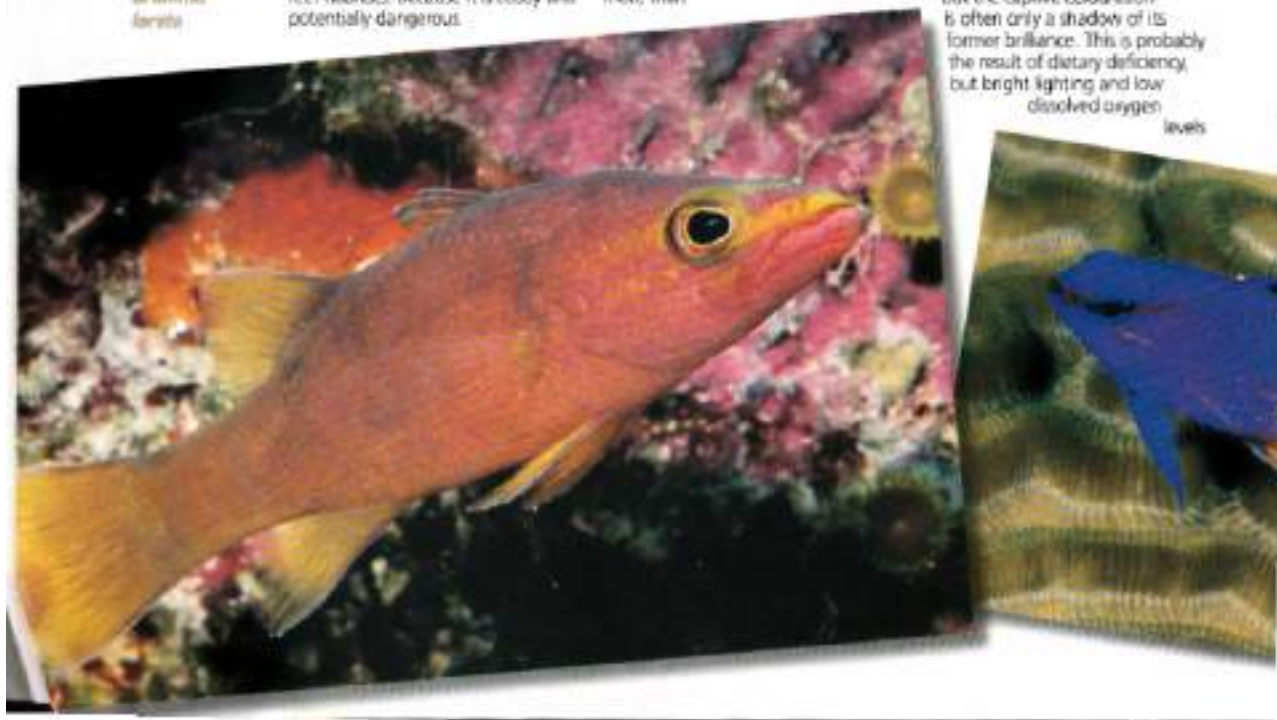
A vertical reef wall, whether composed of live rock or artificial corals, will provide the gramma with a habitat similar to that which they prefer in the wild. If you're keeping more than one gramma or other planktivores, it will also help to increase inter-individual distances, which will help to curb aggressive encounters. The gramma can also jump out of an open aquarium.

One of the biggest drawbacks in keeping this resplendent fish is that its colour often fades in captivity. The gramma may still be attractive even after this chromatic change, but the captive colouration is often only a shadow of its former brilliance. This is probably the result of dietary deficiency, but bright lighting and low dissolved oxygen

levels

BELOW, LEFT:
Digramma
mitratum

BELOW, RIGHT:
Gramma
loreto





009
Ugroponomus
parensis

01009
Ugroponomus
armatus

are also possible causes. Grammas will eat a variety of flake, frozen and fresh foods: the more varied the diet, the less rapid or less likely you'll see colour loss.

The Royal gramma is not a threat to most ornamental invertebrates. As a result, it makes a great addition to the reef aquarium. Note that some shrimps, like smaller members of the genus *Periclimenes*, are potential prey for a larger gramma.

As far as invertebrates go, the Elephant Ear anemone, *Amplexidiscus fenestrifer*, poses the greatest threat to grammas. It feeds by slowly closing up around prey that rest on its disc. And grammas have fallen victim to this large, predatory coralimorpharian.

Carpet anemones, large clabs and piscivorous mantis shrimp (most species found in live rock do not fall into this category) are other inverts that may pose a threat.

The Royal gramma is a protogynous hermaphrodite, meaning that females transform into males. Males defend a small cylindrical hole or narrow crevice, often on the side of a coral head or under an overhang, which will serve as a nest.

The gramma uses algae, sea urchin spines and sponge to cover the depression or seal secondary holes that lead to the nest. The male hovers in front of the primary opening or sits in the hole with only its head protruding.

If an intruder approaches, the male defends it by moving



towards the intruder with its mouth wide open or contorting its body into an S-shape.

The male also maintains the nest, adding pieces of algae that he rips from the substrate or catches in the water column. He also removes detritus from the hole.

Microalgae and filamentous algae are attached to the wall of the nest and provide a framework to hold the eggs in the nest. The male will lead the female into the hole where she lays 20-100 eggs, about 1mm in diameter. In the aquarium they are reported to hatch in 5-7 days, usually after dusk, while in the wild they hatch in 10-11 days (the rate of embryonic development is probably temperature dependent).

At hatching, the larvae range from 2.85-3.78mm long. The male guards and tends to the eggs until they hatch, and the pair continue to spawn every day, or every other day, for a month or longer.

The fry can be attracted to the surface and a specific part of the aquarium using a light. They eat rotifers and newly hatched brineshrimp and grow quickly. Spawning is not a rare occurrence in aquariums.

The other grammas are similar in their care requirement, except for two issues. First, they tend to be more aggressive than *G. loreto*. As a result, only one should be kept per aquarium unless the tank is very large. These other grammas are also likely to pick on their royal cousin.

Another difference between *G. loreto* and the remaining gramma family is that most others, especially *G. melacara* and *G. irani*, are captured in deeper water. As a result, they tend to suffer more from decompression-related maladies. Avoid buying specimens that have difficulty maintaining their position in the water and which swim in a laboured fashion, with the tail higher than the midline of the body.

These individuals usually spend most of their time wedged in a crevice in order to avoid floating to the surface and are usually suffering from swimbladder malfunction as a result of improper collecting techniques.

Reef basslets

The reef basslets (family Serranidae, genus *Ugroponomus*) are some of the smallest members of the grouper family. They range in size from 3-



News

These news stories come from the Practical Fishkeeping website. To read them in full – and hundreds of others – visit: www.practicalfishkeeping.co.uk

Alien fish from Asia spread in UK rivers

An invasive fish species, which poses major threats to UK fish, has been found in rivers and lakes across England and Wales, according to new research published in *Fisheries Management and Ecology*.

Past studies have shown that the Asian Topmouth gudgeon, from eastern Asia, can spread an infectious parasite that is closely related to 'Rosette Agent', which is deadly to salmon and trout.

Lead author Adrian Pinder, from the Centre for Ecology & Hydrology in Dorset, said: "This new work has identified 25 populations of Topmouth gudgeon in England and Wales."

"Ten of these populations are currently thriving in ponds and lakes which, due to their location and water connections, pose a direct threat to native fish in major UK rivers including the Trent, Severn and Yorkshire Ouse."

He added: "The threatened rivers contain many highly

valuable coarse and game fisheries, and are also linked to the extensive canal network which will provide further means for Topmouth gudgeon to disperse across the country."

Co-author Robert Britton from the Environment Agency commented: "Non-native species almost always have an irreversible effect, and so pose a strong threat."

The gudgeon is a silver fish growing up to 10cm/4", and is one of the most invasive fish in Europe.

It also eats the eggs of native species and competes for other food sources.

Earlier in 2005, the Environment Agency removed the Topmouth gudgeon from the Ratherheath Tarn near Kendal, in Cumbria.

They trapped native species, poisoned the lake and then slowly reintroduced indigenous fish.

An agency spokeswoman said they may have to take similar action in other areas to stop the fish spreading. – BBC

Humming the love tunes

A small fish with a remarkable hearing system that enables females to zero in on the love hums broadcast by males during spawning is providing scientists with clues that some day might treat people with high-frequency hearing loss.

Researchers from the University of Washington and Cornell University duplicated a natural physiological change that occurs in the female plainfin midshipman fish, *Pomichthys notatus*, during the

breeding season.

Working with non-reproductive females, the researchers boosted hormone levels that alter the fish's inner-ear hearing sensitivity for a short period so they can better hear the males' humming calls.

"This is the first time anyone has been able to hormonally induce a change in hearing sensitivity in a vertebrate," said Joseph Sisneros, a UW assistant psychology professor and lead author of the paper in the

journal *Science*.

The researchers found that a spike in levels of the hormones testosterone and estradiol (an estrogen) triggers changes in the females' inner ear so they are capable of detecting higher frequencies in the males' multi-harmonic humming.

The midshipman fish live in deep water off the Pacific Coast of the United States for three-quarters of the year. They move into shallow intertidal zones to reproduce. Males

build nests under rocks and begin broadcasting their loud humming love calls.

The research might have human applications. For instance, other experiments suggest that hormones may cause changes in the hearing sensitivity of women at stages of the menstrual cycle. Ageing can also bring about hearing loss, with higher frequencies fading first along with a natural drop in testosterone and estrogen. – uknews.org

More fish news: Visit the Practical Fishkeeping website on

Inquiry as 10,000 canal fish die

Thousands of fish have been killed in the Grand Union canal, prompting an investigation by the Environment Agency.

All the fish were bream, and deaths were confined to a 50m stretch of the canal near Tring, in Hertfordshire. Initial tests at the scene showed the water quality was normal, though further samples will be analysed in a laboratory.

Environment management team leader Steve Boddy said: "We are investigating a number of possible reasons for this

fish kill, and will be carrying out further investigations over the coming days.

"All of the affected fish are bream and come from this year's spawning."

In total, 10,000 fish died in the unexplained event.

Officers at the scene this week did not see any signs of fish in distress.

If you should ever see signs of fish in distress in canals, you can call the agency's hotline number on 0800 807060. - BBC

On the road...

Members of Kirkcaldy Aquarist Society recently travelled hundreds of miles to buy unusual fish at some of the country's top specialist fish shops.

Club member Mike Dewar told PFK that the group left Scotland in the early hours of the morning so they could take in a number of shops on the trip.

"As a club we have various levels of knowledge and fish requirements," he said, "so when it comes to trips we try to get to large outlets, like BAS, and specialist catfish shops like Pier Aquarists. And Sid at North Lakes Aquatics in Perth has such a varied stock that we'd be able to

miss him! This trip allows a large group of members to go, outside club nights, and makes for a good social event."

Members picked up a great selection, including *Nannostomus mortenhalleri*, *Crenuchus spilurus*, *Betta pi*, *B. parosphena*, *B. ruzickae*, *B. ensae*, *Brochis multiradiatus*, *Corydoras concolor*, *C. ornatus*, *C. sp. C121*, *Aspidoras sp. C125*, the Zebra otocinclus, *Osteobrama neri*, *Puntius ashmeadi*, *P. dorsalis*, *P. narayani*, *P. parviteris*, *Nitidulprologus ocellatus*, *Alopioprologus calvus* and some *Hyalobagrus flavus* (formerly *Pelteobagrus ornatus*).

■ Fancy going along?

If you'd like to go on one of the club's excursions, why not join the club? It's a very active group, with 30-35 people at every weekly meeting.

Mike told us: "We are always looking for more members. Anybody with an interest in fishkeeping will be made very welcome."

■ The club meets at 21 Junction Road, Kirkcaldy. Doors open at 7.30pm. Contact Mike or Jill on 01592 757089, or call Joe on 01592 782964.



We want your club news!

PFK is starting a new section for clubs. We want all your news including club results, show results, reports of club activities... in fact, anything that you'd like to report. Send your reports to Ian Fuller,

c/o Practical Fishkeeping, Britton Court, Britton, Peterborough PE3 6BZ.

Please note that you'll have to send in your story discs via the usual method on the PFK website.

NEWS IN BRIEF

● SHARE A FISH JOKE AND WIN

Madasa fish has announced its latest competition where you can win one year's worth of wireless 8MB 3GPP Broadband simply by sharing your best joke about a fish. The value of the prize is over £328.88 and includes a free Voyager 2110 wireless router, free domain name, free static IP address and free newsgroup access.

"We're already offering the best value broadband service in the UK," stated Matthew Herbert, head of marketing. "So it's gotten even better for the person who provides us with the fish joke that we find the funniest. Winners will receive a limited edition Madasa fish gift pack which includes a T-shirt and coffee cup."

Visit www.madasa.fish.com/fun/

● GLOBAL WARMING HARMING FISH

A report by the World Wildlife Fund has shown that global warming could stunt the growth of some fish, resulting in lower offspring as a result of insufficient food supplies. And if winter temperatures do not drop below a certain level, temperate fish like salmon, codfish and sturgeon cannot spawn at all. Freshwater fish also face the threat of suffocation as waters grow warmer. As fish move to cooler waters, other species can suffer. In the Gulf of Alaska in 1995, around 120,000 sea birds starved to death as they were unable to find food enough to reach their relocated prey.

● MALE FISH DEVELOP FEMALE SEX ORGANS

Scientists have discovered sexually altered fish off the southern Californian coast, raising concerns that treated sewage discharged into the ocean contains chemicals that can affect an animal's reproductive system.

Intersex in male are not new, but most previous instances were in freshwater. Environmentalists say this is the first time this has been observed in ocean fish.

Scientists caught 94 bottom dwelling fish near sewage pipes and found 11 had ovary tissue in their testes. DDT, a pesticide banned in the US 50 years ago, may be causing the abnormalities as Los Angeles sewers served as a dumping ground for DDT, starting in the 1930s - Bloomberg

● BEING SEAS FORCE ISLANDERS INLAND

Rising seas have forced 100 people on a Pacific island to move to higher ground. Because of modern global warming, a UN report said. With coconut palms standing in water, villagers on Teqea, Vanuatu, were forced to move 600m inland.

Scientists warn seas could rise by almost a metre by 2100 because of melting ice caps and global warming.

Pacific Islanders, many living on coral atolls, are among those most at risk.

Two uninhabited Kiribati islands, Takauea and Aburatsubo, disappeared underwater in 1989 - Reuters

News

'No place for fish left to hide'

Conservation groups have warned of the danger that fish stocks could run out completely. Numerous popular and once-prolific US fish species have been reduced to 1-10% of their original populations says Oceana, an international ocean protection organisation.

Oceana's chief scientist Michael Hirshfield said that with the global market for fish growing and improved technology to find what fish are left, "there's no place left for a fish to hide". Fishing fleets were built up too

quickly, and as fish became harder to find, fishermen began to take advantage of technological advances including sonar, sea-floor mapping and global positioning satellite data. Endangered fish include the Yellow-tail flounder, Atlantic halibut, Red snapper, Warsaw grouper and Atlantic cod.

Scientists agree that humans are now fishing the last 10% of the Atlantic cod population, while the sturgeon of the Caspian Sea, a traditional source of caviar, is nearing extinction. — USA Today



Fishing 'wastes' 20% of catch

American commercial fisheries kill a pound of fish for every four pounds intentionally caught, jeopardising efforts to restore struggling stocks.

A tally of the nation's yearly unintentional bycatch (unwanted fish that are caught and, in most cases, die before being thrown overboard) was conducted by scientists. The study was sponsored by environmental group Oceana and published in the December

issue of *Fish and Fisheries*.

It found that 1.1 million tons of fish annually are thrown away as dead with every 4 million tons caught in commercial nets.

Andrew Rosenburg, dean of the University of New Hampshire's College of Life Sciences and Agriculture, said: "This sort of waste undermines efforts to recover those depleted resources." — Associated Press

Bound volumes

If you are looking for all 13 issues of *Practical Fishkeeping 2004*, we still have a few sets of our bound volumes left. But you need to hurry because once they're gone, they're gone!

At £40, they represent remarkable value for money. To place your order, call Hannah Travers on 0870 082 2125.

TAXONOMIC RESEARCH

PLAGIOSIONID GENUS REVISED:

The South American tropical fish genus *Plagiosion* has been revised and the number of species it contains dropped to five — *P. squamosissimus*, *P. aratus*, *P. magdalenae*, *P. termis* and *P. maris*.

The genus, a member of the family Serranidae, is found in freshwater, but most specimens are marines. — *Zootaxa*

GORIO DELTAI: A species of gudgeon has been described from Ukraine. It is believed to be at risk of extinction, as large

quantities of water are being removed from the river for irrigation. It has a short barbel, which reaches to the anterior margin of the eye or just in front, and scales between the pectoral fins. Mature males are a dark grey. — *Ichthyological Exploration of Freshwaters*

SYMBRANCHIUS LAMPREIA:

A tropical freshwater eel has been found in northern Brazil. It belongs to the family Symbanchidae and is one of three members of the genus. It differs from its congeners, *S.*

monmerous and *S. madina*, by its distinctive large round black blotches on a light yellow-brown background, interspersed with smaller brown speckles among the darker spots. — *Neotropical Ichthyology*

NEW CATFISH GENUS:

Heek Ng of the University of Michigan and John Sparks of the American Museum of Natural History have named a new catfish genus, *Gogs*, from Madagascar, in the latest issue of *Ichthyological Exploration of Freshwaters*. They also

described two new species, *G. arcuatus* and *G. aratus*, as well as a third species, *Anchorus grous*. The genus is distinguished from *Anchorus* through differences in the number of rays in the anal fin, the morphology of the barbels and the shape of the snout and the position of the mouth on the fishes' head. The paper is the 100th published by Ng, who is fast becoming one of the world's most prolific publishers of papers on the systematics of catfishes.

The PEOPLE'S POLL

What fish did you start the hobby with?

Were you one of the hundreds of people who won a goldfish at a fair and never looked back? Or did a friend's tank provide the spark?

I got my first Saturday job in a fish shop, and cichlids caught my imagination. My boss encouraged me to read all the magazines and books in the shop, and before long I had a tank of breeding Convicts!
Simon Morgan, Cambridgeshire

Five years ago my girlfriend bought me a goldfish bowl with a Moor and a Comet. It was a nice thought, but I knew the bowl was not a good environment. So as not to offend her, I bought a Tropiquarium 55, explaining that they would soon outgrow the bowl. Later I turned to tropicals and now have a 120 l. community tank.
James Petworth, London

The first time we saw a marine aquarium was six years ago in Cromer. Couldn't believe it when the owner said it took a year for the system to mature... Four years later and with no experience

at all, we jumped in at the deep end. Our reef tank has been running successfully for almost two years now.
J Vasey, Norfolk

I started with coldwater, couldn't afford the equipment, but was given a secondhand 6' tank. Kept a mirror carp, tench, three to four roach, a golden rudd, gudgeon and a few minnows. All it had was a gravel base and wild plants. They fed on maggots and worms; quite a mess. I was around 10.
Steve Newsome, West Yorkshire

My first tropical tank came from the green shield stamp catalogue 30 years ago, my reward for sticking hundreds into the saving books. It was a small 18" tank that came with some basic equipment. First fish were Neons and Guppies, but I have never lost the thrill of setting up a new tank.
Melvin Cooper, Mid Glamorgan

Goldfish seemed a good choice as they are friendly to each other and don't require a heater. I soon progressed to tropicals as I was attracted by the amazing variety of species and colours. Started at 14, now 31!
Nicki Woolford, Wiltshire

Someone gave me a 40 l. fishtank when I retired. I put it in the kitchen so I could see it whilst eating. Four little guppies were my choice... it wasn't long before there were 24. A larger tank was needed and so I became hooked. Now I enjoy watching my rainbowfish and Corydoras.
Margaret Ewart, West Lothian

I was given my first tank around 25 years ago and I thought coldwater fish were easier to keep. Looking back, I can't believe the goldfish survived. I filled the tank straight from the tap, changed all the water when it started looking a bit murky and cleaned the sponge filter with washing-up liquid! And I never lost one fish!
Peter Chadwick, West Yorkshire

My first buy was amateur and disastrous. I bought two angelfish and two tiny Neon tetras that I put in the same plastic bag! The tetras disappeared that night, but the angelfish greeted me with an enigmatic smile the next morning.
Louis Grech, Malta

The shopkeeper sold me 'Cichlasoma severum', the first fish I ever kept. Boy did they fight, almost put me off keeping tropicals, but fortunately,

I learned! He told me they were Discus and very peaceful. Now I know the truth, and life is good.
Paul Mahoney, Essex

My mum and brother went to a fish show when I was about six. To my delight when they came home, they had bought me a 2' tank and bags of tropical fish.
Raymond Ellis, South Yorkshire

I was fascinated by the tropical fish at Manchester Airport five station, where my dad worked. I started fishkeeping at 10 when a shipment of Sailfin mollies were left on the Tarmac unclaimed. I got two pairs that quickly turned into 30.
Chris McNally, Merseyside

I started with a fairground goldfish, Eric, who lived for about six years in a small tank before the cat ate him!
Emma Judson, Manchester

Next month's poll

Should fish such as albinos and long-fins be produced by breeders to create sales? Breeders are increasingly manipulating fish to create new strains, eg. balloon mollies and long-fin Oscars and Koi. Is this ethical? Send us your views.

HOW YOU VOTED

What fish did you start the hobby with?

COLDWATER

10%

MARINE

0%

TROPICALS

89%

www.practicalfishkeeping.co.uk

Don't neglect your lighting

Craig Baldwin, of Sparsholt College and Aqua One, explains why the correct lighting is essential in both freshwater and marine aquaria.



One area of fishkeeping often neglected is aquarium lighting. Effective lighting not only enables you to view the contents, but it also enhances the colour of fish, plants and invertebrates. Inappropriate lighting may not only have a direct effect on the welfare of plants and corals, but may also impact the health of fish.

Keep watching...

Our fish, inverts and plants have developed complex behaviours that they exhibit when they are healthy and stress-free. The slightest deterioration, however, such as a variation in water quality, a change in the quality of food or even the appearance of a predator or competitor may lead to changes in these behaviours.

These become more and more

exaggerated as the conditions deteriorate until the animal cannot cope and becomes exhausted. At this stage, it is likely to suffer from physiological damage, even if its environment is returned to its former stress-free state.

As an example, the feeding frequency of goldfish will reduce to zero when exposed to low concentrations of dissolved oxygen. Many other aspects of behaviour such as gill movement, swimming speed or patterns and colour changes have been used as an indicator of any deterioration within the aquatic environment.

By detecting these subtle changes, you may be able to reverse any deterioration before it begins to affect the long-term health of the inhabitants. Using the appropriate form of lighting enables you to observe the slightest change in the behaviour of your stock.

Corals and plants

The health of many species is directly related to the quality and quantity of light they receive. They use the energy from lighting as a means of powering photosynthesis on which their health depends.

Those that concern us most are the microscopic symbiotic algae, or zooxanthellae, which inhabit the tissues of many marine corals, and the tropical aquatic plants that we grow in our freshwater aquariums. Improper lighting may lead to a range of health and other problems.

It is possible to measure the intensity of light, but most fishkeepers do not have the specialised equipment required to measure light intensity. Instead, they rely on wattage as an indicator.

Some fishkeepers have grown corals successfully by illuminating them with a lighting system that

produces approximately 1-2W of light per litre of water, while many aquatic plant specialists have achieved notable success by providing their plants with a level of illumination equal to 1-2W per 2 l.

However, as the wattage of a bulb does not provide an accurate estimation of light intensity, many fishkeepers prefer to use the concept of colour temperature as a means of estimating the lighting requirements for their species.

Colour temperature and colour spectrum

The colour of light may often be referred to as warm or cold. A white light that contains a comparatively high proportion of red or yellow light may be appear 'warm', whereas light that contains a bit more blue light is referred to as 'cool'. Assigning each mix of colour components as colour temperature, given as degrees Kelvin (°K), can assess the warmth of each colour.

To understand colour temperature, think of an iron bar that is slowly heated up and changes from a dull grey to a warm red. This latter has been allocated the colour temperature of around 3500°K. As the bar is heated further, it slowly takes on a bluish hue, which is allocated a colour temperature of around 6000°K.

The spectrum of colours produced by any bulb may be equated to the rainbow of colours that is produced when the light is passed through a glass prism.

While sunlight may be considered as a mix of colours, many of the light sources produced for the aquatics market are designed to produce a particular range of spectra to match the specific requirements of corals or plants, all associated with the environment in which they have evolved.

As the red colour spectrum cannot penetrate more than 5m through clear water, photosynthetic organisms below this depth would not be exposed to red light and will have evolved the ability to use the blue colour or spectrum of light that can penetrate this depth. Consequently, marine algae and many corals need a very high proportion of blue light to survive.

Photosynthetic organisms that inhabit shallower water or even grow above the surface of the water, such as aquatic plants, will have evolved the ability to use a far greater proportion of red light, and could not survive if provided with



the same blue light as required by marine zooxanthellae.

Choice of lighting system

■ AL Series

Inexperienced aquarists might well install a tank without considering lighting, only to find that they are unable to appreciate the myriad of colours associated with their fish. Many others will have an established lighting system that requires supplementation before it can support the light-sensitive species of plants or marine corals.

The AL series of Aquarium Reflector lights is an ideal means of adding a primary light to almost every aquarium, and is also an effective means of supplementing an established lighting system. The lights can be installed within a hood or positioned on the support bars of an open-top aquarium.

The standard tube fittings ensure that one can install almost any form of TB fluorescent bulb to suit the requirements of most species, while the polished aluminium reflector ensures that maximum light is directed into the aquarium.

■ T5 and compact T5 luminaires

The recent popularity of open-top aquariums has been stimulated by the awareness that aquarium covers can dramatically reduce the amount of light entering the aquarium. Besides, many people enjoy the fact that open-top tanks enable their plants to grow naturally from the surface of the water.

By replacing their lighting with one of the PR series of over-tank luminaires from Aqua One, the aquarist is able to enjoy an open-top aquarium while the aluminium finish provides the anti-corrosion qualities required for the most demanding marine environment.

Light fittings within the PR series also enable one to match the

specific lighting requirements of almost every light-sensitive species to the range of fluorescent bulbs that are currently available.

■ Metal halide & combi systems

Metal halide lamps may be regarded as the only form of lighting that is capable of providing the intense lighting required by many corals and plants. The 'rippling' light effect associated with metal halides provides an attractive feature, mimicking the wave-induced flashes of intense light that enhances the growth of many corals. However, many corals and plants also require a combination of fluorescent lights to provide them with a specific spectrum or colour of light.

By combining a high light-intensity metal halide bulb with a range of colour spectrum that is associated with fluorescent bulbs, the Aqua One combination system will meet the needs of the most demanding coral or plant.



TIPS

- The output or spectrum of any bulb will begin to decline as soon as it is turned on. Replacing it within the manufacturer's recommended period of time will help to maintain the health of any photosynthetic species by ensuring they are provided with correct light.
- Up to 50% of the intensity of light may be reduced by a dirty cover slip and light cover, so keep them clear! Many successful marine coral and aquatic plant keepers remove the covers that normally cover their aquariums.
- The impact of any lighting can be increased by adding a reflective cover.
- Even the smallest light system may generate a lot of heat. Ensure any fittings or materials that are located close to any lighting systems can withstand this source of heat.
- The iridescent colours of fish such as Neon tetras, Siamese fighting fish or even goldfish and Koi with a red pigment may be enhanced by installing a light that produces a red spectrum of light.

LEFT: Over-tank lighting.

RIGHT: Metal halide and AL Series lighting.



love

Guppy

From humble beginnings, the Guppy has captured the hearts of millions. Yet breeding them really requires some thought to prevent problems. **Derek Jordan** explains.

There is a popular belief that Guppies are a hardy fish which can be neglected, yet still flourish, and that they are a fish for the beginner. Now, although many fishkeepers started with Guppies, over the years the species has encountered some quite bad press, mainly due to overbreeding and inbreeding issues.

However, there is absolutely no reason why you cannot have a perfectly healthy tank of these stunningly coloured fish. As Guppies are easy breeders, with a little care you can optimise your chances for a healthy, vibrant stock.

Getting down to basics

A breeding set-up should be designed for easy maintenance, especially as chances are you'll end up with loads of tanks! I keep my breeding tanks in the bare mode, so no plants or gravel. Small tanks will suffice: 25 l/5.5 gal. for a breeding trio and 36-45 l/8-10 gal. tanks for growing on. As a rule of thumb, allow 2.5cm/1" of fish per gallon to allow your fish to achieve their full potential. Some enthusiasts opt for higher stocking levels, which is fine if you carry out more frequent water changes. Don't push your luck as you could end up with stunted, poor quality fish.

As for filtration, I opt for air-driven corner filters or sponge filters with plenty of airflow. And I mean plenty, such that the water above the filter looks like it is boiling. Such a strong flow serves one purpose; it forces the fish to develop strong muscles, especially in the caudal peduncle. This helps the delta varieties hold their tails in a more natural way and not look like the tail is too heavy, making the fish look somewhat bent.

Ideal water parameters are pH 7.2 (normal range 6.8-7.8); 8-12°GH (normal range 4-20°GH); and a temperature for fry of 25.5°C/78°F; juveniles (four to eight months) of 24.5°C/76°F, and adults somewhat cooler at 23.5°C/74°F (normal range 10-29°C/50-85°F).

A Guppy needs 12 hours of lighting each day, best provided using 30-40W fluorescents mounted above your tanks. Don't be misquid into thinking that intensity matters. Duration is far more important, and a simple timer will ensure that the lights are turned on and off at the right time.

Care and maintenance

Guppies are omnivores, so offer as wide a range of quality flake food, live and frozen foods as possible. It is also better to feed small amounts every few hours than one gigantic food.

Frozen and live food are digested easier than flake food, so can be fed in larger portions. As a guide, if your fish do not eat all the food you put in the tank in two minutes, chances are you're overfeeding them – or they could be ill. If you overfeed your Guppies, the excess food passes through the gut without being properly digested and will foul the tank. Try to avoid feeding a diet rich in protein as this can cause constipation, causing a build-up of toxins in the fish's gut.

Which leads me to the point that fish create waste, and this waste creates both good and bad

Guppies are easy to breed, and with a little care, you can start to produce healthy, good quality stock of your own.

Who was first?

The Guppy takes its name from Rev. Robert John Lechmere Guppy, a conchologist, geologist and clergyman living in Trinidad. Although he is credited with discovering the wild Guppy in 1866, Spaniard De Filippi found the fish in Barbados in 1892 and labelled it *Lebistes poecilioides*.

However, even earlier in 1857 and 1858, amateur German biologist Julius Goltzer found Guppies near Caracas, Venezuela. He sent these fish to the Imperial Prussian Academy of Science, Berlin. The ichthyologists were apparently not impressed, gave Goltzer only a small reward and then promptly filed the specimens in its archives. There they remained until 1859, when Wilhelm Karl Hartwig Peters, head of the ichthyology department, wrote a scientific description of them.

Unfortunately, the jars were not well labelled and he only described the females as belonging to a new species, *Poecilia reticulata*. Some time after 1866, the males were found and labelled *Goniodius guppyi*. The females later adopted the name of the male counterpart.

The scientific name has undergone a number of revisions over the past 100 or so years. Finally settling on *Poecilia reticulata* (Rosen and Bailey, 1963). Rosen and Bailey also included *Mollis* in the genus.

loses some genetic diversity. Line breeding helps overcome this and keeps a strain true. Basically it combines inbreeding with a crossing from a related line every few generations, ensuring healthy Guppies for years.

The most common method is to break your strain into two lines for inbreeding. Then after three generations, cross the lines. A simple illustration of inbreeding is:

Line 1			Line 2		
P1	M	F	P1	M	F
F1	M	F	F1	M	F
F2	M	F	F2	M	F

Cross Line 1 F2 female (F) with Line 2 F2 male (M), and Line 2 F2 F with Line 1 F2 M.

Guppies are typically four months old before they can be bred, so to repeat the above for three generations would take about 12 months before your first cross. Also the more lines you run, the more diversified your gene pool will be.

Out-crossing

This refers to the mating of two unrelated Guppies. While inbreeding reduces the variations of your offspring and line breeding helps keep your gene pool intact, out-crossing corrects or adds a gene to your strain. For example, you may want to get a bigger dorsal fin, improve the colour or rectify a defect in the caudal fin. Or you may even want to create a totally new strain. Having said that, out-crossing is best not attempted by a novice for if you get it wrong, you could



Guppies can usually be bred from about four months old.



The Guppy has converted so many people to the hobby that it's been dubbed the Missionary fish!

lose the strain traits altogether.

With out-crossing, it's critical to ensure strains are compatible – some colour strains mix, others don't. For instance, crossing a variegated snakeskin with a half-black red results in a very mixed-up Guppy. You really need to keep the original strains pure.

Out-crossing demands plenty of tank space and patience to carry out the required backcrosses to end up with the results you want. You'll need to use established strains whose genetics are stable, meaning that all offspring look identical.

Finally, try the cross both ways – female to outcross strain and male to outcross strain; you may not know whether the trait you want is X- or Y-chromosome linked.

Backcrossing

This is where you breed, say, the male of a strain that you want to rectify a problem back to one of his daughters from the outcross, or the female of the strain back to her son from the outcross. The aim is to restore the strain to its original format, but with the trait fixed.

You may have to perform this a few times. The way to check is if the sibling-to-sibling mating produces replicas of the parents with the trait fixed.

The pioneer

Great Britain's pioneer in the fancy Guppy world was W. G. Phillips, born in 1865. During the Second World War, he sold his excess Guppies to a shop in London. Some months later, he returned to find that a few remained and had bred, with some of the offspring having unusual tail shapes. He took these home and over the next few years, perfected the now familiar Coffin Tail shape.

Phillips created the British Guppy judging standard, from which all subsequent judging standards have been drawn. He also developed and sent overseas the English Leopard Guppy or English Lake Guppy, which may have been the original source of all Snakeskins.

Phillips won over 300 awards for his Guppies, and his house in Kenton was a shrine to the enthusiast. He was not a secretive man but freely shared his Guppies and ideas, leaving behind a huge legacy today.

Next issue

Derek looks at how the Guppy develops, and identifies the critical stages that you need to pay attention to.

Join the club!

The British Livebearer Association is open to anyone interested in keeping and maintaining livebearing fishes, whether they are cultivated varieties or wild forms. For information on joining contact Dai Jones on 01275 876666, www.britishlivebearerassociation.co.uk

Ask the Experts

Got a query or a fishkeeping problem? PFK's expert team of fishkeepers is on hand to help.

You can email your questions to:
questions@practicalfishkeeping.co.uk

TROPICAL LETTER OF THE MONTH



THE SENIOR OF THE TROPICAL LETTER OF THE MONTH wins a TetraTec IN600 internal power filter. A key feature of the TetraTec IN600 is that there are the ease with which they are maintained. There is no need to remove the entire filter, as all components can be quickly and easily removed in situ. In addition, the flow rate can easily be adjusted, and the direction of the flow can be altered. The IN600 is suitable for tanks up to 200 l.

Are these fish endangered?

Q I have just bought a second tropical tank which I hope to stock with a small shoal of Dwarf rasbora, *Rasbora maculata*, and a similar number of Forktail rainbowfish, *Pseudomugil furcatus*. However, I want to be assured that these species are captive-bred rather than wild-caught.

SAM WATSON, VIA EMAIL

A *Pseudomugil furcatus* is 100% captive-bred – in fact, the number of wild fish exported from Australia can almost be counted on the fingers of one hand! The only wild stocks that are exported go to scientific institutions, and then only sparingly.

The Forktail rainbowfish is, of course, a native of Papua New Guinea, but all affairs of this country are run by Australia. Any captive-bred fish emanating from Australia (and again, there are only a few) are subject to licensed approval. Most are bred in Singapore, Thailand and Indonesia.

The situation with regard to the Dwarf rasbora, now *Borneria maculatus*, is less certain. These fish are found over a very wide

area, from Myanmar through to Indonesia. Many of those we see in the shops are captive-bred, as they are quite prolific and relatively easy to spawn.

There are also a lot of wild-caught fish in the shops, but I doubt whether the owners are aware of their origins. Orders are made

through an agent, not always to the exporter, but I think it is very unlikely there would be problems with over-collection of this species.

Most of the captive breeding of *B. maculatus* is done in Thai fish farms.

Neither species is on the IUCN or CITES lists.

PETE COTTLE



All pictures: The Guardian Group / practicalfishkeeping.co.uk, LINDA MANN



Sponsored by tetra - experts in fish health

Getting Platies in the mood

Q I bought some Platies (three females and a male) six weeks ago for my community tank, but they have not yet bred. Is a trigger needed to get them into breeding mode?

KARL BULLOCK, VIA EMAIL

A No, you don't have to trigger Platies to breed, but you can

bring them into condition with good tank husbandry and a varied diet of flake and live foods. Once impregnated, a gravid female Platy will take about 25 days to drop her brood, so you may just need a bit more patience to see results.

A good sign is the male chasing the females – once this happens, a brood of babies is not usually far away. But if you do not have plenty of cover in the tank, they may fall victim to hungry tankmates.

JOHN RUNDLE

BELOW: Good tank maintenance and a varied diet is all that Platies need to begin breeding.



Why not try the natural approach?

Q I am returning to fishkeeping after a 20-year break and setting up a planted community tank. What type of filtration and which plant species would you recommend?

FRANZ MCCONNELL, EAST KILBRIDE

A I suggest you try the latest technique, which is the natural approach. I have a substrate of 6cm/2 1/4" of Tetra aquatic soil, covered by 5-8cm/2 1/4"-3" of fine silver quartz gravel 2-4mm in diameter (available from any

Dennertle dealer). Obtain a plant collection via mail-order to suit the size of your tank and put the plants in 'dry'. Then add water carefully, so as not to disturb the substrate and preserve clarity.

Once this kind of tank is set up, it is very economical to run as the organic matter in the substrate creates natural CO₂ and the soil is rich in minerals and nutrients. This low-tech approach works incredibly well, especially if you keep fish stocking levels low. Whatever you do, avoid using pea gravel.

If you wish to augment the natural production of CO₂, you could try a simple yeast-based system and then move on to a bottle-based set-up. The price of these is coming down all the time.

PETER BRADLEY

YOUR TROPICAL EXPERTS

Write to us using the form at the end of the Ask the Experts section or email questions@practical.fishkeeping.co.uk and we'll forward your query. Please note we can't offer a quicker service for email queries as every question has to make its way to the 'top of the pile'. Please include a stamped, addressed envelope for letters sent by post.

PLANTS

PETER BRADLEY is our plant expert

HEALTH

Dr **PETER BURGESS** is an expert in fish health. He lectures at Plymouth University

ROBUSTLY

ROHANE HARDWICK of Aquatic Arts has a huge knowledge of cichlid fish

LIVERWEEDS & DETRITUS

JERRI HANCE is a fish breeder and expert on liverworts and detritus

DICTION

CHRIS HADRI is a cichlid expert and part-time lecturer at Southend College

LARGE CATFISH

DAVID LAYLEY is a large fish and big fish specialist

AKABANTOIDS

ANDREW SMITH of the Akabantoid Association of Great Britain, is an expert on Akabantoids

WATER QUALITY/GENERAL

Dr **BLAN EVANS** of What? Aquatics, has a vast amount of fishkeeping knowledge

TECHNICAL

Dr **DAVID FORD** has many years of experience

UNDERMOUNTED CATFISH

(PART 2) **JULIAN SIGALL** is the UK's beloved Planted Catfish man. He's kept catfish all his life

BRACONID BEETLES

Dr **NEAL MOSES** runs a specialist website (mosesfish.co.uk)

RAUBMOON, CYPRINID & POND LIFE

PETE GETTLE has 40 years' fishkeeping experience and 25 years as a Glass A show judge for the UK



Ask the experts

Albino cat eggs always vanish

Q I have three bristlenoses – a brown male and female, and an albino female. The two brown fish breed regularly and successfully, but when the albino female lays eggs, they disappear within 24 hours. I notice that she hangs around the cave for a while

after laying, unlike the brown female which disappears to the other end of the tank.

Do you know what might be the problem? I have bred fish from a brown x albino combination before.

JANE LEEDER, VIA EMAIL

A It sounds as though the eggs are not being fertilised – cave-spawning plecs will not tolerate unfertilised eggs and the entire clutch will be ejected.

There are other circumstances that will cause a male to reject

a clutch, such as inexperience, but as your male has successfully spawned with the brown female, so we can rule that out.

Bear in mind that there are many species of bristlenose that range from Argentina to Brazil. While you may have crossed brown and albino before, the parents may have been genetically closer to one another than the pair you currently have.

What I'd initially do is find an albino male bristlenose and see if it spawns successfully with your female. Try to ensure it is of the same species, or you'll muddy the water further with hybrids.

JILLIAN DIGNALL



An inexperienced male bristlenose could reject a clutch of eggs.

A healthy tank – then casualties

Q Having upgraded from a 180 l. to a 300 l. tank, I successfully moved a plec, five Clown loaches, three Rainbows and a barb. Eight weeks later, I added four Polka-dot loaches, but a month on, three had died. The water parameters were fine, except for slightly elevated nitrate levels.

My Clown loaches became lethargic, and one died a few days after the Polka-dots. There were no obvious signs of disease, so I treated the tank with Protozin. The Clown loaches seemed livelier after

this, but subsequently one of them jumped out of the tank during maintenance and landed on the glass bracer. Sadly, she died later that night.

What could be wrong with fish which, until I obtained the Polka-dots, had been disease-free since 2001?

KEITH GRIFFITHS, VIA EMAIL

A Without any tell-tale symptoms, it isn't possible to say whether parasites or some other infectious disease was to blame. Had the Polka-dots been infected with, say, skin parasitic protozoa or flukes, I would have expected them to show symptoms sooner.

Despite your water checks, I wonder if some undetected problem could have caused the loach deaths? Were you routinely

monitoring for ammonia and nitrite as well as nitrate? Or perhaps your water test kits are past their use-by dates and unreliable? Also consider whether you have added any items of decor (ie. rocks collected from the countryside) that could slowly be leaching metals or other poisonous chemicals. If in doubt, remove them.

The final Clown loach death was most likely the result of stress or damage caused by jumping out of the water.

Keep a check on the water conditions, and if the rest of your fish remain in good health, it should be safe to buy more stock in a couple of weeks. If you still have that 180 l. tank, you could use it to quarantine new arrivals for a week or two to minimise the risk of introducing disease.

PETER BURGESS



Sponsored by tetra - experts in fish health

Are Clowns snail-eaters?

Q My 120cm/48" community tank is infested with snails, which I suspect came in with mail-order plants. Among my fish are four adult Clown loaches, which I thought were good at controlling snails – but maybe mine haven't read the right books...?

A Do mail-order companies make any attempt to rid their plants of snails before despatch? I syphon out my snails regularly, but it's a losing battle.

W. TURPIN, CHELTENHAM

A There may be an element of myth surrounding the Clown loaches' supposed fondness for snails. In tanks of mine where these fish were present, I never saw a snail, but I once inadvertently asphyxiated some Clown loaches with CO₂ and within hours of their demise, the snails were back. I guess



LEFT: Are Clown loaches not the avid snail eaters some would have us believe?

the fish keep the molluscs in hiding, and no doubt eat a few as well.

Aquatic nurseries do make sure their plants are snail-free by giving them a good wash before they are sold. However, from what I have just told you, you may decide that the snails were around for far

longer than you thought.

Syphoning is a good, safe means of control. The best time to do this is early in the morning, when you'll remove most snails just before the tank lights come on. This is when they are out on the gravel feeding.

PETER BRADLEY

Good food means healthy fry

Q I am breeding some of the common livebearers, but there is a high mortality rate among the young. Could this be down to the wrong diet? What would you recommend I feed them?

STEPHAN BERTON, BIRMINGHAM

A The best way to ensure fish are getting all the nutrients they need is to give them a varied diet. Baby livebearers can be started on newly-hatched brine shrimp and live microworm, moving on to crushed quality flake and powdered fry food. Both young and adult fish will benefit from flake, frozen bloodworm and whiteworm.

If you are using a breeding trap to confine gravid females, may I suggest that you place them in their own tank with plenty of plant cover for the young to take refuge in.

JOHN RUNDLE



LEFT: The Violet dragon goby grows to at least 30cm/12", and likes to hide during the day.

Wanted – fish with attitude

Q I wish to set up a large tank for fish with character, something a little more exotic than large cichlids and which will have the "wow!" factor when my mates see them. Limited funds mean I can't have anything too expensive, but I shall make sure I get the largest tank possible for Christmas.

CALLUM NEBLER, VIA EMAIL

A Always pick a fish that is pleasing to you, if your mates like it, then well and good.

Good choices include the Black ghost knife, *Aprenonotus albifrons*; Reed or Rope fish, *Epiplatys caelobaricus*; Ornate bicir, *Polypterus ornatus*; Frogmouth catfish, *Chaca chaca*; or Violet dragon goby, *Gobioides broussoneti*; not forgetting the bizarre Butterflyfish, *Pomacentrus buchholzi*. All can be kept in a moderate-sized aquarium.

RICHARD HARDWICK



Ask the experts

Certainly not the easiest plant to grow

Q What's the best way to grow *Hydrocotyle verticillata*? Mine are turning yellow. I left them in their original pots and, because I don't like too much gravel in the tank, I put a fistful of laterite under each. Also in the tank are two Pro-Plant bags from Greenline, and I dose with Leaf Zone (containing potassium and iron) about three times a week. My lighting, as far as I can tell, is more than adequate. Can you help?

CHALDHURI, LONDON



Use a bath for worms

Q I have noticed fine red worms protruding from the anus of my angels, and I suspect these are *Camallanus*. I have treated with Parazin P (for ponds), but this has had no effect. What else is there?

MASON BAQUES, BLANDFORD

A Your diagnosis is correct. As you may know, *Camallanus* are parasitic roundworms (nematodes) of the gut, most commonly found in livebearers

A This wonderful plant is one of my favourites. In the wild, it is found in nutrient-rich springs in the wetlands of southern Brazil.

The plants you acquire from a nursery are grown terrestrially and are easy to continue growing like that, but they often struggle underwater. My original thought was that they were marsh plants, but they can spend the whole time submerged. In the wild they grow alongside *Echinodorus*, which also thrive in bright, nutrient-rich conditions with plenty of CO₂.

I am growing my *H. verticillata* in soft, acidic conditions with good light and supplementary CO₂, but they are not easy and require plenty of TLC. If you are struggling, I could give you a couple of spare plants.

PETER BRADLEY

Whiteworms via the post

Q Could you please tell me where I can buy whiteworm cultures so that I can breed my own live food?

A WHITE, REEDOWN

A I can supply you with a starter culture for £2.50, including p&p and instructions. Send to John Rundle, c/o PFK at the usual address.

JOHN RUNDLE

Where are my male Guppies?

Q My two male and four female Guppies have been breeding regularly, but the 15-20 remaining young of various ages are all female. Are the males eating the juveniles to avoid competition?

ANDREW MASSON

TRAYBURNH

A If you do have only female young left, then it would only be by pure chance that the adults have devoured the males – there is no reason why adult males would be deliberately selective in what they preyed on.

Sex determination in livebearers has been studied in depth, and temperature and pH have been found to influence the sex ratios of broods. A high temperature seems to favour the production of males, so maybe you need to raise the temperature of your tank a little.

Finally, you do not state the size and age of the young fish you have. It could just be that the colour on the males has not yet started to show.

A sure way of picking out females when they are very small is the presence of a dark, gravid spot just forward of the anus.

JOHN RUNDLE



Sponsored by tetra - experts in fish health

28 JANUARY 2006 PFK



LEFT: Silver shark.

Quest to solve eye problem

Q One of my two Silver sharks has what look like smooth, white dots in the pupils of its eyes. None of the other fish are affected and the shark doesn't seem to notice them, but what could they be?

JULIA MUNRO, GATESHEAD

A There are several possibilities – the white dots could be down to a bacterial infection, a vitamin deficiency or eye parasites. In case the problem is bacterial, try treating the shark with a herbal-based remedy, such as Melafix, that clears up cloudy eyes.

Ideally, isolate the fish to save medicating its healthy tankmates, otherwise add the remedy direct to the main aquarium.

Failing that, it could be eye fluke, which is a worm parasite.

There is no cure, but fortunately these parasites are usually harmless (although they may impair the host's vision). They are not infectious under aquarium conditions, something that is true of most eye problems, so your other fish shouldn't be at risk.

PETER BURGESS

You'd chance it with tankmates

Q I have five juvenile Piranha in a 120 x 30 x 38cm/48" x 12" x 15" tank. Would it be possible to keep armoured catfishes, such as pleco or Hoplos, with these? I have had conflicting advice.

JAMES SANFORD, MIDDLETON

A You need to understand that when Piranha attack, they rarely take prisoners – and what happens next can prove disturbing to onlookers. If you introduced a plec that was far larger than your Piranha (say 15cm/6"-plus), there is a chance they would leave it alone as these catfishes lead a rather static existence.



LEFT: Nothing can stop a Piranha that has set its eye on a chance meal.

Hoplos, on the other hand, are active scavengers and would soon attract the attention of your opportunistic assassins.

Believe me, no amount of armour will protect another fish from a determined Piranha.

My advice would be to forget

tankmates and concentrate instead on creating a true Amazonia biotype with lush plant growth, beech branches, bogwood and a sand substrate. Collectively, this will make for a beautiful aquarium with lots of colour.

RICHARD HARDWICK



Ask the experts

CICHLID LETTER OF THE MONTH



THE SENIOR OF THE CICHLID LETTER OF THE MONTH. The senior of the CICHLID Letter of the Month was a tetraologist LABORER KIC containing tests for nitrite, pH, GH, KH and CO2.

'Sex-change' in cichlids

Q About 12 months ago I lost one female from a trio of three *Dicrossus filamentosus* in my 60cm/24" tank. I have now noticed that the female from the surviving pair has grown larger than the male, is becoming iridescent, with red around the gill area, and is developing a forked tail. Are these fish hermaphrodites (if so, why would this happen when a male already exists?), or just

very slow to mature? Should I try to introduce more females?
JULIE CLELAND, AUSTRALIA

A The only cichlid I know to be capable of a sex-change is *Crenicara*, but then only in situations where there is no male. It is difficult to see any advantage to a species in having all females become males in time, and I would think it a disadvantage to lose the egg-producing capacity of females.

However, if one female changes where there would otherwise be no male, that is beneficial. One male can fertilise many females, and the sex-change phenomenon does seem to go in hand with polygamy.

Although *Dicrossus* were assigned to *Crenicara* for many years, there has never been any suggestion of sex-change in *Dicrossus* – only in the two species still in *Crenicara*. As far as is known, where fishes do change sex it is entirely one way and, I think, always female to male.

It is more likely, I think, that your second male was the smaller and less dominant of the two, and that he has been maintaining a low profile. This is quite a common scenario in harem-breeding dwarf cichlids, but the mechanics haven't been studied in detail.

It may well be that such males can remain incognito in that way only for so long. Or it may be that with the loss of the female, the dominant male is less territorial and hence it is safe to 'come out'!

Two males in a 60cm/24" tank is likely to become an explosive situation, and I would be inclined to move one to another tank, and then get a couple of females for each male. You will need soft, acid water to breed them.



It's best to house two females for each male *Dicrossus*.

When two fish become one

Q I had a couple of fish that were described as a breeding pair of *Pendax* cichlids. However, I now think I may have been sold another species. The female (now dead, presumed killed by her mate) was 9cm/3.5", but the male is 20cm/8", about twice the size quoted for *Aequidens diadema*.

Can you help with correct identification? Is it wise to look for one or more replacement females? Or is there another species I could keep? My tank holds 180 l. (Pic enclosed).

STUART CUNNINGHAM, VIA EMAIL

A Having seen your picture, I'm afraid I can't say what your fish is. I can see why it has been labelled '*A. diadema*' as the blotch between the longitudinal band and the dorsal is supposedly diagnostic of that species. But *diadema* is essentially an orange-brownish fish on the back and head, and silvery beneath – no blue/green. So it could be a form of *diadema* or an undescribed species. Size is not an issue, by the way, as that quoted for males is 20cm/8".

I suspect you are going to find it difficult to get any more females, and there is no point in substituting *diadema* females as they may not be conspecifics.

If you do find any, multiple females might work until a pair

forms, but you would then need to remove the spares or put in a divider to prevent aggression towards the rest.

You might also need some sort of 'target' to distract the male from attacking his female (the spares behind the divider should do the trick).

It may have been that your original female was too small to breed and the male too persistent in his courtship. As you already know, he is aggressive. I would be inclined to keep him by himself, with armoured catfishes or in a divided tank where fish in the other half will keep him interested.

Cichlids are intelligent, and I am sure boredom can be a problem if they have nothing to do.



Sponsored by tetra - experts in fish health



Apistogramma cacatuoides can be left to breed in the community tank.

When apistos get territorial

Q I have a pair of *Apistogramma cacatuoides* in a community tank, and lately the female has shown signs of territoriality. I should like to breed them. Can you give me some advice on how to do this?

MICHAEL KAVENJIE, PENZANCE

A In my experience, females of this species like a cave with a small entrance that they can block with sand or fine gravel to keep out

any egg-eating predators. The small clay 'sauces' sold by garden centres as flowerpot stands are ideal – use pliers to break out a small V-shaped entrance. Because the ceiling of such a cave is low, it helps with fertilisation of the eggs since the male usually has to stay outside and fan in sperm using his tail.

Set up a separate breeding tank with a substrate of sand or fine gravel (harshness-free), plant it fairly densely, and position two or three caves among the plants to give the female a choice. Ideally the water should be very soft, with a pH around 6.5 and temperature around

27°C/80°F. For filtration, a very low-turnover air-powered UG, air-powered box filter or sponge filter will suffice. Power filters are out.

Put the female in first, the male a day later. You may find it beneficial to have a few small characins or danios present as cithler fishes to give the cichlids confidence. If you can manage small live foods, that might be beneficial with frozen foods a good second, although it is possible to breed tank-bred specimens of this on a diet of flake.

Then all you should need is patience. The fry can take newly-hatched brine shrimp or microworm, and let mullm accumulate so they can forage among it for micro-organisms. You may need to remove the male as the fry appear, but this will depend on tank size and how the female feels about his presence. There is little likelihood of his eating the fry; if he has to go, it will be for his own safety.

If you prefer, you can probably breed them in the community, and this would mean you would not have to disturb them. A lot depends on the nature of the tankmates.

Once when I bred this species in a 1.2m³ tank, I had to use a divider to stop the female herding near-adult *Discus* and angels into one top corner.

FACTFILE

Scientific name: *Dichthysina* immaculatum

Common name: Tramac

Size: Males to 38cm, females smaller



The *Dichthysina* lives in shallow water.

Distribution: Central America

– Mexico, Guatemala and El Salvador.

Habitat: Apparently not specialised on any habitat – found in rivers and lakes with clear or murky water; no current to strong current; deep or shallow.

Aquarium: Species aquarium only when adult. The tank should be as large as possible, at least 150 x 45 x 45cm/60" x 18" x 18" for an adult pair. A single specimen of either sex should have at least a 90 x 45 x 45cm/36" x 18" x 18". Provide well-founded large rock caves. Efficient filtration essential.

Water parameters: Hard and alkaline, although sometimes found in slightly acid water in the wild. Unfussy as regards water quality, which should nevertheless be good.

Temperature: 24.08°C/75–82°F

Diet: An unspecialised omnivore. Enjoys small tankmates. Feed on shrimp/prawn, raw fish, earthworms.

Will take pellets, but uneaten particles can cause pollution.

Sexing: Males are larger and have longer fins, females have one or more dark spots in the dorsal.

Breeding: Pair-forming, open-brooding substrate spawner in which females can be mature at just 10cm/4". The female guards the brood and the male the territory. Unfortunately, males are territorial and may kill the female if no other target is available. The use of a divider or target fishes is advisable. Pairs are best obtained by growing on a group of youngsters.

Similar species: None

Notes: The generic placement of this species is the subject of debate, and it seems likely that it will be assigned to a genus of its own. It's one of the parent species of the Flowerhorn hybrids, and at least as attractive, with the advantage that it can be bred

YOUR CICHLID EXPERT

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MARY BAILEY

is the featured cichlid writer in the UK and a long-term monthly contributor to PFK.



Ask the experts

COLDWATER LETTER OF THE MONTH



THE NUMBER ONE COLDWATER LETTER OF THE MONTH wins a TetraTox 10000 internal power filter for tanks up to 150 l. TetraTox 10 filters work biologically and mechanically to remove dissolved ammonia and solid waste. They are easy to maintain, the flow rate can be adjusted and the direction of the flow altered.

TIP

How do you protect your fish in sub-zero temperatures?

- Fish in 1.3m³ plus water are at less risk than in shallower ponds.
- Sub-surface water circulation by the return flow from a filter will delay ice formation.
- Preventing wind chill cuts down ice forming, try twin-walled polycarbonate sheets from double-glazing.
- Scratch-free greens also mesh tight over the pond. If snow settles, leave it – it's insulation.
- A thin layer of ice will not harm your fish, but anything longer than a dog will see toxic gases building up. Use a polystyrene dome like igloo.

Think about quality of life

Q I wish to set up an old, irregularly-shaped 30 gal. aquarium for small fancy goldfish. I have all the necessary equipment including external filter and airpump. How many goldfish would such a set-up safely hold, and what coolwater tropical species could I mix with them?

G. RYTEL, THORNTON HEATH

A In my view, people do not spend enough time thinking about the quality of life of their fish. I have always tried to create what I think is a congenial physical environment, one that is stimulating to the occupants and which encourages them to be active.

In practice, this boils down to suitable furnishing in terms of plants (real or artificial), a substrate which is conducive to grazing (moderately fine gravel with an optional UG filter to keep it sweet), and decor in the form of bogwood, rocks and earthenware pots on their sides. Submerged miniature strawberry planters are ideal. At the same time, do not create inaccessible areas



Even goldfish appreciate a tank with suitable decor.

where detritus and even dead fish might go unnoticed.

Your tank capacity of 30 gal., following the traditional guidelines of an inch of fish per gallon of water, indicates 76cm/30" of fish, but that is too simplistic. For larger specimens, 2.5cm/1" per 3 gal. is more realistic, with no individual above 8cm/3" body length. Nobody could imagine a 30cm/12" goldfish in a 12 gal. tank, for example.

As for hardy tankmates, I would suggest the White Cloud Mountain minnow, *Tanichthys albonubes*. It is a member of the carp family, and a lively, active species.

As long as your tank is housed in a centrally-heated room, these should do OK. I prefer to keep fancy goldfish in the company of their own kind, but I think an exception could be made in your case.

JOE SMART

A catalogue of disasters

Q My latest goldfish tank, a 180 l. set-up filled with old water from its predecessor, contains fancy goldfish and has been nothing but trouble. I have lost 18 fish in six months – some showed frayed fins before they died, others seemed fine one moment but were dead the next.

I keep the temperature at 24°C/75°F. The water has been tested at my local aquatic centre and is fine. The fish deaths come in waves, and after losing a couple I normally wait a couple of weeks before buying replacements.

At the moment, the fish seem to spend a lot of time at the surface. I recently installed an airstone, although the instructions with the aquarium said this was not necessary. According to what I have read, I am not overstocked (10 fish). The filter does seem a little powerful – could this be the problem? I am at my wit's end.

SEBASTIAN KITCHEN, VIA EMAIL

A Given there are no signs of disease other than fraying fins, I think this could be a water problem. I assume the shop tested for ammonia and nitrite and found both levels to be zero?

Ensure you do not clean the filter media too thoroughly, otherwise you will remove the beneficial

bacteria. A lack of oxygen could be a problem, too, especially as you are keeping the tank at 24°C. While it is true that fancy goldfish are not as cold-tolerant as the others, it isn't necessary to keep them so warm and I would reset the thermostat to 20°C/68°F.

If your filter outlet is so strong that fish are being blown around in the current, your local aquatic shop should be able to supply you with an elbow joint to redirect the flow to the back glass, achieving a more localised current that the fish can avoid if they wish.

Finally, rather than keep replacing losses, I suggest you add no more stock for the next few months and see how the current fish fare in the lower temperature.

PETER BURGESS



Sponsored by tetra - experts in fish health

How to stop a cat fishing

Q I have a formal, raised pond/water feature about 120 x 60 x 45cm/4' x 2' x 18" deep, which until a week ago housed two 15cm/6" goldfish. Then new neighbours moved in and their cat showed great interest, climbing on to the pond edge and peering down at the fish. Two days later, they were gone. Is there anything I can do to stop this happening again with new goldfish?

MARIA GANNON, DEWESBURY

A Cats are a law to themselves, and there's no point falling out over this with your neighbour because she will have no control over her pet once it has left the house.

The advantage of having a small, formal pond like yours is that it will easily accommodate a home-made guard – I have seen neat ones made of stainless steel mesh, bent into a tray-like shape and pushed down into the pond, where the bricks will hold it in place.

The only problem with something like this is if you are growing marginal plants, which tend to push up through the mesh and make the guard difficult to remove without damaging the leaves.

But I am afraid that once a cat has got a taste for fish, nothing short of a physical barrier will stop it hooking them out.

NICK FLETCHER



What cats want, cats usually get.

A scarecrow could keep a hungry heron away.



Photo: P. J.

Give the bird to a hungry heron

Q How can I prevent a heron taking my fish without having to place a net over my 16' x 8' pond?

HUGH HOSBELL, EXETER

A A sturdy pond net on a frame, or some other kind of physical barrier, is the surest heron deterrent, but I appreciate how unsightly such things can be. No other device can be considered 100% heron-proof, but in order of effectiveness, I would suggest the following:

- 1) An electric fence. These are sold in larger aquatic dealerships in kit form, and the best ones carry two or more rows of wire on struts which project out over the pond perimeter. As a back-up, to prevent the heron landing directly into the pond, stretch heavy nylon fishing line no more than 60cm/2' apart across the water.
- 2) An ultrasonic heron-scare. Their effectiveness depends on the area they have to cover, whether there

are any barriers in the way and – obviously – whether the batteries that power them are in good order. It's easy to fit one and then forget it.

3) A pergola over the pond. I wouldn't suggest this if keeping a heron away is your only objective, but pergolas do serve other purposes, such as shading out UV light from the sun, and they can be very attractive features in their own right.

4) If your garden is small, enclosed and has suitable overhead attachment points, nylon fishing line strung over the pond above head height, with no more than 1.5m/5' between strands, will stop any heron flying in. Just be careful there are no gaps in hedges or fences where the birds can saunter in instead!

5) Make a scarecrow. To keep it effective, change its position every week or the heron will soon wise-up.

NICK FLETCHER

YOUR COLDWATER EXPERTS

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TONY & SUE

NICK FLETCHER

answers your general pond queries and fish keeping queries.

JAMES ALLISON

is our pond building and aquatic plant expert.

DR PETER BURGESS

is an expert on fish health and coldwater fishes.

DR JOE SMARTE

professor of genetics at Southampton University, is a world authority on goldfish breeding and genetics.

Ask the experts

MARINE LETTER OF THE MONTH



THE DESIGN OF THE MARINE LETTER OF THE MONTH with a Tetra brand Nitrate test kit. High nitrate levels in a marine aquarium can severely affect the health of both fish and invertebrates. Tetra's Nitrate test kit will do 45 tests and is suitable for freshwater and marine use.

Starting up after a break

Q Now that I am retired, I wish to set up another marine aquarium. I note a lot of changes have taken place since I last kept fish, so have you any suggestions for setting up a 90 x 45 x 30cm/36" x 18" x 12" system, initially for inverts, with perhaps a couple of damselfish or clownfish added later?

J. SUMNER, ARLINGTON

A Natural systems are popular, using primarily live rock to perform most of the filtration. There are many variations, but this is what has worked for me with a similar, small system.

You will need approximately 1kg/2.2lb of live rock per gal. This figure should be used as a very rough guide, because the weight and porosity of the rock varies enormously. Your aquarium has a

gross volume of around 127/28 gal., so you require 28kg of living rock, which should be positioned to allow a good water flow through and around it. This will help prevent detritus accumulating.

I suggest you turn over the entire volume of the aquarium an absolute minimum of six times an hour, preferably between 10 and 20 times. You can do this with two large powerheads – for example, the Aquadear 402 has a flow rate of 1021 l/225gph, so two would be ample.

An external canister filter is not a necessity in a system with a lot of live rock, but you may wish to include one for mechanical filtration. It would also be useful to house chemical media such as carbon or phosphate-removers.

I always recommend a protein skimmer, although some people

manage without one. They remove a huge amount of waste that would otherwise be left in the aquarium.

In my shop, we have a 908 l/200 gal. invert system that I would class as lightly stocked. It normally has around a dozen fish, several hundred corals and no more than a few hundred kilos of rock. The protein skimmer is cleaned and emptied daily, when without fail there is around a litre of dark, foul-smelling liquid that nobody would want in their tank.

You do not mention lighting, but I would suggest two 86cm/34" T5 lamps. This will provide adequate illumination for fish and hardy, light-loving inverts such as colonial anemones and soft corals. If you wish to keep delicate species like dams and stony corals, then three or four lamps are needed. Fit reflectors to bounce the light down.



Are the tips of your corals white because they are growing?

Tips to save a flagging frag

Q I have started adding hard corals to my system, the most recent being a small *Acropora* frag. After three weeks, it began to whiten at the edges so I increased water flow over it to see if this helps.

The water tests indicate a calcium reading of 710 – but I have not added any

buffers. The tank has *Xenia* sp., Hammer, Mushroom, Button and Teadstool corals, a Bubble anemone and cleaner inverts. Fish include Regal tangs, Mandarins, Chalk gobies, Common clowns, Banggai cardinals, Green chromis and a Four-line cleaner wrasse.

Why are my calcium levels so high, and how can I reduce them? The Hammer coral is in good health.

PAUL MELPASS, VIA EMAIL

A I would get a new calcium test kit or check how you are using the current one. If your reading is in mg/l, I would be very surprised if 710 were correct because I don't think calcium is soluble in seawater at this level.

As for the whitening of your *Acropora*, this could be due to growth (their growing tips are often lighter than the rest of the colony), bleaching (in which case the frag will probably recover), adjustment to lighting other than what it was grown under; tissue recession (less likely in a frag than in a wild-caught colony); or possible predation.

If your Four-line cleaner wrasse is the blue *Carabidicus quadricinctus*, you need to be aware that this species feeds mainly on coral polyps.

If your other corals are thriving, it suggests there is nothing fundamentally wrong with your system – if you can keep a Hammer coral (*Euphylla*, presumably), then *Acropora* frags should not be too difficult. The frag may just be in the wrong position.

It should be where it can get plenty of light and, particularly, water flow.

PHILIP HUNT



Sponsored by tetra - experts in fish health

Feasible, but a bit cramped

Q I wish to convert to a 45 l./10 gal. marine aquarium with two clownfish (one added initially, then a second one to cycle the tank). I should also like live rock, a cleaner shrimp and an anemone. Is this feasible?

JOSHUA BERRY, VIA EMAIL

A Your plan sounds OK, although a 45 l./10 gal. tank is a bit small. Filtration would be with living rock and a sand bed, and would suit all but one of the inhabitants – the anemone. Clownfish-host anemones are difficult to keep, and one of their requirements (intense lighting) could cause overheating problems in a very small tank.

Clownfish (particularly tank-bred specimens, which I hope you will buy) don't need hosts.

For a substitute, you could try some mushroom anemones (avoid large ones: these are often fish-eaters) or perhaps a bubble coral. These require less light, so a twin T5 fluorescent unit or a couple of power compacts should be enough.

PHILIP HUNT

Clowns don't really need anemones

Q I am about to set up a marine tank and would like a Spiny pufferfish, as well as some clownfish with a host anemone. Can you tell me the minimum size tank for the puffer, and whether the other animals would co-exist with it?

AUDREY BROWN, LESLIS

A The Spiny puffer, *Diodon holocanthus*, grows to about 30cm/12" and needs quite a big tank – I'd suggest something like 150 x 60 x 60cm/5' x 2' x 2'. Suitable companions would be tangs,



The Blue-cheek goby seems to be prone to a kind of wasting disease.

CORAL/STOCK

I recommend a tougher goby

Q I should like to set up a reef tank with Aqua Medic Tridacna 160. Fish stocks would consist of two captive-bred Percula clowns, a Coral beauty, a Regal tang, a Yellow tang, a Blue-cheek goby and a Royal gramma.

I would include easy corals such as Toadstool, Mushroom, Leather, etc. a Clove polyp (*Clavularia* sp.) and a *Tridacna* clam. Does this sound feasible?

JOSHUA JONES, VIA EMAIL

A Your proposed set-up sounds fine, assuming you have suitable lighting. My only concern lies with the Blue-cheek goby. These are tricky to keep – they often suffer from a gradual wasting disease, and despite appearing to feed well, get thinner and thinner until they die.

A better bet for a medium-sized goby would be a Yellow watchman, *Cryptocentrus cinctus*, or a Shrimp goby, *Amblyeleotris* sp. These are generally much harder than Blue-cheek gobies and other *Valenciennes* species.

PHILIP HUNT



Clownfish, especially captive-bred specimens, don't need host anemones.

CORAL/STOCK

angels, large hawkfish or similar medium-to-large, robust, but not over-aggressive species.

If you want clowns, you'll need to go for one of the larger species such as Tomato, *Amphiprion frenatus*, Clark's, *A. clarkii* or Maroon,

Premnas biaculeatus. Clowns have no need of an anemone in the aquarium. Besides, anemones are difficult to keep, even in reef tanks, and you shouldn't try to put one in with a puffer – it will just be eaten.

PHILIP HUNT

YOUR MARINE EXPERTS

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GENERAL
PHILIP HUNT is a UK marine biologist who has shared his experiences with UK readers for many years.

GENERAL
DR DAN SPENCER is a USA marine expert. He's written several books on maintaining reef tanks &verts.

GENERAL
DR BOB CORMAN, USA reef expert, is best known for his study of planets and living sand filters.

HEALTH
DR PETER SKRANSKI practices at Plymouth University. He's a specialist in fish diseases and health.

REEF
AGNARRA THOMPSON, UK's Midland Reefs, has kept a number of marine fish and propagated many coral species.

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EQUIPMENT LETTER OF THE MONTH



THE GEM OF THE EQUIPMENT LETTER OF THE MONTH was a Tetra pH test kit. The pH is a measure of how acidic aquarium water is. Fish do not like fluctuating pH levels, and some need to be kept at specific pH levels. Each kit contains 30 tests.

UV can benefit any aquarium

Q I have recently started keeping African cichlids and was wondering if they would benefit from a UV steriliser. If so, how do you set up and run this equipment?

JAM SALARIEL, POMTYPRIEDD

A Ultra-violet units for indoor aquarium use are not to be confused with the UV clarifiers used on ponds. Aquarium units are by far the more powerful, so using a pond UV will have virtually no effect on controlling disease.

The correctly-sized UV lamp has a strong germicidal effect. It can destroy algae spores, bacteria, protozoa and other common waterborne diseases. These include whitespot, velvet and fungus.

It will also help to reduce algal growth, and the small amount of ozone it generates can assist in reducing the yellow tint aged water can take on.

UVs work by having a thin layer of water passed over a UV lamp, which is protected from direct contact by a quartz sleeve.

This exposure kills organisms up to 20 microns across. The lamp normally needs replacing every six months, although Arcadia have recently introduced a version that requires only yearly replacement.

While the installation of a UV steriliser initially appears to be expensive, in my opinion the outlay is justified by the improvement in fish health and the reduction in frequency of disease outbreaks, especially where sensitive fish are



concerned.

A UV should be installed in line on the return of an external filter, as this ensures that only filtered water is passed through the unit. Installation is easy – it is just a matter of cutting the flexi pipe on an external filter, connecting up the UV and plugging it in. However, if you are using undergravel or internal filtration, fitting a UV is not easy. I'd recommend you buy an external filter specifically to run the equipment.

JASON SCOTT



The easiest way to clean sand is to run your fingers through it.

How to stop syphoning up sand

Q I recently changed the substrate in my community

tank to sand, but I find the syphon I use to clean detritus off the floor sucks up as much sand as it does mulm. Can you suggest something that would take out the dirt but leave the sand behind?

C. GIBBERWOOD, BUKTONE

A Sand is a natural substrate for many fishes, but it can be difficult to clean. You are quite right that a gravel cleaner will suck it up. Even one of the air-operated vacuums that only picks up light detritus from the substrate may still gather sand as well.

I find the easiest way to clean sand is just to run my fingers through it. This causes some clouding, but the filter should clear this in a few hours, after which I then clean the filter.

You could try syphoning the sand into a bucket, washing it under the tap and returning it, but this can be traumatic for fish and is not feasible if you are growing plants.

It is important to disturb a sand substrate every week or so, otherwise it may pack down and harbour anaerobic bacteria, which will turn it black and smelly.

Be careful, too, that your filter does not draw sand into the impeller chamber. I have seen a brand new internal filter ruined in this way after only a few months.

JASON SCOTT



Sponsored by tetra - experts in fish health

Additives the 'easiest way' to boost levels

Q I regularly test my water, but I am having difficulty maintaining the pH and KH levels above pH 6.6 and 2°KH. Is there any way of increasing these readings without constantly forking out on expensive chemicals?

GRAHAM MITCHELL,
VA (EMAIL)

A Additives for boosting pH and KH, like those manufactured by Kent or Tropic Marin, are the easiest way to raise these levels. While you may consider them expensive, they do provide consistent results, with 'k' amount giving a known increase. Both manufacturers produce large sizes, which reduce the cost dramatically.

Any fishkeeper who uses RO water has to use this type of product to replenish vital elements.

You could use some calcareous material to boost pH and KH, for example, Calcium Plus. However, this could raise the levels far higher than you wish, and any sudden rise in pH could be disastrous for fish.

Carry out your experiments in a separate container and raise the aquarium parameters gradually if you decide to do so.

There are lots of species that would be very happy in your acidic conditions - many tetras, barbs, catfish and cichlids naturally come from water with a low pH, while plants will do better in acidic water with a low KH.

These conditions make the elements vital for growth more readily available.

JASON SCOTT

This filter is still produced

Q I have always used an Eheim 2252 internal filter, but when I came to replace it, I found it was no longer available via mail-order. Is there any other way I can obtain this model?

C. CHARD, CHESHIRE

A I have contacted one of the UK distributors of Eheim products, and they tell me that the Eheim

2252 is still in production and in stock in their warehouse.

Many mail-order companies stock only last-moving lines. This particular filter is not in especially high demand, which is why you may be experiencing difficulties.

Most aquatic retailers, if you leave a small deposit, are quite happy to order products on your behalf.

The Eheim distributor I mentioned makes weekly deliveries to retailers in your area, so you should be able to obtain your filter quite quickly.

JASON SCOTT

To run or not to run?

Q Is there a reverse osmosis unit which I can use without leaving it running constantly, but only when I need RO water? I change 10-15 gal. a week.

R. DOOLE, WALTON-ON-THE-NAZE

A Reverse osmosis units do not need to run constantly - it is quite OK to turn them off, I would suggest, though, that whether or not you need the water, you run your unit a couple of times a week to prolong the life of the membrane.

When you do

need some RO water, run it to waste for a couple of hours before drawing some off for top-ups or water changes.

Some manufacturers of high-end RO units claim these can be turned off for up to three months without damaging the membrane.

This may be the case, although I would follow the advice above just to make sure, because new membranes make up a large part of the cost of any RO unit.

JASON SCOTT

YOUR EQUIPMENT EXPERT

Write to Equipment Answers using the form at the end of the Ask the Experts section or send an email to us at questions@practical-fishkeeping.co.uk and we'll forward your letters to the relevant expert. Please note that we cannot offer a quicker service for email queries as every question is answered in turn and each one has to make its way to the top of the pile! If sending your query by post, please include a stamped addressed envelope.

Aquarium technology expert **JASON SCOTT** of The Water Zoo is on hand to answer your questions on equipment.



Ask the experts



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reader
service**

Have you got a question for our experts?

Ask the experts enquiry form

If you'd like help with a fishkeeping query, please write your question on the form below. (Photocopies will also be accepted) and tick the box indicating the nature of your query so we know which of our experts is

best placed to answer it. Then send the form, together with a stamped addressed envelope, to **Ask the Experts, Practical Fishkeeping, EMAP Active, Bretton Court, Bretton, Peterborough, PE5 8DL.**

What is the nature of your query? (please tick one)

- | | |
|---|--|
| <input type="checkbox"/> Fish health | <input type="checkbox"/> Other tropical community |
| <input type="checkbox"/> Fish breeding | <input type="checkbox"/> Freshwater aquaria |
| <input type="checkbox"/> Goldfish fish | <input type="checkbox"/> Aquarium plants |
| <input type="checkbox"/> Exotics | <input type="checkbox"/> Marine |
| <input type="checkbox"/> Stone | <input type="checkbox"/> Pond or lot |
| <input type="checkbox"/> Aquarists/Amateurs | <input type="checkbox"/> Seafish |
| <input type="checkbox"/> Substratum/corals | <input type="checkbox"/> Technical equipment etc. |
| <input type="checkbox"/> Large tanks | |
| <input type="checkbox"/> Other water | <input type="checkbox"/> 1. What is the size of your aquarium or |
| <input type="checkbox"/> Rainbow, Danios, Zebrafish | |

What we need to know (if relevant to your query)

1. How long has your tank or pond been set up?
2. What fish does it contain?
3. What type of filter does it have?
4. Do you know the parameters of your water? (pH, ammonia, nitrite, nitrate levels and pH etc.) If so please list them.
5. What's your maintenance regime - how often do you change your water and how much do you change each time?
7. If you're writing about a health disease problem, please describe the symptoms, are all the fish affected or just one or two? Which species is affected?

Your question

Please use the above checklist as a guide and give us as much info as possible - continue onto a separate sheet of paper if necessary. (Please write clearly)

ONLY ONE QUESTION PER COUPON PLEASE

Your name

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Sorry, but we cannot reply to questions sent without a stamped addressed envelope.

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Electric dreams

The Seventies were bursting with colour, disco, skin-tight lycra – and the Electric blue hap. **Mary Bailey** catches up with this reclusive character.



PHOTO: ROBERTO G. GONZALEZ

Since the 1970s, the Electric Blue hap, *Sciaenochromis fryeri*, has been a popular Malawi cichlid in the hobby, albeit often misidentified as *S. ahi*. This is not the only confusion regarding the members of this genus, which generally remain poorly known in their natural biology and to science.

Questions of genus

The genus *Sciaenochromis* was described in 1989 by Eccles & Trewavas in their revision of the Malawian haplochromines, virtually all of which had been assigned to *Haplochromis*. After that genus

was restricted to haps from the Lake Victoria basin in 1980, the Malawian species had been temporarily lumped into either *Cynocara* (although this was clearly wrong) or kept in "*Haplochromis*", but with the "" to show they didn't really belong there at all.

Eccles & Trewavas's work was quite revolutionary in that they used not only traditional morphometric characters (counts and measurements) and dentition, but also melanin patterns to define their genera and decide which species belonged where.

Reliance on dentition had led to some remarkable foul-ups in the past, such as *Melanochromis*

auratus being assigned to *Pseudotropheus* when its behaviour and melanin pattern meant it was obviously a *Melanochromis*.

In the case of *Sciaenochromis*, they defined the genus on the basis of its predatory shape, dentition, a melanin pattern of an oblique row of spots, and assigned to it *S. ahi* (the type species) plus two other species, *spilostichus* and *gracilis*.

A few years later, Konings (1993) removed the latter two species to *Aujacochromis* on the basis of the melanin pattern, as there is, in fact, no row of spots in *S. ahi* – not even in the single, long-preserved, type specimen examined by Eccles & Trewavas! Konings (1993) also described *S. fryeri*, by then already an aquarium favourite (masquerading as *ahi*), and two other new species, *benthicola* and *psammophilus*.

Not everyone agrees with Konings, and the latest study of Malawi haps, edited by Jos Snoeks (2004), suggests – on the basis of new, undescribed, predatory species collected – that this predatory group needs a total rethink based more on size than melanin pattern.

This is way beyond my sphere of expertise, but I would comment that if a bunch of cichlids of quite different ancestry all decide to eat much the same food, chances are they will evolve similar body shape, head morphology and teeth while retaining ancestral melanin patterns (which may not be affected by evolutionary stimuli that led to a specialised diet). There is no indication that the melanin patterns are labile, so there is a good chance they relate to a shared ancestry. Grouping on the basis of size with no reference to melanin patterns seems a backward step.

Doubtless DNA study will eventually provide some indication of the truth, but in the meantime I will discuss *Sciaenochromis* as understood by Konings (and probably most hobbyists).

Ecology

On that basis there are five species, four of them described, the other (given the "working" name *S. sp. "Nyassae"*) undescribed and apparently never collected, just observed occasionally by Konings while Scuba diving. Of the other four, *S. benthicola* lives so deep that it is unlikely we will ever know much about it except from circumstantial evidence (eg. stomach contents). As such we know virtually nothing

LEFT: SDS often referred to as "Waplochromis" *ahi* in most shops, *Sciaenochromis fryeri* is a stunning fish.

FROM
TOP TO
BOTTOM:
Sciainochromis
ahli,
Sciainochromis
psammophilus,
 and
Sciainochromis
benthicola



© Science at home



about two of the five species, except what they look like and what they eat. All known *Sciainochromis* are piscivores.

The depth at which *benthicola* lives also means we may never see this fish in our aquaria, for to prevent deep-water fishes dying through rapid decompression, someone has to go down, catch them by hand, and then bring them up slowly.

We don't know a huge amount more about the natural life of the other three species – *S. ahli*, *S. fryeri* and *S. psammophilus*. They all appear to prefer fairly deep habitats. Most observations have involved a solitary vivid blue male cruising, looking for prey. Korings has surmised from the fact that male *fryeri* remain in breeding colour year-round in captivity that they perhaps do so in the wild as well.

Non-breeding (immature?) males and females are an inconspicuous brown, and females are rarely seen. Most sightings have been simply because they were with a brilliant blue male that attracted the diver's attention. When *S. fryeri* was first imported, it was mostly as males because females were rarely found.

An interesting feeding behaviour has been observed in *S. fryeri*. Some utaka (*Copadichromis*) release their fry above the nests of the kampango (the large catfish *Bagnus meridionalis*) where they will receive some protection from the catfishes. This occurs seasonally, and at such times, *S. fryeri* can be found exploiting this food source.

“We don't know a huge amount more about *S. ahli*, *S. fryeri* and *S. psammophilus*... Most observations have involved a solitary vivid blue male cruising, looking for prey.”

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Breeding behaviour

It appears that *Sciaenochromis* males become territorial only when breeding, which concurs with their wide-ranging hunting behaviour. A cruising or pursuit predator is unlikely to hold a permanent territory, especially when as conspicuous as these, for its food supply would soon be exhausted or move to a safer neighbourhood.

However, there are some questions for when *Sciaenochromis* breed, they apparently do so in groups with males holding adjacent territories. It is difficult to reconcile 'all-year breeding', 'territorial only when breeding' and 'arena-breeding' all in the same species.

Usually arena-breeding goes with permanent territoriality or seasonal breeding, and seasonal breeders tend to colour up only at breeding time. Wandering year-round breeders usually spawn with a female wherever they meet.

To my mind, the most likely answer is a seasonal breeder that remains in full colour year-round – but at Kande Island, *S. psammophilus* breeds all year!

How do you hold a territory year-round if you are a solitary hunter? How do you go hunting and not return to find your territory usurped? Maybe these fishes have breeding grounds used by different males sequentially for short periods? Maybe they call a truce and disperse to hunt at certain times of day? It is difficult to think of any more plausible answer. As *S. fryeri* appears in aquarium observations to be territorial only when spawning, perhaps they occupy territories in shifts.

Again from aquarium observations, we know that in *S. fryeri* at least, the eggs are fertilised before they are picked up by the female. In the wild, brooding females hide among rocks and presumably release their fry there. We don't know what the females of the other species do after spawning, in at least one case, *psammophilus*, it must be something different as the Kande Island area is primarily sandy with only scattered rocks.

The Electric blue tank

So how do we set about keeping these fishes given our general ignorance of them? The obvious prerequisite is for a large aquarium (these are fairly large cichlids), ideally shared with other, similarly sized and not too aggressive haps.

The minimum size for any species

when adult is 120 x 45 x 45cm/48" x 18" x 18", though 180cm/72" (or larger) is a lot better. It must be borne in mind that these cichlids are, as far as is known, solitary hunters at least some of the time, so they should be allowed space to get away from one another.

The water should be Malawi typical: moderately hard with an alkaline pH. The water should be of good quality (nitrite and ammonia nil, nitrate as low as possible) and well oxygenated, with a temperature range in the upper 70s to lower 80s/upper 20°C.

High oxygen levels do not mean turbulent water, especially as these are deep-water fishes and don't live in the surf zone! Avoid bright lighting and the fish will reward you with that vibrant electric blue in the relevantly dim aquarium.

Rocks are important for where breeding has been observed, the nest has been under, half-under or next to a rock. Also include plenty of open substrate. Again, bearing in mind the often deep-water habitat of these fishes, avoid light-coloured rocks, though if light levels are low, light-coloured substrate is acceptable.

As these fishes are piscivores, the most important item on the adult menu should be raw fish. They can also be given shrimp/prawn and aquatic invertebrates (Artemia, Daphnia, bloodworm and similar, live or frozen).

When growing on young fishes, you may find that invertebrates are preferred as most piscivores don't start eating fish until they (or their mouths) are large enough. There is no point in feeding adults or young on greens of any sort.

If you spawn your Electric blues, it is best to remove the female(s) to release the fry in a separate tank. None of the species will regard fry as anything other than food.

Then again, if you are too successful breeding and there isn't a sufficient market, you can allow females to release in the community so that the fry are culled naturally.

Predatory cichlids aren't everybody's cup of tea because they are perceived as aggressive, but provided tankmates are chosen sensibly in terms of size, large non-territorial predators are usually a lot less trouble than smaller permanently territorial omnivores and herbivores such as mbuna. Throw in the gorgeous male colour and Electric blues are truly desirable fishes deserving of the interest they already enjoy, and a lot more.

Factfiles

Common name: Ahli, sometimes sold as *Haplochromis* "Big Eye".

Scientific name: *Sciaenochromis ohwi* Trewavas, 1955.

Meaning: Named in honour of Ernst Ahl, a German ichthyologist in the first half of the 20th century.

Size: To 21cm/8" TL (males); females are smaller.

Distribution: Apparently restricted to the northern part of the lake, including Likoma Island.

Habitat data: Hunts over sand, but a group of males has been seen defending spawning pits dug against rocks.

Remarks: Probably very rare in the UK hobby, if available at all.

Common name: None.

Scientific name: *Sciaenochromis benthicola* Koenigs, 1983.

Meaning: Greek *benthos* = deep, Latin *cola* = dweller, thus 'inhabitant of the deep', referring to its habitat.

Size: Uncertain. The type specimen measures just under 15cm/6" SL; but Brooks (2004) refers to this species being larger than *fryeri*. A photo, with ruler, shows a specimen of around 17cm/6 1/2" TL.

Distribution: Unknown, but probably lake-wide on the basis of known finds.

Habitat data: Apparently sandy terrain in deep water.

Remarks: Not yet seen alive because of the great depths at which it occurs. The type specimen was caught by hook and line at great depth, subsequent material by scientific trawling.

Common name: Electric Blue hap, Fryer, Ahli. Also sold as *Haplochromis jacksoni*.

Scientific name: *Sciaenochromis fryeri* Koenigs, 1983.

Meaning: Named in honour of Dr Geoffrey Fryer, a pioneer in the ecological study of Rift Lake cichlids.

Size: To 23cm/9" TL (males), but usually 12-14cm/4 1/2"-5 1/2"; females are smaller.

Distribution: All around the lake.

Habitat data: Chiefly the intermediate zone where rocks meet sand, but also ventures into the pure rocky habitat in search of prey. In the wild, it digs caves beneath rocks to spawn.

Remarks: The only member of the genus to be readily available in the UK, and probably the most brilliantly coloured of the Electric blues. Large males from the southern part of the lake, sometimes have a white blaze on the head, hence the confusion with the true *Haplochromis* (now *Copadochromis*) *jacksoni*, one of the Utaka group.

Common name: Electric Blue Kande.

Scientific name: *Sciaenochromis psammophilus* Koenigs, 1983.

Meaning: Greek for 'sand-loving'.

Size: To around 14cm/5 1/2" SL (males); females a little smaller.

Distribution: Best known from Kande Island (west coast of the lake) where it is relatively common for the genus, but other sites are known around the lake.

Habitat data: Sandy bottoms in 1-30m of water. Spawns in nests dug in sand half under a rock or in sand pits.

Remarks: Moderately common in the hobby worldwide, but not always easy to find in the UK where the bulk of Malawis are now home-bred or farmed.

Common name: None.

Scientific name: *Sciaenochromis* sp. "Nyassae".

Size: Described as "larger and deeper-bodied than *benthicola*" – Koenigs, 2001.

Distribution: All around the lake.

Habitat data: Seen hunting in rocky habitat for young cichlids.

Remarks: An undescribed species that Koenigs (2001) observed while Scuba diving. Probably not yet in captivity, but included here in case it does turn up.

STAGES OF **LIFE**

In this new series, **Dr Peter Burgess** of the AQUARIAN Advisory Service looks at problems that can afflict fish from fertilisation through to old age. He begins by looking at eggs and what affect fertility and development.

The vast majority of fish species are egg-layers. Fertilisation is typically external with the male shedding his sperm over the eggs after they have been laid by the female. The period of egg development is a very sensitive and delicate stage of a fish's life, so fish breeders must ensure that the eggs are maintained under optimum incubating and hatching conditions.

Infertility

Symptoms: Affected eggs remain 'blank' with no signs of embryo development, and usually turn opaque. Depending on the cause, infertility may affect only a few eggs, or sometimes the whole clutch is infertile.

Causes: It is normal for some eggs to be infertile. As a guide, where the proportion of infertile eggs exceeds 30% of the clutch, this could indicate a problem. Physical or genetic defects sometimes account for egg infertility, as can adverse water conditions.

In many cases, however, the infertile eggs simply never came into contact with the male's sperm (see 'Time is of the essence'). Observations on angelfish reveal that inexperienced pairs may produce up to 50% infertile eggs, but the fertility rate improves as the



DID YOU KNOW?

- If using methylene blue, be aware that this dye can kill off the beneficial filter bacteria.
- The eggs of some species are naturally white (or turn white), eg. *Eutrigla* catfishes and some FW hatchetfishes. Don't remove them thinking they are dead!
- For many species, egg development occurs at a phenomenal rate. For example, the eggs of Zebra danio, *Danio rerio*, develop from a one-cell stage to a 1000-cell stage within just three hours! Hatching occurs between 48 and 72 hours.
- In the wild, the percentage of fertile eggs that fail to hatch can be very high, often exceeding 50%, as revealed from field studies on European cyprinid fishes.

pair gains spawning experience.

Where an entire clutch is infertile, the male may sometimes be to blame, perhaps because it is infertile or sexually immature.

Very occasionally, two female cichlids may pair up (usually because no suitable male is present) and lay eggs that obviously cannot be fertilised. Spawning between closely related species often result in infertile eggs.

Treatment: Tracing the cause of infertility can involve some detective work. First ensure that you have mature fish of both sexes and of the same species! Perform water tests.

If infertility strikes successive batches of eggs, consider swapping one of the parents with another individual, just remember to take care when swapping partners of aggressive species such as cichlids. For group-spawners such as many cyprinids, eg. goldfish, danios, try adding new stock and/or increase the proportion of males.

Most eggs fail to hatch

Symptoms: The eggs develop normally, but then die before hatching.

Causes: An infection, eg. fungus attack, or adverse water conditions are often to blame. Developing eggs that have been roughly handled may also fail to hatch.

Treatment: Check the water conditions and pay strict attention to aquarium hygiene.

Avoid physical handling or netting the eggs wherever possible, especially during early development before they have 'eyed up'.

Fungus attack

Symptoms: Eggs develop a white-grey fluffy or spiky appearance.

Cause: Attack by *Saprolegnia* or related fungi. Usually only a problem in freshwater systems as fungi are intolerant of saline conditions.

Treatment: Malachite green is effective. Use as a short-duration bath (0.5 mg/l for one hour) as a preventative or to treat eggs that show early signs of fungus. Never expose eggs that are close to hatching to Malachite-green as the dye is toxic to the final stages of their development.

Many prefer to use a proprietary methylene blue treatment. Some fish breeders routinely remove eggs that have succumbed to fungus, to help prevent the fungus from spreading to adjacent healthy eggs.

Bacterial infections

Symptoms: Eggs fail to develop and turn white. No tell-tale signs, hence difficult to distinguish from other causes of egg failure.

Causes: Various bacteria.

Treatment: Scrupulous attention to water hygiene will reduce the likelihood of bacterial problems. Methylene blue can be added to the water to help prevent bacteria (and fungus) attack.

Water conditions

Ensure that temperature and pH are kept stable and within the normal range for the species in question. Ammonia and nitrite should be zero, and nitrate kept to a minimum. The degree of water hardness can be important when incubating eggs of some species.

In general, eggs are very intolerant of low oxygen conditions, so ensure the hatching aquarium is adequately aerated.

The water should be free of suspended matter that may otherwise coat and choke the eggs, and possibly encourage infections.

High levels of heavy metals, such as zinc and copper, can harm egg development and cause abnormal white or coagulated yolk spots inside the egg. This can be avoided by using a proprietary aquarium water conditioner that contains a heavy metal neutralizer.

Parental care and egg predation

Some fish guard their eggs against predators, as practised by cichlids,



TOP PIC: *Coffea latiosa*, spawning.

LEFT, FROM TOP TO BOTTOM: Fathead minnow eggs, developing normally; more minnow eggs: one just hatched; one developing and one with fungus; Raccoonfish egg (normal); *Amia nana* egg (normal).

gouramis, gobies and certain catfishes. Many egg-guarding species also routinely clean their eggs to reduce the likelihood of infections.

For many other fish, however, the eggs are abandoned by the parents and hence vulnerable to predation and other dangers. Many fish will eat the eggs of other species, and sometimes their own eggs if given a chance! Some aquatic snails are also under suspicion as being egg-eaters.

Time is of the essence

The eggs and sperm of fish have only a limited time in which they can successfully unite and fertilise. Caro eggs, for example, are receptive to sperm for only about 60 seconds after being laid. The sperm themselves have less than a couple of minutes in which to locate, penetrate and fertilise an egg.

Real-life reef: 10 years on

Phil Hunt had to restock his reef tank after the winter floods of 2000/2001 led to a total fish wipe-out. How did the tank work in its new form (and new location), what went right – and what went wrong?

The tank was by no means trouble-free during its final couple of years. The situation was not helped by the fact that with a busy job, a new house to renovate, a toddler and a new baby, I had little time to devote to it. This was exacerbated by the fact that the tank was in an 'out of sight, out of mind' position in a spare room.

Plagues, pests and algae

The first big problem was a nasty form of hair algae, which was very stiff, bristly and partly calcified. This emerged in the immediate aftermath of the flood, presumably in response to the high nutrient levels and the lack of grazing pressure until I restocked.

Once established, it grew vigorously – the grazers didn't like to eat it, and the only way to

control it (short of adding a large Sailfin tang) was manual removal, which wasn't easy. Persisting with this paid off and although not completely gone, it is certainly under control, particularly now that my Purple tang has grown large enough to keep it cropped.

The algae did claim a casualty, however: it started growing on the shell of my *Indona dorsea* clam (it shows a definite predilection for mollusc shells). Eventually it covered the shell thickly, to the point where the spiky growth was irritating the clam's mantle and preventing it from opening, eventually killing it. This was a real blow as I'd grown the clam on from about 4cm/1½" to 20cm/8".

I'm reasonably confident that this algae shouldn't be a big issue in my new tank, where the fish grazing pressure will be much more intense. To be on the safe side, each piece



Phil Hunt

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1
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To be in with a chance of winning one of the giveaways on this page, fill in this form, enter the appropriate code number for the giveaway you wish to try for and send it to: **Reader Giveaways, Practical Fishkeeping, Bretton Court, Bretton, Peterborough PE3 8BZ** to arrive before January 24, 2008. Photographs of the form are acceptable, but only one giveaway entry per envelope, please. All entries will be placed into the relevant draw for the offer. The first names drawn in each will receive one of the products, subject to the number of products on offer. No correspondence can be entered into, and there are no cash equivalents.

Lateral Lines

Write to: Lateral Lines, Practical Fishkeeping, Bretton Court, Bretton, Peterborough PE3 8DZ. **Email:** karen.youngs@emap.com

High phosphate

I had high phosphate levels in my 125 l tropical set-up, which was leading to algae problems. I tried for some time to reduce my phosphate levels using absorbent sponges and carrying out 50/50 tapwater and RO water changes but to no avail – readings were still over 2.0mg/l in 10ml. So I decided to do a separate test with tap and RO water. The result was 0.25mg/l. I also decided to add a minute drop of thawed frozen bloodworm juice – and the result was sky high, nearly 3.0mg/l plus!

Methinks it's probably a good idea to rinse the bloodworm you are using – I haven't tested brineshrimp, but it might be worth doing the same there.

ANDY BIDDULPH, BIRMINGHAM

The wrong kind of fishkeeper

As the shop owner of a small local aquatic store, I get some strange and sometimes funny enquiries, mostly from novice fishkeepers. But there is one that seems to recur a lot and concerns me a bit – I was wondering what other fishkeepers think about it.

Typically the customer is a bloke and his first comment is about how he wants to 'upgrade' from tropicals to marines, which is fair enough, if a strange way of phrasing it. He then continues that freshwater tropicals are 'too easy' and 'have boring colours'. He has 'done all the tropicals' and 'they died' so now he wants to 'do marines'.

Talking to him you quickly find out that he has only kept fish for six months or less and has lost most of them through a combination of neglect and/or overcrowding and/or experimenting with chemical additives... usually a combination of all three.

Obviously this is the last kind of person who should be let loose on

a finely balanced marine system! But you can't convince them, and I get the impression they just go somewhere else and spend loads of money on some huge marine system and a lot of unfortunate livestock that's just going to stand no chance.

Is there a term for such people? Has anyone else come across them, or are they just a local phenomena?

MIKE STATHAM, WILTSHIRE

Fully automatic

I have been interested in fishkeeping all my life – I probably have my father to blame for that as he kept fish for years until he eventually let me take over the reins. I have successfully kept coldwater aquariums and ponds, a tropical community and a marine reef aquarium.

Since moving to a larger house, I have re-constructed a pond and the goldfish have reproduced, and have now set up a coldwater aquarium and a small barb community tropical tank. My next project is to build a marine aquarium.

My expertise in life is control systems and automation, and I was wondering if anyone else has used this for full control of an aquarium. I have previously constructed a system of timers and relays to control light, heat (chilling and heating) and an automatic top-up system which worked well. I now wish to use a PLC to fully control the aquarium, eg. pH, sg, ORP, lights, heat/chill, water level and wave control.

I also plan to include a shut-down system in the event of abnormal conditions, leaks, extreme temperatures, etc. This system can be web-based and readings viewed from anywhere, and any aquarium alarms sent to your phone by SMS. No more phone calls home to see how things are going. Then I hope to expand the system to web

cams to view the aquarium from anywhere, if anyone has tried or installed this method of using a PLC, I would be grateful to hear from you via PFK.

JOHN SKINNER

Eye trouble

In the summer, I had problems with my fish losing their eyes, usually one, but one fish lost both. A reply in the magazine to another reader's letter suggested accidental injury if infection was not evident.

The very helpful staff (Andrew) at Ultimate Discount Aquatics suggested my algae eaters might be the cause. I removed my Chinese sucking loach, Clown loach and Flying fox, and have had no further problems.

BRIDGET PERKIN

Endangered killies

We have recently commenced a project to save endangered species of Aphanis killifish, assisted by many national and international bodies worldwide. The aim is to standardise captive breeding techniques for these species in order to stockpile species for re-introductions where this is practicable. Full details can be found on <http://www.calypso.org.uk/CalypsoResearch>, or searching 'The Aphanis Project'.

If anyone is breeding any of the 24 Aphanis species, or has surplus stocks, we would really be pleased to hear from you. You can contact us at gerald@calypso.org.uk, or write to The Calypso Organisation, 2 Gatcombe Road, London N19 4PT.

GERALD JENNINGS

What a show!

I'm just writing in to say how much my partner and myself enjoyed this year's Festival of Fishkeeping



weekend in Haying Island. There were some beautiful Discus on show, which was perfect for me, as I'm a big fan and my other half is mad keen on Koi - and there were lots of those to see too. But I would recommend it to anyone as there were plenty of other fish on show and lots of stands. We also met and talked to many other fishkeepers and went to some of the lectures, which were very informative. We're definitely going to go again next year.

J. PAUL

Mistaken identity

I do not normally write in *The Fish* magazines, but I feel that it is beneficial to give credit when it is due. The article by Matt Clark on *Puntius tambapamei* and *Puntius auratus* is simply magnificent. I was awestruck when I read this. He has succeeded in making what I had previously considered a rather dull subject, taxonomy, rather fascinating.

It is amazing to imagine that there are fish in the hobby that we do not yet fully know or understand. Thank you for a superb and highly informative article. Keep up the good work on the magazine and the website.

JEFF WAUGH

Is this a record?

My Swordtail has just given birth to 105 fry. This is the most we have ever had. Is it a record?

PATRICIA PROSSER

NOTE:
Discus at this year's FBA's Festival of Fishkeeping weekend.

The new Active Formula for a longer, healthier life.

50 years of continued development has kept TetraMin as the world's best-selling ornamental fish food. And now TetraMin's advanced formula has been improved again.

New TetraMin Active Formula contains a scientific blend of essential nutrients, immunostimulants, and vitamins in mega-doses. This unique combination is proven to combat the effects of stress, one of the most common causes of health problems in fish. This reduces the risk of disease and increases the ability of the fish to fight off infection.

TetraMin Active Formula's special ingredients also increase the efficiency with which fish use the nutrients in TetraMin, leading to better condition and vitality.

So, for a longer, healthier life the choice is new TetraMin Active Formula.

For further information visit www.tetra.net or send a postcard with your name and address, quoting reference TFF1 to Tetra (UK) Ltd, PO Box 300, Peterborough PE1 5BR.

Tetra
The world's best selling ornamental fish food.

My first encounter with the Kuhl loach, often more affectionately referred to as the 'Cookie' loach, was almost 30 years ago during my early days in fishkeeping. Their eel-like appearance and comical high-speed dashes are what first brought them to my attention, and when I delved deeper into their family history, I discovered that there were actually quite a lot of them.

Well, to be more accurate, I found that there were at least 16 described species at that time belonging to the Cobitidae family of loaches, genus *Acanthopheturus*. This genus has now been replaced by the name *Pangio* (Blythe, 1860).

Today there are more than two dozen species of Kuhl loaches, *Pangio*, many of which will have turned up in the hobby at some time or other as contaminants in shipments of the so-called common Kuhl loaches, *P. kuhlii* (Nalenderines, 1846), but it's doubtful that many of them would have been recognised by all but the discerning hobbyist.

The Kuhl loaches belong to the family Cobitidae which contains some very popular aquarium fishes. All are fairly widespread over most of South-east Asia, from India through Bangladesh, Myanmar, Thailand, Cambodia, the Malay peninsula, Borneo and Indonesia.

Generally speaking, these fishes are extremely hardy and are suited to life in community aquaria. They need clear, clean water, but are tolerant of a wide range of water parameters: pH 6.0-7.5, 4-10°GH. Cooler temperatures suit them better, between 21°C and 24°C (70-75°F), but higher temperatures are tolerated for short periods of time.

A substrate of fine, smooth gravel or sand with the addition of a little leaf litter emulates their natural mountain stream and river habitats. If you let a little of the natural mulm that forms in the aquarium build up and lie around the base of plants, rocks or bogwood, the conditions would then be ideal.

Kuhl loaches, although not regarded as shoaling fishes, are gregarious and seem to enjoy the company of their own kind. Kept in groups of at least six, they will often be seen congregating in what can only be described as tangled clumps. In planted aquaria, they are often seen lying motionless in shaded areas among plant leaves, the roots or under any aquarium furnishing. They

MAULI F. PEREZ/ARND BRONKHORST



Cool *customers*

The Kuhli loaches, affectionately referred to as the 'Coolie' loach, have a deserved place in the aquarium. Ian Fuller reveals how best to keep them, and which species will suit you.



Kuhli loaches are very hardy and well-suited to aquarium life.

BELLOW
Kuhli loaches eat just about anything you offer them!

BOTTOM
Kuhlis seem to enjoy the company of their own kind.

also like to spend a large proportion of their time buried in the substrate with only the tip of their snouts protruding.

In aquaria using undergravel filtration, they soon take up residence beneath the filter plates, only venturing out during the hours of darkness.

When disturbed, their laid-back coolness disappears in an instant and they become frantic tearaways, dashing around the aquarium.

One thing is certain; catching them in anything but an unfurnished aquarium is almost impossible, as many fishkeepers have found!

Their dietary requirements are fairly easily accommodated: they are omnivores and will eat just about anything that is offered to them

– flake, frozen, freeze-dried, tablet and granular are all consumed without hesitation. They love worms and live tubifex. White worm or chopped earthworm are particular favourites, but care must be taken when feeding these as they are very rich with a high fat content. Instead, it's best to use them as a supplement to form part of a varied balanced diet.

One of the main advantages of keeping Kuhli loaches in community aquaria is with their ability and habit of burying in the substrate. They are then able to seek out even the smallest particles of food from places where other fishes just cannot reach.

Identifying all the species of *Rangia* here presents a definite problem as there is very little descriptive information available outside of the scientific press, save for the most popular species which are regularly seen in the fishkeeping hobby.

Exporters rarely keep the species they collect separately, and a single shipment can contain as many as six species. It can be tremendous fun trying to catch particular fish out of batches of several hundred!

Looking for a loach?

The following species are reasonably easy to differentiate and are all well worth keeping, either in a specialist or community tank.

***R. myersi* (Harry, 1949):** The Giant

Secretive spawnings

I have not been fortunate enough to observe Kuhli loaches spawning, but on two occasions, a number of very small specimens have materialised out of nowhere. These were less than 15mm/1/2" in length and disappeared as quickly as they appeared, only to show up again somewhat larger a few weeks later.

I have read reports that they are egg scatterers, depositing their eggs among fine-leaved plants.

So far I have been unable to find any witnessed breeding accounts, but it is quite possible that spawning takes place during the night or early hours of the morning.

Emerging fry are reported as being tiny so require liquid foods at the start, followed by very small live foods in the form of sifted *Daphnia/cyclops*, newly hatched *Artemia* or microworm, followed by powdered flake.

The size of the food offerings is increased as the young loaches grow.

Cooke or Slinky loach from south-east Thailand is one of the largest members of the group at 16cm/4", and arguably the most popular. It has between eight and 11 rectangular dark reddish-brown bars on a golden-orange background that almost encircle the body, leaving a pale creamy area on the



The Goldfish Book / johnmurray.org.uk



AP & C. Pookon / Pookon.com

Kuhli loaches



THIS PICTURE:
Kuhlis seem
to like shaded
areas among
plant leaves and
decor.

BELOW:
Albino forms are
available.

belly. The caudal fin may be almost entirely black, or have a large black blotch at the base and a secondary outer bar or row of spots.

***P. kuhlii* (Valenciennes, 1846):**

Equally as popular but a little smaller than *P. egypti* at 9cm/3½". It also has a wider distribution and is found in Thailand, Vietnam, Malaysia, Indonesia, Sumatra and Java. It can be distinguished from other *Pangio* sp. by its colour.

The body is yellow, paler on the belly, with between six and 10 broad dark irregular bars which extend approximately three-quarters the way down the body. The caudal fin has a large black blotch at its base.

There is also a commercially produced albino form.

***P. semilineata* (Fraser-Brunner, 1940):**

At 8cm/3" and commonly known as the Half-banded loach, this species comes from the Malay peninsula. The body is yellowish on the back, becoming lighter on the flanks and fading to a light, pinkish-grey on the belly.

There are between 12 and 16 dark reddish-brown irregular saddle-shaped blotches along the upper half of the body.

***P. anguillaris* (Vallant, 1902):**

This comes from the Malay peninsula, Sumatra and Borneo, and is commonly known as the Eel loach because of its very long slender body. Growing up to 12cm/4½", it is probably the longest of all *Pangios*. It lacks the banded patterning that many of its congeners have, and has an all-over dark olive to brown colouring that is lighter on the belly.

***P. pangio* (Hamilton, 1822):**

Another plain-coloured species from India, Bangladesh and Myanmar that grows to about 6cm/2¼". The body is a dark reddish-brown on the back and flanks, becoming pinkish on the underside.

***P. shufordii* (Poops, 1903):**

This comes from Borneo, Sarawak and the Malay peninsula, and grows to 8cm/3". It also has a unique colour pattern that distinguishes it from any other member of the family. The body is golden olive on the back, becoming lighter on the flanks to cream on the belly.

A series of small, irregular, ragged-edged black blotches form a mid-lateral stripe that extends from the gill cover to the caudal peduncle, where it meets a black vertical band at the caudal base. The caudal fin is mottled with small, dark, irregular blotches.

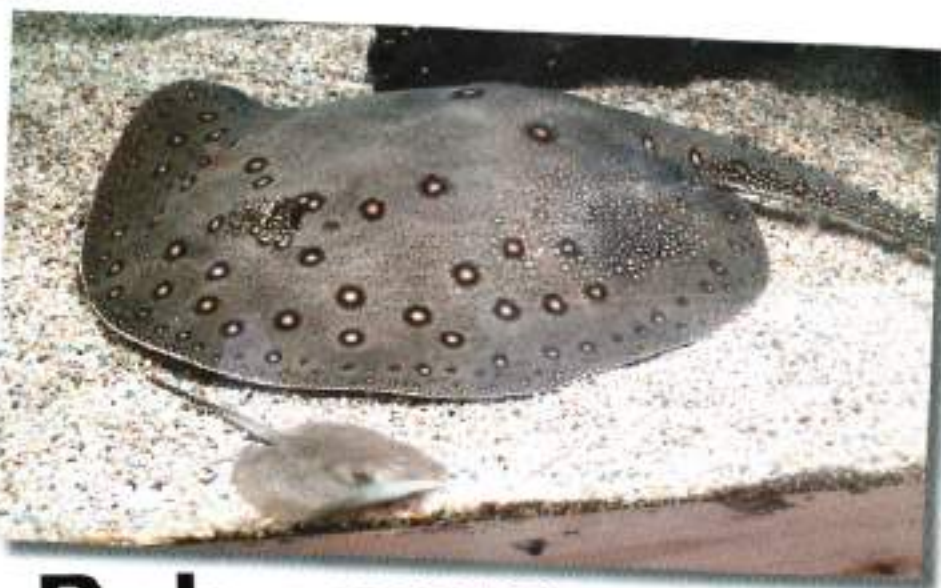


Retail



ROUND-UP

Our monthly forum for Britain's retail shops forms an important part of every issue of Practical Fishkeeping. We help you find the best shops with those all-important high-quality fish, and we hunt out the specialists in every area...



Baby rays

The Maidenhead Aquatics store in St. Albans has had a female motoro stingray give birth to four babies, two of each sex. Staff were expecting their arrival for some time

and had been seeing movement beneath the skin on the back of the mother for about a fortnight.

The parents occupy a 3m x 60cm x 90cm/10' x 2' x 3' display tank, although staff separated

them because the male's continuous advances caused a nasty-looking wound on her back.

The tank runs at a temperature of 30°C/86°F, pH 6.5-7.2. Nitrates are maintained at less than 10ppm, with frequent

water changes using RO water blended with just enough hard St. Albans tapwater to keep it in the range of 5-7°GH.

■ Maidenhead Aquatics
● St Albans, North Orbital Road, St. Albans, Herts.
Tel. 01727 825815



New aquatic shop in Lancashire

A new shop has opened in Lancashire, stocking a wide range of freshwater fish and marines.

Aquahome Aquatic Centre in Leyland has 97 tropical freshwater tanks (total capacity 5000 l/1100 gal.), along with eight Rift Lake cichlid tanks (600 l/132 gal.), eight coldwater tanks (600 l/132 gal.), 16 marine tanks (1000 l/220 gal.) and one large

invert tank.

The shop has some unusual tanks in stock, such as coffee tables, and also specialises in custom-made aquariums in either glass or acrylic.

All fish are quarantined prior to sale, and stock is guaranteed for 24 hours subject to the usual water tests.

Plans are already underway to expand the marine section and open

a new outdoor pond section for 2006.

There's an installation service (the last system they installed was 6000 l/1320 gal.). There's also an aquarium maintenance and leasing service.

■ Aquahome is at Avant Gardens, Wigan Road, Leyland PR25 5XW. Tel: 01772 623497.

Open 9am-5pm Monday-Saturday and 10-4pm Sunday

Full year's guarantee!

Royal Discus is now offering a full year's guarantee on its Discus to customers who are members of the Royal Discus Club.

The club costs £15 a

year to join, and offers members more help with water tests and telephone support.

They are also offering a limited number of tanks on a rental or

maintenance contract, and are looking for 20 selected shops that they could supply Discus to at trade prices.

■ Tel: 01744 814735 or 07866 743286.

PFK subscribers, get your discounts here!

The following shops are offering a discount to all PFK subscribers. To claim your discount, please take the delivery sheet with your name and address on that came with this month's subscription copy into the participating shop when you make your purchase.

- Aquapets, Bents Garden Centre, nr. Warrington, Cheshire WA5 3NP. Tel: 01942 252979.
- Aquatic Finatic, Marlin, Thirsk Road, Northallerton, North Yorkshire DL6 3SB. Tel: 01866 780475.
- The Aquatic Habitat, Shurdington Road, Brockworth, Gloucester GL3 4PU. Tel: 01452 862791.
- Brookside Aquatics, Baydon Road, Bishops Cleeve, Warks. Tel: 01826 612520.
- Cherry Hill Nurseries, Stokesley Road, Hemington Middlesbrough, Cleveland TS8 8DY. Tel: 01642 500659.
- Ely Aquatic Centre, Unit 13, The Dock Business Park, Ely, Cambridgeshire CB7 4DT. Tel: 01553 668998.
- Natural World, 1101 Melton Road, Syston, Leicestershire LE17 2JF. Tel: 0116 260 2001.
- Natureworld Pet & Aquatic Superstore, 86 High Street, Malby, South Yorkshire S66 7BH. Tel: 01709 012400.
- Nemo's Aquatics, White Horse Lane, Maldon, Essex CM9 5QP. Tel: 01621 882552.
- North East Marines (within Parrot Megastore), 1st floor, 20-22 Byker Bridge, Byker, Newcastle-upon-Tyne NE5 1PE. Tel: 0191 295 7170.
- The Aquatic Centre, 15-17 Comely Green Place, Edinburgh, Midlothian EH7 6SY. Tel: 0131 488 2585.
- The Little Fish Shop, 42 London Road, Tanyham, Kent ME9 9QN. Tel: 01795 520023.
- Tranquility Aquatic Centre, 1067-1059 High Road, Chadwell Heath, Romford, Essex RM8 4AU. Tel: 0208 588 8804.
- Tropicals and Marines, 71 Lower Richmond Road, Northcote, London SW14 7HL. Tel: 0208 876 5463.
- West Dorset Aquatics, Goulds Garden Centre, Littlehemp Road, Proton, Weymouth, Dorset DT7 6AD. Tel: 01305 855850.
- Woodford Aquatics, 115-117 Naybank Road, South Woodford, London E18 1LJ. Tel: 0208 505 6444.

READER
RECOMMENDED
SHOPTOUR

Shoptour



This month we visit some of the aquatic outlets in **East Yorkshire**.

Frisby Aquatics



MEET THE EXPERT

Gwen Frisby (above) and husband Arthur have run this shop for many years. Says Gwen: "Always make sure your water quality is OK. 85% of problems are related to water quality. We always advise people check their water before they buy fish."

What we think

This old-fashioned hobbyist's shop is popular with clubs and unusual-fish enthusiasts, but it also caters for locals and youngsters.

There's a friendly, chatty atmosphere here. It's not modern, or that large, but the fish are very well looked after, accurately identified, and the staff have decades of experience.

We saw quite a few things we've not seen on sale before at this shop. Slightly disappointingly, quite a few of the most interesting fish on display were not for sale as they formed part of Arthur Frisby's personal fish collection.

However, it's still a treat to see such fish on display, though.

Address: 113-115 Sculcoates Lane, Beverley Road, Hull, East Yorkshire HU5 1DN. Tel: 01482 445543.

Opening hours: Mon-Fri 11am-7pm, Sat 10am-6pm, Sun closed.

Directions: From Hull Paragon railway or central bus station along Beverley Road until right turn at traffic lights at Sculcoates Lane. Post band at top and about 200 yards on right.

Number of tanks/



ponds: About 150, inc. breeding set-ups.

Fish you specialise in: Any unusual species. Many snakeheads – some undescribed. Malawi, Tanganyikan cichlids. Rare livebearers from Mexico.

Water parameters: Saltwater, pH 6.5, 5-8°GH. All other tanks pH 7.5, 14°GH.

How many quarantine tanks: None.

How long is your

livestock guaranteed for? If anyone loses a fish from us, we help by testing their tank water to establish the problem.

Have you signed our Dyed Fish pledge: Yes.

Plans for the future: To continue to give our expert and free advice. Water tests 50p each. Will do house calls.

Best fish on our visit: Although the range of species is fairly small, there was still a good selection of unusual fish. We restrained ourselves from spending our hard-earned cash on the following mouth-wateringly inexpensive rarities: *Devario regina* £2.40; *Rasbora opibyi* £5.35; *Rasbora vegae* £3.95; *Puntius kuchingensis* £2.20 and *Devario maatsigenensis* £3.20.



The fish specialist would have more on sale at the time of our visit. We promise that if you don't find what you're looking for, we'll do our best to help you find it. We'll also be happy to help you with any other questions you may have. We'll be in touch on your visit.



MEET THE EXPERT

Stuart Fillingham is a very keen hobbykeeper and runs several tanks.

Stuart says, "Don't light your reef tank for too long. Eight hours a day is fine, but some people run them for 12-18 hours and wonder why they are suffering from algae problems."

Tony Cook Ltd Aqua Centre



Address: The Garden and Aquatic Centre, Hull Road, Skirlaugh, East Riding of Yorkshire.
Tel: 01964 670690.

Opening hours: Sat, Mon; Tues, Fri 9am-5pm, Thurs 9am-7.30pm, Sun 10am-4pm.

Directions: Follow A165 from Hull. We are on left, near Gardeners Arms on south side of Skirlaugh.

Number of tanks/ponds: 44 marine tanks,

3 invert tanks, 64 tropical tanks, 24 coldwater tanks and 3 ponds.

Fish you specialise in: Marine fish seem to dominate sales, but we try to offer a mix.

Water parameters: Marine: pH 8.2, 1.021 sg, 25°C/77°F. Tropicals: pH 7.5, 25.5°C/78°F. Coldwater: pH 7.5.

How many quarantine tanks: 18 tanks in situ

How long is your livestock guaranteed



MEET THE EXPERT

Manager **Chris Dierl** offered this bit of advice on controlling flatworms in the reef tank. "If you get an infestation of flatworms in your reef tank, add a Praziquantel. It's a natural form of control."

Marine Tech Ltd



Address: 549 Spring Bank West, Unit 5, Hull.
Tel/fax: 01482 629502.

Opening hours: Mon-Sat 10am-5.30pm, Sun 11am-4pm, closed Weds.

Directions: M62, A63.

Number of tanks/ponds: 44 marine tanks, 30 tropical tanks, 10 coldwater tanks, 400kg rock curing system, 300 gal. coral system.

Fish you specialise in: Marine fish and inverts and all tropical fish.



MEET THE EXPERT

Owner **Pete Jeffrey** keeps South American cichlids at home.

He told us, "Don't feed fish just because they look hungry. We feed our fish only every other day. We offer our fish a mixture of frozen foods, live Tetra and Kingfish flakes."

Newland Pets Aquatic and Reptile



Address: 49 Edgecumbe Street, Hull.
Tel/fax: 01482 342707.

Opening hours: Mon-Sat 9am-5.30pm, Sun 10am-4pm.

Directions: Located in the centre of Newland Avenue, close to A1079.

Number of tanks/ponds: 48 tropical, 2 coldwater, 12 ponds.

Fish you specialise in: Goldfish, shubs, orfe, Koi

and tropical community.

Water parameters: pH 7.4, GH 3.5-8ppm, KH 179ppm, salinity 3ppt.

How many quarantine tanks: 2 in situ.

How long is your livestock guaranteed for: 24 hours.

Are you an OATA member: No.

Have you signed our Dyed Fish pledge: Yes.



for: 24 hours subject to water tests.

Are you an OATA member: No.

Have you signed our Dyed Fish pledge: Yes.

Plans for the future: We are preparing to build an aquatics centre on site. This will feature all new livestock systems, a tank showroom and an outdoor pond section. We hope to move in at the end of January.

Best fish on our visit:



Hexazona barbata £2.99; Malayian sharks £6.50; Spotted headstander £2.82; Gymnothorax £14.99; Indian rock gobies £4.25 and Butterfly plecs £16.50 Southern tubenip wrasse, Labropus australis £19.99

What we think

There's a good basic selection of tropicals, including the odd unusual species, plus a fairly decent marine section with lots of healthy fish, a wide range of soft corals and polyps, and shed-loads of live rock.

The bare-bottomed tanks make them look a little washed-out. Staff are knowledgeable and run some very effective (and very cost effective) nano-meets around the shop, and at home.

What you said...

"Tristy Aquatics in Hull really is the best shop in the area. They have lots of well stocked East African cichlid tanks which are very well labelled as well as a variety of more commonly available species. The shop is genuinely independent and impartial and has given me the expert advice on numerous occasions." **Tim Bourne**

"Marine Tech is a new shop with a fantastic and colourful selection of fish. It specialises in marines." **Peter Brewster**
"Tony Creek Aquatic Centre has some great fish, particularly marines, and the staff are very knowledgeable." **Pete J.**

Other shops

There are other shops in East Yorkshire, but unfortunately we cannot visit them all on our shop-tours. For details of other shops in this area, check out the Fish Shop Finder at www.pfkmag.com/uk/fishshop.

Water parameters: Marines: pH 8.3, 25°C/77°F, 1.021 sg (fish), 1.025 sg (inverts). Very hard tropical water, 24°C/75°F.

How many quarantine tanks: 20 tanks ex situ (10 marine, 10 tropical).

How long is your livestock guaranteed for: 24 hours with recent water sample.

Are you an OATA member: Soon.

Have you signed our



dyed fish pledge: Yes.

Plans for the future: A bigger shop. We shall produce our own designed systems for marine aquaria, i.e. skimmers, sumps etc., for

tanks which we already have produced. Website should be up and running soon with stock and advice, etc.

Best fish on our visit: Although apparently a little low on stock when we called, this store still had a good range of marine fishes and inverts, and all of them looked in great condition.

There's also a small selection of tropical and coldwater fish, but we think it's fair to say that these aren't the main focus at this store.

What we think

Marine Tech is the retail side of a commercial installations company that is refitting the Horniman Museum Aquarium, London.

The staff genuinely care about the hobby and environment – you won't find wild Banggai cardinals on sale; they're keen to buy frags, and they don't recommend using too much live rock.

If you are starting out with marines, this shop's worth a visit.



Plans for the future: We've only owned this property for 9 months. Our aim is to rebuild and expand across to the other side of the city, opening up to cheaper, more affordable systems and with the right advice.

Best fish on our visit: This shop is targeting those new to fishkeeping, so the majority of the fish were common, easy-to-keep community fish. The prices were very low – less than half of what we're used to seeing down south.

What we think

This pet shop has a small room of tropical and coldwater fish, made up almost entirely of the more common community fish.

The shop has recently changed owners, and staff are working hard to improve the systems and refurbish the existing tanks. All of the staff are undergoing training at the local college.

There's an impressive little section of herptiles and arachnids too.

Shop info:
Address: 100-102, The Arcade, York, YO1 1AA
Tel: 01904 626262
Website: www.pfkmag.com/uk/fishshop



Interesting **IMPORTS**

Matt Clarke and **Ian Fuller** look at some of the new and unusual fish in the shops at the moment.



Factfile

Common name: Basket hap

Scientific name: *Mylochromis lateristriga* (Günther, 1861)

Origin: Lake Malawi endemic. Museum records show that this fish has been collected from Lakes Malawi, and the Tanzania and Mozambique coasts.

According to CLOFA, it is more common in the southern parts of the lake, but may also occur in the north.

Size: About 20cm/8" in the wild, potentially larger in captivity.

Diet: Museum records show that this species feeds on crustaceans. Flakes and most frozen foods should be fine for these fish.

Aquarium: According to FishBase, *M. lateristriga* is found in shallow, sandy and vegetated areas in sheltered bays. Therefore, a large aquarium with open water and a soft substrate is preferable. *Walaseovia* can be grown alongside such species, and related species occur in the lake.

As with other haplochromines, keep one or two males and four or more females, or at least two females per male. These should mix with most other large haps, if given sufficient room. A tank of 100cm/48" is the absolute minimum for these, so they are fairly big when mature.

Notes: This fish was originally placed in *Morochromis* following Trewavas and Eccles' study of Malawian haplochromines. However, subsequent authors have suggested that *Morochromis* is a junior synonym and that the fish should be in *Mylochromis* instead.

Identification: Many of the other *Mylochromis* have an oblique stripe, but the snout length, at around 1.4 times the eye diameter, sets this one apart.

They're also more generalised feeders than most others, bearing an oblique stripe.

Cichlid expert Michael Oliver believes that the related and similar-looking *Lichochromis duboisi* is a sister species to *lateristriga*, a specialised insect-feeder with a pointy, laterally compressed face.

Availability: This fish was on sale at Maidenhead Aquatics @ Harlestone Heath, Northamptonshire (01604 532040), and was purchased from the wholesaler African Cichlid Specialists, who imported the fish directly from Lake Malawi.

Price: These wild fish were selling for £75 per pair.

Matt Clarke

Factfile

Common name: Weitzman's Cory
Scientific name: *Corydoras weitzmani*

Origin: Peru, Rio Macho de Dios drainage system.

Water: It is tolerant of a wide range of conditions, but ideally the water provided should be soft and slightly acidic, so pH 5.5-7.0, 2-12 GH.

Size: The holotype measures 4.6cm/1 7/8", aquarium specimens would be expected to grow to 5.0cm/2" for males and up to 5.5cm/2 1/8" for females.

Aquarium: A standard 60 x 50 x 30cm/24" x 12" x 12" well planted aquarium would be ideal to house a group of six specimens.

A fine, smooth-grained substrate, fine sand, a few large pebbles and pieces of bogwood would complete the set up.

Diet: In nature, these fish will feed on insect larvae, shrimps, crustaceans and the minute organisms that can be found living in the biofilm. In aquaria



they will accept flake, tablet, frozen and live foods.

Notes: Described in honour of Dr Stanley Weitzman by Dr H. Nijssen in 1971, this species had, until recently, avoided re-discovery. The main reason for this was that in the original description, the type locality was given as Peru, Est. Gucco, at Gucco. This would have been the highest altitude (around 3330m)

of any known corydorine species. The first specimens to reach the aquarium trade were imported into Japan and reportedly changed hands for more than £200.

Identification: An easily recognisable species with a golden light tan body with four large distinctive black blotches, one forming a band vertically across the eye, the second

and largest in the centre of the body below the dorsal, with the third slightly smaller above the second and reaching into the dorsal fin. The fourth is on the caudal peduncle.

Availability: Imported by Neil Woodward and available at Pier Aquatics, Wigan, Lancashire. Tel: 01542 238 9817.

Price: £24
Ian Fuller



Factfile

Common name: Hora danieli
Scientific name: *Devorio shonensis* Hora, 1920.

Origin: Burma. According to museum records, this species was first collected in 1917 by Fang Kullander at Lawe Pyat stream, in the village of Hong Lic, in the Myingka area of the northern Shan States of Burma.

It's also been collected from the Det Tho Ra Ti river by Britz and Roesler, and near the waterfall at Mon Sen by Tin Win. There are reports of *shonensis* outside Burma, including

records from the Salween basin and in Thailand, but Kullander considers these questionable. Collectors may have confused the fish with *maoiaensis*.

Diet: Flake and frozen bloodworm, Daphnia and cyclops.

Water: Around neutral pH, but keep the temperature less than 25°C/78°F.

Aquarium: Ideal community fish despite its rarity in the trade. Keep a shoal of six or more in a 90cm/36" aquarium with plenty of free swimming space and

a fast current. They are active swimmers.

Sexing: Females become deeper and plump with eggs when ready to spawn. Males are slimmer and more colourful.

Identification: These are really tricky to tell apart from *Devorio maoiaensis* – even for taxonomists. The differences between the two are very subtle, so if you don't know the collection locality, you could get them mixed up.

Both species are on sale here. *Devorio maoiaensis* tends to be

a little more copper coloured, stockier, with a greater body depth and a stouter caudal peduncle than *shonensis*.

The original description of *maoiaensis* says that *shonensis* has a dorsal spot which is absent in *maoiaensis*.

Devorio maoiaensis also has a complete lateral line with 31-35 scales, while *shonensis* has an incomplete lateral line with 23-25 scales.

Later work by Kullander also contradicts this and says that the lateral line of *shonensis* can be either complete or incomplete, and gives different numbers of scales.

You can find out more about this species on Pete Cottle's excellent new daniofish website www.daniofish.info

Availability: On sale at Frisby Aquatics in Hull as *Devorio maoiaensis*. I wouldn't bet on it – I strongly suspect that they are probably *shonensis* rather than *maoiaensis*.

Price: Around £3-4 each at the moment.
Matt Clarke

Reef ramblings



Tim Hayes of Midland Reefs sings the praises of this year's National Aquarium Workshop...

WISHT
Venomous fish like this lionfish can still pack a punch after they're dead.

FISH FIGHT
Geneopore is difficult to keep long-term in captivity.

This month's edition of Reef Ramblings sees me returning from the National Aquarium Workshop. This event is held at a different public aquarium each year, where industry workers from the public aquarium sector, aquaculture and other aquarium professionals gather to exchange information through a series of presentations and informal conversations. This year it was hosted by Anglesey Sea Zoo, at Bangor University. Here are just some of the highlights:

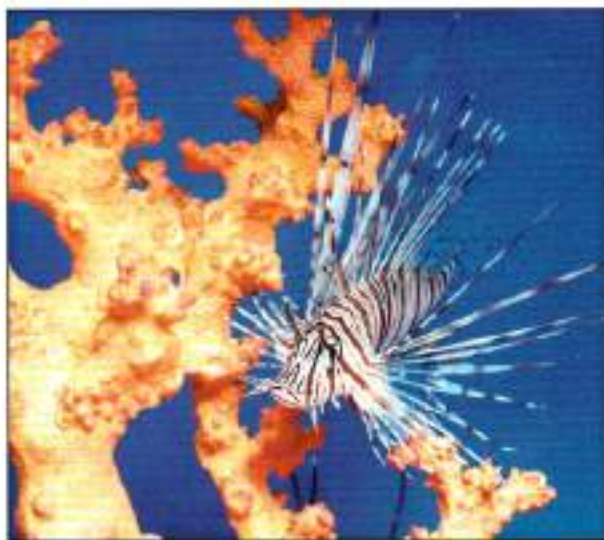
● Rachel Jones of the Zoological Society of London opened the proceedings with *Breeding Corals in Aquariums - Practical Methods and Things to Look Out For*. This highlighted the work currently being done with stony corals, looking at the collection, settlement, and husbandry of coral larvae.

A fascinating field of research, it brings with it the hope that in the future, stony corals will be grown in captivity on a regular basis, taking some pressure off the reefs.

● Marie Orchard from Wildwalk-At-Bristol told us about the brand new Walkthrough Coral Reef Experience that has only just been completed. It's the first live coral reef exhibit to feature a walk-through tunnel, and I for one can't wait to go and see it!

● Another interesting redevelopment project was described by Susanna Legrove. Susanna is the aquarium manager of the Underwater World at Birdworld and her problem involves losing her aquarium building! But all is not lost. She is currently planning how the existing aquatic exhibits can be integrated into the aviary displays, making for a very unusual, non-traditional display.

● Colin Grist, newly back in the UK after some years working at the



New England Aquarium, Boston, USA, is now aquarium Projects Coordinator at Chester Zoo. He outlined a project to create a photographic, taxonomic record of freshwater fishes endemic to the crater lakes of the Philippines.

Interestingly for marine enthusiasts, it seems that one of these lakes, Lake Taal, may contain marine species that have at some time in the past been cut off from the sea. Trapped in this new environment, species such as *Sardinella tawilis* - the only known freshwater sardine, have adapted to living in freshwater.

● Dr Peter Burgess of the Aquarian Advisory Service presented the results of The Big Fish survey. This was a survey to find the extent of the problem of hobbyists wanting to offload overgrown fish onto public aquaria.

The survey questioned the numbers, size and species, along

with a query about whether the owner had known of the potential size of the fish when first bought.

Fewer than 20% of the fish offered were accepted by a public aquarium. And only 32% of the owners were aware of the size their fish could grow to. The majority of the species were large freshwater species, marine species making up about 7% of those offered.

● Professor Rodney Coates, of Seiche Ltd, gave an eye-opening talk on the problems of noise in the ocean and the aquarium. The bulk of his talk focused on the impact of human-generated noise on marine animals. I'll just mention two examples from his presentation.

The first demonstrated how the explosive noise produced by the seismic surveys used for geological exploration, i.e. looking for gas fields beneath the ocean floor, could travel as far as 1000 miles and still be a disruption to marine

mammals. The second concerned how the noise produced by pile-driving during the construction of offshore wind farms was disrupting seals during pupping season by interfering with communication between the newborn seal pups and their mothers.

● Paul Cox, Education Manager for the MMA, spoke of the importance of broadening the role for aquarium education. He talked of how aquariums can work with schools, producing distance-learning packages and linking in with the national curriculum at key stages. The role of the Big Draw in capturing children's imagination was also discussed.

● Mark Burdass of Soarshot College announced a new course aimed specifically at those working in the public aquarium sector. The Foundation Degree in Aquarium Resource Management offers for the first time a nationally validated qualification for those working in public aquaria.

● TMC's Alastair Weddell explained how they could get the best performance out of their ultraviolet (UV) sterilisers. He broke the talk down into ten specific points, each aimed at helping to optimise the efficiency of this equipment.

● Ashley Sharp, senior aquarist at the Zoological Society of London, covered the problems caused by high levels of phosphates in the aquarium and how to deal with it. As far as testing for this pollutant goes, the use of spectrophotometry was recommended as being the most accurate solution. Reference was made to the problem caused by the inaccuracy of many of the available hobby-type test kits.

He also spoke on maintaining *Goniopora* sp. corals long term in captivity. This is a species that, in most cases, goes into decline soon after introduction to the aquarium, usually dying within two years. There is much speculation about the cause of this problem, but as yet no clear-cut answer. Until this problem has been solved, aquarists other than researchers should steer clear of these animals.

● George Ablett, senior aquarist at the Blue Planet Aquarium, outlined procedures for the captive care of venomous species. Much of the emphasis of his talk was on the various health and safety issues involved when handling these species, and what should be done if one is stung.

One important point from this talk that's relevant to hobbyists is



that even after an animal's death, the poison, toxin or venom will still be bioactive and have the potential to cause harm. Good to remember if you ever have to handle a dead animal prior to disposing of it.

● Becs Smith of the Blue Reef Aquarium, Newquay, gave us an overview of the breeding programs in their nursery and of improvements that have been made in husbandry techniques. The nursery was only set up three years ago and was originally limited to seahorses, pipefishes, rays and dogfish. As knowledge has increased and live food culture stations been set up, so the breeding program has expanded to include a couple of tropical marine species and sea bees.

● David Knapp of Sea Life Adventure Southend spoke on *The Life of Brian: Adventures in a Bathyphere*. Brian is, in fact, a quite famous seahorse who was accidentally collected by a trawler in the Thames estuary in June 2004.

Shortly after his arrival at the aquarium, bubbles of air began to collect under his skin. To safely cure the condition, it was decided to use pressure treatment similar to the decompression chamber used by divers. David described how a bathysphere was made using a food bucket, a brick, string and a length of rope. Brian was then lowered into the 2.7m³ deep Ocean Tank incrementally over time, with the process being reversed and repeated every day for a week until his condition had improved.

● Rafael Pérez Domínguez from the School of Ocean Sciences, University of Wales, Bangor, related

a study aimed at determining how much food is taken up and used by marine larval fishes. By learning the true requirements of larval fishes, it should be possible to improve husbandry, allowing more species to be raised successfully.

● Heather Koblewey of the Zoological Society of London talked about improving the sustainability of the trade in coral fishes with emphasis on the public aquarium sector. This consisted of an update about the listing of seahorses under CITES and an ongoing study into using some form of minimum size limit in an effort to improve seahorse sustainability.

● I delivered a talk about my experiences raising the *Borghia* sp. nudibranch that eats pest anemones, passing on information on my husbandry techniques as well as a few observations I've made along the way.

Whose is the biggest?

During the weekend, there was some lively banter about who had the largest exhibit in the UK. This was quickly resolved when Deborah Snelking of the National Marine Aquarium brought us up to date on the progress of *Soylla*. In 2004, HMS *Soylla*, a naval frigate 110m/204' long, was sunk in Whitland Bay as an artificial reef.

The MMA is monitoring *Soylla* to see what the effect is on sedimentary processes in the area, what species are colonising at what rate, and investigating levels of TBT in the bay. TBT is a component of anti-fouling paint used on ships. It's implicated in the disruption of the endocrine system of marine shellfish, leading to the development of male sex characteristics in females, of impairing the immune system of molluscs, and producing shell malformations in shellfish.

Yet *Soylla* has also had a positive effect on the local economy and has become a dive attraction.

It takes two

Breeding has to be one of the most complex behavioural patterns in the fish kingdom. No wonder so many hobbyists are totally confused by how their fish behave at this time. **Dr Ashley Ward** clears the air over many of the mysteries.

The most fascinating part of the fishkeeping hobby has to be studying the natural behaviour patterns of fish. Perhaps most interesting is during their breeding cycle, from courtship to breeding and then providing parental care. Even with the less demanding species, fish display different behaviours.

Why are males more colourful than females?

Vividly coloured or 'ornamented' males are the rule in the animal kingdom – generally speaking, humans are the odd ones out here!

Where male fish are more colourful, this is a result of female choice – and females are choosy because they have more at stake. A female can often produce just one or two batches of eggs during a breeding season, she needs to pick her mate carefully so that she doesn't waste her precious

resources on a male with a set of bad genes! By contrast, males are limited only by the number of females that they can persuade to mate with them. This produces choosy females and competing males who are keen to be chosen!

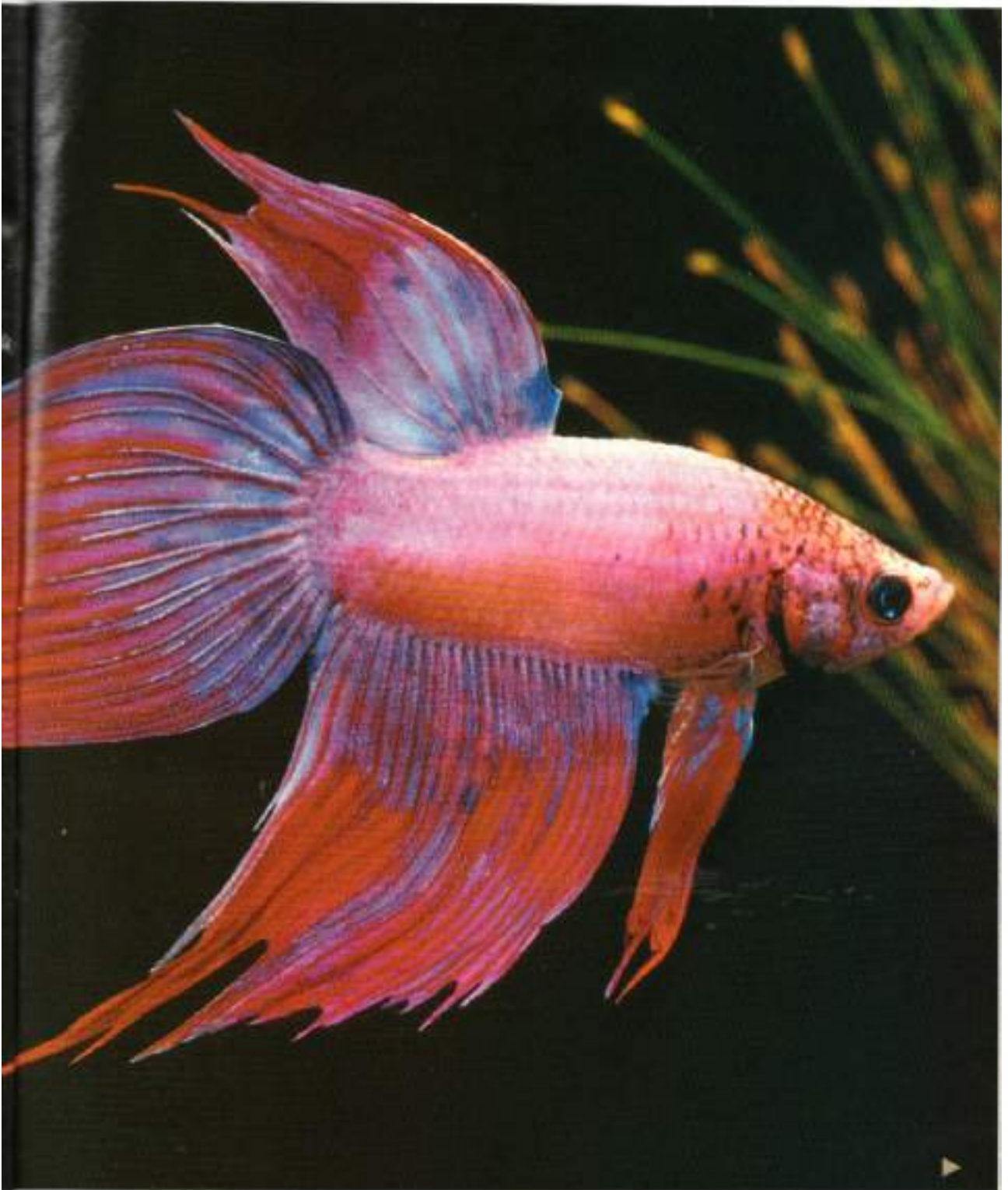
Male colour provides females with an easy way of comparing males, so the more colourful male, or the male with the most impressive sword (in the case of swordtails) gets the girl.

These male traits are thought to be sexy to females, because they tell them something about his general quality, for example how good his genes are and how good he is at fighting off parasites and infections. It makes sense for a female to choose a colourful male because her offspring will inherit their father's good looks. What's more, her sons will be colourful and will be successful at the mating game, while her daughters will inherit her preference for sexy, colourful males!

This produces a positive feedback loop and gradually, over evolutionary time, produces both the most colourful males and the females who demand nothing less! Of course colour isn't always so different; sometimes we see differences in size.

Why are males of some species larger than females, while males of others are smaller?

It depends on the species and its evolutionary history, but big males are good for competing with other males and winning the best territory. The biggest males will take the best territories, and the best territories attract the best females. So when adult males are larger than adult females, this tells you that the species is probably territorial!



PREVIOUS PAGE: The more colour a male fish has, the more desirable he will be to a female.

SHUFF: Mouthbrooding is an advanced form of parental care.

FAR RIGHT: Discus provide body mucus on which their fry can feed.

BELOW: Blatant displays of ornamentation, as in this Swordtail, are also key attractants for females.

and there's likely to be a good deal of male vs male aggression, unless there are females to distract them.

American cichlids fall into this 'big male' pattern, but in fishes, this is rare (unlike in mammals where males are almost always the larger sex). This is because there are advantages to females in being large: the larger she is, the more eggs or, in the case of livebearers, young she will produce. Think of Guppies or mosquitofish!

These advantages are taken to extremes by some species, which change sex over the course of their lives. Protogynous fish are those that are female first and later become male, such as wrasse and parrotfish. To be successful, these species need large, aggressive males to defend territories, so the oldest and largest develop into males.

Protandrous fish are the opposite and are male first, sometimes becoming female as they age, as is seen in the anemonefish. This has advantages in terms of the egg-producing capability, but the next largest fish in any anemone-territory is male, only becoming female when the largest fish dies.

Do fish care who they breed with?

Well, as a politician might say – yes and no! Generally, males are less picky than females and pretty much anything goes for the males of most species. This is because breeding costs him little – he can fertilise the whole tank if he wants! By contrast, females have a bigger physiological investment in reproduction and



MP & C. Bishop/Agfish.com



MP & C. Bishop/Agfish.com

need to avoid putting all their eggs in one basket-case!

But exceptions prove the rule, of course... Not all males are so feckless. In species where males invest in parental care, they tend to be more choosy about their mate. Some of the larger cichlids that form long-term pair bonds have elaborate courtships and advanced recognition mechanisms that contribute to their faithfulness.

Sticklebacks and their distant relatives, the pipefish and seahorses, all exhibit some degree of male choosiness. Male seahorses, which brood their young, are exceptionally picky, and it's the females that are footloose and fancy-free.

Why do my fish defend territories?

Territoriality is common among fish and is usually related – directly or indirectly – to breeding. (That said, many coral reef species defend feeding territories.) Many times, males defend resources that females need, usually a spawning site. This allows the female to choose the best site and the best possible male in one handy package!

After spawning, territory defence becomes more intense. The parental instinct in some species to nurture and protect the offspring overtakes the simple act of staking a claim for space. Before spawning, the territorial fish will save most of its aggression for other members of its own species and sex; afterwards they become less discerning – anything that goes near the eggs or fry needs to watch out!

How do my fish choose when to spawn?

Fish use all kinds of triggers to tell them when the time's right to spawn. A number of shoaling fish, like characins, breed at dawn. There are a number of theories as to why this is – one possible reason is so that the fry hatch and undergo their most vulnerable phase at night when predators are least active.

But perhaps the most commonly used cue is that of temperature. For species that live in seasonal climates, a gradual warming of the water foretells spring. Spawning in spring is common because it means that the fry benefit from the higher temperatures and a comparative glut of food.

Many tropical species have no such obvious seasonal switch from a frozen winter to a warm(ish)



Steve Delaney/PA

summer. They may respond instead to a drop in temperature caused by the onset of the rainy season or the melting of glacial headwaters.

This instinct to spawn is also manifested in marine fish, which may use moon or tidal cycles, salinity or even the prompting of mass spawning aggregations of other species as cues.

Why do fish need live food and precise conditions to breed?

One reason is that the physiological demands of spawning can be enormous. Slight physiological stresses caused by deviations from ideal water conditions can mean that their ability to step up a gear into breeding condition is affected.

This need for exact conditions is prevalent in species with a narrow geographic range or those which experience great stability in their conditions, eg. fish from large lakes and marine fish. With successive captive-bred generations, this effect becomes less and less prevalent. Live food can give the fish an extra lift.

Why do some fish look after their young, while others don't?

Species that provide no care produce thousands, or even

millions, of eggs at a huge physiological cost. In contrast, species that provide parental care save energy by producing comparatively few eggs, 'spending' their energy budget instead on a robust defence of the young.

This is an oversimplification, of course; parental guarding is not an option for all – those that live in open water or in shoals seldom provide parental care. Some fish like the lyretail cichlid, *Neolamprologus zwickhardi*, co-opt their eldest offspring to help look after their siblings so that the whole family cares for the brood.

However, it doesn't seem to make any sense when we see fish immediately after a spawning greedily snaffling their own eggs, or watch a female livebearer chasing the fry that she has just produced! But it does make sense.

Only 1% of all scattered eggs survive to grow into adult fish in the wild: most become high-protein food! The odds are that if the parent of an egg can see it, so can any other waiting predator, and in this case, it might as well be the parent that eats it.

As for livebearers, research has shown that given a choice, female Guppies avoid eating their own offspring (they can detect which ones are their own) in preference to eating someone else's.

Ask Dr Ward
If you have any other questions relating to this or other fish behaviour topics, please don't hesitate to get in touch with Dr Ward via PFK.

Take a **second** look!

Pete Cottle looks at some of the more recently introduced and unusual barbs.

Melon barb,
Puntius fasciatus



FRONT: *Puntius fasciolatus* grows to just under 8cm/3".

BELOW: *P. denisoni* was only 'rediscovered' in 1999.

In the previous two issues, we've seen some gorgeous barbs that are perfect for the community aquarium as well as some definite tankbusters.

This time round I hope to give you ideas about more unusual barbs.

Let's start with a large one. *Ostocroma belangeri* is a very large barb that can only be kept in a spacious aquarium. To reach its full potential, it will need a tank of minimum size 180 x 60 x 60cm/6' x 2' x 2' with good filtration. It is a fish that is not often available.

I have only ever seen small specimens, and if they retain their colours when fully grown, it will be quite stunning. The overall colour is a golden yellow, and it has six black bars evenly spaced along its flanks. For those who like big fish, this is a beauty. As a bonus, it does not appear to be aggressive.

The beautiful Red Line Torpedo barb, *Puntius denisoni*, is a relative new kid on the block. Although this species can grow to 15cm/6", it is ideally suited for a community tank. Originally described by Day in 1865, it was virtually unknown until 1999 when they were 'rediscovered'. Since then they



MP & C. PHOTOFEST/ISTOCKPHOTO



have proved to be a very popular, if somewhat expensive, addition to the community aquarium. With a bright red stripe extending from the nose past the dorsal fin, they are a very showy fish.

Wild fish are currently coming from Kannour, Kerala, in India.

Four or more in an aquarium will make a superb display, particularly if you have a red enhancing light. There are no reports of a successful captive breeding of this species.

The Indian Drape Fin barb is another barb that is fairly new. Its highlight is the very large dorsal fin on the male fish. It was originally thought that this fish was within the genus *Oreochromis*, but the current feeling is that it is probably an undescribed *Puntius*.

It is a small silver fish with a black spot in the caudal peduncle. The dorsal fin is elongated in the male and has a yellow flash topped with black. A pretty fish which is probably happier in softer water, and which shows its best colours in a well planted tank.

Puntius rhombocellatus comes mainly from Borneo, although in all probability most of those we

Yee Seng/ISTOCKPHOTO



“Quite often when *P. fasciolatus* is imported, the body is very thin and it needs plenty of good food...”

see are tank-bred specimens. The overall colour is a pale red and it has black oscillated markings on its sides. These markings are in the form of black oval rings along the flanks of the fish. The fins, except for the pectorals, are orange.

Males tend to show off against one another, which only enhances their colours. They are a peaceful species and are compatible with all of the small barbs.

P. fasciolatus is one that many fishkeepers will probably know better as *Barbus barikoides*. The name was changed a few years ago, but old habits die hard.

It is a slim, orange-red fish with numerous narrow black bars along its flanks. The fins are a similar colour to the body. It is quite active and always on the move searching for food. Quite often when this species is imported, the body is very thin and it needs plenty of good food to get back in good condition. An excellent community fish.

The Melon barb, *P. fasciolatus*, is another barb that has changed

its name in recent years. It used to be called *Barbus melanomyx*; its colour varies enormously, depending on its place of origin. Those from India usually have a fair amount of red with four or five black spots or bands along its length. A peaceful species that is well suited to a community tank.

Last, but by no means least, is one of my favourites. *P. naranyari* or Narayans barb comes from Sri Lanka. It is another of the smaller barbs, growing to only 5cm/2".

It is a deep-bodied fish like the Tiger barb, but that is where the similarity ends! It has no bad habits and is not a spectacularly coloured fish; quite the contrary. The colours are muted, pale but so very nice when seen in the right environment.

The body is silver with a hint of blue. There are two well-defined black spots, one between the gill cover and the dorsal fin, the other between the end of the dorsal and the start of the caudal.

The dorsal and anal fins have a hint of red in them.

Factfiles

Common name: None

Scientific name: *Osteodroma telangani*

Origin: Endemic to China, India and Burma

Size: Grows to 55cm/18"

Notes: Needs plenty of room to grow and the tank should have good filtration. A 'show tank' with six or so of these would, I imagine, look absolutely superb

Price: Small specimens are currently available from Widwoods at £11 each.

Common name: Red Line Torpedo barb

Scientific name: *Puntius denisoni*

Origin: Kerala, India

Size: Up to 15cm/6"

Notes: Beautiful markings. It will benefit from well-aerated water.

Price: Expensive. Usually over £10, often more.

Common name: Indian Drape Fin barb or *Oreochromis* sp. High fin.

Scientific name: Not described, possibly *Puntius* species.

Origin: Streams in the Buxar Tiger Reserve, near the West Bengal-Assam border, India.

Size: Probably no more than 5cm/2"

Notes: Likes clean, 'sweet' water with plenty of oxygen. Will eat all types of food. Likes live Daphnia and mosquito larvae.

Price: £2.85 each, five for £12.50 is typical.

Common name: None

Scientific name: *Puntius rhombocellatus*

Origin: Sumatra

Size: Up to 6cm/2 1/4"

Notes: Beautifully coloured fish that will show its true colours in a well-planted aquarium. Active, but not generally considered to be aggressive.

Price: About £2.50, five for £11 is average.

Common name: None

Scientific name: *Puntius fasciolatus* (*Barbus barikoides*)

Origin: Africa - Angola, Zaire, Zambia

Size: Grows to just under 8cm/3"

Notes: Great community tank fish. Good colour makes it stand out. Accepts all forms of food.

Price: About £1.50.

Common name: Melon barb

Scientific name: *Puntius fasciolatus*

Origin: India, Burma, Indonesia

Size: 5cm/2"

Notes: Good compatible species. Easy to feed and maintain. Look for good coloured specimens.

Price: £2.00, five for £10.

Common name: Narayans barb

Scientific name: *Puntius naranyari*

Origin: Sri Lanka

Size: 5cm/2"

Notes: Peaceful barb that looks superb in well-planted aquaria. Benefits from well-filtered clean water. Should be kept in a small shoal.

Price: £2.50-5.

Previous issues

December 2005. Why barbs are brilliant: Pete looks at some of the barbs you're most likely to see at your local aquatic shop. Christmas 2005. Watch that barb: A look at the larger species, with tips and advice on how best to keep them.

WIN a marine set-up

...including the aquarium, cabinet and loads of equipment worth over £2000! In fact, everything to get you started in marine fishkeeping. With this great competition, the winner takes it all. Just collect two tokens to enter – the first is here, the second is in next month's issue along with the special entry form.

What to do

Here's the first of two tokens that you'll need to cut out to enter this super competition. Look out for the second token in February's issue, along with the special entry form. All you'll need to do is stick this token (and the second one) onto the entry form, fill in your name and address, and send it to the address we'll provide in the February issue.

The first entry pulled from the bag after the closing date (which we'll also give you in the next issue) will be the winner. Sorry, but we can only accept actual tokens from the magazine – no photocopies.

**TOKEN
ONE**

The aquarium

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- Versatile design - the V2Skim Protein Skimmer can be used either as an external hang-on skimmer or internally in a sump or aquarium.
- Water level adjustment dial allows water level and flow to be finely tuned to ensure optimum foam consistency and highly efficient skimming.
- Supplied complete with a high performance pump and a V2Bubble Stop, which filters any remaining micro bubbles from the protein skimmer and prevents them from flowing into the aquarium or sump.
- Ozone compatible.

UV

Helix Max UV sterilizer from Aqua Medic

A new UVC sterilizer from Aqua Medic in five sizes ranging from 5 Watts to 55 Watts with unique spiral water flow and a large volume body enabling increased contact time and optimised efficiency of the UV-C radiation. The connections of the Helix Max can be rotated 360 degrees for ease of installation and space requirements.

With its IP68 electrical protection and 10 metre cable lengths on the 18, 36 and 55 watt models the Helix Max can also be used as a garden pond clarifier killing microalgae.



Competition terms and conditions

All entries for the competition must be received by the entry date (which we'll publish in the February issue), and must be accompanied by the official entry form and the two tokens, published in the January and February issues. The photocopies or faxed entries will be accepted. All the entries will be placed into a draw and the first name drawn will receive the complete set-up as stated. If for any reason beyond the promoters' control it is not possible to provide the stated prize, the promoter reserves the right to award an alternative prize of no lesser value. The promoters' choice of prize is final. There is no cash alternative available. No entries can be returned, and the promoters will enter into no correspondence. The winner will be notified within 30 days of the closing date. We reserve the right to use the winners at any publicity. No employees of Emag Active or other companies involved in this promotion are eligible to enter. No purchase necessary. The editor's decision is final. The promoter excludes responsibility for applications that are lost, delayed or incomplete.

Lighting

T5 lighting is a high output equivalent to the traditional fluorescent tube, and so ideally suited to a reef aquarium where the extra light energy is often required.

Arcadia are donating a 60" model of the "Overtank luminaire" which is a stylish raised canopy and an attractive way of housing these lamps. It comes supplied with four 54W T5 lamps (two "Marine White", and two "Marine Blue Actinic") and has a recommended retail price of £289.99.

It will also be supplied with an adaptor kit (r.r.p. £14.99) that allows the luminaire to be suspended over the aquarium in the same style as a metal halide pendant.



Powerhead

Aquamedic are giving away two Oceanrunner powerheads

Powerheads are an essential addition to reef tanks as they provide water movement around the tank. Corals need water movement to bring them their food but also to rid them of their own waste products. Live rock systems need strong water movement to provide the bacteria on the rock with oxygen and powerheads can be plugged into wave making devices to provide a more natural flow.

Oceanrunner powerheads are well made, robust pumps that are capable of pumping large volumes of water around the tank. They combine energy saving motors with ceramic impeller shafts for a long life and low running costs. They fasten to the glass with four rubber suckers and come with an intake strainer to prevent any accidents with small fish or invertebrates.

Supplements

Waterlife are giving away one of each of their complete range of marine supplements

Reef aquaria require a number of supplements and foods in order to keep corals healthy. In addition to lighting and water flow, corals must feed and take up essential elements in order that they can survive and grow. Waterlife supply Strontium, Calcium, (Replica+), Iodine, Sea trace, 8.3 buffer and Vitazin, a multi vitamin supplement, along with Invertfood, and Seagreen which encourages the growth of desirable macroalgae. The range is complemented by Bioactive filter starter.

RRP: 120ml Strontium: £5.99; 175g Replica: £5.99; 120ml Iodine: £5.99; 120ml Seatrace: £5.99; 120ml Seagreen: £ 5.99; 120ml Bioactive: £8.59; 250g 8.3 buffer; 120ml Vitazin; 125ml Invertfood: £4.45.



Heaterstat

Underworld Products are also giving away a NeWatt Heaterstat.

The NeWatts are designed and made by the renowned heaterstat manufacturer Visitherm (noted by PRK readers as the most reliable heaterstat in two consecutive surveys).

This fully adjustable heater-thermostat has an aluminium core, which distributes heat evenly and efficiently,

and is protected against thermal and mechanical shock by an extra tough polymer casing, making it virtually unbreakable.

One of the unique features of the NeWatt is a built-in sensor that switches the heater off if it is accidentally removed from the water, and automatically switches back on when returned to the water, making it very safe to use within an aquarium or sump environment. There are seven sizes in the range, from 25 to 250W.

RRP is around £24.95, depending on the size of the heater.

Calcium monitor

Priced at £179.95 the PinPoint™ Calcium Monitor is the only truly affordable and accurate digital Calcium measurement instrument available for the marine aquarist.

Powered by a single 9v battery the unit will operate for approximately 150 hours



or using the optional mains adaptor can give a constant reading of Calcium levels in the aquarium. Also available in the PinPoint range are monitors offering measurement of pH, salinity, oxygen, ORP and conductivity levels as well as a wireless thermometer offering temperature readings from up to 4 remote sensors.

For more details of the range visit www.pinpointmonitors.co.uk or call Mark on 01375 390329.



Salt

25kg bucket of Tropic Marin Synthetic Sea Salt worth £85

Tropic Marin first developed synthetic sea salt back in 1965 and it is now a firm favourite with millions of hobbyists around the world as well as being the preferred salt of many of the world's leading professional institutes, hatcheries and public aquariums including The Deep in Hull.

- True to nature and manufactured from pure, pharmaceutical grade ingredients.
- Contains all 70 trace elements found in natural sea water.
- Independently tested to show that it will introduce no harmful by-products, nitrates or phosphates to the water - guaranteed.
- Added special hydrates ensure super solubility in tap water.
- 100% vapour proof packet ensures that no impurities from air and other gases can be absorbed.

Books

£100 worth of books of your choice from TMC Publishing's website

TMC Publishing, a division of Tropical Marine Centre, is the publisher of the English language version of the Marine Fish Families Series of books, a superb range of identification guides covering some of the most popular marine fish species. TMC Publishing also distributes a range of other specialist, quality fishkeeping and aquatic titles, for both the beginner and the more advanced aquarist. To see the full range please go to www.tmc-publishing.com



Phosphate remover

Aquamedic are giving away their Antiphos Fe phosphate remover

Phosphate can be present in almost everything that you place into the marine aquarium, it can be present in rocks, substrates, water, fish foods and live rock, yet levels should be close to zero if your tank is going to succeed. A visible indication that phosphate exists in the aquarium is persistent, nuisance algae.

Antiphos-Fe by Aquamedic is an iron based phosphate remover that binds phosphate irreversibly until it is removed by you, when you replace it. The coarse particle size enables high flow rates of water without the need for it to be fluidised, and it will last for between three and six months in normally populated aquariums. RRP 1000ml £36

Marin Control Digital

Aquamedic are giving away their Marin Control Digital for accurate salt measurement.

Knowing the salt levels and temperature in your aquarium is essential to the success of your system. Many hydrometers offer varying levels of accuracy but the Marin Control Digital can determine a salt concentration or temperature in seconds.

The salinity measurement principle of this meter

is based on the electric conductivity. Salt exists as sodium ion and chloride ion within aqueous solution. As the quantity of sodium ion and chloride ion increases, the solution conductivity also increases proportionately to the increased salt concentration.

The Marin Control Digital comes with spare batteries, 35 ppt calibration solution and a comprehensive instruction manual. RRP £60.00



My favou



rite fish

Kicking off this new series, **John Rundle** talks about his favourite fish – a tale that goes back all the way to the 1970s.

I guess regular readers would expect me to choose either a tetra or a killifish as my favourite. Yet of all the species that I have kept and bred over the years, it is a dwarf cichlid that takes top spot.

I am talking of none other than the beautiful *Nannacara anomala*, which has two very good descriptive common names. One is the Golden-eyed cichlid – when the male is in his breeding colours, the outer portion of his eye is a golden yellow. The other is the Checkerboard cichlid, which refers to the female that, when in breeding colours, takes on this incredible checked body colour.

It was the latter common name that first enticed me to keep and breed this fish. Back in the 1970s, splashed on the front cover of a fishkeeping magazine was a stunning photo of a female dwarf cichlid with this fantastic pattern protecting her brood. I knew then that I had to obtain and breed it.

I also find the attitude of the female incredibly captivating. During breeding, the male takes the dominant role and induces the female into a cave (or in my case an inverted clay plant pot), but once the eggs are laid, the roles are reversed. The female drives away any intruder regardless of size.

So much so that when I have a solitary breeding pair, I make sure that the male is removed for his own safety. This despite the fact that males generally reach 8cm/3", with females somewhat smaller at 5cm/2". It is an attractive fish and often seen in dealer's tanks. It is also easy to breed, making it a good fish for a first-time cichlid project.

Setting up the tank

Although not a large fish, a breeding pair needs a tank of a minimum size of 60 x 30 x 30cm/24" x 12" x 12". This lets the pair use it as a home and a nursery.



MAIN PIC: A breeding pair of *Nannacara anomala* needs a tank a minimum of 60cm long.

LEFT: You know the female is ready to spawn when she adopts this stunning checkerboard pattern.

On the bottom of the tank is a bed of medium-sized aquarium gravel. Two 8cm/3" clay flowerpots lay on their sides for the fish to take cover. As *Nannacara* sp. are open spawners, they breed in open areas of the tank. So somewhere towards the centre of the tank, place a flat stone about 8cm/3" big for the female to deposit her eggs.

I also place Java fern, *Microsorium pteropus*, and Java moss, *Vesicularia dubyana*, to provide extra cover and security. Filtration is supplied by home-made filters and the temperature set to 25°C/77°F. As far as water goes, these fish will live and breed in conditions of pH 6.2-7.2 and a hardness of 3-6°GH.

Getting the ball rolling

Dwarf cichlids such as *N. anomala* like to choose their own partners, so it is advisable to start with a small group, say five to six, and allow them to establish a bond and pair up. Then select a mated pair and place them in the breeding tank. On a varied diet of flake food, frozen bloodworm and, if possible, a live food such as whiteworm, the fish will come into breeding condition.

Visual indicators are when the female takes on the checkerboard pattern. Usually both fish will start to clean the surface of the stone.

Spawning begins with the female laying her amber eggs on the stone, with the male fertilising them immediately. Over 100 eggs can be deposited, after which the female takes control over the eggs.

The male is generally not welcomed after this and is driven away by the female with some vigour. He will probably take refuge in one of the plant pots; this is where the larger tank comes into its own by giving the male a chance to hide. It is best to remove him now and let the female guard the eggs.

Interestingly enough, after three days, the female will gently burst the eggs with her mouth, releasing the yolk-sac larvae. Invariably these are seen as a wriggling mass. She may at this time move them into one of the flowerpots and mounts guard, leaving only to feed.

By the seventh day, they will be free-swimming and closely shadowing their mother en masse. The fry will take brineshrimp nauplii and microworm as first foods. On this diet, they grow to 1.8cm/¾" by six weeks old. At this stage it is best to move them on to a larger tank.

When I first kept this fish, it was the only fish in the genus regularly available to fishkeepers. Now there are new kids on the block such as *N. aureocephalus* and *N. adoketa*, which I can't wait to breed.

Illustrations: SP & C. Photos: ian.speers.com



Who's the *real* boss?



It's ironical but without algae – the bane of fishkeepers, life on earth would not exist in the way that we know it. Perhaps not at all. **Jeffrey Walmsley** looks at algae from a different perspective, and explains how it grows so well.

Our plants are referred to by scientists as 'higher plants' and algae as 'lower plants'. Although when you consider that algae are the oldest living organisms on the planet and may even have been responsible for creating our atmosphere, one is tempted to think it should be the other way

around. Even more so when algae demonstrate their ability to destroy every other type of 'higher plant' – including animal life.

Algae are considered 'lower' only because of their more simplistic construction. Often they comprise just a single cell. But this is their greatest strength; they don't need much to get going, and they absorb it quickly.

On top of this, algae are more resourceful than your 'average' higher plant. When certain nutrients are in short supply, many algae have developed the ability to substitute other nutrients, including some elements which aren't normally considered to be nutrients at all. They are also significantly better at storing nutrients. All this explains why, in some cases, algae continue



to prosper even when we think we have removed their nutrient support. Finally, when present in sufficient numbers, they discharge compounds which competing higher plants (and animals) may find noxious...

The real world

The most significant facts to come out of international research on the behaviour and proliferation of algae relate to nitrate and phosphate. There is much scientific interest in these two nutrients because they escape into the wild in sufficient quantities to destroy habitats, which they do by promoting algae, particularly blue-green algae.

We are told that throughout the world's freshwater, phosphate averages 0.025ppm and in many unspoiled places where our plants are found, it is undetectable.

The second significant fact is that

there are algae for every situation. Leaving aside the oceans, where the vast majority are found, algae grow everywhere from deserts to equally burning hot springs. They are found a metre under the earth, on trees, in the snowy Alps and even on the polar icecaps. There are specialised species for acid and alkaline water, well-lit and unlit water, nutrient-rich and nutrient-poor water, hard- and softwater, plus every gradation in between and in every combination.

If all this sounds too depressing, don't give up! There are known conditions that provide the ideal environment for the most common, most prolific and destructive species. It is these that we need to fear and work to avoid. Fortunately, it is quite easy to do that. In the wild, the most destructive algal blooms occur in waters having high nitrogen and phosphorous levels – by 'high' we mean above 0.1ppm for each.

As you often hear, our plants are

Pumping Iron

Another common algae stimulant is iron. The reason the Reverend Gregory Robman in 1800 advised that fishkeepers keep their tanks out of sunlight to avoid algae was because under the influence of ultra-violet light, algae can convert non-usable forms of iron into the usable form via a process called photo-reduction. Sunlight, of course, contains a vast amount of ultra-violet.

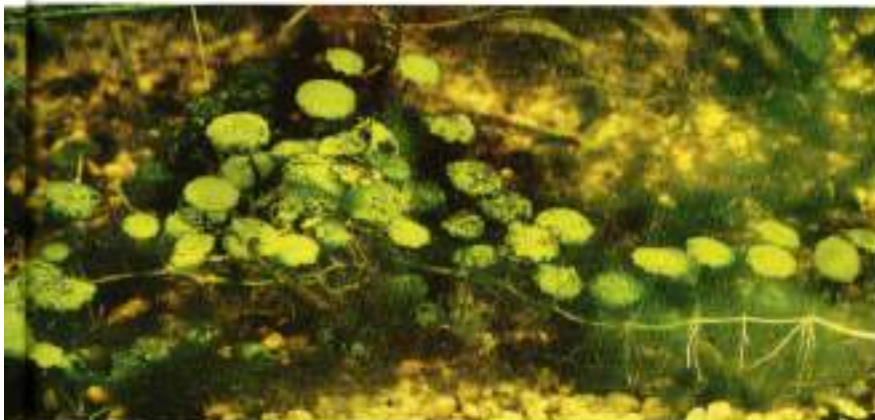
Plants need almost as much iron as they do phosphate. However, iron disappears from the aquarium almost as soon as it is formed or added, explaining why it is the most important additive for the planted aquarium.

Soluble iron is unstable: it oxidises rapidly, which means that its molecules rewire up with oxygen molecules to change its nature, making it impossible for plants to absorb through their leaves. It also precipitates, which means that it again ceases to be soluble, once more making it unavailable to plants.

All this happens relatively quickly. Whereas your plants can't use it (and won't grow without it), many algae can.

However, scientists have found ways of delaying this process of iron loss, which have been used to improve the commercial iron preparations that we buy.

There are also natural situations in which the process is reversed. But more on that another time.



HEAVY PLANTING: Heavily planted tanks rarely suffer from algae.

STUBBORN: Stubborn algae can be difficult to remove from plant leaves.

POISON: 0.1ppm of phosphate can be considered pollution in natural waters.





© iStock.com, Jeff Winters/istock

NOTE: The largest part of plant growth comprises oxygen, hydrogen and carbon.

NOTE: Plants have been known to use up all available phosphate in less than a minute!

the front-line warriors in the war against algae – the more you have, the fewer the algae problems.

The ideal situation is where there is just enough food for the plants and none left for the algae (remember, though, that some algae can manufacture their own food from the most unlikely constituents). Every aquarium is different, however, and there is no standard formula for achieving this nirvana.

Safe – but for what?

You will often see it suggested that this or that level of phosphate or nitrate is 'safe'. For fish, maybe, but for the planted aquarium, it is likely to be a death-knell. We have already seen that the lowest levels that we can measure with many test kits are sufficient to get natural waters officially classified as polluted. Do you want a tank that mimics an environment polluted with detergent or farm fertilizer? Or would you rather replicate the best natural conditions in which our fish and plants come from?

It's my experience that if you can measure any nitrate or phosphate, you are likely to have an algae problem, especially at start-up. And you may still have a problem if your test kits read nil. Contrary to what others may claim, you do not need any measurable level of these for your plants to grow exponentially.

Plants have been shown to take up these substances at phenomenal speed. Those in a certain lake were once shown to be consuming all the phosphate being produced in less than one minute. Even when



the phosphate became more plentiful, they turned over the whole lot every three minutes. And it has been shown that plants can turn over nitrate about every four hours.

The amount of nitrogen and phosphate your plants require daily is literally microscopic. By far the largest part of that growth – like 95% – comprises oxygen, hydrogen and carbon. Nitrate accounts for about half of the rest, and phosphate only a tenth of that!

Plants store these substances in excess, along with all other nutrients, and elements they don't appear to need at all (which is why plants are often used to purify sewage, which they do extremely well). Biologists call this 'luxury consumption', and in some cases it has been found to amount to millions of times more than is needed for growth.

When a plant is saturated with nitrogen and phosphate, uptake will slow to the level of daily consumption, which in the average aquarium is almost always going to be well behind daily production. Thus given that both nitrate and phosphate are being produced 24/7

Keep it acid

You can help both your plants and fish (as long as they prefer acid water) by maintaining an acid pH. One reason plants grow better in acid conditions is that toxic ammonia becomes non-toxic ammonium, which plants take up in preference to nitrate. However, so do algae, of course...

In our aquaria, it should be clear that plants are rarely going to need more to be added.

The hard nuts

There is one other group of algae, the Bacillariophyceae, which require another substance in order to proliferate. Also known as diatomaceous algae, they require silica.

You may have encountered these tiny, tough, tenacious dot-like encrustations on your aquarium glass and plants. They may be green, brown or black, feel rough to the touch, are very difficult to remove from glass and impossible to remove from leaves or other soft material. This roughness arises from the fact that they have a hard coating (in fact, they make little lidded boxes for themselves) created from, you guessed it, silica.

While they may not look like much to you, scientists say that civilised life would probably cease without the modest 100,000 or so species of diatoms that exist on this planet.

Silica, the main form of silicon, is sometimes considered a micro-nutrient, although it's doubtful if any of your aquarium plants need it. But you might find it in some micro-nutrient mixes. If you have been overdosing with these, or if your tapwater contains plenty (it's washed out of natural rocks into the ground or river-water) or you have silica-bearing rocks or substrate, you may have sufficient amounts to enable these tough little fellows to create their armour plating.

No silica, no diatomaceous algae...

Next Issue

More strange ideas about algae prevention and unusual facts.

Glassfish have, sadly, been the target of choice for indiscriminate dyeing. Yet these fish have stacks of appeal without having to be marketed as 'disco fish'. **Neale Monks** investigates.

Glassfish are a regular fixture in tropical fish stores, though often not for the right reasons. For many years they were almost always imported as 'disco fish', with fluorescent paints injected into their bodies to create brightly coloured fish that appealed to inexperienced fishkeepers.

However pretty these disco fish might be, the process of dyeing is known to harm their health, as well as being cruel and unnecessary. In particular, dyed glassfish are significantly more likely to contract lymphocystis than undyed fish.

Since 1996, Practical Fishkeeping has encouraged retailers not to stock these dyed fish, and disco fish are now far less frequently offered for sale than before. A knock-on effect has been that glassfish have slipped off the radar as far as many fishkeepers are concerned, and finding them can sometimes be tricky. Which is a pity as undyed glassfish have a subtle beauty that is easily overlooked when kept with brightly coloured, showier fish like fancy livebearers and Neon tetras.

The not-so-common glassfish

No fewer than three species are imported as Common or Indian glassfish, and in general, no attempt is made by the retailers to separate them. Fortunately, all require much the same conditions to do well. The only difference between them is size – at 3cm/1.1", when fully grown, the smallest species, *Pseudambassis* *lok*, is less than half the size of the largest, *P. ranga*. The third, *P. samensis*, is somewhere between the two, averaging 5-6cm/2"-2.75".

Besides being muddled up by importers and retailers, glassfish have laboured under a variety of scientific names. Older books consign all of them to the genus *Chanda*, and many people still refer to them as such.

More recently they were moved

to another genus, *Ambassis*, and this name remains common in literature. Finally, some of the glassfish were divided up between two new genera, *Pseudambassis* and *Parambassis*. The situation is still far from resolved, but the three species of interest here are all in *Parambassis*. Thankfully, recent aquarium books, magazines and web sites tend to describe these fish under this name.

As if the fact that you could have any one of three difficult-to-tell-apart species of glassfish in your tank wasn't enough, things get even more complicated when it comes to settling on their ideal water conditions.

Traditionally these were viewed as brackish fish, and most books suggest adding an amount of salt to their aquarium. However, collectors say these fish are found primarily in freshwater habitats, sometimes even soft and acidic ones.

Glassfish have a reputation for being delicate and tricky to keep – is this because brackish water is harmful to them? Most likely not since *P. lok* and *P. ranga* are found in brackish water, albeit rarely. Of the three, only *P. samensis* is entirely restricted to freshwater.

Adding too much salt may stress them over the long term, and these fish certainly don't need strongly brackish conditions like Scabs or Morris. A specific gravity of 1.005 or less is probably safe, which means that these fish could be mixed with Bumblebee gobies, pipefish and other fish that do well in slightly brackish conditions.

However, the ideal water conditions are much more like those of other South-east Asian freshwater fish: a neutral pH, not too hard, a steady but not overbearing water current, and plenty of oxygen.

Although not fussy about water chemistry, glassfish can be awkward when it comes to feeding. They rarely, if ever, accept flake, and even some frozen foods are rejected. My glassfish don't show any interest



See Resources

in frozen bloodworm or mosquito larvae, though they enjoy both as live food. Frozen lobster eggs, by contrast, are readily accepted and make an inexpensive and convenient staple food. Frozen lobster eggs are sometimes difficult to find – look for them in stores specialising in marine invertebrates since they're primarily used to feed corals and giant clams. Each egg is tiny, but they're rich in fat and protein, and the glassfish seem to

CRYSTAL EAR

go wild for them, darting about, snapping up the eggs.

Oddball glassfish

A newcomer to the hobby is the Hump-head glassfish, *P. pulcinella*. Only discovered in 2003, it has already become something of a staple and while expensive, is relatively easy to obtain.

A classic oddball, this fish not only retains the silvery transparency

of the smaller glassfish species, but also sports a spectacular nuchal hump. Males have more strongly developed humps than females, and by any standards, these are extraordinary fish.

P. pulcinella is a schooling fish, and given that this species grows to around 20cm/8", it is obviously best suited to a large aquarium. Not much is known about the health of this fish in captivity, but since the fish normally inhabits fast-flowing

waters, good filtration and plenty of oxygen are probably crucial to long-term health.

In terms of social behaviour, *P. pulcinella* is a bit problematic. As with many schooling fish, there is a definite pecking order within the group and if too few are kept, dominant specimens will harass weaker individuals.

You probably want to keep at least six specimens, ideally ten or more. If you only have the option

SPECIES
*Parombrasale
pulcinella*



Above:
Parambassis lala

of keeping three or four specimens, the safest approach is to keep just a single male in the tank, on the assumption that the most aggressive fish within a school tend to be the males.

Another giant glassfish is *P. wolffi*. Like *P. pulcinella*, it is an inhabitant of fresh, not brackish, water and is very widely distributed in slow-moving rivers throughout South-east Asia.

An adult *P. wolffi* is an impressive fish despite not being particularly transparent, with sturdy, spiny fins and a rather menacing face! These fish probably have most appeal to those with an interest in odobol predators, which these most definitely are. At an adult length of 20/8" cm, it can easily swallow fish

as large as platies and small barbs. On the other hand, it is completely peaceful with gouramis, catfish and barbs of comparable size.

Many books suggest that in an aquarium, *P. wolffi* does not grow any bigger than the 'dwarf' species like *P. ranga*. This appears to be the result of confusion over which species was actually imported, with *P. siamensis* often being sold as *P. wolffi*. Recent imports of *P. wolffi* have brought them in at around 10cm/4", and it is probably safe to say that if looked after well, these fish will continue to grow. In other words, this species shouldn't be bought on the hope that it will stay small if kept in a small aquarium.

By far the most infrequently imported glassfish, though many



would say also the most beautiful, is *Gymnochanda filamentosa*. This fish is an inhabitant of acidic, blackwater streams similar to those associated with Discus, though it does tolerate hard or slightly brackish water surprisingly well.

Nonetheless, this fish does best when kept in a dark, thickly planted tank alongside Neons, cardinals, and other small, blackwater fish. While this fish resembles *Parambassis lala*, the males are distinguished by their elongated dorsal and anal fin rays.

Of all the glassfish, this species is generally considered the most delicate, and it is best left to advanced hobbyists.

Glassfish in the aquarium

Keeping glassfish generally presents no problems once the fish are settled in and feeding properly. The main problem is that many fish may not have eaten much over the weeks that they have been in the fish shop. Since glassfish usually refuse flake or dried foods, if they have not been provided with live or frozen foods, they can quickly become weak and disease prone.

Ask the retailer what the glassfish have been fed on: if the answer is flake food, you can assume that the fish will be underweight and will need to be looked after especially well once you bring them home.

They are not particularly disease-



© Gleditsia/istock / Alamy.com

prone, though whitespot can be a problem. Some glassfish, most notably *Gymnocharacin flamentosa*, do not have any scales on their bodies and are in fact very sensitive to skin parasites. Fortunately, glassfish respond well to commercial whitespot treatments.

Glassfish can be susceptible to fungal infections, and keeping them in slightly brackish water can prevent this. However, adding salt is not essential, and in the case of species that are strictly confined to freshwater, such as *G. flamentosa* and *Parambassis pulchella*, keeping them in brackish water over the long term will probably do more harm than good.

Glassfish are generally not aggressive, and the smaller species prefer to be kept with quiet tank mates. Persistently aggressive species like the larger cichlids, pufferfish and some of the sharks and loaches are bad choices, even for the larger species of glassfish.

On the other hand, the small species get along very well with small community fish, and since they are fast-moving midwater fish, they manage to keep out of the way of territorial dwarf cichlids like *Microgeophagus ramirezi* and *Pelvicachromis pulcher*. In short, glassfish are ideal for the peaceful community, much misunderstood over the years, but beginning to be truly appreciated by those looking for something a bit different.

Small
Parambassis waltii

Small
Parambassis pulchella



© iStockphoto

Fact file

Scientific name: *Parambassis lola*
Origin: India to Burma, in slow-moving waters.

Size: To 3cm/1 1/4"
Identification: Small, deep-bodied, amber-tinted fish. There are three vertical black bars on the flanks, and the dorsal and anal fins of the males have electric blue edges.

Water requirements: Neutral freshwater preferred, but can adapt to slightly brackish conditions.

Food: Small live foods such as Daphnia and brine shrimp; will also take some frozen foods such as lobster eggs.

Social behaviour: Peaceful schooling fish.

Scientific name: *P. ranga*
Origin: From Pakistan to Malaysia, in sluggish, standing waters.

Size: To 5cm/2"
Identification: Small, highly transparent species. Similar in shape to *P. lola* but instead of vertical bands on the flanks, there is a single dark patch behind the eye.

Water requirements: Neutral freshwater preferred; can adapt to slightly brackish conditions.

Food: Enjoys frozen lobster eggs as well as live Daphnia, bloodworm, mosquito larvae and brine shrimp.

Social behaviour: Peaceful schooling fish.

Scientific name: *P. zosterata*
Origin: Thailand, Malaysia and Java
Size: To 5cm/2"

Identification: Small, highly transparent species. Similar to *P. ranga* but lacking the dark spot behind the eye, and not so deep-bodied. This species is the one most often dyed and sold as disco fish.

Water requirements: Neutral freshwater.

Food: Small live foods such as bloodworms, Daphnia and

brine shrimp; will also take frozen foods such as lobster eggs.
Social behaviour: Peaceful schooling fish.

Scientific name: *P. woelfli*
Origin: Widespread throughout South-east Asia.

Size: Up to 20cm/8", usually smaller in captivity.

Identification: Large, silvery species similar in shape to *P. ranga*. The dorsal, pelvic and anal fins have very stout spines, and the dorsal and pelvic fins bear distinctive dark patches. Juveniles are more transparent than adults, and can easily be confused with other species of *Parambassis*.

Water requirements: Neutral freshwater.

Food: Live and frozen foods such as brine shrimp, bloodworm and Daphnia. Eat small fish in the wild, so should not be trusted with very small tankmates.

Social behaviour: Peaceful schooling fish.

Scientific name: *P. pulchella*
Origin: Thailand/Burma border, in fast-flowing waters.

Size: Up to 10cm/4"
Identification: Large, transparent species with an unmistakable tall but thin hump on the forehead. This structure is most highly developed in the males.

Water requirements: Neutral freshwater.

Food: Primarily live and frozen foods such as brine shrimp, bloodworm and Daphnia. Also eats small fish in the wild, so should not be trusted with very small tankmates.

Social behaviour: These fish can be aggressive towards one another when not kept in sufficient numbers.

Scientific name: *Gymnocharacin flamentosa*
Origin: Malaysia, primarily from blackwater streams.

Size: Less than 4cm/1 1/4"
Identification: Small, transparent fish, otherwise similar to *P. ranga* but lacking the dark spot behind the eye. Males have greatly extended dorsal and anal fin rays edged with electric blue.

Water requirements: Soft, acidic freshwater, preferably filtered through peat.

Food: Small live foods.

Social behaviour: Peaceful but shy, and must be kept in a fair-sized school. An egg scatterer, and the fry require tiny live foods (infusorians).

Kiss the frog...

PFK reader **Steven Askham** reveals how the Sea frog puffer captured his heart, and says his next challenge is to raise a brood of the feisty characters.

Some things you just have to learn the hard way. Looking for a new challenge, I bought a pair of Sea frog puffers. But on the way home, the bags began to leak – whether my new purchases were trying to escape or just venting frustration, they had chewed a hole in the bag. I don't think I've ever walked so quickly home.

The Sea Frog puffer, *Tetraodon lineatus*, can shift between all shades of green. When threatened, a much darker shade is evident. But what's really captivated me is their behaviour. Their normal activity is to defend their territory – even against their mate! When displaying or chasing each other around the tank (which is when they tend to puff up), they take on a more olive-green. Although their chasing may look aggressive, neither gets hurt and they always return for more.

Other than this, these fish tend to be very inactive – but they still maintain an interest in what goes on around them. For example, if I walk past the tank, the male will stalk and attempt to 'bite' the glass – a right feisty character, all bundled up in 8cm/3" (they can grow to 15cm/6"). And they both try to attack their reflection in the glass.

Care and maintenance

This species comes from Asia, notably India, Bangladesh, Sri Lanka, Burma and Malaysia, where it is found in lakes, ponds and canals, particularly rocky areas. So make sure you offer caves and other hiding-holes. It needs a pH of 7 and a temperature of 24-28°C/75-82°F. I carry out weekly water changes of about 25%, and always replace with water that is slightly cooler to help stimulate spawning.



I decided to house my pair in a tank of their own, 90 x 30 x 45cm/36" x 12" x 18". I use an undergravel filter run by two uplift tubes (one at either end of the tank), powered by two powerheads. There is also a small box filter for extra support because of how much food I feed them. Lighting is just one tube, which is normally left on for nine hours a day.

As for substrate, because these puffers will dig about when breeding, I opted for large gravel to cover (and protect) the filter, followed by a layer of fine gravel which is conducive to any digging.

The tank was heavily decorated to split up their territories. In lieu of caves, I used two halves of a plant pot – the female and male each claimed one as their territory. The few plants I chose didn't do too well thanks to regular attacks.

Feeding is a bit of a challenge. Mine only like frozen food or earthworms, so I offer bloodworm, brineshrimp, krill, prawns, mussels or fresh prawns and earthworms.

Their favourites seem to be mussels and prawns.

Breeding

When I bought these puffers, they had spawned in the shop. In order to encourage them to do so again, I fed them in high quantities to bring them into condition. At first the pair chased each other about. After a week or two, they began puffing up and circling each other. They occasionally seemed to snuggle up to each other, then returned to their own territories.

One morning I saw a hole had been dug at the front of the tank. In it were about 100 transparent eggs. Above them, the male was busy fanning water. If the female went over, he would chase her away.

A day later, the eggs were clearly fertilised, judging by the black dot in them. During the week it took for the eggs to hatch, the male cared for them. On the seventh day, the eggs hatched, releasing free-swimming fry. As the adults did not show any aggression towards them, I left things alone. What a mistake. A week later, not a single fry was left. I am now waiting for my puffers to spawn again, and this time I will be ready!

Watch

Those teeth
You must never let a puffer's teeth grow too long, for this can lead to all sorts of complications, and ultimately the fish will not be able to eat.

The easiest way to keep teeth in check is to feed regularly with food that comes with a shell: prawns and mussels are good examples. If the worst comes to the worst, your puffer's teeth may need filing down by a professional.



ALGAE: Algae are common pests that are quick to attach themselves to aquarium walls.

RIGHT: Flatworms climb up the front glass to be nearer to the light.



grow larger in other situations.) It's very common for small species of Sepsid worm to be found on the front glass. These belong to the subfamily Sepsininae and are sometimes referred to as post horn worms. They have small (1-2mm diameter) bright white spiral-shaped calcareous tubes. Some species have an attractive red crown.

Further reading
If you'd like to find out more about any of the animals we mentioned, or want to identify unknown species in your reef, look at the following books:
• *The Marine Coral Reef Aquarium Series* (four volumes) by Frank and Nilson.
• *Reef Invertebrates* by Gelfo and Ferrer.
• *The Reef Aquarium* (three volumes) by DeBeak and Spring.

Mollusca

There are a number of unintentionally introduced snails that you can find on the front glass.

■ **Limpets:** A couple of species of limpets are common in the reef aquarium. They are small, around 2mm, with a bilaterally symmetrical conical shell. Often mistaken for baby Turbo snails.

■ **Stomatella:** This is a small member of the Trochidae family, hence a relative of the more familiar *Tectus* and *Trochus* sp. that we use to control the growth of algae in our aquaria. This snail has a thin, can-shaped shell that leaves a large part of the foot exposed. Generally around 1cm^{1/2}", although it can grow as large as 2.5cm¹".

Sometimes this snail is mistaken for a sea slug. It makes a useful,

additional herbivore for the reef aquarium.

■ **Carith snails:** Familiar as a frequent shell donor for Caribbean blue-legged hermit crabs. Sometimes comes into the country mixed in with batches of hermit crabs, but can also be a hitchhiker on live rock. A long pointed shell, usually

up to 2cm^{3/4}", and often black.

■ **Nassarius:** A small whelk, 5-10mm^{3/4}"-1 1/2" long, popular as DS8 inhabitants due to their burrowing behaviour but can occasionally be seen on the glass. Most species feed on decaying organic material.

■ **Dove snails:** *Euplica* species, up to about 10mm^{3/4}" in length. Egg masses are found on the glass, small domed structures each containing around eight eggs. Detritus feeder.

Crustacea

■ **Copepoda:** These are small, around 3-5mm. Sometimes referred to as Mussel shrimps. They look like tiny bi-valves, having a carapace made up of two shells. If you look closely or use a lens, you may be able to see their antennae protruding from the shell.

■ **Copepods:** There are thousands of species of copepods. They include carnivores, detritivores, herbivores, omnivores, filter feeders, commensals and parasites. The order of copepods we're most concerned with are the Harpacticoida - these are mostly benthic, but it is possible to have

pelagic (free-swimming) species of copepods in the reef aquarium.

■ **Isopoda:** These are the sea lice and pill bugs; there are over 4000 species described in literature. They tend to have something of a bad name in the hobby as they are best known as fish parasites, but most free-living isopods are reported to be detritus feeders.

■ **Tanaidacea:** These are 1-2mm long insect-like creatures, with around 600 species. They feed to an extent by filtering particles of food out of the water.

■ **Amphipoda:** About 6000 species have been described, making it one of the largest groups of crustaceans. The greatest number belong to the Gammaridea. These have a distinctive curved-back appearance and move by scuttling along on their sides. Very common in reef aquaria; up to about 5mm.

■ **Mysidacea:** These look like miniature shrimps, with a length of up to 25mm. You'll see them constantly on the move, changing direction suddenly. Often after you've fed your tank, you'll see them carrying around fragments of food that seem way out of proportion to their body size.

Echinoderms

■ **Asterina sp.** Sea stars are quite common in reef aquaria. These are small, usually no more than 5cm²" across. They have a base colour that's generally grey/white, along with blotchy highlights in many muted shades that can vary through red, green and blue. They reproduce in the aquarium through fission - they can have five, six or seven arms, and are nearly always of irregular shape due to their manner of reproduction. After a star has split in two, it takes some time for it to generate the full complement of arms. They're harmless.

Small, white brittlestars, up to 2cm^{3/4}" in diameter with an oral disc 2-3mm in diameter, are probably *Amphipholis squamata*. More usually found in or on the substrate. These will go on to the front glass when it hasn't been cleaned for a while.

Small species of filter-feeding sea cucumbers will occasionally place themselves on the glass in a position of high flow, generally in lower light areas. These can be either animals intentionally purchased, eg. *Colochinus robustus*, the Yellow Sea cucumber, or small, 2-3cm^{3/4}"-1" hitchhikers of inconspicuous colour, species unknown.



NOTE:
P. taeniatus
are safe to be
kept in planted
tanks.

Aquarium requirements

P. taeniatus is straightforward to keep so long as its basic needs are met. Good quality water is required, so use power filtration and change the water regularly. A pH of 6.5-7.5 is OK, though they will breed in harder water.

The pH of water can alter the sex of *Pelvicachromis* fry, so if yours turn out to be 90% male, adjust the pH in time for the next spawning and see if that makes a difference.

Keep decor simple – a sand or gravel bottom with some rocks and bogwood are sufficient. Also provide caves in the form of flowerpots, coconut shells or hollow logs as they do like somewhere that is out of the way and may choose them as spawning sites.

Plants can certainly be added; this species is plant friendly. I have kept them in a full-blown Dutch-style planted aquarium with no disruption as they rarely dig or disturb plant roots.

For more basic planting, choose Vallneria, Java fern and Java moss with some Amazon swords to create a forest scene. Lighting is not critical – anything from one to three light tubes on for 10 to 12 hours per day will be fine.

The tank should be as large as

possible, though a 75cm/30" length is the absolute minimum for a pair, and a 90cm/36" or 120cm/48" being better for a pair as part of a mixed community. Tank width is more important than height as they are mostly bottom dwelling.

They will accept a variety of foods including live, freeze-dried, frozen and dry foods such as flake and granules. Bloodworm is popular.

Tankmates

So long as tankmates don't get too large or boisterous and have similar water requirements, you'll be fine. If you want to breed them, leave out other cichlids and species that eat eggs and fry, like most catfish.

Loads of species are compatible like most barbs, rainbowfish and characins, or you could go down the themed route and add Congo tetras or African Red-eyed tetras for a West African tank. Smaller tetras like Cardinals are also OK.

Breeding

If the above conditions are provided, breeding may occur. Spawning is a secretive affair, and the first signs may be that the pair disappear for a few days. Or you may suddenly

see a differently coloured flustered female trying to herd young around the tank. The eggs take up to five days to develop, and a further five days before fry are free swimming.

The male and female both participate in brood care, and 40-60 fry is a usual number. If you do see them with fry, don't panic. The parents do an excellent job of rearing their fry, so you are better off leaving them to get on with it.

If the parents are attacking other fish to the point of nearly killing them, put in a divider as this is the easiest way to resolve the situation.

The ideal is to let a pair form of its own accord from a group of males and females, but at the prices they command, few people will have that luxury. If you get to choose a pair from a dealer's tank, go for a nice, plump female and the best-looking male, or look for a pair that is swimming together.

If you do successfully rear the fry, you may be able to sell the young on to an aquatic store. Only expect to receive a fraction of what you paid for the adults, and don't overproduce or inundate one store. Tell the dealers which variant they are so they can label them correctly and keep them separate to other variants and related species.



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Nemibagrus wycii.

Asian **tigers**

Chris Ralph looks at four tankbusting Asian catfish. Yet despite their 'evil' looks, he is quite taken in by them...



These Asian cats should really be left to public aquaria, unless you have space for incredibly huge tanks – or even a pond! However, they keep cropping up in retailers' tanks, so it is a good idea that you know exactly what that cute little juvenile in the tank is capable of...

Bagarius bagarius

Commonly known as the Devil catfish, *Bagarius bagarius* is also referred to as *B. yarrelli*. This catfish is quite a rare find among shipments of fish from Asia. It belongs to the family Sisoridae, more commonly referred to as Asian Hillstream catfishes.

As their family name suggests, they are found in the fast-flowing freshwater of southern Asia. All can inhabit mountain streams by virtue of the fact that the skin on the undersides of their bodies is 'corrugated', acting as an adhesive

attachment to rocks and stones. They also have flattened heads to withstand the strong water currents, with a ventrally positioned mouth, allowing them to rasp algae from the substrate (with the exception of *B. bagarius*).

Most of the family are small to medium, from 6–30cm/2¼"–12", though some *Bagarius* grow in excess of 2m/6'5".

Bagarius are also predators, quite unlike the other members of the family which tend to be omnivorous. In its natural habitat, *Bagarius* will live under bogwood or logs in wait of its next victim.

I recently had the pleasure of looking after one of these magnificent catfish. Now this is a fish that has 'evil' written all over its face – it watched every move that I made in the fish-house, and no matter where I was, I could sense it watching me. Yet it doesn't play fair and does not like to be watched while it feeds, so you have to try to be out of eye-shot to see it feed.

Factfile

Scientific name: *Bagarius bagarius* (Hamilton, 1822)

Common name: Devil catfish

Synonyms: *Pimelodus bagarius*, *Bagarius yarrelli*, *Bagarius Aca*, *Bagarius euchanani*

Family: Sisoridae

Origin: India, Burma, Thailand, Vietnam, Sumatra, Borneo

Aquarium size: For a juvenile, a minimum size is 80 x 45 x 45cm/36" x 18" x 18"; a semi-mature specimen needs at least a 160 x 80 x 90cm/72" x 36" x 36" tank; an adult a large public aquarium!

Water parameters: pH 5.5–7.6, juveniles prefer hardness up to 12°dH, but adults can tolerate 10°dH, 19–20°C/66–77°F

Breeding: No known reports of it having been bred in captivity; no documented external sexual differences

Diet: Meaty foods. In the wild, this fish feeds on smaller fishes, but in an aquarium it can be persuaded to take cockles, mussels, whole prawns, dead fish and earthworms. It will also eat the scales of fish bigger than itself

Notes: Quite attractively marked – a light brown base colour with dark brown to black mottled markings over the eyes, around the dorsal and adipose fins and at the base of the caudal peduncle. The fins share this mottled pattern of markings. Destined to live a solitary life due to the fact that I am convinced that it would eat just about anything that can fit inside its mouth.

Scientific name: *Hemibagrus wyckioideus* (Feng & Chao, 1948)

Common names: Asian Red-tailed catfish, Common Baung, Pla Kayang Thong, Trey Khya, Asian Red-tail catfish

Synonyms: *Alicorinet wyckioides*, *Alicorinet wyckioides*, *Mystus wyckioides*, *Mystus wyckioides*

Family: Bagridae, subfamily Bagrinae

Origin: Cambodia, Thailand, Malay peninsula, Sumatra, Borneo and Java

Size: 95cm/38" SL, although 138cm/54" TL is suggested

Water parameters: pH 6.0–8.2 (although pH 6.0–7.5 seems to be preferable), 19–28°C/66–85°F

Breeding: No known aquarium spawnings. Males possess a genital papilla in front of the anal fin.

Diet: In the wild it feeds on fish, insects, crabs and prawns; in captivity it will feed on mussels, prawns, fish, earthworms and even catfish pellets

Notes: The base body colour is light grey/brown with a greenish tinge, the lower half and underside is whitish. The caudal fin in adults can be partially or completely bright red. Juveniles have a whitish caudal fin.

The dorsal fin has one spine with seven to eight soft rays; the anal fin has 12–14 soft rays. The maxillary barbels usually reach the middle of the base of the adipose fin, although they may sometimes extend further.

The flattened head has a short occipital process not close to the basal bone of the dorsal fin.

"*Bagarius bagarius*... watched every move I made in the fish-house, and no matter where I was, I could sense it watching me."

Although it is a predator, it will take dead foods in captivity – it ate cockles, whole prawns, mussels, fish and large earthworms.

This catfish needs oxygen-rich water, so you must provide good filtration and water movement, plus regular weekly 25% water changes. Other parameters such as pH and hardness are not as important. This species will tolerate lower water temperatures than most other catfish due to the fact that its natural environment is cooler – I've kept the *Bogaris* at around 22°C/71.5°F.

This is one magnificent cat – just remember that it will eat anything small enough to fit inside its enormous mouth.

Hemibagrus wyckioides

When choosing the Asian Red-tailed catfish, I thought I would be writing about a fairly straightforward catfish... How wrong could I be! First the little beast that I was keeping in my fish-house had changed its name from *Hemibagrus nemurus* to *H. wyckioides*, and then I learned that it can grow up to 95cm/38".

So how did I end up with this catfish in the first place? Well, I had ordered two *H. wyckio* from a wholesaler's list, but when I went to collect them, discovered instead *H. nemurus* (now *H. wyckioides*).

The wholesaler was duly informed of the mix-up and told my local retailer: "But you don't know anything about catfish, and I thought that nobody would notice," to which the response was: "I know, but my customer does!"

Apparently the wholesaler was a tad embarrassed and promised to replace the fish – that was two years ago.

In any case, this is another cat full of character, all packaged in a mammoth bag as it can reach weights of up to 80kg! It glowers at you as if butter would not melt in its mouth, but turn your back and it is probably the most mischievous fish that I have had the pleasure to keep. It constantly rearranges the decor: one day the sand is piled up against one end of the tank, the next you cannot see through the front glass!

In its natural habitat, *H. wyckioides* is found at irregular depths, usually over rocky substrates in large upland rivers. It's a predator, feeding on prawns, insects, fish and crabs in its natural habitat. Not surprisingly, it will eat anything that



I care to feed it, from earthworms, cockles, prawns, mussels, etc. to catfish pellets and floating foodsticks.

It also has a reputation for being one of the most (if not the most) aggressive freshwater fish in the world. It will take chunks out of anything, so in captivity, this catfish is ultimately destined to live a life of solitary confinement.

As with all large species of catfish, good water quality (weekly water changes) and husbandry are paramount. To cater for the water movement it prefers, use adequately sized external and/or internal power filtration.

Anyway, back to the confusion over its name. My first encounters with this catfish were when I saw the odd specimen in a retailer's tank labelled as *Mystus nemurus*. As the years passed, this catfish was re-labelled as *Hemibagrus nemurus*

and then *H. wyckioides*.

To further add to this confusion, *H. nemurus* is indeed a valid species, but differs from *H. wyckioides* in that it does not possess the red tail and has a more flattened head, shorter adipose fin and filamentous extensions to the dorsal and caudal fin rays.

Pangasius hypophthalmus

This is one catfish that should never ever be imported. Not only because of its eventual body size (1.3m/52"), but also because it is a very nervous and skittish fish that does not do well in the confines of cramped aquaria. Yet all too often it is offered for sale as a juvenile of 7.5-10cm/3"-4", labelled as *Pangasius sutchi* or the iridescent shark. A couple of years ago I saw it offered for sale as the 'fish of the week' on



Pangasius hypophthalmus 'albino'

a buy-one-get-one free basis...

These catfish are bred commercially in large ponds for the aquarium trade, which begs the question why? Obviously there is a demand, but who in their right mind would want to keep a catfish that can weigh in excess of 44kg? There is also an albino form.

Hemibagrus wyckii

This species thankfully does not grow as large as *Pangasius hypophthalmus* – though it isn't a dwarf at 71cm/28". Really, it is another cat that is best suited to huge aquaria (minimum 2.7m x 60cm x 60cm/96" x 24" x 24") or, dare I say it, public aquaria. Not surprisingly, perhaps, it is commonly found in local markets where it is sold as a food fish.

As already mentioned, *Hemibagrus wyckii* shares a similar

name with *H. wyckiiodes*, which sometimes causes confusion even though the two are distinctly dissimilar. This fish lives in creeks, lakes and rivers, generally in the middle reaches of these environments. There it catches insects, prawns and other fish.

This catfish is very much a predator, and is capable of crushing its prey to almost paper-thin proportions with its powerful jaws. I have heard of one crushing the head of a dead *Synodontis* before swallowing the fish whole.

Any hiding places in the aquarium must be firmly fixed, preferably sealed tight using aquarium sealant. Heater guards must also be used to protect both the fish and the heater from damage. Cover glasses should be firmly in place as this species is very powerful, swimming from one end of its accommodation to the other at lightning speeds.

Factfile

Scientific name: *Pangasius hypophthalmus* (Sauvage, 1878)

Common names: Indescent shark, Sutchi catfish or Pla Sawai

Synonyms: *Pangasius pangasius*, *Heleocephalus hypophthalmus*, *Pangasionodon hypophthalmus*, *Pangasius pleurotaenia*, *Pangasius sutchi*

Family: Pangasidae

Origin: Thailand, Laos, Cambodia and Vietnam. It has since been introduced in Bangladesh, Philippines, Singapore and Taiwan.

Size: 150m/52" SL

Water parameters: pH 6.5-7.5, 2-25%RH, 22-26°C/71.5-79°F

Breeding: No known records of aquarium spawnings. In the wild, it's a migratory species that moves upstream to spawn in May-July. Males have darker stripes and are more slender than the females.

Diet: An omnivore, it feeds on catfish pellets and tablets, frozen bloodworm, floating food sticks and vegetable matter. It will eat small fish that are in the same tank.

Notes: There are six branched dorsal fin rays and the pelvic fins have eight to nine soft rays. The gill rakers are described as being normally developed, with small gill rakers being interspersed with larger ones. Its fins are dark grey or black.

Juveniles have a black stripe along the lateral line with a second long black stripe below. Adults are grey.

These catfish have a dark stripe on the middle of the anal fin and in each of the caudal lobes.

Scientific name: *Hemibagrus wyckii* (Bleeker, 1858)

Common names: Crystal-eyed catfish, Saung Jeksa and Plaktkao

Synonyms: *Myxus wyckii*, *Hemibagrus wyckii*, *Bagrus wyckii*, *Macromis wyckii*, *Myxus wyckii*, *M wyckii*

Family: Bagridae, subfamily Bagrinae

Origin: The freshwater rivers of Thailand, Sumatra, Java, Cambodia, Vietnam and Laos.

Size: 71cm/28" SL

Water parameters: pH 6.5-7.8, 22-26°C/71.5-79°F

Breeding: No records of aquarium spawnings, and no known sexual differences.

Diet: An eat-and-eat predator capable of devouring any fish small enough to fit in its cavernous mouth. Yet in captivity it feeds on pieces of fish, prawns, molluscs and earthworms.

Notes: Destined to live a solitary life in the aquarium, thanks to its predatory nature. The base colour is best described as black with a cream-coloured conical region. The forked caudal fin is dark grey with a white to cream edge. White markings are present on the base of the pectoral fins, dorsal fin, and on the anterior edge of the adipose fin.

Its head is extremely depressed and broad, while the dorsal fin spine has 10-12 serrations on the posterior edge. The pectoral fins have 10-11 soft rays, the pelvic fins have six soft rays.

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The *Lazyman's* reef

Working as a long-distance lorry driver posed an interesting challenge for Alan Javens, reports **Les Holliday.**

HOW BIG: This isn't a particularly large tank, but it is incredibly successful.

NOTE: Alan's Yellow tang emerged victorious in a battle between it and a Copperband butterflyfish.

Alan Javens is what I call a born-again reefkeeper. He had a crack at a reef tank in the early days of the hobby when undergravel filters ruled and reef hobbyists were topping up their marine systems straight from the tap. Not surprisingly, those systems were veritable nitrate factories, and success in keeping sensitive corals was often measured only in weeks. Consequently, Alan lost all of his fish and invertebrates. This completely killed his interest, and it wasn't until a chance visit to a local shop specialising in marines a couple of years ago that his passion

for the hobby was rekindled. The shop was Interfish, owned by Roy Meeke and Ken Blackburn. Alan was enthralled by their gorgeous reef displays and large stocks of healthy fish and inverts. He could not believe how much reefkeeping had developed, and after a few more visits, was fully committed to having another try.

"Roy and Ken were really helpful and soon became my mentors," said Alan, "starting by assisting me in deciding what form of reef systems would suit me best. My job as a long-distance lorry driver takes me out of the country a lot, and I usually only spend my weekends

at home. I needed a lazyman's reef system, which would be easy for my wife to tend to in my absence."

As Alan was interested in low-tech, natural-based filtration methods, Roy and Ken advised him to consider either a deep sandbed or the Leng Sy EcoSystem method, using Miracle Mud and a Caulerpa refugium. Says Alan: "It seemed that the deep-sand method would suit me best... the simplicity of the set-up and the economical cost were well appreciated. The tank also, from the start, was highly successful, and it has been more or less trouble-free since it was set up two-and-a-half years ago."



All neat and orderly

My immediate impression was how neat and compact a reef system he has. With a capacity of only 214 l/47 gal., it is slightly less than my own preferred minimum size for a reef tank, which I feel should be no smaller than 230 l/50 gal. – but it is so easy for me to make an exception considering the healthy look of Alan's reef system.

The lack of a sump is partially responsible for the low water capacity as the tank is quite roomy. The sizeable dimensions are, in fact, a big advantage as this allows a large area for the deep sandbed.

Depth and composition are the focus of debate among deep sandbed enthusiasts, with various recommendations for different layers of sand of various grain sizes.

Alan uses the very fine Caribsea Aragamax sugar-sized sand, and despite standard advice for a depth of 5-6cm/2"-2½", he has experimented and opted for a depth of around twice that. The concerns of using this sand to such a depth is that a lack of water circulation in the deeper layers could see toxic hydrogen sulphide

form. Yet in Alan's tank, this does not seem to be occurring and his nitrate levels are nil, apparently due to efficient anaerobic denitrification.

Fine-grain aragonite sand has many advantages, but most significant is that it provides a much greater surface area for bacteria to colonise than a coarser material, and more efficient anaerobic action takes place in the lower layers. The fine grains also prevent detritus penetrating the substrate, as can occur with coarser grains.

Recent evidence shows that because aragonite is extremely soluble, it has a stabilising effect on pH and helps to maintain natural calcium and alkalinity levels, while also slowly releasing useful elements like magnesium, strontium and iron.

Living rock contributes a great deal to biological filtration, and he has squeezed in around 45kg/99 lb by using plate-shaped pieces rather than the usual boulder shapes, a factor that must add to the biological filtration's efficiency.

Skimming is recommended with the deep-sand method. Alan uses a Dohco hang-on MCE 600 model, which produces 300lph of air.

For chemical filtration, he relies on a deep layer of activated carbon using an Eheim 2234 canister filter. The filter also contains Eheim Substratpro biological filter media, but it is debatable whether this should be necessary taking into account the seemingly high efficiency of the deep sandbed. Activated carbon is an excellent adsorbent material and will handle toxins and organics such as phenols, which the sandbed will not remedy.

Lighting is pretty standard, using an off-the-shelf Arcadia Series 3 unit which is fitted with two 150 metal halides rated at 14,000K, supplemented by two 30W actinic tubes. This unit seems to be more than adequate at supporting intense light-requiring subjects such as actively growing Acropora corals. These are thriving and continuously need cutting back.

Water circulation is conventional, based on four submersible MPI 200 lph pumps in each of the corners of the tank just below water surface level. Three run constantly, with the fourth controlled by a Natural Wave wave-maker.

Trial and error

With such an array of healthy-looking hard and soft corals, I was surprised to find that Alan hasn't included a calcium reactor. In

Factfile

Aquarium vital statistics

100 x 58 x 45cm/39" x 23" x 18", 214 l/47 gal. There is no attached sump or other connected reservoirs apart from the hang-on skimmer, which is insignificant in terms of water volume.

Biological filtration

The main form of filtration is a deep sandbed of 10-15cm/4"-6", comprised of Caribsea Aragamax sugar-size ultra-fine aragonite sand. Plus an Eheim 2234 canister filter with Eheim Substratpro biological filter media – but its main purpose is to act as an activated carbon reactor. 45kg of living rock.

Chemical filtration

Activated carbon using a deep layer of Eheim carbon pads in an Eheim 2234 canister filter. Changed four monthly according to the manufacturer's instructions.

Water changes

Partial water changes of 10% three times weekly using Kent sea salt and RO water, which Alan buys in.

Skimming

A Dohco MCE 600 hang-on skimmer, powered by an integral pump.

Calcium/carbonate hardness management

Three scoops of Tropic Marin Bio-Calcium dissolved in water and added at fortnightly intervals.

Water circulation

Four MPI 200 lph submersible pumps, one fitted to a Natural Wave wave-maker. This gives a theoretical total water movement of 4800 lph, and a total tank turnover of 20-22 times per hour.

Lighting

An Arcadia Series 3 lighting system featuring:
2 x Arcadia 150W 14,000K metal halide lamps
2 x Arcadia 30W actinic fluorescent

Height above water: 12cm

Photoperiod:

Metal halides: 0900-1700
Fluorescents: 0800-1800

Cooling

Cooling fan used



Tailpiece

News and views from the PFK office - and what's happening in our own tanks



"...it should have been no surprise that out of the whole bank of community fish I gave him to choose from in the shop, the ones he came home with were bright orange (and black) Tuxedo platies."

BELIEVE
Jeremy Gay joins Practical Fishkeeping as Technical writer, while Matt Clarke (pictured with his new son, Henry) moves onto the PFK website full-time.

My three-year-old's favourite colour at the moment is orange. He asked for an orange bike for Christmas this year - and we actually managed to find one; he has an orange lorry which he tries to take everywhere; and an orange pair of pyjamas that we always have to try and wash and dry in one day, so that he can wear them again the next night!

So when I took him to buy his first fish recently, it should have been no surprise that out of the whole bank of community fish I showed him to choose from in the shop, the ones he came home with were bright orange (and black) Tuxedo platies. He stood with a big smile on his face while the assistant netted them out for him, and then he made sure that we went straight home to put them in the tank. Over the last two weeks I think he has shown everyone who has come to the house (including a delivery man!) his new fish, and he counts them every day. At the moment there are six (two males and four females), which is fine as he can count up to 12 - but I'm not sure if he'll be able to keep up with the numbers when they start reproducing in typical Platy-fashion.

■ There have been a number of changes here at the PFK office. I'd very much like to welcome on board PFK's new Technical writer Jeremy Gay. Jeremy has been keeping fish for 20 years and has spent the last seven years in the retail trade. He's had experience with all types of fish over the years and currently has a number of different set-ups at home, including a tank for a group of *Steatoporus 'lowango'* - a cichlid which is new to the hobby and which, despite the quite laid-back reputation of Lumpheads in general, Jeremy reckons are "well nasty!". He also has a thriving reef tank - and the luxury of a fishkeeping partner, which can't be bad.

PFK's former Technical and Website editor, Matt Clarke, will now take on responsibility for our website full time, and he has loads of really exciting things planned. Why not visit the PFK website at www.practicalfishkeeping.co.uk and sign up for our e-newsletter so you don't miss anything?

We've been getting loads of really good feedback on the website since its recent relaunch, and I think it's safe to say that with Matt on board full time, it's going to be even better!

Matt has also very recently become a dad again. His son, Henry, was born at the end of November. Many congratulations to Matt and his partner Sarah.

■ How are you with a camera? In the next issue we'll be giving you some tips on photographing fish - and there'll be a chance for you to enter your pictures in our great competition! There are categories for professional, amateur and junior photographers, so don't miss the February issue which has full details of how you can enter!

■ We'd like to wish all our readers and advertisers a very happy 2006! Why not make a New Year's Resolution not to miss a single issue of PFK by taking out a subscription? You'll find a fantastic offer on pages 110-111 with some great free gifts to choose from.



Harriet Young