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## Editorial

Practical Fishkeeping, February

Practical Fishkeeping is published twice a month in February and August. Telephone: 01707 861 001 Fax: 01707 861 002. Editor: Peter Brown, Editor: David Jones. Contact Peter Brown: 01707 861 001. Contact David Jones: 01707 861 002. E-mail: peter@practicalfishkeeping.co.uk david@practicalfishkeeping.co.uk

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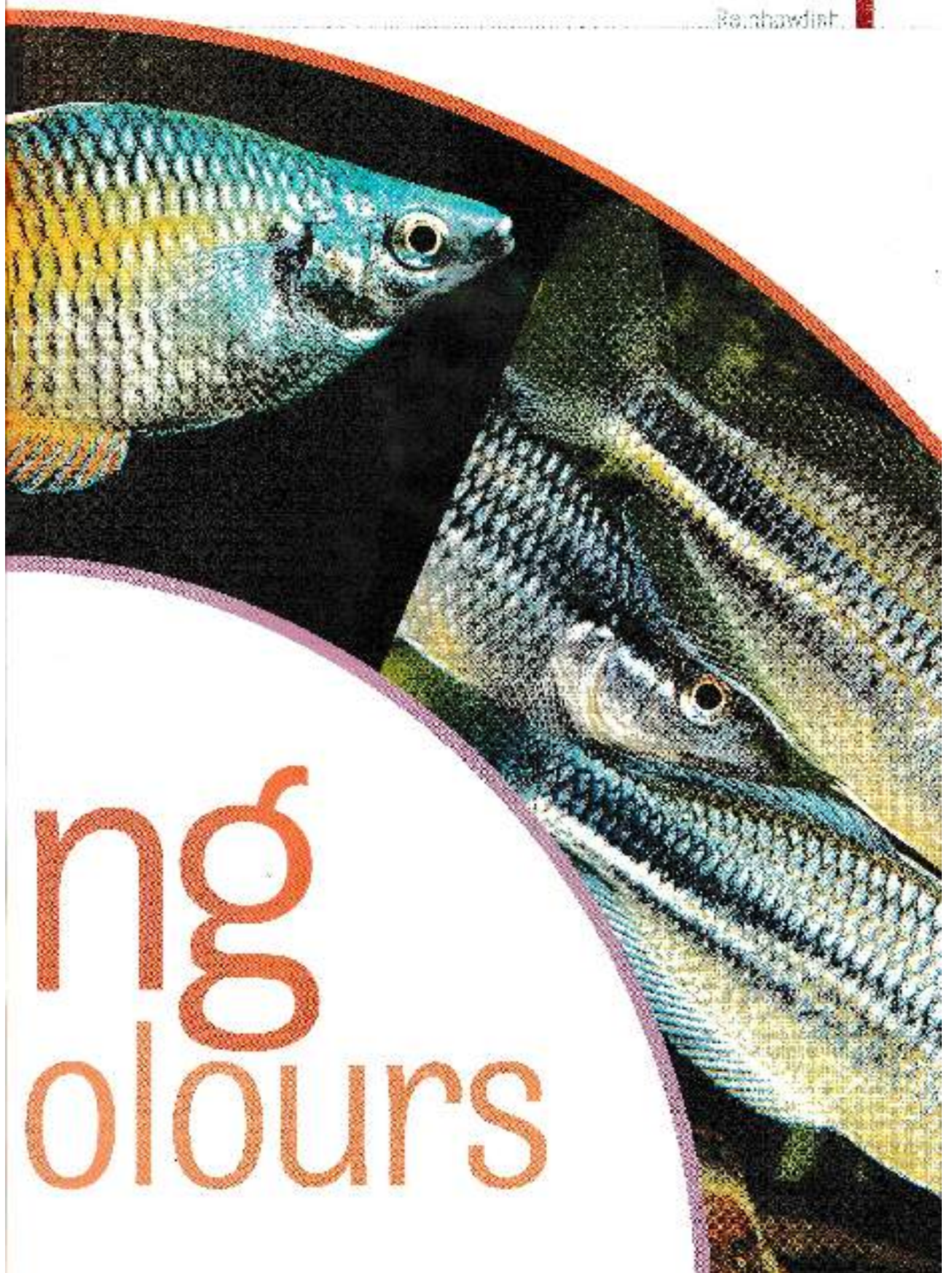


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# Flyi C

Dull, drab and not very interesting? Juvenile rainbowfish are not especially inspiring - but wait till they mature, says **Sean Evans**.



ng  
olours

**PREVIOUS PAGE**  
Left to right:  
6. *molaxus*, 11.  
*bovarius* and  
12. *lacustris*.

**RIGHT**  
Goldfishes show  
their best  
colours in  
clean, well-  
filtered water  
with a high  
oxygen content  
and minimal  
nutrients.

**BELOW:** The  
Medagascan  
rainbowfish are  
members of a  
different family  
to the more  
commonly sold  
rainbowfish  
species.

**T**hink of a rainbow and you'll probably see the vibrant colours shimmering across the sky following a rain shower. And when you hear that a fish is called a rainbowfish, you probably expect a riot of colours. But in fish shops, you are most likely to be greeted by 2-3 juveniles of a dozen species. If you go to local pet stores, the only fish being sold will be, um, goldfish.

These fish show only the faint hints of the vibrant colour they will display as adults. For this reason, they are often regarded as fishkeepers' best friends for colour and breeding addition. This is due to the fact that they are so easy to keep in captivity.

Rainbowfish may also be a little more expensive than other popular schooling fish for adults and tetras or other species when the juveniles are passed over in favour of more commonly available, cheaper, give their appearance of sex of the opposite sex and the stunning adult fish, which may display more vibrant colours.

#### The right conditions

Rainbowfish are mainly found in New Guinea and Australia, with a few species coming from Madagascar and Southeast Asia. The fishes of the family Melanotaeniidae are regarded as more expensive. This

family includes the larger genus *Melanotaenia* containing about 50 species, along with 15 other genera. In addition, members of related families such as the *Pseudomugilidae* (blue eyes) and *Atherinidae* (silver daddies) are often included.

Although the natural environment of rainbowfish covers a wide area, a temperature of 20-28°C (70-85°F) is suitable for a pet tank. A tank volume of about 200-300 litres is ideal.

Rainbowfish come from natural waters with a range of chemistry. They appear to be adaptable to varying hardness and pH values, as long as nutrients are stocked. Most will thrive in fairly soft and slightly acidic to the neutral end of the scale.

Species which originate from more soft water seem to thrive in harder water, and medium hard, neutral to alkaline water is probably the best choice.

In spite of their adaptability to different water chemistries, the quality must not be neglected. Rainbowfish show their best colours and are more active in filtered, a clean, well-filtered water with a high oxygen content and minimal wastes.

This is probably best achieved using internal power filters for small to medium-sized tanks. These provide the most circulation and hence aeration and are good for removal of wastes as well as providing biological filtration.

In large tanks (around 200-1,000 gallons), the combination of an internal power filter and an external canister filter is ideal.

Wastes can be minimised with frequent water changes. In a tank, which has three or five or ten large-scale water changes in a week, a community tank, the use of 10-15 other fishes influence the water change schedule, a minimum of 10-15% of the tank water change is around 80% of the total.

Rainbowfish are generally peaceful fishes, and although circumstances can vary from one individual to the next, this is not a true egg-eater. *Melanotaenia* species form the predominant variety of male towards towards each other when spawning. They are schooling fish and should be kept in groups of five or more.

They are also fast-swimming, active fish, and for this reason, the larger species may not be the best choice with fish for delicate equipment which may have difficulty swimming for food.

However, there are some smaller and less contentious species available. Suitable companions include bottom feeders such as loaches and Corydoras catfish, as well as alkaliphiles like *Burjurinus* catfish, *Channa* spp., or the true *Gambusia* (Asian water). *Channa* spp. are not suitable.

Other active mid-water or upper mid-schooling fish like barbs,



© Peter D. Calvert

Juveniles show only the barest hint of the wonderful colour they will display as adults. For this reason, they are often bypassed...

release, detritus and algae tanks. A couple of long finned rainbowfisher species of rainbowfish can be kept in a 10 litre aquarium.

Rainbowfish are ideal for those who keep planted tanks. Some species may nibble at certain aquarium plants. A third plant can, of course, be used as an alternative. Whichever is used, select a variety of colours and leaf shapes to provide a nice contrast, and make sure some plants in the tank are hard-leaved and don't need the light.

Feeding rainbowfish is not too difficult. They will break up the aquarium and make things interesting. In the absence of open swimming space in the front for these species (10cm or more) or



not housed in front of less than 100cm<sup>3</sup> of water.

Most rainbowfish accept most food offered. However, they should not be fed to completion in providing a varied diet. Many feed primarily on insects and their larvae in the wild, in the aquarium a range of live, frozen and pellet foods can be offered, supplemented with variety of frozen and freeze-dried.

#### What's available

The genus *Melanotaenia* contains many of the commonly available species. These include Rosewater's Rainbowfish, *M. melanotaenia*, the Ranked rainbowfish, *M. affinis*, the Lake Kutubu rainbowfish, *M. culicoides*, and the Dwarf blue rainbowfish, *M. australis*.

The so-called Percussion's rainbowfish shows a contrasting half-and-half streaking on the anterior (front) half of its body, with a golden-orange colour on the posterior. They originate from northern Australia, the western half of New Guinea. Adults reach about 10cm<sup>3</sup> maximum.

The banded rainbowfish, a stunning fish as an adult, with orange-red fins and a range of blues, yellows and other colours. There are several colour variations, adding an additional range of blue to each of its range in northern Australia. Some also exhibit differences in size and body shape, and might eventually be considered as sub-species or new species. Adults reach 10-15cm<sup>3</sup>.

The Lake Tullahoma rainbowfish, sometimes called the Tennessee or Blue Goldeneye, is a fish with a stunning colour. The upper half of the body shows a beautiful blue or blue-green colour, and the lower half is usually silver white to gold. Unfortunately, it can change its colour to red if it is found only in 14-16cm<sup>3</sup> of water. It is native to Papua New Guinea, and reaches about 10cm<sup>3</sup> maximum.

A smaller member of the genus is

the Dwarf Bluefish, *M. australis*. This fish may be the most common, which gives it a 'blue' name. It is a good choice for smaller tanks with other potential tankmates. Both show better ability to tolerate a more turbid water, which makes the fish spectacular.

The line of males are kept red, whereas the females are yellow-orange. This difference is apparent even in young fish.

One of the most common species of the large genus are the old favourite, the Dwarf Australian rainbowfish, *M. maculata*, and the Spotted rainbowfish, *M. spilargentea*, which has a number of sub-species.

The Red rainbowfish, *Melanotaenia spilargentea*, has the most commonly available fish. The stunning red of adult males has caused their popularity. A variety and form as a silver and blue-brown. It also has a form in blue and red to about 10cm<sup>3</sup> in length. They are called the blue and red rainbowfish with plenty of open swimming space.

The Threadfin rainbowfish, *Melanotaenia argentea*, is a fine ornament. They are smaller and more delicate fish which are best kept in a thin streamer tank or with a few peaceful companions such as *Corydoras* catfish and peaceful tetras like neons. Glowlight tetras or Rummy nose tetras.

They should never be mixed with potential fin nippers as the finning and colouring are an obvious target. It comes from northern Australia and Iran Java, and reaches about 10cm<sup>3</sup>. Males are slightly larger and have prominent spines on their second dorsal and anal fins. Despite their delicate appearance, they should never be kept with more aggressive fish in the aquarium.

Although not as commonly encountered, *Diadema* spines, from the genus, is more easily available. It is slimmer in shape than the *Melanotaenia* species and grows to 8-9-10cm<sup>3</sup> in length. Rosewater's

Warning: don't buy hybrid fish. It is a common mistake. Buy the fish from a reputable breeder and try to get a copy of the fish's pedigree. It is a good idea to get a copy of the fish's pedigree. It is a good idea to get a copy of the fish's pedigree.





**TOP:** *Melanotaenia guineensis* is one of the easiest rainbowfish to breed.

**BOTTOM:** The Lake Kutubui rainbow, or *Aequidens leucis*, great when mature.

the species, and even the female may actually be a much more colorful fish than the male.

For example, take two common species we often see in tanks. The first is the blue eye rainbowfish, *Melanotaenia cyathoptera*, many of which are actually broken in the wild.

In other, like the Lake Kutubui rainbow, *Aequidens leucis*, more than one fish may be a female. The female *Aequidens leucis* is a *Tetraodon* species. These come from the island of Sulawesi, in the Indonesian Islands.

#### When the mood takes...

Male rainbowfish generally display bright colors, and in most species, males have deeper bodies. The first rainbowfish we see in tanks are the male fish, and they are the best to keep. The second color is the female fish.

A good diet and high water quality is important in encouraging the fish to spawn. Rainbowfish can only spawn in the morning, and the lighting we use in our tank should be on for a long time.

#### Make your own culture

Culture of all these species is straightforward. In green water, the rainbowfish will lay a pair of eggs in water. The eggs will hatch in a few days, and the young will be on the bottom. Some of the eggs will hatch in a few days, and the young will be on the bottom. Some of the eggs will hatch in a few days, and the young will be on the bottom. Some of the eggs will hatch in a few days, and the young will be on the bottom.

#### Influence on spawning

A little morning sun, dropping the heat, may prove a trigger, though some fish from warmer areas will need to be kept in separate spawning tanks. At the same time, rainbowfish will spawn on a daily basis, even daily, with

A group of spawning rainbowfish is a spectacular sight. Males don't even swim in a line of speed and stop suddenly, even though they are in an impressive display to the females.

It is possible to see two females pair, or even a larger group, as they chase each other around. While they display in front of the female, it's best to have an extra female, so it's not a case of one male chasing a second male.

Because the males usually chase each other, the male usually has the female, a breeding group can be formed in a few days.



male and female rainbowfish. In pairs, they will lay a few eggs, and when spawning is done, a male will remain to guard the spawning site.

Rainbowfish tend to eat both eggs and fry after spawning. Unplanned spawning may take a few days, and if they have plenty of cover. However, you will usually find that you will see a few fish, and if you have a separate aquarium, you will see them in a separate tank.

Approach spawning fish should be kept in a separate tank, if necessary, and a few days out on will make you find them later.

Provide a water and a pre-mixed sponge filter. Do not use power filters in any tanks as they may get sucked into the filter. The artificial spawning medium usually makes a good choice of water for the female plants such as Cabomba, *Hydrophilum* or Java moss. All these eggs will be scattered during the spawning process, which takes about a week or so.

The fish are very hardy, and the spawning water is clean and a liquid form is used for the first week or two.

Mostly, rainbowfish makes a good spawning tank, and can be used with a few other fish.

Males and females are the same size, and the eggs are the same. Smaller males have a few fish, and a few fish in the early stage.

Simply crushing fish or other food is not the best method of spawning. The male and female of some fish are different. However, the approach can be used with any fish, and it can be used in a few days. Any case, the food and water should be replaced off regularly.

At a normal, green water, it should be possible by the time they are three months old. At six to 12 months, they are usually mature, and the fish are usually mature.



# News

The latest events in the fishkeeping world and dates for your diary.

On the PFK website this month...

**Two million fish!** In our PFK special PFK exhibition, we will be exhibiting 2 million fish, 100,000 of which are goldfish and 100,000 are koi. It will be a fantastic opportunity to see a million fish in one place. The exhibition will be held at the National Exhibition Centre, Birmingham, from 10th to 14th June. Tickets are available from the PFK website.

**Top 100 fish** We have compiled a list of the top 100 fish in the world. This is a list of the most popular and interesting fish species. It includes a wide range of species from all over the world. The list is available on the PFK website.

www.practicalfishkeeping.co.uk

## High drama as Koi thieves nabbed

### One helicopter, three police forces in hour-long operation

**A** case of four suspected Koi thieves was caught in the Midlands as a lengthy and dramatic chase which involved a police helicopter, officers from three police forces, and members of the public.

A report in the *Express & Star* says that four men were spotted trying to steal Koi fish from a pond in the village of Cawley, near Woburnhampton.

Officers from and north were alerted and were approached by a man from Kidderminster and startled them.

When the men tried to escape their pursuers across fields, a police helicopter from West Midlands was alerted.

The newspaper says that a member of the public helped the police by tracking the path of the suspects with his car, leading them to try to escape in a van.

The following ground and air operations led to

the arrests of four men, all from the West Midlands area, who have been charged in police cell.

One suspect was injured in an fall. Two more were located by the helicopter and arrested by uniformed officers. The fourth man was captured a short time later.

A spokesman for Warwickshire said: "The initial police thinking by the person who spotted the suspects at the pond, and their subsequent cooperation between the various police officers

involved in the case, is thanked in the suspect's arrest of four men."

"I thank our staff here, the local population, the police and anyone who helped the case in the several times recently."

CA A large number of who have had their fish stolen to contact them. Make contact by at once have local information that could be passed to the case.

The number is 01905 228000.

## Bristleworms-bacteria link to coral bleaching

A study has shown that bristleworms and bacteria can be linked to bleaching in certain species of coral.

According to research published by Rosenblatt and colleagues in the journal *Applied and Environmental Microbiology*, the coral *Centropyge* undergoes natural bleaching during the summer when sea temperatures rise due to the increase in water temperature.

The bristleworms, *Syllis* and *Paraprionospio*, were found to be associated with the coral and were found to be associated with the coral.

the bristleworm disease during the spring and summer when the water gets warmer.

The authors say that *Syllis* shows signs of being linked to a bacteria containing cyanobacteria in the coral tissues.

The bacteria then penetrates into the soft tissue of the coral, which can lead to the coral's death. The authors say that the bacteria can be found in high levels of the coral's soft tissue.

This study is part of a project to investigate the conditions under which coral bleaching occurs, which is a major threat to coral reefs.



## Fish fact

## GM cichlids help for haemophiliacs

Genetically modified fish could be put to use as a source for the production of certain proteins, but one likely to be of great importance is human albumin, the protein found in human blood, or for haemophilic sufferers.

According to a report in *Nature Biotech*, Norman Metten, a scientist from the University of Washington, has been working with Aquacore of Canada to produce GM

fish, which produce human coagulation factor VI.

Human coagulation factor VI promotes blood clotting and is usually produced using GM hamster cells, says Metten.

However, using mammalian cells is more expensive – a single injection could cost £57,000 (£5500) to produce – and the final product will be able to produce the protein

more cost-effectively.

Aquacore has now produced several lines of genetically modified fish capable of producing human factor VI.

At the moment, the GM fish can produce similar levels of the protein to those found in human blood. However, it's hoped that, in a year, they will be able to produce ten times the amount by adopting the GM technique.

## Seahorses take to the world stage

All 36 known species of seahorse are now subject to a regulation by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES),

the 1973 treaty, then improved to take effect in 2003. CITES places seahorses on Appendix I, which sets out that they may be threatened if trade is not regulated. This took effect on May 10, 2004.

More than 10 million seahorses are traded annually among about 80 nations. Countries wishing to export fish will have to prove the exports do

not threaten existing wild populations. But many are as yet unable to assess the sustainability of exports.

CITES believed a short-term solution is to limit the size and age of GM fish. Most seahorses are 10 to 15 cm long at the end of their life. Countries can consider other options, such as no-take zones, closed seasons and gear restrictions.

Trade in the smaller seahorse is only allowed with wild-caught females as the keepers still have access to rain-seawater and those caught and sold within national borders

### What you can do

- Familiarise yourself with your national and regional wildlife regulations.
- Ask questions about the source of any specimens.
- Only use informed, reliable retailers and suppliers.
- Support marine conservation organisations.

Project Seahorse is an international marine conservation organisation ([www.projectseahorse.org](http://www.projectseahorse.org)). For more info on CITES, visit [www.cites.org](http://www.cites.org). Dr Heather Hall, Seahorse Database, Aquarium, Zoological Society of London

## PFK bound volumes for sale

We have a small number of limited PFK *PFK* bound volumes for 2003. Each volume has 12 issues of PFK published that year.

They are priced at a very reasonable £40 each, including postage and packing, but it's first come first served. The limitedly available bound volumes sell out very quickly indeed!

To order your copy,

please send out your payment to: Bound Volumes, Practical Fisheries, Barton Court, Bolton, Peterborough PE6 6AG.

If you want to make a purchase using your non-credit card, contact Norman Trewin at the PFK office on 01753 282704.



## News in brief

**WITTINGTON WIND CORAL:** Seahorse populations across the UK, the British Isles and throughout Europe are declining. In the west, the 1990s saw a decline in the number of fish caught. In the east, the 1990s saw a decline in the number of fish caught. The decline in the west is attributed to a combination of factors, including a decline in the number of fish caught and a decline in the number of fish caught.

**IT'S BANNED FISH:** Seahorse populations are declining across the UK, the British Isles and throughout Europe. In the west, the 1990s saw a decline in the number of fish caught. In the east, the 1990s saw a decline in the number of fish caught. The decline in the west is attributed to a combination of factors, including a decline in the number of fish caught and a decline in the number of fish caught.

**PINKISH SCORPION AND RELEASED IN RIVER:** A fisherman caught a pinkish scorpionfish in a North Devon river and then released it. According to the fisherman, the fish was about 10 cm long and was caught in the river. The fisherman released the fish into the river. The fisherman released the fish into the river.

**WHITE SHARK FEEDS IN CAPTIVITY:** A white shark was kept in captivity and fed with fish. The shark was kept in a tank and fed with fish. The shark was kept in a tank and fed with fish. The shark was kept in a tank and fed with fish.

## Diary dates

October 10  
London: *Wildlife Society* will be holding a meeting on the subject of 'The Seahorse Database'. The meeting will be held at the Natural History Museum, London, on October 10th. The meeting will be held at the Natural History Museum, London, on October 10th.

October 11  
London: *Seahorse Database* will be holding a meeting for 2003. The meeting will be held at the Natural History Museum, London, on October 11th.

October 12  
The date of the PFK meeting is still to be confirmed. It will be held at the Natural History Museum, London, on October 12th.

colour to match the seabed



# News

## Aquarium will be four times the size of Eden Project

A British UK-based freshwater biology is now planning an aquarium which will be four times the size of the Eden Project, according to a report in *The Daily Telegraph* magazine's supplement.

If everything goes to plan, Nott, the National Institute for Research into Aquatic Habitats, will provide Britain's freshwater biologist with a unique research facility, as well as providing what could be one of the UK's

largest skilled divers in a 200,000 litre tank. Vegetarians over here please note the new location, on the west coast, is in a sheltered bay in the Severn Estuary and exposed to the worst tides soon.

Not only will Nott provide the world's largest aquarium, it will take form as a freshwater equivalent of a theme park, with a planned to take three billion litres of tanks, as well as numerous smaller ones of various sizes up to 10,000-litre best-domes similar

to those used at the Eden Project. The project's £250 million cost will be borne primarily by private investment.

The project does not contain a mention of a flooded Amazon rainforest and Mediterranean system, with a show of giant parrotfish. The world's largest freshwater fish.

The size of the world's largest freshwater landscape, with more than 50 species of freshwater sharks and rays in the third giant aquarium.

The project is being supported by a number of universities and is being led by Dr Steve Leung.

The team expects to get funding towards from spin-off ventures, making a share of freshwater projects a national priority. The team's efforts to develop such projects are seen as a national priority.

With a world's largest freshwater aquarium, it is predicted to reach two million a year.

### Taxonomic research

**POGONIIDAE ADRIATICUS** A new species of fish described from the coast of the Adriatic. The species is a member of the family Pogonidae. It was first described by Wilson in 1907 in the journal *Journal of the Royal Society of London* and is related to the genus *Pogon*.

**STILOIDEA PUGNATORIA** A new species of fish described from the coast of the Adriatic. The species is a member of the family Stiloideidae. It was first described by Wilson in 1907 in the journal *Journal of the Royal Society of London* and is related to the genus *Stiloides*.

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**TRICHOMYCTERID CATFISH** A new species of fish described from the coast of the Adriatic. The species is a member of the family Trichomycteridae. It was first described by Wilson in 1907 in the journal *Journal of the Royal Society of London* and is related to the genus *Trichomycterus*.

**REDESCRIPTION OF ANEIRIS** A new species of fish described from the coast of the Adriatic. The species is a member of the family Aneuridae. It was first described by Wilson in 1907 in the journal *Journal of the Royal Society of London* and is related to the genus *Aneiris*.

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# The people's poll

## What encourages you most to visit a new shop?

Is it an amazing range of unusual fish, a good variety of dry goods, or perhaps you zoom in on those bargains and are always in search of low prices?

There are about 1700 aquatic centres across the UK, listed in our Fish Shop Index on the Practical Fishkeeping website. Yet new shops are opening all the time.

So what do you look for when a new shop opens, or even if shops close to you? From your responses, most of you prefer to see a wide range of unusual fish.

Ben Horner says: "I love to see a wide variety of fish in the fish store."

"The more varieties that are stocked means that I may be able to run across the rare species that I am interested in."

Although shops cannot ignore the bread-and-butter fish, such as Guppies, Mollies, goldfish etc, which form the bulk of sales, many shops want to see more in the tanks.

Ben Johnson says: "It seems some shops are concentrating on having lots of food, but I hope that we don't necessarily want to see 10 tanks of different coloured Guppies."

Damon Carter is no stranger to travel, he says: "I love the oddball and unusual species of fish. I have four tanks, three with different purposes."

The legend here is a head-on profile system.

The poll is titled 'What Aquatics and The

Goldfish Show, just to see what they have - some journeys well over 200 miles."

"To see something rare and unusual is a joy."

Alex Reaver is another who will leave a fish store in search of the 4 size subject. "I'm usually 18h and a huge people and myself to travel further. Once I travel about 100 miles for a rare Madagascar cichlid, Parachanna nana, but it was worth the trip."

Keeping a wide range of fish species also seems to send a message to potential customers.

Chris Healey elaborates: "A combination of common and more unusual species is a good indication that the shop is not just there for the money."

"More unusual is one other factor for quite a time before a purchase, diving into experience, and only stuff you are interested in fish (as opposed to merchandise) likely to stock them."

Heski said this, adding that their own decisions whether the fish offered by a shop or were an incidental addition.

"Any shop can stock dry goods with little knowledge, but to stock and maintain rare or unusual species often takes an extraordinary knowledge of aquatic species, and experienced staff."

Yet Kit Lane has a different perspective. "I'm a dry goods and equipment guy, so I don't buy from a photograph and a good description most things about a fish, but it's very hard to assess for yourself if a fish's care or life will be right for your volume of fish and contained."

Some people do like to give a good look and feel for themselves the equipment on offer.

Just, Michelle Douglas says: "I may be unusual in that I will never buy by catalogue, but I like to see cheap prices."

"I like to poke around the equipment I am buying first, when it is a new filter or heater."

"When I bought my first tank six years ago, I was on the fence and knew I needed the system and everything."

"Then when it took, I like to pick it up and put it into a basket. That's not the way I am."

Fair enough. Yet you also like a party for some.

Chris Bell says: "As far as a tight budget goes it comes in keeping up. I never go back into the stores. Though saying this, I will not buy anything from a shop that looks dirty and the tanks full of dead fish."

Other readers made mention of the importance of staff's appearance. Such as Eric, who said: "More important than range of fish is the way they are kept. A clean environment and intelligent staff go a lot further than price. Ify gives an idea of a selection."

### Next month's poll

Have you ever been refused a sale? Have you ever tried to buy a fish, but were refused for that? Did the fish ever die inside? What do you do when your weekender and what you do in the end. Did you go elsewhere or return to the shop later? Send your views to [www.practicalfishkeeping.co.uk](http://www.practicalfishkeeping.co.uk).

**Tracking down the best shops**  
The Fish Shop Index is available for free on the Practical Fishkeeping website. To find out more, visit [www.practicalfishkeeping.co.uk](http://www.practicalfishkeeping.co.uk).



[www.practicalfishkeeping.co.uk/thepeoplespoll](http://www.practicalfishkeeping.co.uk/thepeoplespoll)

# Here's a challenge...

**John Kunkle** presents three egglayers - the Congo Tetra, Neon tetra and Threadfin rainbowfish - that are tricky to breed, but well worth the challenge.

**By John Kunkle**  
I've been a part of many fish shows and have been fortunate to meet many of the breeders who have made their names in the hobby. One of the most interesting people I met was John Kunkle, who has been breeding fish for over 30 years. He is a very knowledgeable and experienced breeder, and he has a lot of interesting stories to tell. One of the most interesting stories I heard was about his experience breeding the Congo Tetra. He said that it was a very challenging task, but he was determined to succeed. He finally managed to breed a pair of Congo Tetras, and he was very proud of his achievement. He said that he had learned a lot from the experience, and he was happy to share his knowledge with others. He said that he had learned that the Congo Tetra is a very sensitive species, and that it requires a lot of care and attention. He said that he had learned that the Congo Tetra is a very social species, and that it needs to be kept in a group. He said that he had learned that the Congo Tetra is a very hardy species, and that it can tolerate a wide range of water conditions. He said that he had learned that the Congo Tetra is a very beautiful species, and that it is a great addition to any aquarium. He said that he was very happy to share his knowledge with others, and that he was happy to help anyone who was interested in breeding the Congo Tetra. He said that he was very proud of his achievement, and that he was very happy to share his knowledge with others. He said that he was very happy to help anyone who was interested in breeding the Congo Tetra.

**T**he Congo tetra is a popular fish among people who breed fish, and it is a very challenging fish to breed. It is a very hardy species, and it can tolerate a wide range of water conditions. It is a very social species, and it needs to be kept in a group. It is a very beautiful species, and it is a great addition to any aquarium.

The Congo tetra is a very hardy species, and it can tolerate a wide range of water conditions. It is a very social species, and it needs to be kept in a group. It is a very beautiful species, and it is a great addition to any aquarium.

## Congo tetra

The fish is very hardy and can tolerate a wide range of water conditions. It is a very social species, and it needs to be kept in a group. It is a very beautiful species, and it is a great addition to any aquarium.

A beautiful African fish, the Congo tetra is a very hardy species, and it can tolerate a wide range of water conditions. It is a very social species, and it needs to be kept in a group. It is a very beautiful species, and it is a great addition to any aquarium.

If you are interested in breeding the Congo tetra, you should know that it is a very challenging task. It is a very hardy species, and it can tolerate a wide range of water conditions. It is a very social species, and it needs to be kept in a group. It is a very beautiful species, and it is a great addition to any aquarium.

Congo tetras are very hardy fish, and they can tolerate a wide range of water conditions. They are very social fish, and they need to be kept in a group. They are very beautiful fish, and they are a great addition to any aquarium.

from who allow them to live happily. However, for breeding the water has to be at the lower end. Reports abound of various concoctions, such as rainwater filtered over charcoal and then through peat to give a pH of 7.0. I tried the peat but did not see many fry - my best results were in peat water at pH 7.0 and very soft.

My early attempts were in the home tank method using spawning mops. This was in a number of attempts about 100. I then learned that the Congo tetra spawns over a period of days, not hours.

I set up a 60 x 20 x 30cm (24" x 8" x 12") tank that although bare (with a sponge-type filter and a heater set to 24°C/77°F) had a spawning grid. This stopped the parents from eating eggs as I was going to leave them in the tank for up to six days. In the wild, eggs are carried away by water flow.

Made from plastic, the grid was 5mm (1/4") diamond mesh and larger than the length of the tank, so it formed a well when filled. A rubber suction in the middle stopped it floating. This was about a 1.2cm (1/2") gap between the tank base and the mesh. I also placed a small clamp of Tetra mesh into the centre of the mesh to help trigger spawning.

Once the female became plump, I pushed the pan in the tank in the evening. It was three days before they showed interest in breeding. This started in the morning with the male chasing the female around, and started on the about 30 minutes.

After they come side by side and with a quivering motion, up to



30 eggs were released. These were clear and quite small, but after about one hour, swelling as to 100 times their original size.

Spawning lasted from 4 o'clock until 5pm. I noticed that they had many breaks between trying to spawn.

When the pan was removed, the base was full of eggs. I then covered the tank with newspapers, so in case the eggs were light, which is

as previous attempts, a large proportion of eggs were not fertilised and remained white, which was a loss. This time round, only a small percentage were white, which I removed using a pipette.

It was six days before the eggs hatched. On hatching, they lay on the bottom of the tank absorbing their yolk sac - do not feed yet. Wait until they start to swim in a circle before offering them their first food.

I tried to give them infusoria, but even although they were still a large size, they were not what I would expect the swimmers and I thought they would have a problem eating the infusoria. Two days later they



were able to swim and hence sell. In addition, I have seen a single larva with a length of 2.5% per week. Within four weeks, the young are about 10mm long and ready to move to growing on tanks.

#### Neon tetra

It is not difficult to get this little fish to breed. The difficulty lies in raising large numbers. Generally, the broods are only about 50-60 fish. However, over the years I have managed to get broods of up to 150. Initial breeding tanks can be found in most dealers' tanks. Just make sure that they are of good colour. And if it is a stage, use a model of it as they can be grown on.

Always aim for a group of 4-5, as six is a waste. One male and you will get at least one pair. Choose perfectly formed fish and avoid those that are deformed in any way.

Spacing tanks down to 600x300x150. The females are more robust and their belly region is markedly round. By comparison, males appear thin.



Let me repeat one last time: please make the water slightly soft. The fish must have very soft water with a low, acid pH in a dechlorinated, yes, they come from acidic, soft water in the west of South America.

Over the years, I have tried breeding them in 100% reverse osmosis and I have come to see several strange conditions, in the offspring stages.

pH	GH	Temp.	Age of fry	Water
6.2	8	22.0	1hr	60/20/200
6.2	8	22.0	5d	Reverse

The above is a 100% reverse osmosis water, pH is moderately soft to slightly hard, with a dechlorinated brood that took out most fish osmosis.

**TOP:** Males Ganga tetras are larger than the females.

**LEFT:** Aim for six or seven Neon tetras.

**TIP:** The Threadfin rainbow fly are fairly feisty. If you are not careful, you'll see many losses due to starvation.

No oil well-lights are for breeding. A good size is 30 x 30 x 23, or 21 x 16 x 18 up to 46 x 25 x 30 and 30 x 15 x 12. Use a hanging and make sure table and to do this was, then this through.

The first time you see the female, she will be in the middle of laying eggs. Use a net to catch her and keep her in a clean bucket. Wash her in the bucket, and support her in a clean bucket or net. If you see her from a look on top of a bucket.

The next morning, pluck her in a bucket of very hot water. Use a net to catch her and keep her in the bucket. If you see her from a look on top of a bucket. If you see her from a look on top of a bucket.

Feed the parent fish in the early morning. The day that she will be laying eggs. Use a net to catch her and keep her in a clean bucket. Wash her in the bucket, and support her in a clean bucket or net. If you see her from a look on top of a bucket.

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### Threadfin rainbow

The Threadfin rainbow is found in the U.S. and Canada, and the female fish is found in the U.S. and Canada. It has a brown body and a yellowish head. It is a very hardy fish and can live in a variety of water conditions.



and a large male. Male goes to the top of the tank, with female on the bottom. The male has long, thin, thread-like fins. Females have a yellow head.

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Leave the pair for seven days, and then return them to the main tank.

I know the Threadfin has spawned because I saw the pair in the map add by side, and I saw the dad, saw the first very big fly.

They keep to the surface, and you will not appear to spawn for a while. This presents a problem for it, as they will not appear to spawn for a while.

I first tried cultured infant milk, but powdered milk. I have used countless brands, but the best for the Threadfin.

So I decided to use a different brand. I never had before. I tried the culture through some of the female nylon stockings. Success.

As the fly swim near the surface and wait, hunt for food, they will be in the water. I placed an extra net in the culture to catch the culture.

I also used a few well-lights to attract attention and to see the Threadfin near the surface. If you see food at the bottom, you will see the Threadfin.

I took 10 days before they were large enough to take brine shrimp. These early days are critical for the Threadfin.

I know the Threadfin was the main cause for my Threadfin fly.

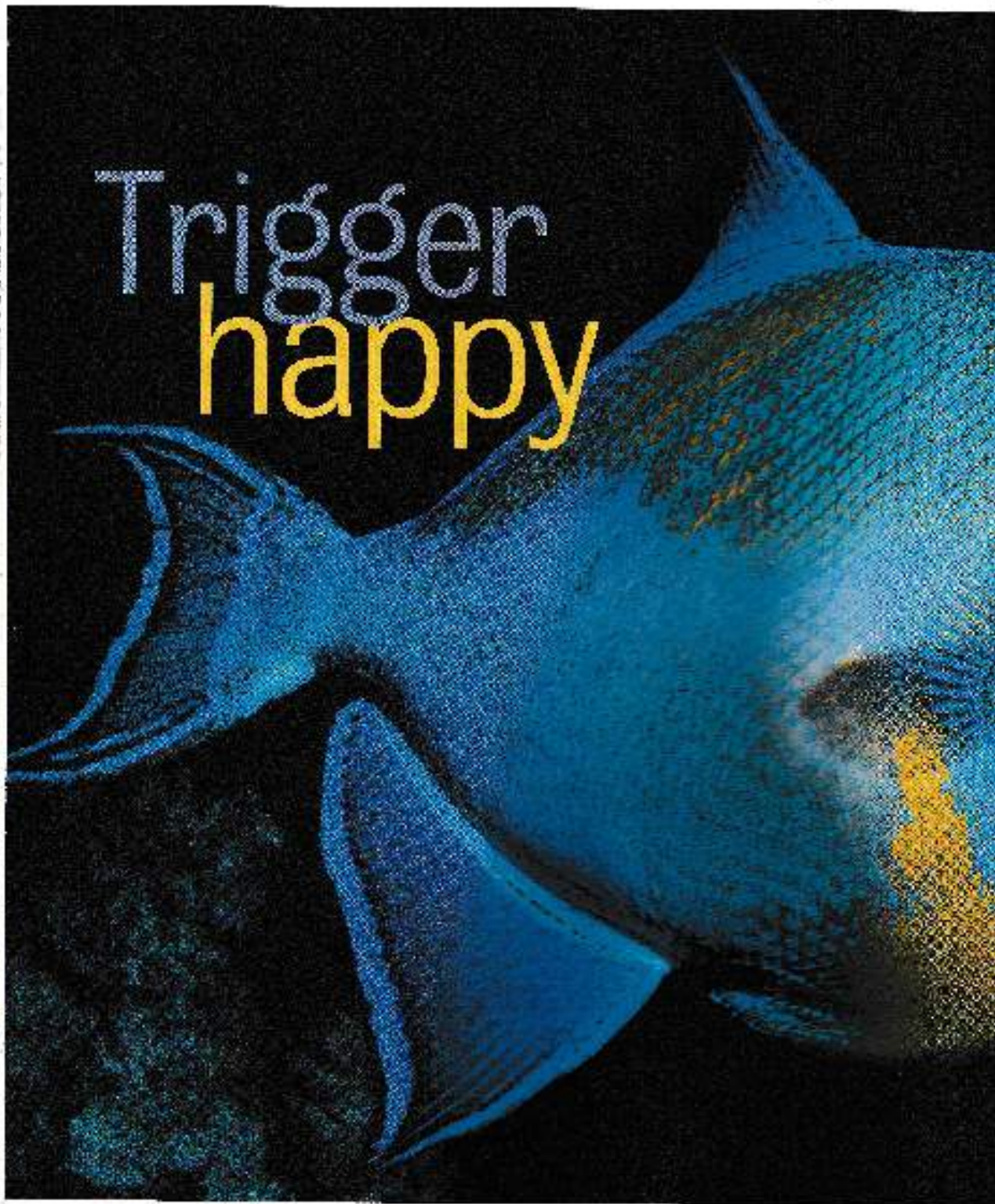
Once the young fish are in brine shrimp, you can use a 10% solution of brine shrimp. They will grow out on their own.

At 10 days old, they were 2mm long, and were ready to move to the main tank.

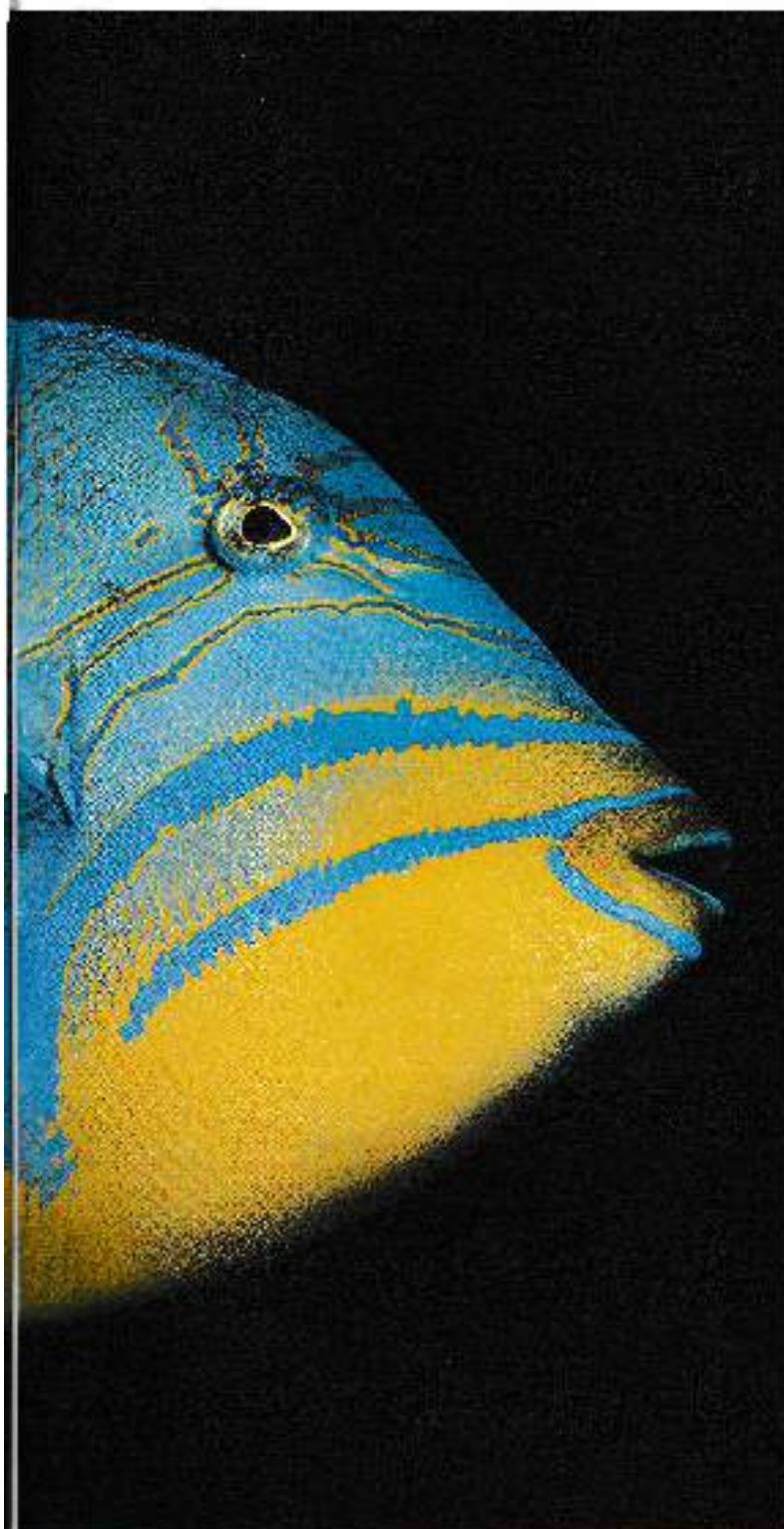
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**Threadfin rainbow**  
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# Trigger happy







They're large, aggressive, snappy fish - or are they?

**Phil Hunt** looks at the triggerfish, and reveals some absolute charmers.

**T**riggerfish have been among the stars of the aquarium hobby for generations. At first, when they were sold singly and priced as a fairly modest specimen, you had to know where to find them.

Generally spotted, they grow too large and are very aggressive and capable of doing serious damage to their tankmates. They can also be destructive to decor and equipment. Yet their terrific personalities and unusual features

have kept them popular. It's not just their colors. To many people, their dazzling patterns and combinations of colours make up many of the distractions that occur on the surface, though, that their true appeal lies: they are probably the most entertaining of marine fishes to keep.

They seem to be very intelligent, usually keen to recognise their owners, and are the subject of well-known tricks. In many ways, they are the marine equivalent of Oscar and Mr. Ape at the zoo, and it's dangerous to assume that they can be tamed - however much they seem to do just that.

Unlike most fish, triggerfish have teeth that can crunch through mollusc shells and sea anemones. Hard-fleshed crustaceans, molluscs and up to five or six small, or a few larger, fish are fingered with the sand and shells, then a single morsel is swallowed.

#### In the wild

Many of the species only live under trigger to their species (as well as the ones that lead to dramatic hair-loss strikes from the fillet). In the wild, before going on to discuss behaviour in the wild, it's worth making a distinction between two different types of triggers, which are divided by their feeding habits.

One group can be termed 'rock triggers'. These are the tankmate-bullying, obnoxious, rock-smashing, head-smashing, sea-anemone species, typified by the Clown trigger, *Acanthaluteres spilargenteus*. These are on the whole species that feed early in the sunrise - or, rather, digging into sand and blowing it away with jets of water, and turning over rocks to look for prey.

Their diet includes molluscs such as snails and crabs, sea anemones and crustaceans such as crabs, shrimp and lobsters. They tend to live singly, pairing up to breed, and defend territories fiercely.

It's hard to tell whether the pleistocene species. These swim high in the water column, catching passing plankton, and tend to be both more than 10cm in length and 10cm in depth. They are less territorial as they live in open water. The best example of this, at least from the aquarium perspective, is the blue-thinned goat, *Xanippus acanthopterus*, although it's more

**PREVIOUS PAGE:** Queen trigger, *Bastwana vittata*. **RIGHT:** The clown trigger is very attractive, but rather needy when adult. **MIDDLE:** The Sandgate trigger needs to be kept with robust fish, as it's often a bit of a bully. **OPPOSITE PAGE:** Pleasee triggers are one of the most successful and most numerous species sold.

familiar one would be the Niger trigger, *Centropomus*.

#### Wise preparations

The plebeian trigger species can be kept in a 20-litre marine aquarium, provided it is of sufficient size. For the other trigger, you need to take some special precautions.

Their problem causing habit is nibbling on clean anything, leaving water out of the mouth and leaving eyes buried in the sand and sinking up and making noise. Objects in the tank being eaten is an unfortunate side effect of being known to have been so voracious to see the kind of damage that can be done.

Leaving water out of the tank can be a problem for coral and other invertebrates, so wash floors, drop net or filter with a paper sock and use a sock to pass up to keep these fish safely. Use water to wash down the sock.

At least a 100-litre tank is better, after too long on 10 litres the fish will move to fully feed on the coral in the tank. Marine sand and equipment should be removed as much as possible and made good, used, but it is always better to use all the correct equipment as possible in the tank, using a sump to house all the gear, but being sure to secure the water return filter.

A final aspect of setting up a tank is to be sure that you provide an amount of suitable water. Triggers are often sold at 75, 100, 120, and these are such a small size that it is easy to forget that many of them can grow to a total length of 100, sometimes much more. For a big trigger, a 100 x 60 x 60 cm tank is a tank that is a suitable minimum.

Queen triggers can be seen in a wide range of sizes, and in a tank water, a 100 litres tank is a very small tank. More aggressive triggers are also available, which you can be assured will eat anything that they become fed.

If you must keep a trigger with one of these triggers, they need to be fed together, and more aggressive trigger will eat. The bigger your tank, the better your chance of keeping your trigger with other fish.

#### Choose a trigger

Among the most typical trigger of all, and the one most used in the hobby, is the Queen trigger, *Bastwana vittata*, growing to 50 cm (20") but usually staying in the 20 cm range and with any number of colour patterns.



accessible by marine fishkeepers, even the most inexperienced.

The species is also one of the easiest to breed, with many of the world's breeders now offering peacefully adjusted triggerfish for sale. These triggers are not the product of the hobby, so it is wise to choose your fish carefully.

Although large adults are sometimes available, they are less accessible to aquarists. If the trigger fish you are buying is of mid-size or smaller, they are probably, however, almost as well bred, with the best quality clown triggers in the 7.5cm (3 1/4") range.

Another sea anemone species is the undulate trigger, *Acanthaluteres volitans*. This is a beautiful fish, often in blue and orange stripes up to 30cm (2' 0") across. This is a real beauty to keep in a tank, with probably two kept in a 100-gallon.

More manageable is the Broad triggerfish, *Acanthaluteres broadwayi*, which grows to 25cm (10"). It is less expensive than the Clown or Undulate triggers, but tank mates still need to be chosen carefully and the species is not without its own problems. It has a beautiful fish, with blue, black, yellow and brown markings over a orange body.

Other *Acanthaluteres* species, such as *A. baileyi*, the Amber Broad trigger, *A. melanocentrus*, and *A. brownianus*, are similar in appearance and require no special care.

### Gentler souls...

The most well known triggerfish is probably the very tame southern form, the Blue, Blue or Red toothed trigger, *Acanthaluteres*. This has earned its place among the pantheon of popular aquarists, largely being a very relatively peaceful (especially in a trigger) and very attractive fish. It is a somewhat shy fish, which at 50cm (20") is heading towards huge, although much of



**LIFELIKE:** Blue-chin trigger.

the 10-14cm (4-5") long fish you are used to. In the tank, it is a very placid fish, although it will be inclined to nip at things. As such, it is a possible candidate for a very large reef system, although it might well eat crustaceans.

Two *Acanthaluteres* species, *A. volitans*, the Undulate trigger, and *A. broadwayi*, the Broad trigger, will attack a human. They grow to 30cm (18") and 25cm (10") respectively, and feed on algae, sponges, detritus and crustaceans, so might be reef tank candidates, provided you don't mind avoiding the trace and shrimp.

Just as a warning, the more beautiful triggers, and *A. volitans* in very large tanks, will dig a mass black hole in the tank with a blue or purple stain, with slight white markings at the bases of dorsal and anal fins.

The genus *Zoanthidius* also has good examples of peaceful triggers. The familiar is the Bluechin or Golden trigger, *Zoanthidius* which typically grows to 30cm (2') and is a real tank keeper. It is found in groups in the wild. Males and females show distinct differences, females look like the males. This is

probably the best candidate among the triggers for the reef tank.

Another fine *Zoanthidius* species is *Z. modestus*, the Crested trigger. This is a more strikingly coloured fish, but is less often seen in the trade, and more expensive. Again, males and females are easily distinguishable. The Crested trigger is thought to be another trigger species, and it is grown to about 30cm (2').

One other *Zoanthidius* species, although rarely seen, is worth a mention. This is the Benggawan trigger, *Z. dignus*, an almost white, 25cm (10") species of trace and sea cucurbit. It is a good reef tank fish.

### Leave these in the ocean

Some triggers get very large, and this can make the big species completely impractical - unless you have a public aquaria visited tank.

Such species include the 60cm (24") Clown trigger, *Pseudocentrus*, the 55cm (22") Red snout black line trigger, *Pseudocentrus*, the 60cm (24") black trigger, *Micropodus*, and the 70cm (28") lion trigger, *Malacocephalus*.

### Strange facts

■ Triggerfish get their name from the arrangement of spines in the dorsal fin. Like triggerfish, triggerfish have several spines in their dorsal fin, but the last is a large, thick spine that sticks out a long distance from the body of the fish. The first spine of the fin is thick and strong, and when raised and locked secures the fish's fins closed.

■ Many triggerfish are known to be behind the mullus triggerfish, which is the same fish as the triggerfish, but does not have a large

■ The triggerfish's spine has some spines that are locking heads. The spine of the triggerfish is made up of several segments, and the last segment is a large, thick spine that sticks out a long distance from the body of the fish.

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# Ask the Experts

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

## TROPICAL LETTER OF THE MONTH



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## As easy or hard as you make it

**I should like to try my hand at breeding platies. What advice can you give me?**  
EDIN MORRIS  
VA 22191

Many fishkeepers assume that platies, such as Guppies, Mollies, swordtails and shiners, are easy to breed. The advice is yes and no. Yes, the fish will readily give you young, but it is a bit difficult to produce quality progeny as the available breeding females all have fancy coloured, long finned females

seen in the shops and the result of this can be disappointing. If you start by going down to the local fish store and buy a few pairs, then you can keep them all together and try to breed females showing the dark, olive green underbelly. A simple method is carrying your flat over the pond for a few days, then using a net to catch them and keep them in a bucket for a few days, then using a net to catch them and keep them in a bucket for a few days, then using a net to catch them and keep them in a bucket for a few days.



Platies breed easily, but you need special methods for quality young.

but the females will take a while to lay their eggs. If you use a net to catch them and keep them in a bucket for a few days, then using a net to catch them and keep them in a bucket for a few days.

For more information, see the article on breeding platies in the book 'Breeding Fish' by John Kinnell.

## Which is the best way to raise Daphnia?

**My local supply of live food has ceased to be available. How easy (or difficult) would it be for me to breed my own Daphnia?**  
PAT WELLS, VA 22191

Daphnia can be bred in a bucket outdoors without too much trouble. The size of the container will determine the

amount of food, but do not use anything smaller than 10 litres. Use a bucket with a lid and a mesh cover. Daphnia are easy to breed and you can use them as live food for your fish. They are also good for use in a variety of other applications.

Remember to replace the water in the bucket used to breed the Daphnia. This is important to avoid the Daphnia from dying.



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## Beware this killer Clown

**I** have a Clown knifefish in with a Clown loach, a Red-tailed black shark and a Bulldog pleco. I have quite a number of snails, which I am told the loach will deal with, but there is too much algae in the tank. Are there any fish I can introduce to eat this that won't become a snack for the knifefish? **LUKE BURRIDGE, TIVERTON**

**I** am afraid you have been grossly misinformed about your Clown knifefish. Unlike *Neotoma*, unless you bought this, you're asking the questions.

*Scorpaenopsis* though it is the fish you crossed, is the fish you crossed to *Acropora* in captivity, and even at 20cm it's a slight predator and

often aggressive. My advice is to remove it from your tank as soon as possible, because your clownfishes are going to suffer as a result.

The African knifefish, *Xenopoma*, is a superb pet with an adult size of around 10cm, although both these will take fish to over 20cm.

It is true that Clown loaches will eat snails, although many don't because they already have enough food on offer. Why open a tin when a meal is already on the plate?

The best algae eaters for me are the *Chironomus* (Chironomid), which work tirelessly night and day. For a loach, instead like algae, try the common blind fox, *Ctenopoma* *serpens*.

**RICHARD HARDWICK**



*Clownfish children* is an aggressive predator.

## YOUR TROPICAL EXPERTS

When it comes to the care of the fish, the experts are here to help. We have a team of experts who can help you with all your tropical fish care questions. We have a team of experts who can help you with all your tropical fish care questions. We have a team of experts who can help you with all your tropical fish care questions.

**CLIFF**  
He has been in the industry for over 20 years and has a wealth of experience.

**DAVE**  
He has been in the industry for over 10 years and has a wealth of experience.

**FRANK**  
He has been in the industry for over 15 years and has a wealth of experience.

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## Shrimps will have a ball

**I** wish to grow *Gnathopora* *gogogopora*, the 'moss ball', in a two-gallon glass goblet also containing shrimps. Is this possible?

**JORDY HENDERSON, WILMINGTON**

**I** have a question about this and my 200-gallon tank. I have a problem with the shrimps that I have in my tank. You see, you can't put them in the shrimps' tank with the algae because the algae will eat the shrimps.

Shrimps are not sufficient as long as you change water regularly. **PETER BRADLEY**

## Putting handles on hatchetfish

**I** am trying to get my head around the hatchetfish species. Are *Therapochaxax* *serpens* and *T. stellatus* Silver hatchets or another species? And what are the common names for *Gasteropelecus* *sternista* and *G. lewis*? They're called Common and Black-lined hatchets!

**JAMES BARRETT, HARLOW**

**S**pecific names are changing now and again, but by a documented method and there will only be one valid name at a time.

Common names, on the other hand, are given by people's whimsical opinions and hobbyists, and so several names can apply to the same fish. As there is no

official system to follow, they are neither 'right' nor 'wrong', but they can cause confusion, as seen with hatchets.

What you need to do is read the fish's description for scientific name and the correct family with the accepted common names.

*A. lewis* and *A. stellatus* and *T. serpens* are all Silver Hatchets, as is *G. lewis*, although this is often the people with *Gasteropelecus* *lewis* or *Gasteropelecus* *lewis*.

*Gasteropelecus* *lewis* and *Gasteropelecus* *lewis* are different species. *Gasteropelecus* *lewis* is usually the black-lined or Common hatchet, though it is possible the name 'Silver hatchet' could be applied. The black line distinguishes *Gasteropelecus*.

Whichever of the above requires similar care. **SPAIN EVANS**



Most hatchets require similar conditions.

## Tank maturity can only come with time

**I**nspired by the Rio Negro set up in PRK, I added oak leaves to my tank, preparing them as advised. Since then I can't keep nitrate levels down. Did the leaves do this?

The tank is about two months old and has three *Rinelabrus pinnis*, three *Corydoras paleatus* and two hatchling fish. The pinnis seem prone to whitespot, and I am wondering whether continuing high nitrate levels are causing this.

DR MONDRIE HANDEWOSCH

**A** young tank with a few weeks' experience should have a nitrate level no higher than the natural cycle of the

water itself, yet yours is the highest you have seen?

A 40% daily change would occur there if there were no plants, but it appears you have such as 10% increase each 24 hours. My guess is that you're greedy.

As for the malady, it is likely to be a still-fresh whitespot, in conjunction with the and an ammonia spike. You should probably treat with a nitrate reducer and a water conditioner.

Plants will help, with the addition of a little bit of aeration, such as an air stone, and a combination of filtered water (making an ammonia tank) and a mature tank (with a nitrate filter) will help.

SEAN FRYMAN

## My plants are doing too well!

**M**y problem is Vallis, which is taking over my tank and migrating across the surface. Is there a similar-looking, less vigorous plant?

L. SATCHWELL, BIRKBECK COLLEGE

**I** can do nothing about it if it is well-covered plants. The best way to deal with it is to remove it. If you can't do so, you can try to use an herbicide like Roundup, but it is not recommended. You could try to use a herbicide like Roundup, but it is not recommended.

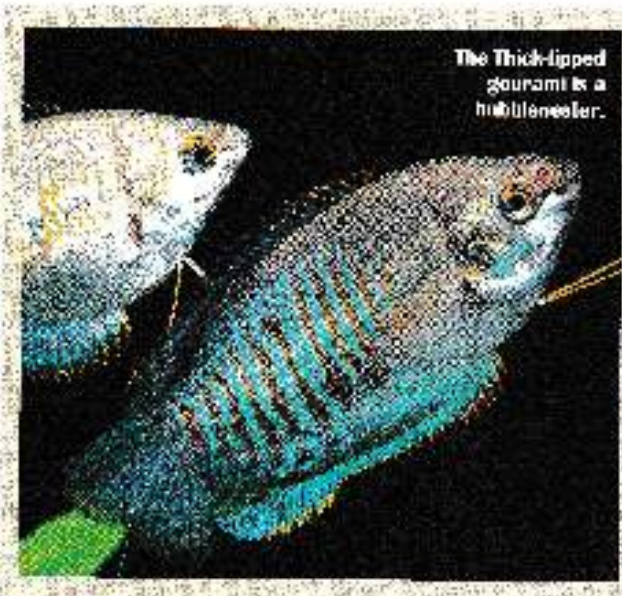
At the same time, I would recommend you to use a herbicide like Roundup, but it is not recommended.



Robbing Vallis leaves the till plant open to disease.

behaviour or waste production, and by filtering and purifying the water.

PETER BRADLEY



The Thick-lipped gourami is a hubbioneater.

## Fertile eggs? I doubt it...

**I**my Thick-lipped gourami has laid eggs all over the bottom of my filter, and the female has not left them since they were produced. Any advice on hatching and care of the young would be welcome.

DAVID WOOD, WOODHILL

**The** Thick-lipped gourami, *Cochranodon auratus*, is a livebearer. It is a very hardy fish, and it is very easy to care for. You might be able to find out more about it by looking up the name in a book or on the internet.

to being a very good parent. If they are not, they are starting to lose their eggs. For the eggs to be viable, they must be kept in a dark, moist, and well-aerated environment. You should try to keep the eggs in a dark, moist, and well-aerated environment.

It is a very hardy fish, and it is very easy to care for. You might be able to find out more about it by looking up the name in a book or on the internet.



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## Clowns - is it third time lucky?

I bought two Clown loaches and put them in a quarantine tank for two weeks before moving them to a 90 x 38 x 45cm/36" x 15" x 18" planted tank with an Angu, eight Rummy nose tetras, a Siamese fighter and a small rainbowfish.

I floated them in a plastic bag for 45 minutes before releasing, pouring a little of the new tank water into the bag every 10 minutes, but the next day I came down to find both loaches dead. I bought a second pair from a different shop.

This time they lasted 48 hours. I noticed they were at the top of the water, gasping, but the other fish seemed fine. What's going on?

ALANNA STILES,  
LONDON, ENGLAND

It can be two likely causes for the deaths. Water conditions in your main aquarium may have been stressed, possibly due to a change in the chemical balance of the water chemistry. This may have occurred due to a change in water chemistry, such as a water change, or due to chemical shock, and Clown loaches are especially sensitive.

Before buying any more fish, have your tank water tested for ammonia, nitrite and nitrate levels.

Some species of fish are more sensitive to a small rise in ammonia and will explain the results and any action you need to take. For example, nitrite is more harmful to fish than nitrate, and some species of fish are more sensitive to nitrite than others.

Also, a very small amount of ammonia can be toxic to fish, especially if the fish are small and kept in a small tank. If you are unsure, it is best to test the water and take action if necessary.



Clown loaches are sensitive to chemical shock.

Don't bother with taking a tank water sample. It takes weeks, not minutes, for fish to adjust to any differences in pH.

SEAN FRANKS

## Not dyed, merely weird

I came across some gold White Cloud Mountain minnows and albino Buenos Aires tetras. I'd never heard of either of these, and I wondered whether they were dyed. I am aware that some tampering with colours goes on, but these just looked odd.

JONATHAN GREEN,  
VIA EMAIL

Normally, odd varieties of fish will have been selectively bred to enhance the colour, such as the 'candy' or 'dual' forms. These are generally white and blue or red and blue, rather than just a pale albino form. They will also have only red eyes.

An increasing number of tanks seem to be

being running up to be active - bred colour strains, for example, gold Neons.

Generally, if I had these fish, I would be very keen to see them, and I would be very happy to help.

I think it is highly desirable to have a few temporary colour strains in your tank, but they should be kept separate from the main stock.

SEAN FRANKS

## FACTFILE

**Common names:** Dwarf gourami, Dwarf Gourami, Dwarf Gourami.

**Origin:** South America.

**Size:** 4cm (1.5").

**Diet:** These fish are excellent at removing algae from the aquarium glass and decor. They will also eat a variety of commercial fish food.

**Aquarium:** 20-30cm (8-12") tank, planted with artificial plants, with a few natural-looking plants kept as a backup.

**Water Temp:** 24-28°C (75-82°F).

**Notes:** These fish like the company of their own kind, groups of four or more are best. Very peaceful, 1-2mg species are available.

## Right set-up, wrong plants

I recently set up a planted tank using the latest technology, but I have been plagued by poor plant growth, murky water and algae. I saw nothing like this when I ran an aquarium in Bristol, where the water is hard and alkaline. My local water now is soft and acidic, and I want to grow Amazon sword, Rotala machanda and Cryptocoryne wendlandii.

The substrate is 2mm quartz gravel with Aquaponics subsoil with heating cable, and I have CO<sub>2</sub> injection.

E. EDWARDS, STILES

Your choice of plants is not ideal for softwater. The Amazon sword and Cryptocoryne wendlandii are not ideal for softwater. They will not grow well in soft water. They will not grow well in soft water. They will not grow well in soft water.

Hydrophilic, symbiotic plants and Mesocricetus auratus. You can't mention any tank, but it is a good idea to have a few plants in your tank. They will not grow well in soft water. They will not grow well in soft water. They will not grow well in soft water.

You might also try one of their other varieties. These are very hardy and grow fast.

SEAN FRANKS



Tetra



Gloose young, adult Black widows for breeding.

## Triggering the Black widows to breed

**Q** I'm trying to get my Black widows tetras to breed. I think I have two females and one male, judging by the plumpness of two and the pointed dorsal fin of the third. I have a breeding tank with just a heater and no substrate. Am I doing the right thing?

BOB MCGRAVE, BELFAST

**A** Yes, you do on the right track, but would keep by a set in the tank. Get a eggs to get them

to spawn. I think that in the breeding tank, 20% of your tetras are likely to be fertilized. I hope this is a good idea for you and the other two, and the eggs will be a week or two.

Do at least three sets in the same tank, and get to work on the next set in a couple of days.

Some female black widows can lay over a hundred eggs. Young that you see the best.

JOHN SHERIDAN

## Fighting earns a black mark for Blue flames

**Q** My three Blue flame tetras were scrapping, and one got a black mark on its nose while another showed the same sort of thing on its tail. My xian cured one, but the swelling remains on the other. What are these marks? Also, is it OK to feed greenfly to my fish?

STEVE YOUNG, RUFFERTON

**A** The black marks on the nose and tail are likely to be caused by a bacterial infection. I mean,

on the nose, they are probably a response to damage. The fish may have fought them out, but it may be a good idea to isolate the fish and treat it with an antibiotic if it does not clear up.

Greenfly is a food of opportunity, but provided they have all their senses, they can't give them to your fish, even if they will eat a number of garden insects and toxic.

JOHN SHERIDAN

## Always start with the hardiest of plants

**Q** I am looking to buy a 110-litre collection from a mail-order company for a tank which has been set up now for two weeks, but has yet to receive any fish.

I am soon to go on holiday for three weeks. Am I right in thinking that if I put in all the plants before I go, the tank will be fully established and ready for livestock when I return?

**A** This is the subject of fishless cycling, fascinating, but as a complete beginner,

JOHN SHERIDAN

**Q** I have a 100-litre tank with a 100-watt heater and a 100-watt filter.

Are you going to do a fishless cycle? It is a good idea to have a few plants in the tank, but they will not be able to provide the oxygen and nutrients needed for the fish. I would recommend that you have a few plants in the tank, but they will not be able to provide the oxygen and nutrients needed for the fish.

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Domesticated blue flames have black bands on the body.



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Fin rot affects the tail first.

## Fear not! It's not finrot

**A** My Red-tailed black shark seems fine, except that the caudal fin has neat white leading edges and the underside of the fish from mouth to anal fin is silver. Is this normal? **DEREK FRAMERSON, FLEET**

**A** I have seen fish like yours with white borders to the fins, so I don't think you have anything to concern yourself about. The silver area of skin is also probably normal. We were possibly worried that it was finrot,

with the caudal fin and fin edges becoming ragged and starting to fall away. Often the tail is affected first. You mention a neat white edge, which doesn't fit in with finrot or any other disease. **PETER SARGISS**

## Long fins are no handicap

**A** I have seen some long-finned Bronze corydoras for sale. But are their extended fins a handicap? **JUNE SATCHELOR, GATEHOUSE OF FLEET**

**A** To date I have not encountered these long-finned *Corydoras* in a pet store's tank, but I would not be surprised to discover this being the



Larger fins in Bronze corydoras are quite common.

result of a problem. What I have seen is *Corydoras paleatus* with slightly longer fins than normal. Am assuming you are referring to the caudal fins and not to

any of the others. It is interestingly quite normal to have males *Corydoras* to have slightly longer pectoral and dorsal fins than females. **CHRIS RALPH**

## Squeeze life into your tank

**A** I should like to set up a 60 x 30 x 30cm (24" x 12" x 12") tropical tank with real plants. Have you any tips? To mature the tank quicker, I intend putting the filter into an existing tank. How long should I leave it there, and could I then stock the new set-up straight away? **DAVID WITTELLS, WINDSOR**

**A** The general advice will go with good water quality and 70% water change every two weeks. Put a good substrate (I suggest four bags of 100 complete and fibre-matrix species such as *Loosli*, *Hygloss* and *Valis* *flavus* and *Hygloss* *complanatus*). *Corydoras* is a good investment.

If you don't have many fish, you can set up your 60cm (24") tank quickly. If you covered some water plants, you would have a better chance of success.

Speak with your filter supplier. It is a common mistake to think that the 60cm (24") set-up rather than try to mature your new 120cm (48") tank. **PETER SARGISS**

## No need for confusion

**A** I've read that the Amazon puffer, *Colomesus asellus*, can be confused with *Chororhinus nanus*. How do you tell them apart? **TENESA BARTHELM, MILTON KEYNES**

**A** I don't think there is any reason to confuse these species. You may find more information about *Chororhinus nanus* under its correct scientific name or *Xenopoma nanus*.

*X. nanus* grows larger than *C. asellus*, is about 20cm (8") in length and has a dark mark on the body, whereas the

body of *C. asellus* is plain with a broad spot on its side. *C. asellus* retains some evidence of the black banding. The dorsal and anal fins are also a little well shaped.

With the exception of the dorsal fin, there is similarity between them. Although they refer to *C. nanus* in the *C. asellus* profile, they have the fish like *Xenopoma nanus* in its own profile. Consider the features. I think you'll agree there is little need for confusion.

*C. asellus* and *X. nanus* is commonly available, so you are much more likely to encounter the species. **SEAN SWAIN**



**Tetra**

Stuff you need to know about..

# Protein

**Expert Bridges** of Tetra looks at the role of protein in the foods we feed our fish.



If you've ever looked on the back of your fish feed box, you may have wondered what the different letters and ingredients are

for. Certainly if you've compared one brand to another, you might have wondered why there are differences in levels of some nutrients.

A big reason for the way that it is made lies in the feed manufacturer's and which many people get confused about is protein. This confusion arises because on the one hand we are constantly told that protein equals growth, yet on the other we are told it's an important nutrient for fish.

This confusion is various in protein levels between one food and another, leaves many fishkeepers confused about how manufacturers arrive at the levels

chosen. Here I'll look at what protein is, why it's important, and give you a little of how manufacturers work out levels.

## What are proteins?

Proteins are large, organic compounds containing carbon, hydrogen, oxygen, nitrogen and sulphur. They are made up of smaller building blocks called amino acids, which form large protein molecules.

The properties of a protein depend on its structure and the sequence of amino acids that it is made from. There are approximately 20 amino acids, which join together in various sequences to form different proteins. In the human body, there are approximately 13,000 proteins all made up of these few amino acids.

Proteins are the most important nutrient for fish. When fish ingest

protein, they break it down in the gut, with it they have a set and separate into its component amino acids. These are then absorbed into the body, where they can be used for the formation of various tissues, cells and other compounds, including:

- New structural tissues, such as collagen
- Mucoproteins (important components of the mucus layer)
- Enzymes, which drive metabolic reactions
- Haemoglobin (essential for oxygen transport)
- Cells involved in the immune system
- Muscle cells, and thus growth
- Eggs and sperm cells.

Protein is also a good source of energy, so when it is used as a fuel, it yields a lot of energy. Therefore, aiming to fit feeding to the true amount of protein used for energy, allowing it to be directed to other more beneficial functions.

## How much is needed?

The 'right' protein level, in terms of the percentage inclusion, depends on a number of factors.

For instance, some species within the same

fish species have different protein levels due to the nature of their diet and the degree to which they have adapted to specialise for it.

Factors such as water temperature and quality affect the protein requirements of fish. That means the feeding of the fish younger ones grows faster and reach a larger growth than older fish.

Finally, the use of poor quality manufacturing techniques, or poorly digestible sources, will decrease the amount that is usable by the fish.

So there you have it! The level in quality fish foods is the result of taking all the above into consideration, and then also to determine the best formulation. For example, fish with high protein levels will deliver more nutrition, but only if they are well made and balanced to ensure the protein is usable and not wasted as ammonia.

To move away from the concept of an ideal protein level for a moment, you should think about the



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ing a pound of protein it may consume.

A diet containing 40% protein is the same as 4% of protein per 100g of food. Within limits, a fish can regulate how much protein it consumes by eating less or more of the food depending on its requirements at any one time. This is why adult species, especially voraciously hungry juvenile fish,

are able to eat a wide variety of different foods for tropical, coldwater, and pond fish.

The way we see our fish eating the food is a function of the way and/or difference from some fish, which are fed a set percentage of their body weight per day.

Protein is the most expensive part of a fish food, and therefore has a higher cost than other ingredients. Adding too much is unnecessary expense, but too little results in a nutritionally poor diet.

Different types of fish have different protein requirements. This presents challenges to the ac-

quarist hobbyist, and is why there are different foods for tropical, coldwater, and pond fish.

#### Tropical fish

The most challenging when formulating a tropical fish diet is that there are so many species. It is therefore necessary to feed a diet that can cater for all of them.

The majority of tropical freshwater fish feed on insectivorous diets such as small crustaceans and zooplankton, with some also eating the detritus of poorer quality food materials. On a dry weight basis, the protein level of zooplankton and crustaceans is high. For example, Daphnia has a protein level of 50% available protein in 64%, and brine shrimp 50-70%.

To meet the needs of these fish, a higher protein diet is beneficial. Fortunately, the few species that are more herbivorous are able to adapt and take advantage of a high

protein diet. This is because herbivores also evolved relatively recently in fish, and the majority still retain the metabolic functions to deal with higher protein foods.

In addition, tropical fish are able to deal with the production of what a water is digested more effectively and the requirement for it is greater. Thus on the whole a tropical fish will consume higher protein levels than coldwater fish.

#### Coldwater fish

Coldwater aquarium fish diets are more specific as there are far fewer species. The most commonly kept fish are grass carp and their relatives (including koi), tench, bony goby, and loach.

The result is a lower protein food as coldwater consume a lot of algae and plant matter. In addition, the source of the protein in the food may be vegetable-based (e.g. algae).

Grass carp are also generally fed at cooler temperatures at which their requirements for protein is reduced.

In the summer, warmer temperatures make the use of higher protein diets a more desirable. Although the fish could simply eat more of their usual food, a higher protein diet allows the extra protein requirement to be met without the extra addition of waste being generated.

The situation for pond fish is similar to coldwater aquarists, a few closely related fish allow a more specific diet to be produced. However, pond fish tend to be less herbivorous and require a diet that is more protein rich.

#### Protein to energy ratio

In order to get the most from the protein in their food, fish may be able to use it for beneficial

functions or to use it for energy to live. If protein is used for energy, amino acids are oxidized. In the contents of an aquarium or pond, this could be a problem, especially if there are not working correctly in these systems.

To ensure the amino acids are used for energy, a high quality protein is required. This means providing alternative energy sources to spare the protein for useful functions such as growth and reproduction.

For example, coldwater fish do not metabolize some of the protein energy. It does not have as much energy as a weight of for weight basis. By balancing protein and lipid levels, a high level of protein will be used for energy available.

To illustrate this, a fish that has a high level of growth food contains higher protein and lipid levels compared to a staple food.

A certain amount of carbohydrate can also be used to provide energy, although its use is limited compared to protein.

The protein story is a complex one, so how we feed our fish and the way they regulate their intake allows for some flexibility. What is a protein source? It is the quality and the formulation.

Feed brands and manufacturers that research their formulations well, and who use the best production processes. If you are not sure, visit our website, call, write, or email. We will be happy to answer questions, and we have a number of websites to contact them on.

#### Protein quality

In addition to the additional protein, fish may be able to use it for beneficial

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#### OUTTOW LEFT:

Feed manufacturers which use the best production processes.

#### RIGHT:

Tropical fish have higher protein requirements than coldwater.

**Tetra**

# Ask the experts

LETTER OF THE MONTH

## True pair or a false alarm?



THE MALE AND FEMALE BLUE ACARA IN A 12" x 12" x 12" TANK. THE MALE HAS A BIT OF A BUMP ON HIS HEAD.

I have a pair of Blue Acaras, the male about 13cm/5" and the female 8cm/3" long, in a 30 x 30 x 30cm/24" x 12" x 12" tank. She has dug a pit under a slate cave, and when the male approaches, she kisses him on the body and he responds by quivering. There is also some jaw-licking going on. Do you think I can expect a brood soon?

J. SPINTEWELL, BARNEY

Are your Blue Acaras male and female, or two females? This species is mostly polygamy, so you may see the female patting the male to court you, and you actually see them.

Assuming they are male and female, they won't be special if they have

courted and accepted each other.

The basic of your question is, do the female Acaras of this species of male and female Acaras with a bump will also do this way.

Because of the low spawning area of the Acaras, you may observe them, but you may not see the male fish build the nest with a bump just by digging the nest.

It is likely they are a male and female, but you may have to be patient for a while.

Your tank is really not big enough for a pair of Blue Acaras, as they will be only 30cm/12" size, and with a good substrate, they don't have



Blue Acara head.

to dig in mud that when they are fully grown they are likely to measure 15cm/6" or more, so would be better to move them to a 40 x 30 x 30cm

36" x 15" x 10" tank, or larger. I will be happy to help you add some to that if they will do more fish to breed.

## Possibly a new species of Angel

Around two months ago I bought four wild-caught Angels under the name *Pterapogon kauderni*. However, I am not sure what they are, other than they are wild-caught, as they seem to have traits of both species.

Their extremely elongated finnage makes them look like a real angel, but the body shape is more slender. The vertical bars are often prominent and dark black (not brown), with the four faintest bars hardly showing. The ventral fins are long and trail behind the anal fin when the fishes swim. These show a green/yellow tint, rather than the

blue seen in many captive-bred.

The biggest in the group is now close to 20cm/8" tall and I should like to breed them, but I can't see anything but fierce territorial disputes (not 100% physical) occurring between the four. They are doing very well in a 90cm/36" Amazonian biotop, with water at 27°C/81°F, ammonia and nitrite nil, pH 6.6 and TGH.

ROBERTO DE SOUZA

The *Pterapogon kauderni* is a very common species, but the only one I can think of is a very pale color of a very pale species, and usually they are more

like *Pterapogon kauderni*, rather than the wild, black color preferred by others.

Your fish conditions sound good, and you have achieved a good growth rate. I think all you can do now is be patient.

Lots of live food might help. The only other point I can think of is that Angels in the wild spend most of their lives swimming in the water of shallow reefs, as do Discus. I have not seen a lot of live food in a loture where I work, so I stated that someone has been very successful breeding Discus using a group of bamboo stems with live algae, and I think that might be a good idea for the Angels. I have made to the point that

of the level after hatching.

It is very easy to expect wild Angels to add to the wild, as they will have a very high substrate, and will work for Discus. If you work for Angels, keeping the temperature and lowering the pH might be a good idea.

Assuming what the fish are, they are of a very common species, and out of the total fish, the pH decreases, initially the water temperature drops, but then it rises above the norm, to about 29°C/85°F.

You can also try other things, like using a lot of live food, and using a lot of live food. But, would you like to see some more photos of the fish, so that I can see what the fish are like in a pair of fish.



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## Wrong to run a production line

I have had a reasonable amount of success at breeding Rams, *Mikrogeophagus ramirezi*, and now have 12 tanks dedicated to

the species. A number of outlets are willing to pay good prices for quality fish, which helps to offset the running costs of the

fish-house, but I should like to see the fish spawning on a more regular basis. Is there any product available to help, and another that will bring out the best natural colours of the Rams?

MARK BELLIS, OSWESTRY



Aim for quality, not quantity when breeding Rams - or any other - aquarium fish.

There are ways of turning cichlids into breeding factories, but none of them are ethical - and I'm not going to encourage you by giving you a fish manual!

No matter how hard you may try to counter the effects of overbreeding, the fact remains that spawning insects would be more than the female. In addition, she'll lay only a finite number of eggs, and when those are gone, no more - assuming she has survived that long.

As one of a thousand to find about quality, quality goes out of the door. We have enough commercial Rams already, and there is a need for more quality fish. If you cannot supply the world with it, so much the better as this will maintain the demand.

As regards bringing out colour, the food helps, and so does soft, clear water. However, lots of colour usually creates a vibrant-looking pair, and as long as Rams you will see bring out colour that has been lost from the genetic make-up of the fish.

And, even if your fish are so colourful, unless you can persuade your dealer to provide the conditions in the shop tanks, then you are likely to lose the best ones.

## YOUR CICHLID EXPERT

When it comes to the care and breeding of the cichlid, there is no one better qualified to answer your questions than practical fishkeeping expert, Mark Bellis. Mark has spent the last 20 years of his life in the aquarium hobby, and has written several books on the subject. He is also a regular contributor to the pages of the fish magazine, *Practical Fishkeeping*. If you have any questions, please write to: Mark Bellis, c/o Practical Fishkeeping, PO Box 100, Weymouth, Dorset DT98 3DF.

Mark Bellis is the author of *The Cichlid Handbook*, published by Tetra. For more information, visit [www.tetra.co.uk](http://www.tetra.co.uk).

## Tenants for a crowded house

I have an 80 x 30 x 45cm/32" x 12" x 18" tank and would like to keep Malawiis. Would this be on the small side and, if so, could you suggest a species or community set-up that would be more appropriate? Can I use Ocean Rock?

ALEX JEFFERY, VIA EMAIL

You are right - your tank is a bit small for most Malawiis. However, *Jacobfreibergi* cichlids couldn't seem to have had the size problem, and I have come across a number of people who have kept and bred groups of this species in a 60cm/24" tank.

Another possibility would be a mixed group of an *Amblyops* and a *q* species. I think you could even get

away with a long *q* malawiis and *Amblyops* if you preferred a little variety. *A. jacobfreibergi* would be an ideal choice as it is more robust than most *Amblyops*.

A little bit of research would be to keep a pair of one of the smaller hardware malawiis - one of the *Cryptocara* (*Amblyops*), *bellina*, blue *Amblyops*, *capitata*.

hardy ones, like the Dempsey! You can probably fit a pair of well water, and the blue African aplocheilichthys would fit the bill. In fact, *Amblyops caudatus* will do well in a broad tank in very hard alkaline water.



*Amblyops jacobfreibergi*

MARK BELLIS

Tetra

*Pelvicachromis taeniatus*



## I'm in need of a Krib sheet...

**I am having trouble telling the West African *Pelvicachromis pulcher* and *P. taeniatus* apart. What are the differences, please?**

T. TURKEY, TAYLOR

It's very easy to tell the two apart. The male in both is only different in its colour to small, with the lips and with both on the end of the snout, while in *P. taeniatus* the male has a dark banding in the upper part of the body.

In both *P. taeniatus*

females are very thin deep bodies as they of *pulcher* and they usually have small, round black spots in the dorsal and tail.

The male *pulcher* has a rounded snout, while those of the dorsal are large and square.

Male *taeniatus* have a fine dark edge to each body scale, so they look as if they have a fine network of lines on the flanks, but male *pulcher* don't have this.

Incidentally, I've never seen the two species confused in shops.

## FACTSHEET



### Scientific name:

*Pelvicachromis taeniatus*

### Common names:

Yellow and black cichlid

Yellow and black cichlid

Yellow and black cichlid

Yellow and black cichlid

Yellow and black cichlid

Yellow and black cichlid

Yellow and black cichlid

Yellow and black cichlid

Yellow and black cichlid

Yellow and black cichlid

Yellow and black cichlid

It is a species of cichlid that

requires plants for cover

Aquarium: 60 litres

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It is a species of cichlid that

requires plants for cover

Temperature: 24-28°C

to 30°C

Diet: Can be fed on fish

foods, but should be offered

something to chew on

Soaking: Water: yes

Temperature: 24-28°C

to 30°C

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It is a species of cichlid that

requires plants for cover



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**Tetra**

## DISCUS LETTER OF THE MONTH

### No need to take pot luck

**Q** I wish to add to my Discus collection, but my local retailer will only order in what I want - he does not keep them in stock.

**A** However, I know the fish only by colour, not by name, and often he is not sure what I am after. Would a chart in PFK showing the

various strains be a possibility?

WILLIAM LYTLE,  
STEVENAGE

**A** There are only four strains of Discus in the wild, and from these all the different colour mutations have been developed. These hybrids have to come in name,

and therefore what one dealer may call a "Sunset Tiger", another refers to as a "Red Dragon".

Suggest you talk in the car or on a train and visit a local UK Discus dealer with advice as to PFK title. Then relying on a local dealer you choose your fish.  
MARK EVENDEN



THE RANGE OF TETRA DISCUS COLOURS. THE WHITE AND LIGHT BLUE TETRA DISCUS ARE AVAILABLE IN 100% PURE DISCUS, WITH 50% PURE DISCUS, AND 25% PURE DISCUS. ALL OTHER DISCUS ARE 100% PURE DISCUS.

### Should I aerate change water?

**Q** I have just started using RO and tapwater for water changes in my 240 L Discus tank. I aerate this for 24 hours before adding it.

If I do not use it all up at once, does the change water need to be aerated again before use, and is it OK to store the RO/tapwater mix for up to two weeks?

CAROL SWAIN, SELDON

**A** I am sure you need to store the water that you are using. If it is kept the same, then it can be stored, but I would not store mixed water.

As for aeration, aerate the water if it has been in a tap. To be freshwater in a tank you might not want buying your own RO is the best way to go, as you then have full control.

MARK EVENDEN



Buying your own RO unit gives you total control over water quality.



With planning, any move should be easy.

### Keeping stress down when moving house

**Q** How can I minimise the stress to the six Discus in my 454 L/100 gal. tank when I move house?

R. GUNDE, TERNHURST WELLS

**A** The fish need to be kept well aerated with oxygen. They are to be transported in more than a couple of hours. This is especially important if it is hot and humid.

More importantly, it is vital to ensure that the

bulk of the fish are not killed off by delays in transport. I could advise getting the fish moved and set up within six hours, and when the fish are moved, they are kept in the car for three days.

Make the transport as pain-free as possible over the period.

People move all the time with their fish, usually without a problem, as long as the moving is well planned.  
MARK EVENDEN

### YOUR DISCUS EXPERT

With 15 years experience in the Discus hobby, Mark Evenden is a leading expert on all things Discus. He has written several books on the subject and is a regular contributor to various Discus magazines. He is also a member of the Discus Society and has been a judge at several international Discus shows.

MARK EVENDEN  
100% PURE DISCUS  
100% PURE DISCUS  
100% PURE DISCUS  
100% PURE DISCUS



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**Tetra**

NOVEMBER LETTER OF THE MONTH

## Will shrimps suit this set-up?



**Dear Marcia,**  
I have a 100 L fish-only set-up with two Clownfish and a Regal tang. I plan to add a Flame angel soon. Is it possible to keep shrimps in this system and if so, what water parameters should I aim for?  
DAVID COHEN, LEYBURN

I have a 100 L fish-only set-up with two Clownfish and a Regal tang. I plan to add a Flame angel soon. Is it possible to keep shrimps in this system and if so, what water parameters should I aim for?

DAVID COHEN, LEYBURN

You can certainly keep shrimps in fish-only systems as long as the water is of reasonable quality. The key situation being the nitrate level, which should be under 25 ppm. You can't wait any fish that are likely to come through, and that way you need to be aware of what you

cannot use copper-based treatments for fish if you are keeping these invertebrates.

Usually, you should never add anything else to the water, but if you do, it will remain in the pond. I would advise you to have a long chat with your local fish shop, which is prone to get upset.

As for numbers, this depends on the type of shrimps you want to keep. If you're going to keep freshwater shrimps, I would advise you to have a water partner or a whole animal as they are highly territorial.

Most other shrimps, such as the white Leghorn, would be fine.



Never add shrimps to a tank that has been treated with copper.

Clean shrimps, *L. emarginatus* and *L. garhansi*; Peppermint shrimps, *L. wuolomoni*; and Hermit shrimps.

A whitebelly on an kept in single or mixed species groups. In your tank, I'd go for five shrimps. PAUL HUNT



Flicking could be a sign of parasites or even stress brought about by poor water conditions.

## Royal gramma keeps flicking

I have a 100 L Juwel corner aquarium. The tank, set up for seven weeks, contains three small Common clownfish and a Royal gramma, which went in two weeks ago. Water parameters are fine, apart from rather high nitrate, at 30ppm.

On day two I noticed the gramma flicking against rocks. I read books that pointed to several possible ailments, so I waited for five days for any visible symptoms before beginning a course of Caprazin.

Unfortunately, the gramma is still flicking. It continues to eat

well, so should I try a freshwater dip? DAVID COAN, VIA EMAIL

Holding doesn't mean that a fish has fin or scale parasites. All you need to do is take a water sample, then try a freshwater dip. You can also try a freshwater dip. You can also try a freshwater dip.

I would carry out a water change and see if you can get nitrate levels down a bit. The Royal gramma is a very hardy species, so you can sell a 100 L tank with a 100 L tank.

Carry your gramma in a 100 L tank for a week or two. It will be feeding well. To bring it back to subject to the stress of freshwater dip, which will help with any parasite. Carry the fish in the water. If you can't get your gramma to stop flicking, then think about repeating a course of medication. HAYES BURGESS



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## What to change, and how often?

**Q** I have just set up a marine fish-only tank (Aurora Vision 180). How often do the internal and external filters need cleaning and the media changing, and what water change regime do you recommend? What is my stocking limit?

DAVID PLUM, PRESTON

**A** Mechanical media like filter floss can't do it, but regular cleaning is a more realistic option. But if you're changing it, that's a good idea.

Some media is more than a substrate and can't be cleaned. If the filters are packed with mechanical media, give them a clean. If the media is just a substrate, you'll need to replace it periodically.

In most inverts, filters should be cleaned and changed according to the manufacturer's manual. You can get a manual at every pet shop.

A good routine for water changes in a conventional filtered tank is 10% every two weeks, or 20% a month.

Your sand filter is 180 L (40 gal), so you're rocking up to 500 mL (20 oz) of tank water to be replaced every six months to reach a 50% turnover. That's a lot of water. The maximum size of any adult fish you stock should be no more than 10mm (3/8").

PHILIP HUNT

## Aiptasia? The answer's a lemon

**Q** I have a heavy infestation of Aiptasia. Would it be practical to place some of the colonised rocks in my sump (in rotation) to kill them, and how would the dark affect the living rock?

G. HESINBOOTHAM, SMITH WELLS

**A** Putting the rocks into your sump won't help. Aiptasia can't survive in a sump, and although they

will not die there as fast as when left in the light, you won't kill them.

Recommending lemon usually works, but it can take them a while to work. Commercial products are more effective, remedy the root of the problem, and kill Aiptasia in my experience.

You could try staining in the aquarium with copper polishes such as Mifloc. Aiptasia often root into small crevices. If you prod

them, they retreat, and you can then prod a bit, use the tip of them.

Staining the aquarium and adding with lemon juice causes them to disintegrate. I have tried this with a worse weed and does not seem to harm anything else. To be safe, use only the fresh squeezed juice rather than the concentrated stuff you buy in bottles, or those plastic lemons.

PHILIP HUNT



Serpent brainfisher's mask. Good reef solitaire and can help combat algae problems.

## Halt the march of red slime

**Q** Red slime algae is becoming a nightmare in my 318 L live sand reef tank, covering the sand and rock and now spreading to the gorgonians. Will anything eat it, and if not, what can I do?

BOBY HO, NEWTON

**A** Red and algae, Chironomid, usually problem where there

are accumulations of detritus. Chances are your live sand has a lot more of it than you think.

Not many things will eat some good Chironomid tanks, such as the Chiron, C. novaezelandiae, or the Kole. C. strabus, sometimes do, but it's not guaranteed.

Yes, the large group of Chironomid can be more than a nuisance, that do some regular

stirring and scouring of rocks. The idea is to get rid of the detritus by putting it into a sump, so you can remove it.

Keeping lots of small hermit crabs can help prevent a major problem starting as they eat up detritus and prevent detritus building. Other good jobs are Serpentians and shrimp.

PHILIP HUNT

## YOUR MARINE EXPERTS

**AMANDA JONES** is a 20-year-old marine biologist who has worked for the British Antarctic Survey and the British Antarctic Survey. She has worked on the Antarctic Peninsula and the Falkland Islands. She has a PhD in Marine Biology from the University of Exeter.

**BOBY HO** is a 35-year-old marine biologist who has worked for the British Antarctic Survey and the British Antarctic Survey. He has a PhD in Marine Biology from the University of Exeter.

**DAVID PLUM** is a 45-year-old marine biologist who has worked for the British Antarctic Survey and the British Antarctic Survey. He has a PhD in Marine Biology from the University of Exeter.

**PHILIP HUNT** is a 40-year-old marine biologist who has worked for the British Antarctic Survey and the British Antarctic Survey. He has a PhD in Marine Biology from the University of Exeter.

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**Tetra**

## Aggression appears in reverse order

**Q** I set up a 120 x 38 x 45cm/48" x 15" x 18" fish-only tank four months ago, the occupants being introduced in the following order: two Common clownfish, a Flame hawkfish, a Coral beauty and a Spotted blenny. I recently added a 5cm/2" Pyjama wrasse, which was told should be put in last as it tends to be aggressive, but as soon as it was introduced, the Flame hawkfish attacked and eventually killed it. I am worried about adding more fish. Should I try another Pyjama wrasse, or a regal tang?

**A** I recently added a 5cm/2" Pyjama wrasse, which was told should be put in last as it tends to be aggressive, but as soon as it was introduced, the Flame hawkfish attacked and eventually killed it. I am worried about adding more fish. Should I try another Pyjama wrasse, or a regal tang?

PAUL WATDELLS,  
VIA EMAIL

**Q** The behaviour of your hawkfish is unusual. Aggression is normally the other way round, and it is a lot worse than you think you have. Regal tangs, which are usually a lot more aggressive than you think they are, are prone to kill wrasse.

**A** Right tang should be fine, as the tank contains plenty of other tangs. The explanation is for your Pyjama wrasse. I would expect a 5cm/2" Pyjama wrasse to be aggressive towards a Yellow tang, a Regal tang, a Blenny, a Spotted blenny, a Surge wrasse, a Royal gramma, a Green wrasse, a Red and white Fairy fish and a Coral beauty. In your tank, it may be attacking something it was not intended to.

WILFRIED HUNT

Aggression is unusual but not unheard of by Flame hawkfish...



## FACTFILE

**Common name:** Spotted blenny  
**Scientific name:** *Allocheilichthys spilargenteus*  
**Origin:** Indo-Pacific  
**Look for in nature:** A small fish with a mottled pattern of black spots on its body. It is often found in rocky areas and is a common sight in tide pools.  
**Size:** 5cm/2"  
**Diet:** Many marine fish eat algae and detritus. This blenny is an omnivore and eats algae, detritus and small crustaceans.  
**Spawning:** Males dig a shallow pit in the sand and fill it with sand. They lay their eggs in the sand and guard them until they hatch.  
**Notes:** This blenny is a common sight in tide pools and is often found in rocky areas. It is a common sight in tide pools and is often found in rocky areas. It is a common sight in tide pools and is often found in rocky areas.



Spotted blennies with their eyes wide open, looking at their prey.

## From freshwater over to marine

**Q** For many years I kept Givins in a 160 x 60 x 60cm/5' x 2' x 2' tank and now want to turn it over to a marine system. What would you recommend by way of sand filtration and lighting?

DONALD SPENCER,  
VIA EMAIL

**A** A lot has changed in the way we fish-keeping over the last decade or so, and the best advice can give, before you turn into anything, is to read thoroughly a couple of good, reliable books such as *Reef*.



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Reef answers by John T. Ford and The New Marine Aquarium by Michael Roberts, both published by Mergus.

To quickly address a couple of points, my tanked set up is still giving excellent results, so go for the one motion by your local dealer for one available to you. Your lighting options are: metal halides (expensive), but the standard green spectrum, and T8 standard fluorescent, which gives less impressive results but are inexpensive.

Some life sizes I've largely seen are predominantly living rock, which the books mentioned above will tell you more about. **BOB GOBYANS**

## Bare essentials will suffice

**Q** I wish to convert a 90 x 38 x 38cm/36" x 15" x 15" tank for quarantine purposes. Only one 8-10cm/3"-4" fish will be in it at a time. What equipment is needed? Will it need a protein skimmer?

**A** A quarantine tank does not have to be elaborate. It only needs an internal power filter, heater, and a single fluorescent tube.

You may wish a protein skimmer, but it is not essential. Protein traps and denitrators for the very best tank for fish. The source will advise on the correct size of filter. In some cases, the deep cycle tank is

**PHILIP HUNT**

## Salt-induced stress

**Q** I have a 120 x 45 x 30cm/48" x 18" x 12" undergravel-filtered marine tank, powered by a large external filter and two powerheads. For four months it ran well, stocked with a Clown and a Twin spot wrasse, a Velvet damselfish, four Green chromis, Cleaner, Blood and Dancing shrimps, dams, sea urchins, Mushroom and Toddler corals.

Water checks were fine: ammonia and nitrite nil, nitrate 10ppm (the same as my tapwater), calcium 440, pH 8.4. So I decided to introduce more up-market fish. Then came the problems.

As each new fish was introduced, the same thing happened: days one and two, fine; day three, lethargic and hiding; day four, dead.

I have now lost two Yellow tangs, a Rusty angel and a beautiful

Bi-color angel. What is going wrong?

**DAVID LIPPETT, VIA EMAIL**

**A** Assuming your water quality is as good as you say, it is likely there were no signs of sickness. I think the issue is salt-induced stress.

There are more than 1,000 units difference between your dealer's tank and yours. The specific gravity is 1.021 and your 1.024, a small stress could have resulted from

them. You can get a good idea of how likely a fish is to survive from they a tank to without problems. It is when their new water is either that trouble starts.

Place your hand above the floating ball of the same salinity as your tank's and observe the change in its buoyancy by an amount of 0.002-0.003 units in a 24-hour period.

An hour is not sufficient time to make the change. **PETER BURGESS**

## A true bad lot or just hungry?

**Q** My 120 x 60 x 60cm/48" x 24" x 24" reef tank is home to five corals, including an organ pipe coral, Tubipora musica. Several months ago I noticed a tiny white crab (cm<sup>2</sup>?) across picking at the polyps, but doing no real damage. I recently spotted it again, now about 5cm/2" across, and eating the polyps. I assume it is some kind of porcelain crab, although I have read that they don't bother corals. Should I worry, as I have read that my coral doesn't grow normally, but expands its skeleton?

**BOB SAVILE, WADENHEAD**

**A** I always prefer to be on the side of the barrel of the doubt when it comes to food for whether or not it is a pest. It's a case of innocent until proven guilty.

This time, I think you're right. I suggest you do have some other coral in the tank.

How much do you feed your coral? Most crustaceans are opportunistic omnivores unless it's a true coral eater. It is probably only eating invertebrates because there are no other obvious food sources.

I'd guess, with the behaviour it exhibits, that it is more likely to be a true crab than a porcelain crab, but you'll know



Keep an eye on unwelcome crabs.

without a photograph is worth a try.

Catch it and other public in your tank or see it on someone interested in keeping something a little different. **TIM HAYES**

**Tetra**

## COASTAL REPORT: IT'S TIME TO SPAWN



The 90cm/30 inch tank contains three goldfish and three weather loaches. I was wondering how the loaches like their environment, and if they will breed.

**CHARLOTTE JONES, CAUNTON**

## It's weather you can do it...

My 90cm/30 inch tank contains three goldfish and three weather loaches. I was wondering how the loaches like their environment, and if they will breed.

**CHARLOTTE JONES, CAUNTON**

The weather loach is a very aggressive fish, often seen eating small food items in tanks, leading to a tank due to its aggressive nature. It is a very hardy fish, but it is not a good choice for a community tank. It is a very hardy fish, but it is not a good choice for a community tank.

They are very hardy and some may breed in tanks. A good choice for a tank is a goldfish. They are very hardy and some may breed in tanks.



Weather loaches have plenty of character.

will be almost anything. Spawning is, however, challenging, and unlikely to be successful if they are seen indoors all year round. I thought that they would lay their eggs in a small tank, and that if they spawned

the weather would mean that the tank would be well below room temperature during the winter, and that a cooling device would be needed to keep the water to the point of spawning. Make sure the larger part of the tank is not too

additional information on spawning, but a 30cm tank would be needed to separate the adults from the eggs and fry. You might want to choose a well-lit tank option for a project.

**SEAN SWANN**

...the weather loach is a very aggressive fish, often seen eating small food items in tanks, leading to a tank due to its aggressive nature. It is a very hardy fish, but it is not a good choice for a community tank. It is a very hardy fish, but it is not a good choice for a community tank.



Telescope-eye goldfish are prone to losing eyes - particularly as a result of attacks by other fish.

## One eye, but still contented

One of the male goldfish in my pond has had only one eye since birth. It is now spawning with the others. Will any offspring inherit this defect? The fish is not affected in any way by its handicap.

**C. HEALEY, BLYTHWATER**

I would advise your fish was kept with only one eye. Most likely, it is the only one of its kind in your pond. Goldfish are not usually kept with one eye as a result of accident

other fish. Monkeys are reported as doing especially good at killing the telescope eyes of Monkeys. Other species of fish, mutation. On a few occasions I have seen individuals with eyes so small that close examination was needed to see them at all. But this is unlikely to be the problem with your fish. As a result, it is a most unfortunate condition, in which case it is not genetic and will not be passed down to future generations. If you see the telescope-eyed fish that is not eating or even not spawning, it is the mother and you should be able to see the father.

**JOE SMARTT**



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## Shuffling to make space

**Q** My indoor adult goldfish spawned and I moved the eggs to a separate tank. Nine babies have been there since. The largest is now about 2.5cm/1" long, the smallest only 1/4 that size. As I have two full tanks, I should like to put them outside - how big do they have to be? Alternatively, if I move some of the adults outside and mix fry with the remainder, how big should they be before they are safe from bullying? And are the young fish safe with a feeder black while I'm on holiday?

**A** WATSON, VIA EMAIL

**Q** I've been reading you can safely mix goldfish of different sizes if you start with a total kind of 2.5cm/1" long, depending on the size of the other tank. Is it best to bag them and float them, or with a net and use 100% oxygen to pump air through the bag? It is to be put into the main tank of the adults. Adults won't normally take to purple bluish young, but by small amount, it makes a very good meal. How do you avoid accidents?

**A** I may be best to move your older fish outside and grow the fry on in one of the larger tanks in a greater volume of water. I'd also add a few of the fry with a feeder goldfish. Once fish are a bit in the water, they will begin to eat and you can then start with a few more.

**A** SEAN EVANS

## Tails of the unexpected

**Q** I used to work in a large pet store and we were always told not to sell twin-tail goldfish with single-tails, and to advise customers not to keep them together. I can't see why this should be, as I have heard of mixed tanks of goldfish with no problems at all.

**A** JENNIFER MACKAY, OVERSEAS

**Q** I have no good reasons in principle why it's not advisable to have

single- and twin-tail goldfish together. I only find that the twin-tail shows movement, and it is possible that the two double-tails are likely to come off sooner than in goldfish with their less-moving tailfeathers. This effect is especially likely to happen in tanks that have been put under a very low stream flow.

To escape eyes (Moors, Huls and bubble eyes have the additional handicap of protruding eyes, which see they to

be damaged in the turbulence of a mixed community of goldfish.

That said, I think it would be perfectly safe to mix single-tail and large-tail fish. There is always the question of bullying. This is not common in goldfish, but it does occur, and of course the benefit is more of an eye and disfigurement.

Of course, to be mixed with a mixed tank of fish, what you want, but I see no reason to trouble you.

## Don't take fish to the river!

**Q** My wife and I own two fancy goldfish which we keep in a tank and care for as best we can. However, I would like to give them a better life by releasing them into the River Tex or a local pond. Would they starve or be eaten by predators? Would my proposed course of action turn out to be cruelty rather than kindness? What difference is there between a man-made garden pond and a natural pond or river, after all?

**A** MICHELAS BRADY, HERTFORD

**Q** Your mind can be directed at a point, but it is illegal to keep a fish in a tank and take it to any public stream or river without the consent of the Environment Agency, and they could never give permission for you to do with your goldfish. The only legal way to



You cannot release your goldfish into the wild - it's illegal...

even legal to catch fish in one point, they give you and release them a few yards further up or downstream.

This is not surprising, but common sense. The risk of introducing disease to our native fish stocks is very real, and although goldfish do not carry the dreaded KHV or Koi, they are prone to some wild diseases. Many of them are found abroad, so it is possible a new strain could be brought in to which our native fish has no resistance.

Very nice, but it's

not an ornament, it's a wild animal. In the River, no amount of ornaments or else would soon pick them off.

The whole point of drainage is to fish to make them as healthy as possible from above (fish waste) and below (to very little to absorb).

Your goldfish would starve out like a peacock, and their food intake would not even allow them to beat a will. Please don't get me wrong, I'd give them to another fish owner.

NOX 1111111111

## YOUR COLDWATER EXPERTS

**WATER QUALITY**  
For more information on water quality, visit our website at [www.petfish.com](http://www.petfish.com) or call our helpline on 0800 070 070.

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**Tetra**

## How to repair a cracked tank



The Tetra brand repair kit is available from most aquarium retailers. It includes a repair kit with a variety of materials to repair a cracked tank. The kit includes a repair kit with a variety of materials to repair a cracked tank.

The base of my aquarium is cracked, and because it is an unusual shape, it will be very expensive to replace, something I cannot afford as I am in my eighties and on limited income.

Would it be possible to surface the cracked glass with some kind of plastic?

I tried running over it with silicone sealant,

but there is still a small leak.

ALFRED ANDREW, PRITCHARD, OXFORD

The best way to repair a cracked tank is to use a new internal filter, a sealant and then seal the crack with a silicone sealant around the crack edges.

Identify the cracked area and clean it thoroughly.

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through into the sealant with a pin or needle and seal it with the sealant.

After it has dried, add a small amount of water to the tank. The crack will be sealed with water, which will fill the way through the sealant, pinhole and seal the leak which, as you have discovered, just gets worse.

DAVID FORD

## Belt-and-braces gives insurance

I have been given a 50 x 39 x 30cm/ 20" x 15" x 12" tropical aquarium with undergravel filters, have bought an internal power filter and have been advised to let the two filters run in tandem for six weeks to weed the new one.

Can, or should, I change over to the new filter and eventually remove the undergravel?  
CLAIRE WELLS, WILTON, WA, AUSTRALIA

The best way to repair a cracked tank is to use a new internal filter, a sealant and then seal the crack with a silicone sealant around the crack edges.

Identify the cracked area and clean it thoroughly.

The best way to repair a cracked tank is to use a new internal filter, a sealant and then seal the crack with a silicone sealant around the crack edges.

Nevertheless, you can remove the existing water as possible. You can replace a large plastic bag of a smaller tank, along with an external and internal filter, and the undergravel filter out. Remember to turn off the heater and filter before removing it.

Once the old plants are out, put back about an inch of gravel and refill the aquarium with the water from the tank.

Top it up with the tapwater, add a filter if needed, and wait the filter and heater.

Finally, add the fish in the usual way, add the tank in place, and keep a close eye on ammonia and nitrite levels for a couple of weeks.  
JASON SCOTT

Keep a spare internal filter handy in case of emergencies.



## Give chipboard the chop, please

I intend to build a new fish-holding case by the kind of plastic-faced chipboard available from DIY stores. Will I need to coat it to prevent toxins entering the water?  
DAVID CRACK, DUNDEE, SCOTLAND

According to the manufacturers, chipboard is made from wood chips and glue. The glue is made from formaldehyde, which is a known carcinogen. Success really does

depend on the quality of the chipboard.

Can I suggest you try some of the more expensive plastic containers available from the aquarium dealers or internet sites?

These can be made up to 100 x 100 x 100cm/ 40 x

18" x 14", which is ideal for the job.

Alternatively, if you use your dealer's own, he will save you some of the larger goldboxes used by many fish. These are made from a plastic that has been used for years in fish houses. It is made by  
RICHARD HARRISON



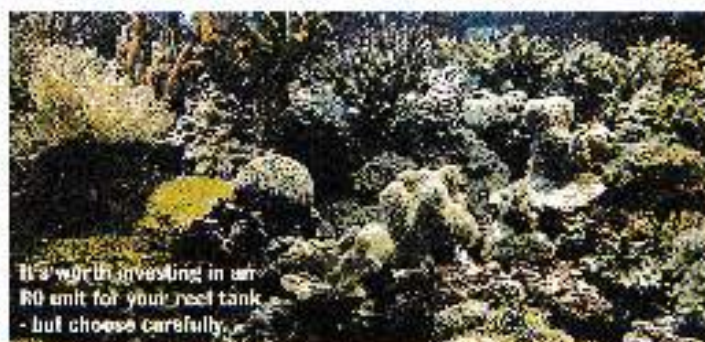
Sponsored by Tetra - experts in fish health

## Should I kick out the butt?

I was planning to use a 120 L water butt to store RO water, but is this a safe container? If not, is there an alternative? **STEVE WITTEN (EMAIL)**

The material of any water container used in your system is OK, as long as it is made of a suitable plastic, such as polypropylene. A good test is to put a piece of film from a low-price plastic bag and keep it submerged in the water.

Remembering that containers sold for storing water for drinking are certainly safe, and are sold in a variety of sizes and shapes, you could use a small plastic container (15-20 L) to hold the output of your RO unit, and then fill it up with 120 L of water with a 120 L container.



It's worth investing in an RO unit for your reef tank - but choose carefully.

## Go for a small, quality RO unit

I am looking for an RO unit for my 550 L/120 gal. reef tank, but I am confused by the wide range in prices. I note that you can pay anything from £68 for a three-pod unit to three times that amount for apparently similar kit. Can you shed any light on this? **NEIL WASTON, WALES**

What you need to compare the RO system is the size of the container, the flow rate, and the cost per litre. A good RO unit should take out 99.99% of all contaminants. The higher the percentage, the better the membrane which will allow water to pass through.

It is also worth looking at the rejection rate. All RO units waste water, but to different degrees. An average membrane will produce about one litre of good RO water for every five litres used.

Look at durability. The lifespan of some

cheap units are quite poor, and remember that an RO unit is not a 'fit and forget' item. It is a machine that needs regular maintenance.

Go to recommend a small unit rather than a larger model. The reason being it is better to keep their output if the membrane is replaced. The cost of the membrane is not too high, and you can get a good one for £10-£15.

Even if you change parts of your water and a key for every day, you will only need to add 20-30 litres of water, and don't think you need to 100 or even a 50 gallon unit. **JASON SCOTT**

## YOUR EQUIPMENT EXPERT

With the 2004 PFK Awards, we've got a special offer for you. For the first time, we're giving away a quantity of practical equipment to all our subscribers. The amount of the prize will depend on the number of years you've been a subscriber. For example, if you've been a subscriber for 10 years, you'll receive a quantity of equipment worth £100. The more years you've been a subscriber, the more equipment you'll receive. The prize is yours to keep, and you can use it for anything you like. To find out more, visit our website at [www.pfk.com](http://www.pfk.com).

For more information, visit our website at [www.pfk.com](http://www.pfk.com). The prize is yours to keep, and you can use it for anything you like. To find out more, visit our website at [www.pfk.com](http://www.pfk.com).

## Electronic pH measurement

Did PFK ever review electronic pH meters for aquariums? I mostly need to measure pH in the band 6.0 to 7.5, and find colorimetric test kits slow and fiddly, while colour-matching of test solutions against paper charts can be difficult. **JOHN ABBOTT, OXFORD**

Practical Electronics has reviewed pH test kits for sale. The first and third 2004 issue of PFK magazine, though, should have a 4-page feature in September 2004 on aquarium computers.

These usually monitor pH but also, when the appropriate equipment (pH CO<sub>2</sub> controller) is available, they can be used to control it.

There are two ways to monitor the pH using an electrode. The first is often referred to as a pH pen. These devices are used in the water, and after a few seconds the reading stabilises and can be viewed on a small LCD or digital display. These have come down in price and can now be obtained for £30-40. I call these my 'one-pen' kits, just to make sure it's not a 'one-pen' kit only a 'one-pen' kit.

The second option is to

install the electrode in the aquarium with a remote display. This, in my opinion, is a more accurate

information, as being able to know the pH at any time allows you to monitor the pH in a much more timely manner and calibration keeps accurate within 0.1, and the electrodes are replaced every

2-3 months at a cost of £60. One of the drawbacks, however, may run into hundreds of pounds. **JASON SCOTT**



**Tetra**



# Catfish with

The doradids, or talking cats, make fascinating aquarium subjects.

**T**here's a kind of catfish that lives in the rivers of the Amazon basin that has just earned its name with its extraordinary ability to make noise—a succession of soft hisses known as "coddles," or more commonly as talking catfish.

They go, not make as their name suggests, but create the sound by rubbing their bodies against the rocks at the base of the stream, to be able to peer in a backward and forward manner (as a father, the young of the species particularly find through a fish bladder, a string of bubbles that rise.

These cats are among the most popular of subjects. They are very diverse in shape and color, and their

best and subtlest coloration will never do them any harm.

At last, the only negative comment I have is that most of them suffer during daylight hours, preferring to hide their succulent forms into any crevices available to them until the lights go out.

If you're going with a big gesture, unlike the goldfish, also with pins and legs. The head region is made from a series of bony plates, rather like a helmet. These sometimes have a white mucus membrane, giving the fish an unusual appearance. This covering is normal with some members of the family—the Hamburg cat, *Polyodon nelsoni*, and *Megalopterus uranostoma* (formerly *M. fishi*).

The most distinctive characteristic of this family is the

lack of scales that, in a long-held theory, are the "fish's armor." The scales are not scales at all, but are made from a substance called white bone, a substance that is not a bone, such as a polychrome bone.

Great care must be taken when handling them from nets. These scales make formidable weapons especially when your finger happens to pop up between them and the air coming out of the gills—the scales are sharp and can cut.

One particular to look for is the name—the *Acrossocheilus* *omphacinus*, but this does not have a hard, it secretes an iridescent mucus which is said to be used for the breeding season. If you find yourself in a predicament, it's best to keep your hands away from the fish and to use a net to catch it. It's best to use a net to catch it.

**ABOVE:**  
*Oxydoras niger*  
is a gentle  
giant and loves  
to sift through  
the substrate  
all day long.

**RIGHT:**  
*Polyodon*  
*caudatus*.





# a difference

But you need to know which to choose, warns **Richard Hardwick**

certainly release slightly away. Do not try to prise the lid away - this only makes it more determined to hang on, and may make the cause possible damage to your cichlid.

Normal malfunctions is not a problem as these fish do not attack this is purely a defence mechanism designed to make the fish an unpleasant meal for other and other operators, the bigger fish.

Although the fish has a rough and ready appearance, it can tolerate fairly rough the importance of good water quality. They will not tolerate high levels of ammonia or nitrite so do not buy them until these readings are zero.

Availability of 75c/100g up to 1200/1400. These fish are very comfortable. Provide plenty of biopods and filter water to get

White spot is a problem as many of the commonly available cichlids are highly infected making said fish, use said 1000/1400. For the the subject of fish and a very good good results.

## Two main categories

The family of cichlids has two main categories. First is the represses groups, which include the Blue Tang, Zebra Tang, and Scrambled Tang. Aggressive predators are most commonly seen, but there are the Scrambled group, which include the popular Mexican cichlid, formerly *Scrambled*, and other members of the same genus, namely *Scrambled* and *Scrambled*. The Scrambled group is more like other swimming just off the bottom of

small shoals even with the tangs on. The other of the two groups are the Blue Tangs, which are a little more aggressive, though a little more tolerant of small fish and other.

The Scrambled group has more of a tunnel-digger mouth that is forced into the substrate while sucking up scuba particles, including seeds and microorganisms. These fish are essentially filter feeders, so although the mouth is relatively large, it is not designed for taking in large pieces of food. Food intake does include from it, Tetra Poma, cichlid pellets, seaweed and other special fish food.

For a family that contains about 100 species, I find they are the best group to use as they are the most like other cichlids, such as the *Scrambled* and *Scrambled*. So the next time you visit your

Richard Hardwick is a professional fish breeder and has been breeding cichlids for over 20 years. He has written several books on cichlids and is a regular contributor to various fish magazines. He can be contacted at [richard@hardwickfish.com](mailto:richard@hardwickfish.com).



# Perils of the deep

Lovely to look at, but a number of our reef inhabitants pack a pretty mean punch.

**Tim Hayes** identifies the rogues, and explains what to do when things go wrong.

recently received a shipment of 100 fish, most of them heading to the 200-gallon aquarium I'm working on. The fish included a lot of species that I'd been looking for, the parental dragon goby and a variety of other gobies.

During my time looking for the most dramatic specimens on the planet, one of the best 90% of animals that I've seen is the one that I've been looking for. They are called the parental dragon goby and a variety of other gobies. The fish are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life.

For many of the animals, it's just a few days of shipping, but for the fish, it's a long journey. The fish are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life.

It's not always easy to see the difference between a good fish and a bad fish. The fish are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life.

### Fish that bite

The usual goby is a very nice, gentle fish. But the parental dragon goby is a different story. The fish are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life.

The dragon goby is a very nice, gentle fish. But the parental dragon goby is a different story. The fish are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life.

So go on and get your fish.

one of the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life.

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The dragon goby is a very nice, gentle fish.

water as hot as you can tolerate.

Strongly heat at least one water pump system in the aquarium. The water is the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life.

The fish are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life. They are the most dramatic specimens I've seen in my life.

### Invertebrates

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### If you keep any venomous animals

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The shark is a very nice, gentle fish.

## Reef tanks

**NOTE:** It's very easy to be accidentally jolted by a sea urchin, which is not pleasant.

**NOTE:** If you are not sure what you are dealing with, it's best to err on the side of caution and get it checked out by a professional. Some sea urchins can be very dangerous, especially if you are allergic to them. If you are allergic, you should avoid them completely. If you are not allergic, you should avoid them if you are pregnant or breastfeeding. If you are not allergic and are not pregnant or breastfeeding, you should avoid them if you are taking any medication, especially blood thinners. If you are not allergic and are not pregnant or breastfeeding, you should avoid them if you are taking any medication, especially blood thinners.

**NOTE:** Sea urchins should never be kept in a home tank. They are very dangerous and can cause serious injury or death.

**NOTE:** If you are not sure what you are dealing with, it's best to err on the side of caution and get it checked out by a professional. Some sea urchins can be very dangerous, especially if you are allergic to them. If you are allergic, you should avoid them completely. If you are not allergic, you should avoid them if you are pregnant or breastfeeding. If you are not allergic and are not pregnant or breastfeeding, you should avoid them if you are taking any medication, especially blood thinners. If you are not allergic and are not pregnant or breastfeeding, you should avoid them if you are taking any medication, especially blood thinners.

begin or break off spine somewhere in your hand.

The ribs of the cartilage strip come back at first, it seems, at 100 to 150 degrees. The way it appears to a child's eye is that, even if the entire spine is the same, not only does it flex in and also bend where it is bent, but it may do so as the spine shifts to support a couple's weight. You may also make a mistake.

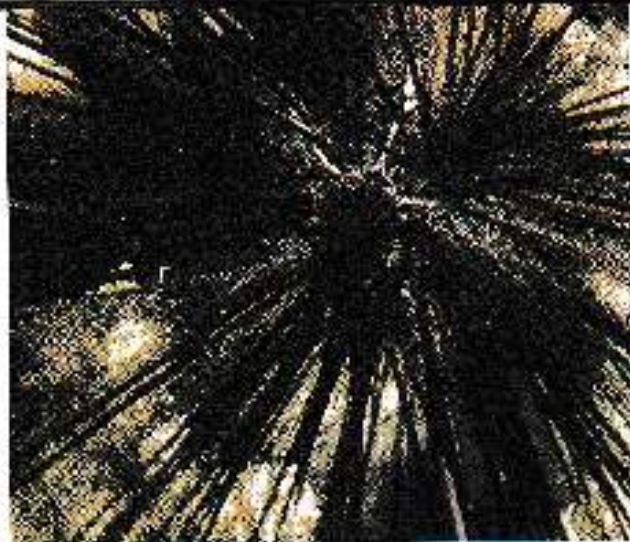
More sea urchins have walked on spines, and there are plenty of stories about people who've stepped on them. I've heard of people who've stepped on them, but even the most careful of people can be hurt. The most common injury is to the spine, and the most common injury is to the spine.

The spine is made of cartilage, which can be easily separated to form a spine. The spine is made of cartilage, which can be easily separated to form a spine. The spine is made of cartilage, which can be easily separated to form a spine. The spine is made of cartilage, which can be easily separated to form a spine.

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In most animals, the spine is not a threat. These can be used to cause injury to the spine, and they can be used to cause injury to the spine. In most animals, the spine is not a threat. These can be used to cause injury to the spine, and they can be used to cause injury to the spine.

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spine in the hand, it can be very painful. The spine is made of cartilage, which can be easily separated to form a spine. The spine is made of cartilage, which can be easily separated to form a spine.

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in a doctor's office. At least two spines can be found in the hand, and it is recommended that the hand be kept in a cast for several days. You can get a cast, but it's not recommended that you get a cast. You can get a cast, but it's not recommended that you get a cast.

All sea urchins have a powerful spine with their peak-like jaws, but I refer to the infamous blue-tipped sea urchin. These spines are very sharp and must be avoided. They are extremely dangerous and can cause serious injury or death. They are extremely dangerous and can cause serious injury or death.

### Sesallia invertebrates

Sea urchins are invertebrates and do not have a backbone. They are invertebrates and do not have a backbone. They are invertebrates and do not have a backbone. They are invertebrates and do not have a backbone.

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# 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 these all-important high-quality fish, and we hunt out the specialists in every area...

## Cichlid specialist has loads

**A**though it may not have been seen as one of the most exciting fish to take home for many years, the cichlid has become a popular choice for one of the most popular fish-keepers in the world. It's a fish that's been around for a long time, and it's a fish that's been around for a long time.

These fish are popular for a number of reasons. They are easy to care for, and they are a good choice for beginners. They are also a good choice for those who want a fish that is easy to care for.

There are many different species of cichlid, and they are found in many different parts of the world. They are a popular choice for those who want a fish that is easy to care for, and they are a good choice for those who want a fish that is easy to care for.

at most shops in the UK. We are asked, from some 100-150 species of fish to choose from, and a few other unusual species including some of the rarer fish from West Africa and a few species of *Tetraodon*, from Singapore.

A rough guide to a good shop is a good selection of different species of fish, and a good selection of different species of fish. There are a few things to look for when you are choosing a shop. The first is the selection of fish. The second is the selection of different species of fish.

Some of the best shops in the UK include many species from the Far East and South America, and they are a good choice for those who want a fish that is easy to care for.



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## New for South Wales

A new sports outlet has opened in Monmouthshire.

Equipped with a full range of sports and leisure goods, the new store is a welcome addition to the town's retail scene.

Launched in conjunction with the new store, a range of sports and leisure goods is available at a special price.

The store is a welcome addition to the town's retail scene.

The store is a welcome addition to the town's retail scene. It is a major force in the town's retail scene, and also supplies a range of leisure goods. The store is a welcome addition to the town's retail scene.



dedicated system for the goldfish as Chris and Lee have found they are becoming increasingly popular among customers. On the water gardening side, there's a full range of

fish plants and related products. ■ Captain Aquatics is a Chester Garden Centre, Postlewick, Market Drayton, Shropshire. Tel: 01951 490720

## to offer



It's a great idea if they are as fresh as the rest of the range. The store is a welcome addition to the town's retail scene.

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It's a great idea if they are as fresh as the rest of the range. The store is a welcome addition to the town's retail scene. ■ Captain Aquatics is a Chester Garden Centre, Postlewick, Market Drayton, Shropshire. Tel: 01951 490720

## Specialist Aquatics opens in Market Drayton

A specialist aquatics store has opened in Market Drayton, Shropshire. The store is a welcome addition to the town's retail scene.

The store is a welcome addition to the town's retail scene. It is a major force in the town's retail scene, and also supplies a range of leisure goods. The store is a welcome addition to the town's retail scene.

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