Today's Fishkeeper

JANUARY 2004 £3.25

PASSIONATE ABOUT FISH

Diamond tetras

Small but beautiful community fish for your aquarium

Find out how Cichlids breed

8 pages of fishkeeping answers

Death to Glass anemones
The fish and invert predators

Burmese Danios
Great community fish

The best new fish of 2003
We review the year's new introductions

9 770003 727105 01

INCORPORATING
AQUARIST AND PONDKEEPER

Designed & Published by
TRMG

TRMG Magazines Ltd
Winchester Court,
1 Forum Place Hatfield,
Herts AL10 0RN
Tel: 01707 273999
Fax: 01707 276555

Editor
DEREK LAMBERT
(01673 885352)

Group Art Director
JON SLOANE ext.223

Production Manager
SIMON LATTER ext.243

Designer
STEVE MADDOX ext.242

Advertising Production
JANET O'SHEA ext.234

Advertisement Repro Manager
BARRY JONES ext.233

Advertisement Repro Assistant
ANNE FALLON ext.233

Advertisement Manager
ALEX MACLEOD ext.221

Classified Executive
HELEN RICHARDSON ext.226

Marketing Executive
SARAH BARNACLE ext.231

Publishing Production Manager
PAULA SKINNER ext.280

Publisher
STEPHEN CURTIS ext.279

Advertisement Director
CHARLIE WISE

Director
ANDREW STEVENS

Commercial Director
JONATHAN FELLOWS

SUBSCRIPTIONS
01858 438817

Colour Repro
DIGITAL CONCEPTS

Printed by
WILLIAM GIBBONS & SONS

Distribution
COMAG (01895 444055)

 ISSN 0003-7371

EDITORIAL CONTACT INFORMATION
Tel: 01673 885352
E-mail: derek@trmg.co.uk
Fishkeeping answers:
fishkeepinganswers@trmg.co.uk

Happy New Year

Doesn't time fly when you are enjoying yourself? Last week I trundled off down to the Japanese Koi Company to put together this month's shop visit feature (see page 38). What a great time I had looking around at all the displays and fish. I may not be a Koi nut case but I can still appreciate the majestic splendour of these magnificent fish. Then it was off to Just Discus (see next month's shop visit for the full write-up). Talk about contrast! From the huge all encompassing mecca that the Japanese Koi Company is, straight into Geoff Lack's Just Discus. Here I chatted for hours, not just with Geoff about Discus, but about all areas of the hobby. This sort of aquatic outlet is where you often get talking to other customers and so did I. Nick Tessier was there to buy some Discus for one of his tanks and was taking a close look at a breeding pair in one of the tanks. It turns out Nick is a subscriber to the magazine and very much a dedicated aquarist. Fish even played a major part at his wedding, with Siamese fighters placed in 1 gallon jars as a centre piece decoration on each table at the reception. We chatted about one or two other fishy things and then I checked the time and realised I should have left an hour ago. Boy was I going to be in trouble when I finally got home!

Then again, yesterday I visited Brian and Steven Critch and Ian Wright (see page 50). Now I knew it was not going to be a quick in and out visit. Get five fishkeepers together chatting about fish and time really does fly. I really should have set the alarm but it was 10pm before I noticed I should have left at least an hour before! Boy was I in trouble when I finally got home!

Still I thoroughly enjoyed myself on both these days out and if you have an aquarist in the family then you have to expect this sort of behaviour. At least we don't hog the television to watch the 'footie' or Coronation street. Admittedly we may slowly (or not so slowly) take over the whole house with fish tanks.

So what will the new year bring for fishkeepers everywhere? I have heard through the grape vine that a new television programme is being made and may reach our screens this year. Will it be any good? Most of what has been done so far has tended to take the Mickey out of us fishkeepers. We will have to wait and see.

We will certainly be seeing lots of new equipment from all the aquatic companies. Some are just refinements of old products, but there should be one or two real innovations coming up. Tank design continues to move forward, so we can find a design to suit the decor of every room. Having said that, I was watching one of those makeover programmes the other day and I have to say I would find it very difficult to find any aquarium which would have looked "at home" in such a setting. The owners of the house didn't look as if they were going to be "at home" with their new room either!

Happy New Year,

Derek

JANUARY inside thi

TROPICAL/MARINE/COLDWATER

MARINE

REPTILES & AMPHIBIANS

s issue

Today's Fishkeeper

TROPICAL

TODAY'S FISHWORLD

PONDS & COLDWATER

KEY TO SYMBOLS:
Keep an eye out for these handy symbols to help you with your fishkeeping.

BEGINNERS

REGULARS

PLANTS

CUT OUT AND KEEP

Starting Point...

I have been keeping fish for more years than I care to remember. I've kept and bred hundreds of species, founded a specialist livebearer group, travelled down jungle tracks in search of fish and given lectures at home and abroad but I still think there's nothing like those first exciting, heady days of keeping fish.

Pat Lambert makes an interesting purchase and introduces two beautiful fish

A beautiful mature pair of Diamond tetras.

A few months ago I told you that I was hoping to set up a tank for Tanganyikan Shell dwellers. I knew that some of the cichlid folk would be going to the auction on November 2nd, so I prepared my tank in anticipation of some of these fish being there.

The Shell dwellers need very hard alkaline water and a sandy substrate. The sand was thoroughly cleaned (ugh I hate that essential job!), and laid it to a depth of 6cm. Numerous shells and low rocky caves were placed around on the base as I knew that these little fish stay low down in the tank. Some bacteria from one of my other filters seeded the filter and a few centimetres of mature water was pumped in. Tap water with conditioner was used to fill the tank after I had harvested some Vallis from another set- up where the Vallis was rampant. As my tap water is extremely hard I thought it would suit these fish very well.

Thus prepared, I went to the auction, hopeful that I would find what I wanted and I was not disappointed. I bought some Neoloprologus *multifasciatus*, a mature pair, an extra mature female and a few young. The pair came with their shell (a kind of mobile home really) and settled in immediately. The next morning they had spawned. I really didn't expect such quick results!

P.S. The editor has just popped his head round the door and said "*I hope you're not telling everyone about those shell-dwellers. There's lots in the magazine on cichlids this month*"

Oh dear! But I just had to tell you about them, didn't I?

Impulse buying is not recommended. Make sure you have a home ready for new introductions before you buy.

A sight to behold

Diamond tetras are beautiful little fish which I can thoroughly recommend for a community tank of small species. A mature pair are on this month's cover and you can see why they are called Diamond tetras when their bodies sparkle and shimmer as they move. The large extended dorsal fin of the mature male is an outstanding feature. These small,undemanding fish only grow to 6cm and really flourish in softer water.

When you see Diamond tetras in the shop you may not give them a second glance. Immature specimens are rather dull and the young males lack the extended finnage which develops with maturity. However, mature fish in a well planted tank are truly a sight to behold.

Are Mollies for beginners?

I've seen tanks containing so many Molly babies the poor fishkeeper doesn't know what to do with them all. I've known some

fishkeepers falter on the rocky shores of Molly keeping as the fish shimmy their way to death. So what can I say about mollies? Quite a lot really, but I've chosen to focus in on the Sailfin molly which is one of the most beautiful of all species. The wild ones are green but there are many hybrids in a wide range of colours. I have not seen the black with orange bordered dorsal for a long time, but there are many varieties out there to choose from. They certainly appreciate a well planted, filtered tank with a good flow through. Many species of Molly do NOT require salt in their tank (as suggested by many writers), but some Sailfins do. Wild Velifera Sailfins come from brackish to almost saline conditions, being found off the coast of the Yucatan peninsula, Mexico. The fish I caught in the brackish pools near Cancun did not have the high dorsals though.

The mature fish need very large tanks as males can grow to 18cm and room is needed for the male to extend his magnificent dorsal fin. A friend spent years building a purpose built fish house which had a concrete trough running round one side of the building. His intention was to breed large Sailfins with large dorsals (impossible in normal aquarium tanks). I was very excited at the prospect. He completed the project... and then he moved house. Ah well! That's life for you.

Many of the most beautiful species do not show their real potential when immature but the Diamond tetra, being a small species, does not take so long to mature.

Reluctant diners in the community tank

All fish need to feed and it is worrying for the fishkeeper if their fish will not eat. When newly purchased fish are introduced to a different environment from what they are used to, they sometimes take time to adjust and may not eat for several days. This only becomes a problem when this fasting continues, particularly when the fish appear to be healthy. It often means, for general community fish, that tank conditions are not quite right. Temperature, water conditions, tank decor and substrate all influence the eating habits of fish. Very important, but often ignored, is lighting. Our marinists have all written about the importance of lighting for coral feeding but lighting can also affect a freshwater tropical's feeding. If a species likes dimly lit tanks and there are bright lights above the feeding area the fish may not come up to feed and may stay in hiding.

They may also stay in hiding if they are timid species and some of the tank inhabitants are too boisterous for them. Care is needed in selection of compatible species otherwise feeding problems occur and some timid species may starve to death.

Even hardy community fish like these Banded rainbowfish (*Melanotaenia trifasciata*) may not feed when first introduced to a new aquarium.

Water conditions for this species have to be just right. They are prone to shimmying (weaving back and forth in the water) if conditions are not to their liking. Tank bred specimens do not develop the high dorsal nor do they reach such a large size.

Male green Velifera molly.

Temperatures that are too high for the species will make the fish sluggish, less energy is needed and food will lie uneaten. Lack of suitable hiding places such as rock caves, logs and flowerpots will make timid fish so insecure that they cower in corners and refuse to eat. The right kind of substrate for bottom feeders is also very important. Large gravel substrates are not suitable for these fish. Food drops into the crevasses which are too difficult for the fish to reach. A sandy substrate is best for these as they can sift through it for food.

Most community fish are not fussy feeders but on being introduced to their new home they may also be introduced to new food and however good the quality is, it may be one change too many, too soon. Try to give them the food they are used to until they have adjusted to their new home.

Most fish find live food irresistible and a feeding of live food to newly introduced fish is something that I would recommend.

LOST FOR WORDS

Metabolism: All the chemical processes in a fish which produce energy and growth.In Swordtails high temperatures lead to an increased metabolic rate so they initially grow faster but mature earlier and die sooner

Sygnathidae: These are the Pipefishes which have bony armour and no pelvic fins. Their snout is tube like and many of them have a pouch in which the female lays her eggs. The male is the carer and most species are found in marine conditions although there are a few freshwater species. The most widely known are the seahorses.

By-catch: These are fish which are not supposed to be in a shipment of species but have been accidentally introduced.

Live Rock: Calcium carbonate rock from reef areas that has living organisms within its structure.

Knife livebearers are just one of many thousands of species of fish which are Viviparous – livebearing.

Fin Rot: A disease that causes the fins to become ragged and frayed until they gradually disintegrate. Is generally thought to be caused by poor environmental conditions

Blue Algae: This replaces green algae when water becomes polluted and has a high nitrate level. The cause is poor water quality due to infrequent water changes. Good tank maintenance is the best preventative as fish do not eat blue algae.

Viviparous: A fish that gives birth to live young.

The ten golden rules of fishkeeping

Read all about it

Take the first steps in fish keeping by finding out all you can about caring for your fish.

a) Manufacturers often provide free booklets about fish care.

b) Inexpensive books provide information on setting up.

c) *Today's Fishkeeper* experts are on hand with help & advice and sections of the magazine are devoted to beginners.

THE WATER

1 Testing: Before introducing any fish to your new tank test the water for Ammonia, Nitrite and Nitrate. Safe water ready to receive fish should have zero readings of Ammonia & Nitrite and almost Zero nitrate. Test the pH, pH7 is neutral, above this is more alkaline and below 7 is more acidic. Read up on pH requirements for any fish you intend to purchase.

2 Temperature norms:
Freshwater tropicals 21-27°C
Marines 26°C
Coldwater 13.5-21°C
Some delicate species have very specific requirements, read up on them before you purchase.

3 Filtration cleans the water in your tank. Choose the filtration most suitable for the fish you intend to keep. Some species do not appreciate being blown around the tank, others that come from fast flowing waters like more turbulence. Large tropicals, coldwater and marines require larger filtration systems.

THE FISH

4 Stocking levels: For freshwater tropical we recommend 12cm² of surface area per 1cm of fish.
Marines: For a fish only setup we recommend 2.5cm of fish for 9l of water and for Reef only setups we recommend 2.5cm of fish per 27l of water.

Ponds to a maximum of 250cm of fish per 4500l of water.
Measurements should be based on the optimum adult size of the species not the size at the time of purchase. **NEVER OVERSTOCK**

5 Knowledge: Find out as much as you can about any fish you hope to buy before purchase.

6 Introducing fish: Fish should be added a few at a time over a period of several weeks to new setups. This allows the filter system to mature.

7 Quarantine: All new purchases should be quarantined for established tanks for at least two weeks.

THE ROUTINES

8 Feeding: Twice daily feeds are the norm for most adult fish. Try to feed at the same time each day as this establishes a routine. Only offer as much as the fish can eat in a few minutes.

9 Water changes: Freshwater tropicals 10-20% weekly
Marines no more than 20% every two weeks.
Pond fish also appreciate an occasional water change. Keep an eye on ammonia, nitrite and nitrate levels. They should be zero in a mature pond.

10 Cleaning filters: These should be cleaned once a week. If they work by biological filtration (bacteria break down the waste) and have a sponge in them, this must be cleaned in old aquarium water that is then discarded. Never use any household detergent or soap on aquarium equipment or tanks.

OBSERVATION: **Daily observation is the key to successful fishkeeping. Look for any abnormal swimming patterns, bullying or listlessness. See that the fish are eating well and that all are getting their share. If fish are in difficulties test the water.**

Tetras and More Tetras

Mary Sweeney creates a community around Tetras.

I can't for the life of me understand why I can't get tetras off my mind these days. I randomly opened my copy of the Baensch *Aquarium Atlas*, promising myself that whatever fish I first laid eyes upon would be the inspiration for this month's contribution, and what should appear but *Hemigrammus pulcher*, the Pretty Tetra. What luck! This is a great fish!

Perfect Community Fishes

These little tetras like the Pretty Tetra; *Hemigrammus ocellifer*, the Head-and-Tail Light; and their conspecifics almost all without fail are perfect community fishes as long as there are no pugnacious or predatory fishes added into the mix.

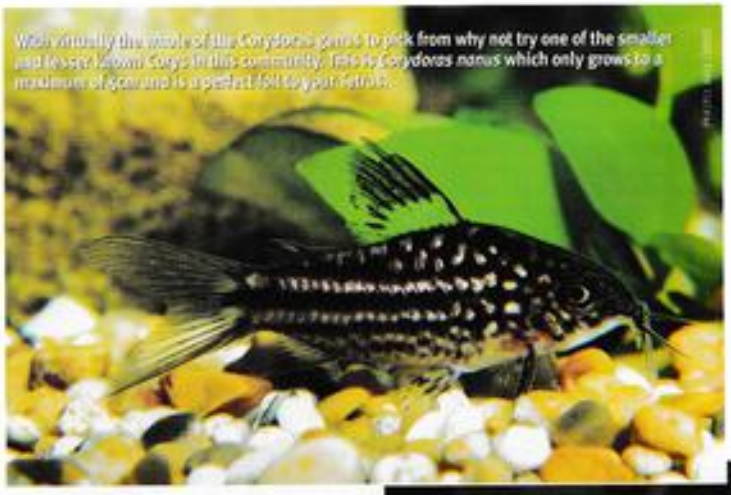
Head-and-tail light tetras are virtually the perfect community fish.

This means you don't add a baby Oscar in the hopes that since they grew up together, they are still going to be nice with each other six months later. I'm not trying to be patronising, but there are a lot of people who are just daft about fish and if I offend the rest of you momentarily, I know you'll forgive me because we all know someone who habitually offers a recipe for pan-fried Discus. (You know who you are!)

In the community aquarium

These tetras are just fine with other fishes of the same size and smaller. The list is long, but it is often best to limit the number of species in the tank as to appreciate the habits of the shoaling fish like these tetras. While they even do well with Dwarf cichlids, there may come a time that the Dwarf cichlids can't even tolerate each other, so be sure that there are an abundance of caves and hiding places for fish that are in danger of persecution (for the cichlids-shoaling fish don't seem to hide much, even when it would be prudent to do so, they use their community as protection). Small catfishes are natural tankmates, simply because they occupy a different level in the aquarium and often the same waters in the wild. Rasboras and small livebearers are also possible additions to the aquarium.

A school of these tetras can be kept in a small aquarium. The tank would of course need to be sized up if more fish were desired. Use a fine, dark substrate. Driftwood and other ornaments are quite attractive in the aquarium, but be sure that any rocks used are inert, that they do not change the water chemistry.

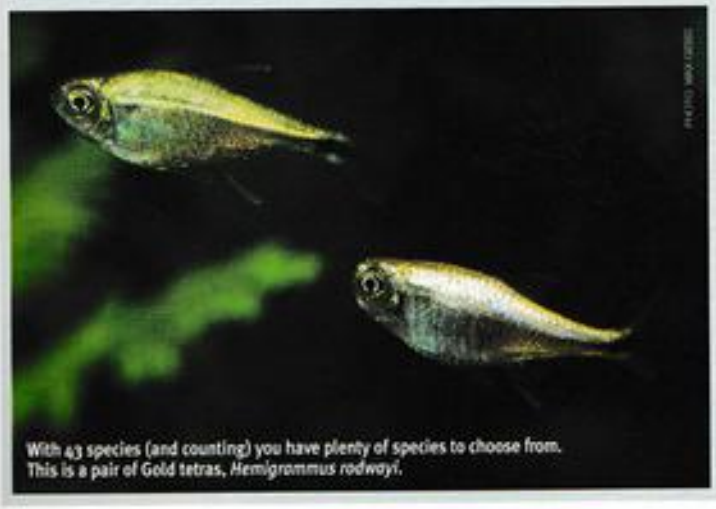


With virtually the whole of the Corydoras genus to pick from why not try one of the smaller and lesser known Cory's in this community. This is *Corydoras nanus* which only grows to a maximum of 5cm and is a perfect fish to your needs.

Dwarf cichlids like this *Apistogramma agassizi* need an abundance of caves and other hiding places if they are to settle in an aquarium happily.

THE GENUS HEMIGRAMMUS

Hemigrammus are in a group of fishes known as characins. Characins are in the family Characidae. Characins are distinguished by having an adipose fin (an extra fin not found in many other fishes)that is found between the dorsal and the caudal fins. Small characins like the tetras of the genus Hemigrammus are generally known as peaceful, well-behaved aquarium fishes. They probably rank closely with the popular livebearers as community occupants. They are lively and colourful. According to FishBase, there are 43 species in the genus Hemigrammus.



With 43 species (and counting) you have plenty of species to choose from. This is a pair of Gold tetras, *Hemigrammus rodwayi*.

A floating haven

Floating plants are often used with tetras and many aquarists are fond of duckweed as long as they don't use a power filter on the tank. When using floating plants, it is generally best to use air-powered sponge filters. Power filters just suck up the small floating plants like Duckweed, Riccia, and Lemna. When used properly, though these tiny plants are attractive and very useful should there be fry to try to raise. Tetra fry are notoriously difficult to obtain in an experienced aquarist's tank and virtually impossible in the community setting. Floating plants, including water wisteria, provide both haven and pantry for the fry of many species of aquarium fish.

Other plants can also be used in this aquarium. It is especially nice to really decorate when keeping these tetras →

because they don't "mess up the house." They will not shred plants or dig them out of the gravel, so their presence is an opportunity for aquarium plant people to have a bit of fun. As usual, the fish will look well if they get a bit of natural sunlight through the day and some plants that couldn't otherwise be easily kept will thrive in such a tank as long as there are 12 hours of good light. Some of the species I'm thinking of here are Alternanthera and Rotala, which are difficult to keep without exceptionally good light and a mature aquarium.

The mature aquarium

When I say "mature," I'm talking about a tank that has been set up for about six months or more and has really passed through all the stages of cycling. What?!? Yes, in my experience, it often takes a full six months to a year for an aquarium to become a good home for delicate plants or fishes. The aged water, while "clean," is nutritious to the plants without the addition of extra fertilisers and it is perfectly clear and beautiful for fishes that are sensitive to the harsh water treatments that make so many of us pay premiums for bottled drinking water. Such an aquarium has a quality to it where every feature is in simple balance. Nothing is overdone and no rash decisions are made about medication use (which shouldn't ever be necessary in a show tank...there are quarantine tanks for that) or chemical alterations. Even the water used for changes is aged, or even collected from the sky...

Very similar in general appearance to the Head-and-tail-light tetra, the Pretty tetra has more black markings in its body.

Pretty by name pretty by nature

Hemigrammus pulcher, the Pretty tetra, is aptly named, for this is a very pretty little fish with a mixture of red, green, silver, and black in its coloration. It also has a half-red eye, that is a drawing feature in many colourful fishes. The total length is 4.5 cm. This species is one of the more difficult of the tetras to spawn, but if you have enough adults, you will likely find fry in the aquarium by and by. Breeders generally remove the parents immediately after spawning and keep the eggs and subsequent fry in a warm, dark tank. When the fry are active, they start to feed on infusoria and move up to brine shrimp as the fry gain size. One of the things that fish breeders virtually never fail to do is to grow appropriately sized live foods for the babies. The adults may live on prepared foods, but the fry of egglayers are virtually always raised on home-grown foods.

WATER CONDITIONS

The water chemistry where these tetras are found varies from a pH of about 6.0 all the way up to 8.0 and can be very soft to slightly hard. Temperature in the area of 22 to 26 degrees C is fine as long as it is held steady.

Shine a light

Hemigrammus ocellifer, the Head-and-tail light, or Beacon tetra, is found in many South American rivers. They seem to exhibit a preference for quiet water with little current. Keep the temperature steady. They avoid strong lights, so floating plants are especially appropriate for this fish's aquarium. Use plants and other decorations to make the aquarium like a cave with open swimming space in the front and all the other areas covered from view and light. The males are smaller than the females and usually grow no larger than about 4.4 cm in total length.

Unlike so many of the tetras, this fish is a good breeder and will frequently spawn in the home breeding aquarium. Condition the fish well on high quality foods until the

female(s) can be seen to swell in the abdominal region. Move the female(s) to the breeding tank first. Of course the fish must be mature adults; and in good condition for spawning. Add the male later and expect the fish to spawn in the morning. Remove the adults immediately if possible, as they are quite avid egg eaters. Some breeders use a layer of marbles on the bottom of the spawning tank, some use Java moss, and others use washed peat moss. It's part trial and error, and part strong personal conviction.

Most egg-laying fishes require very small foods to get them to a size where they can begin to accept finely crushed flake foods. Hatched brine shrimp is the saviour of many a fish breeder, but many of the egglayer fry are too tiny to take even these very small critters. Smaller food is required. Many of the commercial preparations such as liquid fry and powdered dry food do quite well if mixed with water and then fed a few drops at a time, but they are often lost on the bottom and overfeeding is disastrous. Besides, nothing is quite as good as live food for small fry or any fish for that matter.

RECIPE FOR SUCCESS

Infusoria has been the first food of choice for generations of fishkeepers and countless generations of fish fry-it's available in virtually every body of fresh water. It's alive and moving and therefore available to the fry at all times. By slowly altering the diet of your fry you can take them through the most difficult first few weeks of life with few losses. I mix infusoria and a very small amount of prepared fry food in a couple of ounces of water and add a few drops at a time to the fry tank. After a few days I reduce the amount of infusoria and start adding hatched brine shrimp and finely crushed flake food. Any change in the diet should be done gradually over several days. Here follows my recipe for infusoria which one can never find when one has had the good luck to find a spawn of tiny tetras (or other small fry).

To make infusoria

Fill a gallon jar with aged fresh water.

Add a piece of lettuce that has been placed in the freezer for an hour to help break down the fibres. Some people add a few pond snails, but I've found this to be optional. The snails do, however, help keep the culture going longer.

Set the culture near a window where it will get some sunlight. The culture will first turn milky and then clear up. Do not feed the fry with the milky culture as it is not yet good to eat.

When the water clears, it's good food. If you look at the water through a magnifying glass, you will see countless tiny specks moving around in the water. This is infusoria, the fine first food for baby fishes.

It is easy to start an infusoria culture, and it's easy to keep them going. Just fill another jug with aged water and add some of the water from the first culture with a little piece of lettuce. In a few days, you'll have more.

Tropical Q&A

BROUGHT TO YOU BY NUTRAFIN & FLUVAL

Corydoras sterbai were first collected by H.Schultz and named after the world famous ichthyologist Dr Günther Sterba. They grow to about 6cm and make excellent fish for a community aquarium.

Star Letter

What can I keep with my *Corydoras sterbai*?

Q **I have a tropiquarium 88 (85cm wide). At the present I have six *Corydoras sterbai*. They have been there two days and they are very shy and hide every time I go near the tank. Will they get used to me and display themselves or not? I'm also wondering when I can add a shoal of Neon tetras. How many would you recommend? I would like more than 4 or 6 and any other fish that would go well with Neons and Cory's?**

Toby via e-mail

A You need to wait at least 2 weeks before you add more fish. By then your Corys will be out and about all the time. Then you should go for a shoal of about 6 Neons. You can add more later but you should not add more than 6 fish at a time. Other fish to look out for would be some surface dwellers like Hatchet fish and some more mid-water fish like Platies. Take your time and slowly build up your community of fish.

Derek Lambert

SNAIL PLAGUE

Q **I am a beginner with a small tropical tank with community fish. I have a healthy population of snails. I don't wish to put more chemicals in the tank (I have already had to treat my black Molly for whitespot) so have bought two small (5 cm) Clown loaches a couple of weeks ago. Are they too young to eat the snails and will they be able to control the snails? Is the whitespot likely to be a recurring problem with the Mollies? None of the other fish seem to be affected.**

Barbara Dewing via e-mail

A They will eat the snails eventually. You can also weight some lettuce down on the substrate and the snails will munch on it over night. Then you collect all the snails still on the lettuce first thing in the morning - it works a treat! Mollies in acidic or poor water conditions can be prone to white spot. If your filter is working properly and you have neutral to hard and alkaline water they are just as hardy as any other fish.

Having problems? Then let our panel of experts solve them for you. *Today's Answers* is our free reader service. Just send your question by letter or e-mail and we will forward it to our panel of experts. Everyone receives a reply regardless of whether we publish them or not.

Will inbreeding be a problem with my Severum?

I bought a group of Severams 6 months ago. They were quite small and they came from a tank containing many others. They are now about 10cm long and I think they are nearing maturity as I have seen the 2 larger Severams engaging in jaw locking activities. However, I now fear that as they were from the same batch of fish they could be inbred and I am wondering whether or not to breed them. If I do will the try have any deformities?

Also is there a fish called 'Serpia maria'. It's a Cichlid and it's yellow with black bands. Its fins are tinged with blue and red patterns. I own two and after 2 days they began to uproot plants and dig pits in the gravel. A few days later about 40 grey eggs were laid on a piece of slate. 20 to 40 fry survived and they are now about 3months old and growing rapidly. Could you tell me anything about these fish and are they rare?

Ben Turnbull, South Shields

Heros severum are very nice fish and you can see the difference between female and male by looking at the cheek, (if it's not a golden/yellow variety) the male has lines on the cheek, but not the female. The jaw locking activities are a battle between the fish to find out who is the "boss" or to see if the other fish is a male or female. This is one of many signals Cichlids use and is very interesting to study.

I don't mind the fish coming from the same batch, but it's important to buy a group like you did and let the fish find the right partner. This usually makes a good pair that understand each other's signals, and it might work perfectly from the first spawn.

In nature the fish does not know who is a brother or a sister. You should not worry about inbreeding if the fish/pair are perfect without any deformities. Of course if you choose to buy two fish, a female and a male may not make a pair, because if the signals are not correct they will probably fight and one of the fish might be killed.

About your "Serpia maria", I don't know any fish with that name, but the last name maria is the last name of many fish. My guess is that it could be *Tilapia maria*, and they are hardy fish and not very rare.

Alf Stalsberg.

Severum (*Heros severum*) are native to Northern South America southwards into the Amazon basin. They grow up to 20cm long and like plenty of meaty foods in their diet.

Today's Answers Expert Panel

Alf Stalsberg Cichlids.
Pete Liptrot General questions on tropical fish and oddballs.
Andrew Caine General questions on Marines.
Ben Helm General questions on Coldwater plus equipment and technical advice.
Lance Jepson Health.
Tony Sault Discus.
David Armitage Anabantids.
Derek Lambert Livebearers, Rainbows and Breeding fish.
Ian Fuller Catfish.
Andy Gabbutt Killifish.
Stephen Smith Goldfish.
Bernice Brewster Koi and Ponds.
Bob & Val Davies Reptiles and amphibians.

Questions by Post

Please indicate clearly on the top left-hand corner of your envelope which person you wish your query to go to. All letters must be accompanied by a SAE and addressed to: Fishkeeping Answers, *Today's Fishkeeper*, TRMG Ltd., Winchester Court, 1 Forum Place, Hatfield, Hertfordshire, AL10 0RN.

Internet Service

Fishkeeping Answers is also available via e-mail. Most of our experts can be contacted via the Internet. A few are still not on-line so we will have to pass your messages on to them by snail mail (we will tell you when this happens) but otherwise you should receive a reply to your questions in a few days rather than weeks. Send your e-mails to: fishkeepinganswers@trmg.co.uk

Marine

Q&A Star Letter

Q **I have had a 90 x 37.5 x 37.5cm tropical community tank for 2 years now, along with a 37.5 x 25 x 20cm tank for babies. I would now like to add a marine set-up to my collection. I have read countless books to learn about this. My tank is a corner unit with curved front 90 x 90 x 60cm. I understand about equipment to a point and I will use T5 lighting not metal halides and I want a reef set-up. Please advise me as to which products to buy as the equipment market is so big and confusing. I am not scared about the cost as I want a top set-up for the fish and reef to thrive. I will be running with a sump set-up.**
Stel Stylianov

At the heart of any sump system is the return pump. In this case an Ocean Runner 3500 would be needed to turn the water over.

A Wow I could easily run up a bill for £5000 here, come and see me! Let's start at the beginning, you will need a source of purified water, reverse osmosis units have fallen in price now and Aqua-medic, D & D Aquarium solutions, Flow Tec and Kent all produce good cost effective units.

Now to your skimmer, I sometimes get accused of a bias with skimmers as I only recommend two makes. This is simply because of the way air is injected they are Aqua-Medic and Deltec skimmers use one of these and you will be OK.

T5 lighting like this unit from D & D Aquarium Solutions will provide all the lighting you need for this system.

Lighting with T5's is going to supply all the light you will require but the choice of bulbs is imperative :- marine white, actinic and aqua blue are recommended. Good companies for this range are Arcadia and D & D Aquarium Solutions.

Water movement in the aquarium is so important and not only that, wave makers are useful as well. Powerheads by maxi jet are my favourites you should consider the ph1200s. Wave makers by Aqua-Medic and Underworld are high on my list. Your return pump should have the capacity to turn over your aquarium 10 - 15 times per hour, an Ocean runner 3500 should do the job for you or an Eheim 1262.

Liverock is so important, fill your tank with it. Contact TMC for your local stockist. This will get you the basis of a good system, there is a huge amount of other equipment you could choose from. To go through this list could fill the magazine so I hope I have pointed you in the right direction.

CONTACT NUMBERS AND HELP

Aqua-Medic 0845 090 3500
Arcadia 020 8251 5544
Aquatic Solutions (Kent products) 01553 77 3495
D & D Aquarium Solutions 020 8501 2431
TMC 01923 285840
Underworld 01509 610310

ECOAQUALIZER

Q **I have seen some advertisements for an ecoaqualizer, which is meant to improve the clarity of the water, reduce algal growth, increase the redox potential and reduce the need for water changing. have you any experience with this product and what do you think?**

A Well now I am going to open a can of worms. Since the arrival of this equipment about 8 months ago there has been heated debate over the use of this product, some condemning it, others advocating it. After studying the literature and reading all the debates and references it is a highly controversial product. It works by magnetism and far infra red rays, however I am a biologist and not a physicist so I will hold my hand up and say I don't fully understand the theory behind it. Something happens as the water molecules are re-charged and it has a good effect on the water.

I am a firm believer in gaining experience of something first hand than to comment on something I have not tried. However, it is my job to look at things like this, so we obtained one and put it on a display system. After one month I was very impressed, then we put two on our selling systems and I still remain very impressed. We have passed zooplankton through them to see the effect. They came out alive, so at this point it seems to be a good product. We are testing it further but up to now I remain very happy with the results so at this point I can recommend them. For further information please visit www.ecoaqualizer.com

CAN I CYCLE MY TANK FASTER?

I am setting up a marine aquarium a 450 litre sump system, I have been doing a lot of research into the maturation of this aquarium and your advise would be helpful. If I use water from existing systems, mature filter material, live sand and live rock will I be able to stock my system after say 7 days instead of the normal 4-6 weeks?

This is an area that is close to my heart, as I see so many people falling for the same trick week after week. For some inexplicable reason people think to mature a marine aquarium all you have to do is get rid of ammonia and nitrite- big mistake. It is a trap that is easy to fall into. Companies market products to cycle your aquarium at impressive speeds, we are all impatient, what a lovely situation, little waiting and fully cycled. Hey presto! the fish are in.

The unfortunate part of this tale is that getting rid of the ammonia and nitrites is only a small, sorry very small area of your water chemistry that needs to 'cycle' for we are dealing with a complex matrix of chemicals that needs to settle and slowly age. There is no substitute for this process, if there was the person would be a millionaire overnight.

What happens with rapid stocking is that the chemical make up in your aquarium is unstable and your fluctuations in chemical parameters are flying all over the place. Your livestock will suffer as a result of this and could even die, you hit your aquarium with intense light and your algae will grow. Oh boy, will it grow, making your aquarium a mess.

Set up your aquarium and forget about it for at least 4 weeks. Some of the best aquaria I have seen, I do not mean the best to look at I mean the best in livestock loss, did not start stocking for 4 - 6 months, yes 6 months. By then the water chemistry had settled somewhat, but I do not consider a marine aquarium to be mature until it is at least 18 months old. Take your time.

The breaking in period of any marine aquarium is often characterised by algal growths, but at this stage no fish or corals should be present.

All Fancy goldfish can have problems with their swimbladder because of their unusual body shape.

Too long for Goldfish?

Q **I have had 4 Goldfish for a few years now and they used to live in a 60cm tank which they outgrew. I've put then in a 120cm tank as they are between 15cm and 25cm long. Because they are so long a lot of my friends keep telling me that they are not proper Goldfish but part of the same family.**

The tank I have is good enough but I want to take out a bundle of rocks, some slate, a small bridge, archway and a lighthouse, I want to get rid of all these and start again, adding an external filter. I'm also thinking of having a double light which will hang from a frame of some sort. Are there some tips you can give me so that I provide a better environment for my fish?

One more thing, I'm thinking of adding a few Koi into the tank. Would this be a good idea or is it best to keep them separate?

Tony Jones via e-mail

A It seems to me from what you have described that you are an expert at providing your Goldfish a good environment. Your fish sound as though they may be Comet goldfish (slender bodies and long tails). Your fish should benefit from the removal of the unwanted decor, giving them more space into which they can grow. The greater volume of water will also give your fish a more stable environment.

The proposed double-light arrangement (which I assume will be hung over the aquarium without a hood) is likely to increase the amount of evaporation from your aquarium, possibly leading to condensation problems in the room in which your aquarium is kept. Also, excessive lighting without the matching plant life is likely to lead to nuisance algae problems. You could try adding aquatic plants but these may be eaten by the voracious Goldfish.

You could easily add a few small Koi, but they will soon rummage and root around in your substrate releasing silt and debris. This is probably a good reason for installing an external filter as it's function would not be impeded by the action of your Koi. Just bear in mind that Koi will soon outgrow your aquarium, giving you a potential rehousing problem.

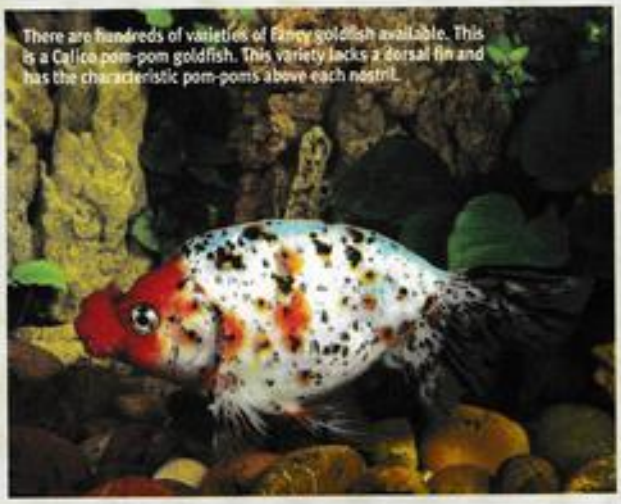
Ben Helm

IS THERE A CLUB TO JOIN?

Q **I am interested in Goldfish and would really like to join a club dedicated to these fish. Do you know if there is one and who I should contact for more details?**

Jan Stevens, Guildford.

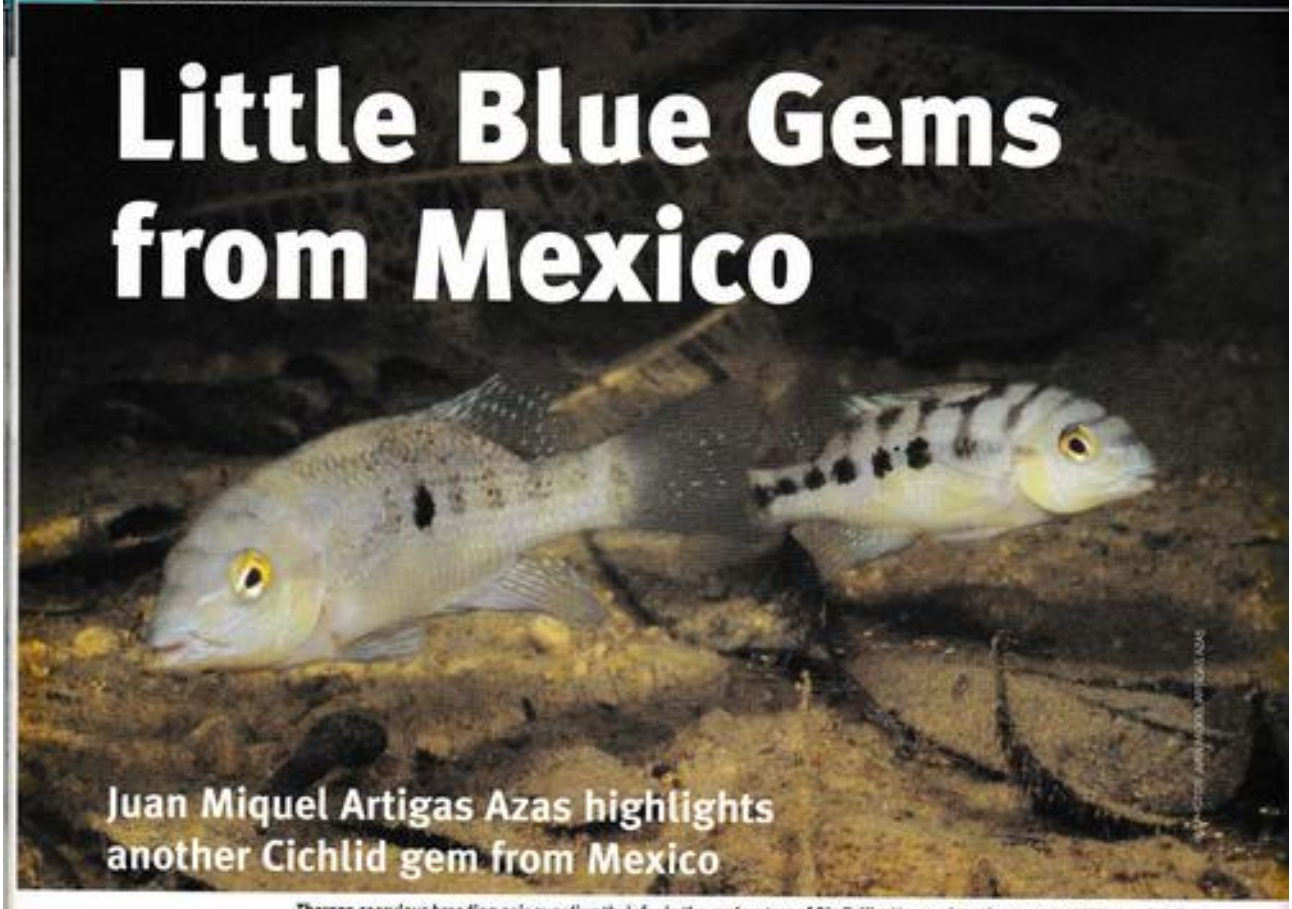
A There are a number of clubs dedicated to coldwater fish or Goldfish dotted around the country but none really close to where you live. Overall your best bet would be to join the Goldfish Society of Great Britain. The G.S.G.B. was formed in 1948 with0 the objective of bringing together aquarists interested in the keeping and breeding of the Goldfish. They hold bimonthly meetings, issue bulletins, and produce a range of booklets including nationwide standards, as well as holding an annual national Open Show and auction. For further information contact Dudley Turner, 62 Balstonia Drive, Stanford-le-hope, Essex, SS17 8HX. (Please include a stamped addressed envelope with your enquiry).



There are hundreds of varieties of Fancy goldfish available. This is a Calico pom-pom goldfish. This variety lacks a dorsal fin and has the characteristic pom-poms above each nostril.

Little Blue Gems from Mexico

Juan Miquel Artigas Azas highlights another Cichlid gem from Mexico



Theraps coeruleus breeding pair guarding their fry in the cool waters of Rio Tulija, Usumacinta river system; Chiapas, México.

Rainer Stawikowski, a German aquarist and editor of the DATZ (Die Aquarien und Terrarien Zeitschrift) magazine, with special knowledge of American cichlids, visited México in April of 1983 in the company of Uwe Werner and H. G. Breidohr on an ichthyological exploration. They focused on Cichlids intended for their personal collections and eventually the German aquarium hobby. At that time they undertook a live Cichlid collection in the state of Chiapas. Four years later, after they had kept and bred *Theraps coeruleus* and *T. lentiginosus* (its closest relative) from Rio Chancalá (Usumacinta drainage), they decided, after realising striking differences in size, life coloration and others between these two species, that the 'little blue' (or Kleinen Blauen') as they had called it, was sufficiently different to propose its recognition as a new species.

WHY COERULEUS?

The term *coeruleus* (sometimes referred as *caeruleus*) stems from Latin meaning 'Sky blue', in reference to the colour of the females and also the breeding colour of parental fish.

The scientific description was finally published as :- **Stawikowski, Rainer and Werner, Uwe**; 1987; 'A new subspecies of *Thorichthys hellen*'; Die Aquarien- und Terrarien-Zeitschrift 40 (11): pp499-504.

Distribution

The type locality is a tributary of Río Mizol-Ha at Francisco I. Madero. Approximately 30

Mizol-Ha River near Francisco I. Madero, type locality of *Theraps coeruleus*. Usumacinta river system, Chiapas, México.

km. south of Palenque, Chiapas, Mexico. Overall *Theraps coeruleus* is restricted to the middle zone of the Tulija river and its affluents in the Grijalva-Usumacinta river system in the state of Chiapas, México, around 100 meters over sea level.

Habitat

Habitat of *Theraps coeruleus* is characterised by wide (more than five metres) mountain rivers of clear cool water, in a temperature ranging approximately between 20 and 27°C. River beds are normally composed of boulders, rocks, gravel and sand, although some backwater areas of sunken leaf layers are also present. *Theraps coeruleus* chose the moderately fast flows as preferred foraging areas, normally away from the very strong currents and visiting the slower flow areas in smaller numbers or during breeding. Hardly ever are they found in stagnant water.

Water transparency is often well over ten metres, although normally rivers inhabited by *Theraps coeruleus* are less than three metres deep. Water is alkaline with pH measurements from 7.5-8.4, General Hardness ranges from 11-22° GD and KH from 7-28° (Stawikowski and Werner, 1998).

OTHER FISH IN THE HABITAT

Associated cichlid species include *Thorichthys socolofi, Chuco intermedium, Paratheraps bifasciatus, 'Cichlasoma' octofasciatum, Paraneetroplus omonti* and *'Cichlasoma' salvini*. Other commonly associated fish species include the Characinids *Brycon guatemalensis* and *Astyanax mexicanus*, Poeciliids; *Poecilia mexicana, Priapella compressa, Xiphophorus helleri* and *Pseudoxiphophorus bimaculatus*, Atherinidae; *Atherinella alvarezi* and Pimelodidae; *Rhamdia guatemalensis*, among others.

Breeding

Breeding *Theraps coeruleus* is one of the most fascinating acts in Central American cichlids. The elaborate colour changes involved with breeding phases are unique, as well as the fish mating system. The more colourful females, with a brown base colour and a strong blue in the lower head, chest and belly, are the first to take a step in colonising the breeding area. They look for zones of slower water flow and search for a cave that will become their nest. Holes in sunken tree trunks, separated from the bottom, are by far the most desirable places, as is apparent by the bigger more aggressive females holding every available hole. In second place are caves formed naturally by rocks, which sometimes have to be enlarged (in the adjacent substrate). On other occasions caves are dug up from beneath rocks in the sand on which they lay.

Theraps coeruleus female guarding her eggs located inside a cave in the wood in front of her. Río Tulija, Usumacinta river system in México.

When females hold a territory they become territorial and express this mood with a row of six or seven big contrasting longitudinal white blotches on their flanks. The white blotches take the place of the normal black blotches that are normally faintly at the base of their coloration. The normal coloration of the female then intensifies, being prominent two bigger black blotches ringed in blue on the middle part of the dorsal fin.

Normally greenish-yellow in base coloration with six or seven black blotches in a middle longitudinal arrangement on their flanks, males of all sizes detect territorial females and patrol by their territories. Females remain at the entrance of their caves and normally ignore passing males. Patrols can last for hours. A chosen male, always bigger than the female, eventually is courted back and both potential mates circle each other in the territory. After the pair is established, coloration changes for both individuals and they start chasing all intruders away. At this point the specific name *coeruleus* becomes apparent, as both males and females develop a fantastic sky blue coloration all over body and fins, with just a black blotch on the middle of their flanks.

The spawning surface is cleaned by both fish where eggs will be placed and fertilised. About two hundred yellow ovoid eggs of approximately 2.1 mm length per 1.7 mm width (Coleman & Galvani, 1998) are attached to the ceiling or walls of the spawning cave, and fanned with the pectoral fins by the female. The female remains at the entrance of the spawning cave while the male patrols the immediately surrounding area. Eggs take about two days to hatch under aquarium conditions and four days later the little wrigglers, having consumed their heavy yolk sacs, become free swimming and venture outside the cave.

NATURAL DIET

***Theraps coeruleus* feeds in the fast flowing areas or rivers with rocky and/or sandy beds, picking on the sand. Although I am not aware of stomach examinations, after having observed this fish underwater on many occasions, it seems apparent that they feed on invertebrates encrusted on the rocks, hiding in the crevices or below the rocks. They may also feed on aufwuchs. Individuals of all sizes group loosely together, swimming against the current while searching for edibles among the rocks. During feeding, they exhibit little or no aggression among themselves or to other fishes.**

Another colour change

At this point another coloration change takes place when a black pattern appears on the sky blue base colour, with six incomplete bars going down from the top to the now black blotches found longitudinally

'it is a beautiful, lively and challenging beauty, with an interesting and intriguing behaviour.'

***Theraps coeruleus* female guarding her territory cave and courting passing males as they swim by - Rio Tulija, Usumacinta river system, Chiapas, México.**

on the middle part of their flanks, contrasting greatly with the light blue background. A black 'U' is also formed just below the anterior base of the dorsal fin.

Parents herd their babies in the moderately fast flowing water. The babies forage on the surface of the rocks, presumably for small encrusted larvae, detritus and aufwuchs. When a perceived danger approaches, fry are quick to disappear below the surrounding rocks, and only the parents remain apparently guarding nothing. After the danger is perceived to have disappeared, the fry start popping one by one from their hiding place.

As there are no studies in this regard it is hard to assess how long parents will guard their babies, but juvenile fish of about 2cm long are seen wandering among the rocks, where they efficiently take refuge in little crevices when danger appeoaches. When they reach about 4cm they are seen grouping with adults searching for food.

A truly wonderful fish

Theraps coeruleus is indeed a wonderful fish. For the behavioural researchers, it gives an excellent opportunity to study its interesting breeding tactics and coloration changes, never studied before, as far as I know. For aquarists, it is a beautiful, lively and challenging beauty, with an interesting and intriguing behaviour. For taxonomists, the relationship of *Theraps coeruleus* with the closely related *Theraps lentiginosus* populations of Usumacinta and Grijalva rivers, different among themselves, provides grounds for thought. *Theraps coeruleus* is indeed one of the more shining jewels of the wonderful Mayan land.

CAPTIVE CARE

Theraps coeruleus is a beautiful Cichlid with a moderately aggressive disposition but it is not the easiest Cichlid to be successfully kept and bred. This fish is shy, and if the conditions are not right this shyness becomes extreme and the fish becomes stressful, so they don't last very long. It requires a good assemblage of dither fish for its well being, as well as proper lighting. A dark environment promotes shyness. Dither fish are ignored and just occasionally very small fish will be eaten. Caves and rocks are necessary in the aquarium. The minimum tank size I would personally recommend is 300 litres, although I keep mine in a 1.5 m 400 litre aquarium, which seems to be perfect for this fish. Of course, I am sure some people would be successful in smaller tanks but you can't expect to see natural behaviour there.

Considering the natural conditions inhabited by this fish, it is easy to understand its requirement for very good water quality, for when water conditions go wrong, *Theraps coeruleus* is very prone to bacterial infections and eventual death. Of special consideration is the amount of dissolved oxygen and temperature. The fish suffer when the former is lacking and the effects of high temperature can be easily seen in rapid respiration rates.

Water chemistry is best kept close to natural conditions, with pH above 7.0 and hardness above 5 GD. Water temperature is important, for too cold or too hot water can easily damage the fish. In particular they should not be kept in water that is too warm, a range of 20-28 Celsius is accepted, but the middle of the range is preferred. Provide all of these things and coloration and behaviour are optimal.

Feeding is not a problem, as they will greedily accept whatever offered to them. I tend not to offer too protein rich or fatty foods to my fish, to prevent digestion problems. Flake or frozen foods are accepted and the fish can be kept long terms on this regime without any apparent problem.

I believe that if the fish is kept in the appropriate conditions the main problem in breeding them is to overcome its natural shyness. Proper water conditions, dither fish, good lighting, abundant food and companions that are not too aggressive are the key. More aggressive companions would stress *T. coeruleus* and prevent them from forming territories. If these conditions are met the fish will most likely breed for us. A breeding cave made by an inverted flower pot with an open base works very well in my experience.

Once pairs form and breeding procedures start, things will normally go well, although the first breeding attempts by the fish usually result in failure. Fry accept brine shrimp as their first food and they normally prosper in the community aquarium, many of them even reaching adulthood there.This only happens of course if there are no efficient fry predators in the tank, and enough cover is provided.

Theraps coeruleus do better in a group of six or more individuals, and although they are not apparently aggressive, they actually are intraspecifically. This aggression is rarely fatal, especially if the space conditions are right.

That was the year that was!

Derek Lambert reviews the new introductions of 2003 and picks his 'Best new fish'.

BEST NEW FISH OF 2003.

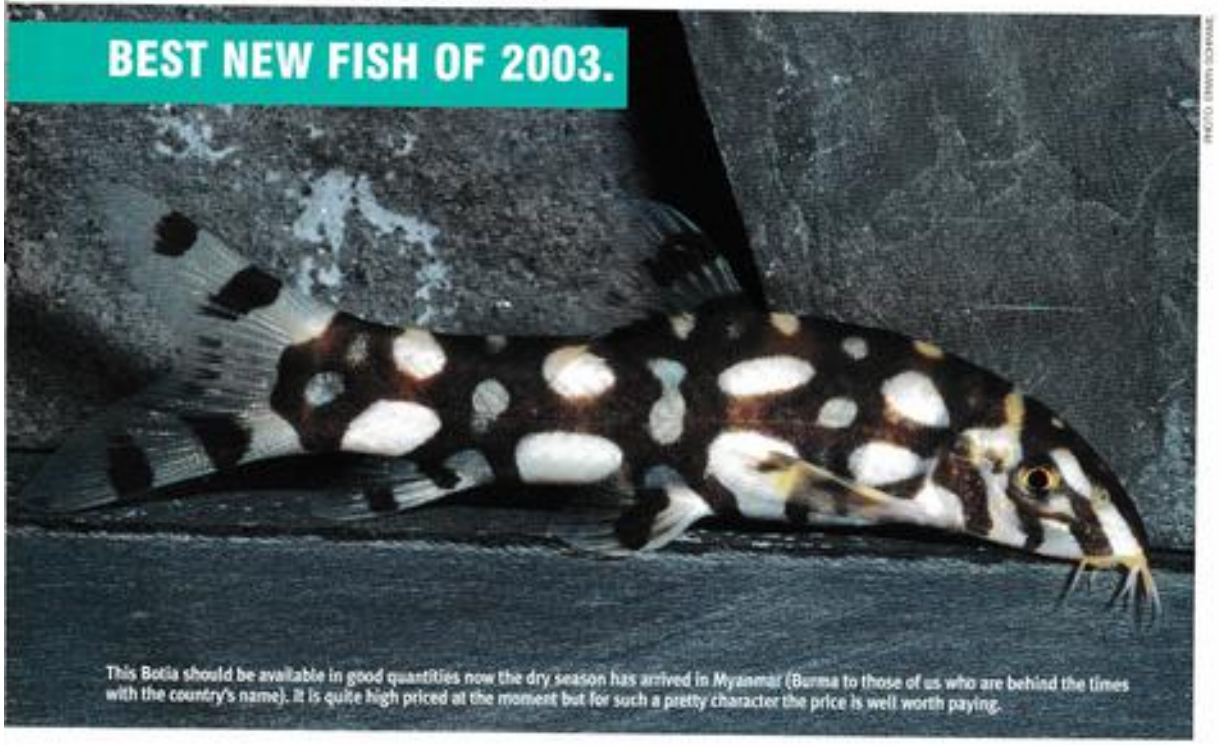


PHOTO: ERWIN SCHRAM

This Botia should be available in good quantities now the dry season has arrived in Myanmar (Burma to those of us who are behind the times with the country's name). It is quite high priced at the moment but for such a pretty character the price is well worth paying.

Today's Fishkeeper has always been at the forefront of all the new introductions to the aquarium hobby. Our new introductions expert Erwin Schraml is uniquely placed in Germany to monitor all the new wild caught fish coming in through the trade, and of course we keep a close eye on all the fish farms around the world to see what they are producing as well. This means we keep you bang up to date with everything going on in the fish world.

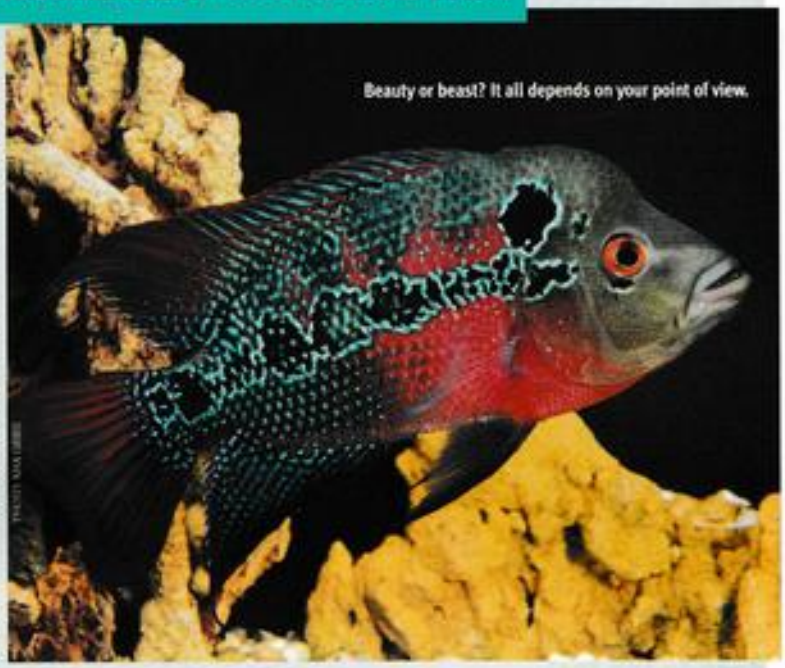
Over the last year we have featured many new introductions including some new species yet to be described by science and one highly controversial new cultivar. Featuring them in the magazine is one thing, but what happens once they hit the local aquarium shops is what really matters. Obviously, availability will play a key part in the fish becoming a hit, price will also play a part. £1000 for a single specimen will certainly limit the market to a very small number of aquarists!

Which will be the big players?

So which fish do I think stand the chance of being big players in the future? Surprisingly my top spot for the year is going to a really cute loach with no certain scientific name. The fish concerned was featured in October issue and has several different common names including :- "River Kwai Loach", "Polkadot loach" and "Myanmar loach". Belonging to the genus *Botia* these pretty fish are being snapped up almost as soon as they arrive in the shops. All Botias make good aquarium fish and the distinctive colour pattern of this fish certainly puts it right up there with *Botia sidthimunki* in terms of attractiveness. There are two slightly different colour forms and as the fish grows the spots become smaller in proportion to the body. A lovely animal which I predict will become a major player in the aquatic trade.

MOST CONTROVERSIAL NEW INTRODUCTION

Well we certainly started a bun fight when we featured the Flower horn cichlid on June issue's cover. This is without doubt one of the most attractive new cichlids to be introduced to the U.K. aquatic hobby this year, yet it is hated with a passion by many "serious" Cichlidophiles. Why? Because it is a hybrid. I first saw a picture of this creature several years ago when Oliver Lucanus e-mailed it to me with some very caustic comments (unprintable here!). Coming from the livebearer hobby as I do, hybrids are not a problem to me so long as they are properly labelled (just like the Flower horn is), so I really couldn't see what all the fuss was about. Growing to 30 cm and with a temperament that precludes other tank mates, these fish will always be kept as a real pet fish. Being highly intelligent they soon recognise their owners and bond with them in a way few other fish do. The price tag is very high at the moment (over £1000 for a half grown good quality specimen) which is going to limit the market to those serious enthusiasts who will house and care for these fish properly.



Beauty or beast? It all depends on your point of view.

BEST NEW SMALL COMMUNITY FISH

The pretty red finnage of this male "Junior pandurini" only partially shows up in this picture. It becomes more intense when the fish is in a well planted aquarium with a group of its own species.

There have been plenty of pretty little new fish coming through the trade over the last year, but this one really caught my eye. The "Junior pandurini" as it has been dubbed (the scientific name has yet to be sorted), only grows to 4cm. It is a peaceful shoaling fish which has a very attractive coloration once it has settled into its home aquarium. Sadly it looks washed out in most aquarium stores so may not sell as well as it should and even Erwin's pictures don't do it full justice. Anyway as far as I'm concerned its one to buy if you are lucky enough to come across some in a local store. It eats commercial flake as though it was brought up on it and seems to be reasonably long lived for such a small fish and can adapt to harder water conditions than it is found in.

BEST NEW LARGE COMMUNITY FISH

Caecomastocembelus sp. "Yellow" is known to obtain a size of at least 20cm but with others in the same genus growing double this size we just don't know how big they will eventually be.

Bright yellow fish are few and far between in the freshwater hobby, so a Yellow spiny eel certainly has the "wow!" factor in full measure. Being intelligent fish it is possible to train them to feed from your fingers and although they are carnivores they are not aggressive towards fish they cannot swallow. That means they can live with other larger fish in a big community tank. Make sure they have somewhere to hide during the day (clay pipes are great for this) and start saving your pennies up now. A very rare import at the moment, it may take sometime to track one of these beauties down and the asking price is bound to be high.

Best new fish of the decade (so far)

Three years into the new decade and we have a fish racing away with the title of "best new fish of the decade". Denison's barb (it is often sold as a Red-line torpedo fish) was first featured by us in November 2001. It was first imported by BAS (one of the largest wholesalers in the UK) during 2001 and has been widely available in shops in the north of England since then. It comes with a high price tag which is still holding sales back a bit, but it has certainly found a place in every barb fanatic's heart. There are two different versions of this fish and we are uncertain if they are different species of just regional variations of the same species. Form A is the larger fish growing up to 15cm by which time they have lost some of their colour. They also tend to be slimmer and are very active shoaling fish. Form B stays smaller with a maximum size of only 11cm and as they grow they actually become more colourful. The popularity of this fish will certainly grow now other wholesalers have started importing them as well as BAS.

Barbs have always been popular in the aquarium hobby but this new (2001) introduction is taking the country by storm. This is Form A.

Looking to the future

So there we have it. A few fantastic new introductions this year and one of the species we picked out as a real winner 2 years ago is certainly living up to expectations. What will the future hold? Can there really be more wonderful fish out there to be found? Of course there are! The world is still a huge place and the least explored part of it is the aquatic world. As fish collectors open up new areas, new fish are being found all the time. Some parts of South America and Africa are closed to fish collecting at the moment because they are far too dangerous to venture into. Others are still inaccessible because there are no roads or other means of transport. So there are many more fish to be found in the future and for us to enjoy in our aquaria when they are.

In the family way

Kathy Jinkings highlights the most rewarding group of fish to breed - those that raise a family.

Jewel cichlids like this splendid creature make wonderful parents. This fish is the proud parent of hundreds of small fry swimming around it.

These fishes are among the most rewarding to watch as they pursue their normal spawning behaviour in the aquarium. However, they are also the least suitable for keeping in a normal community. Not only do the parents need to set aside a small piece of tank to call their own as a territory, but when the fry hatch they are, rather like human children, prone to sneaking away from the group as soon as their parents backs are turned to investigate anything interesting that catches their eye. Their parents know that any fish in the vicinity is likely to get a chance sooner or later, so they are very intolerant of any other fishes. This behaviour is the hallmark of the large family known as the Cichlids.

Love or hate

Most aquarists fall into one of two groups fairly early in their fish keeping days - those who swear off cichlids altogether (often after an encounter resulting in a high death count in a peaceful aquarium) and those who are entranced by them to the extent that their interest is entirely taken up by this group. However, while there isn't a cichlid to suit everyone, there is certainly one to suit most people. There are relatively peaceful fishes, of which a pair can settle into most large communities; there are small species such as the Apistogrammas and the cute shell-dwellers, who are so small that finding room for a species tank won't be a problem, and there are large and aggressive fish who often end up as 'pet fish'. There are easy to keep ones, and shy pernickety ones.

One of the most popular cichlids is the Krib, *Pelvicochromis pulcher*. Relatively small, at up to 10 cm, they easily live up to their Latin name of *pulcher*, which means beautiful. Although they guard both their eggs and the fry carefully and diligently, they are not so aggressive that they cannot be kept in a community. In a 30cm (or larger) aquarium there is enough room for a single pair of Kribs to set up home together, and for the other inhabitants to keep out of the way. You can assist in this by providing plenty of plants and décor to break the line


Kribs have been popular community fish they were first introduced to the hobby. This pair are in breeding colour.

of sight, and a cave or upturned flower pot for the hoped-for Krib family.

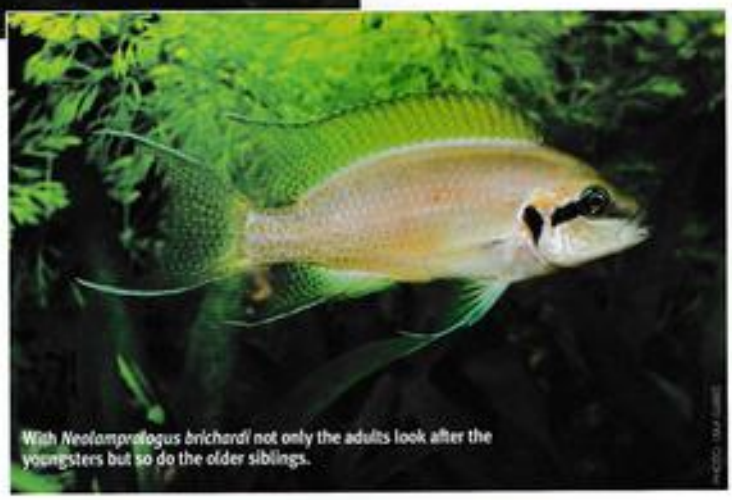
Males are larger than the females, and frequently have spots on their tails. The female is plumper, and when she is ready to start a family her belly becomes purplish red. If you obtain several small Kribs, you can keep them until two pair off, and send the rest back to the shop or to other aquarist friends. You will easily know when love is in the air for a pair - this is when they stop being so mild-mannered and become very possessive about their cave. The female often displays for the male, standing still in the water and "shivering" her whole body. Both sexes become obviously more colourful.

If all is successful, eggs will be laid in the cave, and both fish guard the eggs. Mine have a rather twee little house, intended as an ashtray. At the front opening there are two grooves, where one is supposed to place cigarettes. The fish have found that they fit neatly and comfortably in these grooves, and often lie, side by side, where they have a good view of any potential threat approaching. After a few days, the fish suddenly appear more aggressive, and the other inmates are all banished to the other end. Careful examination of the tank always reveals a little family of tiny fry, almost invisible against the substrate. Both parents take excellent care of them, shepherding them back to their cave at night and continuously rounding up stragglers. As the fry grow, the parental care becomes less diligent, until one day there is a new family and the old fry are now persona non grata. They should be removed, as they will soon be big enough to set up their own households.

In most cichlid families, the last offspring are ousted when a new brood arrive. However, in a number of African cichlid species, the most notable being the Tanganyikan *Neolamprologus brichardi*, fry will stick around for about a year, through two or three subsequent broods. Rather than regarding the newcomers as competition, the older fry help the parents look after the new family. Performing duties such as egg cleaning, fry guarding, and territory defence, these older fry grow more slowly than those who leave home, but continue to reap the benefits of safety afforded by the territorial home.

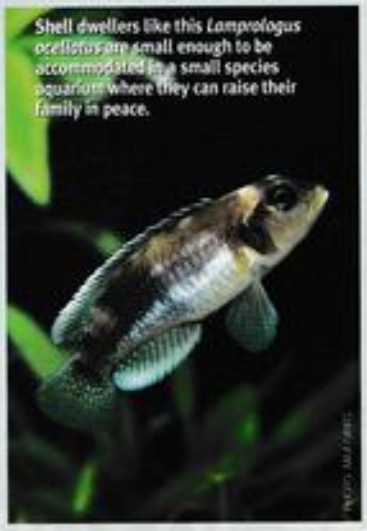
The jewel in the crown

One can hardly consider cichlids without mentioning the Discus (*Symphysodon* sp), regarded by its fans as the ultimate aquarium fish. These soft water Amazonian fishes come in a range of beautiful colours, and are careful and attentive parents. After obtaining a group of young fish, it should not be too long before a pair forms, and the →


With *Neolamprologus brichardi* not only the adults look after the youngsters but so do the older siblings.

A CUTE LITTLE ONE

An ideal fish for a small species aquarium is the shell dweller, *Lamprologus ocellatus*. These pretty and endearing little fish will appreciate a few large apple snail shells (or edible snail shells available from your local delicatessen for serving snails in!). The little 5cm fish are best kept as a male with several females (unlike the Kribs, the male *Lamprologus* is a womaniser!). Each female will stake a claim to a shell, in which she eventually lays her eggs. The male waits outside, and as the female emerges from the snail shell, he produces his sperm. The water drawn into the shell as the female leaves carries the sperm inside, which fertilises the eggs. Being promiscuous, the male take less interest in the eggs and fry than many cichlids, which are primarily guarded and cared for by the female.


Shell dwellers like this *Lamprologus ocellatus* are small enough to be accommodated in a small species aquarium where they can raise their family in peace.

TROPICAL : UNDERSTANDING FISH

Discus are sometimes referred to as the "Kings" of the aquarium world, looking at this splendid specimen you can see why

unpaired 'spares' can be rehoused. The adults lay several hundred eggs on stones, plants, or a vertical surface such as the tank glass, and guard and pick over the eggs constantly to ensure that no fungus can develop. These fish must be spawned in soft water, as the eggs are unable to withstand harder waters. According to many Discus keepers, these fish are about as hardy and easy to keep as a snowflake - they are apparently best kept in pristine bare tanks. Many people do keep Discus in planted aquaria with a few companions - those that share their water requirements should not cause any problems, and Corydoras are often a good choice. Once the fry are hatched, Discus are unusual in that they produce a skin mucous on which the young fry feed for their first few days.

Whether you become a confirmed cichlid fan or a Discus specialist, or just want to experience the fun of seeing a little family of fish growing up in your tank without too much trouble, one of the huge number of cichlid species will suit your purpose. Even if it does mean that you need to set up a special tank, you will have the pleasure of witnessing the courting fish, and then the emergence of the first family. It really is well worth the effort.

Biological warfare

Anthony Calfo explains how you can use Berghia to eradicate Aiptasia.

ALL PHOTOS ANTHONY CALFO

They may be small but take a close look they are quite attractive Sea slugs.

Berghia are not only attractive, easy to keep, and easy to breed... but they live as specialised feeders on one of the most bothersome pest organisms in marine aquaria: Aiptasia (Glass anemones).

Possibly more than one species involved

The genus Berghia is widely distributed circumtropically in warm and temperate waters alike. The organism that most people recognise and seek for Aiptasia control is commonly identified as *Berghia verrucicornis* (A. Costa, 1864), however, field pictures and observations of several specimens called by this name throughout the Atlantic, Caribbean and Mediterranean reflect not only variable colour, but different morphologies so we may be dealing with more than one species here. The most prevalent stock of Aiptasia-eating nudibranchs in the American trade, however, have been collected from the Florida Keys.

Adult Berghia grow to about 25 mm or slightly larger. Cerata (coloured tassels covering their backs) perform functions of respiration, digestion and defence. Although this nudibranch consumes and utilises the zooxanthellae of its cnidarian prey, they must be fed Aiptasia several times weekly if not daily instead. With adequate supplies of anemones, however, Berghia will reproduce and maintain a breeding colony.

Handling Berghia

The care and culture of this sea slug has been difficult due to their small adult size and vulnerability to aspects of aquarium filtration (pumps, overflows, etc.). Hatched juveniles cannot be clearly seen with the naked eye for as many as eight weeks after hatching. Subadults are commonly shipped at 12.5 mm and are still rather delicate to handle. For those receiving shipped Berghia, it is best to simply sink the transport bag or cup into the new vessel for a gentle acclimation of 15-20 minutes without illumination and then allow the sea slugs to crawl out on their own volition.

The culturing vessels should be established with aged water for some weeks before seeking specimens. Newly mixed sea water is particularly harsh to invertebrates. Hundreds of Aiptasia will be needed to support a single pair of Berghia for the first few months.

Today's top tip

Imposing dark cycles is a way to successfully exploit this anemone into producing smaller Aiptasia to feed small Berghia in culture.

WHAT CAUSES AIPTASIA TO PROLIFERATE?

Nuisance anemones only proliferate when they are not properly screened in quarantine. Aiptasia thrive on poor water flow (less than 10 - 20 X minimum turnover), which allows particulates to accumulate and settle on and feed them, overfeeding and/or overstocking, poor lighting which allows pest Aiptasia to out compete more demanding and desirable organisms for nutrients, and poor nutrient export mechanisms (neglect of a well-tuned skimmer, weekly changes of carbon/chemical media, frequent water exchanges, etc.). Aiptasia, with adequate light and food, conduct fission rapidly. With inadequate light (even darkness!) they will issue numerous asexual buds that drift with the purpose of surviving elsewhere.

The aftermath of a Berghia attack is not pretty. Each Aiptasia predated is usually reduced in a matter of hours.

Berghia are conspicuously stout after a good meal with swollen cerata and a noticeably inflated or elongated body.

I strongly recommend that all new Berghia be acclimated in isolation. Their home could be a simple floating plastic cup or beaker, or an elaborate refugium. The pitfalls of the latter however will likely include a pump or overflow at minimum. The sequestering of new acquisitions gives these small creatures time to acclimate to your water quality and schedule of husbandry. Aquarists interested in culturing Berghia must engage this species in monospecific culture. Aiptasia covered rocks can be placed in the culturing vessels for the first few weeks until specimen(s) become established.

Many common community fishes and invertebrates will damage or eat small "nudis" if they are simply dropped into an aquarium. High water flow, pump intakes, overflows, etc. are perilous before they can establish themselves and breed. In isolation it takes a few days or couple of weeks to collect egg masses from active breeders. Patience with quarantined Berghia can easily translate into tens or hundreds of propagated nudis to fight the Aiptasia battle. Sea slugs released into a large overrun display are more likely to be killed by predation or accident among the many potential perils before they eradicate the last few remaining Aiptasia in the system.

Can Berghia completely decimate populations of Aiptasia in our aquariums and if so, what happens to the nudibranchs then ? It's a matter of inverse predator prey relationship: Berghia flourish (population increases) while consuming Aiptasia (population decreases) then high densities of Berghia can no longer be supported and crash (Berghia decreases) while Aiptasia recover (population increases). An infinite continuation of Berghia is not assured or even likely without assistance from the keeper. We can expect a spike of prey, then spike of predator, then drop in prey, and subsequently a drop in the numbers of predators. Unlike wild habitats, however, the home aquarium is not a balanced ecosystem and Berghia cannot always weather the cycle. I cannot repeat and recommend strongly enough the importance of the need for sequestering broodstock of Berghia. Neglect of this admonition would be a waste of a living resource and, at best, require that the keeper repeatedly buy Berghia with the "boom and bust" cycles of prey over time to control their pest anemones.

Today's top tip

Placing newly purchased Berghia directly into a display tank is not recommended.

The bane of many aquarists: nuisance Aiptasia anemones, which can reach plague proportions in aquaria.

Housing

It's best and easiest to grow these sea slugs in small cups or beakers (250-1000 ml). The challenges of concentrating, feeding and locating such tiny organisms in even the smallest aquaria are daunting. Plastic cups floating in thermostatically controlled aquariums seems to work very well for our purpose. Rods, pipes, or lines can be used to cordon off the floating vessels at the surface so that they don't bump around or capsize in the display. Water quality is a challenge in small cups due to evaporation, so its important to mark the sides of the cups or beaker with a line to indicate where to reconstitute the vessel with freshwater for evapoeation. Keeping lids or covers on culturing vessels will slow evaporation. Frequent water changes ensure optimal water quality (several times weekly for adults). The culture of Berghia is really quite easy and straightforward, but tedious. Small lengths of flexible airline tubing and plastic or glass pipettes will be handy for water exchanges, removing debris/feces, and for transporting small Aiptasia between cups. Before the arrival of Berghia, place a couple Aiptasia in each of the cups. Be warned though that it is quite possible to have too many Aiptasia in a cup,it's best to let Berghia prey on just one or two anemones at a time in small cups or beakers for the obvious reasons (water quality).

Vessels, instruments, hands and anything else that comes into contact with live Berghia must be clean and free of contaminants. Nudibranchs can be very sensitive to small concentrations of foreign substances. Larvae are particularly sensitive to contamination. The rule should be to cleanse hands and objects of the system thoroughly in pure freshwater only (de-ionized if possible).

Water changes on vessels with adults can simply be done by wiping out the walls of the containers and pouring off the old water before tipping in seawater from the tank of healthy aquarium water which the culture cups float upon. After a pair spawns, it's usually best to remove the breeders to a new cup and leave the eggs undisturbed. Note any spawning date to track the progress of the egg mass(es) for hatching predictions and preparations. A reliable air pump regulated with a gang valve rounds ends the list of equipment needed for Berghia culture. Water changes and water →

CULTURING AIPTASIA

Heehee... it sounds as funny to me writing it as it does to you reading it perhaps. But nonetheless, culturing Berghia will require an adequate supply of food/Aiptasia. A popular way of producing small Aiptasia is to keep a brood stock population of the anemones in the dark for some weeks/months to produce tiny asexual buds. Like many cnidarians (corals indeed), Aiptasia can be maintained under inadequate illumination by compensating with extra food. In overrun displays, excess nutrients are the catalyst for plague populations of the anemone. It does not take much for illuminated and fed Aiptasia to proliferate. They can also be propagated by simple division... or rather, laceration. Attempts at scraping or rasping them off the rocks has often met with dismal results as the effort only increases numbers of Aiptasia for the buds formed by residual pedal tissue. Aquarists interested in culturing Berghia will inevitably want to set up a tank for co-culturing food-Aiptasia for a controlled and reliable source of prey to offer.

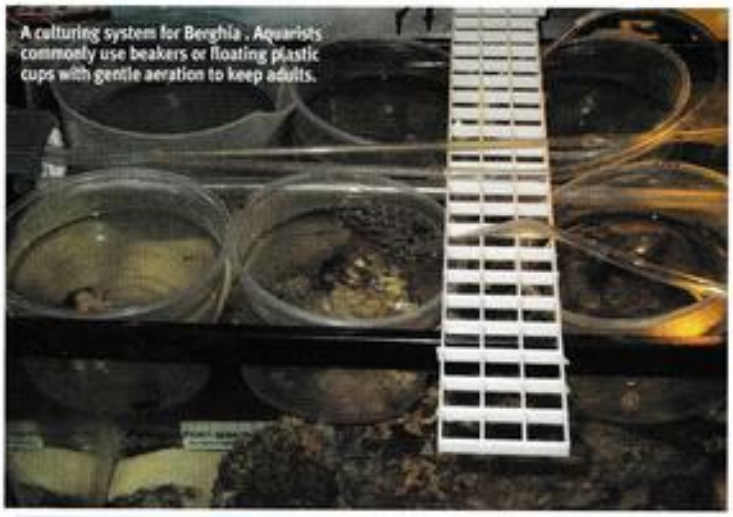
quality will be less imperative with gentle aeration of each of the adult's culturing cups/vessels.

Reproduction

Berghia reach sexual maturity early (at approximately 12mm) - long before they achieve full adult size. Eggs are laid in a characteristically nudibranch spiral egg-casing fashion. Spawns may be deposited on or underneath a rock, if available, but can be found on the aquarium or container walls. Occasionally the egg masses will be released in free-floating strands (often so if they are disturbed while egg-laying). Well-fed and well-conditioned young adults reproduce at a frequency of one egg ribbon laid every one to two days - per individual! Older specimens slow down and are less prolific. You can start with one pair of Berghia and have a couple hundred individuals in just a month or two. Providing adequate supplies of Aiptasia to feed such colonies soon turns your pest problem from an Aiptasia plague to a Berghia plague!

Today's top tip

I have seen cultured specimens sold so small that you could fit half a dozen on the tip of a pencil eraser... some are even sold without well-developed cerata! I recommend 10 - 12mm as minimum size.



A culturing system for Berghia . Aquarists commonly use beakers or floating plastic cups with gentle aeration to keep adults.

COURTSHIP AND SPAWNING

Courtship is a dance, a slow dance with two individuals in a spiral "embrace". If you think it looks like your mating pair are necking, you are not mistaken. The genital openings on Berghia are on their right side just behind the rhinophores. Their heads must be very close together for the successful alignment of copulatory apparatus. Berghia are hermaphrodites, which spawn reciprocally and take turns fertilising each other's eggs. (note: self-fertilisation and fission are rare by comparison).

Fortunately, it is easy to find homes for your surplus juveniles. Recruiting food for your Berghia may be as simple as exchanging clean rocks for anemone covered rocks with folks delighted to get rid of their nuisance anemones. Nonetheless... home culture of Aiptasia is still necessary as a more reliable means of ensuring adequate food supplies for the Aeolid.

Hatched larvae do not have a long or complicated stage or series of stages of development as plankton, but are non-feeding and settle out to the seafloor rather quickly to begin feedings like adults, in a matter of days. As such, we are spared the tedious co-culture of specific larval foods. Very small Berghia simply eat very small Aiptasia - or, at least, they will develop faster and easier in captive culture. Young Berghia forced to contend with oversized Aiptasia may be observed to pull back as if rebuffed on an approach of the anemone.

Larval Berghia hatched in un-aerated vessels may navigate the planktonic stage and settle out faster to begin feeding on anemones. Adults and egg masses need little or no aeration when water quality is maintained via regular water changes and due diligence with evaporation compensation.

Hatching out

Egg ribbons will hatch in 10-14 days depending on temperature (a range of 24 - 26°C is recommended). After two months you can see growing juveniles with the naked eye. Nonetheless, keep small Aiptasia in the culturing vessel and observe the decline of the hardy anemones as evidence of predation. It may be helpful to artificially hatch the egg capsules by "pumping" them into and out of a pipette repeatedly. The rasping motion will rupture the casing and liberate the larvae. It's difficult to say exactly when is best to conduct an artificial hatch. After 9 or 10 days, the eggs casing takes on a milky or hazy appearance with embryonic development and growth.

A failure of juveniles to develop cerata is often attributed to attempts to feed anemones that are too large for juvenile Berghia to successfully attack. Lacerated adult anemones may be helpful in the absence of an adequate supply of small Aiptasia. Nicking, notching or shredding the pedal base of feed-anemones opens the door, so to speak, for tiny Berghia to begin feeding, as well as facilities reproduction by fission with any tissue left alone long enough to regenerate. ■

TABLES COULD BE TURNED

Make no mistake, this predatory sea slug can in fact be prey for Aiptasia, like bad acclimation techniques where Berghia are poured into the aquarium and drop into the open and waiting tentacles of a hungry anemone!

Koi and more ahoy!

This month *Today's Fishkeeper* visits the **Japanese Koi Company** in Henlow, Bedfordshire.

One of the most attractive displays you will find in any shop is a marine tank, but this Aqua Medic Tridachna aquarium was really beautiful.

Just a few of the Japanese Koi on sale.

The name "Japanese Koi Company" is totally misleading for this aquatic outlet. It is so much more than just Koi. Just about every aspect of the aquatic hobby is very well represented under this shop's roof. Obviously with its roots in Koi these tend to take pride of place, with some very beautiful fish on sale when we were there.

The 91 tropical tanks are displayed all along one wall. There is plenty of room to walk along the display and take in all the fish available.

Lots more than just Koi

For those of you with little or no interest in Koi this is still a shop worth visiting regularly. On the tropical side the 91 aquaria contained a wide range of fish from L-numbered Catfish right through to Guppies and other bread and butter fish. Then you find some Polyopterus just that bit further down and interesting Cichlids dotted about.

The 3 invert tanks allow you to look down on the corals and select which pieces you want.

Beyond these tanks you reach the marines. Some good quality liverock was on sale in several of the tanks and there were 3 invert displays with some nice corals on sale. Prices were reasonable on all the fish but among the equipment there were some real bargains to be had.

Tank displays

Most notable of the products on display were two ranges of tanks you don't often see in shops. Eheim have for a long time produced their own complete set-ups. Some of these are interesting in design and of course come with high quality equipment. The other tank range was completely new to us. These were the Craftsman tanks. With a variety of styles to choose from, the cabinets and hoods were of excellent build quality.

Talking to Mr R. Cox who is the Advertising and Media manager of this shop, it becomes clear that a huge amount of thought, time, and effort has gone into the range of products on sale. With over 30 years experience of keeping aquarium and pond fish and 17 years in the aquatic trade, he has been involved with a number of innovative products including the design of the Craftsman tanks. These are made specifically for the Japanese Koi Company which is why we had never seen them before. We asked him which fish was his favourite he replied *"I have to say Hariwake koi now. That is what working for the Japanese Koi Company has done. Prior to that it would have been a freshwater tropical.*

Even in the winter the Charlie Dimmock watergarden is impressive with over 30 pond ideas on show.

Shop name Japanese Koi Company, Hitchin, Henlow, Beds, SG16 6BB. Tel :- 01462 850822 Fax 01462 811403. www.japanese-koi.com
Shop opening hours 9 - 5.30 Mon - Saturday, 11 - 5 Sunday.
ProprietorsMr C.M. Wiles
Manager Mr I. McCarry
Advertising and Media Manager Mr R. Cox
Staff 20
Number of tanks91 Tropical, 34 marine, 3 Inverts, 15 Fancy Goldfish + 200 gallon plant tank.
Vats & holding facilities 50 + quarantine facilities.
Show tanks and ponds 85,000 gallon pond plus over 30 ponds in the Charlie Dimmock watergarden display area. Also Aqua Medic Tridachna marine aquarium.
Specialities Japanese Koi, Marines, Reptiles & L. Number catfish.
Staff knowledge Knowledgeable staff in all areas of the business.
Brands stocked All major brands stocked.
Which groups of fish do you sell? Tropical, Marine, Coldwater, & Koi. Plus Reptiles, Rabbits and Guinea pigs.

Our verdict

A beautifully laid out shop with something for everyone.

Mr Cox's verdict on the manufacturers

Which manufacturer has the best range of products in your opinion? - *Aquatic Industries.*

Which company gives your company the best service? - *Aquatic Industries*

Test kits and air pumps on test.

We review Hagen's new test kits and Waterlife's Ghost airpumps, and have all the news from around the aquatic trade.

A neat package with just the 4 essential tests in it.

Nutrafin Essential mini master test kit

We were great fans of the original Nutrafin Master test kit when it was first launched. However, it contained a number of tests which were not essential for your average freshwater fishkeeper and these pushed the price up. This new combination contains only the 4 essential tests no real aquarist would want to be without. These are, of course Ammonia, Nitrite, Nitrate and a broad spectrum pH test. These four tests will keep a check on the health of your aquatic environment from week to week.

The nitrate and pH come in handy for testing your tap water before you do a water change. Why test for these two factors? Because tap water can vary wildly from month to month and even week to week for these values. If you already have a high reading for Nitrate in your tap water (and in some parts of the country there have been this summer) then doing a water change can do more harm than good! Likewise the pH of tap water has been shooting all over the place in some areas. The reason for this is because in some areas reservoirs or underground wells have been running low so water from different sources than usual have been used. At its most extreme one day you might have very alkaline water and the next acidic. Such a drastic change for your fish would kill many of them outright. So you need to check your tap water and tank water before any water change.

Ammonia and nitrite are essential tests when you are starting out. Using these you can watch the filter mature. Once that is over they should take a back seat unless you have a problem with your fish. At the first sign of illness or any unexplained deaths, always reach for these two test kits. Nine times out of ten the problem will turnout to be water.

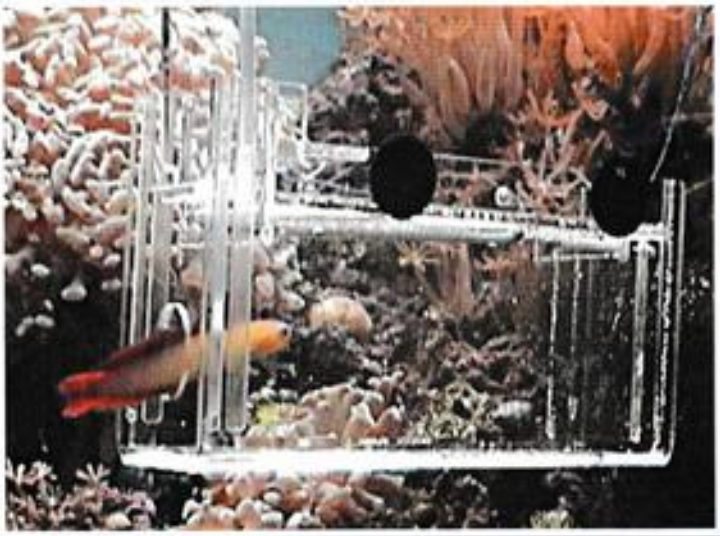
Easy to use, reasonably priced, and with a high degree of accuracy for an aquatic test kit, we are happy to award this neat package our Gold Star.

GHOST AIR PUMPS

Waterlife are best known for their excellent range of health treatments but they also manufacture their own range of air pumps. The GHOST air pumps are designed to power undergravel filters, air curtains, air stones, wooden diffusers, protein skimmers and other air-driven equipment. Before the GHOST air pumps went on sale Waterlife ran them on continual test, for 24 hours a day, 7 days a week, for three years operating a Waterlife longlife air diffuser. During that time there were no mechanical failures with any of the models, which were tested. We haven't had ours on test anywhere near that long, but they have run well for some months now and are fairly quiet as well. The three models range in output from 90 litres per hour for a GHOST 1, 210 litres per hour for the GHOST 2 and 420 litres per hour for the GHOST 3. We are happy to award this range of air pumps our Silver star award.

Simple, sturdy and reliable. The Ghost range of airpumps are a welcome addition to the market place.

TRAPEZE MOVES HOME



GHL Products (Trapeze) have moved to a new address. They can now be contacted at GHL Products at 7 Clandon Road, Liverpool, L18 9UL. For general enquiries Tel: 0151-427 1351and for orders Tel: 0151-281 4113. The website address and email remain the same. These arewww.trapeze.net and e.mail :trapezetm@aol.com

TETRA PLECO WAFERS HIT THE MARKET PLACE

Tetra have long been synonymous with good quality aquarium fish foods. They have now launched Tetra PlecoWafers. These are specifically formulated to meet the feeding requirements and nutritional needs of bottom feeding herbivores, such as Plecostomus. The wafers remain stable in the water for long periods to allow these fish to come out and feed on them naturally. They are produced using Tetra's advanced extrusion process, which ensures good nutrient retention, something that is essential for foods that remain in the water for long periods. These are available from all good retailers now.

NEW 1,200 SQ FT. STORE IN PLYMOUTH

Named '5th Day' - the day God created all the creatures of the sea - the new store is the brainchild of Dave Morgan and Stephen Dewdney and is at Faraday Mill, Plymouth. It aims to stock a wider range of fish and equipment than any other in Devon and Cornwall. *"No other shop in Devon and Cornwall has the breadth of livestock and equipment that we are able to offer at 5th Day,"* said Dave. *"We are confident the sheer scale of our stock will draw people from a very wide area."*

With 6,000 fish in stock including tropical freshwater varieties such as Hi-fin swordtails, Killifish , central American cichlids and rare Loricaridae; African species from lakes Malawi, Victoria and Tanganyika; Discus, rays and many 'oddball' species; Marine fish and invertebrates, including Epaulette sharks, Trigger fish, Tangs and Angels, and of course the Percula Clown fish.

Dave and Stephen have equipped the 1,200 sq. ft. store to suit the needs of all enthusiasts, from the beginner to the specialist. They plan to run evening courses for newcomers to the hobby as well.

The store, which opens on Saturday the 29th November is close to the National Marine Aquarium, Britain's foremost aquarium which has attracted over 1Ω million visitors since it opened four years ago. For further information, contact Dave Morgan on 07793 556736 or e-mail: dave_morgan@btconnect.com .

Glee 2003

Andrew Caine takes a look around the new marine products on display at GLEE exhibition this year.

Quite a good show this year with countless products on show both new and old, but what was happening for the marine aquarist? In fact there were quite a few new products so I enjoyed myself and I am looking forward to testing a few.

D & D AQUARIUM SOLUTIONS STAND

D & D Aquarium solutions won the best product of the show with the dimmable T5. This new addition to lighting allows the tube to lose it's brightness and then start to gradually increase its intensity. This is all controlled via a chip inside the light unit and the owner can set the timing, but it will add around another £100 on the cost of a normal T5. They also displayed a refract meter, a scientific instrument for accurately determining the salt content of your water, retailing at £49.99. Every marine aquarist should have one because hydrometers can give inaccurate results leading to serious problems.

Aquatic solutions stand

Aquatic Solutions were displaying a range of systemised aquaria aimed at the budget end of the marine market. The 1300 x 45 x 60cm model has a recommended retail price of £1349.99 and the 1600 x 60 x 60 version is £1599.99. They also had a Ratz fluidised bed filter on display for under £55.00 which has to be a winner. But it's funny that with all the high tech equipment the most exciting thing for me was the new food on display, Cyclop-eeze. This freeze dried Cyclops is a great coral and fish food. You can see the coral polyp extension improve with this great stuff.

AB AQUA MEDIC STAND

On the Aqua-Medic stand their trusted skimmer the Turboflotor multi 5000 has been improved with the Turboflotor SL. I have one on test and will report soon, but so far it is looking good. They also had a multi doser which is effectively 4 peristaltic pumps mounted together. What's new about this? Nothing, but in the middle is a digital timer allowing second timing for each separate pump, now that's good and expect to pay around £250 - that's even better.

The old Turboflotor multi 5000 has been improved by the addition of a Turboflotor SL.

The new systemised aquariums from Aquatic solutions feature lighting, filtration, and a Ratz protein skimmer. Whilst costing a lot less than many other complete marine systems on in the market place, the quality has not been compromised.

Arcadia's stand

Arcadia were there to show off their impressive display of lighting but one new bulb that caught my eye was the new ultra violet tube giving 12 months of service instead of the usual 6. It doesn't cost much more but saves on maintenance and every little helps.

Arcadia launched their new Ultra Violet tubes which are ideal for pond UV clarifiers. These should be available by the beginning of the new pond season.

BEST DISPLAY

Which was my favourite display? With all the new innovative products you will be surprised, it was in fact what can be considered an antique of aquatics.This was an aquarium circa 1930s owned and displayed by David Saxby, it was really interesting to see how they were designed and constructed in that era.

MARINES NEED PURE WATER

Tapwater contains many pollutants which will cause problems in marine aquaria. For this reason a reliable purification system is vital. D-D Aquarium solutions have a range of RO units which are ideal for this job. The units contain a TFC membrane and are supplied with either a 42 or 67 gallon /day membrane as standard but are available as units which can produce up to 250 gallon/day.
For furthur information check out www.d-daquariumsolutions.com web site.

Water purification has become a major concern for marine enthusiasts everywhere.

NEW FROM EHEIM

In October 2002 we reported that Eheim (one of the world's top filter producers) had acquired another high quality German aquarium product company specialising in heaters. At the time Jäger were unknown to British aquarists but through out contributors in Germany we were able to find out they had a very good reputation for quality and reliability. Finally Jäger heater/stats have arrived in the UK. Over the last year Eheim have improved the design of the heaters and are using a special glass in their production. There are nine models in the range from the smallest unit at 25w for an aquarium up to 25 lt in volume. The largest unit is a 300w heater designed for aquaria up to 1000 lt. For more information check out www.eheim.de

CLOVERLEAF FILTERS

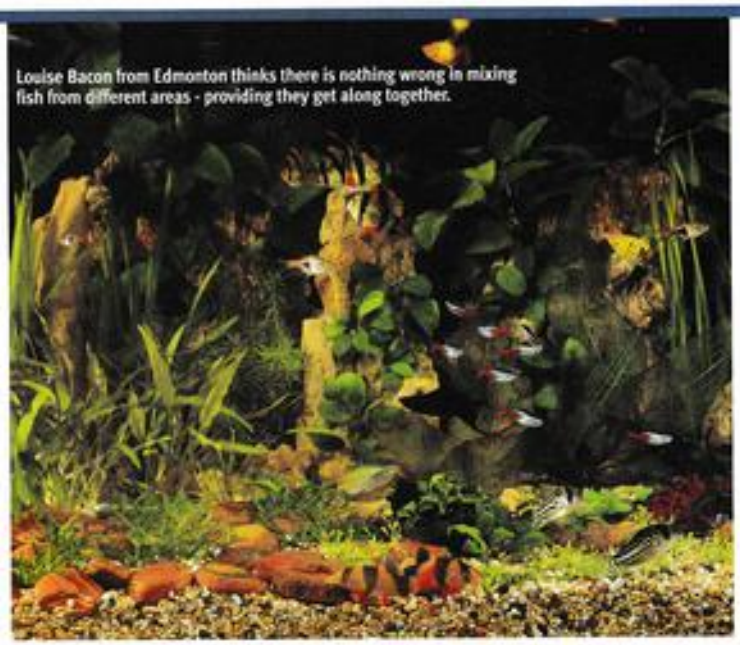
Cloverleaf filters are one of the market leaders for koi pond filtration.

In the December issue we used a photograph of a Cloverleaf pond filter to illustrate a filter which uses bacteria to break down ammonia and nitrite into nitrate. When some medications are added to a pond these bacteria can be killed off and will take time to re-colonise the filter media.We want to make it perfectly clear that ALL filters which use biological filtration are vulnerable to this sort of damage.

We apologise to Cloverleaf if the impression might have been given that it was only their brand which was vulnerable in this way. In fact with the very effective mechanical filtration which these filters utilise you would be less likely to experience chronic "new pond syndrome" than with some other filters.

Our readers Write

Dick Mills is 'in the chair' for your opinions.



Louise Bacon from Edmonton thinks there is nothing wrong in mixing fish from different areas - providing they get along together.

A Very Happy New Year to all our readers. I do hope your New Year Resolutions include something like "*I really must drop POV a line*" because, apart from the Editor and me, there are many people out there waiting to debate any aquatic issue with you. Who's going to be the first to toss the argumentative pebble into the pond and then sit back to watch the ripples spread?

Following up from last month's Point of View (and Max Gibbs' coincidental article on the same subject) Louise Bacon from Edmonton lost no time in responding. She writes:

"*I've just read Tony Bleetman's letter and felt that I had to put pen to paper immediately. His argument about always keeping fish together from the same habitat does not hold water. Would you keep Piranha with Rummy-nose Tetras? No of course you wouldn't, but they are found in the same natural habitat! It's as ridiculous as keeping Sparrows with Barn Owls!*

Minuscule fishes come from the same natural habitat as some veritable giants but you wouldn't keep them together in an aquarium. Some wild Platies live with wild Swordtails but if you were trying to maintain pure stock you wouldn't keep them together either or they would cross breed.

This argument really leads us nowhere. From my earliest fishkeeping days I have kept the fish I liked that lived happily together- some living as long as 10 years. I consider compatibility of species much more important than where they originally come from. The tanks in my home are not natural habitat tanks but safe havens for many species that are disappearing in the wild, as for example, my beautiful shoal of Cherry Barbs."

Barley straw problem

How will you be affected by possible legislations over the sale of Barley Straw products this summer? According to some sources it is only the 'Extract of Barley Straw' products that are being targeted at the moment but unless positive means of testing can be found and published (thus making sure the 'it does what it says it does on the tin' syndrome holds good) then any ban must surely spread to the basic straw-in-a-bag product too. What's going to be your alternative defence against Blanketweed? Your solution (no pun intended) could save the good looks of many ponds.

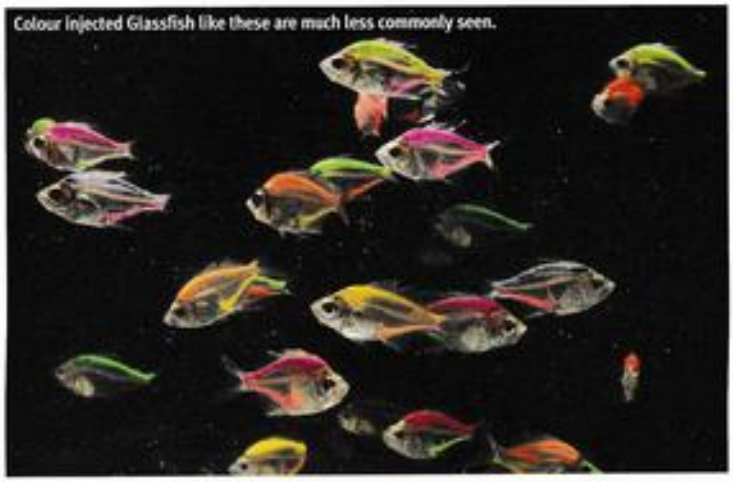
Artificially coloured fish

Parrots of many different colours.

The Press has been quoting several instances of artificially-coloured fish again. Most recently it was Glowing Zebra Fish which had been treated with genetic material from sea corals: having been to Singapore's Aquarama 2003 (see next month's TFK for a report), I also came across some more of these technicoloured marvels. In the excellent Aquarama catalogue there was details about a green Killifish (courtesy of jellyfish-donated material) and I'm including shots of

SHINE A LIGHT

Do you depend on timers to switch on your aquarium lights or any other ancillary equipment? I ask, because a Club mate has managed to get through half a dozen or so timers within the last couple of months, and he wants to know what might have changed. Some low-energy, mini-fluorescent light bulbs have warnings printed on their box to the effect that they are not suitable for use with electronic timers but I would have thought the more 'primitive' electro-mechanical types of timers - the 'plug in a socket and then plug in the device' types would have been OK. The only use his timers had been put to was switching fluorescent tubes over the aquarium. Does this ring a bell or, rather more pertinently, ring any alarms or trip out fuses with you?


Colour injected Glassfish like these are much less commonly seen.

coloured Parrotfish (nothing strange about that) but how about the similarly coloured Pearlscale Goldfish?

Whilst we may be tempted to applaud such achievements on their technical merit and ingenuity, since such colorations may lose their effect after a couple of weeks (well that's what a fish dealer told us) who's gaining from these experiments? Thanks to the efforts of the more responsible aquatic press, colour-injected Glassfishes seem to have waned in popularity but now someone, somewhere, has found another means of colouring perfectly good fishes whose appearances we have been happy with for many, many years. reactions please.

However, one area in which we have no objection to its aims and achievements is in captive breeding and, happily, there was much to feel pleased about in this respect, especially where marine species were involved.

Speaking of first replies

Speaking of 'first' replies, here's one from John Bradshaw, Bedfordshire. There's no need to be shy John, whoever writes in gets their letter passed on to the correct destination.

"I am a new reader (3 months now) to Today's Fishkeeper. I don't know if I should really be writing this to the Editor or you, but it is my opinion, and you are asking for readers' opinions. First of all I want to say I love the magazine. It is so different from any other fishkeeping magazine that I have read. My only problem has been buying it from the newsagent in my local town. They only get 3 copies a month and four of us try to buy them! That means one of us always misses out. If I do not get in there within a couple of days of the magazine coming out is gone!

I have now filled in the subscription form and am posting that off at the same time as this letter. This way I will be certain I don't miss out on my copy of the magazine. Of course I will be saving about £9.00 a year as well as getting a free book so I'm very happy. No doubt the other 3 readers in my area will be happy as well, since they will be able to buy their copies every month now."

Thanks for your comments John, it's nice to know that someone, somewhere is willing to make the sacrifice of subscribing, so that his neighbours can benefit, although it looks as if you'll be benefiting more than most (non-subscribers should look to page 83 for money-saving details).

See you next month.

Dick Mills.

TRUE BLUE FLOWERS

Now a comprehensive reply to an earlier topic from Kevin in Canada.

"Hi, just read your footnote regarding the photographing of blue flowers in September's Today's Fishkeeper - sorry for the delay but we get the magazine here in Canada about 1 month later.

From the sound of things it could be a combination of lighting, and possibly the type of film you are using, e.g. bright sunny day and perhaps an Agfa type film. Guessing as you are on the other side of the Ocean, and from my last trip there, other types of films were more prevalent than here. I've found that Fuji has a rather strong and perhaps overly-acentuated blue so if you are using that, perhaps that combined with lighting might be the problem (yes, I do use Fujichrome Sensia film, Kevin). Usually with plants I try and photograph on a slightly overcast day as direct sunlight tends to cause colour wash out. Also early or late light tends to be 'warmer' and that can cause a colour shift.

We use digital cameras now both here at work and personally. But the problem is that not all digital cameras are created equal! Personally I like the Canon G2 camera which is now discontinued but has a very good macro feature but mainly has very accurate colour reproduction. But I can't say I have photographed many blue subjects other than my car, so can't give you a definitive answer to that question. The big advantage though is that you can see the results immediately. I've been a photographer for almost 30 years and I believe that many of today's digital point-and-shoot cameras are now as good, or better, than their film counterparts. Not sure what resolution you guys need for reproduction but here at the paper we get by quite well with 4 megapixel cameras.

I shoot with digital SLR cameras personally, while my wife uses her point-and-shoot Canon G2, I find for most situations the point-and-shoot camera is as good or better than my big $$$ SLR kit. Some might argue, but she shoots Peonies for a friend's catalogue and business and so far this camera has been the best we have used in terms of true colour reproduction. The other advantage with digital is that, as you mention, images can be further tweaked on the computer. One thing to keep in mind though, most folks don't calibrate their monitors so what you see might not be exactly correct. At work we use monitors calibrated to our presses which are slightly different than what I see on monitors set up with, say, the gamma correction in Photoshop or Windows.

Sorry if I crammed too much into such a short first e-mail. If I can help you out with more detailed answers please send me a note. If you were over here in Canada I'd be happy to loan you my camera to test."

Thanks Kevin for your comments - to avoid colour discrepancies in future it seems the digital route offers less chances of going wrong or more chances of putting things right afterwards. The best part of Kevin's reply was in his last paragraph; no, not his offer of help if, and when, I get to Canada but in his apology "a short first e-mail" - let's hope there's more from where that came from, whatever the subject!

January's show, auction and club meeting dates.

African redfin tetra

Copy for Today's Diary Dates

Copy for Today's Diary Dates should be sent to Today's Fishkeeper, Winchester Court, 1 Forum Place, Hatfield, Hertfordshire, AL10 0RN Telephone 01673 885352, fax 01707 269333 or e.mail derek@trmg.co.uk with Diary Dates in the subject line. Copy deadline 8 weeks before publication date.

Thurs 1st	*Happy New Year to all the clubs*
	Glenrothes meeting. Contact D. Smart, 4 Lochty Ave., Kinglassie, Fife.
	Faircity A.S. meeting. Contact 01738 561291 or 07714 188507
	Sandgrounders A.S. meeting. Contact 01704 541177
Fri 2nd	**Basingstoke A.S. BBQ.** Contact 0118 970 1461
	West Cornwall Fishkeepers meeting. Contact 07799401248 or 01209 614518
	North West Cichlid Group meeting. Contact 019422 707593
Sat 3rd	
Sun 4th	
Mon 5th	**Kirkcaldy A.S. meeting.** Contact 01738 634689 or 01592 205565
	Solway A.S. meeting. Contact 01387 750606
	St Helens A.S. meeting. Contact 01942 671463
	Ayrshire Fishkeepers Association meeting. Contact 01294 605272
	Reigate & Redhill A.S. Contact 01293 781282
	Merseyside Aquarist Society meeting. Contact 0151 260 3664
	Warrington A.S. Contact 01925 483979
	Port Talbot & District Aquarist Society meeting. Contact 01639 770736.
	Co Armagh tropical/marine fish society meeting. Contact 02838332210/07760405
Tues 6th	**Southend Leigh & D.A.S.** Contact 01702 305740
	York & District A.S. meeting. Contact 01904 416272
	The Irish Tropical Fish Society meeting. Contact 01 4561836
	Halton A.S. meeting. Contact 0151 2898190
	North Bucks A.S. meeting. Contact 01908 377333
	Oldham A.S. meeting. Contact 0161 281 3725
	Preston A.S. meeting. Contact 01772 321145
	Lang Toun Aquarists and Pondkeepers Group meeting. Contact 01592 595825
	Wyke A.S. meeting. Contact 01482 445543
Wed 7th	**Corby & D.A.S. meeting.** Contact 01536 790932
	Oasis Fish Club (Sunderland) meeting. Contact 0191 3841433
	Perth A.S. meeting. Contact 01 738 621704 or 01506 510558
	Clacton Fish Keeping Club meeting. Contact 01255 428065
	Portsmouth A.S. meeting. Contact Gill Utting, 9 Inverness Rd., Gosport, Hants.
	Bracknell A.S. meeting. Contact 01189 732874
	Ryedale A.S. meeting. Contact 01751 472715 or sdmarshall@lineone.net
	Tameside A.S. meeting. Contact 0161 339 6593
	Plymouth & District Aquarists' & Pondkeepers' Society. Contact 0795 6421510
Thurs 8th	**Mid Sussex A.S. meeting.** Contact 01924 602407
	Kings Lynn Fish Club meeting. Contact 01553 769522 or 01553 763743
	Faircity A.S. meeting. Contact 01738 561291 or 07714 188507
	Isle of Wight meeting. Contact 01983 721246
Fri 9th	**South East Marine Aquarist Society.** Contact 01279 301542
	Yorkshire Cichlid group meeting. Contact 01924 367086
	Basingstoke A.S. meeting. Contact 0118 970 1461
Sat 10th	
Sun 11th	
Mon 12th	**Kirkcaldy A.S. meeting.** Contact 01738 634689 or 01592 205565
	Ilford &D A&P Society Auction. Contact 020 845507329
	Derby and District Aquarists. Contact 01332 773416
Tues 13th	**Darwin A.S. meeting.** Contact 01254 701925
	Northwich A.S. meeting. Contact 01606 882966
	Caer Urfa A.S. meeting. Contact 0191 5237464
	Telford & D.A.S. meeting. Contact 01952 616410
	Lang Toun Aquarists and Pondkeepers Group meeting. Contact 01592 595825
	Northern Goldfish and Pondkeepers meeting. Contact 0161 9697567
	Greenock D.A.S. Meeting. Contact 01475 704219
	Bangor Aquarists & Breeders Society. Contact 028 9187 3539
	Clyde Aquarist Society meeting. Contact john@farnanf.freeserve.co.uk
	Hull A.S. meeting. Contact 01964 562387
	Strood & D.A.S. meeting. Contact 01634 221291
	Oldham A.S. meeting. Contact 0161 281 3725
Wed 14th	**Linlithgow Aquarist Society meeting.** Contact 01506 510558
	Halifax A.S. meeting. Contact 01274 880471
	Bradford A.S. meeting. Contact 07768 666057
	Hounslow D.A.S. meeting. Contact 020 8890 6933
	Dunstable & D.A.S. meeting. Contact 01582 750564
	Plymouth & District Aquarists' & Pondkeepers' Society. Contact 0795 6421510
	Hambleton And District Aquatic Club. Contact 01765 640644
Thurs 15th	**February 2004 *Today's Fishkeeper* on sale**
	Glenrothes meeting. Contact D. Smart, 4 Lochty Ave., Kinglassie, Fife.
	Bristol Tropical Fish Club meeting. Contact 0117 973 2145
	Sandgrounders A.S. Contact 01704 541177
	Faircity A.S. meeting. Contact 01738 561291 or 07714 188507
Fri 16th	**Discus Ireland meeting.** Contact (061) 318593
	West Cornwall Fishkeepers meeting. Contact 07799401248 or 01209 614518
Sat 17th	
Sun 18th	**Catfish Study Group (U.K.) AGM**
Mon 19th	**Kirkcaldy A.S.meeting.** Contact 01738 634689 or 01592 205565
	Bristol Aquarist Society (Goldfish) meeting. Contact 01792 207467
	Grimsby & Cleethorpes meeting. Contact 01472 349178
	St Helens A.S.meeting. Contact 01942 671463
	Otley A.S. meeting. Contact 01274 531418
	Robin Hood A.S. meeting. Contact mdtalbot@corydoras.freeserve.co.uk
	Port Talbot & District Aquarist Society Meeting. Contact 01639 770736.
Tues 20th	**Southend Leigh & Dist A.S.Auction.** Contact 01702 305740
	Greater Manchester Cichlid Society meeting. Contact 01706 810284, 01706 353363, 0161 766 4457 or 01422 942 155
	Midlands Marine Aquarists Society. Contact 0121 359 4469
	Lang Toun Aquarists and Pondkeepers Group meeting. Contact 01592 595825
	Wyke A.S. meeting. Contact 01482 445543
	South Park Aquatic Study Society. Contact Eric 0208 6792680
Wed 21st	**West Yorkshire Marine Aquarist Group meeting.** Contact 01924 420101
	Clacton Fish Keeping Club meeting. Contact 01255 428065
	Tongham Aquarists Society meeting. Contact 01252 25686
	Portsmouth A.S. meeting. Contact Gill Utting, 9 Inverness Rd., Gosport, Hants.
	Perth A.S. meeting. Contact 01 738 621704 or 01506 510558
	Bracknell A.S. meeting. Contact 01189 732874
	Workington A.S. meeting. Contact 01900 67951
	Tameside A.S. meeting. Contact 0161 339 6593
Thurs 22nd	
Fri 23rd	
Sat 24th	
Sun 25th	
Mon 26th	**Kirkcaldy A.S.meeting.** Contact 01738 634689 or 01592 205565
	Thorpe & D.A.S. meeting. Contact 01953 605394
	Solway A.S. meeting. Contact 01387 750606
	Merseyside Aquarist Society meeting. Contact 0151 260 3664
	Ayrshire Fishkeepers Association meeting. Contact 01294 605272
Tues 27th	**Northwich A.S. meeting.** Contact 01606 882966
	Lang Toun Aquarists and Pondkeepers Group meeting. Contact 01592 595825
	Greenock D.A.S. meeting. Contact 01475 704219
	Croydon Aquarist Society meeting. Contact 020 8654 0984
	Strood & D.A.S. meeting. Contact 01634 221291
	Oldham A.S. meeting. Contact 0161 281 3725
Wed	28th
Thurs	29th
Fri	30th
Sat	31st

Champion of Champions – the results

In 1967 we launched the Champion of Champions competition to find the very best show fish in the country. This year's competition, the first as a stand alone event, drew exhibitors from all parts of the country and an attendance of more than 100 people.

Saturday 1st November was one of those warm sunny autumn days when you could almost forget winter was just around the corner. In fact it was a real pleasure driving over to the Chesterfield hotel to deliver as much of the manufacturers' display goodies as we could fit in the car. Fortunately several companies sent their products direct to the venue otherwise we would have had to make at least three journeys!

The day arrives

Sunday, however, started wet and windy just about everywhere. With exhibitors, judges and members of the aquatic hobby coming from all parts of the country it was not the best start to the day. However, by midday the rain had stopped and things were set fair for the Champion of Champions contest. With two judges out because of ill health and people dropping like flies with flu/colds and other ailments we really wondered what sort of attendance we were going to have. We needn't have worried because by 12.30 the exhibition hall was full with people viewing all the beautiful fish and manufacturers' displays.

1pm prompt the auction started and what an auction it turned out to be. With Cichlids, Killifish, Anabantoids, Livebearers and other specialist fish rarely seen in normal aquatic outlets on sale the runners were certainly kept busy. The equipment from the manufacturers' displays was also sold off during the course of the afternoon and many a good bargain was had.

THE BEST SHOW FISH IN THE COUNTRY FOR 2003

This splendid *"Cichlasoma" robertsoni* gained maximum points for size from all our judges and literally shone with health and vitality. The other most important factor which makes or breaks a show winner is that the fish actually enjoys the experience of going to a show. This fish certainly did, being fully aware of what was going on around its show tank and interested in everything and everyone that came within sight. What a winner!

The awards

Then came the awards. For such a prestigious event as this we gave certificates for 1st down to 5th places. It is important to remember that every fish on the bench had won major awards before and that quality was reflected in the standard of entries. None of the judges or indeed exhibitors could remember such a high quality class of fish. However, after all the points were added up we did have a clear winner and a very worthy winner it was too. Roy Davies had travelled all the way from Wales to show his fish and was rewarded with the top prize in the country. Well done Roy!

As the day wound up and the hall cleared of people, it was obvious that the Champion of Champions Exhibition had been a resounding success. No it was not a Festival like those that were held in the past. But it was a good start and the hundred or so people who came along seemed to have gone away happy. Some great bargains were had, some new fish purchased and everyone had a chance to see the top show fish in the country fight it out for the honour of being recognised as the Champion of Champions for 2003.

ROLE OF HONOUR

1st	Roy Davies:	*"Cichlasoma" robertsoni*
2nd	B. & S. Critch & I. Wright:	*Hypostomus margaritifer*
3rd	David & Lois Speed:	*Pseudacanthicus spinosus*
4th	John Smith:	*Brachyrhaphis roseni*
5th	Mr & Mrs Mogford:	*Tilapia buttikoferi*

MANUFACTURERS' DISPLAYS

Hagen royally supported the event by sending "One of everything" from their aquatics range. A wonderful display which proved a great focal point at the exhibition.

Interpet sent a selection of their freshwater range of products. Also *Interpet publishing* kindly sent their only copy of *Focus on aquarium fish*. The main batch would not arrive in the UK until several weeks later.

The *Aquarion* advisory service brought along a great range of products including some from top French equipment manufacturer *Rena* which they have recently teamed up with. They also kindly gave 1st, 2nd & 3rd winners external power filters as part of their prize.

Another company to send "One of everything" in their freshwater aquatics range was *Waterlife*. The Ghost air pumps were certainly an eye-opener for many visitors because they did not realise this company manufactured their own air pumps.

Tetra featured some of their more specialist fish foods as well as some of their electronic equipment and testing kits. *Easybalance* was just one of their products which caught the visitors attention. Launched a few years ago many long term hobbyists had never really become aware of its existence. This was their chance to see the product and discuss it with other people who had tried it out.

THE WINNING EXHIBITOR

Roy Davies had never entered the Champion of Champions before, but his beautiful cichlid had been a worthy winner of many awards prior to this. Here Dr Peter Burgess of the Aquarian advisory service is presenting him with the Champion of Champions perpetual trophy, together with a keepsake trophy, certificate and Rena external power filter. Oh and £500 in cash!

THE JUDGES

The judges are all too often left out of the limelight, yet theirs is the hardest job on the day. From left to right, Peter Wright of the Federation of British Aquarist Societies, Trevor Douglas of the Yorkshire Association of Aquarist Societies, and John Cowan of the Federation of Northern Aquarist Societies. Well done, you did an excellent job one and all!

THE SPECIALIST SOCIETIES

Three specialist societies came along to put on displays. The British livebearer organisation - Viviparous (Contact Alan Rothwell 01782 317741) had a small stand but ran the auction and show side of things as well. Alan Rothwell, Bonnie Myers, Graham and Wendy Booth, David and Susan Marshall and Pat Lambert made up the team from this organisation.

The British Cichlid Association (contact the BCA, 20 Morton St, Middleton, Manchester, M24 6AY) had a nice selection of books and information available to visitors. Jim Dawson (editor of the BCA) did a great job as one of the auctioneers and Karen Horrocks helped out as one of the runners.

The Anabantoid Association of Great Britian (Contact The Secretary, AAGB, 59 Chiltern Crescent, Spotborough, Doncaster, DN5 7PE) put on a nice display of literature as well as some very rare Anabantoids which were also sold through the auction.

NEXT YEAR

Obviously with the success this year's event has been, we are already planning for next year. One of the most important aspects of this competition was always the Aquarist Gold Pin badge which was awarded to all the winners of the Best Fish in Show. This is being reinstated for the coming show season with every club in the country that holds an open show being entitled to award one of these at their show. For this reason we would ask all club secretaries to send in the details of their open show to us as soon as possible. The address to use is :- The Champion of Champions Organiser, "Northside" Spridlington Rd., Faldingworth, Market Rasen, Lincs. LN8 3SQ.

E-mail :- white.shark@btinternet.com or phone Derek Lambert on 01673 885352 during office hours.

Meet the aquarists

Today's Fishkeeper visits a fishkeeping family "par excellence".

Brian, Steve, & Ian receive their prizes from Dr David Ford of Aquarian, for the 2002 Today's Fishkeeper National Show league. In one year they had notched up over 1000 points and shown from one end of the country to the other.

Brian and Steve Critch and Ian Wright won the Today's Fishkeeper Show League for 2002 and were runners up in 2001. Their Catfish also came 2nd in the Champion of Champions exhibition held at Chesterfield on November 2nd. They are well known characters on the Show hobby scene throughout England and Scotland, so we decided to visit them and introduce our readers to this trio of very enthusiastic fishkeepers. They are father, son and grandson, three generations of fishkeepers, each one of them as keen on their fish as the others.

Steve started keeping fish nearly 17 years ago, after a 120cm community aquarium was installed in their home for his mother. Brian caught the bug from his son and a year later they were well and truly hooked. At the ripe old age of 50, Ian decided he wanted a fish tank and installed a 120cm tank in his bedroom which contained one large Cichlid, and Cichlids have remained his primary interest to this day. His favourites are Rifts, although the newly acquired *Tilapia butterkoferi* is getting more than its fair share of attention from Ian at the moment. After its arrival a few weeks ago it has taken ages to settle down in its new home. Tasty tit-bits like prawns have finally started him feeding properly but it will be a long term project to transform him into a first class show winner.

Trophies line the lounge walls. All but one of these are for Best Fish in Show. The exception is the little green one in the middle of the top row. That was their first 'First' at an open show.

Brian and Ian at work in the fish room. Water changes of about 20% are undertaken every week in all the tanks. This is a vital part of what it takes to produce top class show fish.

Brian was very eager to show us his catfish, encouraging them out of their pipes to come and see us. Brian can tell you all about the personality and history of each fish. When, where and how much was paid for it. What its preferred diet is and if it has had any health problems (some need a lot of TLC before they reach their peak). Catfish are Brian's favourite group of fish, as they are with Steve.

Ian lives on the other side of the town, but keeps his fish in the converted garage/fishroom with Brian and Steve. He comes over every Wednesday night after work to help do the water changes and filter cleaning. Brian is responsible for feeding routines and Steve does all the humping and carting around.

The water in their area is hard with a pH

Since the water in their area is hard, an Aqua Medic RO unit is used to produce soft water to mix with tap water to create exactly the right conditions for each fish.

of 7.4 and the temperature of the room is maintained at 76° F. The big tanks low down contain heater-stats to maintain a steady temperature but the other bottom tanks are cooler. This is where their Goldfish live in winter.

Equipment

They have 1 Project external power filter, 2 Hagen Hi blow pumps (20840) , a Hagen 303 external filter, an Aqua Medic RO unit and the rest of the tanks have sub gravels and box filters. One of their prizes at the Champion of Champions was a Rena Filter and they are going to install it on their next tank to see how it performs as they have never had one before.

When asked what makes their fish such good Show fish they said, *"Good food, good maintenance routines and daily observation"*. Their fish are fed on a basic diet of Aquarian flaked food, frozen bloodworm and earthworms. Brian buys 2 to 3 cucumbers a week for the Catfish.

Just starting out?

They are interested in all aspects of the hobby and recommend beginners to find a local fish club if they can as this is a good source for information. A good magazine will also be helpful. The Internet is also a good source of information but Ian said that you have to be very careful what you believe because there is some very poor information on the net as well.

When asked which was the best shop in their area, in their opinion, they all said, *"Rainbow because Don Harris is such a good fishkeeper and gives good advice and has some cracking fish"*. Wider afield they thought that BAS was probably the best shop in the country and had provided them with many fish with good potential. They also carried such a wide variety of species that would be hard to beat.

Most of their tanks have communities of compatible fish and are lightly stocked giving the fish maximum room to grow. This one has a selection of Barbs, Characins, Rainbows, and tucked away in the pipes an eel and Knifefish.

3 TOP TIPS

1. Always ask for a discount when buying expensive fish or equipment. You will be surprised at how much you can save this way.
2. When catching Loricariids place a soft cloth over their eyes like a hood. This keeps them calm and you can move them from container to container without frightening them.
3. Show fish in tanks which are as large as possible. They must be able to turn around without touching the sides and be long enough so they can spread their fins and deport at their best.

This very pretty Paradon sp. is so far unidentified and cannot be shown until it has a provable scientific name. All the good Internet sites have been searched as have all the major books. Pictures have also been sent to various scientists and aquarists around the world to try and find out what it is.

FUTURE PROJECTS

Christmas is when any major changes are made in the fish room. This Christmas more lighting is being installed and some of the tanks are going to be planted up. The aim is to do more breeding in the future.

Wood-Eaters

Erwin Schraml examines those catfish which include wood as a part of their diet.

ALL PHOTOS: ERWIN SCHRAML

Typical mouth structure of a wood-eater, notice the few, large, and spoon-shaped teeth. The fish pictured is a Panaque nigrolineatus.

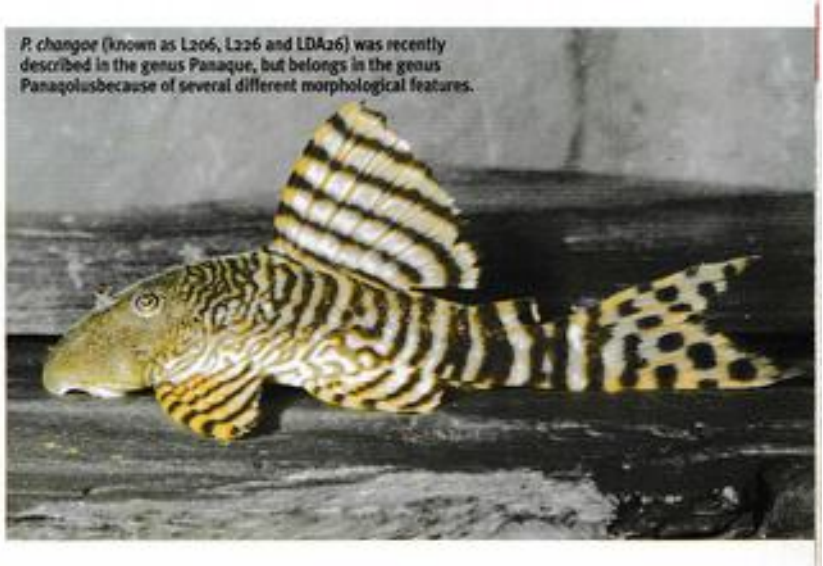
Hypostomus cochliodon, from Paraguay is a *Hypostomus* from the *H.cochliodon* group.

It is a well known fact that not all plated catfish are algae-eaters. Many of the most popular forms must have a protein rich diet to flourish in the aquarium. We don't know exactly what some species eat in the wild, which means we don't know which trophic group they belong to,but the wood-eaters are easily recognisable because of their dentition. They have a reduced number of teeth in their jaws, and these teeth are large and usually spoon shaped. The group's taxonomy, however, is somewhat more complicated.

At the present time wood-eaters are known from two subfamilies, the Hypostominae and the Ancistrinae. In the Hypostominae they were integrated recently with four known species in the genus *Cochliodon* Heckel (1854). Investigations by

different scientists, however, showed, that the *Cochliodon* species are derived not only morphologically from *Hypostomus* relatives (Weber & Montoya-Burgos, 2002), but also genetically they are placed within the genus *Hypostomus* (Montoya-Burgos et al., 2002). Therefore *Cochliodon* is at present only a synonym of *Hypostomus*, but one speaks of them as the *Hypostomus-cochliodon* group. Four new species have recently been described which belong to this group (Armbruster, 2003a).

The reverse situation is found in the ancistrin representatives. Until recently all species were placed in the genus *Panaque*. Isbrücker & Schraml (2001) were of the opinion that the small species of the *Panaque-dentex* group should be placed in its own genus which they called *Panaqolus*. They justified this with the morphologic peculiarities of this group, as diagnosed already by Schaefer & Stewart (1993), and also through the more striking odontodes on the head and the body plates. *Panaque* has a particularly streamlined head. Further differences are the form of the supraoccipital-process (pointed in *Panaqolus* versus straight in *Panaque*), the form of the skin ossification shortly over and before the orbital rim (not enlarged in *Panaqolus*, enlarged in *Panaque*), and the striking secondary sexual differences. Males of *Panaqolus* in breeding mood develop extended odontodes in the interopercular-region and on the fin spine of the pectoral fin; especially striking are excessively extended odontodes on the posterior half of the body; *Panaque*.Males in breeding mood have exaggerated long odontodes in the interopercular region and long odontodes on the fin spine of the pectoral fin. Additionally, both sexes of *Panaques* have some rows of extended odontodes on the posterior half of the body; in *Panaqolus* the odontodes are arranged over a large surface. Mature *Panaqolus* reach less than 15 cm of standard length; *Panaque* can reach up to 49cm.



P. changae (known as L206, L226 and LDA26) was recently described in the genus Panaque, but belongs in the genus Panaqolusbecause of several different morphological features.

Some discussion

Not all scientists are of the same opinion, some argue that the genus *Panaque* represents a small, well diagnosed group, which makes it unnecessary to separate it. I can't follow this argument, because the definition of *Panaque* as Eigenmann & Smith-Eigenmann (1889) have published it, is restricted to the terse sentences: "*Teeth enlarged, bowl-shaped at tip, few in each jaw. Interopercle with a bunch of erectile spines.*" That is no more than the description of the dentition of a trophic group within the Ancistrinae and not really a good definition for a genus!

My opinion is that *Panaqolus* is much more closely related to *Peckoltia* Miranda-Ribeiro (1912) than *Panaque*.They are a kind of wood eating *Peckoltias*. Therefore, the very recently described species *Panaque changae* Chockley & Armbruster, 2002 must also be placed in the genus *Panaqolus*. It lacks the typical features of a true *Panaque*, but it has all the characteristics of *Panaqolus*.

Among the species, which are known in the aquarium and still called Panaque today, there are several undescribed species which belong to two further, likewise still undescribed genera. There are species with greatly extended fin-filaments in the caudal (a group with species similar to L90) and one species, with a caudal peduncle that has thorn-like odontodes (LDA65), as we know it in Acanthicus and Pseudacanthicus.

Panaque needs to be subdivided into two more genera, one covering the species like this L90 with fork-tailed caudals.

The importance of other characteristics

Several new plated catfish species were described recently, without evaluating secondary sexual differences as a possible aid to correct genus classification. The extended odontodes around the caudal peduncle are in some cases a very important indicator, because this characteristic is far less exposed to the plastic change by the selective pressure as is the dentition. This is also known in another, completely different, and taxonomically difficult group, in which, for a long time, too much value was placed on the dentition which later has turned out to be a mistake. I am talking about the cichlids, particularly haplochromine species. There it was features such as scale counts, body characteristics, colour pattern and behaviour which yielded a reorientation.

Beside the recombination of *P. changae* I am of the opinion, that *Hypancistrus*

LDA65 needs to be placed in a new monotypic genus because of the thorn-like odontodes around the caudal peduncle.

Peckoltia sabaji (L301, L124, L75/LDA2(?)) does not fit well into *Peckoltia* and should really be placed in *Ancistomus*.

Which wood

It has to be said that the wood-eaters actually require wood as food, even if they do not have to be nourished exclusively with it. The small rasped wood particles rich in dietary fibre are an important element for nourishment as these prevent gut-problems. The right wood should be also raspable. Mangrove roots which are sometimes used in decor for our aquaria are too hard. If possible, even fresh wood of tree-cuts can be used. However be careful, this might be dangerous because of hyperacidity (tannic acid) and poisonings (ecological damage, sprays for tree and fruit parasites!).

inspector Armbruster, 2002 is not a *Hypancistrus* within the meaning of Isbrücker & Nijssen (1991). This species belongs to a *Peckoltia* near genus, which is still undescribed. It develops elongated odontodes around the caudal peduncle.This species also has a distinctly higher body depth than *H. zebra* (the very flat physique of this species was a diagnostic character for the genus *Hypancistrus*). *Peckoltia sabaji* Armbruster, 2003 has also been described in the wrong genus. The extended odontodes around the caudal peduncle are missing in this species. It is, therefore much better placed in *Ancistomus* Isbrücker & Seidel (2001). It also fits with this genus because it has a very slender caudal peduncle.

Different *Panaqolus* and even *Panaque* species have already been bred in captivity. The chosen breeding grounds have always been caves. In the large *Panaque* species intraspecific aggressiveness is frequently a problem. But it seems that, this can be solved by giving the species a spacious aquaria.

References

ARMBRUSTER, J.W.(2002): Hypancistrus inspector: a new species of suckermouth armoured catfish (Loricariidae: Ancistrinae). (Copeia, 2002(1): 86-92)

ARMBRUSTER, J.W.(2003): The species of the Hypostomus cochliodon group (Siluriformes : Loricariidae). (Zootaxa 249: 1-60)

ARMBRUSTER, J.W.(2003): Peckoltia sabaji, a new species from the Guyana Shield (Siluriformes: Loricariidae) (Zootaxa 344: 1-12)

CHOCKLEY, B.R. & ARMBRUSTER, J.W (2002): Panaque changae, a new species of catfish (Siluriformes: Loricariidae) from eastern Peru. (Ichthyol. Explor. Freshwaters, 13(1): 81-90

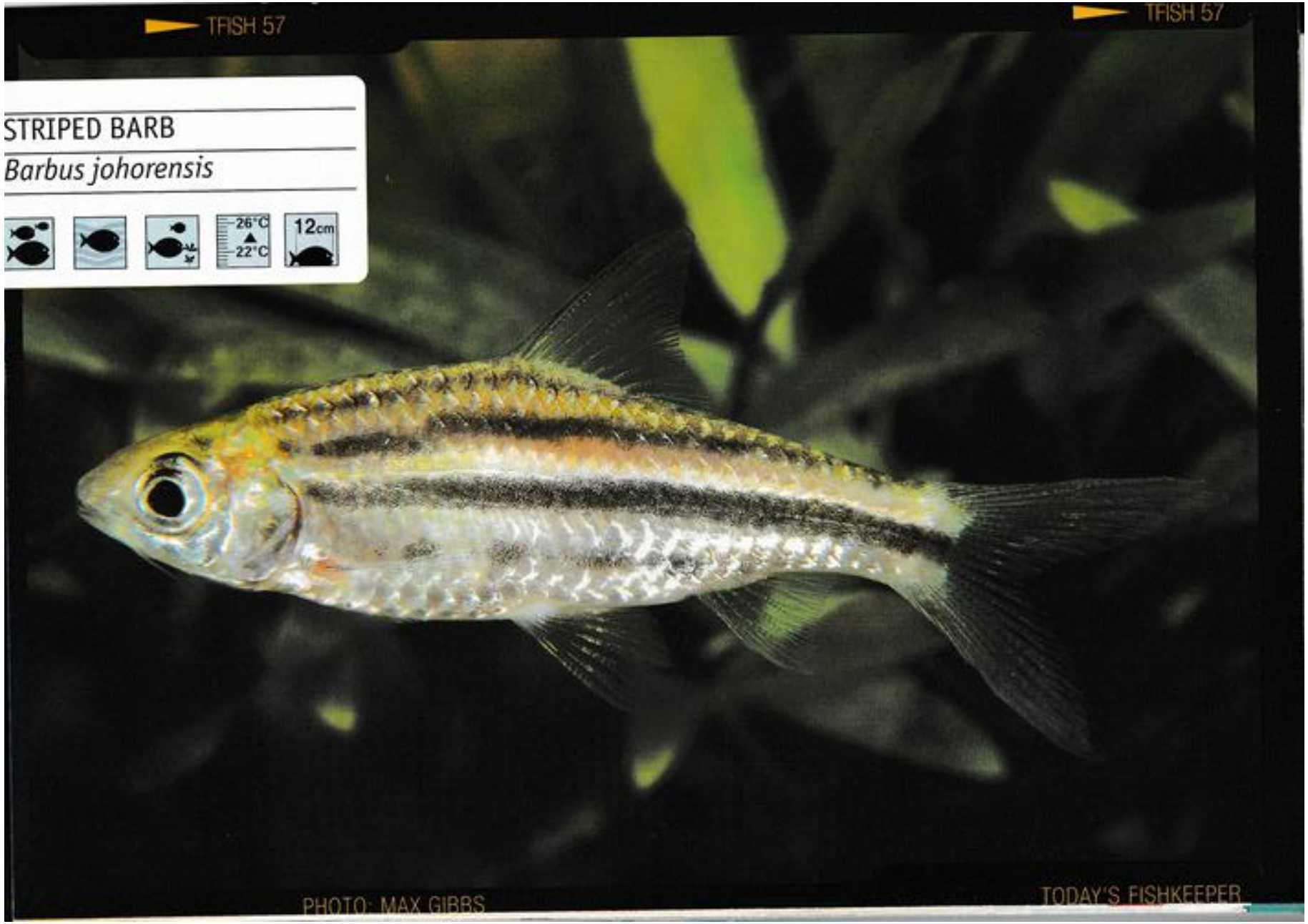
EIGENMANN, C.H. & SMITH EIGENMANN, R. (1889): Preliminary notes on South American Nematognathi. II. (Proc. Calif. Acad. Sci. (Ser. 2) v. 2: 28-56)

ISBRÜCKER, I.J.H. & SCHRAML, E. (2001): pp. 20-21 in: ISBRÜCKER, I.J.H.; SEIDEL, I.; MICHELS, J.P.; SCHRAML, E. & WERNER, A. (2001): Diagnose vierzehn neuer Gattungen der Familie Loricariidae RAFINESQUE, 1815 (Teleostei: Ostariophysi). (DATZ-Sonderheft Harnischwelse 2: 17-24)

MONTOYA-BURGOS, J.I.; WEBER, C.& LE BAIL, P.-Y.(2002): Phylogenentic relationships within Hypostomus (Siluriformes: Loricariidae) and related genera based on mitochondrial D-loop sequences. (Rev. Suisse Zool. 109 (2): 369-382)

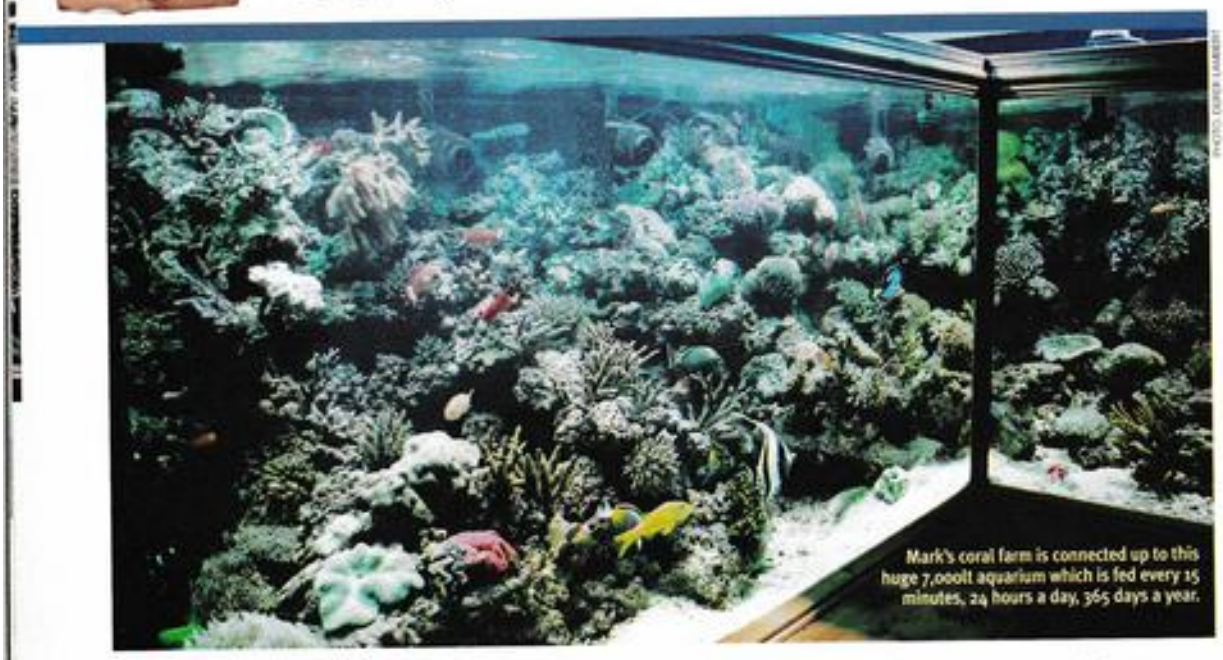
SCHAEFER, S.A. & STEWART, D.J. (1993): Systematics of the Panaque dentex species group (Siluriformes : Loricariidae), woodeating armoured catfishes from tropical South America. (Ichthyol. Explor. Freshwaters 4 (4): 309-342)

WEBER, C. & MONTOYA-BURGOS, J.I. (2002): Hypostomus fonchii sp. n. (Siluriformes: Loricariidae) from Peru, a key species suggesting the synonymy of Cochliodon with Hypostomus. (Rev. Suisse Zool. 109 (2): 355-368)


TFISH 57
TFISH 57
STRIPED BARB
Barbus johorensis
26°C
22°C
12cm
PHOTO: MAX GIBBS
TODAY'S FISHKEEPER

Sea view

Venturing into Coral cultivation



Mark's coral farm is connected up to this huge 7,000lt aquarium which is fed every 15 minutes, 24 hours a day, 365 days a year.

About 6 months ago Mark and I installed a coral cultivation aquarium, linking it to the existing system. We installed a horseshoe shaped tank 2.6 m along the back pane, 3 m down both sides, front panes at either side 60 cm then going back into the tank another 60cm each side and then another front pane joining the two, 35cm high. If you can follow that then you are doing really well.

We hooked this up to the sump with a ITT 1.5 hp pump and fed the return around the sides of the aquarium utilising 50mm pipework with tee pieces creating a rather large spray bar, ensuring that all the water was distributed equally. Lighting was 5 x 250w metal halides and 6 twin actinic T5 tubes under computer control and reverse lit to the main aquarium. We experimented with different pumps for water movement and now have an array of Maxi jet 1200s doing a very fine job indeed.

A fragging we will go

Then off to work Mark went, snipping all sorts of small polyped stony corals, gluing them to rocks and in his very words "*Throw them in and watch em grow*". As always family joined in, 8 year old Myles and 13 year old Dariane were hanging off the sides of the sump gluing corals to stone avidly, Julie, Mark's wife, was passing mother colonies for chopping, whilst dear old mum lay slumped in the corner clutching a bottle of brandy. Yes, nothing much changes at *Acropora House*.

Then suddenly something strange happened, the frags that grew were of a very high quality indeed, even I had to admit that to Mark. Then people became interested in acquiring these frags for their aquaria. Before long Mark formed a company called *Acropora House* which could not keep up with demand. How come the fragments were of such quality and grew so well? Simple, Mark does not have just a coral farm, it is linked to a huge mass of water with state of the art filtration and feeding equipment, and the cultivation tank is a small offshoot of this investment.

Expansion on the horizon

The phone rang, "*Andrew, I have been thinking*", he said (that meant trouble for me and I was not wrong). "*I need to expand the farm*" he said. "*I need a beer*" I replied. "*I have a big room in the cellar*" he said.

Theee 3m x 0.9m x 0.3m tanks were needed. The day before the installation we had all the glass ready, cut to size with polished edges and it was just a simple matter of building them on site. Then the phone rang, "*You're going to kill me*", Mark stuttered down the phone. "*My dad was building the frames and I can't use a tape measure so they won't fit, so we will put in two 2.4m x 1.2m x 0.3m tanks instead*". I cried into the phone as I could hear the sound of glass cutting on site, one easy job made more difficult.

At the time of writing we have just installed the aquaria and soon they will be hooked up. The system will be capable of holding up to 5,000 coral fragments at any one time. This is of major importance to the hobby and over time we will be able to reduce substantially the amount of wild caught corals being brought into this country. I cannot stress how important this is, we in the fish community should be actively striving to develop new methods and coral cultivation awareness to all.We feel privileged to help with the planning and development of coral cultivation in the UK.

For further information please visit the following web sites www.aqua-world.co.uk and www.acroporahouse.com.

PHOTO MAX DIRIS

A fish for you

Yellow goatfish are definitely not a fish for the reef tank.

YELLOW GOATFISH *(PARUPENEUS CYCLOSTOMUS)*

We are blessed with one of the most wonderful hobbies anyone can think of, no other allows the replication of truly wondrous visual and intellectual (if you want it) creations of living biotopes within the home, but it's a hobby full of urban myths. Like such myths you can believe them or not, but thankfully 99% of these tales are researchable, for the truth is out there- find it and big problems are avoided. This fantastic fish is a good example of a fish that is shrouded in an aquatic urban myth.

Let's look at Goatfish in general. Here we have a group of good workers for any aquarium, they will not touch your corals but their habits dictate that most small crabs, worms and anything living in your substrate will not last for long. This fact is not often told and Goatfish can be termed reef safe because corals are untouched, but what about all the other animals living in that aquarium? This is urban myth number one!

A big beast after all.

The biggest myth comes with this baby, the most common Goatfish of them all. Looking at it we can see why they are imported in large numbers. What splendour this great splash of yellow brings, at 7 cm, a fish that will grub about in the substrate cleaning it for you, it's not expensive either. Welcome to our myth, for this beast will grow to attain a length of 50cm very fast indeed and on a diet consisting mainly of your existing fish! Add in the fact it will not grub around in the substrate like other Goatfish, which is what you bought it for. Oh dear! This is not quite the fish you were expecting.

So all you reefers out there, this beast is not for you, but it would grace any large fish only collection, so let's look at its requirements. They are 'on the go' all of the time and as such they require their boiler to be well stoked meaning they require feeding at least 4 times per day with large chunky meaty foods such as cockle and lance fish. They need a big tank full of hiding spaces and open swimming space. Kept with non aggressive tank mates, it will all add up to a stress free fish which allows the true vibrancy of that splash of yellow to shout out at you.It's a truly magnificent sight.It's much better than crying because you fell for an urban myth.

Research your purchases and avoid common mistakes.

PROFILE

Phylum :
Mullidae

Name :
Parupeneus cyclostomus

Location :
Indo Pacific

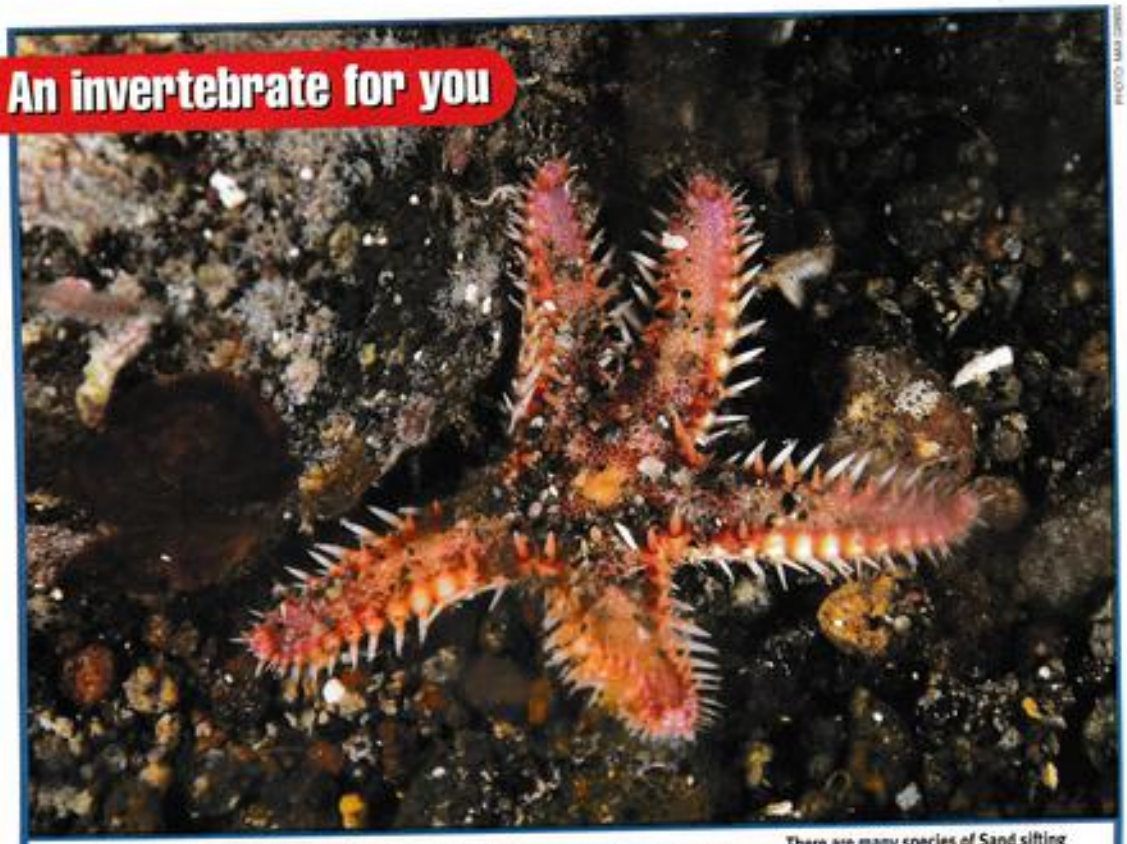
Feeding :
Large vitamin enriched meaty foods

Size :
50 cm

Reef compatibility
Not recommended

Difficulty :
Very hardy fish indeed

An invertebrate for you



SAND SIFTING STARFISH *(ASTROPECTIN SP.)*

There are many species of Sand sifting starfish belonging to the genus Astropectin.

We have just seen a fish that is falsely thought to clean your reef sand. So when we look at your reef aquarium we see a big stick on sign saying 'Vacancy, animal required to work through the substrate and clean it'. Attractive package includes excellent water conditions, good non aggressive tank mates, meals provided, and careful acclimation to new working conditions.

Nearly perfect

Looking at any applicants for this employment our baby is nearly perfect, and being nearly perfect in the aquatic world is a great CV.However, nearly perfect means that we have to be aware of a few things about our beast that make it slightly less than perfect.

Our baby is an Echinoderm, it has a water vascular system that if damaged will cause the animal to die. I find that it is always a good idea if you try not to expose this animal to the air, bag it up and unbag it underwater. Slow, and I mean slow acclimation to your aquarium is a must, float for 30 minutes, then add your water to the bag over another 60 minutes, then let it free.

Most Starfish are active predators, this is a biological fact and our beast is no exception. As it travels through your sand it will eat all your organic waste but also the life that lives in it, the very life you want. Do not overstock with these Starfish as this way your sand will be kept clean and populations of benthic beasts remain viable. Once a week, at night, you can also bury a piece of meaty food for the beast to find, think of it as his pay.

It will also grow and can get too big over a period of years. Large beasts are in demand for big aquaria, large sand sifters are not imported so they are in demand,this means your local shop should be happy to buy from you.

An extremely hardy, safer member of the cleaning crew which should be high on the 'must have' list for everyone.

PROFILE

Family:
Echinodermata

Name:
Astropectin sp

Location:
Worldwide

Feeding:
Meaty food once per week

Reef Compatibility:
Very good

Lighting:
None required

Size:
Normally 6cm to buy, but some species can get big

Difficulty:
Easy

Ponderings

Dave Bevan takes a walk round the pond in winter.

PHOTOS: DAVE BEVAN

Great diving beetles, in common with all water beetles take in air from the water's surface.

Below the surface

There are very few ponds which do not have a resident population of water beetles, some remain active throughout the year, whilst others spend the cold winter months as pupae, transforming into adults as spring arrives.

Even on the dullest winter days, provided the pond is not frozen, it is possible to see these insects as they go about their daily business. Many of the larger Diving beetles spend the winter as pupa but a few manage to over winter as adults, hiding amongst the water weed in case a small fish comes within striking distance.

The smaller *Acillus* species are often active through the winter as they scurry across the bottom of the pond in search of food or occasionally float to the surface to take in more air.

You will have to wait until spring to see the first of the surface beetles. The tiny, but aptly named, Whirligig beetles whiz round on the surface in an apparently aimless fashion, their numbers increasing until there are literally hundreds covering the surface with motion.

FASCINATING FACT

Water beetles have to work hard to stay below the surface! Why? They need a supply of air, so when they do surface they take in air and store it under their wing cases allowing them to remain submerged for long periods. However this air makes them buoyant so they must continue to swim or use their legs to hang onto submerged plants. If they let go then they will pop back up to the surface just like a cork.

DACE FACTFILE

Species:	Dace (*Leuciscus leuciscus*)
Other names:	None
Other forms:	None
Size:	Up to 30cms
Weight:	250 - 300 grams
Availability:	Only from specialist outlets
Habitat:	Prefers clean, clear water
Identification:	A small slender member of the carp family with a body which is almost circular in cross section. The back is dark with a blue sheen and silvery sides.
Habits:	A shoaling fish, preferring the deeper water but rises towards surface in the evening. Feeds on small insects and their larvae. Spawning takes place in March on aquatic vegetation and both sexes develop the white tubercles on the head during the breeding season.
Pond fish value:	A possible candidate for the large pond with plenty of vegetation and clean water.

Dace make an interesting alternative pondfish.

PLANT LORE

With the short damp days, January can be a dreary time around the pond. No matter how hard you try the conventional pond plants simply do not provide colour through the winter months, and a few Reed mace stalks rattling in the wind are hardly colourful.

However if you brighten up the area around the pond then the pond itself becomes less dreary. Low growing evergreens like *Cotoneaster horizontalis* turns red in winter as the berries ripen. The dogwood family provide colour right through the winter with their brightly coloured barks. Try *Cornus alba* "Sirbirica" for its bright red winter shoots and red leaves. *Cornus stolonifera* "Flaviramea" is also a good choice for its bright green winter shoots.

By using some Dogwoods behind the pond (this is *Cornus alba* "Sirbirica") you can have winter colour when everything else is rather drab.

DIPPING DEEPER

Freshwater shrimp pair feeding on leaf.

The Freshwater shrimp (*Gammaris*) is probably the most widely known of the freshwater crustaceans. Up to 25mm long they spend most of their time hiding amongst the stones and gravel on the bottom of the pond or amongst very dense vegetation where they spend their time feeding on organic debris thus helping to keep the pond clean.

They favour clean running water, and this coupled with their dislike of light and the need to find shelter from predators, means they are often found in large numbers in pond filter media. The chances are that if you lift a foam section from a filter or examine a brush closely it will be covered with these tiny creatures or the closely related Freshwater louse. A healthy population of Freshwater shrimps is indicative of a healthy pond.

FISHY TALES

About two years ago I helped a friend to drain a large pond on a fish farm which had been used for Carp fishing and was being converted for Trout. We had great fun as we netted large Carp, Orfe and even a few Goldfish - and then we came to the 15cm layer of mud on the bottom. In the mud we found lots of tiny gold brown fish, some only 2.5cm long others up to 10cm and I could not resist rescuing as many as I could find.

About 50 found their way into a cold water tank in the office but after a couple of months their rapid growth meant transfer to an outside pond where they continued to thrive. As they grew they continued to change and what started out as a nondescript shoal of little brown jobs is now an interesting and varied shoal of pond fish.

One or two of the larger ones, now over 15cm long, are clearly Common carp but several have completely changed colour ranging from white, through yellow and orange to almost red.

Shape has also become more defined and whilst most have taken on the characteristic Goldfish shape at least two are the classic pearlscale shape and already having difficulty in swimming normally. Finnage is also varied with some starting to develop the long tail of the comet and there is even one white, comet like fish with a red spot on its head.

DISCUS PROBLEM SOLVER

Our resident Discus expert **Tony Sault** solves another batch of your problems.

Discus often use Amazon sword plant leaves to lay their eggs on. Here you can see the newly laid eggs which look like yellowish beads on the plant leaf directly below one of its parents.

Breeding success

Q My shoal of Discus in my 350lt community tank are now approximately 18 months old and quite large, two have paired off and begun spawning on an Amazon Sword plant leaves. The first two batches of fry disappeared overnight so I put a divider in to give the pair a chance. This has worked to some extent even though it is not a perfect fit as some of the fry have been seen on the community side and then disappeared. When will the remaining fry be large enough to remove from the parents as I can set up a smaller tank for them when required?

John Stevens, Newcastle-upon-Tyne.

A Congratulations on your success so far. As you have already determined, without the divider the pair have little or no chance of success in a community set up. You can remove the remaining fry at approximately 2 weeks old. Watch for them migrating from the parents and picking at other foods on plants or substrate. The tank they are to be put into should be filled with water from the parents' tank when you do water changes, this will ensure they are not shocked when moved. You can feed them initially on newly hatched brine shrimp or finely crushed granular or flake fry foods.

Whipping boy at risk!

Q A month ago I introduced 3 small Discus into my community tank, I intend to put more in when I feel confident that they will be OK as I have heard that they are hard to keep. Now one appears to be very aggressive to the other two. Should I remove this one to give the other two a chance?

K Bailey, Dorset

A Young Discus are a very strong shoaling fish and feel more secure in higher numbers. I am afraid 3 is the worst number that you could have chosen as you get a dominant fish, a sub dominant fish which defers to the boss, and a whipping boy picked on by the other two. Consequently, this leads to one fish growing slowly and one that is only allowed enough food to survive and not thrive. The answer is not to remove the dominant fish but to increase the size of the shoal as soon as possible, then the pecking order will reform. Even in a large shoal one fish will always be on the bottom rung of the ladder, accept this as a fact of life and the others should be fine.

First attempt at breeding Discus

Q I would like to have a go at breeding Discus. I have kept them before with reasonable success in the past. I will be setting up a tank specifically for a pair as I do not want to grow them on for a year in the hope of obtaining a pair. What size tank will be OK for them? This will be bare except for heater and external filter.

P Sharman, Birmingham.

A My standard size breeding tank is 100cm x 50cm x 50cm. This is a good size for one large pair but it is also large enough to hold a batch of fry for a reasonable length of time. A friendly word of warning, the fry grow rapidly and in my opinion you need 2 spare tanks of this size to hold the growing fry of every producing pair you have. Good luck and please let me know how you go on.

Can I cure "Hole in the head disease"

Q One of my shoal of adult Discus has developed 2 holes above one of its eyes and I have read in a book that it is Hole in the Head disease. Can this be cured or will I lose the fish? It is still normally coloured and feeding OK. I have a small hospital tank that can be used to quarantine it.

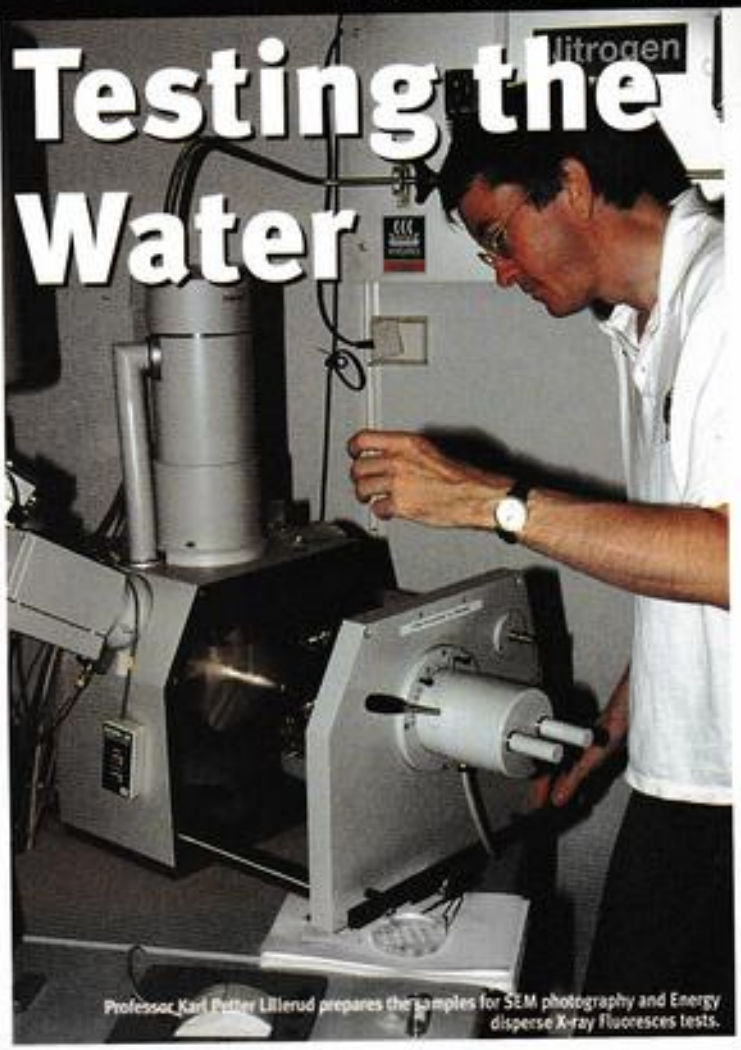
Bernard Kaye, Leeds.

A It certainly has the symptoms of Hole in the Head disease but you should not lose the fish. Hole in the Head is not the scourge it once was. Set your hospital tank parameters as close as possible to the main tank parameters and place the sick fish in it. Then slowly raise the temperature to 32°C. You need to work out the volume of the hospital tank, then visit your local Vet where you should be able to obtain some Metronidazole tablets - the dose is 1 tablet per 20 litres of water, crush these into a fine powder then pour over the surface of the tank. This will slowly dissolve over a couple of days. Do not do a water change or lower the temperature for at least 1 week, after which the fish should be fine.

Testing the Water

Alf Nilsen evaluates the results of his great experiment.

ALL PICS BY BIOQUATIC PHOTO - A.J. NILSEN



Professor Karl Petter Lillerud prepares the samples for SEM photography and Energy disperse X-ray fluoresces tests.

The most difficult, but perhaps also the most interesting aspects in the project was to see how different chemical parameters in the aquarium change over time. We have tried to follow some elements over a period of some months to see how some of these might influence the skeletal composition of one species of stony corals.

TEST METHODS

Water samples were collected regularly from the aquarium (in the beginning each two weeks, later on once a month). Each sample was filtered and stored in plastic containers and stored frozen or cold. The samples from the period November -96 to May -97 (6 months) were shipped to Prof. Marlin Atkinson, Hawai'i Institute of Marine Biology, where they were tested by ICP (Inductive Couplet Plasma Spectroscopy). This method is very accurate with respect to concentration. Unfortunately some containers leaked during transportation and therefore some results had to be calculated from the other tests.

Skeletal samples of *Acropora microphtholma* were tested by Energy Disperse X-ray Fluoresces, which can track all elements in the periodic table showing which elements are present relative to the others, but does not give exact data for the amount of the individual element.

Water parameters

Freshwater was used for preparing "kalkwasser" and a little nitrate was added to the aquarium in this way. Phosphate, nitrate and ammonium must all be regarded as major sources of nutrient for the algae. Both nitrate and ammonium declined rapidly during the first two weeks. The high concentration of nitrogen during the first two weeks must be linked to the release of nutrient from the fresh live rocks added and is normal in such situations in newly decorated reef tanks. Phosphate increased from almost 0.005 to 0.07 ppm (that is a 14 times increase) during the first two weeks and then slowly declined to reach a concentration of only 0.008 ppm. The phosphate is probably also a result from nutrient release from the fresh live rocks, but seems to build up more slowly than nitrogen. All three elements stabilised at concentrations that are in the range of those found at many natural reefs.

Dissolved Organic Nitrogen (DON) showed the opposite development during the first 3 months of the experimental aquarium when the inorganic amount of N declines rapidly during the first 2 weeks, the DON increases to reach a maximum concentration of 0.689 ppm after one month and then decreases only slowly. The continuous growth and development of various algae in the system supports the idea that DON remains high in the system.

The concentration of Dissolved Organic Phosphate (DOP) also increases slightly and does not reach a higher concentration than 0.013 ppm which must be regarded as very

CALCIUM A PROBLEM

Calcium is an obvious problem in the aquarium. The concentration of Ca2+ has never been higher than 355 ppm and declined steadily. The maximum concentration is at least 50ppm below the average concentration found in natural sea water (400-420 ppm is usually regarded as the normal value). It is difficult to maintain "kalkwasser" saturated over a longer period of time. We did some experiments and measured the pH of the "kalkwasser" in the container over time and kept the temperature constant to 25Co. We used a special *iks aquastar* that was designed to measure pH up to 12.45 (about equal to that found in saturated "kalkwasser"). During the first week the pH declined to pH-values around 11.0 and thereafter continued to decline reaching very low values around 10.0 – 10.5. This has a great effect on the concentration of dissolved Ca2+ in the "kalkwasser". Saturated "kalkwasser" (at 25Co) has a pH of 12.4 and a [Ca2+] of 900ppm. When the pH drops to 12.0 the [Ca2+] drops to about 175ppm and reach a minimum of only 5-6ppm at pH=10. It is important to keep the "kalkwasser" saturated, but this has proven to be very difficult in this project. "Kalkwasser" usually keeps the pH in the aquarium high, normally to values around 8.5-8.7 in the afternoon. Kalkwasser adds a lot of OH- to the water, ions that are used for neutralising the organic acids produced during decomposition of organic material and vast products continuously produced in the aquarium. OH- are sacrificed and the buffer capacity (the ability of the water to withstand changes in pH) is saved. In addition to this the high pH probably prevents a potential phosphate pool in the aquarium being dissolved.

Alkalinity

The alkalinity starts out very high reaching almost KdH = 12 but soon declines stabilising around 4.5 KdH . Natural seawater has an alkalinity varying from 5.9 - 7.0 KdH, which is higher than the conditions in the aquarium. Low KdH is typical for aquaria refilled with "kalkwasser" without the addition of CO_2 to adjust the pH. Still the buffer capacity is good due to the amount of OH- -ions added constantly. A too low alkalinity probably affects coral calcification negatively. Although the growth of corals is good, we would have preferred that the alkalinity was higher stabilising at levels around the natural values. In the typical "kalkwasser" aquaria where the KH is low and the pH is high, there are probably sufficient carbonate ions present to give a good calcification.

low in this connection, and lower than the concentration of inorganic PO_4.

Silitium is another algae nutrient utilised by the diatoms. In the nature it is found as silicic acid in a concentration of 2-3 ppm. The concentration of Si declines to reach a concentration of about 0.05 ppm after about one month. This corresponded with the decreasing growth of diatoms in the system.

The Strontium debate

Strontium has been much debated by reef aquarists. In the sea the average concentration is about 8 ppm. The element incorporates in coral skeletons, but whether the element is significant to the corals has been much debated. The importance of Strontium in reef aquaria is also uncertain. We know that the element accumulates in the coral skeletons and if not added in the aquarium the concentration of Strontium declines. The adding of Strontium Chloride to the reef aquarium is probably mostly based on intuition. In the sea salt we used the concentration of Sr is about twice as high as in the sea. The experimental aquarium. (16.65 ppm vrs. 7.89 ppm). The concentration of Sr started out high (12.8ppm) but declined steadily reaching the natural sea-concentration after about 3 months and thereafter declined further. This supports the theory that Strontium is consumed in a reef aquarium.

Boron is present in the sea as $B(OH)_3$ and $B(OH)_4$- and the concentration is about 4.5 ppm. In the experimental aquarium the concentration at day zero was about 1.1ppm higher than this and the concentration declined slowly compared to those of Strontium and Calcium.

GENERAL TRENDS

These studies only indicate that most inorganic elements and compounds decline. Even major elements like Sodium and Magnesium steadily decline. More studies and more testing over a considerably longer period of time needs to be done to verify this in more detail. Trace elements should definitely be followed.

Accumulation in coral skeletons

As the concentration of some elements and the ratio between the elements in the reef aquaria obviously differ a lot from those found on the coral reefs, it was interesting to study how this affected the composition of the skeletons in stony corals.

***Acropora microphthalma* from the family Acroporidae was well suited as a subject to study changes in the coraline structure.**

The parent colony of *Acropora microphthalma* was first collected at Suva Reef, off Suva, Fiji in 1990 by Dr. Bruce Carlson and brought to Waikiki Aquarium, Hawaii. The colony was quite large, more than 2 metres in diameter, growing on the seaward reef slope at a depth of about 20 metres, at the base of the reef slope where the reef flattened out and became more rubbly. It grew among a lot of other rocks and corals in a fairly rich coral reef area.

In 1991 a couple of off-springs were given to me by Dr. Carlson and legally brought back to Norway where they have been successfully grown and spread to many aquarists. *Acropora microphthalma* grows fast, forming dense bushes in the aquarium.

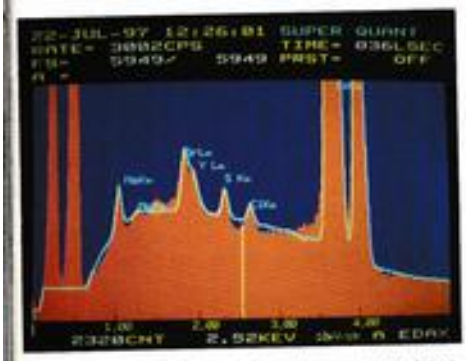
Over the years I have collected several skeleton samples of *A. microphthalma* in various aquaria. All samples originate from the fragments brought back from Hawaii in 1991. Waikiki Aquarium runs open system tanks where sea water is taken from a well in the ground and fed into the outdoor tanks. This water is rich in inorganic nutrients (SiO_3, PO_4, NO_3 and NH_4) and dissolved CO_2, but low in organic nutrients (DON and DOP).

In December 1995, Dr. Carlson collected some fragments of *A. microphthalma* growing close to where the parent colony →

once lived, dried them and shipped them to Norway. We now had several skeleton samples of the same genetic material grown in different aquaria (open and closed systems) that could be compared to the material from Suva Reef.

In the summer of 1997 the first analyses of the skeleton samples were done at the Chemical Institute, University of Oslo. We took SEM photos of the samples, but it was not possible to physically observe any difference in the structures of the samples. The Energy Disperse X-ray Fluoresces tests did, however, indicate significant differences in the skeletal element composition among the four samples tested.

The results



Energy disperse X-ray Fluoresces tests detect all elements present in the skeleton. Their levels are displayed in a graph like this one. Here we have enlarged the area showing some interesting elements found in much lower concentrations than Calcium. The peaks show sodium, potassium, strontium, ytrium, sulphur and chloride.

The major part of the skeleton is of course built from aragonite ($CaCO_3$) where Ca and CO_3 have been set to compose 40% of the compound. One could expect that Na and Cl originated from remains of dried sea water found on top of the skeleton. If so the [Cl] would be 2mol% while it in fact it is 0.04-0.37 mol% indicating that salt remains are not present in significant quantities.

The readings in general indicate that elements are accumulating differently in the two colonies grown in closed systems (Kor5 and Kor25-1) than in the Fiji sample (Kor24-1) and the open system Waikiki Aquarium sample (Kor4).

Most striking is the content of Mg in the sample that has been grown for 5 years in a closed system. Magnesium is negligible compared to the parent colony which has more than 26 times as much Mg in its skeleton.

***Acropora microphthalma*... changing in elements over a 5 years period**

	Parent colony, Fiji	After 5 y. in an aquarium
Na	1,74	0,85
Mg	0,79	0,03
Sr	0,31	0,30
Y	0,00	0,20

all values in mol%

The concentration of Na, Mg, Sr and Y in the skeleton of *Acropora microphthalma*. Comparisons of the parent colony with the same genetic material growing for 5 years in a closed aquarium.

Strontium

The content of Strontium is higher in the Waikiki Aquarium sample than in the parent sample from Fiji. The concentration of Strontium in the Waikiki Aquarium open systems was tested by us to be 11.5 - 11.9 ppm which is significantly higher than the natural concentration. The content of strontium from the 5 years grown sample is lower. The aquarium was tested in 1996 to contain 4.0 - 4.7 ppm Strontium which can explain the result. The concentration of Strontium in the experimental aquarium is steadily declining. We lack the value for 20. July -97 although we must expect that [Sr] continued to decline. If the decrease continued at the rate shown over the first 6 months (where the concentration was reduced by 50%), an estimated [Sr] at the time of sampling would be around 5.0 ppm. The skeleton sample from the experimental aquarium has the lowest content of Strontium of all four samples. Strontium was added regularly to the aquarium where Kor5 was growing, but never added to the experimental aquarium.

A surprising find

The most surprising finding is that of Yttrium . Yttrium (element #39, atomic weight 88.91) is found in most rare-earth minerals. Moon rocks and meteorite samples contain yttrium and yttrium is used as a "phosphor" to produce the red colour in television screens. In the sea Yttrium is present in extraordinary small amounts. Spotte (1979) gives a concentration of only 0.0000013 ppm. Yttrium has no known biological functions in living organisms. The element is present in the ground where I live and is probably transferred to the aquarium through the fresh water where it accumulates in the coral skeleton.

SUMMARY

The experimental aquarium has from my point of view been successful. The experiment has shown that it is possible to grow corals and to develop a functional system without doing any water changes and the growth rate of the corals can be significant, even in a small aquarium. At the same time it has indicated that the skeletal composition of the corals seem to differ a lot from their natural appearance. Further studies should indeed be done on this subject. The tests also indicate that the corals accumulate many of the elements present into their skeletons and if an element lacks or declines in concentration in the water, it might very well be lacking or declining in the coral skeletons also. The concentrations of most of the inorganic elements that were tested in the experimental aquarium decline. The micro animal fauna is diverse and several settling organisms develop and establish themselves in the aquarium. The aquarium contains a few organisms that must be regarded as very rare. It is clearly a tool for the study of tiny tropical reef organisms. The Modern Coral Reef Aquarium has come to stay!

SEM photo of *Acropora microphthalma*, sample "Kor25-1" . The bar is 2mm long. Note how the axial corallite penetrates the centre of the branch and how the radial corallites bud off along the margin.

Today's Surgery

Malawi cichlids like this *Metriaclima phaeos* need very hard and alkaline water to thrive.

Lance Jepson, our resident vet looks at three vital aspects of water which many fishkeepers confuse.

Aspects of pH, GH and KH

Fish, like every other creatures, have evolved in a particular habitat and are adapted to that habitat in such a way that their survival is optimal. For all aquatic animals this evolution must involve an ability to deal with the water conditions in which they find themselves, and two particular features of any body of water are its pH and its hardness.

Unfortunately water hardness and pH seem to be two aspects of water quality that are easily confused, something in part to do with the fact that in one aspect they are related. A working knowledge of them is essential for the health of fish and invertebrates, especially once you start expanding your skills into the more taxing areas of marines or specialist freshwater fish such as Discus or Rift Lake cichlids.

pH in nature

In nature, the pH of a body of water depends upon a variety of factors:

- The underlying rocky strata. Water flowing over limestone beds will be quite alkaline with a high pH.
- Surrounding geology. Rainwater runoff and sources of onflowing streams will all contribute to the overall pH. High peat levels will increase the acidity of surrounding water.
- Presence of organic material. Large amounts of leaf litter and branches will produce a fall in pH as this material rots down to form excess carbon dioxide and a wide variety of acidic compounds.

One of the reasons why geology plays such a part is that certain compounds can be present in water that combine with or

pH

- 1 pH is a measure of how acidic a sample of water is and is measured on a scale of 0 to 14.
- 1 If the pH is below 7.0 then the water is said to be **acidic.**
- 1 If the pH is above 7.0 then the water is said to be **alkaline.**
- 1 If the pH is at 7.0 then the water is said to be **neutral.**

How acidic a sample of water is depends upon how many hydrogen ions (H^+) there are in solution. If there are lots then it will be more acidic; if there are few then it will be more alkaline. Because of the way that pH is measured, the difference in the hydrogen ion concentration between two points on the pH scale is ten times. This means that:

- There is a ten times increase in the concentration of hydrogen ions between pH 6.0 and pH 5.0.
- There is a one hundred times (ten times ten) increase between pH 6.0 and pH 4.0. So Water at a pH of 4.0 is *one hundred times more acidic* than at pH 6.0.

Acidic substances are those that when dissolved cause an increase in the number of hydrogen ions (measured as a fall in pH). An obvious example is sulphuric acid (H_2SO_4)

$H_2SO_4 + H_2O = SO_{42}^- + OH^- + 3H^+$
Sulphuric Acid Water Sulphate ion Hydroxide ion Hydrogen ions

So sulphuric acid is very acidic as every molecule of it causes the release of three hydrogen ions when dissolved. Sulphuric acid is not usually a problem in fishkeeping, but carbon dioxide is. Carbon dioxide is released as a biproduct of respiration by fish, invertebrates, plants and filter bacteria. With high stocking densities carbon dioxide levels can become significant. Carbon dioxide dissolves readily in water forming carbonic acid, which further breaks down into bicarbonate ions and hydrogen ions. This is why carbon dioxide makes water go acidic.

$CO_2 + H_2O \quad H_2CO_3 \quad = HCO_3^- + H^+$
Carbon dioxide Water Carbonic acid Bicarbonate ion Hydrogen ion

This process is readily reversible and so the proportions of the different forms are constantly varying, depending upon the amounts of the other components. The above reaction is constantly trying to balance itself out so the process is said to be in equilibrium.

When two rivers of differing chemical qualities meet, as here where the Rio Negro (a blackwater river with very low pH and hardness) meets the Rio Solimoes (a white water river with much higher pH and hardness values) it forms a kind of chemical barrier where the fish from one river can not swim into the other until they have mixed together much further down stream.

release free hydrogen ions and so have an effect on the pH of water. They can literally take hydrogen ions out of the equation! These substances are known as *buffers* and the most important of these buffers is the carbonate-bicarbonate system.

- The carbonate-bicarbonate buffer relies on the equilibrium between dissolved bicarbonate ions and carbonate ion.

HCO_3^- H^+ + CO_3^{2-}
Bicarbonate ion Hydrogen ion Carbonate ion
(usually as calcium carbonate)

- The carbonate ion is usually present as a calcium carbonate molecule and so is present in anything made of calcium carbonate such as dolomite, coral sand, limestone and tufa rock. If the water becomes more acidic (more H^+) then some carbonate ions dissolve and combine with them to make bicarbonate ions. This removes the extra hydrogen ions and so stops the pH from falling. If on the other hand there is a fall in hydrogen ions (the pH is increasing - more alkaline) then the bicarbonate ion divides to release a free H^+ and a carbonate ion is deposited back out of solution. This prevents any temporary swings in pH.
- There are limitations to this system, however. Over time an organic coating develops over any calcium carbonate media or decoration. Also phosphate ions bind on to the surface forming a thin layer of insoluble calcium phosphate. Both of these events reduce and eventually stop the release of calcium carbonate into solution.

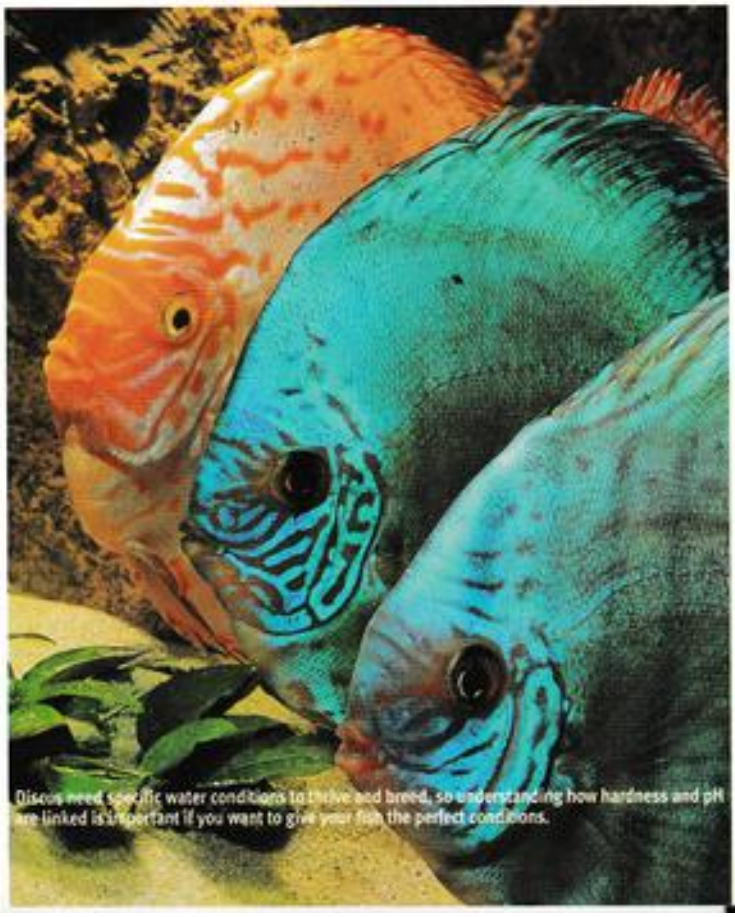
Hardness

Water hardness is a different thing from pH altogether. It is a measure of the *total* dissolved mineral content of a sample of water i.e. all of the calcium, magnesium, carbonates, sulphates etc. There is a huge variety of minerals that can be found dissolved in water, ranging from calcium carbonate (that is head and shoulders above every other mineral in quantity) to those substances found in minuscule amounts, such as zinc, cobalt and molybdemum (no wonder these and similar ones are often known as *trace elements*).

Calcium carbonate is the commonest dissolved substance in the world's waters and so most means of measuring water hardness is based upon the concentration of this substance. For consistency the overall hardness of water, usually referred to as the General Hardness or GH, should be written as *milligrams per litre of calcium carbonate* (*mg/l Ca CO3*). It may occasionally be seen as *parts per million* (*ppm*) - its the same thing. Good water hardness test kits will give you one of these values.

Very confused area

Unfortunately anyone who has tried to grapple with water hardness, or who has a



Discus need specific water conditions to thrive and breed, so understanding how hardness and pH are linked is important if you want to give your fish the perfect conditions.

CONVERTING DIFFERENT HARDNESSES

Fortunately the different measurements of GH can be readily converted into *mg/l Ca CO3* by using the following conversions:

- One degree (1o) Hardness (USA) = 1.0mg/l calcium carbonate.
- 1odH (German) = 17.9mg/l calcium carbonate.
- 1o Clark (UK) = 14.3mg/l calcium carbonate.
- 1 milliequivalent (meq) = 50.0mg/l calcium carbonate.

HARDNESS VALUES

Water Hardness	General Hardness (mg/l calcium carbonate)	General Hardness (odH)
Very soft	0 - 50	0 - 3
Moderately soft	50 - 100	3 - 6
Slightly hard	100 - 150	6 - 9
Moderately hard	150 - 200	9 - 12
Hard	200-300	12 - 18
Very Hard	300+	18+

This beautiful marine tank requires careful maintenance by its owner Gary , to keep the water parameters healthy.

selection of books on fishkeeping will soon realise that there are several different ways of describing and measuring water hardness - something that can readily lead to confusion. This problem is worsened by the fact that in some cases the authors themselves appear to be confused by the issue.

The most important of the different scales is the German scale of degrees Hardness (odH), because it is so often quoted. This is used extensively throughout the hobbyist literature and reflects that historically, German aquarists have helped to lead the way in ornamental fishkeeping. If your water has a hardness of 5 odH, then the water has a hardness of (5 x 17.9) = 89.5 mg/l Ca CO_3.

The water in marine aquaria should be very hard because of all the dissolved minerals in it, although in reef aquaria with large numbers of actively growing stony corals removing dissolved calcium, the GH can be affected. Otherwise GH is, in reality, only of significance in freshwater aquaria.

How pH and GH are linked

High pH waters tend to be high GH for the same reasons - namely the high levels of dissolved minerals, in particular calcium carbonate. Calcium and carbonate concentrations are connected to each other. As carbonate levels rise, it combines with free calcium ions to form calcium carbonate that will come out of solution. The same happens if calcium levels rise. The result of this is that if calcium levels rise, carbonate levels fall. The same is true for the opposite situation. The calcium part will affect GH whilst the carbonate will influence pH via the carbonate-bicarbonate buffering system. This brings us to where pH and hardness overlap - a measure known as the Carbonate Hardness (KH).

The KH is a measure of the levels of carbonates and bicarbonates dissolved in water. These ions are able to mop up spare hydrogen ions via the carbonate-bicarbonate system and so have an effect on pH. This leads on to some important points:

- These ions form the major part of the buffering system of any aquarium or pond.
- These ions tend to reduce acidity, and so KH is often referred to as the *alkalinity* of a sample of water. This frequently leads to confusion with pH alkalinity and should, I feel, be discouraged. Always try to refer to it as the KH.
- Note that *total alkalinity* is a measure of all buffers present and not just carbonates and bicarbonates. This is different again from KH.

Lethal pH drops

The KH is an important parameter that needs to be monitored in high pH, high hardness aquaria such as Rift Lake and marine displays. If the KH reserve becomes depleted by the production of too much acid - something characteristic of heavily stocked tanks or aquaria with large, predatory fish, then we can start to see serious falls in pH. These falls can take place over a relatively short period of time and be very stressful, or even fatal to your fish.

Maintaining KH in marine aquaria

The above preamble has been made in order to demonstrate a common mistake that arises by confusing pH, GH and KH. This mistake is often seen in heavily stocked marine aquaria. Common values would be :

- The pH is high at 8.3
- The GH is very high at 300 + mg/l.
- The KH is reasonable at 110mg/l

Over time acidic compounds (including carbon dioxide) are being continually produced by the inhabitants. In addition both calcium and carbonate are being absorbed by invertebrates present such as any corals or echinoderms, so that there is a gradual fall in KH and dissolved calcium. The pH would start to fall towards 7.8; lower would spell death for many of the inhabitants. The KH will fall to below 80mg/l, yet the GH still remains high. How you deal with this matters.

- A good way of dealing with this is to do regular partial water changes. This directly tops up the calcium and KH components. An alternative is the addition of an appropriate buffer that contains calcium carbonate and bicarbonate to augment the KH.
- Problems can arise if a suitable buffer is not used. Its an easy mistake when there are many different water supplements marketed for marine aquaria today. If we add calcium in the form of calcium chloride (a commonly used calcium supplement), then we will increase the calcium levels and the GH (the overall hardness) but crucially not the KH because there are no extra carbonates or bicarbonates.
- 'Kalkwasser' (calcium hydroxide) has a temporary effect, as the hydroxide ions bond to any free hydrogen ions and so spare any carbonate ions. But this is only temporary. Without carbonate-bicarbonate backup the pH will eventually fall (once all the hydroxide ions have been used up), in spite of a high GH.
- Both of these forms of calcium supplementation can affect the KH because, as they increase the calcium level, this will combine with carbonate and come out of solution leaving less carbonate available for the the carbonate-bicarbonate buffer system.

I have known of aquarists attempting to shore up a falling pH by supplementing with inappropriate calcium products, because they had confused pH with hardness. If you are adding supplements to your aquarium, always check what it says on the label. For marine aquaria measure calcium levels (and not GH) in conjunction with the KH. I hope that this article has helped.

CORRECT LEVELS OF KH

KH value	Comment
← 20mg/l	Too low. There will be insufficient buffering capacity for safety. Use an appropriate buffer to increase the KH.
20 - 80 mg/l	Suitable for fish found in low pH waters.
→ 80mg/l	Suitable for fish found in neutral to high pH freshwaters. Very good buffering capacity.
105 - 125mg/l	Suitable for marine aquaria.

Danio kyathit was described as a new species by Fang in 1998 and are often referred to as "Gold ring" Danios in the shops, however, there are two types of "Gold ring" Danios with the other possibly an undescribed species.

Ring the changes in Danios

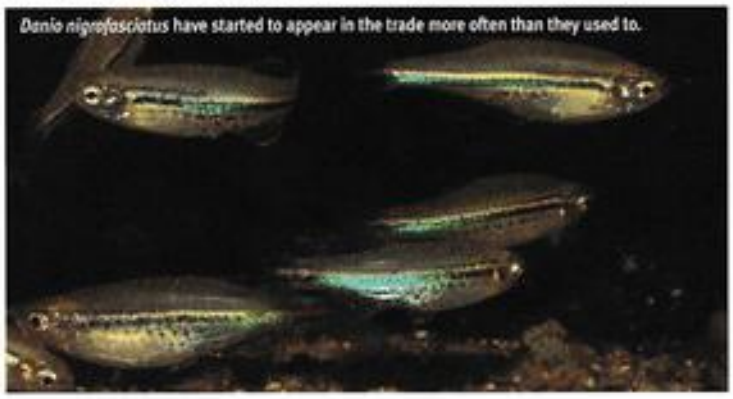
Danios make delightful community fish, here Ian Fuller introduces a couple of the more recent introductions to be found in aquatic shops today.

ALL PHOTOS BY IAN FULLER

Danios have been around since the very early days of the aquarium fish hobby, most have all the right qualifications for being very popular aquarium fish. They are relatively small, ranging in size from 4cm for the smallest species ,up to 12cm for the largest. All are very peaceful and will not bother any other tank mates; their colours are striking with blue, gold and red being most prominent. All species ,especially the smaller ones, look fabulous in shoals and a group of a dozen will not break the bank. The larger species are also very colourful and look very good when kept in shoals but will require somewhat larger aquaria to house them comfortably.

Pretty little gems

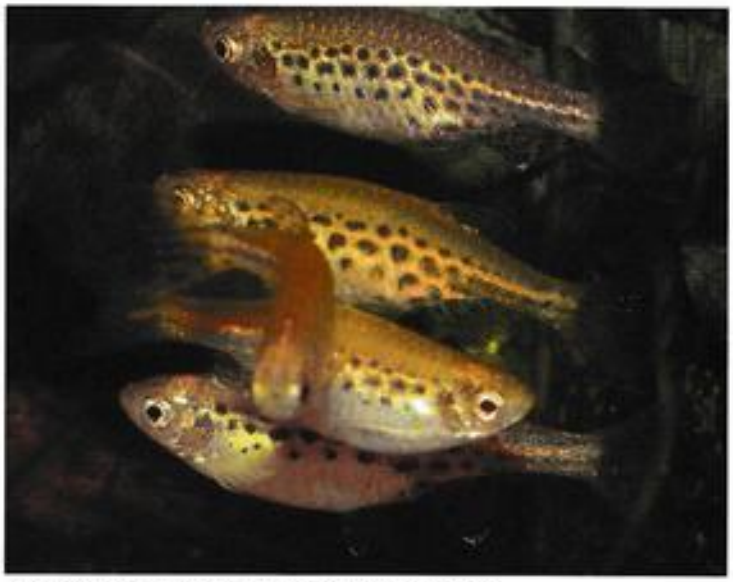
I have been mainly interested in the smaller members of the group , having bred and raised many thousands over my thirty years of fishkeeping. The main stalwarts of the group have always been *Danio rerio* the Zebra Danio, its colour varient (known as *Danio frankei*) the Leopard or Spotted Danio, and *Danio albolineatus* the Pearl Danio. These are commercially bred on Asian fish farms and exported in their thousands all over the world. There



Danio nigrofasciatus have started to appear in the trade more often than they used to.

probably isn't a tropical fish shop anywhere in the world that does not have these fish on sale.

Other members of the group, such as *Danio kerri* from Thailand and *Danio nigrofaciatus* from Myanmar, occasionally find their way into the hobby, but this is usually in small numbers and often as contaminants with other species. However, more recently shipments of *Danio nigrofaciatus* and *Danio choprae*, both originating from Burma ,have become more readily available. There has also been the appearance of two new species , The first one is *Danio kyathit* Fang, 1998 and the other is possibly an undescribed species, both species originating from Myanmar. They are both being referred to in the trade as "Gold ring" Danios and are very striking with their brilliant blue spots on a golden background. The difference between these new arrivals is in the size of the body markings, one has spots that are quite large and the golden background gives the appearance of a series of golden rings along the sides of the body. The other, *Danio kyathit* is a slightly larger fish with smaller more numerous ovate spots and the illusion of golden rings is not so apparent. Both species are beautiful looking fish and should very quickly establish themselves as favourites in the hobby.



This 'Gold ring' Danio could well turn out to be another new species.

Aquarium conditions

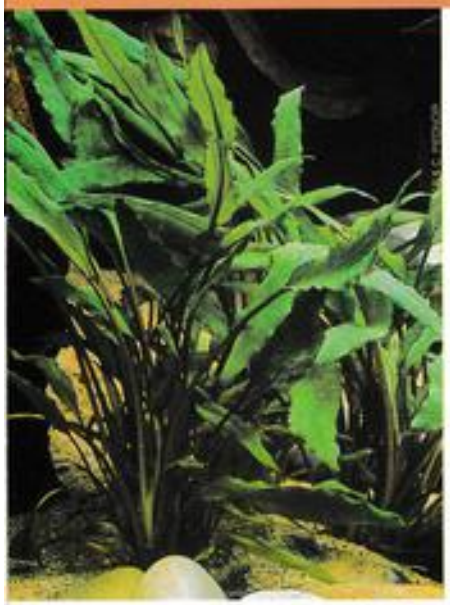
The Danio is generally considered to be a fish that prefers cooler water than the so-called average tropical fish, naturally inhabiting the waters of fast moving streams. Temperatures around 20° C (68 - 72° F) will suit them best .*D. kerri*, *D. nigrofaciatus* and *D. choprae* inhabit slightly warmer waters and are better suited to temperatures around 24 - 26° C (75 - 80°F). The ideal set-up for these species would be an aquarium with dense thickets of fine leaved plants along the back and sides of the aquarium, leaving a large open area towards the front which provides plenty of open swimming space . Reasonable water movement created by a power filter would also be beneficial, as this would simulate a flowing stream. However, one species that does not need plants in the aquarium is *D. kerri*. Plants are not normally found in the streams and creeks on two islands in northwest Thailand where this species is found, therefore a natural habitat aquarium set up for this species would be that of a rocky stream and should consist of a fine gravel substrate with areas of large pea gravel and large pebbles. Because of the lack of plants in its natural habitat this species has evolved as a substrate spawner. Most if not all of the other members of the genus are considered plant spawners, however most can be induced to spawn over gravel.

This beautiful little gem is *D. choprae*, another recent Danio introduction well worth seeking out.

CAPTIVE SPAWNING

The ideal breeding set up would be, a 20 - 25 litre aquarium, which should only be filled to a depth of 12.5 - 15cm, with the same water parameters as the water the fish are normally kept in. A layer of large pea gravel or glass marbles should cover the entire bottom. An adult trio of fish should be selected, choose a well-rounded female and two of the brightest coloured males. The brightest males will almost certainly be the most dominant in the tank. Place the trio in the breeding aquarium in the evening and allow them to settle leaving the aquarium lights off. These fish usually spawn in the early hours of the morning as the sun is rising.The eggs are released in small clutches and fall to the bottom and settle in between the gravel/marbles, where they cannot be reached and eaten by the adults. The shallow water gives the eggs a chance to reach the gravel before the adult fish can reach them, especially when spawning takes place near the surface. Depending on the species involved the eggs take between two and four days to hatch. The tiny fry require very small food for a good start in life and some of the commercially made very fine powdered or liquid foods fit the bill very well. The fry grow very quickly and soon look like smaller versions of their parents.

Plants for everyone



Cryptocoryne undulata is a very distinctive looking plant which has pretty leaves which look a little different from most other plants in this group.

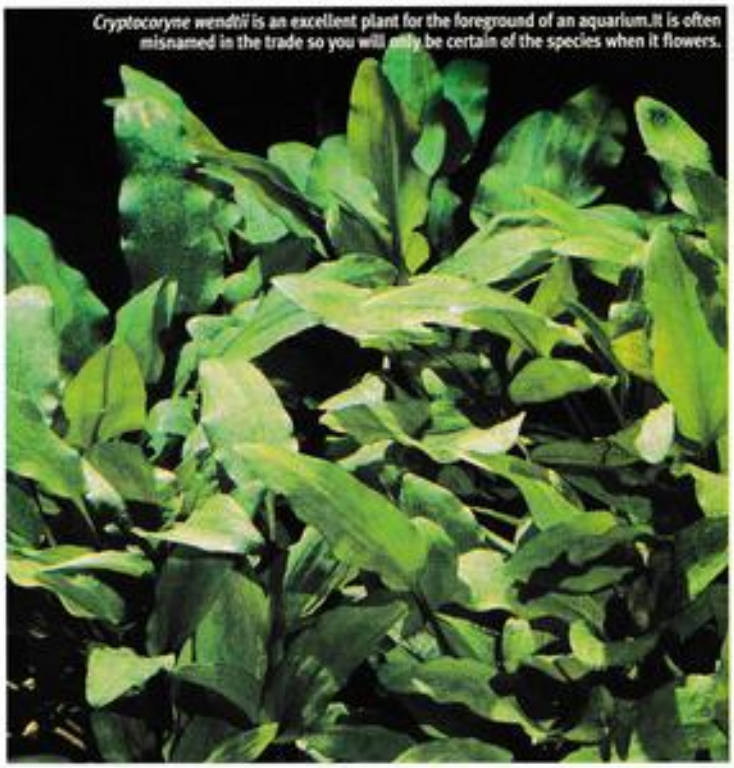
Peter Hiscock focuses on the ever popular Cryptocorynes.

For the next few articles I will be focusing on some popular groups of aquarium plants which lend themselves well to the aquarium environment. The Cryptocorynes are an ideal place to start, containing a range of species that provide something for any aquarium. The name itself is a bit of a mouthful and I must admit I'm not entirely sure of the correct pronunciation.

'Crip-toe-CORE-in' or 'Crip-toe-co-RYE-nee' seem to be both acceptable, but to make things easier I like to simply call them *Crypts*. Attempting to pronounce Cryptocoryne is a doddle when compared to attempting classification of some specimens. In nature there are many local variations within Cryptocoryne species and in the past few decades the group has undergone a large number of reclassifications. In the aquarium trade there are also a number of crosses and the result is often a plant named from a confusion of an original name, a new name and a crossed name! In many cases, it is only possible to accurately identify a plant when it produces flowers, which are usually quite distinctive.

Little light and fluctuating water

The crypts are part of the Aroid family, which includes the similar *Lagenandra* sp., and are found in nature in the tropical Asian area from India to Papua New Guinea. The majority of Crypts grow in lowland forests, swamp areas, riverbanks and streams and ditches. Life in these areas often means reduced light conditions and varying water levels. The Crypts cope well with such variations and will grow quite happily out of water providing their roots are kept damp. Some Crypts actually require a period of growth above water and may only live a limited period submerged. Due to the likelihood of growing above water the



Cryptocoryne wendtii is an excellent plant for the foreground of an aquarium. It is often misnamed in the trade so you will only be certain of the species when it flowers.

Cryptocoryne moehlmannii grows taller than many other Crypts and looks good when used as a clump towards the rear or sides of an aquarium.

CRYPTOCORYNE ROT

The biggest failure fishkeepers may experience with Crypts is the dreaded Cryptocoryne 'rot', a disease which can quickly reduce a Crypt to a pile of mush. The occurrence is common but little studied, it is likely that high nitrates, unstable or sudden changes in water conditions and possibly high temperatures all play a part. Crypts are therefore not ideal plants for new aquaria where water conditions may fluctuate, and are best introduced once an aquarium is a few months old. Cryptocoryne 'rot' is often seen when leaves rapidly disintegrate or the development of expanding holes and will quickly spread if the affected leaves are not removed. The disease seems to only affect the leaves and I have experienced Crypts that have lost all their leaves and appear dead only to re-grow from the undisturbed root a few months later. If you should experience this problem, it is best to remove any affected leaves as they appear. I have also used a product called Cryptoplus by *ESHA*, which seemed to work rather well to halt symptoms whilst the plant recovers.

Crypts are structured to obtain virtually all their nutrients through their roots in preference to leaves. In the aquarium this translates to a requirement for a nutrient rich substrate and the addition of an iron rich substrate fertiliser will greatly improve growing success. Another side effect of using roots almost exclusively for nutrient gain is that Crypts do not require a high dissolved carbon dioxide (CO_2) content in the water so CO_2 fertilisers are not required. In fact, most Crypts will do well in a "low-tech" aquarium with only moderate lighting providing that the water is free from floating debris and the substrate is rich in nutrients.

Plenty to choose from

Many species of Crypts are now readily available in aquatic retailers and vary in size, shape and colour. The majority of Crypts are short plants with numerous spade-shaped leaves, which vary from green to olive-green and brown. The plants produce new leaves on short stems from a central root and although slow-growing the leaves are normally robust and a small plant can soon become a very attractive specimen. Some Crypts sport very elongated leaves and can grow quite large. *C. aponogetifolia* is the largest crypt and can apparently reach up to 1m tall, although under most good conditions will only reach about half this height. In contrast, *C. parva* is the smallest Crypt and will only reach around 6cm, making an excellent plant to use in large numbers in an open foreground area. Most Crypt species do best in medium-soft water but a few common varieties including *C. affinis, cordata* and *crispatula* will only thrive in harder conditions. One variety, *C. ciliata*, can even be grown in slightly brackish conditions.

For an established aquarium, the Cryptocoryne group of plants are generally easy to care for plants, which are mainly ideal for the foreground. I have seen some very nice displays that use Crypts exclusively, with little specialist equipment and fairly standard lighting conditions. Next month I will look at the more demanding Amazon swords (*Echinodorus* sp.) group of plants.

Cryptocoryne lucens

RECOMMENDED CRYPTOCORYNES:

Cryptocoryne parva

This tiny Crypt will reach up to 6cm and is best suited to an open foreground area with reasonably good lighting. The leaves are thin and elongated and the defining point between the stem and leaf is visually lost. This Crypt makes a good alternative to other more difficult 'grass-like' carpet forming plants.

Cryptocoryne affinis

The crinkled leaves of this plant and its suitability to harder water have made *C. affinis* a popular species. The leaves vary in colour and shade, usually sporting a light green glossy appearance and growing up to 25cm. An easy species which will grow well once established before slowing down as it ages.

Cryptocoryne beckettii

This 'typical' Crypt has large oval olive-green leaves born on a darker stem and makes an excellent specimen plant. The plant is best given room to grow into a thick, bushy specimen and will reach up to 15cm. Will do well in almost any water conditions.

Cryptocoryne pontederiifolia or moehlmannii

Both these plants appear virtually identical, growing to around 20cm and sporting bold oval olive-green leaves often with a dimpled surface. These two Crypts are undemanding but do prefer medium-soft water.

Cryptocoryne undulata

The leaves of this Crypt are long, dark green and ruffled with prominent reddish stems. The plant is a good display specimen although it has a slightly 'unorganised' look. Good lighting is a benefit and the plant will reach around 15-20cm but can grow up to 35cm as it ages.

Cryptocoryne wendtii, willisii, and nevillii

These Crypts are often mis-identified, crossed and generally labelled fairly uselessly. They all stay fairly small, usually below 15cm and will grow well amongst other plants in the foreground area.

Cryptocoryne beckettii has several different forms which are available in the shops.

C.crispatula balansae has several different leaf forms depending upon lighting.

CRYPT ESSENTIALS

Crypts do not do well in tanks less than a few months old.
A well-established nutrient-rich substrate is highly beneficial.
Most crypts like soft water but a few will only do well in medium-hard conditions.
Crypts are best kept in water between 18-25°C.
Crypts will flower if grown near the surface with humid air above.

Koi world

Bernice Brewster looks back at how shipping Carp around the world has changed.

In 1881 The Great Exhibition was staged in Hyde Park, an exhibition which was designed to show that this country was a world leader in technology and innovative ideas. Following in the wake of the Great Exhibition, other smaller ones followed, not the least the International Fisheries Exhibition, which took place in 1882 and the Prize Essays from this Exhibition were published in 1883. One of these prize winning essays is interestingly entitled '*Foreign Fish Most Suitable for Introduction into British Rivers and Waters*'. Interestingly, the fish which the author, Mr W. Oldham Chambers was most keen to encourage was the carp, although this species had already been introduced here approximately two hundred years earlier but he regarded these as inferior to the German farmed strains. In terms of paper work and documents required for the movement of fish from Europe to the UK, in 1883, there were none as the Diseases of Fish Act restricting the movements of live freshwater fish into this country was implemented in 1937 and revised in 1983. Under the current regulations, freshwater fish can only be imported with permission of the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) and on arrival, samples including Koi, are taken for routine health screening, including virology.

These Koi are for sale at a market in Thailand, however, this may only be the first leg of a very long journey.

Difficulty of moving fish

The difficulty of importing fish back in 1883 was literally one of moving them. The fish would be transported in canisters and the journey by horse drawn carriage and crossing the Channel would take several days and probably very few of the carp would survive. We therefore take it very much for granted how much easier it is for us to transport Koi from one continent to another. Plastic bags, available oxygen, insulated boxes and of course, continually improving times for air transport mean that it is unusual for Koi to die during transportation. None the less the conditions in the bag are less than ideal. The fact that oxygen gas is used to inflate the bag, prior to shipment does mean the water contains more than adequate amounts of this vital gas for the entire journey. As Koi breathe, they consume oxygen but carbon dioxide gas is given off as a waste product and this accumulates often to dangerous concentrations by the time the fish have been in transit for 24 or more hours.

Prior to shipment, the Koi will have been unfed for several days and this reduces the amount of solid waste which is void into the bag during transit but even though they have not eaten, there will still be a considerable amount of nitrogenous waste in the form of ammonia shed into the water. In the confines of the bag, the ammonia concentration can be frighteningly high; I have certainly measured concentrations of 120 mg per litre in the shipment water. The poor water conditions in the shipment bags must cause the Koi considerable stress and discomfort, without any doubt. It takes the Koi several months to fully recover from the stress of shipment.

The Japanese Koi breeders have been harvesting their mud ponds for some months now and of course, they will be shipped to us as quickly as possible but we must remember that when we buy them they are still recovering from their journey.

Shade-Seekers

Red-foot tortoises are a fairly large but attractive species.

Continuing the theme of caring for tropical tortoises, **Bob** and **Val Davies** move on to some available species which require more humid conditions and hides for shade

Red-footed tortoises are a South American tortoise which can be found both east and west of the Andes from Panama to Argentina. Inhabiting the edges of tropical rainforest it grows up to 50cm. It is an attractive creature with the carapace a blackish coloration with yellow patches. The legs have orange-red scales hence the common name. There are also yellow/orange scales on the head. Occasionally a few wild caught specimens are imported but there are captive bred youngsters available.

Captive care of Red-footed tortoises

These are large creatures. If maintained indoors then an adult pair will require an area approximately 210 x 210 x 60cm. Ideally part of a room is better. They can be maintained outdoors in warm weather but

WHAT'S IN A NAME?

Red-footed tortoises are in a state of flux with regard to their scientific name they are usually called *Chelonidis carbonaria* but some authors refer to them as *Geochelone carbonaria*.

Kinixys erosa has a distinctive serrated and angular carapace.

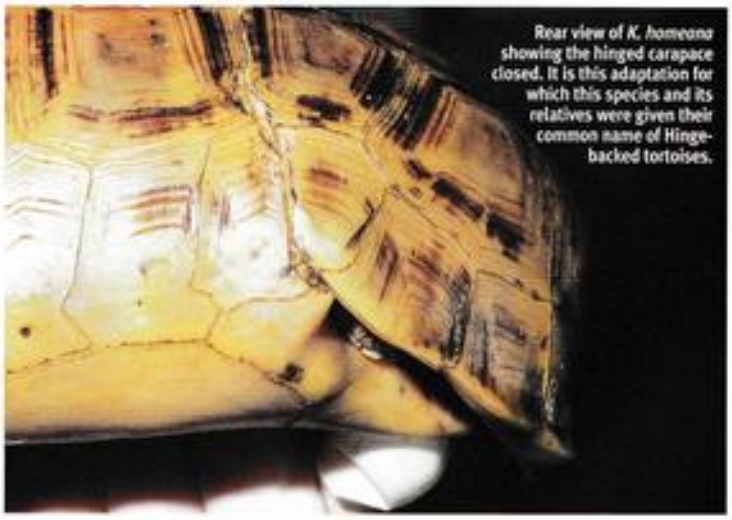
Kinixys homeana is easily distinguished by the steep rear end of the carapace.

will need heated indoor accommodation for cool nights and during winter. Hides for shade are essential. In the wild these tortoises would move into forest shade after initial basking. A shallow water dish should be provided both for drinking and bathing. A light daily spray can be given. If maintained indoors then adequate ventilation is needed. Some means of egress should be provided for young Red-foots to leave the water tray safely. It is important to avoid over wetting or creating sodden conditions. If maintained indoors full spectrum UVB light is essential. Temperatures should range from 24°C at the cool end to 32°C at the hot spot, falling to 22°C at night with a 12-14 hour photo period. Since Red-foots do not need all the photo period with bright light some of the heat can be provided using infrared heaters and bright spot bulbs used for a few hours to stimulate feeding.

Red-foots like fruit. Their favourite is Banana to which they can become addicted to the extent that they refuse other foods. Alternative fruits to offer include Melon, Mango, Peaches and Grapes together with a wide range of leafy vegetable greens. These tortoises are known to eat carrion. However protein in large quantities is inadvisable. For an adult a small thawed rodent once a week is sufficient. Our specimens would happily 'gnaw' a cooked chicken leg from which some of the meat had been removed. As with other large tortoise species adequate supplies of calcium are needed for bones and correct shell formation. Failure to supply this will result in deformed and thin shells.

Hinge-backed tortoises

Hinge-backed tortoises (*Kinixys erosa* and *Kinixys homeana*) possess a hinged carapace at the rear which, when closed, gives extra protection to the hind legs if attacked. Both species come from West Africa. *K. erosa* has a strongly serrated carapace whilst that of *K. homeana* has a steep slope. *K. erosa* grows to about 30cm, *K. homeana* 23cm. Their native habitat is forests and swamps. These tropical tortoises are somewhat secretive. An adaptation to their lifestyle i.e. active at dawn and dusk are the eyes. These are larger than tortoises from areas where they bask in bright sunlight.



Rear view of *K. homeana* showing the hinged carapace closed. It is this adaptation for which this species and its relatives were given their common name of Hinge-backed tortoises.

...End Point

Finescale tigerfish make entertaining pets, but make sure you have an aquarium big enough to house a fish that grows 40cm long.

Derek Lambert profiles a fascinating predator which is an ideal subject for those aquarists that want a little more out of their fish.

Throughout the world there are fish which have black vertical stripes on a pale background. They lurk among the grasses and other submerged aquatic plant life and wait. As time passes the other fish and aquatic organisms which live in this habitat forget that they are there, and because of the coloration fail to see them . So bit by bit they swim closer to where these fish lie in wait. Finally one swims close enough for the predator to strike and grab its unsuspecting prey.

Finescale tigerfish

The fish described here is the Finescale tigerfish. They inhabit freshwater rivers, lakes and reservoirs, where they can be found in areas with a lot of submerged branches and other aquatic plant life. As adults they usually snap up shrimps, crabs, worms, insect larvae and small fishes, while youngsters make do with zooplankton.

For many years these were included in the family *Lobotidae* but have now been separated into a family of their own and the genus name has also changed. So in most books and other literature you will still find them listed as *Datnioides microlepis*, but in the more up-to-date publications you will find them listed as *Coius microlepis* which is their current scientific name.

There are at least three species in the genus but of these *Coius microlepis* has the deepest body depth of between 2 to 2 1/2 times the standard length of the adult fish. There are several colour forms known, fish from mainland Southeast Asia usually having 5 full bars and those from Borneo normally having 6 to 7 bars.

Distribution

They are found in Asia with specific reports of them being collected in the Chao Phraya basin, Mekong basin of mainland Southeast Asia, Kapuas basin in western Borneo and Musi basin in Sumatra. They are considered a very valuable food fish and will often be found for sale in the local markets as well as for the aquarium trade.

In the aquarium they may grow to about 40cm long, so this is a large fish needing bigger than average quarters. Although not a messy eater, this predator will need excellent filtration. For this reason it is a good idea to use an external power filter to keep the aquatic environment pristine.

Freshwater fish not brackish

Most books will tell you this is a brackish water fish, in fact it is perfectly happy in freshwater and can adapt to a wide range of water conditions without too many problems. Obviously any changes will need to take place over a period of time and it is best to confirm what water conditions the fish has been kept in prior to purchase.

PROFILE

Name:
Finescale tigerfish

Scientific name:
Coius microlepis

Size:
45cm

Aquarium type:
Species tank

Distribution:
Southeast Asia, Thailand, Borneo, Cambodia and Sumatra.

Diet:
Live foods, or their frozen equivalents but some young specimens will learn to take pellets.

Temperature:
22-26°C