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DECEMBER 2002 £2.95

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Welcome

As a teenager I was lucky enough to attend a lecture by Dr Herbert Axelrod which included lots of pictures from his trips to the Amazon. I said to my parents at the time "That's what I want to do" but never really expected I would ever make my dream come true. A couple of years ago I finally made it out to Brazil and had the experience of a lifetime. Now we are able to offer our readers the chance to make their dreams come true and experience the Amazon first hand. One lucky reader will even win a free trip. Sadly, my boss says I can't enter the competition. Why, I have no idea! After all, if I win it nobody would think I had fixed the result, would they?

As I put this magazine to bed we are just reaching the end of the show season, so I have been busy adding up the points to see who has won. With Tony Tyson not in the running this year, it looked like last year's runners up (Brian & Steven Critch and Ian Wright) would walk to an easy victory. In fact, it looks like it is too close to call between them and a Scottish competitor. Bradford show looks like it will be the decider and both parties will be fielding all their best fish.

Christmas is nearly upon us and everyone's thoughts turn to the thorny problem of presents. What to buy a fish fanatic for Christmas can be a real problem. As a youngster it was always very easy for my parents to buy me Christmas presents. The main present would be another fish tank (where to put it was left until after Christmas), and my small presents would be a mixture of a couple of new fish and maybe a few bits of equipment for my established tanks. Of course, that does have a knock on effect as the years go by, which is why ten years after they bought me my first tank, we had to move house to one with a garage which could be converted into a fish house.

Computer problem

I said a few months ago that if we had any more computer problems I would go back to using quill and ink. Well the computers seem fine at the moment, it was just the Q&A and my e-mail addresses that were hit last month. So, if you sent an e-mail and have not had a reply, please send it again. Hopefully, all the bugs (including the bugbear virus which has been doing the rounds) have been ironed out of the new system, and everything will work properly now, but I doubt it.

Until next month,
Happy fish keeping



What's in this month's issue of *Today's Fishkeeper*?

With Christmas just around the corner, we have put together a pull out guide of great ideas for presents. All you have to do is pull it out, circle what you want and leave it lying around the house for your loved ones to find. Hey presto! You finally get the Christmas present you really want, rather than a ruff jumper you have to wear from time to time just to keep everyone happy. Since Christmas time can be a really hectic period for

everyone, Mary Sweeney has put together an aquarium which is all peace and harmony. This is a tank you can truly relax in front of and put all the cares of the world aside. Andrew Caine has some invaluable advice for those of you who want to start keeping Stony corals. Now that the pond is settling down for the winter, Dave Bevan has some essential advice on how to help your fish survive the coming months. Enjoy!

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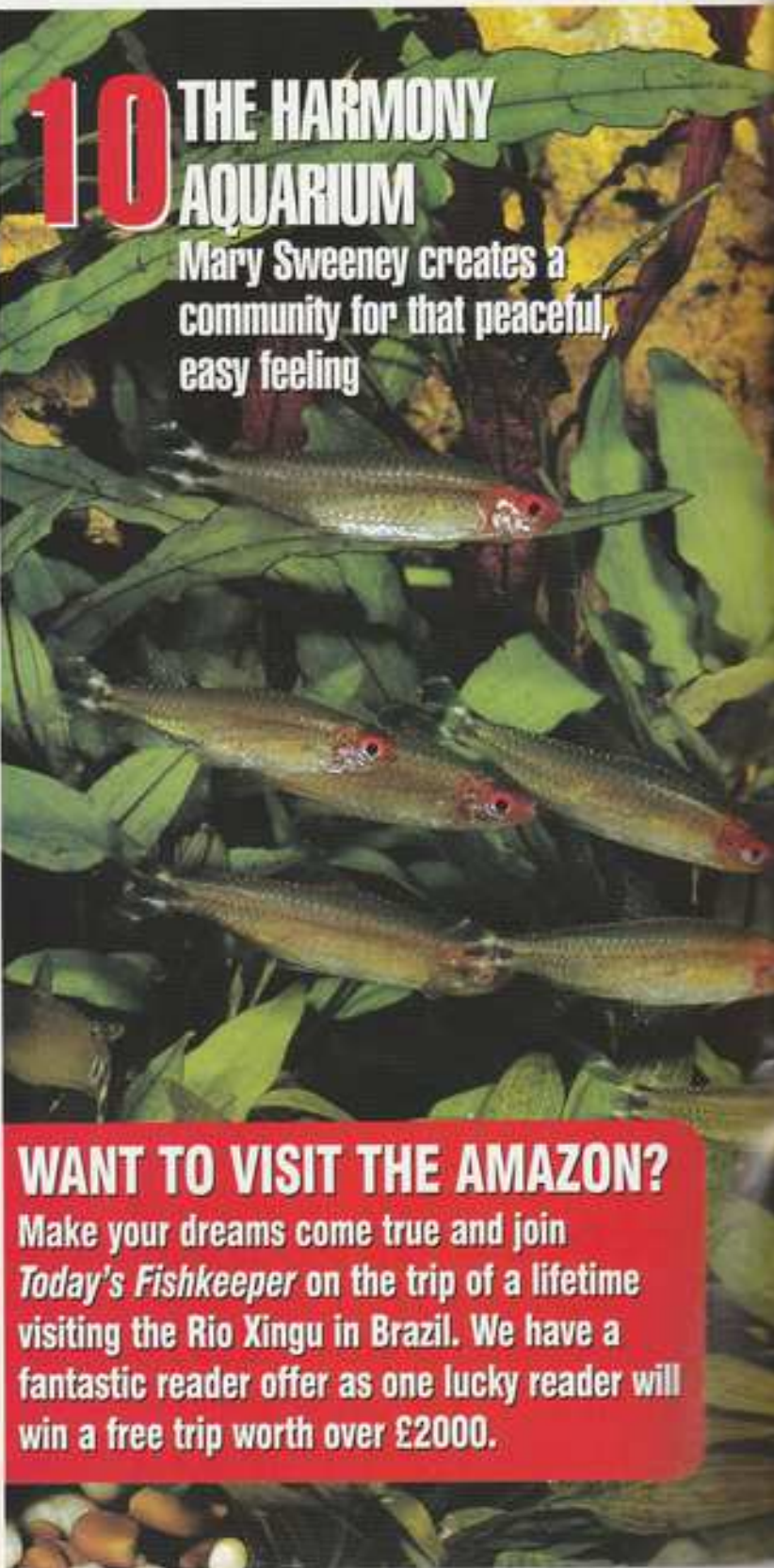


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WANT TO VISIT THE AMAZON?

Make your dreams come true and join *Today's Fishkeeper* on the trip of a lifetime visiting the Rio Xingu in Brazil. We have a fantastic reader offer as one lucky reader will win a free trip worth over £2000.

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KEY TO SYMBOLS:

Keep an eye out for these handy symbols to help you with your fishkeeping.

	COMMUNITY		MID WATER
	NON COMMUNITY		BOTTOM
	CARNIVORE		TEMP
	SHOVELLER		10cm SIZE
	HERBIVORE		NOT SUITABLE FOR KEEPING IN CAPTIVITY
	SURFACE		



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PLANTS

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Four more great plants for your aquarium.



Starting Point...

Just beginning in the hobby?

Pat Lambert writes especially for you...



PHOTO: NICKY WILSON © NICKY WILSON

Harlequins are a peaceful, shoaling fish, it is a case of the more the merrier.

A GREAT CHOICE FOR A SMALL COMMUNITY

The Harlequin rasbora must be one of the favourites of all time. Long before air transportation of fishes Harlequins were transported from Asia to America in large vats on ships. These fish had to be tough to survive. Rasboras as a group are very peaceful community dwellers, displaying beautiful colour and containing some of the tiniest fishes you will ever see.

The Harlequin is deeper bodied, being less streamlined than many others in this group. Males and females are the same size but males are redder in coloration, this intensifies when the fish is in breeding

condition with the whole body having a deep rosy glow. The dorsal and caudal fins are also bright red in the male. A breeding female is much plumper and has a more golden hue.

They are easy to tell apart when in breeding condition but often need to be looked at more closely in the shop. If the water is slightly acidic, the fish will give you a magnificent display of colour and life. It's a small fish only growing to 4.5cm. They are adaptable and easy to feed. Go on, treat yourself to some, you won't be disappointed.

I HAVE BEEN WRITING THIS COLUMN FOR over a year now and Young Aquarist for two years before that. This means that beginners have now become fishkeepers with three years experience or have disappeared from the hobby. Allowing for the fact that fish keeping is a passing fancy for some people before moving on to other hobbies, there is a band of beginners who fail because they receive conflicting advice and are unsure what to do. The *First Time Fishkeeper* supplements were written for this band of beginners and are available for any of you just starting out.

The range of equipment available is rather bewildering and makes choosing the right equipment difficult. Different retailers have their own particular ideas and if the beginner visits several outlets for advice he/she may come away totally confused and end up with a load of kit that is not necessary. It is a good idea to find yourself a good retailer and stick with them. You are not just buying a piece of kit you are buying the good advice and help that goes along with it. Often you need to know how to use equipment effectively. I know several retailers that have club nights after hours when all aspects of fish keeping are discussed, and these include the merits or otherwise of particular pieces of equipment. If you go regularly for your fish food to your aquarium shop, you will get to know like minded hobbyists who will share their experiences with you.



Today's top tip

Each aquarium is unique. Be guided by your instincts, if the fish look good you must be getting it right, even though your methods may differ from others.

One further observation

I have found moving fish from one aquarium to another in my fish room can create problems for some fish and, conversely, some fish have flourished after a move, although the tanks appear to be the same. One of the things I have discovered over the years is that each aquarium is unique.



This fully mature Quetzal cichlid has a fully developed nuchal hump and wonderful head coloration.

A CHOICE FISH

The Quetzal cichlid (*Vieja synspilum*) is a relatively peaceful Central American cichlid as Central American cichlids go. Another common name for this fish is the Redheaded cichlid, as the whole head develops a beautiful red coloration. They are undemanding in their requirements but they do need plenty of space. Quetzals are usually purchased at a rather small size and, at this size can fit in with a community of similarly sized fishes, but they will soon require their own quarters. Sexual differences cannot be observed in young fish so if you want a pair it's best to buy a few. As juveniles they start to form pairs becoming quarrelsome with each other in the fight for their own territory, which in this instance means a large space all round. In the wild this species' territory extends several metres in diameter. This means that

WARNING

If you want a beautiful, planted aquarium these fish are not for you. Well bedded rocks and caves should be the furnishings for their tank.

a pair will need a large aquarium to themselves as they will defend their territory from all intruders. If you really want to keep these large Cichlids (the Quetzals grow to 30cm), you will need a large tank just for one pair. Some fishkeepers think they are fully adult at 15cm as they breed at that size. The male develops a nuchal hump at full size and it is only at this point that the sexes can be recognised. An adult pair of this species is indeed a glorious sight to behold and they can become real pets enjoyed by the entire household.

ANOTHER PLANT FOR YOU

I have found *Ambulia* easier to grow than *Cabomba* though it really depends on the species that you choose. *Limnophila heterophylla* grows quite well even under less strong lighting conditions and the normal parameters for tropicals, although it does not like it too hot. It looks beautiful when grouped in the back or mid region of the aquarium. It is quite a tall plant and a stand of these plants will grace any normal community tank.



Lost for Words

Freshwater stingrays have a skeleton which is made up of only cartilage.



Cartilaginous fish Cartilage is the tough fibrous connective tissue attached at the joints between bones. A major constituent of the young vertebrate skeleton, it is largely converted to bone with maturation. However, some fish such as sharks and skates have a skeleton entirely made up of cartilage.

Fasciata When this word is used in a fish name it means banded. *bifasciata* means two banded and *trifasciata* means three banded.

Gamete A mature sperm or egg capable of participating in fertilisation, derived from the Greek *gamete* (wife), *gametos* (husband), *gamos* (marriage).

Lamproys These fish like species have bodies shaped like an eel. Their tongue is covered with teeth and acts as a rasp. Many of them are predatory and parasitic on fishes. They often migrate from fresh to salt water and back again.

Nuchal hump A large swelling of the forehead in some species that indicates maturity. (See photograph of the mature Quetzal. The nuchal hump is seen on the male).

Piscivores Predatory fish who live on a diet that consists of other fish.

Sympatric Fish that share the same habitat in the same geographical region are known as sympatric species. Conversely, *allopatric* species live in separate geographical regions.



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The harmony aquarium

Mary Sweeney creates a community for that peaceful, easy feeling. PHOTOS: MAX GIBBS & M.P. & C. PIEDNOIR



Marie-Pasile and Christian Piednoir created a similar aquarium but based it around Gouramis and a much greater diversity of plants. For this aquarium to flourish, you should use a plant growing substrate, specialist lighting and add a CO₂ fertiliser system.

THIS TANK IS FOR PEOPLE WHO LIKE TO relax. It's the aquatic version of "Don't Worry, Be Happy." Enjoy!

There is nothing quite like a combination of peaceful fishes in a beautiful aquarium to take the edge off the end of the day. The suggestions that follow are for the design of an aquarium that is restful and relaxing to the senses. In this tank there are no surprise attacks or toothy predators, just handsome fishes and a beautiful and

harmonious scene. I suggest you place it close to your favourite easy chair.

The Actors

The headliner of this act is the Pearl gourami, *Trichogaster leerii*. There are few fish, tropical or marine, that can match an adult male Pearl gourami for good looks. That he's so nicely mannered as well makes him a real treasure. Supporting players are Rummynose

tetras (*Nemigrammus bleheri*); Bronze corys (*Corydoras aeneus*); and the Siamese algae-eater (*Crossocheilus siamensis*).

Pearls

The Pearl gourami is distinguished by the opalescent "pearls" that stand out against the iridescent reds and blues of the flanks. Were this not fancy enough, the rays of the anal fin are elongated in aroused adult

**Lambert Court,
Chestnut Avenue,
Eastleigh, Hampshire SO53 3ZQ
www.tetra-fish.co.uk**

TROPICAL: COMMUNITIES



One male and two female Pearl gouramis will be very happy together in this tank.

males. The Pearl gourami is blessed with a pair of long feelers (actually their specialised ventral fins) that do actually seem to be used for "feeling their way around." These fish grow to about 12.5cm. The males have a red breast and greater size and colour. The females have a more rounded dorsal and anal fin and are often seen to be rounder in the belly. Pearls are omnivores that will generally accept all kinds of live, fresh, and flake foods. Live Brine shrimp are a special treat as are live or frozen Bloodworms. The other fishes selected for this tank will also thrive on this diet, but add some vegetable flake foods for the algae eater.

Rummynose tetras

Rummynoses are a great schooling fish and usually stay in tight formation. For this tank, you could go to a dozen fish, but remember that these are not the hardest tetras in the shed. Add these fish last, after the filter is well cultured and the other fish have settled →

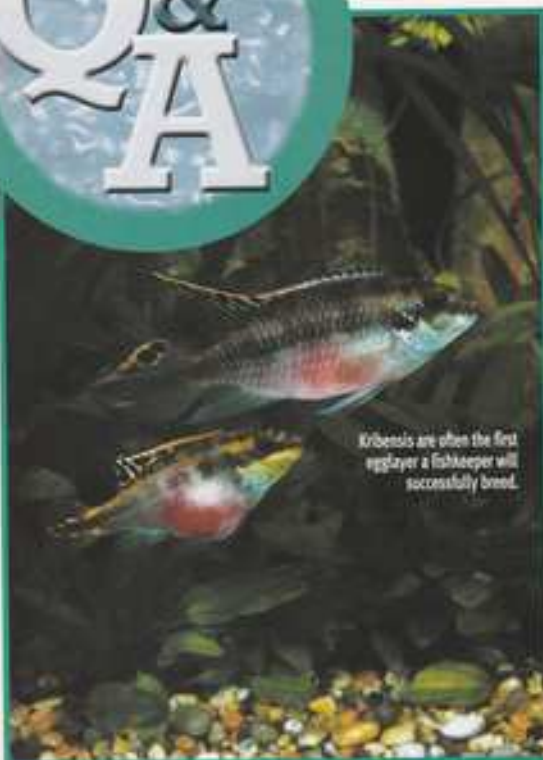


If you want to see Rummynose tetras at full potential they should be kept in shoals of six or more fish.

Q & A

Tropical

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Kribensis are often the first egglayer a fishkeeper will successfully breed.

Is my tank big enough for Kribensis?

I am a budding 14 year old fishkeeper and I am currently running 3 tanks, 2 tropical and 1 coldwater. I am contemplating setting up a 4th tank in the near future, tank size 60x30x30cm. It will have medium planting and I am hoping to include a pair of Kribensis *Pelvicachromis pulcher* with a few smaller fish. Is my tank big enough to house them? If not could you please suggest a few other fish that would be suitable.

Neil MacGeehan, Birmingham.

Your tank is fine for a pair of Kribensis and some other smaller community fish. Include some rockwork and caves so they can find somewhere to spawn when they want to and you may well have the chance of watching these beautiful Dwarf cichlids breed and raise their young. Good companion fish would be the smaller Danios, Hatchet fish for the surface and maybe some Platies or Guppies. Corydoras for the bottom of course and maybe a pair of Honey gouramis. This sort of mix will give your Kribensis a chance at rearing their offspring in the community.

Derek Lambert

Can I keep this halfbeak in my community tank?



Could you please give me some more information on *Nomorhamphus ebrardti* as I would like to try and keep it. Can it be kept in a community tank 75x30x30cm?

B. Coombes, Merseyside.

Star Letter



Nomorhamphus ebrardti was described by Popta in 1912. They originate from the island of Sulawesi (formerly called Celebes) and the original specimens were collected around Kabaena and Penango. They are occasionally imported as are several other closely related species with slightly different colour patterns. All grow to about 10cm and can be kept in the same way. Contrary to most books, they do not need or require brackish conditions. Most thrive in freshwater and will adapt to hard or soft water conditions. The pH should be neutral to alkaline, and the temperature should be kept at between 21 and 26°C.

They eat all commercial flake, pellet, and granular foods, as well as any live foods they are offered. Their mouth is large and designed to catch insects from the water's surface but they can also manage anything in the midwater region of the aquarium and will scoop up food from the substrate if it is something particularly tasty like chopped earthworms.

Water quality is very important with any ammonia or nitrite impacting on them earlier than many other fish. Overcrowded environments which are low in oxygen will also severely stress them. When selecting fish to buy, always look closely at the lower jaw, if it is badly damaged don't buy the fish. A bacterial infection will often have set in and it will be very difficult to cure.

Tank mates for these larger halfbeaks have to be big enough not to present themselves as a juicy meal. Any fish above 3cm in length will be safe enough. Otherwise they make good community fish which will do well in a community aquarium. They like some plant cover under which they tend to lurk. Females will drive away males when they are close to giving birth. Broods are born every 4 to 6 weeks and you can actually see the babies moving inside the mother before they are born. The fry are very large but are usually eaten or attacked in a community aquarium. If you separate the female into a well planted aquarium, the fry will stand a chance of survival. They eat small live and commercial foods a day or so after being born.

Derek Lambert



There are several different species of fish known as halfbeaks, but all can be kept in the same way.

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Let's shed some light on a plant problem

 As a relative newcomer to fishkeeping (12 months now), I've managed to overcome the main problems associated with inexperience. I find myself with one recurring problem - that of plants. I have always tried to make my community set-up look like a window into the aquatic world so have always planted real plants. However, after several independent trips to my local dealer, bringing back a variety of well looking species each time, I find that after three or more weeks the plants fade before my eyes. They become gangly and algae ridden finally turning into mush. I have a Jewel Rio 120 which has a substrate of fine sand which the said plants are pushed into. What am I doing wrong? Are there any varieties of plants that are more suited to the newcomer without compromising on appearance? I would welcome any insight you can give me.


John Peters, via e-mail

 Plants are the same as fish, they require certain conditions to thrive in an aquarium. The two most important elements are the substrate and lighting. Plain sand is not the best substrate for plants since it has no nutrients in it when the aquarium is set up. Fish waste etc will slowly add some nutrients but this takes time during which your first batches of plants will starve to death. The best way around this is to use a proper plant growing substrate in your aquarium. Since you may not want to completely strip your tank down at this stage, an alternative is to use plant food blocks or sticks and push these into the substrate next to plants when you initially place them. These get the plant food where you really need it - next to the

plants roots. Next we come to light. At a year old your tubes need replacing which is great because it gives the excuse to dump the ones which came with your aquarium and put in tubes specifically designed to grow aquatic plants. Use one of these with another tube which will enhance the colours of your fish. Remember to make a note of when you installed them and change them again in 12 months time. Another good idea is to add a CO₂ fertilisation system to your tank. Hagen brought out the cheapest and easiest to use system on the market just a couple of months ago.

Moving on to which plants to grow, you could be falling into several traps depending upon which species you are buying. First of all, not all plants sold as aquatic plants will live long term under water. A combination of ignorance on the part of some retail outlets and greed on the part of some others means you will often find unsuitable plants for sale. These sit in your tank until they fall to pieces. It usually takes several weeks to a couple of months depending upon species. The neat trap it is easy to fall into is buying plants which need very strong lighting to do well. Cabomba and others with feathery foliage never often than not will elongate and then fall to bits. If you change your bulbs then you should be able to grow them, but even so they can be a problem long term. Good plants to try are many Cryptocorynes, Amazon swords, Vallis and Ludwigia species. The leaves of Cryptocorynes and Amazon swords will probably die off but new ones will be coming through either at the same time or a week or so later. This is normal, just leave the roots undisturbed and they will leaf up as soon as they are settled into their new environment.

Derek Lambert

 This is a house plant which will die under water yet it is often sold as an aquatic plant.

Does CO₂ have any side effects for plants?

 I have a 25 gallon tropical community set-up with is running with full stock and is quite heavily planted. Ammonia = 0 Nitrite = 0 Nitrate = 0 pH = 8. The question is, can I control the pH with CO₂? My plants are growing fine at the moment and I don't want to jeopardise them, will the CO₂ have any bad effects on the plants or the fish?

Philip Alan Thowney
Via e-mail

 You must have got all aspects of the balance of your aquarium just right for it to sustain such lush plant growth. The addition of CO₂ will be beneficial for you in two ways. Firstly, it will support your plant growth further by providing them with an enhanced source CO₂ that they require for the formation of sugars. This will provide you with a belt-and-braces method for virtually guaranteed plant growth. Furthermore, the addition of CO₂

will, by chemical reaction, cause your pH to drop slightly (which in turn will help your plants by mobilising more soluble nutrients). The volume and rate that you should add CO₂ to your aquarium is governed by the volume of your aquarium and the KH (the aquarium water's ability to buffer a downwards pressure on pH). A KH test and careful interpretation of the CO₂ diffuser manufacturer's instructions will set you on your way.

Ben Helm

Today's Answers Expert Panel

- All Stalsberg Cichlids.**
Pete Liprot 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 let 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

www.hagen.com

Q&A

Tropical



Appear from being poisonous to clown loaches in 30-day treatments. Clown loaches will show signs of the illness in aquariums all by themselves.

Pest snails

I keep getting snails in my tank. I asked my local shop keeper, who is very helpful, and he suggested that I just crush them on the glass and the fish will eat them. I did notice he had them in his tanks as well. Most of my fish I have had for two years but these snails appeared about six months ago. I have two Clown loaches in the tank so I can't use any commercial snail treatments. Do you have any suggestions how I can get rid of these pests?
G. Miller, Newport.

You can be pretty sure that the snails you are having a problem with originated at a retailer you have visited recently, while purchasing plants or fish. You are correct to be wary about using certain treatments where *Botia* spp. are concerned, and to be honest I have never used chemicals to kill snails in an aquarium. The medications concerned can be quite toxic to many fish, not just Loaches, and the subsequent die-off of snails can be a source of pollution in the tank.

There are various methods that can be used to limit snails in the aquarium, including the use of home-made traps (and also at least one trap that is sold commercially), but they will only restrict numbers and not eradicate them.

I am surprised that your Clown Loaches are not dealing with this problem for you, they are well-known for their snail-eating prowess. It may be that the Loaches are so well fed that they simply cannot be bothered to eat them, so you could try reducing the amount of food you are giving for a few days and see if this encourages your fish to hunt out some free-range food!

You may need to do as your dealer suggests and crush a few snails (this would be a very quick death for the snail and certainly more humane than using a toxic chemical), this would increase the likelihood of the fish recognising them as a source of food. If you can, crush them between finger and thumb rather than against the glass.

If your Clown Loaches insist on being lazy, you could also try looking in retailers for the Indian Dwarf Puffer, *Tetraodon lineatus*. These are happy in pure freshwater, do not grow as large as many Puffer species sold, and are effective snail predators.

Pete Liptrót.

Do you have any Chocolate zebra plecs?

I have just seen a couple of Chocolate zebra plecs L270 (which I have put a deposit on). I am having trouble finding any information on these plecs. I have looked through the Aqualog book, and trawled over the net but keep coming up empty handed. If you can help in any way, it would be most welcome. I am looking for any info, diets etc. I am guessing mostly it's the same as the normal, but expensive, Zebra plec.
Barry Lee

You have chosen one of the many beautiful *Loosicariids* which have been imported over recent years. It is probable that it is a *Hypancistrus* species, similar to the 'Zebra Plec', but as yet undescribed by science. I'm sure you are aware that this is why the 'L-number' system was developed, to ensure that aquarists could all talk about the same fish without the confusion caused by varying trade names.

As with many of the smaller *Catfish* of this type, distinguishing the sexes can be largely guesswork until they are nearly adult. Once fully grown, male fish should be slightly larger than the females, and have a darker and more distinct colour pattern. The head of the male is often comparatively much broader than that of the female. They can also be identified by the longer odontodes in the 'cheek' area, and a greater number of bristles on their pectoral fin spines. Obviously mature females will be rounder in the body than males. Maximum size does not appear to be over 12cm, and usually smaller.

Although territorial, as long as they have sufficient space aggression will be limited to brief chases should they approach one another too closely, particularly during feeding time. They are likely to spend much of the day when not feeding in narrow caves or under pieces of bogwood. They require warm water between 27 to 29°C, but this must also have a high

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information on plecs – L270?

dissolved oxygen content so plenty of aeration/turbulence is required. Filtration must be of a high standard, they require very clean water as found in the large rivers they inhabit. A substrate of inert sand will be ideal and aquatic plants are not necessary. Water changes should ideally be 50% per week to keep nitrates to a minimum.

It has been found that many of these L-number catfish actually require a 'meaty' diet, as opposed to the traditional Loricarid fare of largely vegetable matter. Good quality tablet food would make a good staple, with sinking pellets and quality frozen foods such as shrimp or insect larvae as valuable additions. Live food is not necessary, as this can potentially be a source of disease. Some vegetable foods should also be offered such as algae wafers, peas or courgette slices, as this will help provide a balanced diet. Plenty of variety should be given, as each fish can be slightly different in its preferences.

Breeding has been achieved, and apparently requires similar methods to those which have been used to spawn the better-known Zebra plec. Narrow caves are preferred and some enterprising aquarists have made their own from aquarium-safe clay or similar. Sometimes they will refuse to spawn unless the conditions are just right, and so it is worth experimenting until a successful spawn is obtained.

On the subject of sources of information, there are several places to obtain this. There is a really wonderful Catfish-specific e-mail list, details of which can be found on the Internet at <http://lists.aquaria.net/fish/catfish/> which has as members many aquarists from all over the world, some of whom may well have had success with this fish.

There has been a book produced by an aquarist in the US, Larry Vires, titled 'Loricaridae: Tricks of the Trade'. This has been difficult to obtain for some while but is now becoming available again through a member of the

Catfish list mentioned above. Soon to be published is a Catfish Atlas that will cover details of reproduction for many species, written by two of Europe's premier experts on the subject, Ingo Seidel and Hans-Georg Evers. Look out for details of this exciting publication in this magazine soon.

There are some excellent web sites dealing with Catfish, including www.scotcat.com and the equally popular www.planetcatfish.com. There is also a thriving Catfish Society in the UK, The Catfish Study Group, and details of this can be found at both web sites listed above. Last but certainly not least, the above society will be holding their annual 'Catfish Convention' early next year, and the planned speakers are the two writers of the upcoming Catfish Atlas. No doubt they will be discussing their techniques for breeding species such as the one you are interested in, and they will of course be available to answer questions during the day. The date for this event will be available in the society information pages of this magazine in the near future, it is sure to be one not to miss.

Pete Liprot

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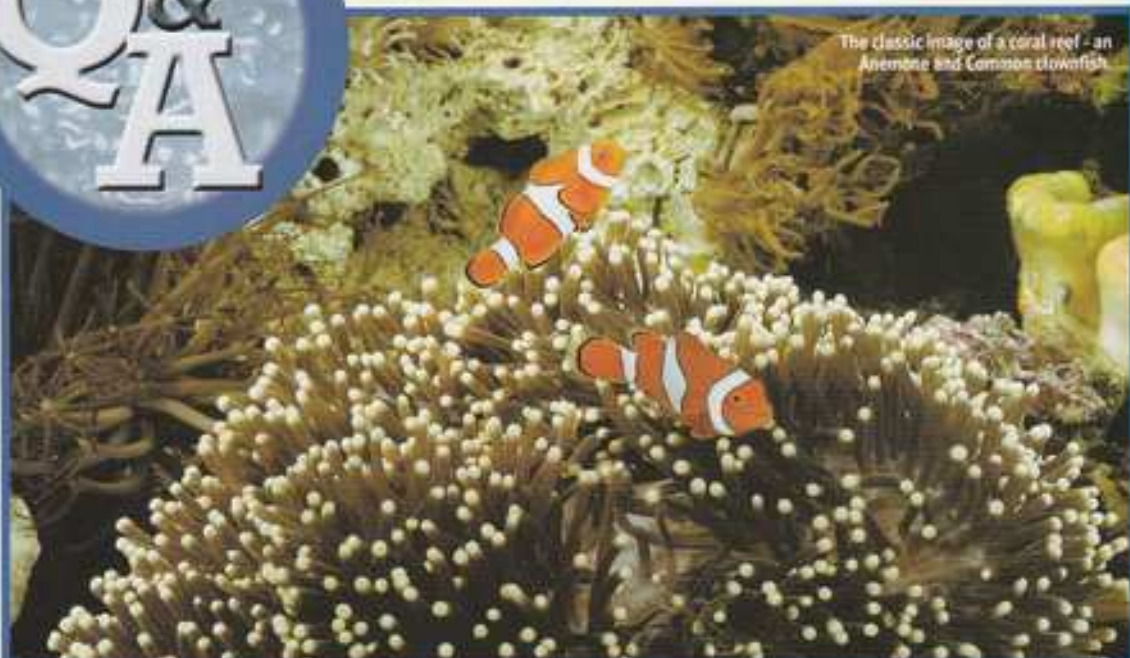


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Q&A

Marine



The classic image of a coral reef - an Anemone and Common clownfish

What equipment do I need to keep an Anemone/Clownfish set up happy?



I've had a tropical freshwater set up, since just a few days before Christmas and it's quite successful. My parents paid for most of the tank costs (in more ways than one!) and I bought the fish, plants, decor etc... Two of my angels have paired up and I'm getting a regular batch of eggs, which I've started to try and rear. All other tank inhabitants look happy and well. But frankly, one tank just isn't enough!

I'm writing to you because my room is soon to be refitted and I would love to have a go at keeping two Common clownfish with a host anemone, in a new tank next to my bed, but the problem I am having is which filter and light systems to use. The books I have, go into fine detail, but don't say which filters or lights are suitable to my needs, and they seem to contradict each other.

The new tank would be 90cm+ and contain a large amount of tufa and living rock. My present tropical tank contains a bio-life filter (trickle system, sponge and carbon filters), is this adequate and would I have to add more equipment? What lighting would show up an anemone best and keep it healthy? Could I also keep a couple of Cleaner shrimps and a Royal gramma with the anemone to keep things interesting? Your input would be greatly appreciated!

Mathew Ingham (14).



Keeping up two aquariums can be quite time consuming, however if you are prepared to put the effort in you will be successful in both your freshwater tropical and marine aquariums.



A 90 cm aquarium will be more than adequate in size for what you wish to keep. Filtration will have to be via external filters, one large for biological and a small one for chemical filtration, utilising phosphate removers and activated carbon.

Do not use tufa rock but utilise ocean rock, it displaces more water but is a safer option. Use as much live rock as possible and buy it from your local shop where you can see the quality before purchase. Place the rock directly on the glass base and then dress the front with a little thin scattering of sand.

A skimmer is essential and in the bedroom a very quiet one is also essential. Aqua-Medic and Dettec produce such skimmers. However, all marine aquariums produce noise, if you wish to turn off the skimmer to sleep then I have no problems with that.

A couple of powerheads (say 900 litres an hour) would be essential for your anemone, don't go too powerful or you will produce a storm 24hrs a day. Anemones require intense lighting so 3 or 4 T5 tubes will be your most cost effective way, two actinics and two whites would be best.

Regarding your anemone, this should be added when your aquarium is at least six months old, this will ensure that your water body has attained some degree of stability, remember patience is the name of the game here.

You can keep a couple of Cleaner shrimps, however it would be a cleaner tank with six, and a Royal gramma will be OK too.

Andrew Caine

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Mucus shedding in a Fox face

I introduced a Fox face to my new marine set-up 6 days ago and noticed a mucus like film coming off its body. It now seems OK and the shedding has stopped. Is this normal as it's a newly introduced fish and maybe stressed etc, or is it something I should be worried about?

Paul Leeman

The Fox face probably *Lo vulpinus* can undergo many changes when stressed. Coloration will change to a dull, colourless fish looking as if it is on the way to the great aquarium in the sky. The fish will recover the true vivid colours when de-stressed I have often seen this transformation in only two minutes.

The excess mucus production is common in quite a number of fish when stressed or infected. As you report the mucus production has stopped with no adverse effects, I think this is the result of travel and different water parameters between your aquarium and the dealer's aquarium.

Andrew Caine

The most common Fox face in the trade is *Lo vulpinus*.

Shift work problem



Controlling the photoperiod is important for marine fish and invertebrates. This is best done with a light controller which switches the lights on and off in the correct sequence.

I'm setting up a 75 x 60 x 75 cm Ecosystem reef tank. I work shift work, one week I'm up at 4:30 am and home at 3 pm and the next week I'm up at 8 am and start work at 3 pm and am not home till 11 pm. I was wondering what to do about lighting (timers etc) and also what fish would be better at feeding at irregular times? I'd be grateful for any help you could give.

Ash Via e-mail

Here we have a common problem with people who work irregular shifts, and it can be frustrating for the people concerned, however we have to think of our aquarium inhabitants before our personal pleasure.

It is imperative that we produce a stable photoperiod regardless of our lifestyle, or the poor fish and corals will not know what is going on and hormonal control will be all over the place - A total photoperiod of 12 hours is recommended 10 hours of full light intensity with one hour of blue actinic either side. When the lights go on and off is entirely up to you, you do not have to keep to our day and night cycle as long as the aquarium lighting never alters.

Feeding can be sporadic as in the wild there are no regular dinner times, food is acquired as often as possible. Keeping the feeding to set times is unnatural and should be avoided if possible. You can introduce any fish as long as you research their feeding requirements, as many differ and some starve to death with only one feed per day. It is much better to feed at least twice per day with all aquariums.

Star Letter Prize from AQUA MEDIC



Modern Coral Reef Aquarium books, written by Ail J Nilsen and Svein A Fossa are regarded as probably the most authoritative series of books for the marine hobbyist in years. At Aqua Medic, the leaders in Marine Aquarium technology, is pleased to present whichever of the three volumes, normally £55.00 each - desired to this month's star letter



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Sea view

In his regular monthly column, **Andrew Caine**, has a better Brittle star for your reef, a splendid fish which is definitely not safe in a reef tank and has some valuable advice for those thinking about keeping SPS corals.

So you want to keep SPS corals?



SPS corals, like this *Acropora millepora*, require more than just special lighting in order to survive long term.

FOR THOSE WHO KEEP MARINES, MAYBE you remember the giant leap in confidence it took to take the plunge. You might not be able to keep them alive and the cost setting up scared you to death. It was worry after worry and yet you did it. Now you might be wondering why you were so hesitant, yet for many of you the same worry might be creeping up on you again. Why? You are now thinking of taking the final plunge into that of keeping and growing the most difficult of corals, the small polyped Stony corals (SPS).

It was only in the mid 1980s that the first *Acropora* grew out of a piece of live rock in Germany. Now, only 17 years on, we can all embrace the challenge. We have to ask ourselves why these corals are more popular than ever before. The answer is quite simply, accessibility. Yes my aquarist friends, as a politician once said, "We have never had it so good". The equipment has now been developed and with the advent of T5 lighting,

and the low cost relative to a halide pendant, a surge of interest in SPS is evident. You also have the choice of purchasing SPS fragments for about £50 - £15 each instead of forking out £60+ for one coral.

Yet alarm bells are starting to ring, for it is not only the addition of intense lighting that is required. It is an easy trap to fall into, with new lights you can keep a Clam which you have wanted that for so long. A little while later, the Clam is great, now for the *Acropora*. The confidence is rising, but just the addition of intense lighting is not the answer to the long term keeping of SPS corals. They will be fine for a while, even showing good growth, you add more, and all is great. As time goes by your water quality slowly falls as various ingredients that you never had to test for before are depleted. Slowly things start to go wrong, and that's the end of the tale.

So you want to keep SPS corals, and why

not indeed. You can keep them, but not only that, you can grow them at such a rate you can frag them, yes even have babies. Yet for their long term care there are a quite a few fundamental differences between the mixed reef and the SPS reef. That intense feeling of 'can I do it' is creeping back again and of course it is.

Over the next few months I will take you through the fundamental differences and how you can address such problems, overcome them with relative ease, and be successful. We are talking about marines here, so yes it will cost, accept this now, however in many respects it will be cheaper in the long run than what you are doing right now. It's like buying a diesel car, the engine costs more initially but you know you will save on fuel.

Next month we will look at the differences we are going to meet and start on the path to your first SPS frag. ■

There are a number of very similar species in the trade as Red brittlestars.

An invertebrate for you

Sea
view

RED BRITTLESTAR *OPHIOCOMA RIISEI*

Quite often I hear the cries of an exasperated aquarist, "My cleaner is clearing my fish stock out of my aquarium." What is happening here is that there is a rather large animal within the aquarium and it's most likely *Ophirochma incrossata*, the Green brittlestar. The beast in question is large, not able to find enough food scavenging, so it's predatory nature comes to the fore and it eats the fish stock. The next cry of woe is, "My Brittlestar has gone, my cleaning stock is down, what can I replace it with?" Enter our little baby, the red one.

They are often overlooked because these can show arm damage in the dealer's tanks, or dealers don't like picking 'damaged' stock from the wholesaler. In fact a Red brittle showing damage on 5 arms is a better animal than our intact predatory friend. As a means of predator escape (human handling) this beast will voluntarily snap part of an arm that is being handled (or grabbed by a fish or crab) only to regenerate later, so don't be put off.

In common with most Brittlestars this beast is a great scavenger picking out all sorts of debris resting in crevices in the

rockwork. The arm extends into the crevice, the tube feet, covered in sticky mucus, probe the void and collect food, a 30cm length is cleaned in one fell swoop. The long spines over the top of the arm not only provide a deterrent from predators, but double up as another method of food collection. Our baby spins a mucus web between the spines, collecting planktonic animals and suspended particles from the water. The mucus is then rolled up into a ball increasing in size as it is passed down the arm via the tube feet towards the mouth for ingestion.

The success of the second feeding strategy is the reason why it is a much safer animal for inclusion in the cleaning crew. However, as with all cleaners, you must feed it twice a week with a portion of meaty food. Think of this as a way of rewarding the cleaners for the work they perform for you.

Often babies appear, yet you only have one animal!!! Brittlestars exhibit protective development, eggs are fertilised and deposited within a body cavity called the bursae, here they develop until the babies crawl out to populate the aquarium. The lucky, lucky aquarist purchased an individual with a developing brood on board.

It is an extremely hardy animal (if acclimated correctly), and a safer member of the cleaning crew. A Red brittlestar should be high on the 'must have' list for everyone.

PROFILE

Phylum	Echinodermata
Name	<i>Ophiocoma riisei</i>
Location	Caribbean to Brazil
Size	Disc diameter 3cm arm length up to 18cm
Reef compatibility	Very good
Feeding	Supplement cleaning activities with coral food and meaty foods
Lighting	None required
Difficulty	Easy

A fish for you

Sea
view

Splendid dottybacks are not the reef friendly creatures many of its relatives are.

THE SPLENDID DOTTYBACK *PSEUDOCROMIS SPLENDENS*

Who ever named this beast certainly knew what they were doing, splendid is the only way of describing such coloration. It is a limited import usually seen in aquarium shops at about 3-4 cm in length, commanding at least £35.00 and feeding like a gannet. A small colourful fish costing a bit of cash, a rare import and a Dottyback, it all adds up to a reef safe beauty.

STOP, never forget to research your potential purchase, for this is a fantastic beauty which will grow up to 20cm and is one of the largest Dottybacks. As the size increases, so the natural predatory behaviour begins to show itself. In a reef it has been very happy consuming the range of meaty frozen food offered. Then in one fell swoop your shrimp population is decimated along with all your crustaceans. This is a fish only aquarium animal, but boy oh boy what an addition it would make to any such aquarium.

As stated, normally it is only small individuals that are seen in dealers' tanks, so make sure it will not fit into any potential tank mate's mouths (this is common in fish only set ups). Do not house with other Dottybacks, or you will

be rewarded with world war three in your own front room, with only one survivor.

If you find a pair, lucky person, the male is always the larger and brighter in colour of the two. It is possible to 'make a pair' as these beasts are hermaphrodites. By placing a glass separator between the two, time will produce a pair, then the glass pane can be removed. However, unlike other more commercially viable species, I am unaware of successful breeding in captivity, but that does not mean it has not occurred.

Splendid dottybacks require a splendid aquascape full of hiding places, caves, ledges along with open swimming space. An aquarium capacity of at least 400 litres is necessary. They do not need intense lighting, however, the light wavelength produced by T5s and Halides will make them shine.

Although a hardy fish, as with all marines, Dottybacks require good water quality. Being a pig it is an easy feeder and a varied diet of vitamin enriched meaty foods will soon produce a vivid coloration. In the right aquarium with correct tank mates you cannot acquire a better fish.

PROFILE

Family	<i>Pseudochromidae</i>
Name	<i>Pseudochromis splendens</i>
Location	Restricted to East Indonesia extending to Northwest Australia
Size	20 cm
Feeding	Meaty vitamin enriched foods
Reef compatibility	Not recommended
Difficulty	Easy

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 **AQUA MEDIC**

Top of the Pops Rainbowfish

Who are "Top of the pops" in the fish world? Rainbowfish have always been a bit of a rarity but several species have been hits from the moment they were introduced. In recent times several others have come along to challenge the oldsters. How are the "Wannabes" of the Rainbowfish world doing?

PHOTOS: MAX GIBBS, M.P. & C. PIEDNOIR

Dwarf rainbowfish



Dwarf rainbowfish are also called MacCulloch's rainbowfish.

OUR VERDICT

Popular from the very moment of being introduced to the aquarium hobby in 1854, it lost ground because the Asian breeders didn't select it as a fish they wanted to breed. You will still find it in all the books and it has made a comeback in recent times but it is not currently ranking as a "top of the pops"

Scientific name:	<i>Melanotaenia maccullochi</i>
Aquarium type:	60 x 30 x 30cm
Distribution:	Australia and Papua New Guinea
Diet:	Not fussy. Flake, granular, pellet, frozen and live foods

Companion species: This species is a perfect community fish with other small to medium sized species

Red New Guinea rainbowfish



Male Red New Guinea rainbowfish are red colour while females are silver grey.

OUR VERDICT

A "Wannabe" which made it big time as soon as it was introduced in 1873 pushing the old established species out of the hit parade.

Scientific name:	<i>Glossolepis incisus</i>
Aquarium type:	120 x 30 x 30cm
Distribution:	Papua New Guinea
Diet:	Flake, granular and pellet foods plus all types of live foods
Companion species:	Other medium to large sized peaceful species

Boeseman's rainbowfish



This is probably one of the most attractive fish in this genus.

OUR VERDICT

A "Wannabe" which became an overnight "Top of the pops" when it was introduced in 1962. It takes time to fully colour but if you see an adult you will know why these outstripped the old established species.

Scientific name:	<i>Melanotaenia boesemani</i>
Aquarium type:	90 x 45 x 45cm
Distribution:	New Guinea
Diet:	All good quality foods including commercial flake, granular and live food
Companion species:	Other medium sized peaceful community species

Eastern rainbowfish



This fish is often labelled *Melanotaenia* species and you will even see it in many shops as that species.

OUR VERDICT

A "top of the pops" of yesterday which has fallen by the wayside because the Asian fish farmers breed other species for the aquarium hobby now.

Scientific name:	<i>Melanotaenia splendida splendida</i>
Aquarium type:	120 x 60 x 60cm
Distribution:	Australia and Papua New Guinea
Diet:	Flake, granular, pellet, frozen and live foods. Easy to feed
Companion species:	Other medium to large community species

Dwarf neon rainbowfish



This beautiful gem was dubbed the "Fish of the century" when first imported.

OUR VERDICT

A "top of the pops" which took the hobby by storm when it was first introduced. A very beautiful fish justly deserving its popularity.

Scientific name:	<i>Melanotaenia praecox</i>
Aquarium type:	60 x 30 x 30cm
Distribution:	Papua New Guinea
Diet:	All commercial foods, plus any live foods they can get hold of
Companion species:	Other small peaceful community fish

Madagascan rainbowfish



Male Madagascan rainbowfish have larger and more colourful fins.

OUR VERDICT

A "Wannabe" which almost made it to "top of the pops" but it often travels badly and must have perfect water conditions to look good.

Scientific name:	<i>Bedotia geayi</i>
Aquarium type:	120 x 30 x 30cm
Distribution:	Madagascar
Diet:	All foods including some live foods
Companion species:	Other medium sized community fish

Kutubu rainbowfish



This blue rainbowfish makes a lovely addition to any community.

OUR VERDICT

A gorgeous "Wannabee" which is only held back by taking so long to fully colour.

Scientific name:	<i>Melanotaenia locutris</i>
Aquarium type:	90 x 30 x 30cm
Distribution:	Only found in Lake Kutubu, Papua New Guinea
Diet:	All floating foods.
Companion species:	Other medium to large community fish

If you want to try breeding a tetra a little out of the ordinary, try the Splashing tetra. **Peter Capon** tells how this fish defies gravity to provide a safe haven for its developing embryos.



The Splashing tetra is native to the Amazon and Rio Para. Adult males like this fish grow to about 8 cm but females normally only reach 6 cm.

Jump for joy

THIS FISH WAS FIRST INTRODUCED TO Europe as early as 1905 by Oscar Kottler of Hamburg and in the older literature is referred to as *Copeina arnoldi*. But in the late 1970's Gery and Weitzman placed it in the genus *Copella* retaining the old genus *Copeina* for that old aquarium favourite *Copeina guttata*.

Spawning

The striking thing about *Copella arnoldi* is its strange spawning habits. It spawns about 5 cm above the water surface! No, that's not a mistake! It genuinely does lay its eggs about 5 cm above the water surface. In the wild the male will select a leaf overhanging the water which he will splash using his tail to provide a moist spawning site. Then the pair will repeatedly leap out onto the leaf to spawn.

In the aquarium substitute leaves can be supplied and even glass sheets propped up at an angle can be used, provided the glass is sufficiently rough to afford the parents and the resulting eggs some purchase. Neither the eggs or the adults are able to

NOT THE MOST COLOURFUL TETRA

As an aquarium subject the Splashing tetra will not be bought because of its outstanding beauty. Its interest lies in its unusual spawning habits rather than its brilliant colours. The coloration is a mottled brown which pales towards the underside. A black line runs from the mouth to cross the eye, this line usually has a lower white highlight that extends onto the operculum. The males grow to about 8 cm, and their long slender fins are set well back on their elongated, slightly compressed body. The male's dorsal is more pointed, slightly yellowish with a black slash mark and a faintly red tip. The operculum is decorated with a green to gold blotch. The caudal fin is forked, slightly yellow with a longer upper lobe which has a red edge. The ventrals and anal are yellow with red leading edges. The mouth is large in comparison to the body size, indicating that care should be taken in selecting companions if you don't want them eaten. The female is plainer but she still carries the dorsal fin slash mark.





A well-ripened female Splashing tetra. This female can easily lay 100 eggs during one spawning.

Sexing Splashing tetras is easy. The male (upper fish) has much longer and more pointed fins than the female.



Underwater there are lots more predators around than on a leaf just above the water's surface. Even something as small as a snail will attack fish eggs when they find them.




Today's top tip

As with all fish, the ideal water conditions will mimic their natural habitat. In this case soft, slightly acidic water is ideal.

adhere to the polished surface of most plastics. An ideal substrate is slate which is slightly rough, or can be easily roughened with sandpaper. Without a suitable spawning site the pair will even attempt to spawn on the cover glass, but often the eggs fall into the water and fail to hatch.

Courtship

Courtship is indicated by the male displaying his fins and quivering in front of his mate. Often the male will make a few leaps onto the leaf or leaf substitute on his own as if to show the female what is 

TROPICAL: BREEDING

expected of her.

Then, with their tails spread wide, the pair will leap out to land side by side on the leaf. Just prior to leaping the pair can be observed to form their bodies into an "S" shape as though all their muscles are being held in tension like a taut spring. On the leaf the female's head is just below the edge of the male's pectoral, with the male's fin braced to take the pressure of the female body.

Often the first joint leap does not result in eggs. Subsequent leaps yield about ten eggs

before the pair slip back into the water after about ten seconds. A pair can be expected to lay and fertilise about a hundred eggs which are laid in a solid flat mass with not one egg laid on top of another. An incredible feat involving accurate jumping and positioning of the ova. In the wild males have been observed to spawn with several females in succession.

Care of the eggs and fry

After the eggs are laid the male's task is far from over, he now has to guard his offspring. He hides in the plants close to the clutch, and about every fifteen minutes he rushes from cover and splashes the eggs with water to keep them moist.

When first laid the eggs are slightly yellow, and within 24 hours the developing embryos can be seen. Depending on temperature, hatching takes place in about

72 hours. As soon as the eggs hatch and the fry fall into the water it is advisable to remove the parents as they have no compunction in eating their own offspring.

The fry will initially need the finest of infusoria as a first food. After several days they should be gently weaned onto Artemia nauplii (Brine shrimp), eventually taking larger foods. The fry have a thin, rounded, movable appendage growing from the back just in front of the tail. This strange appendage is called the urostyle and is longer than the actual tail. The urostyle simply disappears when the fry reach a length of about 15 mm.

Copella arnoldi, the Splashing tetra, is an interesting, if not a particularly colourful fish that is quite happy in a well planted community aquarium. However, it is important that a secure cover must always be kept in place, as they can leap some 10 cm above the water surface and more. Splashing tetras have died on the floor or down the back of the aquarium than have ever succumbed to disease. ■

WHAT'S IN A NAME?

The Splashing tetra gets its common name from its habit of laying its eggs out of the water and the males caring for them by regularly splashing them with water which keeps the developing embryos moist.

These eggs are about 24 hours old and you can see the embryos developing inside.



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TROPICAL: HABITATS

PIRANHA NURSERY

Just as floating plants in the aquarium can provide a refuge for small fry, so fixed floating meadow has a high population of juvenile fish, including Piranha (*Serrasalmus* sp) fry, various cichlids, and juvenile characins such as *Mylossoma aureum*. They are less likely to be found in drifting floating meadows, perhaps because of the danger of being flushed, along with their meadow, out of the lakes. Although the juvenile Piranha were prevalent within the fixed meadow area, the biomass of Piranha in drifting meadows was about the same, as here there were found a few, large individuals.

large mammal. These shy and peaceful herbivores are now almost extinct due to hunting by humans. At one time their flesh was eaten in Holland and their skins used to make fan belts! Fortunately the remaining manatees are now protected, although they remain extremely endangered.

Home to huge numbers of fish

More than seventy species of fish have been documented from the floating meadows. The location and type of meadow affects the size and type of fish who live there, and populations also vary according to the season, although all floating meadows carry a large fish population, with more

individuals and weight of fish than any other type of Amazonian habitat. A survey within the floating meadow habitat of Lago Mamirauá, an upper Amazonian floodplain lake, was undertaken during December 1993 when the water was rising and had just begun to enter the forest. From the results of the study, for anchored meadow the total wet weight of fish was estimated as 312 kilograms per hectare, and total number as 90,400 individuals per hectare. It is argued that this biomass estimate is below the annual maximum because some fish had dispersed into the forest, but the number of individuals is close to the annual maximum because of the recent arrival of juvenile *Serrasalminae* and Cichlidae.

For drifting islands of meadow fish biomass and density were estimated as 192 kilograms per hectare and 12,700 individuals per hectare respectively. The large amounts of food available for fish in the floating meadow habitats makes them able to support a large fish density. Aquatic insect larvae, ostracods and small fish are not the only food sources; insects such as spiders, ants and other insects that thrive on the upper side of the floating meadow fall or can be knocked into the water, as do grass and other seeds.

Siluriformes (catfishes) are unique in that they seem to favour drifting floating meadows; although present in fixed ones they were less common. Species found

hypopomidae are electric or knife fish, and like other gymnotiform fish have the same characteristic elongate shape linked to the use of electricity for locating objects. This family possesses long tails, which can become very long in the males because the females assess the quality of their mates by the length of their tails!



Piranha release their eggs amongst vegetation and in the flood plain the young spend their early life within the floating meadow. When they are large enough to survive, they enter the open waters where they search widely for food entering the forest when flooded.

Leporinus species are among the largest fish found in the floating meadow. This is the Banded Leporinus (*Leporinus fasciatus*) which grows up to 30cm.



included *Pseudorasbora*, *Parachanna*, *Pterygoplichthys*, and *Anadoras*. Cichlids and Anostomidae are found in both floating and fixed areas, with the largest fish found being Anostomids; common genera included *Leporinus*, *Schizodon* and *Rhytilabus*.

Fixed floating meadows

In general, more fish seem to prefer the fixed floating meadows. The Swamp eels, and Erythrinidae, primitive Characiform hunters like *Hoplias malabaricus*, were found here, although these fishes are also found in other habitats showing that they do move about.

Knife fishes are ideally suited to a floating meadow habitat, being able to survive almost anoxic water and to navigate with electricity in low light. It is not, therefore, surprising that they occur in large numbers. A wide range of knife fishes was found by the survey: *Hypopomus*, *Apteronotus*, *Stetogonyx*, *Rhamphichthys*, *Gymnotus*, *Stenomopygus*, *Adontostemarchus Eigenmannii* and *Stenomarchorhamphus*. Of these, only a single individual, *Adontostemarchus* sp., was found beneath a drifting island, with all the others located in the fixed floating meadow. It can be surmised that the knife fishes are able to detect when a piece of meadow is likely to break away and become free-floating, and

move back into the fixed areas. This makes them probably the group most prone to reproductive isolation. Indeed, the genus *Hypopomus*, the genus typical of floating meadows, is indeed very species rich. ■

READER OFFER

Peter Henderson has produced a CD entitled *Amazonian Fishes and their Habitat* priced £40. This is one of the most complete reference works about the region ever published and covers all Amazon habitats and the fishes that live there. This CD is not generally available through aquatic shops so *Today's Fishkeeper* has got together with Pisces Conservation Ltd. to offer this to our readers. The price includes postage and packaging.

Send a cheque or P/O made payable to Pisces Conservation Ltd. to:

Today's reader offer,
Pisces Conservation Ltd.,
IRC House, The Square, Pennington,
Lymington, Hampshire, SO41 8GN



Equipment

NEW FROM TETRAPOND — THE WINTER ISLAND

The TetraPond Winter Island is the latest product from the TetraPond range. It is a pond de-icer that incorporates a facility for providing fresh water to birds. The TetraPond Winter Island works by using a heating element to warm an area of water contained within the floating platform. The area melted is small, so the unit only requires a low power consumption of 24W, making it cheap to run. This area allows gas transfer in and out of the pond through the Winter Island and birds can bathe and drink in the contained pool of water. Since small birds need to drink twice a day in the winter, and dirty feathers do not insulate and waterproof properly, this product can be a real life saver for birds. It can also be a life saver for fish trapped under a layer of

ice, where harmful waste gases (such as carbon dioxide and hydrogen sulphide) will accumulate to toxic levels and oxygen levels will drop over time killing fish and over wintering amphibians.

The Winter Island comes with 7m of cable which is longer than many other pond heaters which will make installation much simpler and cheaper. It will work down to temperatures of -18°C which is lower than we usually have in the UK even in the hardest of winters. Whilst the Winter Island has mainly been designed for use in a pond situation, it can also be used in a water feature / barrel to provide a permanent bird bath through the winter.



THE PRICE
RRP £39.95

TOP GEAR

All the new products

OSI ARRIVE IN THE UK

Ocean Star International Inc. began harvesting Brine shrimp eggs on the Great Salt Lake, Utah in 1982 for the aqua culture market. Within a short time they gained a reputation for quality eggs at a price aquarists could afford. They even made it to the UK in large quantities, as people in specialist societies got to hear about them. In 1989 OSI decided to branch out into the pet industry forming a new company called O.S.I. Marine Lab., Inc. and started developing their own foods. These hit the US market in 1991 and were well received by aquarists. Today they produce a wide range of high quality flakes and pellet foods. These include several specialist foods such as: Cichlid flakes and pellets, freshwater Angelfish flakes, Marine flakes and pellets, and Goldfish flakes and pellets. The Spirulina flakes and pellets are great for improving the colour of your fish. For aquarists who like to breed their fish, the growth/colour food has a great reputation in the US. For fishkeepers with a large number of tanks, or clubs that want to share out a bulk purchase among their members, the 5kg freshwater flake at a R.R.P of £125 is good value for money.

Contact details

O.S.I. is distributed in the UK by C-World 222, High Street West, Sunderland, Tyne and Wear, SR1 1TZ.
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VISION AIDS LAUNCHES A NEW UNDERWATER CAMERA FOR PONDS AND AQUARIA

POND CAMERA ^{NEW}

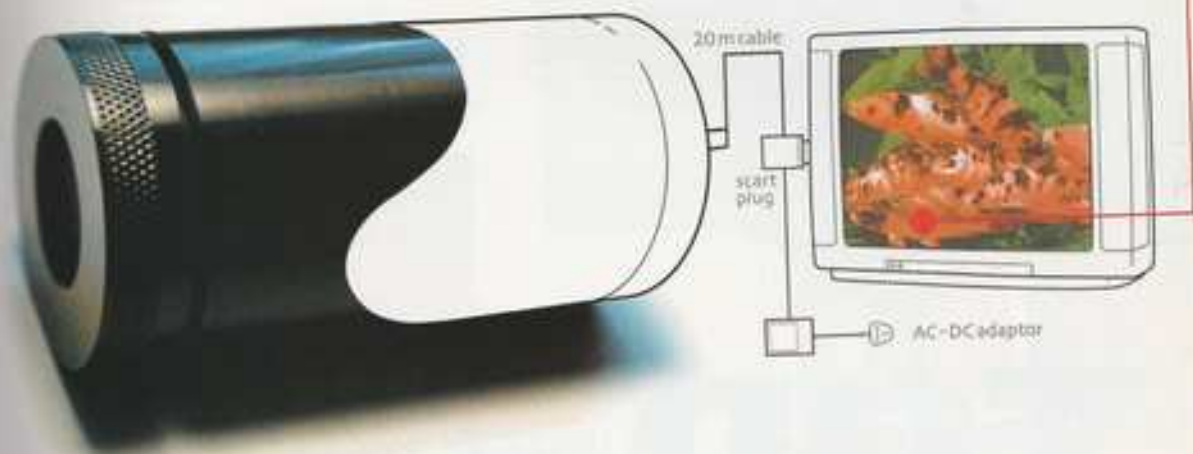
under water quality colour camera

What a fantastic idea, an underwater camera you can connect to your television, video or computer. Being able to look at your pond fish when the weather is bad was the idea behind this little gadget, but when fishkeepers started to look at it, a whole host of ideas and applications came to light. Firstly we have the security side of

things. Not only can this equipment be used with an underwater camera, but a security camera can be added on with sensors, so any movement around your pond can set off a silent alarm. Thieves, both human and animal, can be dealt with before your fish go missing. Another important application is checking the health of your Koi. Many ulcers start on the underside of the fish. These are not normally spotted until they have become very large and the fish is in severe distress. Because you can see your fish from the side and underneath with this camera, you can see ulcers as they start to develop and treat them weeks or even months before you would normally be aware of them. Another good aspect is being able to see the bottom of your pond all the time. Detritus builds up in any pond but with this system you will know just how

much muck is there and when you need to clean the bottom with your pond vacuum cleaner.

Moving indoors, you can place the camera in a part of your aquarium you would not normally view the inhabitants from, creating a unique perspective on the TV. In reef tanks in particular, you can position the camera in a cave looking out or even behind much of the decor and see the lives of a whole host of critters you would never normally see. If you breed secretive fish like many of the cave spawning Cichlids you can set the camera up to record the whole event - from the inside of the cave. Imagine having a video of your favourite pair of Cichlids laying their eggs and looking after the fry! The opportunities are endless and since the camera is a high quality unit you won't be peering at a grainy, almost black and white picture, but seeing everything in full colour.



INSTALLING THE UNIT

This is simplicity itself (even our editor could do it). A few cables to plug into sockets, and you're away. 20m of cable is standard, and a further 4 x 20m add ons take the total cable length to 100m so you should have enough to reach most ponds. The camera can go down to 5m under water which is deep enough for even the largest of Koi ponds. Up to 3 more cameras can be added to the system, so you can view various aspects of your pond or aquarium. The only negative at this time is that the camera will float to the surface. A bracket is being produced or you can easily attach it to a suitable stone or such like. In an aquarium it is easily wedged under some rock work,

TODAY'S VIEW

Priced at just £299, this falls in the expensive toy bracket, but it has huge practical applications as well as being great fun, why not buy one for Christmas!



NEW INTERNAL POWER FILTER FROM AB AQUAMEDIC

Internal power filters are now the most popular way to filter freshwater aquaria, so it comes as no surprise that AB AquaMedic have brought out their own model. As usual with this company's products the OF 1000 is built to the very highest standards and will probably last a lifetime. The motor is only small but it kicks out up to 1000 litres per hour and has a head of 1m. The flow rate is adjustable and can be brought down a long way from its maximum, but it still creates a lot of water movement in a small aquarium even on its lowest setting. This is great for riverine fish, but not so hot for still water fish. There is plenty of filter media in the unit so it delivers both good mechanical as well as biological filtration. All in all, an excellent quality product which firmly establishes AB AquaMedic as more than just a marine equipment manufacturer.

THE PRICE
RRP £22

AB AquaMedic's new OF 1000 is a powerful unit which will clean up an aquarium in double quick time. It also works well as a biological filter so polishing your water to perfection.

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Contact details

Hawkings and Manwaring, PO Box 50, Newark, Netts, NG23 5GY. Tel 01949 842917. Website -> www.Aqwascribe.com

TOP GEAR

All the new products

Two new books before Christmas

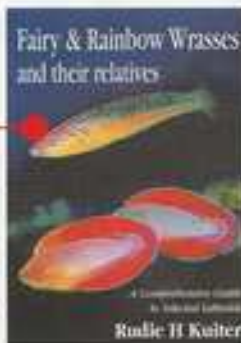
THIRD TITLE IN MARINE FISH FAMILIES SERIES IS NOW AVAILABLE

The third book in TMC Publishing's marine fish families series has just been published.

Fairy & Rainbow Wrasses and Their Relatives, A Comprehensive Guide to Selected Labroids is another excellent identification guide, this time covering one of the largest and most important groups of fishes on the reef. Over 460 species are currently recognised around the world, belonging to more than 65 genera, however, the taxonomy and relationship between the various genera and species continue to be scrutinised.

This 308 page book by Rudie H. Kuiter includes detailed information on the families, genera and more than 100 known species and retails at just £19.95. Illustrated with hundreds of spectacular underwater photographs, it contains information on behaviour, habitats and details of aquarium requirements for the various groups. There are picture index pages for visual quick-find of genera and a comprehensive index of common and scientific names of families, genera and species.

If you would like further information or would like to order a copy of *Fairy & Rainbow Wrasses* or any of the other books available from TMC Publishing, please look at their website - www.tmc-publishing.com - or telephone TMC on 01923 284151.



HOW TO RAISE AND TRAIN YOUR PEPPERMINT SHRIMP BY APRIL KIRKENDOLL

This is a hobbyist's guide to raising saltwater aquarium shrimps from egg to adulthood and one definitely not written as a dry, incomprehensible scientific manual. This book is a fun packed, easy to read guide that has all the information you'll need to successfully raise the saltwater aquarium shrimp, *Lysmata wurdemanni*, in your home. It is loaded with all the details that other manuals leave to experience, and it is written so that it can be easily understood even by individuals who lack the scientific background and vocabulary to comprehend those other manuals. It also includes tips on raising two other species of Cleaner shrimp (*L. amboinensis* & *L. debelius*) as well as notes on commercial propagation.

Whilst not produced on fancy paper or with lots of pretty pictures, this excellent guide tells you everything you need to know to be successful in this rapidly evolving area of marine keeping. A smashing book, fun to read, and a real inspiration to those people who want to try breeding their marine animals.

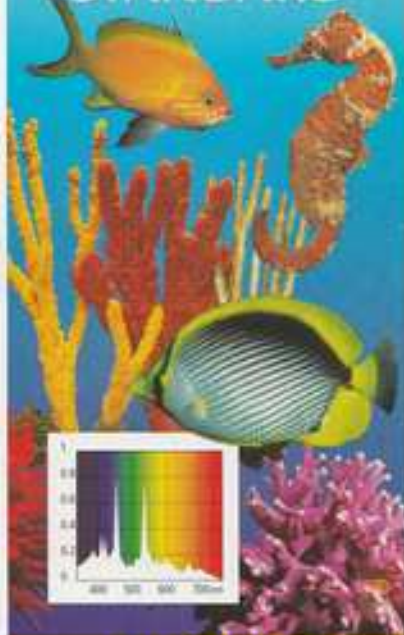
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Today's Fishkeeper "Xingu"

It is many a fishkeeper's dream to travel to the Amazon and see where the fish they keep at home actually come from, but this sort of adventure doesn't appear in your local travel agent's brochure.

So *Today's Fishkeeper* has teamed up with Goldenline to offer you the trip of a lifetime to the Rio Xingu and Altamira.

This expedition will take you into the heart of rare Plec country where Golden nuggets, Zebra plecs and many other beautiful fish come from. What you won't find here are first class tourist hotels. You will be travelling many miles away from civilisation, sleeping in hammocks and staying in native accommodation. You will need to be fit and willing to rough it a little to join this expedition. On the plus side, you

will be taking part in a real Amazon adventure rather than a sanitised tourist holiday.

On a trip like this you will have a chance to catch hundreds of species of fish which, up to now, you have only seen swimming around in aquaria. If you snorkel then you will have the added bonus of being able to watch your favourite fish swimming around in its native home.

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ITINERARY

Day 1: Flight UK-Recife. Transfer from the airport - (approx. 40 mins) Check in at hotel in the heart of the Historic Old Town of Olinda.

Day 2: Flight from Recife to Belem at the mouth of the Amazon. Stay overnight in Belem.

Day 3: AM - Catch the early flight from Belem to Altamira. PM - Short boat trip out into the Lagoon at Altamira.

Day 4: Early start take fast canoe down stream to Isla do Faz. This is the main base and stopping off point for fishermen and traders in the Zebra (L46) fishery. Overnight at Isla do Faz (Hammocks)

Day 5: AM Continue by fast canoe downstream to the main fishing grounds, visiting small settlements where families

fish for Gold nuggets, Peppermint plecos, Goldy plecos and the like. Here we will also find divers collecting Zebras, Heterodon and other deep water fish. PM, Return to Altamira.

Day 6: Full day in Altamira to experience the lively latino atmosphere of an Amazon river town. Visit to local fish exporters.

Day 7: AM Early start going by fast boat upstream to the Iriri River. Overnight camp.

Day 8: Explore the fishing activities and local settlements on the Iriri river. Overnight camp.

Day 9: Return to Altamira

Day 10: Flights back to Recife.

Day 11: R+R in Recife

Day 12: R+R in Recife. Return to UK Late on Day 12.

WIN a free place on the *Today's Fishkeeper* "Xingu Experience"

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Roif C. Hagen has kindly agreed to send one lucky reader on this expedition. To enter this competition simply fill in the form and send it to *Today's Fishkeeper's* "Xingu Experience", TRMG Magazines Ltd., Winchester Court, 1 Forum Place, Hatfield, Herts. AL10 0RN.

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COMPETITION ENTRY FORM "XINGU EXPERIENCE"

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Please complete this sentence: I would like to join this expedition because

Entry forms must arrive at TRMG by 31st December, 2002. Each entry must include an entry form from the magazine, photocopies will not be accepted. Occasionally we pass reader details onto reputable companies who may contact you with future offers. If you DO NOT wish to be contacted please tick box



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Andrew Caine, Today's Fishkeeper July 2002

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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 0BN Telephone 01623 885352, Fax 01707 269333 or e-mail direct@tffmg.co.uk copy deadline 6 weeks before publication date.

Today's Diary Dates

December's show, auction and club meeting dates

Sun 3rd	Kirkcaldy A.S. meeting. Contact 01738 634689
Mon 2nd	Solway A.S. meeting. Contact 01387 750606 St Helens A.S. meeting. Contact 0151 4260423 Ayrshire Fishkeepers Association meeting. Contact 01379 605277 Religate & Redhill A.S. Contact 01293 781482 Merseyside Aquarist Society meeting. Contact 0151 260 3664
Tues 3rd	Southern Leigh & D.A.S. Contact 01702 305740 Paisley & District A.S. meeting. Contact helena@fishkeepersmeeting.co.uk Dunstable & D.A.S. meeting. Contact 01582 707280 York & Dist. A.S. meeting. Contact 01904 414272 The Irish Tropical Fish Society meeting. Contact 0145 68836 Hallow A.S. meeting. Contact 0151 269 8190 North Bucks A.S. meeting. Contact 01908 377131 Oldham A.S. meeting. Contact 0161 281 3725 Preston A.S. meeting. Contact 01772 32114 Lang Toun Aquarists and Pondkeepers Group meeting. Contact 01592 595825
Wed 4th	Corby & D.A.S. meeting. Contact 01536 764736 Oasis Fish Club (Sunderland) meeting. Contact 0191 384 1433 Hounslow club meeting. Contact 01784 259230 Perth A.S. meeting. Contact 01738 621704 Claxton Fish Keeping Club meeting. Contact 01252 428005 Portsmouth A.S. meeting Contact 01673 885352 Bracknell A.S. meeting. Contact 01344 483287 Workington A.S. meeting. Contact 01909 67993
Thurs 5th	Gleenthies meeting. Contact D. Smart, 4 Lochry Ave., Kingussie, Fife. Faircity A.S. meeting. Contact 01738 634689 Sandgrounders A.S. meeting. Contact 01704 541177
Fri 6th	NorthWest Cichlid Group meeting Contact 019422 707593
Sat 7th	
Sun 8th	
Mon 9th	Kirkcaldy A.S. meeting. Contact 01738 634689

Tues 10th	Bristol Aquarist Society (Goldfish) meeting. Contact 01792 207467 Ilford & D A&P Society meeting. Contact 0188 550 7329 Grimby & Cleethorpes meeting. Contact 01472 349278 St Helens A.S. meeting. Contact 0151 426 0423 Oley A.S. meeting. Contact 01274 531418 Robin Hood A.S. meeting. Contact midalbert@robinhoods.fiveriver.co.uk Darwin A.S. meeting. Contact 01294 791825 Northwich A.S. meeting. Contact 01606 882966 Caer Ulla A.S. meeting. Contact 0191 573 7404 Telford & D.A.S. meeting. Contact 01952 409221 or 01952 606410 Lang Toun Aquarists and Pondkeepers Group meeting. Contact 01592 595825 Northern Goldfish and Pondkeepers meeting. Contact 0161 969 7567 Greenock D.A.S. Meeting. Contact 01475 714279
Wed 11th	Linlithgow Aquarist Society meeting. Contact 01506 510558 Hullfax A.S. meeting. Contact 01274 880471 Tameside A.S. meeting. Contact 0161 339 6593 Bradford A.S. meeting. Contact 01274 652542 or 0113 257 7799 Houseslow D.A.S. Meeting. Contact 01784 259230
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Fri 13th	Yorkshire Cichlid group meeting. Contact 01924 367086. Basingstoke A.S. meeting. Contact 0181 970 1461 West Cornwall Fishkeepers meeting Contact 01209 717886
Sat 14th	
Sun 15th	
Mon 16th	Kirkcaldy A.S. meeting. Contact 01738 634689 Thorpe & D.A.S. meeting. Contact 01953 605394 Solway A.S. meeting. Contact 01387 750606 Merseyside Aquarist Society meeting. Contact 0151 260 3664
Tues 17th	Southern Leigh & Dist A.S. Contact 01702 305740 Greater Manchester Cichlid Society meeting Contact 01422 942155

Wed 18th	West Yorkshire Marine Aquarist Group meeting. Contact 01924 420001 Claxton Fish Keeping Club meeting. Contact 01252 428005 Tongham Aquarists Society meeting. Contact 01252 25686 Portsmouth A.S. meeting. Contact Gill Lilling 9, Inverness Rd, Gosport, Hants. Perth A.S. meeting. Contact 01738 621704 Bracknell A.S. meeting. Contact 01344 483287
Thurs 19th	January 2003 Today's Fishkeeper on sale. Gleenthies meeting. Contact D. Smart, 4 Lochry Ave., Kingussie, Fife. Bristol Tropical Fish Club meeting. Contact 0117 973 2445 Croydon A.S. Meeting. Contact 0208 654 0984 Sandgrounders A.S. Contact 01704 541177 Faircity A.S. meeting. Contact 01738 634689
Fri 20th	
Sat 21st	
Sun 22nd	
Mon 23th	Kirkcaldy A.S. meeting. Contact 01738 634689
Tues 24th	
Wed 25th	Happy Christmas to all the clubs from Today's Fishkeeper
Thurs 26th	
Fri 27th	Eastbourne & District Pondkeeping. Contact 01323 773369 Discus Ireland meeting. Contact 061 318591 West Cornwall Fishkeepers meeting. Contact 01209 717886
Sat 28th	
Sun 29th	
Mon 30th	Kirkcaldy A.S. meeting. Contact 01738 634689
Tues 31st	

Festival of fun

AFTER MONTHS OF planning and hard work by Joe Nethersall, Peter Furze and their hardworking team of volunteers, guests started to arrive on Friday evening. By then the team had been at the venue for a week putting all the displays together. Maidenhead Aquatics had done a sterling job with dozens of furnished aquaria, and lots of good quality fish available to buy at the end of the exhibition. The scene was set for the most successful festival for some years.



Just a small part of the furnished aquaria displays exhibited by Maidenhead Aquatics. All the fish in these tanks were for sale at the end of the show.

Since many aquarium and pond problems can be linked to poor quality tap water All Clear Water Purifiers were on hand to help sort out any problems visitors had.



The Goldfish Society of Great Britain exhibited some absolutely stunning fancy goldfish. Unlike at a normal show in the UK these were exhibited so they could be viewed from above - which is how they have always been judged in Japan.



A number of local clubs put on displays.

With every room at this year's *Festival of Fish keeping and Water Gardening* booked up, everything was set for a great weekend.



Several miniature ponds and water features were dotted about the show hall.



Sunday saw the "Hagen Masters" open show become the largest show held to F.B.A.S. rules this year.



Today's *Fishkeeper* columnist Alf Nilsen enjoyed the whole weekend and gave an excellent presentation on beginning with marines. This was followed by Paul Davies of *Aqua Medic* who dealt with all the hardware you need to keep marines successfully. Between the two of them anyone thinking of starting with marines will have had an excellent grounding.



The livebearer convention was well supported with over 20 members staying the weekend and a packed auction room on the Sunday. Top money went for a new strain of *Micropoecilia picta* recently imported from America, but with about 50 different species and strains of livebearer in the auction including the newly described *Xiphophorus mayae* most people were spoilt for choice.

Harro Hieronimus gave a fascinating lecture on Goodeids for the livebearer enthusiasts but as editor of Germany's foremost water gardening magazine presented a great lecture on water lilies.



NEXT YEAR

Next year's date has already been booked at Bracklesham bay. This is the weekend of the 17th & 18th October. Booking hotline 020 8847 3586.

Out & About: Shop Visit

Home to Marines and much more

Today's Fishkeeper visits Home Marine in Crews Hill, Enfield.



This shop is home to quality freshwater as well as marine fish and inverts.

THE FIRST THING to do with this shop is ignore the name. Home Marine is a great venue for freshwater fish as well as marines. Looking along the freshwater tropical tanks in particular, there were not just all the "bread and butter" fish which every shop stocks, but lots of the more unusual things as well. Apart from some nice Halfbeaks and African cichlids, there were some Antenna



A full range of dry goods are stocked, in fact it would be hard to fit another box in this jam packed shop.

Our verdict

What a great shop! It was a real pleasure to visit with its fantastic range of fish (both tropical and marine) and inverts. Well worth travelling a long distance to visit.

fish. What are those? They belong to the Silaginidae family and have the first dorsal fin elongated to a tall antenna like fin. There are 3 genera and about 32 species in the family so exactly which one of these they were is difficult to say.

Moving over to the marine fish section, the array of species was really good. All the fish were in excellent condition and looked well fed and maintained. The young Black tang had pride of place in the sales tanks, as far as manager Paul Hughes was concerned. He did admit it was his favourite fish (although he loves Anthis as well), but this species is rarely imported and this was a really sharp looking fish which was feeding well. Look at the Deffec display aquarium and you can see a much larger specimen that is Paul's pride and joy. You really do need to look at this reef tank even if you keep only freshwater fish. It has not been set up very long, but



Plants are more than just a bit of something green to put in your aquarium at Home Marine. They not only have a good range on sale but have a planted display aquarium using Hagen's new CO₂ fertilisation system.

Shop details: Home Marine, Springtime NSY, Cattergate Road, Crews Hill, Enfield. Tel 0208 363 3648.

Shop opening hours: 9.00 am - 5.30 pm 7 days a week.

Proprietor: Russell Jackson

Manager: Paul Hughes

Staff: Adam Carter, Rob Mottram, Simon Smith.

Staff knowledge: Paul has an extensive and in depth knowledge of reef tanks and marine fish. Adam is into plants and South African fish, for African cichlids speak to Simon and Rob's your man for both marines and aquarium equipment. That leaves everything else for Russell who has a broad spectrum knowledge of aquatics.

Number of tanks: Tropical 120, Marine 54, Inverts 12, Coldwater 45, Plants 7.

Specialities: Marines, Inverts, African cichlids, South American fish and plants.

Additional services: Tank maintenance & installation, also water analysis.

Brands stocked: All major brands.

Which groups of fish do you sell?: Freshwater tropical, Marine, and Coldwater.



We think Deffec's display tank will encourage many more people into the marine hobby. Paul's pride and joy is down on the bottom right picking at the substrate.

already shows the promise of things to come. Inverts are not an after thought at Home Marine but a well catered for part of the marine hobby. Some lovely corals were on sale as well as all the usual clean up crew and scavengers.

One really good idea which Home Marine have developed is a shop club. By joining this you save money on every purchase and have a free newsletter telling you all about what's new in the shop. Most members find they save the cost of membership in a matter of months. ■

Russell's verdict on the manufacturers

Which manufacturer has the best range of products in your opinion? Aquatic solutions particularly with their Kenf range of products. Which company gives your customers the best service? AB Aqua Medic

Letters in association with Tetra



Today's Postbag



Share your news, views and experiences through *Today's Postbag*. Every month the star letter wins £25 worth of Tetra fishcare products – all for the price of a 27p stamp or an e-mail.

Laws on keeping Bitterling



There are a number of Bitterling that can be kept without a licence, but the laws change all the time, so check with DEFRA if you are unsure.

I read a letter in the November edition of *Today's Fishkeeper* with interest, but also with nervous caution. The letter was on Page 20 and concerned a reader's ownership and keeping of Bitterlings. The letter was actually in relation to overstocking. What surprised me most about the letter was that at no stage was it mentioned that it is essential by law to have a licence to keep these non native fish. I really do feel that this should have been made a point of.

Jane Verrall, Wareham, Dorset.

Editor's response

Jane is quite correct in needing a licence to import and keep certain non native fish in the UK. Many of those species affected by this legislation are coldwater fish which can become established in our natural habitats. You can still keep them, but you need to apply for a licence to do so from

DEFRA. The problem for us is that only one species of Bitterling, *Rhodeus sericeus* is currently listed in table 1 of this legislation. This means you will still find various species of Bitterling offered for sale in aquatic outlets and may still find English bred *Rhodeus sericeus* as well. Your local aquatic retailer will be bang up to date on the current legislation and will make sure you are not going to be breaking the law by buying a fish you don't have a licence for. However, for further information about this topic readers should contact the Department for Environment, Food and Rural Affairs (DEFRA), Room 308, Nobel House, 17 Smith Square, London, SW1P 5JR
e-mail: s.fishii@defra.gsi.gov.uk
web: <http://www.defra.gov.uk/fish/fishindx.htm>
Tel: 0207 238 5931 Fax: 0207 238 5938.

Dear Today's Fishkeeper,
I read in the newspaper the other day about Piranha being found in one of our rivers. Experiments in genetically modifying fish to be temperature tolerant could be disastrous to the native species in our rivers. If Piranhas were temperature tolerant and several of them were released, imagine what havoc could be caused to the natural environment. I don't have a shop, but if I did I would support the No to GM fish campaign
Louise Bacon, Edmonton

www.tetra-fish.co.uk

New introductions

Top German aquarist **Erwin Schraml** has been trawling through the new imports for some new introductions to the aquarium hobby and found a brace of new loaches plus some really strange fish. PHOTOS: ERWIN SCHRAML



Schistura nicholsi is known from the Mekong basin in north-east Thailand. Aquarium Glaser received their specimens from Vietnam, so either the distribution area of this species has to be assumed to be larger than known up to now, or the exporter is getting his specimens from across two borders?

Schistura nicholsi (Smith, 1933)

This species has characteristic dark bars which are broader than the lighter intervals, the last light bar before the base of the caudal fin being lighter than all the others. The dorsal fin has a dark edge, a submarginal light patch, and a dark base which is interrupted after the first rays. The tail fin is described by Kottelat as having two rows of spots, however, I could not see these on my live specimens, but I can't see these spots on the black-and-white photos in Kottelat's paper either (these spots must be very small). The reddish colour of the dorsal is not mentioned by Kottelat either. Perhaps he only examined preserved specimens. The red coloration normally fades out very quickly after death.

Two new loaches

Only a few loaches have made a permanent place for themselves in the aquarium hobby, yet there are numerous other species, which will be excellent aquarium fishes if they are imported regularly. Here I would like to present two alternative species.

Schistura balleata (Rendahl, 1948)

This loach is only known from the type locality 'Malwedang' in Tenasserim (Myanmar). Malwe Taung is a mountain range around Manung. It is not known where the imported specimens originate from. In the aquarium *Schistura* species feed well on worm-like food. It doesn't matter whether it's living or frozen Tubifex, Bloodworms or something like that. *Schistura balleata* should even be able to catch live Daphnia.

The Burma loach, has a distinctive colour, a beige background with two narrow dark bars under the dorsal fin. In this area the beige body coloration is lighter than in the rest of the body.



Toadfish

Toadfish do not belong to the standard range of fish in the ornamental fish trade, perhaps that's the reason why these species are especially striking. This species was imported from Vietnam and is new to me. The animals were introduced by Aquarium Glaser in Europe. It was said that the species could be *Aburachomoeus trispinosus* (Günther, 1861), however, for now I am referring to it as *Aburachomoeus cf. trispinosus* until the identification can be confirmed.

A first check in FishBase showed photos of a similarly marbled species. However, the real *A. trispinosus* has, in front of the long dorsal fin, a lower and smaller fin than the species seen here in the photographs. Furthermore, the fish here has more and longer

According to FishBase *A. trispinosus* is harmless despite its similarity to fishes of the family Synbranchidae, however, one always has the feeling that the spines could be filled from poisonous glands, although this does not seem to be the case.



skin appendages at the sides of the chin than the real *A. trispinosus*. However, that could be because of the difference in size. The animals introduced by Aquarium Glaser measured about 6 cm without the tail. *A. trispinosus*, however, can reach up to 30

cm. Also it's a predominantly marine species which inhabits reefs, and it is known even from trawler catches from offshore grounds, as well as also being found in mangrove estuaries. The distribution extends over the Indo-West Pacific, from northwestern Australia, the Arafura Sea, over Thailand, Indonesia and Papua New Guinea. The species shown here, on the contrary, appears also to have a home in the fresh waters. Perhaps this is because it is the juvenile form and may move back into the sea as adults.



Toadfishes are typical ambush predators, which devour almost exclusively living prey (fish and shrimps). In earlier years mainly *Alienotrochus grunniens* was found in the trade, a species that is from Thailand. For comparison look at the picture of this greenish species, which is imported as a freshwater fish, but is really a marine species and requires salt in the water.

Betta brownorum

Maybe the last import of *Betta brownorum* was received by Aquarium Glaser three years ago. The home waters of this extraordinarily pretty small *Betta* have been extensively destroyed. The fierce forest fires which have raged on the island of Sumatra have to be blamed for this. Through the quantities of ash from these fires the formerly very acidic waters have become alkaline for a long period. This has probably caused the death of this Dwarf fighting fish in its native habitats.

We can only hope that a sufficient number of specimens are being kept in captivity around the world to make this species available to aquarists for the future. Therefore, any wild caught individuals should go, first of all, only into the care of committed breeders. From them, hopefully, tank bred fish can be returned in the trade or be spread by the local fish associations.



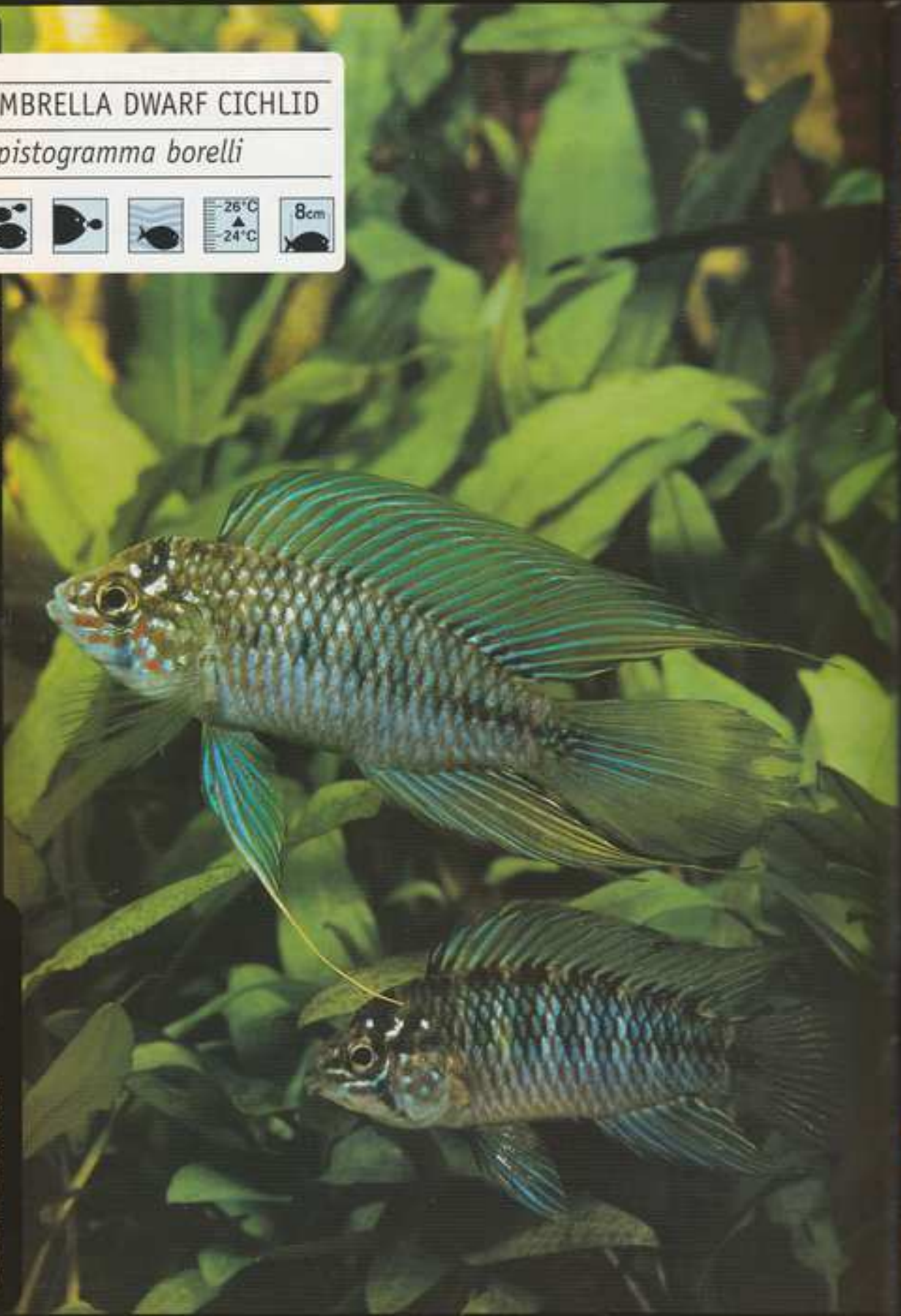
UMBRELLA DWARF CICHLID

Apistogramma borelli



PHOTO: MAX GIBBS

TODAY'S FISHKEEPER





A lovely group of American flagfish. The two upper fish are males.

American flagfish

Kathy Jinkings profiles the American flagfish

THOSE FISHKEEPERS WHO LIVE IN HARD water areas are often frustrated in their efforts to keep certain types of fishes. Without investing in a reverse osmosis unit, the peace of mind of such a fishkeeper can come to depend on the rainfall, as the water both is scrutinised to see if there is enough water to do the water changes that week. Many Killifishes are soft-water, sensitive fishes. However, help is at hand, as one of these Killifishes not only makes no special demands as to water, but is also happy kept in a temperate (unheated) tank. In their natural habitat, these fishes are found in both fresh and brackish American waters. This is the American flagfish, *Jordanella floridae*.

Although the flagfish is not as colourful as some of its cousins, it is nonetheless attractive. The fish show a large dark spot on the side, and females may have another dark spot in the dorsal fin. Their ground colour is olive-green, with some yellow and red; they become much brighter while spawning, and can be very attractive with their scales outlined in red or yellow to make a checker board pattern. These fish are happiest as pairs, since they can become very aggressive towards their own species while spawning. They are, however, shy and peaceable to other fishes, and if they are to be kept in a community care should be taken to ensure they are not kept

with bullies.

They prefer slow-moving water, and a dense planting at the sides and back with swimming space in the centre will make them feel secure. They are happy to feed on flakes, live food, frozen food, or spinach, but do enjoy algae (and the communities of microfauna that flourish therein), so don't be too enthusiastic about keeping your Flagfish aquarium shiny and pristine! If the water temperature is raised to around 24°C, the fish will consider starting a family. The spawning tank should be furnished with plants or spawning mops, with a base of fine gravel. The first sign of spawning may be the female digging small pits in the gravel, and once the male gets interested the chasing and courtship can get quite rough. The eggs are laid over several days, and the male will guard them, fanning them with his fins. Once a reasonable batch of eggs has been produced, the female should be removed, as she is more likely to snack on her developing offspring.

In about a week the first fry will be free swimming, and ready for their first meal of microfood. The American flagfish has the dubious privilege of being in the Guinness Book of Records as the fish with the fewest eggs, producing about twenty over several days, although more (around 70) are normal over the entire spawning period. Although

the American flagfish is not the most beautiful of the Killifishes, it is certainly the most tolerant and easy to keep, and their spawning practices provide a great deal of interest. If you have always wanted to try Killifishes, but not had suitable water, then give the American flagfish a try. ■

PROFILE

Name	American flagfish
Scientific name	<i>Jordanella floridae</i>
Size	5cm
Aquarium type	Best in species tank, but can be kept in carefully chosen community.
Distribution	North America
Diet	Flakes, live food, algae.
Temperature	20°C

Sulawesi revisited

Alf continues his exploration of Sulawesi Utara.

ALL PHOTOS A. J. NILSEN

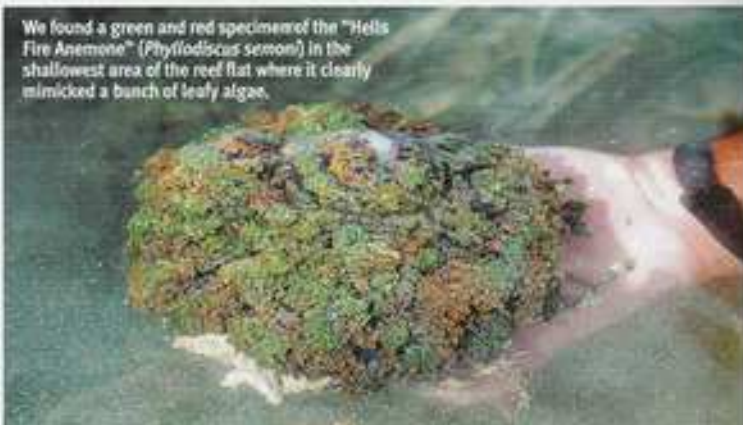


ONE OF THE MOST INTERESTING FINDS AT Bunaken was the "Hells Fire Anemone" - *Phyllodiscus semoni* - a remarkable organism that is capable of mimicking

other organisms like algae and corals.

We also found a number of Stony corals that were hosts for the Gall crab (*Hippolocochinus morsupiolis*), which lives symbiotically with corals of genera *Pocillopora*, *Sylophora* and *Seriatopora*. A juvenile female settles on a coral branch and starts to create water currents with its setae-equipped claws, to filter out food particles. This action irritates the coral, and it reacts by developing a spherical-shaped tissue outgrowth - a "gall" - which eventually encloses the female crab. Only a small opening remains, for the female to "swirl" water in order to obtain food. The male, which always remains in the vicinity, moves into the gall only to mate with the female and then leaves again, to resume its permanent life outside the gall.

The diversity of Stony corals on the reef flat was very high. Within a few square metres there were several species of *Acropora*, *Montipora*, *Pavites*, *Pachyseris* and other genera. There were *Euphyllia* and *Plerogyra* species and many colonies of the Red stoloniferous *Tubipora musica* just to mention a fragment of the total coral diversity. Down the reef slope the fauna naturally changed. The orange cup-corals, *Tubastrea* spp., were everywhere. The many colonies of sea squirts were very impressive with the blue species *Rhopilema crossei*, a small colony of the photosynthetic and widespread *Didemnum molle*, and the large, yellow and purple *Polysiphonia* being the dominant ones. Huge schools of fishes swam in the open water while damselfishes and gobies hide in between the branches of corals. At about 20 metres depth the slope ended in a sandy bottom. Here the reef was full of small channels and crevices and in these I had a first time glimpse of the Multibarred pygmy



We found a green and red specimen of the "Hells Fire Anemone" (*Phyllodiscus semoni*) in the shallowest area of the reef flat where it clearly mimicked a bunch of leafy algae.

angelfish, *Centropyge multicoloratus*. The fish was very shy and took refuge deep in crevices every time I approached.

Interesting dive sites

Both Bunaken Island and the near by Manado Tua have a number of interesting dive sites. At Bunaken Island the sites are spread all around the reef, which encircles the complete island, while at Manado Tua the best dives are done as wall dives on the western side of the island.

The small island of Siladen is situated 2 km north-east of Bunaken and has only one good dive site, which is a wall dropping to 35 metres. Here we saw lots of big pelagic fishes, but also delicate corals and a lot of colourful nudibranchs. Just as interesting was the shallow reef flat surrounding the island. During low tide the reef could be walked. In the many small tide pools, a number of white *Xenia* soft corals flourished. Their polyps were pumping desperately and I have wondered if this activity has something to do with coping with the very high temperature that existed here. The water must have been more than 35°C inside the pools were photosynthetic Sponges and lots of Blue starfishes. Close to the reef edge were huge stands of the Blue coral (*Heliopora*

coerulea), which although it feels hard to touch, actually is an Octocoral. In between the colonies of Blue corals were many colonies of the rare *Acropora indiana*. Close to the jetty where our boat had anchored were huge stands of the soft corals *Sinularia flexibilis*. Never since have I seen so many huge colonies of this common species



WALKING THE REEF FLAT

For an aquarium enthusiast walking a "billed out" reef flat is just as interesting as diving, since the organisms can be studied close up and much better than under water when time is limited and a lot of gear has to be watched constantly. If you turn boulders to search for hidden invertebrates and algae, remember always to turn them back to their original position afterwards. The organisms living in the shadow below boulders cannot stand the intense sunlight on the exposed side. And if you collect some organisms to study and photograph in photo aquariums, do always let the organisms go free after use and be careful not to hurt anything. Remember that Bunaken NP is a protected area and nothing must be removed from the magnificent reefs here!

Alf examines the corals and sponges at Siladen. If you can't dive, a walk on the reef at low tide can be just as fascinating to an aquarist.



gathered in one location.

A number of local people live permanently on Siladen as well as on the other islands of Bunaken National Park. On the islands we visited it was possible to get accommodation in local huts for a very cheap price. It was really pleasant and heartwarming to see the kids on the islands playing so happily on the beaches and under the palm trees. Smiles were on their faces all the time although they had no access to "plastic, electronics and money" that we westerners so luckily dispose...

We collected a few of these beautiful Apogon (probably juvenile *A. margaritophorus*) among sea grass close to the beach of Bunaken Island. They were all released in good shape after being photographed.



Tangkoko Dua Saudara Reservation

The area around Manado has a lot more to offer than reefs and corals. I always try to combine visits to tropical coral reefs with visits to rain forest areas if possible. While the reef is the most diverse marine ecosystem, the rain forest is the richest terrestrial ecosystem on Earth. And staying in North Sulawesi, a mountain rain forest is not far away. A two hours drive on horrible tracks ("yes, you do need a four wheel drive!"), led us to the Tangkoko Dua Saudara Reservation, which is located on the Northeast tip of Sulawesi's northern peninsula in the Minahasa area. The reserve protects 8800 hectares of the most beautiful forested land remaining in Sulawesi with unique flora and fauna in a mountainous area. It is a spectacular nature reserve with the possibility of seeing rare animals such as the *Moraco nigra* a black monkey, which only lives in North Sulawesi. Rarely seen are Cuscus or Python and other tree snakes. But the real attraction of the reservation is the *Tarsius spectrum*, called Tarsius, which is the

smallest monkey in the world. It is active at night and grows to only 12cm in length. Near to the sunset he leaves his place in the big trees to look for food. Big Rhinobirds (*Penelopides* spp.) are frequently spotted, and if you are lucky you can even see the Coconut Crab at the shore in the area. →



A beautiful Rhinobird, (*Penelopides* sp.), photographed in Tangkoko National Park.



The "Tarsius Monkey" (*Tarsius spectrum*), is the world's smallest and probably cutest monkey.

VISITING TANGKOKO

Take your time to settle in local resorts when visiting Tangkoko. You need time to explore the area and you need a ranger who can lead you through the many tracks in the rain forest. "Mama Roon Home Stay" located in Batu Putih Village close to the shore is a good place to settle in. Do remember that you need a permit to enter Tangkoko Dua Saudara Reservation. Such a permit can be obtained from The Directorate General of Forest Protection and Nature Conservation (PHPPA) in Manado.

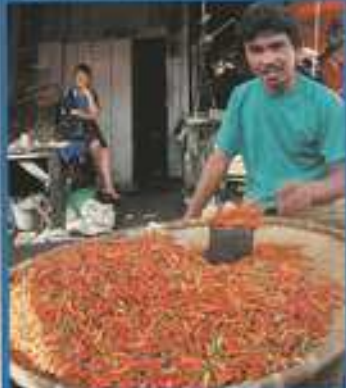
The area is rich in snakes, including giant pythons. We spotted medium sized pythons high in the tree crowns where they lie resting. Without an experienced guide we would never have spotted them. Stories were told to us about a giant python that appeared from the forest and attacked and ate a little boy from the local village just weeks before our arrival. Village people rushed into action, killed the snake and cut it open, but unfortunately too late to save the child. Luckily such horrible events are very, very rare. The rain forest - just like the coral reef - is indeed home to a few very dangerous animals that are capable of hurting and killing humans. However, the majority of organisms are relatively harmless and generally speaking it is safe to walk the forest and dive the reef if you have a minimum of knowledge about the biotope and if you follow safety

SATURDAY MORNING IN TOMOHON

If you want to buy dogs, rats and bats for the pot, the mountain village of Tomohon is just the place for you! Tomohon is a busy place. The buildings are small wooden houses with steel roofs. In the middle of the town is the market, which is open on Tuesdays, Thursdays and Saturdays. The marketplace is really something special! We arrived early Saturday with our jeep from Manado. Our first glimpse of what was to come was a man walking along the street with a dead dog on his right hand shoulder. The dog's four legs were all stiff and pointed to the sky - a rather horrific sight. It became even nastier when it turned out that the man and his dog were on their way to the market where the dog would be chopped in half and sold!

The market is actually streets that have been covered with steel plates to form a roof. Along the streets are sales stands that offer everything edible for sale. Outside and closest to the entrance are slaughtered pigs, chillies, fish, chickens and lots of vegetables. The sun is burning. It is hot

The smells were tropical, the gutters were full of every imaginable waste. "Yes", it smells! We were in Tomohon on a Saturday morning! People were hurrying around everywhere and we felt like we were in the middle of an ant's nest - but what an exciting nest it was! We walked along the steel-covered streets. People and salesmen were smiling and shouting and the camera shot one film after the other. Further in - well away from the outside streets - were bats, dogs and even rats offered for sale. On a table a dog was chopped in half with a huge knife. Dog blood and intestines all over the place! Large flying dogs (which are actually bats) were kept in cages, burned with flames and chopped in pieces and sold. Smiling, smoking people! Indeed very different from our western supermarkets. Shocking? "Oh, yes!". Disturbing to foreigners? "Indeed so!" Should it be abandoned? "Oh no, we are not the ones to judge!" This is a different culture, different traditions and a mechanism to serve needed food to the many people living here.



Everything edible is sold in Tomohon Market. These are fresh chillies but there are lots of less savoury items to be seen as well. Not a visit for the weak stomached.

flora communities, including mangrove forest, beach forest, lowland forest, sub-mountain forest and elfin cloud forest. These forests contain more than 240 tree species and are dominated by the stately Rao, large strangling figs and graceful palms.

Our journey to North Sulawesi and the Manado area ended in Tomohon. The next morning we were on our way back to Scandinavia. Indonesia is a huge country - Manado is just one interesting spot in a tropical paradise. We will return to explore more of this fantastic country - for sure! ■

REFERENCE

Spalding, M.D., C. Ravilious and E. P. Green (2001). World Atlas of Coral Reefs. University of California Press, London, UK. 424pp

precautions and listen to what local people and trained guides have to say.

Exploring the reserve

Despite the reserve's small size, its boundary runs from the sea to an altitude of 1351m, providing opportunities for tracks from beach forest through gently sloping lowland forest and on up to cloud forests that cling to the edges of volcanic calderas. The reserve also contains three volcanoes; the mountain Tangkoko (1109m), the ash cone of Batuangus (150m), which resulted from an eruption in 1839, and the twin peaks of Dua Saudara (1351m). The reserve contains a full range of

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Ponderings

In his regular look at ponds and pond life, **Dave Bevan** introduces a great pond fish to look out for, and has some handy practical tips to help your fish survive the winter.

DIPPING DEEPER - WATER STICK INSECT

The water bugs are one of the most varied groups of insects found under the water. They spend their whole lives in the water as they mature from egg through nymph to adult. Most species are predatory, feeding on small creatures they can easily subdue, up to the size of

Daphnia make up the bulk of a Water stick insect's diet, but they will take small fish if they strike it lucky.



small fish and tadpoles. This is done by piercing the prey with the sharp pointed rostrum through which toxic saliva is injected which partially digests the soft parts. The resultant soup is sucked up through the hollow rostrum.

Eggs are deposited in or on plant stems below the water surface and the nymphs, who resemble the adults, moult up to five times before becoming adult. They are long lived sometimes hibernating through the winter.

The water stick insect with its long body and legs resembles its land-based cousin and spends its time hiding amongst the water plants striking at passing fish or tadpoles. Although it is up to 5 cm long it rarely takes anything larger than the smallest fry.

BITTERLING FACTFILE

Species: Bitterling (*Rhodeus sericeus*)

Other names: None

Other forms: Asian species include *Rhodeus ocellatus*. A golden form is often available.

Size: up to 30 cms

Weight: 20 grams

Availability: Occasionally found in specialist fish keeping outlets.

Habitat: Found in slow running waters of larger rivers, shallow creeks and backwaters but only if inhabited by the freshwater mussel. A European fish which has established in a few locations in the British Isles.

Identification: A small fish with a high backed body and a blue green side stripe. During the breeding season the male is stunning as it takes on a red/purple sheen.

Habits: The bitterling is best known for its symbiotic relationship with the freshwater mussel. The female develops a long ovipositor and deposits her eggs inside the mussel. Here they hatch and eventually are exhaled by the mussel.

Pondfish value: An excellent candidate for the small wildlife pond where it may breed given the right conditions.



A shoal of normal and golden Bitterling.

STICKLEBACK MAKES A TRICKY MEAL

In the tough world of the natural pond the fish need all the help they can get and the tiny Stickleback is better protected than most. Rather than tiny scales its body is covered with bony plates. Its main defence is its array of sharp spines which are not only located along its back but also on either side of the gill plate. When these spines are locked in position it makes it more difficult for a potential predator to swallow the Stickleback.

WINTER SERVICE FOR YOUR POND PUMP

If you have not had a look at your pond pump yet there is still time. Don't leave it much longer because once the new year dawns Spring is only just round the corner. Most submersible pumps regardless of size or shape are basically the same, so disconnect the pump from the electric supply, haul it out of the pond and hose it down. Some pumps come with quick fit connections for the water inlets and outlets, for others you will need a screwdriver. Once you have the pump reassembled test it out to make sure everything is working smoothly.

BELOW THE SURFACE

As winter approaches the ambient temperature drops and life slows down in the pond. The fish huddle together in the bottom of the pond, hardly moving as they conserve energy. Here they are safe in an environment which only changes slowly whereas above, the water temperatures can swing violently between plus 20 and minus 20 degrees centigrade.

This is because cold water is more dense and falls to the bottom of the pond, displacing the warmer water. So a large, deep pond will give your fish the most stable environment to see out the worst of the winter.



Providing a hole has been made in the ice most fish will live quite happily under a layer of ice.


ONE...

Remove the filter housing and filter.


TWO...

Check the impeller. Is it damaged?
Does it rotate freely?


THREE.

Check the impeller shaft and bearings for wear — replacement parts may be less expensive than a new pump.

Today's top tip



When servicing a pump always remove the impeller housing and check the outlet for blockages. Also check out the electrical cable for cracks and damage particularly round the gland where it enters the pump body.

PLANT LORE

One of the reasons why the alien water plants are so successful is that having found ideal growing conditions they can spread very quickly to cover a large area, as their long shoots produce roots which anchor the plant further from the original parent. Plants like *Cassida helmsii* are brittle and small pieces break away and float to a new area where they root to establish a new colony.

Many of the marginals produce seeds in the conventional way. The flag iris produces



Close up of Flag iris seeds. When fully ripe they turn black and can be harvested to produce more plants next year.

large green seed pods which when they dry, crack, and release large black seeds which float away eventually coming to rest on a wet bank where they can germinate. Himalayan balsam, another alien, actually propels its seeds up to a metre from the parent plant when the seed pod cracks with an explosive pop.

Frog bit cannot stand the cold winters so each year it produces tiny plantlets called bulbils, which break away from the parent plant and drop to the bottom of the pond where they remain dormant until spring.

Water soldier sends out runners each year, which terminate in a new plant. This may remain attached or break away to form a new colony but as the cold weather approaches it sinks below the surface only rising again as spring approaches.



During warm spells newts move slowly about the pond bottom looking for a mate.

WINTER CHECK UP

Winter is a time of relative inactivity around the pond. In fact, weeks may pass without giving it a second thought. A warm spell may see some activity among the wildlife. Male frogs can be seen hanging near the edge awaiting the arrival of the females.

Towards the end of this month is a good time for that mid winter check up. Is the net still secure? The chances are that a few autumn leaves have found their way in and are floating on the surface. Remove them before they sink and add to the biological load on the system.

Perhaps some of the submerged plants were too close to the surface and have become frozen into the ice? Now dead they will rot if not removed along with the wind blown paper, plastic and polythene that has found its way into the pond.

Marginals, upright in autumn, have not withstood the ravages of winter and now lay in the water. Cut them back leaving a few projecting stems for the wildlife.

Check out the fish but don't worry if you cannot see them at all. The chances are that they are hiding amongst the plants in the bottom of the pond where they are safe from the worst of the winter.

LITTLE SUCKERS

Most of the leeches found in the garden pond are harmless, feeding on other small invertebrates. The Horse leech which can reach more than 7.5cm in length does not suck the blood of horses but actually eats small invertebrates like tadpoles which are

swallowed whole. Medicinal leeches are vertebrate blood suckers but are now extremely rare in the wild and are only found in a few locations. The ones to watch out for are the fish leeches, which, once having located a host fish, can cling on

with their specially adapted jaws whilst they feed from the fish. Repeated or multiple attacks can cause a significant loss of condition in the fish, with the wound sites providing entry for secondary bacterial infections.

FLAGTAILED CHARACIN

Semaprochilodus taeiurus

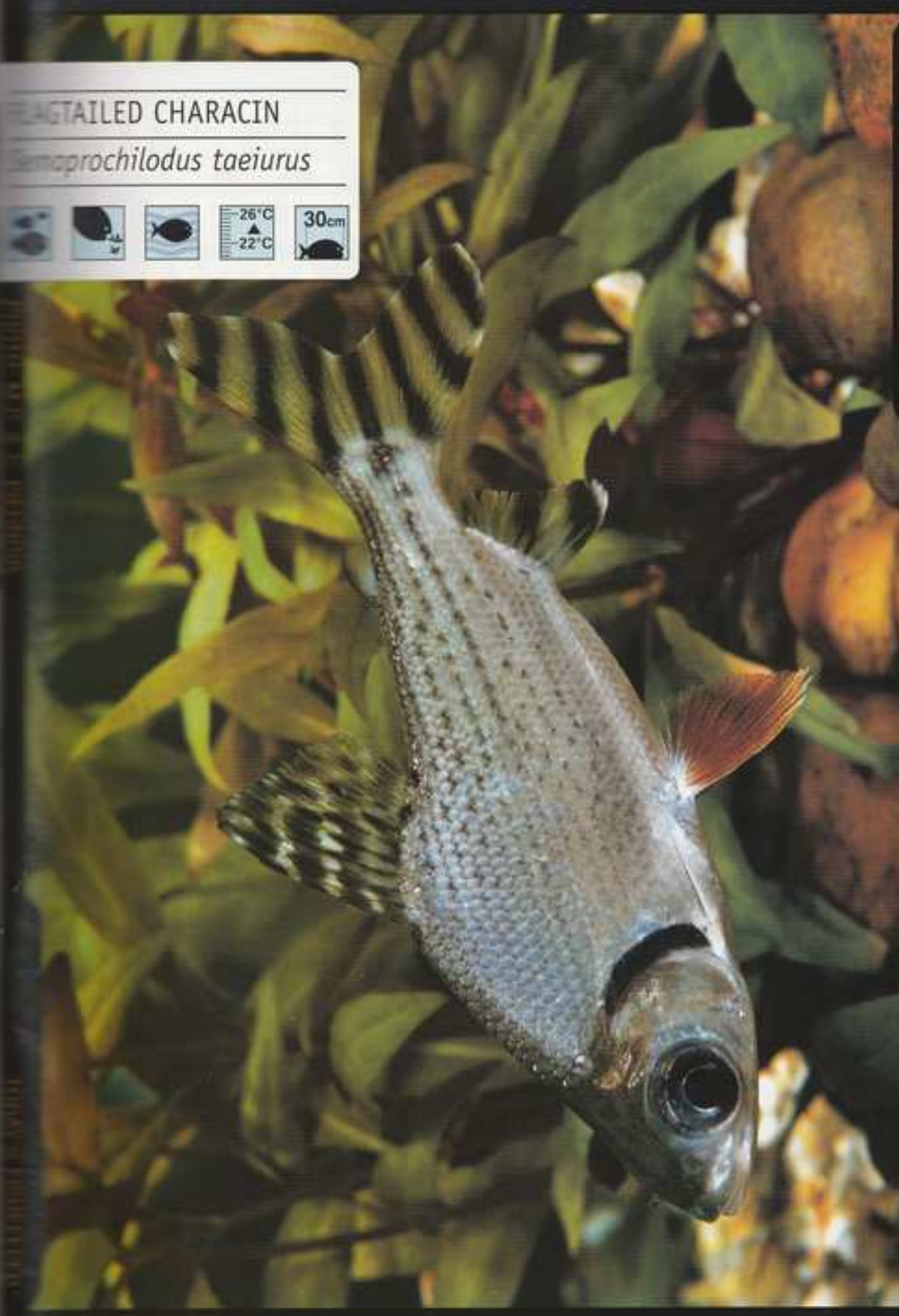


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DISCUS PROBLEM SOLVER

Good advice
from Tony Sault



A wild caught Discus from Alenques in their native habitat Discus often go through periods of famine when they have to live off their stored reserves. Likewise, in captivity a week or two without food will not harm them.

Worried about your holiday?

Q My first Discus tank has been stocked and running for a few months now and after one or two initial problems everything has settled down and the fish are doing fine. My worry is that I need to go away for a week in the near future. Should I have someone come in and feed the fish regularly and do my weekly water change?

Kath Armitage, Leeds

A Please do not be afraid to go, your fish will be fine if you take a few initial precautions. It will help if you have a timer on your lighting, the plug in type is ideal, set this to the times that you normally turn the lights on and off. For a few days before you go give the fish an extra feed per day of their favourite food. The day before you leave do your weekly water change, then leave them to it, your fish will be fine. If you wish to have someone call in daily to see if everything is OK, then that is fine but I can assure you that your fish will not die of starvation while you are gone. A previously well fed Discus, particularly a mature fish, can go 34 weeks without any food whatsoever, they just burn off the fat laid down in times of plenty.

How do I sterilise my aquarium?

Q I have recently had a disaster with my Discus community tank and have lost all my fish which included Neon Tetras, Rammoses and Corydoras cats. I intend to set the tank up again, how can I sterilise the tank to make sure it is disease free.

Mark Thompson, Nottingham



I am very sorry to hear of your disaster and from what you have told me a parasite was certainly present. To ensure that the tank is disease free, you must strip it down and anything that can withstand immersion in boiling water should be boiled. Leave the tank full with filters running without media then add to the water some Potassium Permanganate which you can obtain from a local Pharmacist. Add until the tank water is a deep purple, leave it like this for a week and I can assure you that anything in the tank will be dead. The tank can then be emptied and rinsed out thoroughly with clean water before being set back up.

Does white faeces mean my Discus has internal parasites?



Q I think that one of my Discus must have internal worms as the droppings are always white and not dark like the other fish, it also hides most of the time and only comes out at feeding times when it will get some food but not much. Can I treat this fish and what should I use?

Carl Painter, Manchester



White faeces are often an indicator of internal parasites but not always. First of all determine where the fish belongs in the pecking order as it sounds as if it is pretty low down the order. If it is only getting enough food to survive, it will still excrete a faecal sac which will be empty or white in appearance in which case all it needs is more food. If you have a hospital tank I suggest that you transfer the fish into it, set the temperature a few degrees above your normal temperature and feed it more often. If the faeces, as I suspect, revert to the normal colour let the fish put on some

weight before you transfer it back to its original tank. However, always remember that while it is away recovering, the pecking order will reform as someone has always to be at the bottom.

Can I use undergravel filters?



Q I am about to set up my first tank for Discus but I can't decide which filtration to use. I would like to have undergravel filters with power heads to assist the flow but I have been told that these will not be good enough for Discus. Is this true?

Gordon Smith, County Durham



Let me assure you that for many years I kept Discus in undergravel filtered tanks and never once had problems that could be attributed to the filtration. All I would say is be prepared to do a little maintenance once in a while such as cleaning the gravel of uneaten food.

When can I introduce my Discus?



Q I am setting up a tank for Discus and a few catfish. How long will it have to mature before I can introduce the fish?

G.Fothergill, Pontefract, West Yorks



It can take approximately 6 weeks before the filter will be mature. You will see the ammonia level rise first, then start to fall as the nitrite level begins to rise. Finally both levels will fall back to zero and you can start to introduce your Discus. By then the temperature will have settled and the plants will have had a chance to become established, so this period is absolutely vital.

Anthony Calfo explains why water flow is crucial for success with reef invertebrates.

Water the thi ingr for su

PROPER WATER FLOW IS CRUCIAL FOR success with reef invertebrates. However, it is an often neglected and surprisingly inflexible parameter for coral health. Water movement is one of the three fundamentals in reef aquarium husbandry along with light and food. Fortunately, it is also the least controversial dynamic and a very straightforward and simple endeavour. While inadequate lighting of symbiotic corals can often be compensated for with

LAMINAR FLOW

Laminar flow is the easiest flow to produce and the most commonly misapplied in aquaria. Submersible pumps and powerheads produce laminar flow: a one-directional, linear movement of water. Among popular species of coral in the trade, few will tolerate long term exposure to this type of water flow and even fewer actually need it. It is plainly harmful for many species and is especially harsh on fleshy, large-polyped Stony corals (LPS).

However, there are reef invertebrates that do favour laminar flow and grow strategically to exploit it. Sea fans are the most conspicuous example of reef invertebrates that favour this type of water movement. The large, flat plane of a Fan gorgonian's body grows perpendicular to the brisk path of water flow to fully exploit the unidirectional movement. Not all gorgonians favour brisk, laminar water movement, though; there are as many or more species of gorgonian that favour surging water movement. To reiterate, only a minority of corals commonly kept in aquaria will thrive with laminar water movement. Most corals prefer random turbulent or surge water flow.

Some Sea fans are one of the few reef invertebrates that can tolerate a laminar flow in the aquarium.

flow, d redient ccess



For sessile animals, like this Sun coral which are ill-adapted to weather an imposed laminar flow, prolonged exposure can literally strip away the living tissue!

SURGE FLOW

Surge is a dynamic form of water flow that is the hardest to replicate in aquaria and yet the most useful to employ categorically for the health and growth of reef invertebrates. It is characterised by a rush of water in one direction and then an equally voluminous change or exit of water in the opposite direction at timed intervals. Most corals tolerate or favour this type of water motion. Polyps and whole animals, if flexible, advance and retreat almost hypnotically in the surge having either side of their structure cleansed and bathed in the life supporting flow.

Unfortunately, it is very inconvenient to produce surge flow in small home aquariums. Specialised aquariums and equipment are needed to produce and contain the wildly fluctuating volume of water in the system. Furthermore, the waves and "salt creep" produced by the delivery of water in this manner are more challenging issues to contend with than most home aquarists care to embrace. Display aquariums in living spaces are necessarily more tidy and compact. They often cannot afford the space or aesthetic compromise of a deeper vessel or overhead surge device. There is also the nearly inevitable concern about the sound

("noise" to some) of surge activity in aquariums within the confines of a living space. Ultimately, surge activity is resorted most only to larger aquariums and public displays where such special considerations can be addressed. Aquarists interested in creating surging water flow might begin by referencing The Carlson Surge Device or the Borneman Flush Device (page 341 of Borneman's indispensable work "Aquarium Corals"). For all other aquarists, rest assured that the creation of random turbulent water flow in aquaria instead is a small compromise that still has tremendous benefits to coral health for most species commonly kept.



Brain corals must have the correct type and amount of water flow to thrive in captivity.

extra feeding, inadequate water flow will limit growth and may lead to death.

As predominantly sessile animals, reef invertebrates are critically dependent on specific water movements to not only help them thrive, but to survive in oceans and aquariums alike. Proper water flow serves many purposes including but not limited to the following: the carriage of food and other nutrients to a coral, the carriage away of waste products, the exchange and dispersion of sexual cues and gametes, the removal of suffocating detritus and to stimulate and support new growth.

It is very difficult to create too much water flow in most reef aquariums, given the very dynamic environment that most corals hail from, but it is possible to dispense water flow improperly.

There are three basic types of water flow on a reef that we commonly replicate in aquaria: laminar, surge and random turbulent.

Random turbulent flow

Random Turbulent flow is perhaps the best universal type of water movement to create →



Power heads can be used to create the correct type of water flow in a reef aquarium.

in aquaria for the optimum health and growth of reef corals. It is created by the simple convergence of laminar effluents to create a random and vigorous mix of water. Unfortunately there is no single recipe for creating this type of flow since we all rockscape our aquariums differently and such structural impediments change the dynamic of water moving through the system. Very basic experimentation by repositioning the nozzles or effluent stems of powerheads, pumps or returning manifold outputs will determine an arrangement that produces the best movement of water in the display. Ideal flow will stimulate coral polyps to extend eagerly and move about briskly at random. Also, it will prevent any unwanted "dead spots" where detritus could otherwise accumulate.

Powerheads are the most commonly employed devices for moving water in aquaria. For those using powerheads, begin by positioning pumps to discharge water to the diametrically opposite end of the aquarium. A pump in the upper left portion of the display might be directed to the lower right area of the tank. Hopefully, another pump in the upper right portion of the tank can be employed to converge on this pattern. Additional powerheads used to disturb the balanced pair of pumps will likely be of great value. Some of the simplest and most effective pump arrangements I have seen have used the top-mounted Turne "Turbelle" or Aquarium Products "Gemini" pumps in all four corners of the display directed at each other in opposition.

Ultimately, one of the very best and easiest ways to create random turbulent water flow involves a single large external pump (usually plumbed into a sump for the return of water) to reduce or avoid using unsightly pumps and

powerheads in the display. A simple and solitary return line from the pump can sneak up the back of the aquarium to form a discreet closed loop of pipe that runs the perimeter of the display and is to be mounted just at or slightly above the running water level. This run of pipe will serve as a manifold to evenly distribute water flow to the tees plumbed into the loop for a very fine-tuned delivery of water flow to the reef corals below. Small segments of interlocking, flexible pipe can be attached to the end of each tee for even more precise control. Else, a swivelling 45-degree elbow at the end of each tee can still deliver variable water flow nicely. Either way, a tee manifold will afford an aquarist nearly limitless opportunities to adjust the movement of water in the aquarium with ease as necessary.

Whichever form of pump and plumbing an aquarist chooses, flexibility of direction for water flow is critical to be able to continue to produce random turbulent movement in the tank. The rockscape might change (plants, rocks, etc.) and corals will certainly grow, and all such impediments will alter the dynamic of water movement in the display. Be assured, though, that a dynamic and random pattern of water flow is the least complicated and most effective way to provide adequate water movement for most popular corals.

Water turnover

Finally, to address the specific amount of water flow needed for corals, we cannot only say that more is better. The type and volume of water flow in the aquarium must be tailored to suit each collection of corals that have hopefully been assembled with regard to their similar needs. The old "rule of thumb" for water movement was 4 to 10 times a

tank's total volume. In modern aquariums however, a 40-fold turnover of water is mediocre at best. Now enlightened to avoid laminar flow for most corals, aquarists will find that 30 to 20-fold turnovers are common and appropriate. Some systems with various Stony corals or programmes targeting fast growth will likely employ even greater flows. Judicious experimentation is the only rule to follow here.

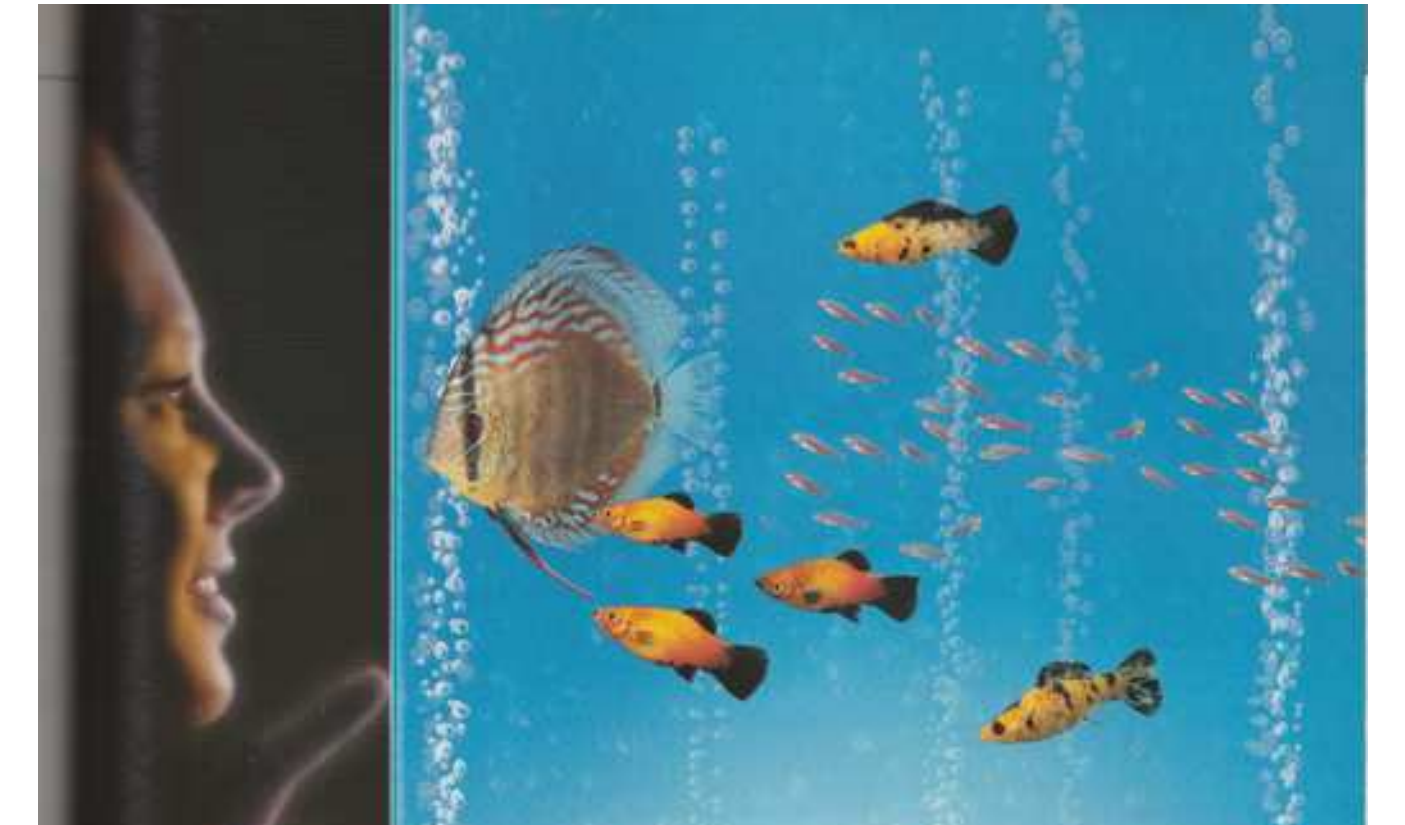
And so, with this third article we have now addressed the three simple ingredients for the successful care and growth of corals, light, food and water flow. These elements are the foundation for a healthy aquarium and all certainly require manipulation and experimentation to satisfy the many different species we keep. Simply approach your aquarium husbandry with an open mind, consider new and old techniques alike, and make an informed decision that serves your corals based on an intelligent consensus. Reef keeping is still a pioneering endeavour. Embrace the pioneer spirit and carry on gently! ■

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Boneman, E. K. 2001. *Aquarium Corals: Selection, Husbandry and Natural History*. T.F.H. Publications, Neptune City, NJ. 464pp.

ABOUT THE AUTHOR

Anthony Calfo is the author of the "Book of Coral Propagation", and co-author of the upcoming title "Reef Invertebrates" with Robert Ferner. He is a daily member and content provider for WetWebMedia.com and he can be reached for comment via e-mail at anthonycalfo@readingtrees.com



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Plant profiles

Four more great plants for your aquarium.

Windeløv's java fern (*Microsorium pteropus* 'Windeløv')

This plant is a variety of *M. pteropus* which was named after Tropica's founder Holger Windeløv. It has very distinctive finely branched leaf tips which make it a beautiful structural aquarium plant. It is a hardy and very easy plant for both beginners and the more experienced aquarist proving almost impossible to kill in the aquarium. It is usually planted on a stone or piece of bogwood which is how members of this genus grow in the wild. If planted into the substrate the rhizome must be laid flat on the surface and left uncovered. Since the root structure is not well developed it may float up from the substrate if grown this way. It will also grow well in a bare tank and will provide cover for fish in a quarantine, hospital or maternity aquarium. Another big plus is that few fish (even the most ardent herbivore) will eat it. It belongs to the Polypodiaceae family and the wild form can be found growing in Asia.

AQUARIUM CONDITIONS FOR WINDELØV'S JAVA FERN

Light: Very low to high

Temperature: 18 to 30 °C

Hardness: Very soft to hard

pH: 5 to 8



Windeløv's Java Fern will grow to a height of up to 20 cm and spread of 18 cm or more. It is a slow growing but undemanding plant.

Hornwort (*Ceratophyllum demersum*)

Hornwort (*Ceratophyllum demersum*) is virtually found all over the globe. It is very unusual in having no true roots although you can still plant it in the substrate. In the wild it forms large clumps held in place with the lower leaves forming anchors in the mud. When disturbed large pieces break off and float away down stream to lodge in the substrate and form the start of a new clump. Both in the wild and in captivity it provides a great hiding place for young fish and eggs. In captivity it can be really useful in combating algae because it gobbles up all

the nutrients in the water and secretes substances which act as an algacide. The only problem with buying this plant is that some varieties are difficult to transport and will break up into little pieces if roughly treated. It belongs to the Ceratophylloceae family and can be found on all continents. It grows to a height of between 5 and 80 cm with a spread of 5 to 15 cm.

AQUARIUM REQUIREMENTS FOR HORNWORT

Light: Very low to very high

Temperature: 10 to 28 °C

Hardness: Soft to very hard

pH: 6 to 9

Hornwort (*Ceratophyllum demersum*) is a fast growing undemanding plant which most aquarists will find easy to grow. It is ideal for the temperate aquarium as well as tropical.





Stargrass (*Heteranthera zosterifolia*)

Stargrass (*Heteranthera zosterifolia*) is an extremely beautiful plant which is not stocked by aquarium shops often enough. It forms lots of side shoots and will quickly grow into a lovely bushy clump. When grown in strong lighting, growth can be so fast and rampant that no light reaches the lower leaves of the clump which will die off. Regular and extensive pruning should, therefore, be carried out before this becomes a problem. Roots will often form along the stems, so cuttings can easily be taken and new groups quickly established. In modern, open style aquariums this plant will produce pretty small blue flowers if some shoots are allowed to reach the surface. It belongs to the *Pontederiaceae* family and is widespread in South America. It grows up to 50 cm tall and will spread 15 cm.

Provided Stargrass (*Heteranthera zosterifolia*) is grown under strong lighting it is easy to grow and will rapidly form large clumps.

AQUARIUM REQUIREMENTS FOR STARGRASS

Light: High to very high.

Temperature: 18 to 30 °C

Hardness: Very soft to hard.

pH: 5.5 to 8

Red milfoil (*Myriophyllum mattogrossense*)

The distinctive red stems and feather shaped leaves make this a very attractive and unusual looking plant. It is best planted in groups with each stem being given plenty of room. A planting distance of 5cm, or even a little more, between stems works well. If they are planted too close together, the lower leaves will be starved of light and the whole plant will suffer. All plants which have this type of fine leaf structure suffer if particulate matter settles on them, so make sure the aquarium is well filtered. This is a greedy feeder which requires an iron-rich fertiliser to maintain maximum growth in an aquarium. It belongs to the *Haloragaceae* family and will grow in excess of 100cm in length across the water's surface and produces many side shoots.

AQUARIUM REQUIREMENTS FOR RED MILFOIL

Light: High to very high.

Temperature: 22 to 28 °C

Hardness: Soft to hard

pH: 6.0 to 7.4

Red milfoil can be used as a very effective background plant. Here it will grow up to the surface and spread towards the front of the aquarium. Care must be taken it doesn't shade the lower growing plants further forward, but it does create some shade and hiding places for more timid fish.





Pete's Parade

Pete Liptrot introduces you to another selection of unusual fish for the connoisseur. PHOTOS: OLIVER LUCANUS

If you love predators, you'll love this fish.



PEPPERMINT OR PEARL PIKEHEAD *LUCIOCEPHALUS SP.*

It is unclear whether this is a new species or just a regional form of *Luciocephalus pulcher*. The name *Luciocephalus* does actually mean "Pike-head", but it could be argued that size for size this is an even more efficient predator than the Pike.

Found in warm, soft, very slightly tannin-stained streams in East-Central Sumatra, from Jambi to Palembang, in spite of appearances it is actually related to the Anabantoids, which includes the Chocolate and Liquorice Gouramis found in the same habitats.

Their jaws are thought to be among the most highly protrusible of all fish, this means that they can strike at prey fish from some distance away. Their cryptic coloration and the position of their fins show that they are ambush predators, being designed for a quick burst forwards out of cover.

As they really require live fish for long-term maintenance, there are ethical questions about their suitability for the aquarium, and they should certainly only be attempted by dedicated aquarists. The water in the aquarium should have similar parameters to that found in nature, with a pH of around 5 (the pH recorded in their natural habitat was 4.8), hardness virtually undetectable and a temperature of about 27°C. A substantially proportioned aquarium is required, as a length of 15cm for this fish is possible, and there is of course a risk of cannibalism if specimens of a widely differing length are housed together.

They are known to be delicate on first importation, and it has been found that unlike many of the fish found in similar habitats, they do appreciate gentle flow, with refuges where they can feel secure. Tall plants and some floating vegetation such as Indian Fern (*Ceratopteris*) would certainly help this.

Although no reports have been found of captive breeding, reports from the wild indicate that it is a mouthbrooder, as with the better known *L. pulcher*, which has been bred on occasion in the aquarium.

EIGHT-BANDED FALSE BARB *EIRMOTUS OCTOZONA*

This species appears to be distributed across parts of South East Asia, from Thailand to Borneo, with no records from the countries in between, so the possibility exists that there is more than one species involved. Whether or not this is true, the requirements for care are not affected, and this is a subtly-coloured and delightful little fish for the peaceful aquarium containing a community of Southeast Asian fishes.

They are found in the same habitats as many of the other small and highly attractive aquarium fish from the area, such as *Puntius hexazona*, *Rishora ogilbyi*, *R. pauciperforata*, *Bonaras meruli* and *brigitiae*, *Sundadania xantradi*, *Parasphyromenus* spp. and some *Betta* spp.

An aquarium featuring a mix of these fish would suit *Eirmotus* very well, and would make a superb display for the home.

They are not as delicate as some of the fish imported from these areas, but for optimal husbandry similar water parameters to those found in nature should be aimed at. Soft, acidic warm water with gentle filtration would be ideal, with a dark substrate and heavy planting with *Cryptocorynes* or other plants characteristic of the region.

They are imported frequently enough so they can be found in the better retail outlets without too much difficulty. As far as is known they are not currently being farm-bred for the aquarium market, so if in doubt ask your retailer when the next delivery of wild-caught Asian fish is due.

Surprisingly no reports of captive breeding have been found, so this may represent a worthwhile challenge for the aquarist looking for something slightly different.

Although not the most highly coloured of Barb like fish this species has a subtle charm all of its own.



**PETE'S PICK
OF THE MONTH**

DOUBLESTRIPE APISTO *APISTOGRAMMA DIPLOTAENIA*

A delicate gem of a fish, found from the Rio Negro to the Rio Orinoco drainage, this Apisto was only described 15 years ago, and has found its way into the aquaria of very few dedicated aquarists in the UK so far. The price and lack of supply undoubtedly are the main reasons for this, which is a shame as it is one of the most beautiful members of the genus. Like many *Apistogramma* species, as youngsters they show little sign of the exquisite colours they will show in later life.

Very soft, acidic and warm water is required for successful maintenance, and particularly for breeding. A pH between 5-6, temperature around 27°C, and a conductivity below 200 micromhos/cm should be aimed for. Plenty of cover in the form of leaf litter, bogwood etc. should be provided. Plants are not required, as aquatic plants are rarely present in the natural habitat, although floating plants may help to provide a sense of security. A substrate of fine inert sand covered with leaf litter would be ideal, as this species digs its own spawning sites, and this may be an important part of the courtship process.

Small live foods or quality frozen foods will form the basis for a balanced diet, and once settled it may be found that this fish will accept a high-quality fine granular food, which should ensure that all nutritional requirements are met. In nature they appear to breed colonially, and a group in a large aquarium may display this fascinating behaviour given the opportunity.



A young male Doublestripe apisto.

With a mouth this big not much is safe from this predator.



ANGLER CATFISH *LOPHIOSILURUS ALEXANDRI*

This fish is featured as much as a warning to the unwary as anything else. The genus name actually does mean Anglerfish-catfish, and obviously is a reference to the similarity in appearance between this fish and the marine Anglerfish (sold on the fishmonger's slab as 'Moekfish'). Another obvious similarity with a species perhaps more familiar to aquarists is with the Chaca or Frogmouth catfish from Southeast Asia, but there is a considerable difference in eventual size. Known to science for over 125 years, it has only recently come to the attention of the aquarium trade.

Variouly placed in the *Pimelodidae* or the *Pseudopimelodidae*, it is highly doubtful that the fish itself cares, as long as it has a ready supply of smaller fish! It originates from the Rio Sao Francisco in Brazil, where it obviously waits on the river bed for prey to swim over it. This prey could be fish anything up to half the size of the Catfish as the mouth is cavernous and the stomach can expand to hold huge meals.

In a Public Aquarium this would make for a fascinating display to show convergent evolution and camouflage, but at a length of over 1 metre it is not a fish for the home aquarium. Although largely sedentary, this fish is capable of powerful swimming, and for this to be possible huge accommodation would be required for anything more than a juvenile.

Only a few specimens have been imported up to now, which is fortunate, as the number of facilities able to house such a beast are very limited. Should a Public Aquarium create a dedicated display for this species, efforts should certainly be made to go and see what a remarkable fish it is, but that is perhaps the closest this species should get to the aquarium trade.

Replicating reptiles

Want to breed your reptiles?
Bob & Val Davies start with
 some general information.

MOST KEEPERS WILL, SOONER OR LATER, want to attempt breeding so we are providing some basic, general information although more specific details will be included in future articles on individual species.

Sexing

This is not always easy for beginners and some advice may be necessary from a more experienced person. Generally speaking, tortoises and turtles can be sexed by examining the tail. It is usually longer in males and the cloaca tends to be further away from the shell (i.e. nearer to the end of the tail). There is an obvious reason for this: the male needs to be able to curl his tail underneath the female in order to transfer sperm. This sexual difference would not be apparent in young specimens. In many, but not all, Chelonian species the male has a concave plastron (lower shell) again to facilitate mating. Difference in shell size may be a guide in a few species.

Male snakes tend to have longer tails but some species, especially short-tailed species e.g. Royal pythons may not be easy as both sexes have very short tails. In certain species of pythons and boas males possess longer spurs than females.



Sexual dimorphism in adult Russian sand boas - The female is longer and has a thicker body.



Male lizard with everted hemipenes and showing femoral pores.

These are actually remnants of limbs that have been lost during evolution and are thought nowadays to be used to 'scratch' the female in order to stimulate receptiveness. Many female snakes are larger, both in length and girth, than males but age differences and feeding regimes may distort this. Popping is a method of sexing snakes which must only be done by experienced keepers and is only effective on baby snakes. The method consists of applying gentle pressure to the front of the cloaca. If male both hemipenes will be everted. However, non-eversion does not necessarily mean a female. The hemipenes at this stage are small and by the inexperienced may be confused with two small, red scent glands which are also positioned in the cloaca.

Sexing lizards

In some lizards there are colour differences particularly in the breeding season when males of some species intensify or change

PROBING

In competent and experienced hands probing is a fairly good method of sexing snakes. To do this the correct size of stainless steel probe (specially manufactured) is inserted into the cloaca and gently manipulated forwards. The probe will penetrate further into the male's folded hemipenes than into the female. The difference in probed length between male and female of certain species is actually documented in various literature. At one time the use of a lubricant on the probe was recommended but some experts claim that these are spermicidal and the probe should be simply dipped in water. We must stress that beginners should not attempt probing - it is too easy to cause permanent damage to a snake. Ask an expert for assistance. Nowadays lots of captive-bred snakes are sold ready sexed.

their colour. This greatly assists in sexing them. This colour change can be done partly to attract females and partly to intimidate other males. This change may also be accompanied by posturing and behaviour such as head bobbing. In addition, in species which have various adornments such as horns, crests, frills etc. these may be absent or much reduced in females. Males of many lizard species can be identified by bulges at the base of the tail, femoral pores on males of some lizard species tend to be larger than in females and also produce a hard, waxy discharge. These are caused by the hemipenes which give the tail a more thickened appearance at the base. Out of the breeding season these bulges may reduce in some males. A few lizard species may be difficult to sex and one may have to rely on behaviour.

Preparation for breeding

As mentioned previously keeping two reptiles together can be a recipe for disaster. Some males can be extremely aggressive in their courtship and if the female is unreceptive severe damage can

result. Alternatively, some females can retaliate against an over amorous male and inflict damage. Ideally the two specimens should be: unrelated to prevent genetic mishaps; old enough to breed; healthy enough to breed.

For species which normally hibernate or are subject to a slightly cooler winter, such conditions should be replicated where possible. An increase in humidity can be a stimulus for some reptiles after slightly drier conditions. During cooling or full hibernation a reduction or absence of light is needed. Preparation for full hibernation is crucial. The creature needs, initially, to be kept at normal temperatures for two to three weeks but all food withheld so that the animal's gut is emptied. A gradual reduction in temperature and photoperiod (over two to three weeks) follows until desired hibernation temperature is reached. The hibernation quarters must be frost-free and most importantly not subject to fluctuating temperatures. A small water bowl should be provided and the animals checked every few days. In spring the process is reversed and when normal temperatures and photoperiod are reached food can be offered. Males may not always feed until mating has finished. ■



Colour differences and a thickened tail base in males enable sub adult and adult Feather chameleons to be sexed easily.

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Dave features Crayfish in his regular column on pond life



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Peter & Kathy look at the main Amazon rivers and the waters which flow through them



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...End Point

The number of fish available to the hobby from Sulawesi (formerly Celebes) barely gets out of single figures. Those that do appear in aquatic outlets certainly warrant consideration though, as in general they make highly rewarding aquarium inhabitants. **Pete Liptrot** has picked one of his favourites, the Celebes medaka.

Celebes rainbowfish are one of the few fish from this island that are regularly available in the hobby.

Celebes medaka make great community fish. They are easy to breed and make the perfect starter fish for anyone wanting to try their hand at breeding fish.



BREEDING CELEBES MEDAKA

Males can be distinguished by their more slender bodies, brighter colours and elongated dorsal and anal fins. Breeding follows the pattern as for other Medaka species, the female carrying around a cluster of eggs attached to her vent until they fall off amongst plants. When maintained correctly spawning is likely to occur regularly, and with plenty of shelter a few young may survive in the adult's aquarium. If more young are required it would be better to set up a couple of pairs in an aquarium with quantities of Java Moss to provide a refuge for the eggs. Once the females are seen to be carrying eggs the males should be removed, followed by the females as soon as the eggs have fallen off. Hatching will soon follow, and the fry will immediately take fine dry foods, although of course live foods would encourage better growth.

THE CELEBES MEDAKA (*Oryzias celebensis*) is a great little oddball well worth hunting out. It is pleasingly coloured, with subtle yellows in the body and fins and contrasting black edges to the tail. They use all areas of an aquarium, although they do spend the majority of their time in the upper water levels and are perfect community fish.

An aquarium of 45 litres upwards will be sufficient, they reach no more than 4cm in length.

The water chemistry is unimportant. Anywhere between pH 6.5 and 7.5 would suit them very well, and the hardness need be no more than that required to help

create stable conditions. The water should of course be clean, but regular water changes will ensure this.

A temperature of 24 - 25°C will be sufficient for routine maintenance and breeding.

Décor is a matter of personal taste, although a well-planted tank will undoubtedly make the fish feel more secure. Feeding is simplicity itself. They will thrive and breed on a diet of nothing but quality dry food, although frozen and live foods will be eagerly accepted. They show little if any real aggression towards each other, males will compete for the attentions of females but this rarely goes beyond harmless sparring. ■

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The Biolight is rated at 6,000 Kelvin with a spectrum designed to recreate sunlight. For both Saltwater and Freshwater Aquariums.



The Blue 2 produces an actinic colour spectrum. For both Saltwater and Freshwater Aquariums.



Aquablue is specifically designed for growing SPS corals down to a depth of 80cm. For both Saltwater and Freshwater Aquariums.



Nature superb tube brings blue and red colours in your fish whilst maintaining maximum plant growth.

Benefits of Al T5 tubes include:

- T5 with Al phosphor mix give up to 10% more light output than obtained from HQI's with minimal colour loss.
- T5 tubes have a 5 point spectrum.
- 50% improvement in coral colour and growth in saltwater aquariums (see Bernie Moore's aquarium which have been using our T5 lights for approximately one year).
- 50% increase in tube plant growth and fish colours maintained in freshwater aquariums.
- Lifetime of up to 15,000 hours.

Benefits of Our REFLECTOR include:

Our unique 'W-shaped' Reflector catches the light and reflects it around the tube and NOT through it. Thus saving the maximum Light/per Watt.

NOTE: Our T5's are NOT compact T5s. Compact T5s have the disadvantages of NOT being able to reflect the Light away from the tube causing Light and Power to be wasted.



PRODUCT INFORMATION

Suggested Prices below include: 3pin Plug, Switch and T5 Al Phosphor Tubes

MEGA SINGLE

BRMS 139 :	1 x 39 Watt / 895L x 125W x 65H mm	RRP£89.99
BRMS 154 :	1 x 54 Watt / 1195L x 125W x 65H mm	RRP£99.99
BRMS 180 :	1 x 80 Watt / 1495L x 125W x 65H mm	RRP£114.99

MEGA TWIN

BRMT 239 :	2 x 24 Watt / 859L x 163W x 65H mm	RRP£109.99
BRMT 254 :	2 x 24 Watt / 1195L x 163W x 65H mm	RRP£118.99
BRMT 280 :	2 x 24 Watt / 1495L x 163W x 65H mm	RRP£135.99
BRMT 224 :	2 x 24 Watt / 595L x 163W x 65H mm	RRP£109.99

Benefits of Light Holder includes:

- Water Resistant.
- Maximum Power for Minimum Space above the Aquarium.
- All Components are Non-Corrosive.

Innovators of excellence

Exclusive components for all aquarium enthusiasts



D-D Lighting Solutions - as well as the above, offers over 60 different options of light fittings which can be manufactured in any colour to your individual requirements.

www.d-daquariumsolutions.com

Bernie Moore's aquarium in Germany which have been using our T5 lights for approximately one year.

maidenhead aquatics

www.fishkeeper.co.uk



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- Weylake Garden Centre, Weylake End, Aylesbury Road, Wendover, Bucks HP30 5DD. Tel: 01296 423333. **MT**
- Roome End Garden Centre, Hendon Road, Roome End, Bucks MK45 5SE. Tel: 01493 535885. **MT**
- Weylake Garden Centre, Forest Road, St. Pauls, Bucks MK42 4HA. Tel: 01344 423888. **MT**
- Weylake Garden Centre, Hockley Dale, Kingtonham, Bucks Ayles, MK21 2AG. Tel: 0117 977 2885. **MT**
- Fugate Garden Centre, Wargrave Road, Wargrave, Camph, South Camerton, CP11 8LZ. Tel: 020 3394 3489. **T**
- Weylake Country Gardens, Soggon Road, Chichester, West Sussex PO20 8EG. Tel: 01243 771077. **T**
- Weylake Garden Centre, Tress Hill, Drossfield, Kings Langley, Herts MK4 8LN. Tel: 01442 834417. **MT**
- Sunnydale Garden Centre, Tranter Road, Cressingwell, Cambridgeshire, Cambs MK44 2SE. Tel: 01533 973339. **T**
- Honey Garden Centre & Nursery Ltd, Honey, Carlisle, Carlisle CA2 1PB. Tel: 01352 291221. **T**
- Beaver Farm, Eastbourne Road, Newchapel, Litchfield, Surrey RH7 9HL. Tel: 01342 825373. **T**
- Weylake Garden Centre, Calverton Road, Clove Hill, Epsom E15 8DE. Tel: 020 8364 9077. **T**
- West Herts Garden Centre, Epsom Road, West Herts, Surrey MK24 6AR. Tel: 01442 291678. **MT**
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- Havard Garden Centre, Weylake Country Gardens, Barlow Road, Havard, Hampshire PO8 3HA. Tel: 023 8449 9407. **T**
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- Weylake Country Gardens, Woodmill Lane, Oxtrey, Middlesex TW8 3PH. Tel: 020 8888 3082. **MT**
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- Pink Garden Centre, Linton Road, Redgers Mount, Swindon, Wiltshire SN1 7DD. Tel: 01899 233019. **T**
- Weylake Country Garden Centre, Henson Road, Remegate, Kent CT11 7ET. Tel: 01644 587587. **MT**
- Thorpston Garden Centre, Nulty Lane, Shepperton, Middx TW17 9PQ. Tel: 01832 791500. **MT**
- Weylake Country Gardens, Wymester Road, Farnham, Eastleigh, Hants SO50 1HD. Tel: 020 8669 0383. **MT**
- Peterborough Garden Centre, Alvington Road, Peterborough, Cambridgeshire PE4 1DS. Tel: 01753 862587. **MT**
- Marae Garden Centre, Cheney Manor Garden Centre, Cheney Manor, Bedfordshire MK42 2GJ. Tel: 01753 598888. **MT**
- Ryan Park Garden Centre, Spring Park, Brentford, Middlesex TW8 8JG. Tel: 020 8888 7776. **MT**
- The Greenhouse, Church Farm, Birch Grove, London NW9 6RY. Tel: 020 8800 3545. **MT**
- Weylake Garden Centre, Crooked Bridge Farm, New Heath Road, Addlestone, Weybridge, Surrey, KT13 2UB. Tel: 01832 821198. **MT**
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