Today's Fishkeeper

JULY 2002 £2.95

NEW SERIES
Ad Konings on MALAWI CICHLIDS

PONDS
Pond liner guide

MARINES
Stony corals

PLANTS
Growing Cryptocorynes

TROPICAL
Four new fish revealed

FROM BEGINNER TO ADVANCED

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Welcome

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NEARLY 11 YEARS ago I dug a pond, as the farmer behind our garden filled in a natural one. The newts and other wildlife moved over and soon we had a thriving aquatic habitat as an attractive feature. Since it was never built as a fish pond, a filter was not included and the banks slopped gently into the water. Time passed. The white Water lily grew huge and smothered the surface (it was a bargain at the local garden centre – I should have known). That was removed and replaced with a smaller named variety at a much higher price.

The Water soldiers then went crazy and we had dozens of those to pull out every year. The Water-forget-me-not cascaded over the bank and into the water (what a lovely sight). Eventually it was covering nearly a third of the surface. No problem, just yank some out each autumn to keep it under control.

Then came a Swamp grass of no name (I can't print what I called it!). Slowly, at first, but with increasing vigour it took over the bank where my pretty Water-forget-me-not lived. Hand weeding had little effect and besides it didn't really like the land. What it wanted was to get its toes in the water. Once there it spread. By the end of last summer it had swamped the Water-forget-me-not and covered over a third of the surface with a grass like mat.

It was time for drastic action. I went indoors for the winter (one of the great things about a wildlife pond is you really don't have to look at them in the winter) and finally stuck my nose back outdoors in March. The pond had vanished! Instead I had a water meadow with only a small area at one end free of the Swamp grass. So after a major operation to remove this carpet of weed (it took two people to lift it out) it was time to restock with lots of pretty plants.

Which brings me to the point of this month's editorial. Just what do some of the water garden plant suppliers think they are up to? Incorrectly named plants have always been part and parcel of the garden scene. That beautiful red leaved plant so often called "Lobelia cardinalis" is in fact a form of *Lobelia fulgens* called Queen Victoria. It lives happily in a bog garden so it doesn't matter if it has the wrong name on it. Those of us who are in the know nip over to the perennial section to buy this plant because it is usually less than half the price than those offered for sale in the water garden sector.

That I can live with. But this year I found *Mazus reptans* being sold as a moisture loving plant suitable for a bog garden. Utter rubbish, it is much better suited to a rockery and requires well drained soil. Not exactly the conditions found in a typical bog garden! The other plant, which I have to admit was a welcome discovery, was a great selection of Canna. Beautiful summer bedding plants which are not used enough by the home gardener in this country to my mind, but once again being sold as moisture loving plants for a bog garden!

Yes ,I did get caught out by the *Mazus reptens* only finding out its real requirements when I checked at home. At least I have somewhere suitable for it to live, but I could have done without adding to the rockery plants at this time. It just goes to show that buying marginal plants is really turning into a mine field. How many other people have ended up with plants they don't want, can't accommodate, or have unwittingly killed because of this sort of misrepresentation? I would love to hear from you if you have.

Until next month,
Happy fish keeping

Derek

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

I am pleased to say we have the start of two new series in this issue of *Today's Fishkeeper*. Ad Konings is one of the world's top authorities on Cichlids and has studied Lake Malawi and the Cichlids that live there in great depth. In the first part of this major new series he looks at wave washed rocky habitats and those fish which make this type of habitat their home.

Do you like aquatic plants? Then you will love Mark Duffell's new two part series on *Cryptocorynes*. The variety of species and forms is huge and many of them are available for you to try growing in your aquarium.

Also we have an update on the "Just say no" G.M. fish campaign plus all the regulars.

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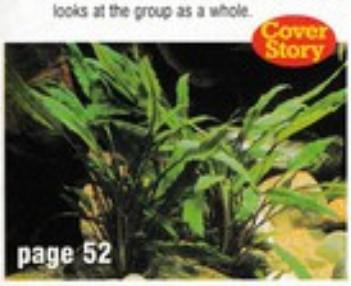

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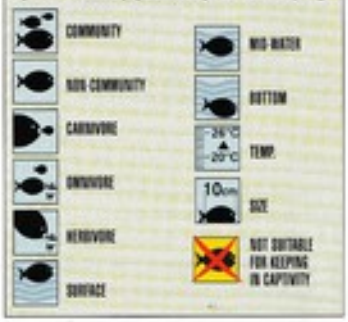
KEY TO SYMBOLS:

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



it's easier with AQUARIAN

Starting Point...

Just beginning in the hobby?
Pat Lambert writes especially for you...

ONE OF THE MOST CONFUSING THINGS IN fish keeping is the mixture of measurements used when dealing with capacity and linear measurements of tanks. In conversations with fish keepers I have found that there is a wide variation in the measurements they use. Personally, I can see, just by experience and looking at the standard rectangular tanks, what size they are in feet and inches and their capacity in gallons.

Nowadays, however, there are so many differently shaped tanks. Circular, oval, bow fronted, you name it, there are tanks in all shapes and sizes. Just to make it even more of a headache, if you read American publications the US gallon is less than the imperial gallon. This all gets very complicated and can cause real problems when choosing the right sized filter for your tank or, worse still, when you are using a medication.

A letter came into the office from Mrs Wendy Watson with a plea for help and I quote the following from Wendy.

"Some water treatments are now in gallons, some in US gallons and some in litres, WE NEED HELP! Could you please print a chart that I could cut out and keep. This would be a big help in working out medication doses." So here we have the small version. Later on a more complete version will be in the cut out and keep section.

Litres	US gallons	Imperial gallons
4.55	1.2	1
22.75	6	5
45.5	12	10
68.25	18	15
91	24	20
136.5	36	30

Tall narrow tanks have smaller surface areas which means fewer freshwater tropicals can be kept

Working out fish stocking levels which, for freshwater tropicals, are based on surface area, can also be a nightmare. Rectangles, squares and circles are easily worked out but odd shaped tanks are much more difficult. The surface area is very important and the larger the surface area the better. I tend to err on the cautious side and under stock my tanks. As there are so many beautiful fish out there, it's very difficult when you are starting out to resist them, isn't it?

This plant does not appreciate acidic water

The Giant hygrophilia, *Hygrophilia corymbosa*, is a fast growing plant with broad leaves carried on an upright, strong brown stem. Grown as a single plant it becomes quite bushy but it can be grown in a group. This plant does not do well in acidic water and is an ideal plant for the general community tank in the normal pH range. Looks best in a larger tank as the common name would suggest. It's easy to grow with its broad, long , mid-green leaves and regular pruning makes it more bushy.

One degree is much more than you'd think

One degree on the logarithmic scale, the scale used for testing pH, is ten times more or less than the one above or below it counting from 7 (neutral). This means that 6 is ten times more acidic than 7, and 5 is a hundred times more acidic than 7. At the upper end of the scale 8 is ten times more alkaline than 7 and 9 is a hundred times more alkaline than 7. Most aquarium fish we keep live in the pH range between 6 and 8. Some species are less tolerant of a pH shift , even when it is gradual. Some species will not breed unless the pH equates to that found in their natural habitat.

Let's take a look at pH...

Measured on a scale of 1-14, 7 is neutral, count down from there and it becomes more acidic, up from 7 and it's alkaline. You can buy a test kit that measures this, it is easy to use, comes with full instructions and it's a good idea to have one. A sudden drastic change in pH can be a killer. This is not something I have learned from text books, it is something I have seen in the real world. I have seen the beautiful fins of guppies disintegrate when the fish have been moved suddenly to water of a different pH.

Some years ago I received two pairs of livebearing Goodeids from a friend, he lived in a similar water area and I had obtained many fish from him previously with no problem, transfer was easy.

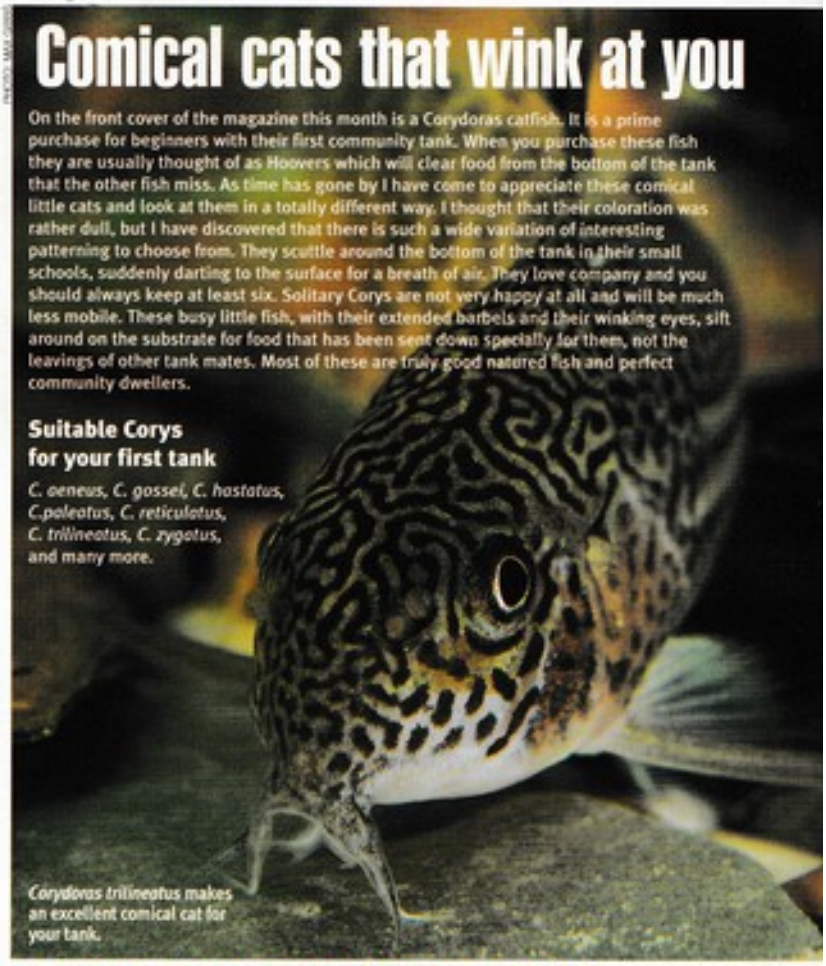
I had a tank ready for them and left the robust, healthy fish to settle in. The next morning, the four adult fish were dead but swimming around in the tank were 20 healthy young fry. I could not understand this until I had a frantic phone call from my friend asking how the fish were. His tank was reading pH 5.6 instead of the normal 7.2. I had taken the fish from a pH of 5.6 to 7.2 just like that. The babies survived because they were born in my tank water but this really illustrates the importance of testing the water. Many fish will adjust to a slightly different pH but the change must be gradual. **Always test pH of water you bring the fish home in before introducing them to your aquarium water.**

Comical cats that wink at you

On the front cover of the magazine this month is a Corydoras catfish. It is a prime purchase for beginners with their first community tank. When you purchase these fish they are usually thought of as Hoovers which will clear food from the bottom of the tank that the other fish miss. As time has gone by I have come to appreciate these comical little cats and look at them in a totally different way. I thought that their coloration was rather dull, but I have discovered that there is such a wide variation of interesting patterning to choose from. They scuttle around the bottom of the tank in their small schools, suddenly darting to the surface for a breath of air. They love company and you should always keep at least six. Solitary Corys are not very happy at all and will be much less mobile. These busy little fish, with their extended barbels and their winking eyes, sift around on the substrate for food that has been sent down specially for them, not the leavings of other tank mates. Most of these are truly good natured fish and perfect community dwellers.

Suitable Corys for your first tank

C. aeneus, C. gossei, C. hastatus, C.paleatus, C. reticulatus, C. trilineatus, C. zygatus, and many more.



Corydoras trilineatus makes an excellent comical cat for your tank.

LOOK OUT FOR CONTAMINANTS !

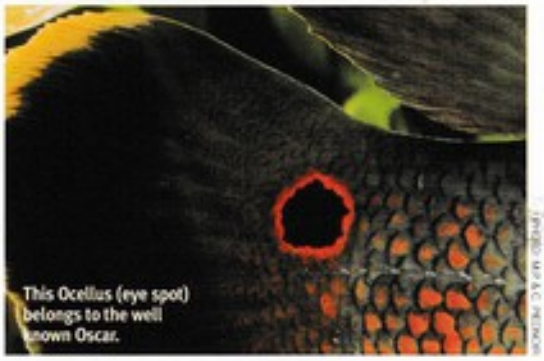
Here's a fish that often comes in with a consignment of cultivated Platies and Swords from Florida, the natural habitat of *Gambusia holbrooki*. This species, however, also infiltrates consignments of fish from various parts of the world. I have received numerous excited phone calls from fellow fishkeepers who think they have found an unusual livebearer in their local aquarium outlet. Along comes the question, "Could you tell me what they are?" On their description , without even knowing the details, I am reasonably sure that they are *Gambusia holbrooki*., although other species of livebearer have occasionally come in this way.

Gambusia holbrooki was spread throughout the world to combat malaria, as they eat tons of mosquito larvae which are a gourmet meal for them. These are quite nasty fish and can cause havoc in a peaceful community if they get that far. They have led many fishkeepers to believe that **all** Gambusias are fin nipping, body biting creatures which is not true.

If you want to keep these fish, and the black speckled form are quite attractive, they should be kept on their own in cool conditions. I have kept a group of these fish, with no other species, in a water barrel for the summer months and they do very well in there. They are certainly a great controller of mosquitos and they are an easy livebearer to breed, but they are fry eaters as well, so heavy planting would be necessary. When you're in the aquarium shop look carefully in the tanks and see if you can spot any, they'll be rather colourless but, unless you can provide the right conditions don't be tempted to buy because you think they're an unusual livebearer.

The black speckled form of *Gambusia holbrooki* is a very attractive fish - but still an aggressive fin-nipper.

Lost for Words



This Ocellus (eye spot) belongs to the well known Oscar.

Biotope tanks A biotope is the natural habitat of fish. Biotope tanks use the word more loosely. These are tanks which contain fishes, plants, rocks, wood and substrate from a particular geographical area e.g. An Amazonian tank.

Emerse plants This is a seasonal stage in an underwater plant's life when it grows up above the water.

Estuarine fish Also known as brackish water fish These fish are found in river mouths where salt and fresh waters mix, Many of the fish (Scats and Sailfin mollies for example) that live in these estuaries move between fresh and salt water and adapt to either.

Ocelli These are eye spots , circles with a spot in the middle. *Astronatus ocellatus* is the Latin name of the well known Oscar. Ocellatus means with an eye spot which the Oscar has in the caudal area. When you see ocellatus in a fish name it simply means 'with an eye spot'.

Planaria worms Small worms with a diamond shaped head and flattened body which is white through to brown in colour. They look a little like leeches and may be introduced on plants. They can become an infestation when overfeeding of the fish provides them with food.

Styrofoam Expanded polystyrene which is used in the manufacture of fish boxes. It has good insulating properties and a cushioned surface which make it ideal for the packing boxes used to transport fish around the world.

Ultraviolet (UV) Type of light used as disinfectant and produced by a special tube usually enclosed in a surrounding water jacket through which aquarium water is passed

Water turnover This is the rate at which water flows through a filter or pump. Large fish (such as many large Cichlids)which are messy feeders require a greater water turnover through their filter and for this purpose larger filters and pumps are required.

The ten golden rules of fishkeeping

Read all about it

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

a) Manufacturers often provide free booklets about fish care.

b) Inexpensive books provide information on setting up.

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

THE WATER

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

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

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

THE FISH

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

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

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

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

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

THE ROUTINES

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

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

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

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

tropical | marine | coldwater & ponds | plants | regulars

top tips Fluorescent lighting

Correct lighting is vital for growing plants, but also for your reptile, amphibian or fishes well being as well

1 Don't take the cheap option. Yes you can put cheap tubes from a DIY store above fish tanks, but better results will always be achieved when specialist tubes are used instead. Even if it is only to see your fish by, you still want to appreciate their full beauty. Good lighting allows you to do so.

2 Change your tubes every year. Although they may still look bright they will be producing a lot less light than they used to.

3 Select the correct type of bulb for the job. Each tube available through specialist shops has been designed to create a specific spectrum. Many years of research has gone into the development of these tubes with the result that species of plant which were almost impossible to grow in the past can now thrive in aquaria.

4 If keeping Reptiles correct lighting (including low levels of UVA and UVB) is vital to their well being. It helps them synthesis vitamin D3 (preventing rickets), increases appetite, stimulates activity and helps induce mating.

5 Don't use a cover glass between special reptile tubes giving out low levels of Ultraviolet light and Reptiles. It will filter out almost all the beneficial UVA and UVB rays you have specifically bought the tubes for.

6 Always use a cover glass between lights and your aquarium water. These must, however, always be kept clean and free of algae growth.

7 If you want good plant growth use at least two tubes above the aquarium, three is better. In Holland where aquatic plant growing is almost more important than the fish, people use up to six tubes above an aquarium.

8 Always use a special reflector attached to each tube. They focus the light downwards and can double the light reaching your plants.

9 Never keep switching light on and off. Use a timer so they come on at a specific time of day and go off between 10 and 12 hours later. This should be about 30 minutes before the room light is normally switched off at night. A longer light period (12 hours) will be needed in a dark room which receives little or no direct sunlight.

10 Too much light is often blamed for excess algae growth. In fact it is more often caused by high phosphate levels in the aquarium water and too little growing plants in the tank. If algae becomes a problem starve it out by using a good quality phosphate remover and add in more growing plants. It takes time but eventually the algae bloom will die back. ■

Tropical Q&A

BROUGHT TO YOU BY NUTRAFIN & FLUVAL

Not so angelic Angel

PHOTOS: MIKE DAVIS

Star Letter

Q **I have a problem with one of my Angels bullying just about everything else in the tank. He is an adult male about a year or so old. There are also three small Angels (about 4-5 months old) and an adult female about the same size as him. There are eight Black widow tetras, two small Clown loaches, small Plec and a lone Rainbowfish (the other two died not long after I bought them).**

The tank is 60 x 45 x 55cm high, fairly well planted with a good mix of plants including several large Amazon swords. The problem is the large male Angel has a go at all the other fish except the Clowns. I have heard that it might be a good idea to stick him in a tank on his own for a while to calm him down. Could you please give me some advice as I don't think it will be long before the other Angels get bullied to death.

A You are right to be concerned. A territorial Angelfish is quite capable of harassing other Angels to death, to them it is a natural part of defending their 'patch'. No fish will actually 'bully' another fish, they are merely following instincts developed over millions of years of evolution which get twisted out of shape when we choose to put them in extremely close proximity to each other.

If anything, it probably can't understand why the other fish aren't taking the hint and getting well out of the way! A territorial Cichlid will take the presence of another fish of the same species in it's chosen area as either an indication of sexual receptiveness or as a challenge. Unless it can defend a territory in nature it is unlikely to successfully attract a mate, and hence the quite understandable vehemence it is showing in trying to achieve this, as it probably sees your aquarium as prime real estate.

The adult female may not be able to feed enough to come into breeding condition, but if you were to remove the male, temporarily, this would probably allow the female to come into condition. When the male is returned they could possibly spawn and then you would have the problem of two Angels guarding a territory between them, each with murder on their minds!

In a mixed community I have had problems with a single pair in a 200 litre aquarium. They regarded the whole of the tank as their territory and did their best to exclude everything else. Other people I know have had no problems with a compatible mated pair in a similarly-sized aquarium (although no fry were raised in either situation due to predation by the other fish).

Obviously the young Angels will be bearing the brunt of the aggression, but many of the other fish will be instinctively recognised as potential egg/fry predators, and will be chased off. I must admit I don't know why the Clown loach are not being targeted, but it could be that they simply do not register as fry predators and so are ignored, Alternatively, the Angel could have discovered that Clown loaches have very efficient weaponry in the form of a spine under the eye, and have learnt to avoid conflict with this species through painful experience. It can be expected that, should the Angels spawn, the Botia are quite likely to be first to the eggs, being active at night when the Angels will be dormant.

I'm afraid your choices may be somewhat limited, as you may have already guessed. You either need to permanently rehouse the dominant individual (unfortunately this may simply result in one of the other Angels taking on the dominant role), or you need a larger aquarium where the male can defend a territory while giving the other fish room to avoid being harassed. Although your aquarium is quite wide and deep relative to it's length, it is still not quite big enough, in the long term, to house a pair of Angels, but would make an excellent breeding tank for them.

Peter Liptrot

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

Angelfish spawning problems

Q **I have six Angelfish which are my favourite fish. I would just love to be able to breed them. They have laid eggs three times now but never get to the hatching stage as they are eaten within a couple of days. I have just put in a divider to see if that will help. Or should I take the eggs away from them and hatch them that way.**
Jane Aye, *via e-mail*

A Angelfish regularly eat their eggs the first few spawnings. Sadly, many pairs continue to do so virtually all their lives! So I would take them away and hatch them artificially. Take out whatever they have spawned on and position it vertically with an air stone gently running a few cm away. This keeps the water well oxygenated and moving near the eggs. Add 1 drop per litre of 5% methylene blue to the water as a fungicide. The eggs hatch in 3 days and the fry are free swimming on the eighth day. Feed newly hatched Brine shrimp or Micro-worms as a first food. The fry can take commercial powdered fry foods in a few days time. Start water changes in a few days to clear the blue out of their water. Water changes must be done with matured water of a similar pH and hardness. I usually take this from the adults' tank.
Derek Lambert.


Poor diet may result in Platy fry developing deformities and may eventually lead to death.

DEFORMED PLATY BABIES

Q **I have had two lots of baby Platies and, within a few weeks, some of them develop a bend in their spine and their tails, instead of being straight are bent slightly upwards. It is a little difficult to explain. The first batch which did it eventually died and now the second ones are doing the same. Any ideas?**
Elaine Marshall
via e-mail.

A The symptoms you describe in your baby Platies are typical of feeding a poor diet which lacks some vital element. I suspect you might be grinding up a poor quality adult flake food to feed to your babies . Buy a well known high quality brand of powdered fry food to feed your youngsters . I would also add in a regular feed of small live food. Micro-worms or Brine shrimp are excellent for this.The problem could be genetic (rarely) or possibly the fry have been damaged in some way during development or at birth. It is possible that the fry have poorly developed swim bladders In addition to the symptoms you describe, the fry will not rise from the aquarium bottom and swim normally if this is the problem. Using shallow water for the female to give birth in will help but it is not uncommon to get a few fry born like this no matter what the species or variety of livebearer.
Derek Lambert

Fishkeeping Answers Expert Panel

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

Questions by Post

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

Internet Service

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

Marine Q&A

Black cap basslet, like Lemonpeel angelfish are usually fine with other fish, however, occasionally large individuals have been known to harass other fish.

PHOTO: MIX CARES

Which fish can I have?

Q **While my new aquarium has been maturing, I have been trying to read up on all the fish that will be available to me now I have a bigger tank. My problem is that while all these books I have read tell you about the general species behaviour, none of them tell me how the individual fish will behave with other species, or in which order I should stock them. Any help on what I can put in this tank and order of stocking would be appreciated.**

Peter Jones, *via e-mail*

A When it comes to choosing fish it can be a bit of a nightmare due to several factors, compatibility, stocking order and the stocking limits of the system are but a few. So what fish can you introduce? I cannot tell you that as aquariums are personal taste, a fish I like might be boring to you. Please forward a stocking list of a few species that you would like, then I can sort it out for you.

If you think of physics as a science and remember all the 'laws' that abound in that subject, well biology as a science, has only one 'law' and that is "there are no laws in biology" Remember this when choosing fish as we are dealing with animal behaviour, and so play the percentage game. Some fish will be 100% safe, others 80 for 20 against, others 50/50, (getting a bit dodgy now) and so it goes. I remember a person taking a Lemonpeel angel with a 70/30 compatibility, it came back two days later after terrorising the whole aquarium. Another person expressed an interest in the fish, he was told the tale of woe, and took the fish regardless. That Angel is now happy in an aquarium with some of the same species he terrorised in the original tank! There are no hard and fast laws to stocking, send me a list, then hopefully I can help you out a little.

Andrew Caine

Star Letter

How long can I store R.O. Water?

Q **How long can RO water be stored and does it make any difference if it is aerated and has been mixed with salt? I know that it depends on temp etc. but when I tested my RO water which had been stored for a week, the ammonia reading was high. I have been trying to read up on it, but all the books I have read have not given a specific time, they just say long periods.**

Paul Leeman *via e-mail*

A R.O water is a bit of a funny thing, and what happens depends on your RO unit, membrane condition, quality of source water and then mains water pressure. However, when I use RO I will not keep it stored for more than 14 days. I will normally salt it up within two days, then it is no longer RO but marine water, termed as 'a complex matrix', which can be stored for much longer.

Your ammonia reading is most likely as a result of how you stored it. If you used a normal bucket, not a food grade plastic one, your salt water could have released ammonia in chemical reactions with the bucket walls, however, this depends on the chemical make up of the bucket.

When storing this water you must keep it moving by using a small power head, to circulate and aerate the water. Only use an air stone for short periods of no longer than 24 hours as you are skimming the water with the introduction of air. Always wash out the bucket between fills with a small amount of RO.

Always use food grade, marine safe plastic for all pipe work and storage vessels, cheap alternatives will only contaminate your aquarium water.

Andrew Caine

A REAL PEST

I have a problem developing in the form of what I am led to believe are Aiptasia anemones. Several small anemones have started to appear on my living rock, first there was one and then four and almost overnight about seven. It is almost like a new one walks in overnight! I have been reading postings on the web, and others with this problem talk about using a Peppermint shrimp. When I enquired about this creature at my local fish shop, I was told that they cannot get them any longer and I should consider a Copperband butterfly.Then ,to confuse me more, a friend who keeps marines also said they had read about the Black banded butterfly being good for this problem .Then I read about Nudibranches, but they starve when the anemones have gone which I don't want. Please help! I need to know the best reef safe and commonly available natural predator for this problem. My fish Stock is 1 Clown, 1 Powder blue tang, 1 Blue cheek goby, 1 Coral beauty and 1 Cleaner wrasse. My tank size is 132 x 38 x 43cm.

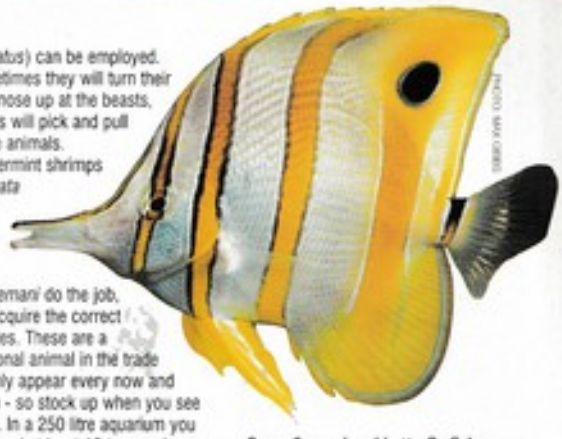
Nick Honor *via e-mail*

Aiptasia is the name most people call this anemone, however, I like to refer to this beast as a little bastard, as when in your aquarium they dig in deeper than an Alabama tic, and are harder to shift than a plague of locusts. As soon as you see one, action should be taken to stop these spreading. I cannot stress how serious these can be, they can, and will, kill all your corals if allowed to take over.

There are only two methods of total control. If they appear on one rock and you can remove it, do so. Then place it in aquarium water and raise the temperature to 32 C for three days. This kills the anemone but also all the other life on and in the rock apart from bacteria. This is 'a bit over the top I know' but it does the job. The other is a Berggia nudibranch. This animal is prey specific to Aiptasia so it will starve to death when your problem has gone, share this animal between fellow aquarists. In fact ,it would be a good idea if marine clubs could have one for its members.

All other methods are hit and miss, all work to a degree but most people have to employ a range of methods to stop the infestation and start to clear the animals from the aquarium. When we employ animals to consume the nasties we have a problem, in that if they get enough food from other sources the clearance will be slow ,if at all.

Reef safe butterfly fishes such as the Copperband (*Chelmon rostratus*) can be employed. Sometimes they will turn their long nose up at the beasts, others will pick and pull at the animals. Peppermint shrimps *Lysmata wurdemani* do the job, but acquire the correct species. These are a seasonal animal in the trade so only appear every now and again - so stock up when you see them. In a 250 litre aquarium you will need at least 10 to even have a chance of getting rid of the beasts.



Some Copperband butterfly fishes will eat Aiptasia.

Mechanical methods mostly involve injecting the animals with a number of solutions, the problem with this is that you have to be quick, the enemy can retract into the trench very quickly. Solutions which have been utilised include, Calcium hydroxide, Iodine and salt, all in very high concentrations. So be careful not to upset the chemical balance within your aquarium. Another method is to squirt boiling water into the hole where the nasty resides, though this will kill a small section of your live rock as well.

Last but not least is the gouging method, a thick needle and in you go, scraping at the sides of the live rock as you go in deeper and deeper. With this method don't mess about but really go at it. Again there is a draw back, if you mess up and don't kill the animal, the cells that make up the pedal disc, the foot, if broken away from the animal, can settle on your rock and start to grow another Aiptasia

Andrew Caine

Star Letter Prize from AQUA MEDIC

***Modern Coral Reef Aquarium* books, written by Alf J Nilsen and Svein A Fossa are regarded as probably the most authoritative series of books for the marine hobbyist in years.**

ab Aqua Medic, the leaders in Marine Aquarium technology, is pleased to present whichever of the three volumes, normally £55.00 each - desired to this months star letter

Algae? No, Flatworms

Two months ago I purchased a small Mushroom coral, after three days I noticed a few brown rectangular shaped algae growing around the base of the mushroom rock. Two months later this algae is out of control, it is growing all over the aquarium, I siphon out loads at each water change.

At first I was not too bothered about this until last night, they always grow on the glass and I soon sweep them off, but last night I actually saw one move. Looking closely I can seen hundreds of them all moving slowly. So now I do not think of them as algae, but what are they and can I remove them from my aquarium?

P. Smith, *via e-mail*

PHOTO: BOB & VAL DAVIS

Flatworms like these can become a real pest.

I am very sorry but what you have is an outbreak of Planarian flatworm, most likely *Convolutriloba retrogemma* and you are quite right they need to be removed. These little pests really like areas of low water flow and loads of light, and will smother corals to death if allowed. There is only one 100% way of eradication, that is a Nudibranch *Chelidonura varia*, however this will starve to death when all have been consumed. Other methods of biological control include the introduction of fish to eat them, but this is hit and miss since members of the same species will eat them while some will not. Try such species as *Chrysiptera cyanea*, Blue damsel, *Pterosynchiropus splendidus* Mandrin and *Pseudocheilinus hexataenia* Pyjama wrasse.

Andrew Caine.

Q&A

Dying water lily leaves will certainly pollute the water in autumn.

PICTURE DAVE BEVAN

Can dying plants pollute the water?

Q **Is it possible for dying vegetation in a garden pond to pollute the water?**
Peter Sykes, *Bristol*

A It is not only possible but very probable that decaying vegetation will pollute pond water very quickly. One of the worst offenders is the water lily. Although so handsome when in flower, as their leaves die and start to decay they can pollute the water considerably. If such a leaf is pushed under the surface there will be a quantity of oil left on top. Most of the dying leaves and flowers should be removed as soon as they start to decay.
Derek Lambert.

FRY DEATHS

Q **I am having trouble with rearing Goldfish fry. Every year I have plenty hatch out but never seem to be able to rear many. Where do I go wrong?**
Andrew Wright, *Brighton*.

A It is possible to rear most of the fish hatched out but ,to do so, many conditions are necessary. The chief conditions necessary for success are plenty of swimming space, the right food, but not too much of it. Problems arise in many different ways. Fry can be killed with fresh tap water if it is run straight from the tap and contains chlorine. Sometimes a lot of fry hatch from a spawning and unless they have plenty of swimming space they will soon be in trouble. The next point to watch is the feeding. If the fry were in a fair sized container with plenty of growing water plants they would find plenty of food among these plants, and the addition of a little Liquifry each day would keep them going for about ten days. It is when dry food is given that trouble can start. It is so easy to overfeed the babies. If this happens you will lose the whole brood almost overnight.
Derek Lambert.

Winter spawnings

Q **I have a large tank with Moors, Orandas, and Fantails which spawned in November and have done so every 14 days since. Will this late spawning prevent them from spawning next season?**
John Toledo *via e-mail*.

A It is unlikely that this will make any difference to the fishes spawning next season. You must have kept your fishes too warm to bring them into spawning condition at that time of the year. As winter approaches it is far better to gradually reduce the temperature of the water where these fishes are kept.In cooler conditions, the fishes will have a good rest and be ready to breed the following spring. When goldfish varieties spawn it is usual for only some of the eggs to be laid at one spawning. I have noticed that it is rare for all the eggs in a female fish to be laid at the one spawning. In an outdoor pond spawnings can take place once a month through the warmer days, but it is almost certain that after each one there will be many eggs remaining in the female.
Derek Lambert.

Ideally fancy Goldfish, like this Moor, should go through a winter resting period if they are to be bred next season.

Are frogs a problem in my pond?

Q **Some Goldfish have bred in my pond and I have now found a large frog in the pond. Will this eat the young Goldfish?**
Pauline Pratt, *via e-mail*.

A I do not think the frog will do any harm in the pond. Frogs often spend the whole winter at the bottom of a pond and do not eat during that time.
Derek Lambert.

Top of the Pops the Danios

Our new series features all the most popular aquarium fish in the trade and some of their lesser known cousins who are the "Wannabes" of the fish world

PHOTOS: MAX GIBBS

Leopard danio

Leopard danios have led the scientists a merry dance for years.

OUR VERDICT
A hit from the moment it was introduced and now firmly established as a "Top of the pops" species.

Name	Leopard danio
Scientific name	*Danio rerio* (was always thought to be *Brachydanio frankei*) is just a colour form of the Zebra danio.
Aquarium type	60 x 30 x 30cm
Distribution	Not known
Diet	Not fussy. Flake, pellet, frozen and live foods.
Companion species	Well suited to a small and medium sized community aquarium with other peaceful fish.

Queen danio

Queen danios are a recent introduction.

OUR VERDICT
What better "Wannabee" to reach "Top of the pops" in our Queen's Golden Jubilee year. Sadly it probably won't make it because of its large size and high price tag.

Name	Queen danio
Scientific name	*Danio regina*
Aquarium type	120 x 30 x 30cm
Distribution	Thailand and Malaysia
Diet	Not fussy. Flake, pellet, frozen and live foods.
Companion species	Well suited to a large sized community aquarium with other peaceful fish.

Zebra danio

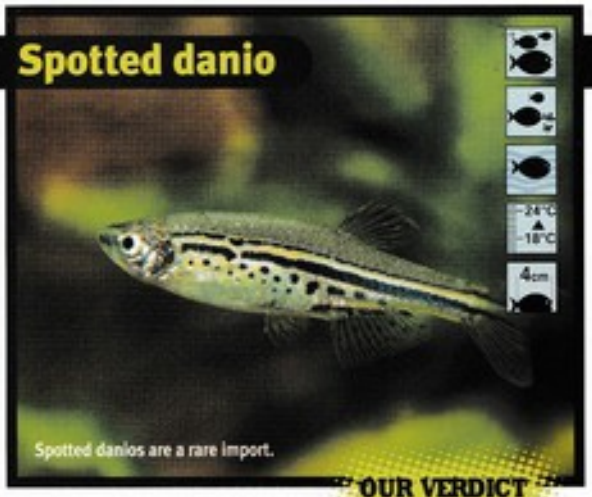
Zebra danios come in several colour forms and long finned versions as well.

OUR VERDICT
An excellent community fish which richly deserves to be "Top of the pops".

Name	Zebra danio
Scientific name	*Danio rerio*
Aquarium type	60 x 30 x 30cm
Distribution	Western India
Diet	Not fussy. Flake, pellet, frozen and live foods.
Companion species	Well suited to a small and medium sized community aquarium with other peaceful fish.

SEE KEY TO SYMBOLS ON PAGE 5

Spotted danio



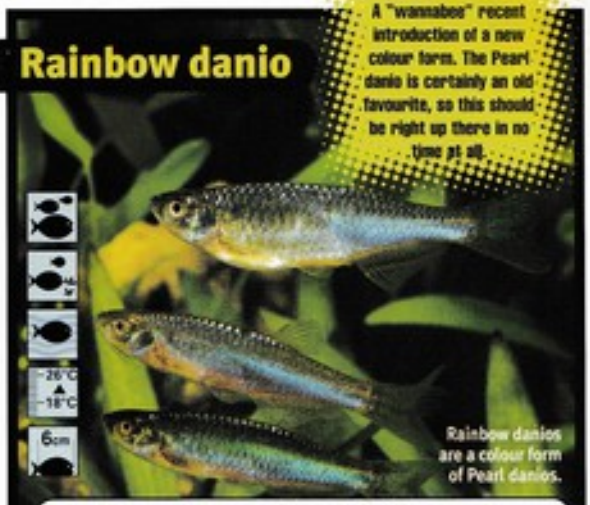
Spotted danios are a rare import.

Name	Spotted danio
Scientific name	*Danio nigrofasciata*
Aquarium type	60 x 30 x 30cm
Distribution	Burma
Diet	Not fussy. Flake, pellet, frozen and live foods.
Companion species	Well suited to a small sized community aquarium with other peaceful fish.

OUR VERDICT
A lovely fish which has lost out to its better known cousins. Always a "Wannabee" but never a "Top of the pops".

Rainbow danio

OUR VERDICT
A "wannabee" recent introduction of a new colour form. The Pearl danio is certainly an old favourite, so this should be right up there in no time at all.



Rainbow danios are a colour form of Pearl danios.

Name	Rainbow danio
Scientific name	*Danio* sp.af. *albolineatus*
Aquarium type	60 x 30 x 30cm
Distribution	Northern Thailand
Diet	Not fussy. Flake, small pellet, frozen and live foods.
Companion species	Well suited to a small sized community aquarium with other peaceful fish.

Giant danio

OUR VERDICT
An excellent community fish which justly deserves to be "Top of the pops"

Giant danios are one of the largest members of the group.

Name	Giant danio
Scientific name	*Danio aequipinnatus*
Aquarium type	90 x 30 x 30cm
Distribution	West coast of India & Sri Lanka
Diet	Not fussy. Flake, pellet, frozen and live foods.
Companion species	Well suited to a large sized community aquarium with other peaceful fish.

Bengal danio

Bengal danios are seen in the trade regularly now.

OUR VERDICT
A lovely fish which seemed to be losing out to its better known cousins, however, it is seen much more often these days and is steadily climbing the charts.

Name	Bengal danio
Scientific name	*Danio devario*
Aquarium type	120 x 30 x 30cm
Distribution	Bangladesh, India and Pakistan
Diet	Not fussy. Flake, pellet, frozen and live foods.
Companion species	Well suited to a large sized community aquarium with other peaceful fish.

tropical | marine | coldwater & ponds | plants | regulars

A fish for you

Sea view

What a fish!

The Lacey Scorpionfish, *Rhinopias aphane*

This is a fish that divers pay thousands to travel and photograph, aquarists would have to empty the bank account to acquire one, that is if one came on the market, and if anyone accuses me of self indulgence in my writing , I am guilty. The Lacey scorpion fish has to be one of my personal favourites. Gloating time now! For one such beauty sits proudly in one of my aquariums and, even better, it was given to me as a gift.

Described as very rare in the wild, many authors from all areas have also agreed that the 'rarity' could also be due to the fact that you cannot see them in the wild due to their camouflage, and lack of study of their habitat. I have had people looking at mine in the middle of a sand bed, not on rocks, and they still could not see it.

As you would expect this beauty is an ambush specialist, it can wait for an eternity on rocks unseen by all, then a little fish passes by, blink an eye and you will have missed it. River shrimps will walk over them, thinking they are on a rock full of seaweed, big mistake! So put him with larger fish, follow the golden rule of aquatics. If it fits into the mouth, do not put it in.

They do not move around much, I have never seen mine swim, it only walks utilising the pectoral and pelvic fins. Sometimes they will sway in the water looking like a weed covered rock or debris. However, if hungry they will hop towards a piece of fish offered to them, they will hop with great urgency, but never swim. This means that a small aquarium can house one.

Grazing fish and inverts can be avoided as they sometimes try to eat off this fish but most of the time this would not concern the animal. However the Lacey scorpionfish is prone to bacterial infections so any surface damage is taken seriously and a knowledge of fish health is required. This beast will rid itself of parasites, algae and other irritations by shedding its skin, leaving two perfect pectoral fin shapes and a blob of skin behind.

This is a fish for the serious aquarist, truly a gob smacking animal, words do not do it justice, you have to see one to truly appreciate such a wonder of nature.

PROFILE

Subfamily
Scorpoeninae

Name
Rhinopias aphanes

Location
Northeast Australia, New Guinea, New Caledonia

Size
22 cm

Feeding
Acclimate from live food to whole frozen fish offered on tongs

Reef compatibility
Not recommended

Difficulty
A serious fish for the serious aquarist

tropical | marine | coldwater & ponds | plants | regulars

At home with Malawis

Ad Konings has 30 years experience with Malawi cichlids and is widely regarded as one of the world's authorities on these fish. In the first part of this series he introduces us to the lake and focuses on the wave-washed upper rocky habitats and the fish that live there

WHEN DAVID LIVINGSTONE, ON ONE OF HIS many expeditions through Africa, stumbled upon Lake Malawi, he asked the natives the name of this impressive body of water. The fishermen told him 'Nyasa', and Livingstone thus named it Lake Nyasa, unaware of the fact that "nyasa" itself means lake. Lake Malawi (its present name in Malawi) or Lake Nyasa, as it is known in Tanzania and Mozambique, is of great importance to Africans. Tens of thousands of tons of fish are harvested from the lake each year. Fish - mainly 'utaka' (*Haplochromine* cichlids), 'chambo' (*Tilapiine* cichlids), Catfish, and 'usipa' (Lake sardines) - enrich the daily meal of "msima", a type of corn flour, of the Africans living in the area.

Aquatic habitats

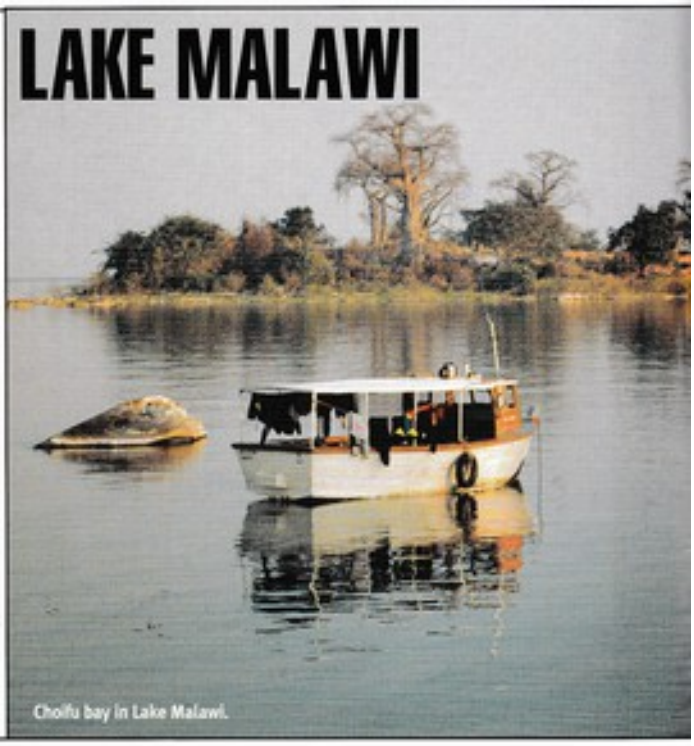
The shoreline of the lake consists of three main types. A quarter to a third is rocky while most of the remainder consists of sandy beaches. The third type can be found at river estuaries, and consists of swampy areas covered with reeds. The alternation of gently sloping sandy or swampy shores with steep rocky coasts has

LAKE MALAWI

The lake is approximately 600 km long and up to 80 km wide. It has a maximum depth of 700 metres and covers an area of about 31,000 km². Most of the lake (the western and southern part) belongs to Malawi, the northeastern section to Tanzania, and a relatively large stretch of the eastern coast is under the jurisdiction of Mozambique.

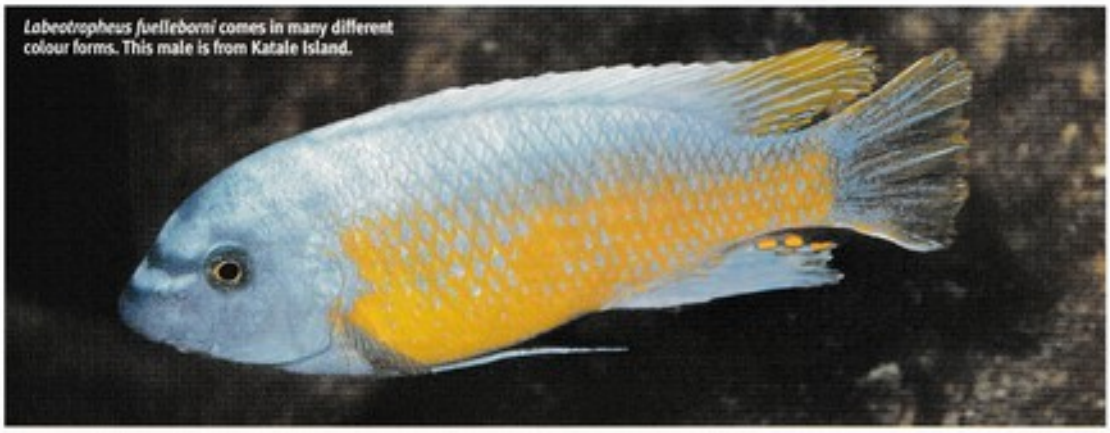
The lake's setting in the tropics prevents the surface waters from becoming much colder than the deeper layers, thus preventing any extensive vertical circulation of the water - although there is some. Only the upper 200 metres of the water column are sufficiently oxygenated to support life other than the anaerobic micro-organisms prevailing in the anoxic (and somewhat colder) layer below. The southeasterly wind ('mwera') - most prevalent during the dry season from June to August - induces an upwelling of the somewhat colder layers in the most southerly parts of the lake, lowering the surface temperature in that region to 20° C. In the rainy season (November to April), temperatures in sheltered bays may rise to above 30° C. The average surface temperature, however, ranges from 23° to 28° C.

The chemical composition of the water is rather uniform throughout the lake. Its pH, a measure of acidity/alkalinity, varies between 7.8 and 8.5. The difference between these two values is due mainly to the carbon dioxide (CO_2) content of the water. In the surf zone gas exchange is optimal, reducing the CO_2 content so that the pH is higher than in sheltered bays or deeper layers. The conductivity, a measure of the mineral content, ranges between 200 and 260 microsiemens, which is relatively low in comparison with the other lakes of the East African Rift Valley.



Chofu bay in Lake Malawi.

At Makulawe point the wave-washed upper rocky habitat consists of the first three to five metres below the surface of the rocky habitat.



Labeotropheus fuelleborni comes in many different colour forms. This male is from Katale Island.

been, and still is, an important factor in the speciation of the Cichlids.

The wave-washed upper rocky habitat consists of the upper three to five metres of the rocky habitat. It includes rocky outcrops, small islands, and steep rocky coasts which are usually characterized by clean but turbulent water. These places all have a substrate free of sediment, and the algae mat covering the hard substrate (biocover) contains many firmly attached algal strands. When the rocks are small the power of the turbulent water is efficiently deadened by the many cracks and caves. The face of a large rock receives the full force of the waves and only a few species of Mbuna are able to feed from such a surface during heavy swells.

Perfect adaptation

Labeotropheus fuelleborni has a clear preference for this kind of habitat and is found on any rocky coast throughout the lake. It is also found on small patches of rocks amidst sandy beaches, especially at wave-exposed sites. *L. fuelleborni* has two adaptations for living in the upper reaches of the rocky habitat. One of these features is a broad underslung mouth coupled with a remarkable fleshy 'nose'. When the fish is held upside-down the mouth is seen to be a straight line across the full width of the head. Its ventral position allows *Labeotropheus* to feed in a position almost parallel to the rocks, its body making an angle of approximately 30° with the substrate. *Labeotropheus* thus remains in close contact with the substrate while cropping algae.

The fleshy 'nose', which overhangs the mouth, is even more remarkable. Both nose and chin are callused, probably as a result of continuous contact with rough substrates during feeding. The effect of the fish closing its mouth on the firmly attached filamentous algae is to pull it closer to the substrate, and the nose then functions as a fulcrum, allowing its owner to shear off the algae by leverage rather than energy-consuming jerking of the body. This not only saves energy but also allows *Labeotropheus* to remain in close contact with the rocks, thus reducing the risk of being swept away by the turbulent water. Moreover it allows greater quantities of, and more tightly attached, algae to be cropped using the three or more rows of tricuspid teeth in the outer jaws; this feeding method is so efficient that the algae is removed completely, leaving visible scrape marks in the biocover.

The second feature that ensures *L. fuelleborni* a (physically) stable position in this habitat is its laterally compressed body. Together with the extended dorsal fin, which acts as a sail, it prevents the fish from wobbling. Male *L. fuelleborni* defend their territories with great vigour, especially against conspecific males. Females and non-territorial males congregate in groups and feed from the upper parts of the habitat.

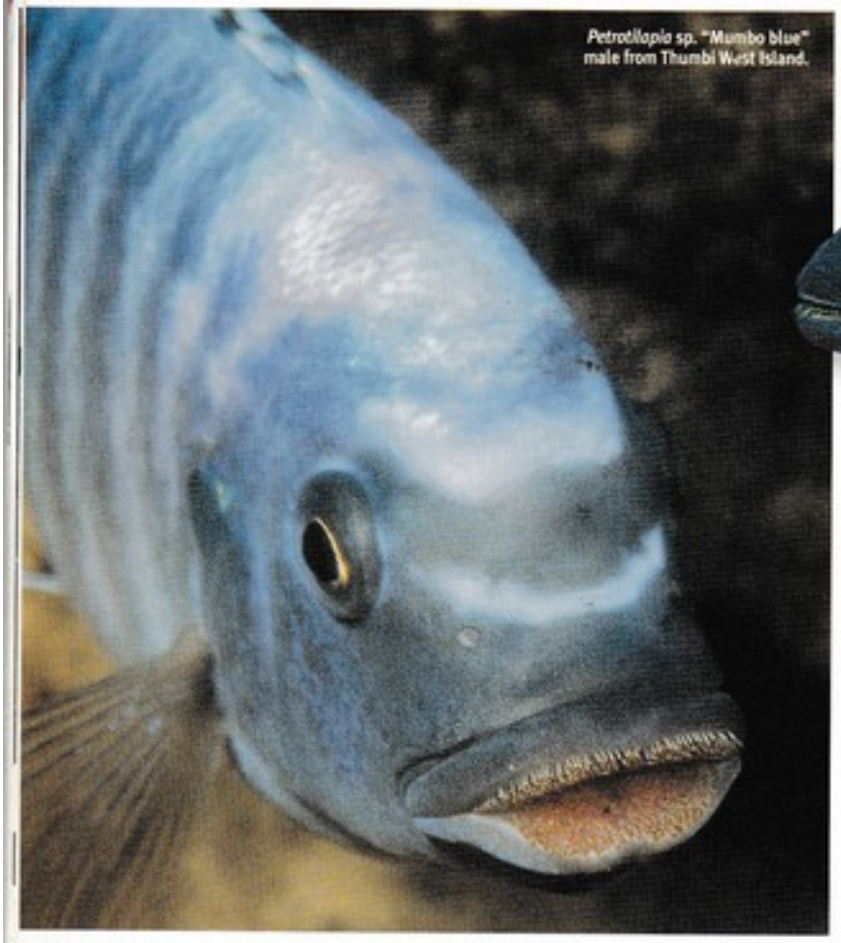
Tropheops

The genus *Tropheops* has several representatives inhabiting the turbulent areas of the rocky biotope. T. sp. "olive" is found in this habitat along the northwestern and northeastern coast. Like most *Tropheops* this species feeds from the biocover and tears off filamentous algae, usually with a jerking twist of the body. Most *Tropheops* are sedentary, and this prevents the continual intermingling of genetic material between two neighbouring populations that might otherwise be expected to occur.

Male T. sp. "olive" defend their territories - often the upper surfaces of large rocks - against all intruders. The result is that the algae, which are not entirely eaten by the resident male, grow to a thick layer. These so-called 'algal gardens' can be readily seen as yellow-green patches on the rocks.

The species of this genus which inhabit →

Tropheops sp. "Olive" male from Mara Rocks.



Petrotilapia sp. "Mumbo blue" male from Thumbi West Island.

this biotope all have a rather large average size (10 cm), defend their territories (males) with great zeal, and are generally very common. The territory encompasses the entire rock (1 to 2 meters in diameter) that the male chooses as his domain. All intruders are chased from the centre of this territory and intruding conspecific males are chased beyond the boundaries as well.

Petrotilapia

Members of the genus Petrotilapia are characterized by broad, fleshy lips densely covered with slender flexible teeth with a tricuspid (three-pointed) crown. The teeth, which are permanently exposed even when the mouth is closed, are excellent tools for combing loose aufwuchs. *Petrotilapia* grazes at right angles to the substrate. The large mouth and the numerous teeth efficiently collect the fine, loose material. In contrast to *Labeotropheus* and *Tropheops*, *Petrotilapia* is not capable of scraping off or cutting the filamentous algae from the substrate. The very flexible teeth merely comb the algae strands.

Petrotilapia is ill at ease when dealing with thick layers of aufwuchs; it simply cannot cope with the abundant algae that become entangled between the teeth. Therefore these "tooth-covered" lips are usually seen combing the partially grazed-off biocover in the territories of other species or at places which are heavily visited by other Mbuna.

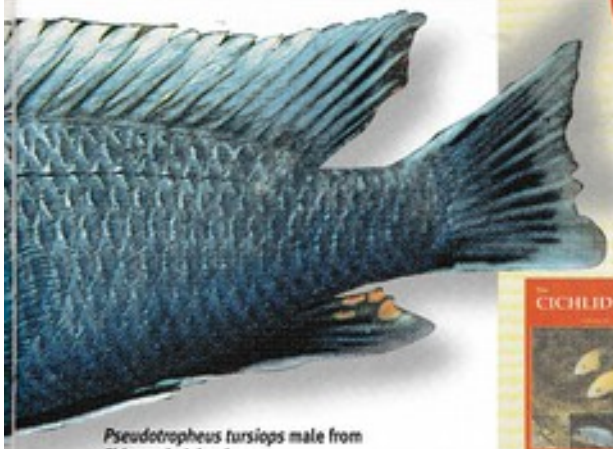
Most of the species of this group are successful inhabitants of the rocky biotopes. Only males seem to be sedentary and occupy territories in the rocky regions. Non-territorial individuals are regularly observed singly, roaming through the habitat or congregating in schools to feed on plankton.

Dolphin mbuna

All three "Dolphin mbuna" share the rare feature of an elongated, beaklike snout. Burgess & Axelrod, the describers (1975) of *Pseudotropheus tursiops*, considered that their new species bore some resemblance to the Bottle-nosed dolphin (*Tursiops truncatus*), and gave the Cichlid the dolphin's name.

P. tursiops and P. sp. "Tursiops mbenji" are herbivorous Mbuna that bite and comb loose algae from the biocover. The pointed snout enables them to reach into cracks that are inaccessible to most other species of similar size. In most other herbivorous Mbuna, which harvest algae by combing the biocover, the mouth is widened in order to accommodate as many teeth as possible to "attack" the aufwuchs. In "Dolphin mbuna" the mouth is not broad but V-shaped probably for the same reason: to enlarge the algae-combing apparatus. The V-shaped jaws are set with large bicuspid teeth that enable the owner to collect algae using the sides of its mouth (the arms of the V). P. sp. "Tursiops

***Protomelas spilonotus* and its relatives are the only non-Mbuna species group found in this type of habitat. This one comes from Mara Rocks.**



Pseudotropheus tursiops male from Chizumulu Island.

chitande" behaves differently from the other two 'Dolphin mbuna'. It is much less aggressive towards other species and it may not be a strictly herbivorous species as it is rarely seen browsing from the biocover.

The Pickers

Melanochromis joanjohnsonae and several cichlids of the genus *Labidochromis* represent another group of Mbuna in the wave-washed rocky habitat. *Melanochromis joanjohnsonae* is endemic to Likoma Island and is exported as the 'Pearl of Likoma'. It actively moves around its territory, screening the biocover for invertebrates. It halts regularly and focuses on a specific spot while hovering a few centimetres above the substrate. This behaviour is often followed by a sudden dart forward and a bite into the biocover, in an attempt to dislodge the prey. Its food consists of nymphs and larvae of terrestrial and aquatic insects, small crustaceans, and the inevitable algae.

Other Cichlids

There is only one species group of non-Mbuna found in the wave-washed upper habitat. They have a non-overlapping distribution throughout the lake and are common at steep rocky coasts. The best-known species of this group is *Protomelas spilonotus*. This species is frequently collected at Mbenji Island and is known in the aquarium trade under the misleading name of 'Haplochromis ovatus".

The species of this group usually form small feeding schools and remain in midwater a few metres away from large boulders. They are carnivorous Cichlids which feed on insects and other soft-bodied invertebrates that fall or are washed into the water. Males normally defend territories in the open water and are much less aggressive in claiming their domain than, for example, *P. taeniolatus*. Territories are located in the upper five metres of the open water but spawning takes place in the caves of the rocky substrate. The maximum total length of *P. spilonotus* is around 25 cm (for males, females may reach a total length of about 16 cm). The other species in the spilonotus group remain about 5 cm smaller. ■

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Ad Konings runs his own publishing company called Cichlid Press which produces a great range of Books, CDs and Videos. Since these are very difficult to obtain through normal aquatic outlets, *Today's Fishkeeper* has teamed up with Cichlid Press (U.K.) to offer a selection of these publications

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Red bellied dace
Phoxinus erythrogaster

There are many coldwater fish which make great aquarium fish. The Red bellied dace is one of them

PHOTO: MAX GIBBS

Red bellied dace get their common name from the male's bright red belly, however, this fades outside the spawning season.

WHAT A GEM OF A FISH! A PEACEFUL community species, with good coloration (particularly when in breeding garb) and undemanding dietary requirements. Throw in the fact it is a coldwater fish that lives happily in an unheated aquarium indoors, and you have all the reasons you need to try keeping this lovely fish.

Natural habitat

In nature, it lives in clear flowing streams generally with a gravel substrate, however, it is also found living above mud and organic debris. These habitats are generally oxygen rich, unpolluted waters with areas of lush plant growth. Temperatures range from 10 - 23°C. Water quality tends to be soft and neutral.

This description gives us all the factors we need to set up an aquarium for these lovely fish . You are going to need good filtration with some way to boost the oxygen content. An external power filter will do this, if a spray bar attachment is used to return the water to the aquarium. A straight forward gravel substrate will be fine. Plants should be limited to the back and sides to provide a dense area of growth. Vallis is one of the most reliable for this type of planting as it will tolerate cool temperatures without any problems. Water quality, in the wild, tends to be soft with a pH of about 7. Hard and alkaline water, however, does not seem to cause this species a problem.

Good water quality is vital so, apart from the filtration already mentioned, you should make sure 25% of the water is changed each week. This is not a tropical fish, so the usual formula of 12cm³ per 1cm of fish does not apply. You need to up this to 24cm³ per 1cm of fish. That applies to all indoor coldwater fish including Goldfish.

In nature, the diet consists almost exclusively of microscopic plants and detritus, which are grazed mainly during daylight hours. They also take small aquatic insects, particularly chironomids, despite having a long coiled gut which is typical of a herbivore. In captivity, they will happily eat normal aquarium flake, pellet or granular foods. Frozen Bloodworm, Daphnia and other aquatic life can also be fed to add some variety to their diet.

A bit of a Cuckoo

Spawning in nature occurs between April and June, and usually involves a school of fish rather than a single pair. At this time of year the water temperatures are usually between 10 – 16°C. Spawning takes place mostly over clean gravel or in the abandoned nests of other fish. Common stoneroller (*Campostoma anomalum*) or other Minnow nests such as those of *Semotilus atromaculatus* are often used for this. In those areas where the substrate is mud or organic debris, spawning tends to take place over plants or in or above the substrate. Preferred spawning sites are in areas of slow water flow. ■

PROFLIE

Name
Red bellied dace

Scientific name
Phoxinus erythrogaster

Aquarium type
90 x 30 x30cm

Distribution
USA:- southern Minnesota to western Pennsylvania, southward to northeastern New Mexico, northern Arkansas, and northwestern Alabama

Diet
In nature, microscopic plants, detritus and small aquatic insects. In captivity flake, pellet or granular foods, frozen Bloodworm, Daphnia and other aquatic life

Temperature
10 - 23°C

tropical | marine | coldwater & ponds | plants | regulars

Bountiful Belize

Early this year *Today's Fishkeeper* magazine followed a team of aquarists on holiday in Belize. This is the story of their trip, the fish they found, and just a few of the trials and tribulations which are part and parcel of exploring a third world country looking for fish.

PHOTOS: DEREK LAMBERT

FIRST OF ALL LET US INTRODUCE OUR intrepid explorers. The leader of the party was David McAllister, a long term aquarist from the Midlands, who has travelled throughout Central America and the Caribbean in pursuit of livebearing fish. Braving all sorts of problems, including robbery and what could so easily have been a fatal car crash, he has become one of the UK's most prolific fish collectors.

His loyal lieutenant and enthusiastic fish catcher is Brian Chittenden. Brian has been along on quite a few of Dave's trips and has a positive passion for catching fish - any fish. All the more interesting ones tend to find their way into his suitcase, which has led to a very strange assortment of fish in his home aquaria. From Cichlids to Livebearers, from Characins to Eels, all have found a new home with Brian.

Martine Mapes, from the Southend area, was on her third trip with Dave . Martine only has one community aquarium at the moment, so fish collecting was not high on her agenda. Bird and wildlife spotting was, and Belize is a wonderful country for these pursuits. Martine was also the navigator, secretary and accountant on this trip.

Moving on to the Welsh contingent, we have Trevor Williams. A passionate fishkeeper who recently retired and now has the time to indulge in his hobby, Trevor was focused on collecting just a few livebearer species on this trip, plus a couple of Cichlids.

Last, but by no means least, is Scotland's representative Ian Sinclair. Ian is a retired pharmacist who has the reputation of being one of Scotland's foremost livebearer breeders. He already has a formidable collection of various livebearers but wanted to add a few more interesting species. He also has a wicked sense of humour and had the whole team in stitches for much of the expedition.

Off to a difficult start

Flights to Belize are usually via America and, no matter how Dave tried to arrange things , an overnight stop,this time in Miami, going out was inevitable . Everything seemed to be going fine until the next morning when our explorers were heading back to the airport for the flight down to Belize. Two of the tickets had gone missing! An hour and a couple of hundred dollars later and replacements were issued but it was indicative of some of the problems to come.

The intrepid explorers. From left to right – Brian (fish catcher), Trevor, Ian, Martine and Dave.

Once at the airport in Belize City it was time to hire a car. All the normal sized vehicles were far too small for our party. Eventually a bigger vehicle was located and sent out from the City. All the bags were packed into this and the team hit the road. The original plan was to head north towards Corozal town and the Mexican border and then work southwards back down to Punta Gorda close to the Guatemalan border.

First day's fishing

The first night's stop had been in a hotel which was grey from all the soot settling out from a local factory's smoke. Things certainly became a whole lot more smoky when Dave turned on his air conditioning - it started smoking and nearly caught fire! The plus side was that the New river flowed alongside and it gave our team a chance to have a good look at some Belizean fish. No fishing was done at this location but further upstream by the town of Caledonia.

About Belize

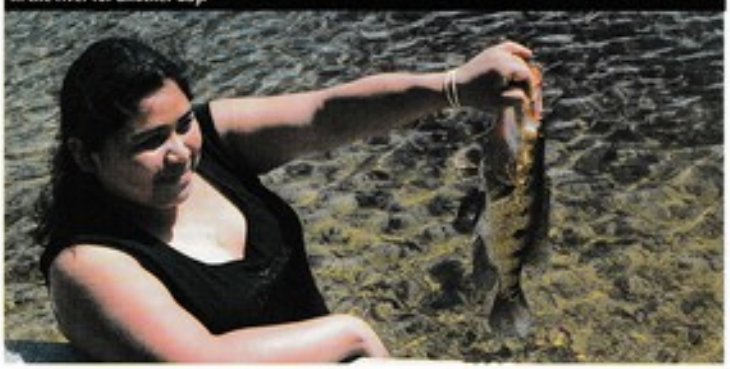
Belize used to be known as British Honduras and is bordered by Mexico to the north and Guatemala to the south and west. Its northern border is marked by the Rio Hondo and its southern border by Sarstoon River, with a total distance of 280 km (174 miles) between the two. At its widest point it is 109 km (68 miles) from east to west. Originally part of the British Empire it became independent in 1981 but the British army still maintains a presence there - if only to deter Guatemala from invading (most Guatemalan maps still show Belize as part of Guatemala).

The people of Belize are an incredible mix of all colours and creeds with remarkably few tensions between the groups. Bordering the Caribbean as it does, there is a definite West Indian flavour to many of the coastal towns and to Belize City itself. The current population is estimated at 210,000 and climbing fast. This is a relatively low population density when compared to other Central American nations.

The simple methods sometimes work the best. Using an old carrier bag and some bread worked much better than any amount of high tech fishing gear when it came to catching *Astynax*.

Here it becomes a large wide river with only a few clumps of aquatic plant growth , although more plants were seen down stream. Our team caught Firemouth cichlids and *Viejа synspila* in those areas where some plants did occur. Some huge Mollies (*Poecilia orri*) could be seen in open water but they always managed to escape the nets. Right at the surface, and much easier to catch, were shoals of Bandit mosquitofish (*Gambusia sexradiata*). Out with the Mollies were huge shoals of *Astynax fasciata*. These proved just as difficult to catch (not that anyone really wanted to bring any home) until they watched a couple of local ladies with a large polythene bag and some bread. Put some bread in the bag, wait a while, and lift quickly. Hey presto! a shoal of stupid *Astynax fasciata* for dinner.

Caught using a rod and line this beautiful *Petina splendida* made someone a very tasty dinner that night! By now Brian was itching to try his rod and line out. Several casts later and he was rewarded with a beautiful *Petina splendida*. Photographs were duly taken and the fish given to the local ladies for tea. Another couple followed suit and the shoal of *Astynax* were dumped back in the river for another day.



Northern base

The team decided on a hotel just near Corozal as its northern base. Several days would be spent here exploring the rivers, streams, swamps and lakes of the area. All this part of Belize used to be under the sea and is made up of limestone. This means all these habitats had very hard and alkaline water. A typical set of readings would be pH 8, KH20 and GH 21+. Being close to the sea, many of these habitats were also brackish. Most attractive of all the endemic species were the full grown Mangrove mollies (*Poecilia orri*). Huge males, easily in excess of 15cm, could be seen. Alpha males had dark black finnage, but red and blue patterned fish could also be seen. Obviously, such large fish would never make the journey home and just seeing them was wonderful, but not being able to catch any of the big ones was really frustrating.

Other fish found in almost all these habitats were Bandit mosquitofish (*Gambusia sexradiata*), always in shoals and always at the surface right out in the open. Tucked away in planted areas and where rocks created more cover were "Cichlasoma" *salvini*, *Viejа synspila* and Firemouth cichlids (*Thorichthys meeki*). Large Antenna catfish were also being caught on a rod and line by one of the locals.

The back door jammed losing our team a few hours .

The day after our team first arrived at the hotel the back door of the van jammed. A simple phone call and a few hours solved this problem, but it was not to be the last problem with this vehicle. This day's trip was across a ferry and into slightly different terrain and habitats. Two of the most interesting were Progresso Laguna and a creek near San Estavan which flowed down into it. The laguna itself is influenced by the tide and brackish, yet the pH was only 7.6, KH6 and GH 16. Most of the same fish occurred here but the Bandit mosquitofish were replaced by the Nicaraguan mosquitofish (*Gambusia nicaraguensis*) and a killifish (*Garmanella pulchra*) should also have been present though that one escaped the nets altogether.

Fascinating fish

San Estavans' water quality was pH7.6, KH10, and GH21. Here we caught the same 3 Cichlids we had been catching all along, but a different group of livebearers. →

This stream at San Estavan has a different selection of fish than most of the other sites visited in this part of Belize.

Another first

Another first for this trip were some Pike livebearers (*Belonesox belizanus*). Not wholly unexpected since they were named for this part of the world, but they would obviously eat any Widows or Platies which happened their way. The other livebearer caught here was a member of the *Pseudoxiphophorus* genus. These fish have the common name of Twin spot livebearer and to look at with the naked eye, almost all of them look the same. Since many species are known from just next door (Guatemala) I will not use a specific species name since it seems likely that any one of a number of species were being caught. Instead they will be referred to as Twin spot livebearers and they became our constant companions on the rest of this trip.

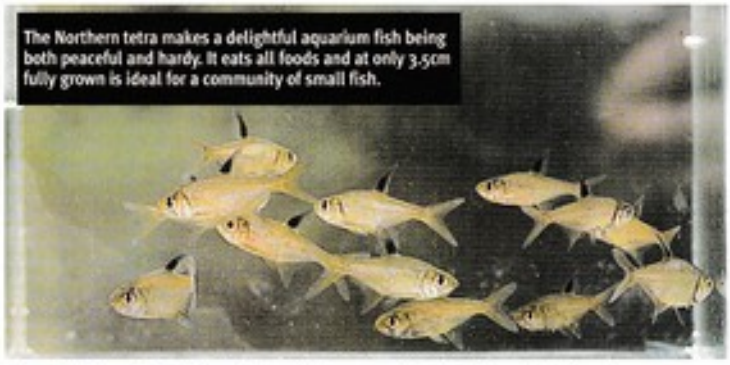
I have saved the most remarkable two species found at this location until last, and they are not livebearers. The first to be caught were two really ugly Eels. They were thin, worm-like creatures of only 10 cms in length. If anyone else had caught them they would have been slipped back in the water without further comment. However, Brian caught them and fell for them. The other species which was found here, and in several other streams that day ,were some Tetras. The Northern tetra (*Hyphessobrycon compressus*) is very rarely in the trade and yet makes an excellent aquarium fish. Just the sort of reason why our intrepid explorers were out in Belize in the first place.

To be continued... ■

Origins of cultivated Platies

PHOTO: MIKE CARR

These fish are usually of hybrid origin, however, this fish does exhibit three wild patterns naturally found in Southern platies. The "Mickey Mouse" tail spot pattern which was also found in some of the Belize populations on this trip. "Red dorsal" which in wild fish would be red at the base of the fin and fading towards the outer edge. "Yellow body" which in wild fish would be much paler than in this fish.



The Northern tetra makes a delightful aquarium fish being both peaceful and hardy. It eats all foods and at only 3.5cm fully grown is ideal for a community of small fish.

Elegant widows (*Phallichthys fairweatheri*) were present, although in small numbers. This was on everyone's list so a lot of time and effort was spent trying to catch a reasonable number of fish. Less interesting to most people in the group, but well worth finding, were Southern platies (*Xiphophorus maculatus*). These had a golden iris, blue spangles and some black patterning on the body. Wild Platies like these were the origin of many of the cultivated forms we see today. The black spot pattern in their caudal peduncle is the origin of Micky mouse platies' distinctive coloration, Blue platies have been developed from the blue scales on their sides and the golden iris pattern could well be the start of a whole new strain of cultivated Platies should someone like to do the work on them. From this party's prospective, however, they were bad news. Wherever Elegant widows and Southern platies occur together, the Platies are forced into deeper water and the Widows take up residence in the shallow heavily planted areas. The fry, of course, have to fight it out for what food there is, so numbers of both species are reduced.

Don't miss next month's installment

Our team go fishing in a Crocodile pool for a new Molly and have a "smashing" time with the van.

Today's Surgery

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Today's vet, **Lance Jepson,** deals with intestinal parasites

What causes the disease?

Intestinal parasites have pretty much got it made. They are protected from the rigours of an uncertain external environment, kept safe from potential predators, provided with regular, ready-digested meals and have virtually nothing better to do than breed and make more of the same. I can think of worse lives. In many cases they appear to live in harmony with their host - after all if you depend completely on another animal for all your needs it is foolish to kill it - yet in other situations they can be of serious detriment to their host. This can be obvious in the example of emaciated worm-infested fish, but can be more subtle, for example, reducing the number of young produced by a given individual.

What are they?

1. Tapeworms. These are flat worms that are usually attached by their head (or scolex) to the lining of the bowel. Some are relatively small such as *Khawia* found in Carp, whilst others can be very long, often longer than the whole length of the intestine! An example of this would be *Bothriocephalus*, another tapeworm of Carp.

All tapeworms have an indirect lifecycle, whereby eggs produced by the adult worm in the gut are passed out in the host's droppings where they are taken in by one or more intermediate hosts. In *Khawia* these are Tubificid worms, whilst in *Bothriocephalus* Copepods play this role. It is only following the ingestion of the intermediate host by the main primary host fish that the adult worm finally develops and the life cycle is completed.

2. Roundworms. The two commonest are *Camallanus* and *Capillaria*. *Capillaria* have been recognised for a number of years as a serious problem in Discus. General thoughts seem to be that Discus are particularly sensitive to infestations with this worm - a parasite they seem to be free of in the wild. In addition it is thought that these worms damage the lining of the gut, allowing protozoa such as *Spironucleus* and *Hexamita* to invade the rest of the body through this breached area.

3. Thornyheaded worms (*Acanthocephalans*) are occasionally encountered. The series of spines on their heads that help them to attach can also easily damage the lining of the bowel. These worms have an indirect life cycle and it is usually, but not always, a fish in which the adult is found - intermediate stages are commonly in invertebrates but can be in "prey" species of fish.

4. Protozoa

• *Coeddia*. These Protozoa are found throughout a huge range of species, but are usually fairly species specific - that is to say that they are only found in one single species, or a few closely related ones. Examples of these would be *Eimeria macropoda* found in the Roundtailed paradise fish (*Macropodus ocellatus*) and *Calytospora spinosa* from the Pike cichlid (*Crenicichla lepidopa*). As part of their life cycle they burrow into lining of the gut where they multiply inside their cysts by multiple divisions - very much like the way Whitespot (*Ichthyophthirius*) behaves. *When the infective stages are released this is accompanied by damage to the gut lining as the cysts rupture.*

• *Hexamita and related Protozoa, such as* Octomitus *and* Spironucleus. Collateviely we can call these Flagellated protozoa as they all possess at least one flagellum, a hair-like structure that they flail around to help them move through the water. Large numbers of these motile single-celled parasites can cause serious damage to the intestinal wall causing loose watery to mucoid faeces which can often be seen trailing from the anus of the fish. If these parasites breach the gut wall then they can spread in the blood stream to seriously damage a variety of internal organs, especially the liver, pancreas and kidneys.

Hexamita is still often said to be associated

WHAT DAMAGE DO THEY DO?

Intestinal parasites generally cause harm to their host fish in one or more of the following ways:

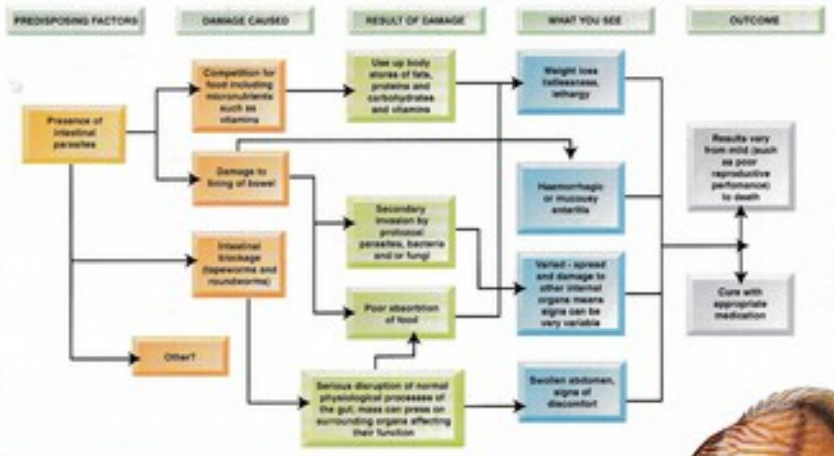
1. Competing with the host for food. Food material is usually broken down in the stomach and guts of the host fish into simpler, easily absorbed substances such as sugars and amino acids. These are also what the parasites need in order to fuel their owl metabolism and reproduction, so here there is direct competition between the host and the parasite. If the parasite is present in large numbers then the fish may not be able to absorb enough of its own food across the gut wall before its parasites have taken it, causing a severe loss of body condition in the host despite an often increased appetite.

2. Damage to the lining of the bowel. The presence of parasites in the gut may trigger an inflammatory reaction in the gut wall. This may trigger a thickening of the gut wall which in turn affects the ability of the host to absorb food across it at that point. More serious damage can also be done. Thornyhead worms ,especially, may cause extensive damage with the array of hooks attached to their head. Coccidia complete their part of their life cycle in the lining of the gut and so the deeper they penetrate the more damage they do. Such injuries may lead to blood loss with an accompanying loss of important blood proteins and salts. This can lead to a very debilitating illness These damaged areas are also unable to absorb food across them and so the total gut surface area available for food absorption is reduced.

3. Intestinal blockage. Large tapeworms can be many centimetres long and are often folded back upon themselves in the gut. Roundworms can form large aggregations in the gut. Both of these situations can lead to a partial or complete blockage of the gut.

4. There may be other consequences of a gut parasite infestation. In the case of *Hexamita*, it is thought that in some cases this parasite escapes from the gut and can travel around the body, possibly in the blood stream, where it can enter and damage other organs such as the liver and kidneys - a condition known as disseminated hexamitiasis. Some species of Roundworm will occasionally penetrate through the gut wall and go 'walkabout' carrying infection from gut bacteria with them. In other groups of animals allergies to gut parasites are suspected to be significant and something similar may prove to be the case with ornamental fish.

DISEASE FLOW CHART: INTESTINAL PARASITES



DIAGNOSIS

Species susceptibility. All species are potentially at risk. Some parasites such as the tapeworm *Bothriocephalus* are usually fairly happy providing the host is a member of the Carp family, whilst Coccidia are normally very species specific. Flagellated protozoa are a major problem in Cichlids and Anabantids, although they can also infect Cyprinids such as Carp, as well as Catfish.

Recognizable signs of disease. These include weight loss, diarrhea (soft, often slimy droppings) and increased appetite. Young fish may fail to grow and thrive, and may develop a characteristic big-head appearance with the head seemingly well out of proportion to the wasted body. Female *Camallanus* worms will be obvious as a red "brush ' of worms visible at the anus of infected fish.

Fish infected with *Hexamita* or similar protozoa often show a darkened coloration and pale or reddish skin patches. In Cichlids, such as Discus and Oscars (*Astronotus occellaris*), head and lateral line lesions have been linked with infestation by these parasites. Anabantids, especially Siamese fighting fish (*Betta splendens*) may show vague signs of ill health followed by death.

Microscopy. Worm eggs and coccidial oocysts are readily seen in fresh faecal samples with light microscopy. *Hexamita* and other flagellates will be obvious as motile single-celled organisms in a fresh sample - older samples may be contaminated by free-living protozoa from the surrounding water. Examination of a "squash" preparation of some of the internal organs of infested fish can reveal huge numbers of these parasites.

with "hole-in-the-head" disease of Cichlids, yet there are not usually any obvious parasites to be seen in the head and lateral line lesions - it is considered by many that these "holes" could have a multifactorial cause and diet, stress, secondary bacterial infection and the like may all play their part.

Predisposing Factors

High stocking densities are often crucial in allowing parasite numbers to build up. Eggs or cysts are passed out in the faeces and reinfection usually occurs by accidental ingestion of these. High stocking levels mean more potential host fish exposed to more infective faeces. Poor husbandry may also be important - the longer faeces are left in the aquarium the greater the chance of parasites being taken in by a host. This may prove to be a disadvantage of undergravel filtration although to my knowledge this has not been proven one way or the other.

Feeding live foods is another risk factor, as many worm species occur as intermediate infective stages in a variety of invertebrates such as Daphnia and Cyclops. If in doubt feed safe live foods such as cultured Brine shrimp or use gamma irradiated frozen foods.

Disease lookalikes

Any wasting diseases such as fish tuberculosis, *Ichthyophonus* or even diabetes mellitus (sugar diabetes has been described in Carp) should be considered. Also fish given insufficient food, an inappropriate diet or a poor diet may resemble advanced parasitision. For instance

TREATMENT

- Tapeworms: Praziquantel (Droncit, Bayer) as a three hour bath at 10mg/L, or 400mg/100g food once daily for 7 days.
- Roundworms and Thornyheaded worms:
- Levamisole at 10mg/L as a single dose added to the water. This is particularly good for killing larval worms. Suspend carbon filtration during treatment.
- Piperazine at 2.5mg/g of feed, added to the food. This may only kill adult worms.
- Fenbendazole at 50mg/kg body weight added to feed, or by stomach tube if the fish is large enough. Fish are quick to refuse medicated food. so it is best to starve for 24 - 48 hours prior to offering such feed.
- Protozoa:
- Metronidazole as a bath at 50mg/l daily for up to 24 hrs, for 10 days, or 200mg/100g food daily for 14 days.
- For coccidia:
- Sulphonamide antibiotics at 30mg/kg body weight daily for 10 - 14 days.
- Amprolium at 10mg/1 into water for 7 - 10 days.

Note: Those species with indirect life cycles can rarely build up in numbers sufficient to cause problems as their normal sequence of host interactions cannot be completed in most aquaria and to a lesser extent, ponds.

Captive bred Discus can be very prone to infection with *Hexamita* or similar protozoa.

PHOTO: TONY STAY

Carp on a vitamin E deficient diet develop a "big-head" appearance.

Prevention

Quarantine and regular (possibly six monthly as a suggested minimum) worming of new and old stock if worm infestations are a problem ,or where they need to be avoided such as in Discus breeding ventures. Feed only safe live foods or gamma irradiated frozen foods. ■

Today's Guide to...

POND LINERS

Ben Helm guides us through buying a pond liner

ANY AQUARIST WHO is fortunate enough to be able to keep fish inside in an aquarium and outside in a pond soon starts to see the many parallels between keeping fish in both environments. The fish are fed an artificial diet, the water is circulated through a filter by a pump and the water quality parameters are measured routinely. But when it comes to their installation, an aquarium and pond are worlds apart.

Outside, we can enjoy the freedom of pond design, designing and creating the shape, depth and overall volume of our pond, whereas an indoor aquarist is virtually limited to aquaria off the shelf, where any shape is available, as long as it is made with straight sides! Wouldn't it be great if we could build an aquarium like we can a pond - into any shape we wished.

With a pond, we have both options. We can go for the off-the-shelf instant pond approach, or the no-holds-barred method for the more creative. There is obviously a market for both approaches but which is going to be the better one for you?

Preformed pools

There are two or three different types of preformed pool available, offering us differing degrees of rigidity, lifetime expectancy and size. The most basic of preformed pools are made from a very flexible thin plastic that is moulded into various shapes, usually holding up to 318 litres. Tougher high-density polythene pools offer improved strength and puncture resistance and although they are semi-rigid they are capable of holding nearly 910 litres comfortably when buried. The most durable of the preformed pools are the rigid glass-fibre pools which are also the most popular. Available in a range of volumes from a tiny 135 litres to over 4500 litres, these strong and durable ponds are built to last a lifetime.

Just as when we are choosing an aquarium, we are limited to the range of ponds that our retailer can supply. It is rare for an aquatic outlet to stock the full range and you might have to be prepared to wait a few days while your particular one is ordered. Before looking at ponds, you will have a good idea of the area of the garden that you want to give over to water. This will immediately allow you to focus in on the preformed ponds that are the most appropriate for your plot. The models in your size range will offer different depths, and shelving arrangements for marginal plants, some of which may be more to your liking than others.

Rigid fibreglass ponds offer you many benefits if you intend your pond to be a formal, regularly shaped pond. You do not have to dig a hole of the correct geometric shape or dimensions. Just make one large enough to take a pond, back-fill accordingly and hey-presto, you've created a perfect formal pond.. If you have chosen a pond over 1350 litres in volume you will not be able to get it home in the boot of your car, so make sure your retailer can deliver it when you want it (hopefully free of charge).

Flexible pond liners

Pond liners offer us flexibility in both the material we use and the extent to which we can design a pond. Long gone are the days when a heavy-duty polythene sheet was used for lining a pond. Today's pond liners have gone the way of pond pumps in that they have been re-engineered to meet (and indeed exceed) our expectations, with many pond liners now being sold with a lifetime guarantee.

Installing a rigid pond

Installing a rigid pond could not be more straightforward.

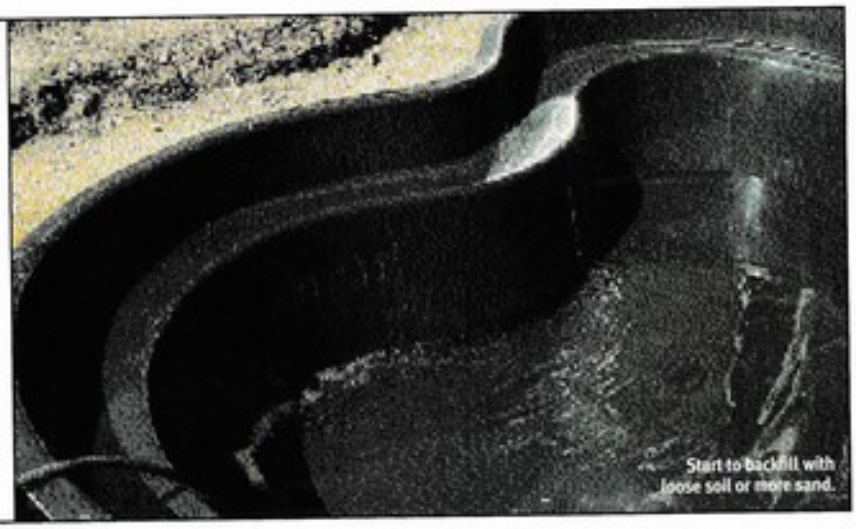
1. Dig a hole a little bigger than the shape and depth of the pond.

2. Place a loose covering of moist sand in the hole.

3. Place the pond in the hole, ensuring it is level and begin filling with a hosepipe.

4. As it fills, start to backfill with loose soil or more sand, checking regularly that it is level.

5. Keep the remaining spoil to one side with a view to using it to make a raised rockery and waterfall.



Start to backfill with loose soil or more sand.

Start filling the pond , pulling and stretching the liner as it fills to reduce the creases.

Like rigid ponds, flexible pond liners are available in a range of qualities that reflect their durability. Made from materials such as PVC, rubber and butyl rubber and more recently hi-tech composite materials which, to be competitive, are guaranteed for life, as long as they're installed correctly.

Liners are sold either pre-cut and packed or off-the-roll, depending on the size of the liner. Take your three-dimensional pond measurements to your retailer who will then work out the area of liner you require. This is also a good opportunity to plan out a waterfall. One particular advantage a liner has over a preformed pool is that you can lay the liner to incorporate a waterfall, making the cascade in effect an integrated extension to your pond. So even if your waterfall leaks (as is often the case) as if by magic, all of the leaking water still returns to the pond.

In summary

Each method of creating a pond provides us with different benefits depending on the nature of the pond. Both materials now offer a similar guarantee, with pond liners giving more flexibility with our pond design. We dig our hole first and then line it. With rigid ponds, we work the other way round, digging the hole to suit the size of the pond. Flexible liners can prove difficult to install in a formal shape (square or circular) whereas preformed ponds can create that effect perfectly and immediately. The choice is yours but with flexible liners you're offered far more scope as a pond designer and comparatively, they offer excellent value for money. ■

Recently hi-tech composite materials have come on the market.

Installing a flexible liner

Once cut off the roll, your liner should easily fit into the boot if your car (but may be deceptively heavy). Because of a liner's flexibility, more care must be taken when preparing your hole to protect against protruding stones or invasive roots. If the liner is going to last over 25 years, you cannot expect it to do so while pressing down hard against a sharp object.

Prepare the shape and depth of the hole as desired (this time you're the boss) and then cover the surfaces with loose damp sand or special pond underlay. I have even used old carpet very successfully (but remember to check for any old tacks!). The liner will become very supple in direct sunlight making laying it far easier. Once you have laid the liner and attempted to reduce the number of creases, start filling the pond , pulling and stretching the liner as it fills to reduce the creases further. Only when the pond is completely full should you trim off the excess liner, leaving at least nine inches overlap. Remember to leave an extensive overlap intact to underlay your waterfall.

PRICE COMPARISONS £££

How much would it cost?

1,138 litres pond

Rigid Fibreglass	0.5mm PVC	Butyl Rubber
'Lifetime Guarantee'	'Lifetime Guarantee'	'Lifetime Guarantee'
240 x 180 x 60cm shelved + irregularly shaped	390 x 330cm equivalent	390 x 330 equivalent
£239.99	£43	£100

4,550 litres pond

Rigid Fibreglass	0.5mm PVC	Butyl Rubber
'Lifetime Guarantee'	'Lifetime Guarantee'	'Lifetime Guarantee'
480 x 240 x 75cm shelved + irregularly shaped	660 x 420cm equivalent	660 x 420cm equivalent
£1000	£84	£224

Competition

Just add water

£1000 worth of prizes to be won!

Win one of two £250 complete Juwel aquarium set-ups or one of a hundred 55g pots of flake food and a 100ml Safe Guard water conditioner from King British.

More aquarists than ever before are buying a complete system rather than trying to put together separate pieces of equipment to set up their own aquarium. In this series we look at a selection of these tanks and give them away to lucky readers. However, not only will one of this month's winners win a complete Juwel set-up, but you will actually have it installed in your home by *Today's* team of aquarists!

About King British

SINCLAIR, MANUFACTURERS OF King British, one of the leading brands of aquarium Goldfish & Tropical fish flake have announced their biggest ever promotion for the brand. As part of this promotion thousands of children's tickets to Sea Life Centres and Seal Sanctuaries are being given away in this on-pack promotion. This promotion runs over a 4 month period and all you have to do is simply collect 2 tokens from special packs of King British Goldfish, Tropical Fish or Goldie's Mega Flakes packs and up to 2 children get FREE entry into any UK Sea Life Centre or Seal Sanctuary with one full paying adult. One token can be found in special packs of 12g & 28g Goldfish & Tropical fish flake with Immuno Health Booster and Goldie's Mega flakes and 2 tokens can be found in 55g & 200g Goldfish and Tropical fish flake with Immuno Health Booster packs. Alongside the promotion Sinclair are running an exciting competition with 520 prizes being given away including 15 Rio 125 Juwel aquariums (apart from the two they are giving away in Today's Fishkeeper).

Sea Life, part of the Merlin Entertainments Group, is one of the UK's top attraction brands with over 3million UK visitors per annum. With a strong educational focus centring on interactivity (touch pools, quiz trails, etc) Sea Life is an ideal day out for the family. With 7 Sea Life Centres and 3 Seal Sanctuaries spread throughout the UK no one needs to travel far for their day out.

King British Tropical flake is a complete diet for all species of tropical fish.

Cichlid flake food is ideal for small Cichlids.

Cichlid floating sticks are the perfect diet for carnivorous Cichlids.

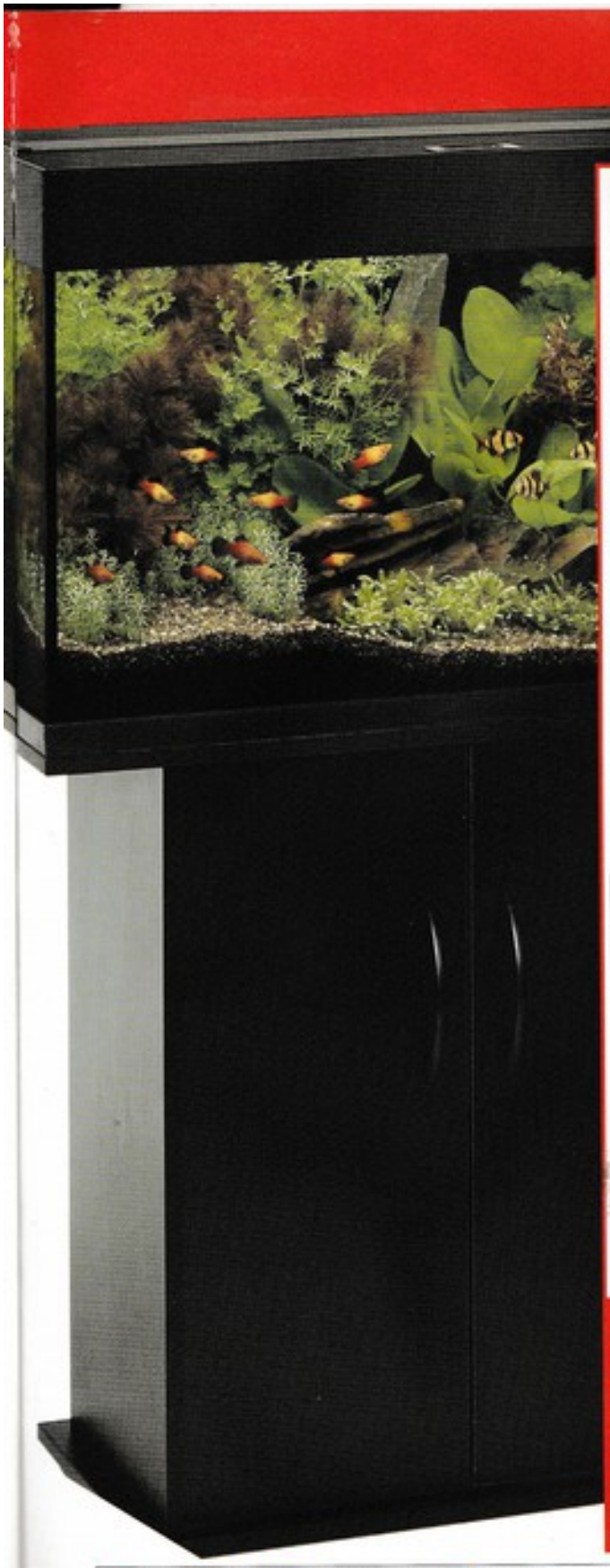
King British are a long established UK company producing a range of aquatic products. Best known among these is their flake foods for Marine, Tropical, and Goldfish. There is more to King British, however, than just these well established brands. More specialised diets are catered to with Cichlid foods (flake and floating sticks) and Catfish foods (sinking pellets for all Catfish, and Plecostomus tablets for those bottom feeding vegetarian fish). All these foods have an added Immuno Health Booster which King British say is a natural compound that stimulates the immune system in your fish to provide a stronger shield against infection and disease. A treat tablet food, dried Bloodworm, Tubifex and 2 types of holiday feeding blocks round off the fish food side of things.

WS3 is a very effective treatment for White Spot.

On the tank treatments side of things they produce a full range of dechlorinators, green water, cloudy water, liquid plant food, and medications. One of the stars of these treatments is WS3 White Spot Terminator. This fast acting treatment is one of the most effective on the market and will usually knock out White Spot in a matter of days. Another great product is Methylene Blue which is a general anti-fungal agent and is widely used by aquarists to reduce fungal infection of eggs.

Packing live fish for transport can be a problem if you don't have the right polythene bags to put them in.

Other handy products are Dow Corning Aquarium sealant which is great for making or repairing an aquarium. The Uno Aquarium Cable Tidy helps keep all your electric cables under control and something which is probably unique among the UK Manfacturers - a range of specially developed fish bags for packing live fish. ■



Juwel aquarium set-ups

Which came first, the chicken or the egg? Something similar could be asked in the aquarium world. Which came first, Juwel tanks or the desire to buy a complete unit instead of fitting one together yourself? Whichever it was, for a number of years now Juwel have dominated the complete aquarium market. Their range includes 6 basic styles with black trim and cabinet. Each basic style comes in a range of sizes and several of them also come in beech instead of black.

The classic Rio range is one of their most popular with the smallest being the *Rio 125* holding 125 litres of water and the largest a *Rio 400*. The *Rekord* range is generally a step down in size and has a different style top. The largest of these is the *Rekord 120* which holds only 120 litres of water and the smallest of the *Rekord* models is the *Rekord 70* which is just over 60cm long and contains 70 litres. Fancy something a little taller but not so wide? Then that is where the *Lido 100* comes in. Holding 30 litres more than the *Rekord 70* it is just over 5cm shorter but 10cm wider and 4cm taller.

Need a corner filling? This is where the *Delta* range fits in. They have an unusal triangular shape with the two front corners cut off. A great design which is ideal for most rooms. Alternatively, for a bigger space, the *Trigon 350* has a wonderful sweeping bow front. This feature is also incorporated into the *Vision 180* and *Vision 260* which are otherwise rectangular in shape. So, something for everyone and a tank for every room.

What the Juwel Rio 125 aquarium set-up includes

Aquarium: 81 x 36 x 50cm - holding 125 litres approximately.

Cabinet: 73 x 36 x 81cm

Filtration: Juwel 2 stage compact 4 filtration system.

Lighting: Multilux lighting system with 2 x 18/20w tubes.

Heating: Juwel automatic heater thermostat

CONTACT DETAILS

For more information about Juwel aquariums or a stockist near you contact: Tel 01953 606 363 Fax 01953 603 839
E-Mail info@juwel-aquarium.co.uk

WANT TO WIN THIS COMPLETE SET-UP?

Write to:- Today's Fishkeeper, Just add water feature, TRMG Magazines Ltd., Winchester Court, 1 Forum Place, Hatfield, Herts. Include your name, address, telephone number and why you would like to have this complete set-up installed in your home or office. Remember you can get your fellow workers involved with this competition as well - after all, this aquarium could be a permanent part of their working environment

Toadfish

Batrachus grunniens

Copy for Today's Diary Dates

Copy for Today's Diary Dates should be sent to Today's Fishkeeper, Winchester Court, 1 Forum Place, Hatfield, Hertfordshire, AL10 0RN Telephone 01673 885352, fax 01707 269333 or e.mail derek@trmg.co.uk copy deadline 6 weeks before publication date.

Today's Diary Dates

July's show, auction and club meeting dates

Mon 1st

Kirkcaldy A.S. meeting. Contact 01738 634689
Solway A.S. meeting Contact 01387 750606
St Helens A.S. meeting Contact 0151 42604213
Ayrshire Fishkeepers Association meeting. Contact 01294 605272
Reigate & Redhill A.S. Contact 01293 781282

Tues 2nd

Southend Leigh & Dist A.S. Contact 01702 305740
Paisley & District A. S. Contact hellenburns@thefreeinternet.co.uk.
Dunstable & D.A.S. meeting. Contact 01582 707280
Greenock D.A.S. meeting Contact 01475 704219
York & Dist. A.S. meeting Contact 01904 414272
The Irish Tropical Fish Society meeting. Contact 01 4561836
Halton A.S. meeting Contact 0151 2898190
North Bucks A.S. Meeting. Contact 01908 377333
Oldham A.S. meeting Contact 0161 283 3725
Preston A.S. Meeting. Contact 01772 32114
Lang Toun Aquarists and Pondkeepers Group meeting. Contact 01592 595825

Wed 3rd

Corby & DAS. meeting. Contact 01536761736
Oasis Fish Club (Sunderland) meeting. Contact 0191 3841433
Hounslow club meeting. Contact 01784 259230
Perth A.S. meeting. Contact 01 738 621704
Clacton Fish Keeping Club meeting. Contact 01255 428065
Portsmouth A.S. meeting Contact 01673 885352
Bracknell A.S. meeting Contact 01344 485287
Workington A.S. meeting Contact 01900 67951

Thurs 4th

Faircity A.S. meeting. Contact 01738 561291
Sandgrounders A.S. Contact 01704 541177

Fri 5th

NorthWest Cichlid Group meeting Contact 019422 707 593

Sat 6th

Sun 7th

Yorkshire A.A.S. Open show and auction. Contact 01482 801389

Mon 8th

Kirkcaldy A.S. meeting. Contact 01738 634689
Bristol Aquarist Society (Goldfish) meeting. Contact 01792 207467
Ilford &D A&P Society meeting Contact 020 85507329
Grimsby & Cleethorpes meeting. Contact 01472 349178
St Helens A.S.meeting Contact 0151 42604213
Merseyside Aquarist Society meeting. Contact 0151 260 3664
Otley A.S. Meeting. Contact 01274 531418
Robin Hood A.S. Meeting. Contact mdtalbot@corydoras.freeserve.co.uk

Tues 9th

Darwin A.S. Meeting. Contact 01254 701925
Northwich A.S. Meeting. Contact 01606 882966
Caer Urfa A.S. Meeting. Contact 0191 5737464
Telford & D.A.S. meeting. Contact 01952 409721 or 01952 616410
Lang Toun Aquarists and Pondkeepers Group meeting. Contact 01592 595825
Northern Goldfish and Pondkeepers meeting. Contact 0161 9697567

Wed 10th

Linlithgow Aquarist Society meeting. Contact 01506 510558
Halifax A.S. Contact 01274 880471
Tameside A.S. Contact 0161 339 6593
Bradford A.S. Contact (01274) 652542 or (0113) 257 7709

Thurs 11th

Mid- Sussex AS meeting Contact 01273 602407
Kings Lynn Fish Club meeting. Contact 01553 769522 or 01553 763743
York D.A.S. meeting. Contact 0776 769 8331

Fri 12th

Yorkshire Cichlid Group meeting Contact 01924
Basingstoke A.S. meeting. Contact 0118 970 1461
West Cornwall Fishkeepers meeting. Contact 01209 717880

Sat 13th

Sun 14th

Club 2000 Open show and auction. Contact 0115 9531635

Mon 15th

Kirkcaldy A.S.meeting Contact 01738 634689
Thorpe & D.A.S. meeting. Contact 01953 605394
Solway A.S. meeting Contact 01387 750606

Tues 16th

Southend Leigh & Dist A.S. Contact 01702 305740
Greenock D.A.S. meeting Contact 01475 704219
Greater Manchester Cichlid Society meeting Contact 01422 942 355
Midlands Marine Aquarists Society Contact 0121 359 4469
Oldham A.S. meeting Contact 0161 281 3725
Lang Toun Aquarists and Pondkeepers Group meeting. Contact 01592 595825

Wed 17th

West Yorkshire Marine Aquarist Group meeting. Contact 01924 420101
Clacton Fish Keeping Club meeting. Contact 01255
Tongham Aquarists Society meeting. Contact 01252 25686
Portsmouth A.S. meeting. Contact Gill Utting 9,Inverness Rd.,Gosport,Hants.
Perth A.S. meeting. Contact 01 738 621704
Bracknell A.S. meeting Contact 01344 48528

Thur 18th

August 2002 TODAY'S FISHKEEPER on sale
Bristol Tropical Fish Club meeting. Contact 0117 973 2145
Faircity A.S. meeting. Contact 01738 651291
Sandgrounders A.S. Contact 01704 541177
Croydon A.S. meeting. Contact 0208 654 0984

Fri 19th

Sat 20th

Goldfish Society of Great Britain (GSGB) meeting. Contact 01277 215298

Sun 21st

North East Goldfish Society (NEGS) Open Show. Contact 01670-364748
Merseyside A.S. Open show & auction. Contact 0151 260 3664

Mon 22nd

Kirkcaldy A.S. meeting. Contact 01738 634689
Ayrshire Fishkeepers Association meeting. Contact 01294 605272
Merseyside Aquarist Society meeting. Contact 0151 260 3664

Tues 23rd

Northwich A.S. meeting Contact 01606 882966
Clyde Aquarist Society meeting. Contact john@farnanf.freeserve.co.uk
Lang Toun Aquarists and Pondkeepers Group meeting. Contact 01592 595825

Wed 24th

Workington A.S. Contact 01900 67951
Halifax A.S. Contact 01274 880471
Tameside A.S. meeting. Contact 0161 339 6593

Thurs 25th

Mid Sussex A.S. meeting. Contact 01273 602407

Fri 26th

Eastbourne & District Pondkeeping Contact 013237731369
Discus Ireland meeting. Contact (061) 318593
West Cornwall Fishkeepers meeting. Contact 01209 717880

Sat 27th

Sun 28th

Mon 29th

Kirkcaldy A.S. meeting. Contact 01738 634689

Tues 30th

Wed 31st

Sad news

IT IS WITH great sadness that we report the death of Dr Peter A. Lewis a long time fishkeeper, a valued contributor and a subscriber to this magazine. Peter died suddenly and unexpectedly at his home in Glendale, Ohio, USA on 28th April 2002.

Born in England 55 years ago, he excavated a fish pond in his back garden, and also purchased his first aquarium, at the age of 21. This was the beginning of a life long passion for the hobby. He learned as much as he could about the fish and began to take photographs. He became a judge and lecturer serving at local and national shows throughout the U.K.. While studying for his Ph.D at Bristol university, he built his first fishroom. During the next 35 years he moved seven times, each time building bigger and better fish rooms to house his growing collection of fish. He built fish rooms in basements, at the end of a single car garage, alongside his house and even in a dis-used coal storage area. Peter moved to the States in 1980 and was managing director at Sun Chemicals where he was very well respected.

Peter had a tremendous amount of knowledge about fishkeeping which started as a hobby, but soon became a great part of his life. We received the following communication from his brother Robin Lewis, "We know that Peter knew lots of people in England through his fish hobby and we would be obliged if you would let them know of his death. He has often told us he has every issue of your magazine going back many years and he recently sent you an article about building his new fish room, of which he was very proud." Peter leaves his wife Phyllis, three step-children and a daughter by whom he will be sadly missed.

Ed. Note. Peter's article on building a fish house will be featured in a future issue of this magazine.

FESTIVAL OF FISH KEEPING AND WATER GARDENING WEEKEND – OCTOBER 12TH & 13TH

Bookings are coming in thick and fast for this year's festival. With marine expert Alf Nilsen from Norway and Livebearer expert Harro Heironimus from Germany speaking during the weekend interest in the lectures is at an all time high. Add to this line up our very own Pete Liptrot and several more UK based speakers and we should be in for a great weekend. There is also live entertainment every evening and a quiet area away from the music (but close to a bar!) arranged for those of you who just want to sit and talk about fish. There will be lots of beautiful furnished aquaria on display thanks to *Maidenhead Aquatics* If you want to learn more about your water and how it affects the health of your fish, bring a drinking water quality report for your supply zone so Ann Telford of *AllClear Water Purifiers* can explain what it all means.

How to book for the marine beginners seminars

If you are interested in attending one of the beginners seminars please phone 01673 885352. They are free to day visitors and weekend guests but places are strictly limited and will be allocated on a first come first served basis.

How to book for the weekend

Full board weekend packages for the Festival are available priced at £78. To book contact Grace Nethersell, 8 Acacia Avenue, Brentford, Middlesex, TW8 8NR. Tel/Fax 020 8847 3586.

Trade Talk

A selection of the new products from around the aquatic trade

Blagdon launch two new pumps aimed at gardeners looking for a small fountain or water feature, a low voltage submersible water garden light and a cage to help stop your pump sponge from blocking.

Photech multi light

Garden and water garden lighting are increasingly becoming essential elements of popular garden design. The New *Photech multi light* offers all the features needed to safely create water garden lighting effects. A 12-volt transformer and 10 meters of low voltage cable allow flexible and safe installation. While the important job of correctly positioning the high output 20-watt halogen spotlight is made easy with its 360o rotating pivot joint and three easy installation options. It can be fitted to the supplied light support base, screwed to a solid point with a supplied fixing bracket or attached directly to the new range of *Hydratech multi* , which have a built in light port.

The *Photech multi light* is a safe lighting option for your garden.

THE PRICE
MRRP £59.99

Foam-Free pump cage

This is an inexpensive solution to the troublesome problem of needing to frequently clean pond pumps fitted with a foam pre-filter. The cage has been designed to fit the *Blagdon Amphibious, Hydratech* and *Iris* pond pump ranges, and most other popular makes of pond pump.

The design has produced a pump cage with a large surface area of just the right size intakes to enable the vast majority of pond waste (soft organic matter and fish waste) to pass through the pump cage where it will be easily broken up and pumped out by normal "non-solid handling" pump impellers. Large hard particulate matter, like stones, are prevented from entering the pump cage and damaging the pump by the base design. The large surface area of vents reduces water flow rates and so stops undecayed vegetation blocking the cage, so reducing cleaning. This piece of equipment is fine for pumps powering a filter system or waterfall but should not be used on pumps which supply fountains.

THE PRICE
MRRP £19.99

Whilst an excellent idea for pumps supplying waterfalls and filters the *Pump cage* should not be used on a fountain where the nossle may clog up.

At a flow rate of just 400 lph the *Minipond 600* is ideal for a small water feature.

Fountain and water feature pumps

The *Minipond 600* (400 lph) and *Minipond 900* (900 lph) are aimed at gardeners looking for a small fountain or water feature. They offer all the features that you would expect from the makers of the award winning *Amphibious* pond pump and have powerful motors and single moving part impellers which are both economical to run and reliable. A 2-year commitment to quality is guaranteed on both pumps. A comprehensive range of standard fittings is supplied with each pump including hose connector, flow control valve, sectional fountain extension pipes, and two fountain jets. These fittings ensure the *Minipond* is ideal, whether you are creating your own water feature or installing a pebble pond.

THE PRICE
Minipond 600 - MRRP £15.28
Minipond 900 - MRRP £21.15

New from *Red Sea - Reef base*

Reef base is a blend of aragonite chips and the spherical, calcareous shells of reef foraminifers. Aragonite is well known for its beneficial effects on pH and calcium stability so the buffering capacity in the aquarium will be greatly enhanced by using *Reef base*. The addition of the foraminifer shells, which are highly porous, gives a substrate that is effective in aiding the nitrification and denitrification process in marine aquariums, resulting in superior water quality. Due to the spherical shape, *Reef base* is ideal for all burrowing fish and invertebrates, and does not carry the risk of damage which is associated with less smooth substrates. *Reef base* comes from CITES approved sources and its manufacture does not involve the destruction of beaches or reef eco-systems.

***Reef base* is being marketed under Red sea's well-known and popular "Reef Success" banner.**

tropical | marine | coldwater & ponds | plants | regulars

Product Review

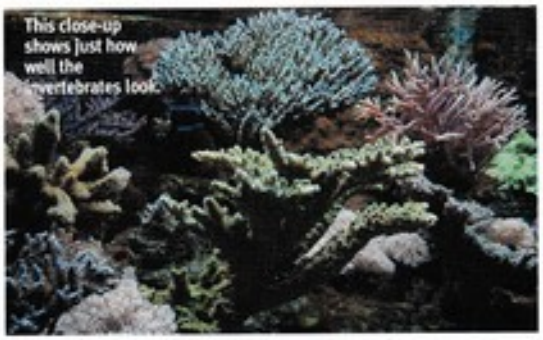
D&D aquarium solutions are introducing a new range of *T5A1* light bulbs and fittings. These fluorecent tubes are said to be a replacement for metal halides for marine reef aquaria and will produce a wider spread of growth on Corals. It is also said that the freshwater tube will produce a huge improvement in plant growth and enhance your fish's colours beyond belief. *Today's Fishkeeper* investigates.

Bernie Moore's reef aquarium has been lit for some time using these lights and is doing brilliantly

THERE IS VERY little which is truly new on the aquatic market, but T5 lighting really is. The tubes are much thinner than normal fluorescents and VERY much more powerful. They can produce the same amount of light as a standard bulb but use 40% less electricity doing it. Add to that a cool electronic ballast, a tube life of approximately 15,000 hours, with a maximum drop off of light output of only 15%, and we have some very good reasons why these bulbs are going to be a great new introduction to the aquatic scene.

They have already been tested in Germany and the UK with very good results. In Germany, Bernie Moore has been running them on his marine aquarium for some time now and the Corals have been doing superbly well as you can see from the pictures. Initially, he used a metal halide on one side of the aquarium and the new tubes on the other. Once he was sure the new tubes worked, he switched over completely to the T5 tubes.

In the UK, Wetpets at Romford have removed 400W and 250W metal halides and replaced them with the 6 x 54W T5s. As a result they are saving 24p a day in electricity and sold three of the new lighting systems within half an hour! Talking with the owner of Wetpets, Terry Evans, sales and interest in the new lights have continued to be strong ever since their introduction. More interesting than any money saved on these tubes, however, is how the Corals reacted to them. Initially, just like any animal subjected to new conditions, the Corals looked a little unsure of their new lights. Terry said that two weeks later they were fully out and looking better than ever. According to Terry, the other feature that was particularly good was the fact they run at a very cool temperature compared to a metal halide. This means they can fit inside a hood as well as be suspended above the aquarium.



This close-up shows just how well the invertebrates look

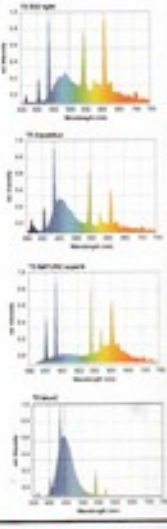
Our view

As with all new products only time will tell just how good these new lights are going to prove. On the face of it, however, they could well take over from metal halides for aquarium use. Certainly their low running costs, cool running temperature and better distribution of light throughout the aquarium will make them the bulb of choice for many aquarists.

Other companies have their own ranges of T5 lights just about to hit the UK market as well, although D&D aquarium solutions say that several of their tubes are being made specifically for them and buyers should check that the tubes they are buying are of A1 quality. This means the tubes should have the highest possible rating for spectrum and gas quality.

THE RANGE

D&D aquarium solutions will be distributing four tubes. The *Biolight* is rated at 6,000Kelvin with a spectrum designed to recreate sunlight. The *Blue 2* produces an actinic colour spectrum and *Aquablue* is specifically designed for growing SPS corals down to a depth of 80cm. For freshwater tanks a specially designed *Nature superb* tube brings out the red and blue colours in your fish whilst enhancing plant growth. Since algae can be a problem if very strong lighting is used above a freshwater aquarium, it is very important to keep phosphate levels in the aquarium as low as possible. A phosphate remover placed in your filter will do this.



CONTACT DETAILS

D&D aquarium solutions - www.d-daquariumsolutions.com
Wetpets, 71 Victoria Rd., Romford. Tel 01708 744880

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New releases

The hobby is moving at a tremendous pace these days and new fish and other aquatic life are being discovered and imported all the time.

Oliver Lucanus is right at the centre of all the new introductions and discoveries. This month he has a line-up of interesting fish and an invert you are unlikely to find in any of the books. PHOTOS: OLIVER LUCANUS

Cinderella goby pike cichlids are rare imports well worth seeking out.

Asian bumble bee shrimp (*Neocaridina* species)

The Asian bumble bee shrimp now has its first colour forms, and the Red bee shrimp is the most colourful and striking addition for a well planted micro aquarium to date. Because of their tiny size this beautiful shrimp can only be kept with the smallest and least aggressive fishes such as Licorice gouramies, tiny Tetras and Barbs.

Neocaridina will breed readily if they are kept alone in heavily planted tanks with plenty of algae as food. They are not very sensitive towards differing water quality or temperatures but great care must be taken to avoid any copper based medications as with all invertebrates.

Cinderella goby pike cichlid (*Teleocichla cinderella*)

Despite their small size and interesting behaviour the Goby pikes of the genus *Teleocichla* are not imported often. *T.cinderella* is found in the Rio Tapajos, Brazil in shallow water less than 60cm deep. The maximum size of all *Teleocichla* species is less than 10cm but they are territorial and aggressive enough among each other to require tanks of over 180 litres for groups of four fish or more. Plenty of hiding places in the form of rocks, driftwood and plants must also be available. An extra powerhead or strong pump should provide the tank with a very strong current.

Goby pikes accept all common aquarium foods but must be fed often with frozen or live foods such as Earthworms, Mosquito larvae and other insect larvae to gain weight. Due to their fast metabolism the small Pikes quickly lose weight and become skinny and lethargic if not fed often enough. *Teleocichla* breed in small caves or crevices, occupying large territories that are rigorously defended against all — even much larger fish.

Red bee shrimps are beautiful animals which feed on algae and any small pieces of food they can scavenge.

African moon tetra (*Bathyaethiops caudomaculatus*)

Few African tetras have made it into the common assortment of aquarium fish and ,apart from the Congo tetra (*Phenacogrammus interruptus*), none are bred commercially by fish farms in Asia or the USA. The African moon tetra, *Bathyaethiops caudomaculatus* is one of the nicest and most striking schooling fish for the well planted aquarium, yet it is rarely available and only in wild imports from the Congo region. Since this is a very unstable area these can be few and far between.

The maximum size of this hardy Tetra is just under 7cm making it better suited for the average community aquarium than the much larger Congo tetra. With maturity the African moon tetra displays a bright red line along the head and back. A lovely attractive fish which really should be more widely available. Perhaps one for the commercial fish breeders to take on board in the future?

African moon tetras (*Bathyaethiops caudomaculatus*) like this are just one of many African species which would be great assets to the aquarium hobby.

Pungu (*Pungu maclareni*) have derived their common name from their generic name in much the same way many other aquarium fish have.

Pungu (*Pungu maclareni*)

The Crater lakes of Cameroon harbour a great number of endemic Cichlids, the greatest number of which are found in the lake Barombi Mbo. More than 10 species of Cichlids have evolved here and *Pungu maclareni* is one of the most interesting. In nature this bizarre mouthbrooder feeds on the sponges growing on submerged logs and rocks of the lake. While the fish resemble some mbunas from Lake Malawi, they are not nearly as aggressive and can be kept with most other fish. At a maximum size of less than 15cm they are smaller Cichlids easily housed in tanks of around 180 litres. Pungu is best suited for community tanks with other endemic Cichlids from Barombi Mbo — a different community aquarium for aquarists that have kept most Rift lake Species.

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Creating waves

Today's Fishkeeper visits one of the UK's newest aquatic shops, Creating Waves Aquatics in Nottinghamshire.

THERE IS NOTHING to beat enthusiasm, hard work, and a good level of knowledge in this business, and those three qualities Paul McCree and Denice Cawthorne of *Creating Waves* certainly have. In the months since they opened their business on the 17th November 2001 they have seen their business expand at a dramatically faster rate than they ever expected. Part of the reason for this is Paul's unique way with customers, the first time people visit they are customers, the second time they are insulted - just like everyone does with their best friends! That certainly didn't happen with the *Today's Fishkeeper* team, Paul just went straight to the second visit and instead of the red carpet treatment we were told where the kettle was. True, we had called in totally unannounced late on a Sunday. In fact, it was after opening hours but there were still customers in the shop and they looked like being there for some time to come. When they had all left there was some pond maintenance to do on a customers pond before heading for home but Paul didn't seem to mind. He thrives on hard work and even runs a not for profit fish club on the first Monday of the month.

Paul originally started in the aquatic business in 1987 working in an aquarium shop for a couple of years. That was followed by another stint as manager of another shop from 1993 to 1995. Then Paul left the business and eventually became a Sales manager for a national window company - where he made the money to start his own aquarium shop.

Paul's current love is his marines and this section of the shop makes up for nearly 50% of the tanks. As a hobbyist, Paul first started keeping marines about 20 years ago and has followed all the technological break throughs with keen interest. He has, however, had tropicals for 34 years and his favourite fish are still Dwarf cichlids, particularly *Apistogrammas*. When combined with some of the lovely Tetras, Paul thinks they can give any marine set-up a run for its money. ■

Shop details: Creating waves aquatics, Hardy's farm shop, Farndon Crossroads, Farndon, Nottinghamshire, NG24 3SX. 01636 684484
Shop opening hours: 10am - 6.00pm. Mon - Sat. Sun & Bank holidays 10am - 3pm.
Proprietor: Paul McCree & Denise Cawthorne.
Staff: Stef full time and Daniel weekends.
Number of tanks: 36 tropical, 24 coldwater, 40 marine fish and 18 invertebrates.
Number of Vats:27,000 litre pond.
Specialities: Marines and Tropicals.
Brands stocked: All major brands.
Which groups of fish do you sell?: Freshwater, Marines, Coldwater & Koi

Our verdict

A really friendly shop with a good selection of marines and inverts. The tropical section was up to a good standard with lots of healthy "bread and butter" fish, but, when we visited, nothing really unusual stood out. Some particularly nice lemon yellow Goldfish were on sale in the display pond, but catching them was a nightmare (although great fun to watch). When the expansion outside is completed it should be a good venue for pond equipment and fish as well.

Brian's verdict on the manufacturers

Which manufacturer has the best range of products in your opinion? Kent Marine, TMC and Hagen's Fluval range of equipment.

Which company gives your customers the best service? Aqua Medic

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This furnished aquarium has a carpet of *Cryptocorynes* in the foreground.

Cryptocoryne mohlmanii

Hidden Gems

THE MEMBERS OF THE GENUS *Cryptocoryne* are probably some of the most popular plants for the aquarist after *Echinodorus* (Amazon swords) and, like Amazon swords, they can tolerate a wide range of aquarium conditions.

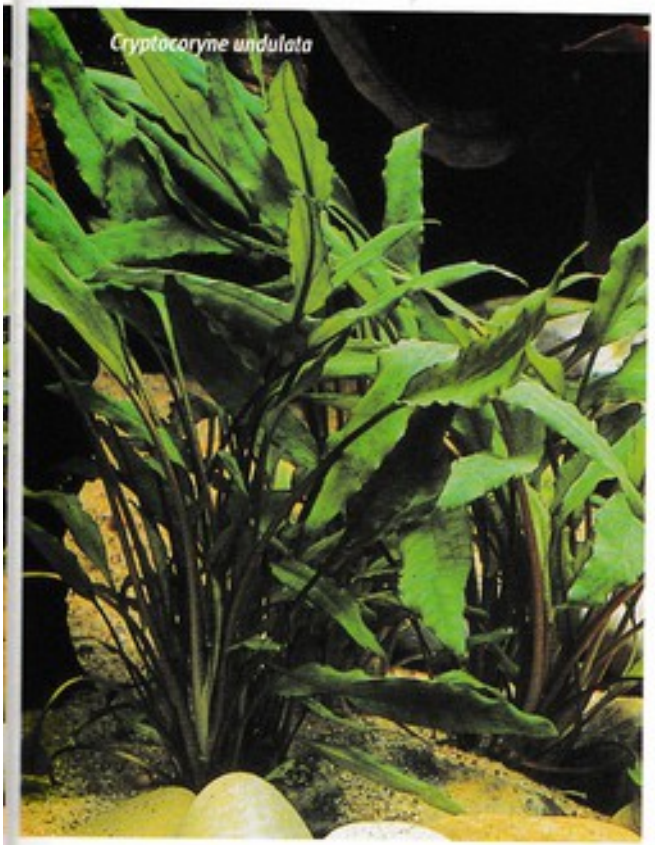
Cryptocorynes belong to the family *Araceae* which has around 150 genera and over 2000 species, most of which are terrestrial plants belonging to the tropics, but with members in most parts of the world. Of these genera, several members have adapted to survival in damp conditions, and may even be totally submerged for long periods of time, sometimes indefinitely. There are approximately 50 species of *Cryptocorynes*, most endemic to the Indomalay region, and all dwelling in paludicolous (marshy) or aquatic conditions, and it is this habit makes them particularly useful to aquarists.

What is common to all members of the *Araceae* is the inflorescence (flower), comprising a cylindrical spadix enclosing a large spathe. Gardeners will be more familiar with this type of flower when looking at Lords and Ladies (*Arum maculatum*), which is typical of the family.

The fact that the central spathe is enclosed by the spadix or sheath, is recognised in the genus name of *Cryptocoryne*, which literally

Fascinating flowers

The method by which Aroids flower and ensure fertilisation is fascinating. With *Cryptocorynes* the inflorescence is filled with air and is kept water tight right until the moment the flower appears above the water line. Then the 'cap' formed from the spathe unfurls to reveal the typical Jack in a Pulpit flower. Housed at the base are the female flowers encircling the central male flowers (the spadix). Once on the surface, the inflorescence starts emitting an unpleasant odour which attracts fruit flies similar to *Drosophila*. These crawl down the spadix and fall to the bottom of the flower passing a special 'valve' which prevents the flies returning immediately. For the flies to escape, they must first pass over the female parts of the inflorescence, depositing any pollen they may have picked up from other receptive flowers. After around 12 hours the valve withers allowing the flies to escape, but not before they have pushed past the now mature and sexually active male flowers which liberally apply pollen to each fly. The fly then goes off in search of another flower and so the process goes on. If pollination is successful and fertilisation has taken place, fruit may be formed which are shaped like five bladed stars. These release their seeds after several days to float off and germinate wherever they can find a suitable site.


Cryptocoryne undulata


Cryptocoryne lucens

In the first part of a major two part feature on *Cryptocorynes*, plant expert **Mark Duffell** looks at the group as a whole

Part One

PHOTOS: M.P. & C. PIEDNOIR

means hidden club. In some species, particularly the estuarine growing *C. ferruginea* and *C. pontederifolia*, flowering occurs in the dry season when an especially low tide takes place which allows time for flowering and pollinating, thus reducing the risk of the flowers becoming submerged and limiting successful fertilisation. In the aquarium, flowering is uncommon which can make identification a nightmare, although flowering can be initiated by dropping the water level seasonally, however, this can prove problematic in a well planted aquarium with lots of fish.

An impressive sight

Most aquarists do not grow *Cryptocorynes* for their flowers, but as a backdrop to display their fish, and this is where *Cryptocorynes* come into their own. *Cryptocorynes* have an upright habit with leaves forming a rosette, the leaf shape varying from species to species, but it is usually of an oval spear or a more rounded lanceolate form. The leaves are usually held on slender stems that are at least the length of the leaf, if not more, and these give the plant some movement when grown near a current, as well as providing plenty of swimming space for fish.

A well grown *Cryptocoryne* is an impressive sight with the larger species such as *C. ciliata* growing 300mm tall, and spreading up to 450mm, it forms a large, undulating clump of deep green with newly emerging leaves of deep burgundy,which can be made to last longer by keeping the plant in bright light. At the other end of the scale, the diminutive *C. becketii* forms a low growing mat of green and deep red leaves. Both plants are perfect for the community tank where most fish will leave them well alone.

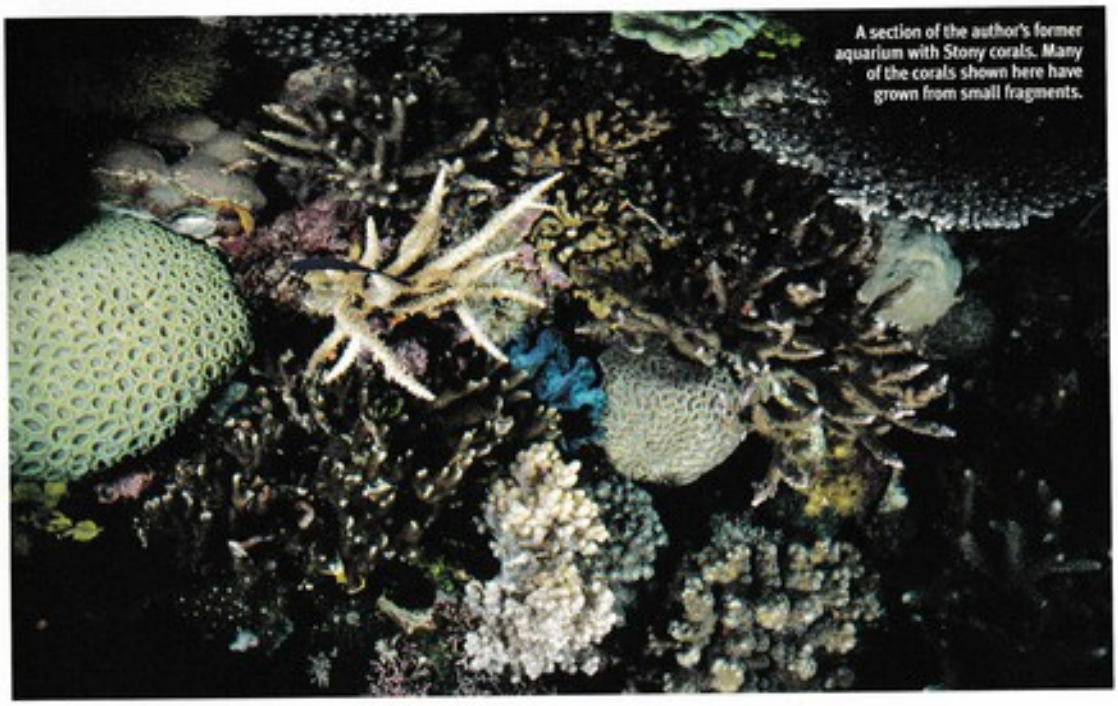
Of the species available to the aquarist the most common are :- *C. affinis*, *C. becketii*, *C. ciliata*, *C. cordata*, *C. crispatula* var. *balansae*, *C. lingua*, *C. pontederifolia*, *C. retrospiralis*, *C. wendtii* and *C. willisii* (*C. nevillii*). Many other species are available intermittently, especially under the general name of 'Malayan Sword'. This wonderfully vague term is due to the confusion over the naming of the members of the genus, as most species have many varieties and do not flower regularly enough to be identified.

The above photographs are just a small selection of these. ■

Next month Mark takes a close look at some of the more popular species in this genus

Protection by poison

Alf introduces us to the world of Stony corals



A section of the author's former aquarium with Stony corals. Many of the corals shown here have grown from small fragments.

THE BEAUTY OF THE CORAL REEFS immediately stuns visitors to the tropics. Like flowering gardens they occupy much of the shoreline of many tropical countries. Some countries, like the Maldives Laccadives in the Indian Ocean, are built exclusively from coral reefs. The Great Barrier Reef off the eastern coast of Australia is more than 2000 km long and the only living structure on Earth that is visible from the moon. Recent estimates conclude that coral reefs cover an area of 284,300 km² world wide. One tiny animal is responsible for building this gigantic structure – "the Stony coral polyp".

What are Stony corals?

Stony corals belong to the phylum *Cnidaria*. This is a large phylum that contains four classes; the Hydroids (*Hydrozoa*), the Jellyfish (*Scyophozoa*), the Box Jellyfish (*Cubozoa*) and the "Polyps" (*Anthozoa*), all together incorporating several thousand species.

CORALS AT WAR

Stony corals belong to the phylum *Cnidaria* which means "protection by poison"! And indeed the Stony corals can protect themselves. They have several ways of defending their territory against neighbouring corals; sweeper tentacles with many nematocysts (stinging cells), chemical warfare by releasing protective chemical compounds into the environment and often a high growth rate – especially among the Staghorns that enables them to win in the competition for space.

In general Hydroids and Jellyfish alter during their life cycle between two generations; an asexual polyp (sessile) generation and a sexual medusoid (free-swimming) generation. In *Anthozoa* the animals have only a sessile generation, free-swimming generations are completely lacking. The principle "polyp" is a simple animal with a basal foot that anchors the animal to the substratum, a stem that raises the animal above the substratum, and a central disk containing the mouth opening surrounded by tentacles that are used for capturing food. The anemones in order *Actiniaria* show this principal organisation very well. In principle the Stony corals follow this organisation with the exception of the polyp secreting a skeleton built of aragonite (a form of calcium carbonate). The skeleton is built from dissolved compounds absorbed from the surrounding water. In

The glass-anemone, *Aiptasia* sp., shows the principal organisation of a coral polyp very well :- foot-stem-disk-tentacles.

fresh water, where minerals are "lacking" compared to seawater, Stony corals cannot build their skeletons.

Solitary or colonial?

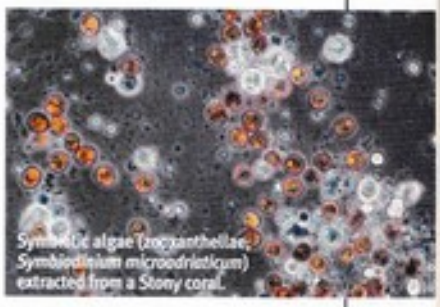
Stony corals are either solitary living as one single polyp or they build colonies that consist of anywhere from a few, to a thousand polyps. The differences between a polyp and a colony are not always obvious, though. A solitary coral is one single coral animal or one single coral polyp living alone. This polyp is usually male or female. It is normally attached to the substratum as juvenile, but free-living as adult. A colony, on the other hand, is an aggregation of more polyps connected to each other through a common tissue. The colonies are built around a central, axial polyp with radial polyps budding off around the central polyp. The individual animals (polyps) of a colony are clones (genetic copies) of the primary (first) axial polyp. Some colonies are huge and can be several hundred years old!

The border between "solitary" and "colonial" is, however, not always clear. If we define "solitary" as a coral that has a single polyp, we expect to find only one mouth opening in the centre of the polyp. A colony will have more mouth-openings as they will consist of many polyps. However, in the family *Funglidae* this is not always →

PLANT-LIKE QUALITIES

Stony corals must also be looked upon in two other ways; "animal-like" or "plant-like". This does not mean that some corals are plants, however, since all Stony corals are of course true animals! Many tropical corals have, however, a plant-like way of existing as they contain symbiotic algae (zooxanthellae) in their tissue. The algae are flagellates that live in millions per cm in the endoderm layer (the innermost of two cell layers) and belong in the genus *Symbiodinium*. The zooxanthellae – like other plants – carry out photosynthesis and produce organic compounds from inorganic carbon dioxide and water with light as the source of energy. Some of this nutrient is translocated to the coral polyps while the algae in turn benefit from metabolic waste products from their coral host. Stony corals containing symbiotic algae are the true builders of tropical coral reefs and are called "hermatypic corals".

The symbiotic relationship with algae is a purely tropical phenomenon and is an adaptation to a life in a nutrient poor environment. Stony corals with zooxanthellae are – for yet unknown reasons – not found in temperate or cold oceans.

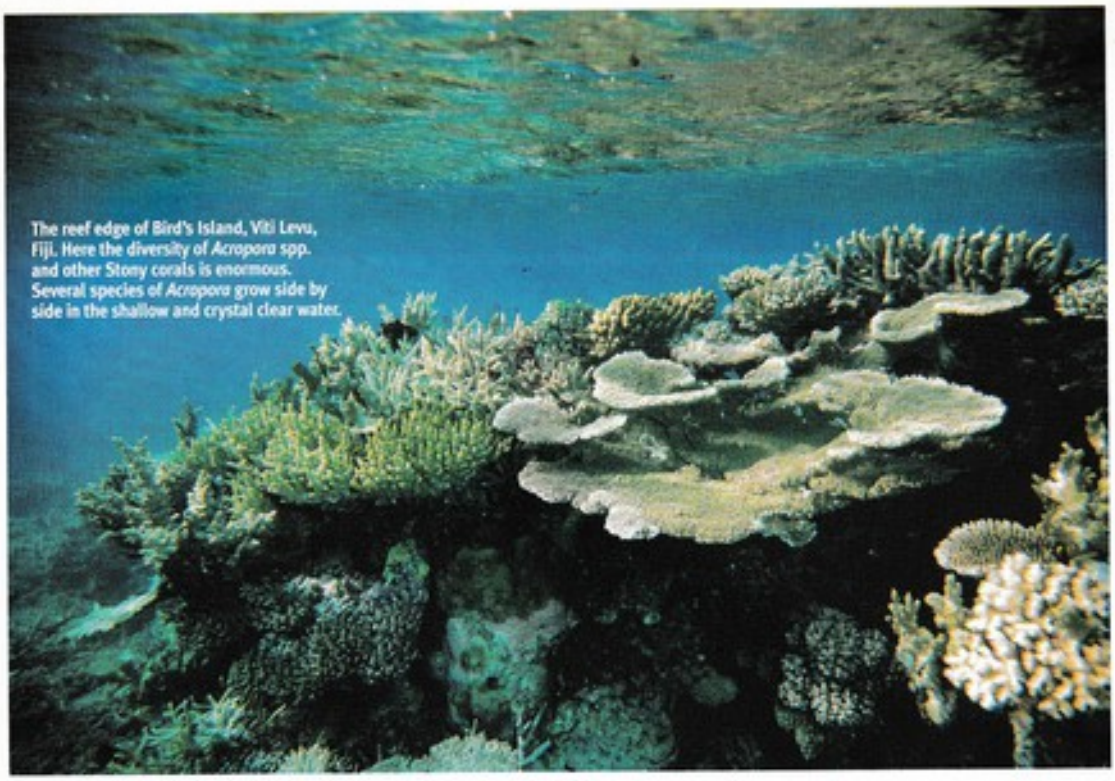


Symbiotic algae (zooxanthellae, *Symbiodinium microadriaticum*) extracted from a Stony coral.

Corals that do not contain zooxanthellae are called "ahermatypic corals" and are totally dependent on the capture of plankton for survival. Ahermatypic corals are numerously found in all oceans of the world, including on the coral reefs – where they usually avoid the strongest radiation by growing under overhanging rocks and in caves. The polyps of ahermatypic species are usually larger and have longer tentacles than those of hermatypic corals, which probably is an adaptation to the necessity for capturing plankton.

Do corals with zooxanthellae also capture plankton? Do hermatypic corals need additional food? The answer to both questions in general is "yes". However, there are clear differences from species to species as well as from habitat to habitat. Some corals can, in extreme cases, be autotrophic, meaning that they produce more energy than they consume – in other words they are living as autotropic organisms. However, most corals with zooxanthellae need more energy than they get from their symbionts and consequently depend on plankton and other organic sources of nutrient. In practise, this means that most hermatypic Stony corals capture plankton and utilise other food sources such as dissolved organic compounds, particulate organic matter and even bacteria. The nutrient budget of Stony corals living on the shallow coral reefs is a complex matter that is far from fully understood. Scientists continue to solve the puzzle day by day.

A male polyp of *Fungia* sp. is spawning in the author's aquarium.



The reef edge of Bird's Island, Viti Levu, Fiji. Here the diversity of *Acropora* spp. and other Stony corals is enormous. Several species of *Acropora* grow side by side in the shallow and crystal clear water.

the case.

Stony corals are ,obviously, animals of the tropical shallow seas, but are also found in temperate and cold oceans. Off the coast of Norway, as well as in deep water in oceans world wide, bioherms exist. Bioherms are slow-growing deep-water coral reefs built by the "glass coral" *Lophelia pertusa*, clearly illustrating that "reefs" and "Stony corals" are not tropical phenomenon.

Colours and shapes

And then.... When you dive the shallow reef, you see all those colourful Stony corals. Branching or brain shaped, green, brown, pink and purple.... What then about colours and shapes? Stony corals (as well as other sessile organisms) living in the powerful radiation from the equatorial sun that hits the shallow tropical reefs, need a "sun lotion" to avoid getting sunburned. Place yourself naked for a couple of hours on a tropical beach at midday, and you will be completely fried – so also for the corals. Protect yourself with a UV-protective lotion and you are safe – so also for the corals! The natural colours among Stony corals are brown – simply because their symbiotic algae give them the brown cast. But obviously, not all Stony corals are brown. On a shallow reef flat we see all sorts of spectacular colour....the reason is the protective lotions, compounds that give the polyps protection against the killing ultraviolet radiation. Put a shallow-water colony in a bit deeper water, and it changes its colour from red, blue, pink or yellow to brown. Go the opposite way and it dies! Why? Well, the corals can adapt relatively rapidly to less harmful conditions as long as they get enough light to support their symbiotic algae, but they cannot give their cells protection within minutes. The UV-radiation burns in minutes and the corals can die just as quickly! ■

HOW MANY STONY CORALS ARE THERE?

Veron (2000) lists 793 species of Stony corals in his three volume book series "Stony Corals of the World". The centre for species diversity is found in the Indonesian-Philippines Archipelago, where more than 580 species are known. This area also contains 31 endemic species that are not found elsewhere.

Cnidaria

The phylum *Cnidaria* as a whole contains about 25 orders. The class *Anthozoa* contains nine of these orders with the "Stony corals" one of them, scientifically named "order *Scleractinia*".

WHAT ABOUT IDENTIFICATION?

This is a complex and difficult question. The polyp lives in a house – a calcareous hollow called "corallite". The corallite has a lot of tiny calcareous structures; plates, spines and ridges – all that have their scientific terminology such as "septa", "calyx", "coenosteum" and "columella". Some species of Stony corals are easily identified while other species need detailed examination of the corallites in order to get identified. This is a matter for experts. When it becomes a fact that many colonies alter their colony-shape as well as corallite-structures depending upon the environmental conditions in their habitat, the matter of species identification can become an impossible task.

Ponderings

In **Dave Bevan's** regular column on ponds and pondlife, he shows you how to plant oxygenators and he looks at a fascinating fish and some nasty predatory creatures

Plant Lore

The variegated form of Flag iris is particularly attractive.

The largest and most diverse group of plants for the pond are the marginals. These fill the area between shallow water and dry land with colour and form, thus integrating the pond with the rest of the garden. Grasses, rushes and reeds provide winter colour and texture as well as cover for wildlife. Their luxuriant and rapid growth during spring also helps to keep the nutrient levels down as the extensive root systems absorb nitrates and phosphates.

Look for the tall and versatile Flag iris for a lovely display of colour in June, the variegated form is particularly stunning. Marsh marigolds, controllable but clump forming plants, provide early spring colour from the deeper water right through to the bog garden. Water mint and Water forget-me-not ,together with the multi coloured leaves of Houtinia, are prolific through the summer.Another versatile plant for both wet and dry situations is the summer flowering Arum lily with its spectacular white blooms. In late summer the bright red Lobelias and tall yellow Ligularias stand out.

These are only a few of the hundreds of marginals that will brighten up the pond.

Pond problem

Have you ever been out in a small boat on a sunny day? The heat can become relentless! It's no different for your fish if they cannot retreat from the midday sun.

In a natural pond the profusion of plants will ensure that there is plenty of shade, but in the well-stocked fish pond shade is sacrificed for clear water and the chance to easily view the fish. Plants often take longer to establish as the fish's natural inclination is to grub among the roots.

For the future, planting water lilies to provide shade is the answer but a quick and inexpensive solution is to float a piece of polystyrene on the pond. It can even be anchored in position using string and a stone ,but it does little for the visual appearance of the pond.

A more permanent solution involves suspending netting above the pond.

Suspending green netting over the pond will provide shade from the summer sun.

STICKLEBACK FACTFILE

Species: Three- spined stickleback (*Gasterosteus aculeatus*)
Ten - spined stickleback (*Pungitius pungitius*)

Other names: Nine spined stickleback

Other forms: None

Size: Up to 7 cms

Weight: A few grams

Availability: Native species occasionally available through aquatic outlets.

Habitat: Slow running, weedy streams and ponds. The Ten- spined stickleback can survive in water containing little oxygen.

Identification: The presence of three or ten dorsal spines, the male Three-spined stickleback has a bright red belly in the breeding season. The male Ten-spined stickleback is almost black. Females of both species are drab brown in colour.

Habits: Territorial nest builders. Three - spined sticklebacks often live on the pond bottom, whilst the Ten -spined stickleback is usually near the surface. Males of both species build nests and look after the eggs. Even the smallest of ponds can support 3 or 4 pairs of each species. These are natural predators which feed on crustaceans and larvae of water insects.

Pond fish value: Great for the wildlife pond, where they may become established as the top predator. An interesting little fish easy to observe during the breeding season once the nest position is established. Ten -spined sticklebacks have a tendency to hide amongst water plants. These are self sufficient fish but they cannot be kept in a pond with newts.They will eat young newts and gradually drive out the adults, due to their territorial tendencies.

Male Ten- spined stickleback with his nest and developing eggs

Emperor dragonfly nymphs are extremely effective predators.

Dipping deeper

Dragonfly nymph is rather a misnomer for this exceptionally ugly and fearsome looking creature. The nymphs of our largest Dragonflies, like the Emperor and Southern hawker, are nearly 75 mm long when fully grown and can take up to five years to reach maturity.

During this time they lurk amongst the water plants, superbly camouflaged with their green or brown bodies. They will eat anything they can catch and hold, but rarely tackle anything more than half their size. When a tiny fish or tadpole comes within striking distance, the nymph strikes using its hinged mask, which shoots out to reveal a pair of sharp pincers. These hold the prey while it is drawn back to the mouth.

The nymphs of the Chaser dragonflies are generally much shorter at around 40 mm and usually hide in the sediment on the bottom of the pond where they camouflage themselves with tiny sand grains. If threatened, they can shoot forwards quickly by expelling water out of the anal pore.

Planting oxygenators

When you visit the garden centre, oxygenators are usually sold by the bunch, neatly fastened by a rubber band or strip of lead. "Just drop the bunches into the pond and let them grow" says the aquatic assistant. They stand a chance of growing, but so do Daffodil bulbs if you scatter them on the flower bed!

If the bunch lands on bare pond liner then it may not grow, which is probably just as well because if it does grow there it will spread rapidly over the bottom of the pond rooting amongst other plants, making it impossible to control.

For guaranteed (almost) growth and control it is much better to use planters and to ease the pocket visit another pond owner - they will probably be only too pleased to let you have a hand (or bin bag) full.

STEP 1 Once you get your material home tease it out into individual pieces.

STEP 2 Cut them into approximately 15cm long pieces.

STEP 3 Using plastic garden ties, tie the pieces into bundles of three or four.

TIP
Always keep oxygenators wet and do not expose them to bright sunlight as the delicate foliage dries out very quickly.

STEP 4 Fill a 20cm planter with pond soil, plant four bundles in the soil and cover with shingle before putting the planter in the pond.

Every few months the planter can be lifted out and the plants cut back to a manageable size.

Diving beetle larvae really do live up to their common name of Water tiger. A voracious and skilful hunter, it is armed with a set of sharp pincer like jaws from which there is little chance of escape - if you are a tadpole or small fish. Once held in its grip, a toxic saliva is pumped into the prey reducing it to a soup, which is sucked out to leave the hollow skeleton behind.

Below the surface

Many creatures, some of them very small, live in the accumulated debris on the bottom of the pond. At certain times of the year these creatures can multiply very rapidly, none more so than the various worm-like creatures. They may take the form of Bloodworms, larvae of Midges or small segmented worms closely related to the Earthworm.

A sure sign they are working, helping to reduce the levels of rotting material, is the presence of worm casts on the bottom of your pond.

HOLIDAY FEEDING

Having successfully brought your pond fish out of the winter and through spring they are now feeding regularly, some even coming to hand, and then holiday time is just round the corner. What do you do? A well established garden pond with a sparse population presents no real problem for up to a month at this time of year. The fish will find plenty of natural food in the form of insects and larvae and be just as healthy and happy as when you left them.

The well stocked pond, provided the fish have been fed regularly during the previous weeks, will be alright for a couple of weeks. In the long run, they may be better off if they are left alone rather than to the tender mercies of well meaning neighbours.

If the fish must be fed during longer breaks why not try one of the automatic feeders which can be set to dispense the correct amount of food at the correct times. Should you have to rely on a neighbour, the chance of over feeding must be avoided by pre packing the food for each feed, together with clear written instructions detailing frequency and times.

Hand feeding Koi is a real pleasure - but what should you do when you go on holiday?

DISCUS PROBLEM SOLVER

Tony Sault answers your questions on Discus

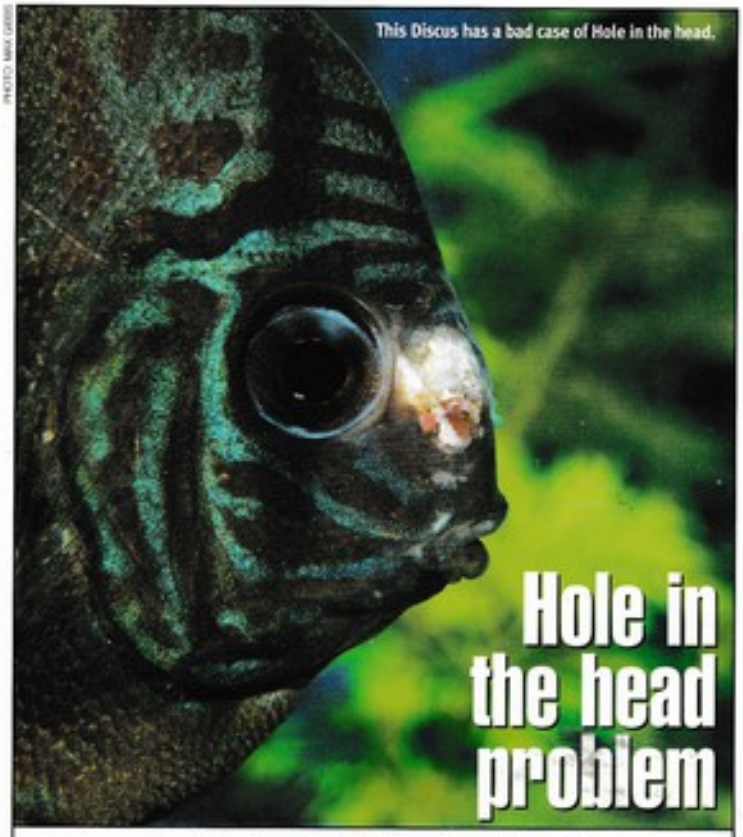


PHOTO: MIKE CARR

This Discus has a bad case of Hole in the head.

Hole in the head problem

Q **One of my Discus has stopped feeding and some white pimples have appeared on its forehead between the eyes, all the other fish seem fine. Can you tell me what this can be and how to treat it?**
David Sanderson, *Ipswich*

A I am afraid the symptoms sound like the onset of Hole in the head disease, but please do not panic as it is relatively simple to cure. The sick fish should be removed from the community tank and housed in a small isolation tank where it can be treated. Raise the temperature to 32°C and treat with Metronidazole which you can get from your local vet. The tablets will be 250mg tablets and the dose is 1 tablet per 45 litres of tank water. The tablets should be crushed into a fine powder and mixed in a glass of tank water until you have a milky liquid . Pour this over the surface area of the tank so that it descends like a snow fall. It will dissolve over the next couple of days. Do not carry out a water change for the next 10 days, then slowly return the temperature to normal.

Unexpected breeding

Q **After my recent purchase of a water purifier to improve the water quality of my Discus which were really in a poor state, they have improved to such an extent that I now have another problem, two of them have paired off and begun spawning. I know some Discus keepers strive to achieve this but I do not want to breed them as this only serves to upset the balance in my tank. The question is, how can I stop them spawning?**
Barry Cranwell, *London*

A Congratulations on your achievement. I often have to syphon out of the tanks unwanted batches of eggs and have found this to be the kindest way to solve the problem without causing too much distress to the parents. There are numerous other ways to stop the pair spawning but all involve either moving the fish or altering the parameters of the water which will also affect the other tank mates as well. Nature will run its course and the potential parents will eventually stop spawning.

Is my tank large enough for Discus?

Q **I have a small 80 litre tank in which I would like to house two small Discus. Would they be alright in this size tank?**
Allen Wilson, *Leeds*

A I am sorry but an 80 litre tank is far too small for Discus. These fish are strong shoaling fish and the smallest number that should be put together is six. Discus will only grow to the size of the tank they are in, so this size tank would be very restrictive and not allow the fish to reach their potential.

Gill cover problem

Q **I have recently transferred two of my Discus to a new tank containing other tropicals as well as some small Discus. I have noticed that one of the Discus that I moved has one of its gill covers closed all the time and rubs it against objects in the tank. All the other fish seem to be alright. Has this one got gill flukes and do I need to treat the tank?**
John Davies, *Cardiff*

A As the fish was fine before you moved it I would doubt that it now has gill flukes. Could the fish have damaged its gill filaments while being transferred to the new tank? Discus often close a gill cover when the filaments have been damaged as this allows the damaged filaments to heal themselves. My advice would be to allow the fish to recover in its own time but keep a close eye on it. ■

Female Mosquito fish. Males of this species have a gonopodium and are smaller than the female.

Mosquitos that won't bite

They may not be the best community fish but if you like livebearers, you'll love this fascinating little fish. **Paul Skinner** has all the details...

THE MOSQUITO FISH IS THE SMALLEST OF the commonly available livebearers and, indeed ,they are one of the smallest of all vertebrates. Their size alone makes them a very interesting species. They are lively, attractive, peaceful and active but ,unfortunately, are too small to be kept in a run of the mill community tank. Any larger tank inhabitants tend to bully these fish, making them very shy and they will hide away and their condition will gradually deteriorate - if they are not eaten before. They are, however, ideal for very small tanks, making them perfect for keeping if space is at a premium.

The body colour is olive to brown on the top and white underneath. A dark brown, horizontal line runs from the nose, through the eye, to the base of the tail. Above this line there are faint vertical lines across the body. There are two spots in the dorsal fin, one black and the other red. The male's gonopodium (elongated anal fin) is long in relation to the rest of the body. I first kept these interesting little fish a number of years ago, when I was given a pair by a member of my local fish club.In the fish room I had a 35 x 20 x 20cm tank that was

WHAT'S IN A NAME?

This fish has three common names: Mosquito fish, Least killifish and Dwarf top minnow. The most commonly used name is Mosquito fish due to its small size, however, this name is also used for all the fish in the *Gambusia* genus and in particular *Gambusia holbrooki* which has been introduced throughout the tropical world for mosquito control - usually with disastrous results for the native fish.

FACTFILE

Scientific Name
Heterandria formosa
Family
Poeciliidae
Distribution range
Southern USA
Size
Males 1.5cm : Females 2.5cm

usually used for breeding Killifish but was empty at the time. I decided that this would be an ideal aquarium in which to try to breed these little fish.

The male was just over 5cm long, the female was almost twice this size. I decided that, although the tank was small, I would set it up to replicate, as closely as possible, the conditions that these fish are collected from in nature. I read as many books and articles as I could. I discovered that, in the wild, they inhabit heavily vegetated standing to slow-flowing fresh and brackish water. They prefer to remain among loose, fine-leaved plants, and especially among the hanging roots of floating plants. Their diet mainly consists of tiny worms, crustaceans and plant matter.

With this in mind, I set the tank up using silver sand as a substrate adding a small piece of bogwood and some attractively rounded pebbles for decoration. I planted some small bundles of *Cabomba* and *Myriophyllum*, with the addition of some floating plant (*Salvinia*) to add shade and complete the natural appearance of the aquarium. As Mosquito fish are found in slowly moving or static water, I decided to employ a small air-powered sponge filter to create a gentle current. The water was heated to 25°C.

The fish settled down nicely and were soon relishing a diet consisting of flake food, frozen Brine shrimp and live Daphnia. I do not usually like to feed live Daphnia in my spawning/raising tanks as there is always the risk of introducing predatory Hydra. However, in this case I made an exception due to the limited choice of diet caused by the adults being such a small size.

Steady stream of babies

After a period of five to six weeks I was rewarded by the sight of the first youngster, found swimming happily amongst the plants at the surface. The baby seemed to be quite large in comparison to the adults. They did not seem to be molesting it in any way, therefore, I decided to leave it in the same tank as the parents. The next morning I could see a further two and the day after three more. The small fry were fed on a liquid fry food for the first week before introducing powdered flake and live Brine shrimp to their diet. I subsequently found that they developed faster if the first liquid food was supplemented with infusoria.

I left the young with their parents for a further four weeks, after which time I noticed another tiny newcomer swimming about. I then moved the original fry to a larger tank in order to grow them on. They were not the quickest growing fry that I have raised but they grew quite steadily. I found that with good feeding the female will produce two or three youngsters every day over a period of six to ten days, and that she could have such a pregnancy period every four to five weeks.

Steady demand for youngsters

As my number of adults increased I put two young females, together with two from another source, into the breeding tank and I was shortly finding a couple of fry nearly every day. Due to the small size of the spawning aquarium I started to remove all of the youngsters as they were born. I found that although the adults were not suited to life in a community tank there was nonetheless a steady demand for these fish.

Indeed, it is the unusual breeding habits that make these fish so interesting a subject to study. Rather than producing distinct broods, like many livebearers, Mosquito fish continually produce a few fry a process known as superfoetation. This is in effect a production-line in which unfertilised eggs develop at the same time as embryos at various stages of development. This means that a female will have embryos of all stages from just fertilised to those ready to be born. The females are thus able to keep up the production of relatively large fry, giving such a small fish an evolutionary advantage.

If you have limited tank space but want to keep a livebearer that rewards you with fascinating behaviour, I highly recommend the Mosquito fish as the number one choice. ■

AQUARIUM SET-UP

Tank used:	35 x 20 x 20cm	Temperature:	17 - 26°C
Filtration:	Air powered sponge filter	pH:	7.0 - 7.5
Substrate:	Silver sand	GH:	5 - 20°
Decoration:	Bogwood and pebbles	The fish:	1cm male and 2cm female
Plants:	*Cabomba*, *Myriophyllum* and *Salvinia*		

Nuisance algae in the pond

Bernice Brewster discusses algae and suggests some plants that may help to clear your pond of this nuisance so that you can see your fish.

NOW THAT THE WEATHER IS IMPROVING, it is time to start work in the garden and, of course, this includes the pond. One of the most frustrating aspects for many pond keepers is that in the summer, when they want to enjoy the pond, it is plagued by nuisance algae. When a new pond is installed it sparkles and is a pleasure to see but often within a few months of summer warmth and sunshine, the water turns pea green or the sides and plants become choked in a dense fibrous growth of blanket weed. Green water and blanket weed are the nuisance algae which commonly affect the pond and cause such irritation to the pond owner.

Green water is actually a suspension of microscopic algae cells, which collectively turn the water a green colour, in strong sunshine, the algae can be seen swirling to the surface. These tiny algae cells thrive in warm, shallow water which unfortunately is typical of most garden ponds. Blanket weed is the term used for a number of species of algae which are comprised of long chains of single cells, which give rise to the fibrous appearance. The strands of cells reproduce by dividing at the tips but as anyone who has blanket weed in the pond is aware, the rate at which it grows is phenomenal. The blanket weed algae also undergo a sexual form of reproduction, which periodically results in the formation of tiny spores, which are easily spread in the water. In many instances blanket weed is especially a nuisance in hard water areas, where a layer of lime scale forms on the bottom and sides of the pond and allows the algae to become anchored to these surfaces. ■

What encourages algae?

Apart from water temperature, there is one other important factor which promotes the growth of green water and that is the presence of dissolved nutrients. Fish produce waste in the form of ammonia, which in a planted pond is either utilised directly by the plant life or in an established filtration system, is broken down to nitrite and then nitrate through the activity of bacteria. The ammonia waste produced by the fish is therefore a plant nutrient and, in the absence of sufficient or established plant life, will promote the growth of nuisance algae. Similarly, nitrate is also a plant fertiliser and encourages the growth of both green water and blanket weed.

There is one other nutrient, which forms part of the fish waste, phosphate and this is the most potent nutrient for plant growth. As many good gardeners are aware the use of phosphate products makes the plants in the garden grow prolifically and it is the same in the pond. Phosphate is termed 'the limiting factor' with regard to plant growth. Generally speaking, phosphate is in rather limited supply, so the plant life can only consume what is available. In the pond, the fish produce a certain amount of phosphate waste and therefore form a rich supply of this nutrient and it is this which ultimately promotes the growth of the unwelcome algae.

WHAT IS THE SOLUTION?

The addition of more plant life is certainly a solution but it must be appreciated it is a very long term answer to the problem and there are drawbacks. It may take several months or even a year or so before either marginal or submerged plants are firmly established and can compete effectively with these nuisance algae. The algae which cause green water and blanket weed can respond far more rapidly to increases in both day length and water temperature than can the majority of pond plants.

There is an exception among the plants and this is the Cresses, Water cress ,*Rorippa sp.* and Fool's water cress, *Apium nodiflorum*, begin to grow early in the year and will successfully compete with the algae for available nutrients. The Cresses prefer slow flowing waters and therefore should ideally be planted in gravel in the waterfall, they also require regular pruning and cutting back throughout the summer as they grow rapidly and if left untended may also turn into a nuisance.

Haul out the blanket weed

NICKI DAVIES

Cool Cats

Ian Fuller deals with some of the *Corydoras* species that prefer the cooler end of the so-called tropical scale

THE RIGHT TEMPERATURE AT WHICH TO maintain certain fish is a subject that creates an element of debate wherever fish keepers meet. This seems to be even more evident when Catfish, or in my particular case, *Corydoras* are being discussed.

Coolwater species

For this particular discussion I would like to deal with some of the *Corydoras* species that prefer the cooler end of the so-called tropical scale. When we use the term tropical we are usually talking of temperatures around 24° C. Here, we are talking about a temperature range considerably lower, at 15.5° - 21° Celsius.

There are four species in particular that would be very comfortable living at these lower temperatures. Two of them, in fact, become very uncomfortable and stressed if the temperatures rise much above 21° C. Dealing with these two first, they are closely related and resemble each other in colour pattern, in particular the females. They are *Corydoras barbatus* (Quoy & Gaimard, 1834), coming from fast flowing rivers that empty into Guanabara Bay in the State of Rio de Janeiro and *Corydoras kronei* A. de Miranda Ribeiro, 1907, which comes from the Rio Ribeira de Iguape basin, São Paulo State.

The third species is *Corydoras macropterus* Regan, 1913, which also comes from São Paulo State. This species is a little more tolerant of higher temperatures but they will eventually start to suffer if maintained in warmer water for long periods. The fourth species is *Corydoras paleatus* (Jenyns, 1842) originating from the Rio Paraná, north west of Buenos Aires in Argentina. All four species are found at least 22° South of the equator, in the case of *Corydoras paleatus* 33° South. The water temperatures in these areas fluctuate far more than we would imagine, with temperatures of below 15° C being regularly recorded.

Even captive bred fish like these albino *Corydoras paleatus* will happily adapt to cool temperatures.

Spawning techniques

The three species *Corydoras barbatus*, *Corydoras kronei* and *Corydoras paleatus* I have successfully spawned at 15.5° C and in the case of *Corydoras paleatus* the lowest was 12.8° C.

In smaller tanks (60cm minimum) *Corydoras barbatus* and *Corydoras kronei* are best kept in pairs. If there are two males per female, which is the preferred ratio with most *Corydoras* species, there will certainly be squabbling, if not out and out serious fighting.

***Corydoras paleatus* are perfectly at home in relatively cool water and are found in the wild at temperatures below 15°C.**

ALL PHOTOS: IAN FULLER UNLESS OTHERWISE STATED

RECOMMENDED SET-UP

My recommended set- up for any of these four species would be a tank of at least 60cm in length, with a thin layer of smooth grained sand (so - 12mm), a few lumps of sandstone or other inert rock to create a few hiding places and give the illusion that you are looking at a sandy creek or a river bank. Two or three clumps of Java fern attached to pieces of bog wood will add a bit of colour and a few soaked Oak or Beech leaves scattered on the bottom, would give it that final authentic touch.

For filtration I would recommend an outside canister type power filter, this will create good water movement, optimum filtration and they are very easy to maintain. I would only install a heater to combat extreme winter temperatures, if you live in an area that is free from winter frosts then I would not use a heater at all. The natural day night temperature fluctuation would actually be beneficial to all four species.

This pair of *Corydoras barbatus* appreciate a few pieces of inert rock which make hiding places.

PHOTO: PETER

Corydoras barbatus.

The males of both species are territorial and become especially aggressive towards each other during the breeding season. *Corydoras paleatus* I have found are best kept in multiples of three, two males per female.

Although *Corydoras macropterus* also enjoys the cooler temperatures, these are not a fish for the inexperienced *Corydoras* keeper. They are a fish that inhabit Blackwater biotopes and require a little more water preparation. Soft and acidic water is needed by many fishes. *Corydoras macropterus* need soft, acidic water if they are to have a reasonable chance of successfully breeding. They will survive, without too many problems, in neutral water (7pH, 8°-10° GH) but are definitely at their best when the water is around 5-6 pH. 2°-3° GH. To help put some of the natural elements into the water, I use pieces of soft bogwood and oak leaves, which are allowed to leach their tannins into the water, this gives the water the appearance of weak tea.

Regular water checks must be kept on the pH to make sure that it does not suddenly crash to dangerously low levels, which can happen very quickly in a small environment like an aquarium. The best way I have found to avoid such problems is by twice weekly 25% or 30% water changes. Rainwater filtered through moss peat is a good way of creating the right water conditions providing, of course, that there are no industrial contaminants in it. If it is found that the rainwater is not suitable through contamination, the mains water can be filtered through a water-purifying device and trace elements added to create the exact parameters needed. ■

Problem fish

Corydoras macropterus males are territorial all the time and not just at breeding times. They are very aggressive towards each other, even when there is an abundance of females. In the past, whenever I have attempted to keep these fish, let alone breed them, I have had trouble with males fighting and killing each other. The best method I have found to stop any serious damage from being caused is to slightly overcrowd them. For the last twelve months I've had a group of 6 males and 5 females in a 45 x 30 x 30cm tank and, so far, there has been no harm done from their little squabbles. Because of the overcrowding I change 25% of their water every day. I have been unable to breed this species but I'm working on it.

Corydoras macropterus are not for the beginner

Reptiles for beginners

THERE ARE A CONSIDERABLE NUMBER OF species of reptiles readily available, so how do you choose which one to start with? Obviously the creature has to appeal but the following points must be considered

❶ How big will it grow? Monitors, large snakes, turtles and some tortoises will eventually need large quarters which can often be beyond the means of the average keeper.

❷ Should it be a temperate or tropical species? The latter need additional equipment for heating and will cost more to keep.

❸ What is its temperament? Most wild reptiles will be skittish and may bite but in some cases will gradually become tamer. Captive-bred specimens are generally more amenable to handling. A few species however, remain intractable and do not settle to vivarium life.

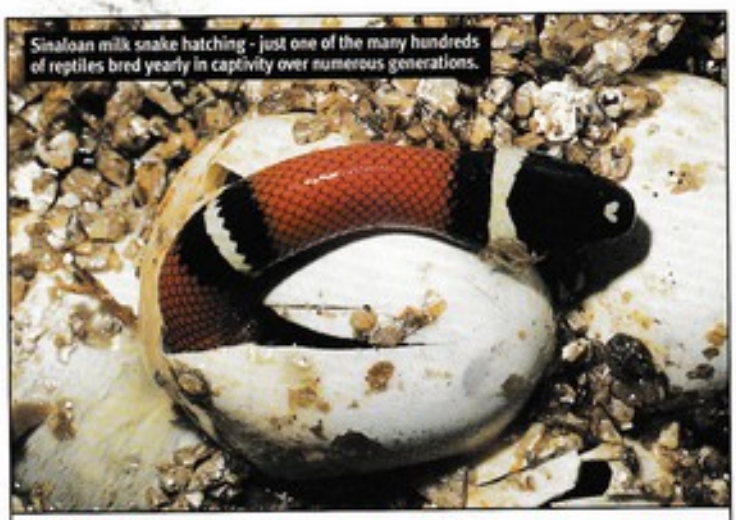
❹ Can you provide the right food? Correct diet is all-important for any animal. Keeping Reptiles is not simply a matter of throwing in some crickets or other food. Nutritional needs should be studied before attempting to keep anything. Among reptiles there are insectivores, herbivores, carnivores and some omnivores. Failing to provide the correct diet will lead to deficiency diseases and ultimately death.

❺ Can you spare the time? Remember the reptile will need to be cleaned out regularly and to ensure all is well time should be spent observing it

Lonely lizards?

A final point/word of caution - some people imagine a single reptile is 'lonely' and will try to keep other species with it 'for company'. Although, in some cases, this can work it is not a good idea as reptiles (with a few exceptions) are mainly solitary creatures, except at mating time, and can be territorial or view a smaller species as food. Visual intimidation by one can eventually cause the death of another. ■

With plenty of space Bearded dragons can be kept in groups where they form a hierarchy.



Sinaloan milk snake hatching - just one of the many hundreds of reptiles bred yearly in captivity over numerous generations.

SHOULD THE REPTILE BE CAPTIVE-BRED OR WILD-CAUGHT?

Wild-caught	Captive-bred
Age unknown. May be older specimen with short life expectancy.	Age is known.
Possibly not amenable to handling - may bite.	Used to being handled from very young.
May not adapt to vivarium life	No problem - born to vivarium life.
A few may not adapt to a captive diet.	Brought up from birth on a captive diet.
May be carrying disease or internal/external parasites.	Should be disease/parasite free.
Depletes wild populations.	Does not affect wild populations.
Some species are only available as wild-caught.	Not all species are captive-bred yet, although more breakthroughs are being made.
If purchasing wild-caught it is worthwhile trying to breed and establish them in captivity.	

HOBBY UNDER ATTACK

Chameleon - beautiful and fascinating but labour intensive; Chameleons may not get enough moisture from lapping leaves so need individual daily care.

A press release based on a report entitled "Far From Home" was produced by the RSPCA this year claiming that "thousands of vulnerable, wild-caught reptiles are dying from bone disease and severe digestive disorders like anorexia". The society hopes that such claims will persuade the European Union to ban the importation of "Chameleons, some snakes, crocodilians and certain species of lizards". The report states "malnutrition is found in 15% of pet reptiles" as well as "other health problems including rickets, osteoporosis, respiratory diseases and serious skin loss." Other factors in 'Far From Home' mention incorrect husbandry. A paragraph in the press release maintains the RSPCA's belief that exotics do not make suitable pets, but "in the meantime it wants to ensure that those who are determined to own reptiles are adequately informed about the needs of the animal".

So what do we have to say to this report?

It is the stated aim of the RSPCA to ban the keeping of all exotics so to paint as black and depressing a picture as possible is to their advantage. It brings into question their opening statement that "thousands of vulnerable, wild-caught reptiles are dying". Over the last three years the number of wild-caught reptiles imported into the UK via Gatwick, Heathrow and Manchester airports has fallen considerably. Going in to specialist reptile dealers now, the vast majority of animals are captive-bred, some for successive generations.

The "15% malnourished" and with health problems is to be deplored. However, the RSPCA. does not state, by contrast, what percentage of dogs, cats, horses and ponies are malnourished, have attendant health problems which are ignored by owners or treated cruelly except to state on television and in the press (April 2002) that such cases are at an all time high.

Hollow claims

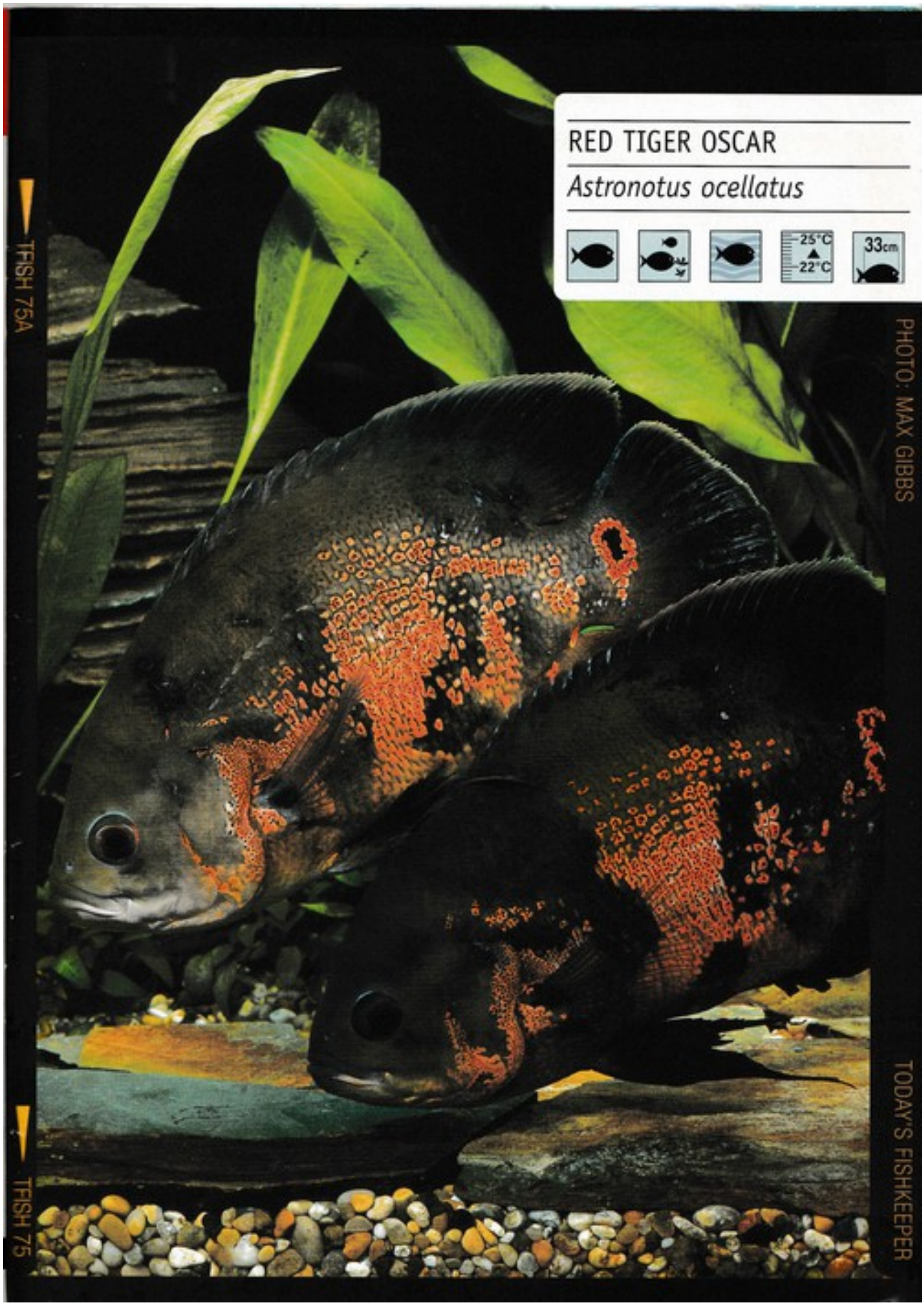
The Society claims to "*want to ensure that all who are determined to keep reptiles are adequately informed about their needs*". It produces relatively inexpensive books about caring for rabbits, guinea pigs, hamsters etc. but does not produce literature, readily available in shops, for reptiles. How does it intend then to disseminate this information to fulfil this aim?

We agree that some large reptiles are only for specialists who have facilities to care for them properly and know how to handle them. Any creature, not being cared for properly, can become difficult to handle. A large, hungry dog can be very aggressive and inflict considerable damage including death. We have always pointed out that Chameleons are not suitable for beginners - indeed they and some other species should not be general pet shop animals. Studies in the wild. however, show that some species of Chameleon, especially females, are short lived, yet experience has shown that some specimens have lived for considerably longer in a captive environment than they would have done in the wild.

Along with many other reptile keepers we care deeply about all our creatures. In all our work, writings, lectures and advice we have tried to impress upon would-be keepers the need to obtain full information on the proper care of an animal before purchasing it. That way we make sure our pets are well cared for and live a long and happy life.

MALNUTRITION IN 15% OF WHICH REPTILES?

The question has to be asked 15% of which reptiles? Are we talking about captive reptiles as a whole, or newly imported wild caught reptiles, or reptiles which are brought to the attention of the RSPCA? Also, exactly how have they arrived at this figure?


RED TIGER OSCAR
Astronotus ocellatus
25°C
22°C
33cm
TFISH 75A
PHOTO: MAX GIBBS
TODAY'S FISHKEEPER
TFISH 75

...End Point

Mr B. Coombes from Merseyside wrote in and asked for more information on the Fork-tailed blue-eye as recommended in the *Starting point* last month. He wrote that he would really like to keep it in his 75 x 30 x 37.5cm Rainbowfish community tank. **Pat Lambert** has all the details.

Fork-tailed blue-eyes make a great addition to a peaceful community aquarium.

THE FORK-TAILED BLUE-EYE'S SCIENTIFIC name is *Pseudomugil furcatus*. The family, to which this species belongs contains 15 species and they naturally occur in brackish and fresh waters of Australia and New Guinea. The *Pseudomugilidae* are a truly beautiful group of fish but all of them are rather small and can be difficult to maintain in captivity. They are a relatively short lived species, when compared to the larger Rainbows, but come into their full adult coloration at about four months old. They are not commonly found in the shops but do come in through the trade occasionally as they are being bred by specialist breeders, so you should be able to search them out.

These fish really need to be in a shoal of at least six to be happy. The Forked tail tells you that they are fast swimmers and very lively aquarium inhabitants. Some planted areas are appreciated but they do need plenty of open swimming area. Water quality is of the utmost importance if you want to keep your Rainbows happy. They can tolerate a wide range in pH and hardness but if the oxygen content is depleted, or dissolved waste products are allowed to build up, these fish are among the first to show signs of stress. Regular weekly partial water changes are very important and should not, under any circumstances, be neglected.

The one pictured here is a male *Pseudomugil furcatus* NICHOLS 1955 yellow form and can be found at Peria Creek, near Pumani and Safia area, eastern Papua New Guinea. In the same river system there is a blue form of the same species (also a beautiful fish) but this is not normally available in the UK. Females have a much more subdued coloration.

They are found in nearly all coastal waters in fresh and brackish waters and adapt very well to a wide range of water conditions. I have found that they are very happy in my hard, alkaline water, temperature range 22 - 26°C where they have been bred successfully for the past 10 years.

Fork-tailed blue-eyes are surface and mid-water swimmers and they are very unlikely to follow food down to the bottom of the tank, this can be a problem if the food has a chance to rot. I have found, as Ian Fuller has found, that Rainbows and Corydoras live together very well and the Corys will eat up the food as it falls into their domain.

They are not fussy eaters and live quite happily on a good quality flake food but appreciate live and frozen foods as well. They have a small mouth so only small foods should be offered.

These fish will live happily with fish like Neon tetras, Platies, Guppies and other similarly sized community fish. They are good-natured, lively fish with no bad habits. ■

Breeding

Ideally you should use several females to one male. A male will set up a territory by a spawning mop or above some Java moss. The females tend to swim around in a group away from the mop. As the male displays, with full colour and splayed fins, in front of the females, he entices a female back to the spawning site along the lower regions of the tank until they rise upwards side by side from the bottom of the spawning medium. Near the top of the spawning medium they push together releasing an egg or two and some milt into it. The eggs are large but few in number and should be picked off the spawning medium and spread out in another aquarium. They take 14 days to hatch. Fry should be fed on newly hatched Brine shrimp and good commercial fry foods.

Other members of the Genus to look out for

P.connieae-
Truly beautiful at less than 2.5cm
P. gertrudae -
A stunner reaching only 1.5cm
P.signifer -
Extremely active larger one at 3.5cm

tropical | marine | coldwater & ponds | plants | regulars