

Today's Fishkeeper

APRIL 2002 £2.95

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feed your fish

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for your filter

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from scratch

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Welcome

WELCOME TO THE APRIL ISSUE OF TODAY'S FISHKEEPER. It is hard to believe it is 7 months since we changed the name from *Aquarist and Pondkeeper*. With careful schooling I have finally stopped saying "Aquar...Today's Fishkeeper" and now usually manage "Aq...Today's Fishkeeper". You have to remember it is hard for us "oldsters" in the hobby. I have grown up with the old title and it will take time to make the shift to its new name.

Obviously, with this being the April issue, readers will have to be on the lookout for the traditional April fool joke. Anyone who spots it should write in to Today's Fishkeeper "April Fool" at the usual address stating which feature it is in. Include your name and address, and a winner will be picked out of the hat. Have a good close look at the magazine and I am sure most readers will figure it out.

Yesterday, I attended the Catfish Convention and was really looking forward to sitting in the audience and enjoying the lectures. Oliver Lucanus had flown in specially from Canada for this convention. Knowing his reputation as an excellent speaker I was particularly looking forward to his presentations. Unbeknown to me, Pete Liptrout and Oliver cooked up an evil plot. Instead of Oliver giving 2 talks, the final talk was Oliver's slides and a panel of 4 poor devils dragged in from the audience - including me. Obscure catfish abounded and since many of them looked like dead twigs and lumps of bogwood (at least to me) I was well and truly stumped. Luckily, we had several people who really know these weird fish and could tell the audience all about them, so all was not lost. Of course it does mean I have to sit and think up some **REALLY** evil retribution for Pete and Oliver.

Until next month,
Happy fish keeping

Derek



PHOTO: OLIVER LUCANUS

In this month's magazine

As usual, we have a whole raft of fascinating articles for you this month, including a new name to Today's Fishkeeper. Mark Wessels introduces a beautiful Dwarf cichlid in his article called *African gems*. Mark is a longtime fishkeeper well known for his success at breeding Dwarf cichlids and Killifish. Mark was also partly responsible for Oliver Lucanus's article because he asked me if it would be possible to have some information on how fish are transported back from the wild. In *Peruvian Giants* Oliver gives away a few of his trade secrets and we see some of the real monsters of the Amazon.

On the marine front Alf's Column features the Sea pens, another group of very difficult but beautiful marine animals. Andrew Caine, however, has an easy fish and invertebrate for you to keep and some important news about captive breeding successes.

It's spring and the pond has finally started to wake up. In the second of Dave Bevan's new series, *Ponderings*, Dave keeps us all up to date with the jobs that we need to do. Bernice Brewster discusses the effect of Kol and Pond treatments on our environment after a recent visit to a local water treatment plant, and Ben Helm takes an in depth look at U.V. clarifiers.

Enjoy!

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KEY TO SYMBOLS:

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

	COMMUNITY		MID WATER
	NEW COMMUNITY		BOTTOM
	CARBONIDE		18°F
	AMPHIBI		TEMP
	AMPHIBI		2"
	AMPHIBI		SIZE
	AMPHIBI		NOT SUITABLE FOR KEEPING IN CAPTIVITY
	AMPHIBI		
	AMPHIBI		

Starting Point...

Just beginning in the hobby?

Pat Lambert writes especially for you...



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

DAVE SOUTHGATE WROTE ASKING IF WE could recommend a selection of fish for his first attempt at an aquarium which will be a freshwater, tropical, community aquarium. He has a 60cm tank with all the appropriate filters, and has had the water checked for ammonia & nitrite levels etc. I would refer him to Kathy Jinkings article in the February issue which discusses small communities. An important part of his letter, however, says how he would like to experiment with different species who feed and swim at the three different levels of the tank. This, strange as it may seem, posed a question that I was going to answer in this month's column.

If you look at the ten golden rules of fish keeping you will see, in bold capital letters, NEVER OVERSTOCK and I consider this one of the most important rules in fish keeping. Overstocking causes more problems than anything else. Unfortunately, it is the rule that is most frequently broken, particularly in the early stages when you are looking at all the beautiful fish you could possibly buy for your first community tank. Always look at your stocking levels before temptation gets the better of you.

Overcrowding, however, can occur when you buy too many fish that swim at the same level in the tank. Serious problems

Too many fish swimming at the same level leads to problems

may arise at feeding time in the rush for food when too many fish occupy the same level. Dave's proposed choice of species swimming at different levels is the one that

is recommended for a successful community of fishes.

Dave has the most commonly kept size of tank that most beginners start with. To help you out Dave, here is my recommended shopping list for your tank. All the species listed grow up to 5cm and you should not buy species larger than this for the size tank you have.

Aspidoras are close relatives of Corydoras and are ideal bottom dwellers for a small fish community.



Lampeyes make excellent top dwellers for a small fish community.

Shopping list

Top of the tank dwellers

Hatchet fish and Lampeyes. Guppies often like it there too.

Easy mid-tank dwellers

Small Danios, such as Zebras, Pearls and Leopards, are very lively and always on the move. Platies and Guppies, small active fish which give birth to living young are also good choices. Small Tetras, like Neons and Cardinals, always look good, as do Penguin fish and Silver tips. Avoid Serpae tetras at this stage as they can be nippy. Small peaceful Rasboras such as Harlequins and Red-tails are also good additions.

Easy Bottom Dwellers

Corydoras species such as *C. paleatus*, *C. caeruleus* and *C. bilineatus* are funny little characters and bottom feeders. Other possibilities are Aspidoras and Otocinclus which are good at keeping down algae too.

Avoid top-dwelling Helpeaks at this stage, they are not a beginner's fish and need special care.



PHOTO: JAMES GILMAN

Here's a honey of a fish for you

Many Gouramis are not suitable for a small community tank, but the Honey Gourami is a cracking little fish. They are gentle, peaceful, shy and males are not too tough on the females during courtship. I have kept a pair in a well planted community tank where they have lived happily and even gone through the spawning ritual in a corner of the tank, with the male constructing his bubble nest. Often, in the shops, the male does not show his breeding colours and looks a rather dull coloured individual, but when he is happy and ready to spawn his colours are incredible. He really does light up the tank as he shows off to a prospective mate. Don't pass them over as dull and uninteresting for they certainly aren't that.



Male Honey Gourami in breeding colour.

PHOTO: MARK FREDERICK

Keep a tight lid on this one

Some beginners like to keep a pet fish of a somewhat larger size in a specimen tank on their own. For the smaller tank there are some suitable species but, if you like snake like fish, why not try one of the small(er) Snakeheads. These are interesting fish and make unusual pets. I had an Asian snakehead (*Channa asiatica*) soon after becoming a fishkeeper. This is a fish that just lives to jump out of a tank and unless you keep a tight fitting lid, preferably with Encyclopaedia Britannica on top, you could frequently be picking it up from the floor. They do have an accessory breathing organ which enables them to

breathe air but this doesn't really mean that frequent land excursions will do them any good (they can wriggle across land in drought conditions in their natural habitat). There are some very large Snakeheads around but at 30cm max. *Channa asiatica* is one of the smaller ones. Silvery, shiny pearly spots and black zig zag lines adorn the body with the spots also found on the dorsal and anal fins. There is a large black pearl encircled spot at the caudal peduncle. This fish gets to know its owner and becomes quite excited at feeding time, particularly if you are carrying a large juicy earthworm.



Identification is very important when purchasing a Snakehead. This is a Red snakehead which grows to 1m in length and loses all its lovely red colour as an adult.

An easy plant for you

Ludwigia is an easy plant to grow, it must be because it was one of the plants I found grew well in my early fish keeping days. The contrast between the green upper surface of the small broad leaves and the deep red underneath of some forms of *Ludwigia repens* adds interest to the planting scheme. The plant looks like a small shrub as it produces side shoots. Trim the top shoots and it becomes more bushy. Lighting is not critical, moderate lighting is tolerated as is a wide temperature range.

There are many different forms of Ludwigia but this is the most commonly seen green form.

Starting out with fishkeeping

Naturally... AQUARIAN

LIGHT UP YOUR TANK

It's often quite difficult to get the lighting just right in a planted aquarium. Many factors affect the amount of light needed. How much natural daylight hits the tank? What is the size and depth of the tank? Does the tank have a dark substrate which does not reflect the light so well?

With strong lighting, plants take in carbon dioxide which is broken down into sugar for food. If there is not enough light plants starve, turn brown and die. If there is too much light algae grows all over surfaces in the aquarium. Hairy threads may form on the leaves of plants. In extreme cases a dark green, veiling on black skin forms which can be peeled off. In this situation you need to cut down the strength or amount of light reaching the aquarium (12 hours a day is the norm) or increase the number of plants so that there is no surplus food to feed the algae. A good retailer will recommend the most suitable lighting for your aquarium.

Full, wide or broad spectrum fluorescent lighting simulates sunlight for planted tanks.

Pat's tip

Fluorescent lighting dims as tubes age, so tubes should be replaced every year or at least half-way through their advertised life.

Lost for Words

Activated Carbon This is used in filters to remove by adsorption (bonding onto the surface) dissolved materials from the water. It loses its adsorptive properties after a while and needs to be replaced.

Aerobic environment

This environment has oxygen present as opposed to an anaerobic environment where oxygen is absent.

Cover glass This is a panel of glass or plastic beneath the hood which protects electrical equipment from splashed water and is an added precaution against fish leaping out.

Dorsal fin Most species have one of these which is located on the top surface of the fish. Some species such as the Rainbowfishes have two dorsals. The size of the dorsal has little to do with the size of the fish. Discus with their large, disc shaped bodies have very small dorsals. In fish such as eels the dorsal runs into the tail fin.

Fin rays These are rod like bony supports for the skin fold forming the skin membrane. To the scientist, counting the number of fin rays a fish has is an important element in the identification of a species.

Pharyngeal teeth These teeth are found in the throat of many fish.

Tubercles These are small white bumps on the gill covers or the first ray of the pectoral fins of male goldfish and can be seen when they are in spawning condition. These spots are frequently mistaken for white spot by beginners, but the tubercles are only found on the gill covers or pectorals. On other parts of the body or fins it could be white spot.



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.

- Manufacturers often provide free booklets about fish care.
- Inexpensive books provide information on setting up.
- 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, pH 7 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 70-80°F
Marines 75-78°F
Coldwater 55-70°F
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 12" of surface area per 1" of fish.
Marines 1" of fish for 6 gallons of water is safe for reef tanks.
Fish only systems can house more fish but safe stocking level depends on the filtration system.

For your free beginners guide please call: 0845 677 6770 or visit our website: www.aquarian.com

AQUARIAN

Stock to a maximum of 100" of fish per 1000 gallons. Measurements should be based on the optimum adult size of the species not the size at the time of purchase. **NEVER OVERSTOCK**

- Knowledge:** Find out as much as you can about any fish you hope to buy before purchase.
- 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.
- Quarantine:** All new purchases should be quarantined for established tanks for at least two weeks.

THE ROUTINES

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

Neon Tetra

Paracheirodon innesi

A profile of one of the most popular aquarium fish in the world



A TANK-FULL OF NEON TETRAS SWIMMING above black gravel in a well-planted tank are a common enough sight to see in display tanks. These fish are widely recognised, for this is one of the most well known of all aquarium fishes. Introduced into the hobby in the 1930s it was named after William T. Innes, author and well known publisher of many aquarium books.

This species was brought into France by A. Rabaut, a butterfly collector, who was shown this fish by the fishermen in Peru. First exported from Germany to America on the Hindenberg.

Its natural habitat is the Rio Putomayo, Peru, where it lives in the Amazonian jungle in dark brown water under the tree canopy of the forest where the lighting is subdued.

A neon blue/green stripe runs along the lateral line from above the eye to the base of the adipose fin. Below this line, the front part of the lower body is silver and the back

half is a deep red. Mature females are deeper bodied and very slightly larger than the males.

Despite its small size (maximum 4cm), this is a bold little species which is happiest in a small shoal of at least six. The Neon tetra is an excellent species for a community tank of small fishes. They are not fussy eaters enjoying flake foods and live foods.

A very adaptable species tolerating a wide temperature range 20-26°C and pH 7 but a lower pH and subdued lighting will be needed for breeding. Spawning may occur but the eggs are sensitive to bright light and will only hatch in soft water. In hard water the egg shells become too hard for the baby to break out of. If you provide the right conditions in a tank specially set up for breeding them, up to 150 eggs are laid into fine leaved plants which take about one day to hatch and the fry start feeding on the

fourth day. Parents should be moved after spawning otherwise the spawn will be eaten.

The colours of Neon tetras are brightest and the fish happiest in softer water but this is a tough little fish and has been known to live over ten years in suitable conditions. ■

PROFILE

Name	Neon tetra
Scientific name	<i>Paracheirodon innesi</i>
Aquarium type	60 x 30 x 30cm
Distribution	Peru
Diet	Flake food, brine shrimp and other small live foods.
Temperature	20-26°C

tropical marine coldwater & ponds plants regulars

Fishkeeping Answers: Tropical

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Star
Letter

What can I store water in?

Q Can you tell me if it would be safe to use a 113 litre domestic type water tank, such as is used for header tanks in the roof, to prepare water for regular water changes. At the moment I use 2 x 45 litre plastic buckets but I feel it would be easier if I could use just the one container. My tank is a 337.5 litre, 120cm x 60cm x 45cm Malawi tank so I have to do a lot of water changes.

Terry Lewis via e-mail

A The black header tanks are suitable for storing water. They are the same as those used in box-biofilters for garden ponds, and if you're using it to store alkaline water (suitable for Malawis), if leaching were an issue, any rates would be negligible. The same, however, cannot be said if you used it to store acidic water.

Ben Helm

Can I keep Firemouth cichlids in my community?

Q I've got a long established 120cm x 45cm x 45cm tank. At the local fish shop, asking about more fish, we were pointed towards three Firemouth cichlids. We looked them up in our fish book at home which did not mention that they were shoaling, but that they needed caves to sit in. I'd dearly love one, but can I keep just one? I'm rather heavy on bottom, living-in-caves type fish and find it difficult to clean under the caves. I'd manage for one of these beautiful fish, but couldn't cope with three. Will one be happy by itself? Other fish in the tank are a Pleco, Clown loaches, Sucking loaches, Angels, Rosy barbs and Rainbowfish.

Susan Dyer via e-mail.

A I would not keep only one Firemouth cichlid (*Thorichthys meeki*). The tank is big enough, so I would buy several small ones (at least those three they had) and let them grow up together. When the time comes they will form pairs and then you can keep one pair, and give the odd fish away. As your book tells you, they like to have some caves as shelter to hide if they get scared. One fish will only give you problems, because he might turn out to be a bully. Your Angelfish will be chased, and they still might be, with three Firemouths, because Angelfish are Cichlids too. I don't think one Firemouth alone will be happy.

Alf Stalsberg



Adult Firemouths are best kept as a pair

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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.

Cloudy water

Q I wonder if you can give me some advice regarding the maintenance of water clarity in my 120cm x 30cm x 45cm Malawi tank. Last weekend while visiting a local dealer and looking at his Malawi show tank which had gin clear water, I realised I had a problem. If I look closely at the water in my tank I can see very small particles in suspension. I do a 30% water change every two weeks. I feed foods which claim not to cloud water. I have two Eheim filters, a 2228 filled with 1 litre of ceramic rings plus coarse and fine filter pads, and a 2224 filled with nitrate resin, Rowaphos, occasional carbon plus coarse and fine filter pads. I do not have any live plants. I use sand as a substrate and I use lava rock and 3 large plastic plants for decoration. I also have trouble keeping the surface of the water clear. I have an Eheim surface skimmer on the smaller filter which clears the surface very quickly in about 30 mins after which I switch it off as it's a bit noisy (the filter of course stays on). However, next day the surface has what appears to be a layer of dust back on it. I have tried water clarifiers but have not noticed any improvement. I would welcome any suggestions.

Terry Lewis via e-mail

A I will start with the last part of your question. I guess you do not have any cover on the tank because it sounds like there is ordinary dust which is laying on the surface. This is only normal if you don't have any cover on the tank, add a glass cover and you will probably get rid of the problem. Back to your first question. You do not say how many fish you are keeping? I wonder if your tank could be overstocked? To me it sounds as if you have a good filter capacity, but I think I would change more water, maybe 30% every week. Could it be that there is calcium in your water, that you see as small particles? Or do you use something to make the water harder for your Malawi's.

It could be several things, but try to change more water, more often, add a cover glass and maybe reduce the number of fish.

Alf Stalsberg

DO PLANTS DIE BACK IN A NEW SET-UP?

Q I have recently installed a new fish tank. The dimensions are 90cm x 45cm x 30cm and I have followed all the general rules on setting up. Running the tank without fish for a week, keeping the lights on to stimulate plant growth. I then added six Black widow tetras the second week and ran the tank a further week before adding ten Cardinal tetras.

The tank has now been running for four weeks and I did a water change yesterday, as my Fluval 3 filter indicated that it needed to be done. Although I have not lost any fish and the pH and nitrite / nitrate levels are all OK, I am a bit concerned over my plants, they do not seem to be doing very well. Their leaves are turning yellow. My local pet shop suggests that this would happen as the plants would initially have no "food" to depend on and would die back before coming on. I have since started using a Flora boost to hopefully help them thrive.

Can you please advise if I'm doing anything wrong, and is it OK for the plants to initially die back, particularly in a new tank set-up.

Duncan McLarty via e-mail

A Depending upon the species, many plants will die back when introduced to a new set-up, although there could be a number of other reasons why your plants are not growing. The usual one is that the plants purchased have been grown out of water. Most Cryptocoryns and Amazon swords are grown this way. When replanted in deep water the old leaves die off and fresh young shoots come through. Young Vallis leaves are yellowish and turn darker as they mature, so are many Anubias. Lighting is also very important. Make sure at least one of your tubes has a spectrum designed for growing plants. Many of the most popular complete set-ups come with ordinary tubes as standard. Switching one of these for a plant growing tube will make all the difference. Be very careful not to overdose with any plant foods as this can lead to an explosion of algae growth rather than the boost the plants you want to grow.

Derek Lambert



Fishkeeping Answers Expert Panel

Alf Stalsberg - Cichlids.
Pete Lipinet - 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 Saul - 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 let you when this happens) but otherwise you should receive a reply to your questions in a few days rather than weeks. Send your e-mails to: askap@btinternet.com

Fishkeeping Answers: Tropical



Botias would be a good choice for Neil's aquarium. This is *Dofis striata*.

How do I change my Goldfish tank over to a tropical one?



I noticed in the February issue of Today's Fishkeeper your answer about goldfish being able to be mixed with tropicals and was quite intrigued. I have a 60cm x 38cm x 30cm tank with a Goldfish, Black moor,

Shubunkin and two Grandas (blue / white). I appreciate that there probably isn't much room for many more fish, but wondered how you would go about changing the environment to a more tropical one - as I think it would be good to have one or two small Catfish, and to be able to grow tropical plants in the tank.

Would all the above-mentioned fish be able to cope with warmer temperatures? Would it simply be a case of installing a heater and increasing the temperature by a degree or two every few days?

Neil Green via e-mail



We can often overlook goldfish as warm water fish. I think we regard them as coldwater as they will live in temperate waters. However, ask a Carp farmer (especially one who grows them intensively) and they will advocate 27°C as the optimal temperature for growth.

I have known people keep a mixed coldwater and tropical aquarium (one in particular who didn't heat their tank but had it over the boiler cupboard! - it seemed to work well).

Once you have added a heater and raised the temperature gradually to 25°C, you can then add tropical plants and beneficial scavengers. Bear in mind that aeration will have to be increased and that your fish's appetites will also improve, meaning you will need better filtration. If you don't feel you're already overstocked (depending on the size of your fish) then try a few hardy bottom feeders first and see how the transition goes.

Ben Helm

Which filter should I buy?



I would like to ask your advice about purchasing an external filter? I have a 152cm x 60cm x 45cm, community set-up. Looking around I would like to purchase a Eheim Thermo as the heater would act as a back up. My main question is which one to buy? Either the Professional 11 2128 or a wet & dry 2329? Could you please tell me the advantages/disadvantages of each or which one you would recommend or do you know if Eheim is to bring out a Pro 11 wet & dry?

Nigel Dyer via e-mail



The key differences between the 2128 and the 2329 are that the 2128 is a wet filter, incorporating a range of mechanical and biological media, whereas the 2329 is a wet/dry filter that performs a far more effective biological action than traditional wet or 'closed' filter systems. The fact that the bacteria in the 2329 are periodically treated to the benefits of atmospheric oxygen means that the breakdown of ammonia and nitrite is 73% and 67% more effective than a comparable wet filter. Both filters that you are considering are rated as suitable for 590 litre aquaria, each with an integral 210W heater.

The ingenious wet/dry system of the 2329 means that it must be situated at least 1m below the surface of the water (for the toilet-cistern-like siphon to work, thereby giving it the wet/dry action) so this may be a worthwhile consideration if planning to purchase this unit. The Professional II external filters benefit from a self-priming pump which does take the chore out of probably an external filter's main weakness, (priming the filter) and because the wet/dry configuration in the 2329 requires 3 pipes (the usual inlet and outlet with an additional breather pipe for the dry system) a self-priming version is unworkable as the unit is not a fully closed or airtight system and so will never be released. If you have the opportunity to watch a 2329 in action, you will be intrigued by the ingenious design that enables an intermittent dry action to be created in a filter that is positioned below an aquarium. The 2329 comes with 6 litres of sintered glass substrate for biological action and it is recommended that the intake is screened inside the aquarium while it is run-in to prevent the sintered glass from blocking in the early weeks. For more information, visit www.johnallinaquariums.com.

Ben Helm

Star Letter Prize from Hagen



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TODAY'S FISHKEEPER

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BLUE EMPEROR TETRA

Inpaichthys keri

FISH 16

FISH 17



Fishkeeping Answers: Marine



A beautiful reef tank like this can be achieved by anyone who does their research and buys the right equipment.

Freshwater to marine reef tank



I keep tropical fish at the moment and I would like to try keeping marine fish. I have a 60cm tank I want to use as a quarantine tank and a 120cm x 30cm x 45cm aquarium that would be my main tank. Could you tell me if these tanks are big enough and how to set them up from start to finish as I really want to get it right. I want to know what water to get, what filter system to use etc. I want to start with fish that are a bit stronger and work my way on when I know more. I also want to keep a reef tank eventually so I want the system to be able to do that from the beginning.

Zara via e-mail



Your tank is too narrow so it will be hard to create a natural aquascape with just 30cm width. Personally the thinnest aquarium I would be happy with is 37.5cm. The equipment you need is two external filters, one large biological packed with good media, one small chemical filter with phosphate remover in. A good hang on protein skimmer, three tube lighting system, one actinic and two whites, all on timers, but not used during the maturation period to escape a maturation algal bloom.

Two powerheads pointing at the middle of the front glass to cause turbulence and twin heaters.

Aquascape with live rock if you can. If you can't afford it to start with, think about adding it as you go on. The live rock should go directly on the bottom glass with just a thin layer of coral sand in front. Use a good salt mix and spend some cash on a high accuracy hydrometer, so many things happen with poor hydrometers. Buy the following test kits: Ammonia, Nitrite, Nitrate, pH, Phosphate, Calcium and Iodine, you will need the lot.

Water should be obtained from a local marine stockist, or invest in a good purifier system of your own - this is a must. Why spend lots of cash on a system, only to stress it with toxins introduced with semi-purified water or, worse still, tap water.

The most important thing to buy will cost you under £10. (yes a cheap marine item) get a diary and record absolutely everything, you will need that information. Research your fish well before buying them, make your own mind up what you want, your aquarium is your personal taste.

Andrew Caine

Tony has always wanted a Yellow tang.



Following your advice in January I have purchased a Jewel flo 240 and use my Fluval 303 external filter in combination with the internal they supply to filter the tank. All nitrite and ammonia are zero and nitrate around 20ppm. All is working very well, although the algal bloom on gravel and glass is a bit unsightly. The green algae is not so bad but the mix of that and the brown algae make it look worse. I appreciate that I have to clean the glass but is there any sort of cleaning crew I can get to help with the gravel? My collection consists of three Damselfish and a magnificent Yellow Tang (always wanted one!)

Tony Mendoza, via e-mail



Try to keep your nitrates down by regular water changes or, even better, invest in a small nitrate reducer. Aqua-Medic produce a small unit. Your algal bloom is a nice maturation bloom, good to see as this indicates your tank is going through the initial stages. However, we want to reduce its intensity. Check for phosphates and if you need to utilise a phosphate remover such as Rowaphos in your canister filter, not the internal one. As you have no corals reduce your lighting period, algae do not like this. Good animals for clearing sand are any sand sifting gobies and how about a sand sifting starfish, but be sure to bury a little food every week.

Andrew Caine

Why hasn't my tank cycled correctly?



I am quite worried about the lack of activity in my new marine tank. All the books say to expect a high ammonia reading, and as that falls off to expect a high nitrite reading, followed by a high nitrate reading, all falling to zero, ready for stocking. I have had only small readings for all three with zero for two weeks now. Has my tank matured correctly or am I in trouble? I spent a lot of money on a water purifier and have added biological cultures every week to make sure everything would go smoothly.

John Bates, Worthing.



Don't worry all is fine. Yes the books say expect high readings, however the books did not use purified water to set up the aquarium as you did. This has reduced the toxin peaks and you have been adding biological cultures every week, so your filter is now mature enough to cope with your first fish.



CLEAN UP CREW



What does adding a "clean up crew" mean to my stocking levels? Will I have to reduce how many fish I have in my tank and how many cleaners do I need?

Peter Smith, Dorchester



In a fish only tank your stocking levels can remain the same. However, if you have a lot of inverts, such as in a reef tank, your fish stock would have to be reduced. Stocking levels for the clean up crew should be about 1

Brittle star per 45 litres, 1 Turbo snail per 9 litres and a couple of shrimps in a 1m long tank.

Which book?



I am writing to ask some advice. I made lots of mistakes when I first started keeping freshwater fish, so this time I want to find out everything I can before I start keeping marines. At the moment I know nothing. I would be grateful if you could recommend a book I could buy that will tell me everything I need to know to set things up properly for a reef tank.

Joanne via e-mail



A great set of books are "The Modern Coral Reef Aquarium" in three volumes costing around £60 each, don't flinch, get them before you start to set-up your new tank as they could save you £600! Good luck, and most of all remember it is fun to read about your hobby.



Regular Today's columnist Alf Nilson, together with Steve A Foster, have written one of the world's most authoritative series of books on the modern coral reef aquarium.

Fishkeeping Answers: Coldwater

Can I keep Chub and Trout



I have seen some native British fish called Chub and Golden trout for sale at my local aquatic store. Can I keep them in a 60cm aquarium or should I put them in my pond instead? Could you also tell me what conditions they require?

Craig Mason, Via e-mail



Chub are a native cold water riverine cyprinid (member of the carp family). They are carnivorous and will eat large insects and insect larvae, fry and other small fish. They grow to reach several pounds in weight and prefer moving water. I have grown Chub fry on in an aquarium environment, where it can be difficult to offer them sufficient appetising food, preferring to take fresh and moist food over dry and prepared diets. It was also difficult to keep them sufficiently cool because they prefer a temperature in the mid-teen °C. They would fair better in a pond situation, but will be tempted to eat small pond fish and fry in your pond. If you are fortunate enough to get Chub to eat a dry pellet, they may do well, however, I feel the best place for chub is in a native river, rather than a garden pond.

Golden trout, being a Trout variety, requires cold water conditions of the highest quality. Originating from fast flowing crystal clear highland waters, it would be difficult (if not impossible) to recreate the necessary habitat for them in a garden pond. They are most comfortable at temperatures below 15 °C and will start to stress at higher temperatures.

Ben Helm



A Brown trout where it is supposed to be - swimming in a fast flowing river.

Can I use coldwater Plecs to control blanket weed?



I would like to know how I can control the algae that is growing on the sides of my pool. Could I introduce some coldwater Plecs to my pool to control this problem. I have tried to add snails but they were all eaten by my leech.

Sabrina Bright, Wurzling.



There are numerous ways of controlling blanketweed growth with each method being more appropriate in certain pond situations. Coldwater Plecs would not over winter well in a pond and would not keep on top of filamentous algae, but they'll graze on the pond surfaces. I fear that if you were to put some in your pond, that would be the last time you would see them.

Other methods include:

1 Using an algicide to kill the blanketweed

This is ideal in an unplanted pond as algicides can retard other plant growth. This is the only way of killing (rather than controlling) blanketweed in a pond.

2 Shading

Blanketweed requires light to grow. Success can be achieved by erecting a pergola with shading over the pond, or by adding coloured vegetable dyes that reduce the amount of sunlight that penetrates the water.

3 Blanketweed also requires nutrients (particularly nitrates and phosphates) to grow. There are a number of nutrient removing products that bind up these nutrients, making them inaccessible to the algae.

4 A new method of algae control uses beneficial bacteria that digest and reduce the nutrients (as above), reducing the potential for algae growth.

Ben Helm

Coldwater Plecs (*Pseudogostomys* sp.) are not suitable for an outdoor pond.



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Food! glorious food!

Linda Lewis serves up a
treat of information

PHOTOS: MAX GIBBS

IN CAPTIVITY, FISH ALWAYS SEEM TO BE hungry. They will bunch together against the front glass, as if desperate for food. Give in to their pleadings and it is very likely that uneaten food will quickly begin to pollute the water, weakening, and possibly even killing

The effect of temperature

Water temperature affects how much tropical fish need to eat. At normal temperatures of between 24 - 26°C, fish eat, and need more food than when the temperature increases to 28°C or more. This is because the warmer the water is, the less oxygen it can hold, and at lower oxygen levels, a fish's appetite is dampened. Take a look next time we have another heatwave. You should notice that most tropical fish become less active.

the fish; an example of death by kindness. So why do fish always behave as though they are half starved, when they are not?

To answer this question it is necessary to look at conditions outside of captivity. There, fish are on a constant quest for food. It is not readily available as it is in an aquarium. Whenever an opportunity to feed presents itself, it is in the fish's best interests to take it, for it has no idea when its next meal will be. A fish may even eat when it is full. Then the food will simply pass straight through and out the other end, without being digested properly or even at all. In a river, the vast volume of water copes with this small source

of pollution, but in a tank, the situation can quickly become critical. Fortunately it is an easy problem to solve. Although most fish will take food even when they are not hungry, their enthusiasm for feeding will diminish. If a fish snaps up food eagerly, then it is probably safe to say that it is hungry. Watch your fish and you will soon get to notice the difference.

What is the right diet?

There are many thousands of species of fish and between them they manage to eat just about everything edible found in water, plus some things that seem inedible, at least to us.

Butterflyfish feed exclusively at the surface.



UNDERSTANDING FISH

The Longnose butterflyfish uses its long pointed mouth to feed on tiny organisms that live in amongst the crevices of the coral.

To ensure that you are feeding the right diet it is important to find out what your fish's requirements are as some need particular food stuffs, without which they will not thrive. Take for example herbivorous fish, like Tangs, which need plant material in their diet, and compare them to the Indian glassfish (*Chanda ranga*) that only thrives when given plenty of live food.

Some fish only feed at certain levels in the water. For example, the freshwater Butterflyfish (*Pantodon buchholzii*) waits motionless at the surface, ready to take any insect that lands there. Feeding these with sinking pellet food would not be successful. Often, it is possible to tell at which level a fish prefers to feed simply by noting the position of the mouth. In many surface feeders, such as Zebra danios and Hatchetfish you will find an upward pointing mouth, located at the top of the snout. If the mouth is more central, this indicates a fish able to feed at all levels (Tetras for example). Finally, a downward pointing under slung mouth indicates that its owner will take much of its food from the bottom, as in Catfish and Loaches.

The design of the mouth itself, and teeth if present, also affects the kind of food a fish can take. These variations are particularly apparent in marine fish. On a coral reef, many different species of fish live in close proximity to each other, and in comparative peace. Most fights occur between members of the same species. This harmony is possible because so many of the fish have subtly different diets and are not in direct competition for food.

To cope with the variety of foods available, there are many mouth designs, just think of the Long-nosed butterflyfish with its apt scientific name of *Forcipiger longirostris*, and compare that slim, delicate mouth with the beak like equipment belonging to Parrotfish. The Butterflyfish uses its long pointed mouth to eke out tiny organisms that live in amongst the crevices of the coral; by contrast, the Parrotfish bites off whole pieces of coral. A similar beak-like mouth belongs to Pufferfish where the teeth have fused together giving just two, or four large teeth which can even make short work of Crabs.

Different kinds of teeth

Teeth also come in different designs to deal with particular foods. Most Sharks have rows of sharp teeth which, as they wear down, are replaced by other rows behind. Not all Sharks have such impressive teeth though, and the biggest species does without teeth entirely. The Whale shark, of which the largest recorded specimen was 12.65m in length, feeds by swimming, mouth open, amongst the plankton. Water, with its load of plankton passes over the Shark's gills where special rakers trap the food and direct it back into the mouth. A similar method of sifting food can sometimes be seen in *Corydoras* catfish if they are kept in a tank with a sandy

UNDERSTANDING FISH

Sand tiger sharks have rows of sharp teeth which, as they wear down, are replaced by other rows behind.



substrate. Watch carefully and you may see jets of sand being ejected from the gill covers after any edible material has been filtered out. Gobies also do this as well.

Many fish are predators of other fish and have to catch their next meal. This can be done by simply chasing the prey, but there are also rather more cunning methods of achieving the same end. One is to just keep still and wait for your next meal to come to you. For this technique to succeed, it is necessary for the predator to be well hidden, so good camouflage is essential. One of the best belongs to the Anglerfish (*Lophius piscatorius*). It looks exactly like a large (up to 2 metres long) battered, algae covered rock. For bait, it has a specially adapted dorsal fin. The first ray of the fin is separate from the rest and resembles a stalk with a grub on the end. Without moving another muscle, the Anglerfish can wave its rod and line so that the 'grub' wriggles. Eventually, an unsuspecting fish will move in to investigate this tempting morsel. Then, and only then, does the Angler come to life and swallows down its prey in one surprisingly fast movement.

There are other kinds of Anglerfish in the ocean depths. As well as wriggling bait, some of these also use lights to entice their

Feeding your fish

When you keep fish in a tank it is important to bear in mind their various feeding habits. Some species eat faster than others (Tinfoil barb and Danios for example) and if kept with more sedate eaters like Tetras, can hog an unfair proportion of the food. When feeding fish, take a good look and make sure that each one is getting a share. If not, there are some simple tactics you can use to

restore the balance. You can feed a pellet or two at the same time as flake for even the fastest fish cannot be in two places at once. Or, instead of adding one large pinch of flake, feed the same amount of food in two portions, one at each end of the tank! Other possibilities include adding a small portion of live food at the same time as prepared food. I'm sure you get the idea.



Giant danios eat faster than many other fish and will hog all the food if they get a chance.

prey into range. In the deepest oceans, a meal may not come along very often so a predator has to be able to make the most of

any opportunity. Some can actually swallow fish much larger than they are by means of extensible jaws, and stomachs that can stretch, and stretch, a feat on a par with a human eating a whole cow at one sitting! Such a huge meal will keep the predator going for months. The ability to protrude the jaw so that large food can be taken is not confined to deep sea fish; even the John Dory and the humble Cod can do it! ■




This Anglerfish looks exactly like a battered, algae covered rock.

Linda's holiday tip



How about feeding when you go away for a few days? Is it best to get someone else to feed your fish? Unless the person is an experienced fishkeeper, then the answer is probably no. They are likely to be fooled by the begging and may give too much food. As long as the tank has been set up for some time, you are quite safe to leave the fish without food for several days with no ill effects. There are also holiday food blocks available which release food slowly over a period of days. The fish may be a little hungry when you get back home, but at least they won't have suffered death by kindness.



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Tinfoil barb

Richard Friend profiles a loveable giant of the fish world



Tinfoil barbs are striking fish but need space to grow.

COMMONLY AVAILABLE IN THE TRADE, THE Tinfoil barb should have a "Wide load" sign on the shop tank. This is because this pretty little silver gem that you proudly carry home from the aquatic shop, flitting about in its plastic bag, will give you lots of pleasure as you watch it grow, and grow, and grow. They can reach a staggering 45cm, in the wild, (the Koi carp of the aquarium world), and like all Barbs they do prefer to live in a shoal.

Quickly you will come to realise that a big tank is a first requisite, 120cm minimum with 180cm being better. Although this could be a community tank, the other occupants should also be large, or your Tinfoil barb will just assume that it is dinner that is swimming around, rather than its neighbours. Apart from ensuring that the other tank inhabitants are big enough to survive the Tinfoil's appetite, a good and steady diet should be provided. This should include flake, pellets, and chopped earthworms, and to prevent the disappearance of the tank plant life, blanched lettuce, cucumber, and peas are a welcome addition.

A shoal of Tinfoil barbs prefer well filtered flowing water rich in oxygen, this is just what they would be used to in their native fast flowing rivers of Thailand, Indonesia and Malaysia.

What do they look like?

The Tinfoil Barb bears a striking resemblance to the Roach - the favourite of anglers in Britain. The flat deep body is iridescent silver with striking red fins, the dorsal has black tips. The large forked tail will have served it well in its natural habitat of fast flowing rivers where it would give the Tinfoil a good turn of speed. Should yours decide to exert this skill in your tank he might not stop at the water surface. A good cover should be employed if you do not want to arrive to find the fish flipping around the lounge carpet.

The large tank should be kept at a temperature of 20-25°C with a pH of 6.6-7.5. The decor of bog wood and smooth rocks could include plants but, as stated, the Tinfoil barb sees these as an addition to their diet, so plastic would be better. These should be well fixed as the fish will otherwise drag them around the tank, perhaps in frustration at not being able to eat them. The Tinfoil barb will occupy the mid-water and bottom of the tank. Try to provide plenty of water movement and very regular water changes will benefit the fish.

Trying to tell the difference between the male and female fish is near impossible, a problem that must beset the Tinfoil barbs themselves, as to date there has yet to be a record of captive breeding. Thus all the fish in the trade have been wild caught and their import has been banned in Australia. ■

PROFILE

Name	Tinfoil barb
Scientific name	<i>Barbus schwanenfeldii</i>
Aquarium type	Large community, providing the other inhabitants are also large
Distribution	The fast sections of the large rivers of Thailand, Malaysia and Indonesia
Diet	Flake, pellets, blanched lettuce, peas
Temperature	20-25°C

top tips

Sub-gravel filters need regular maintenance if they are to work well. Here we show you what you need to do every week to keep yours in tip-top condition

SUB-GRAVEL FILTERS WORK BECAUSE bacteria coating the surface of each grain of gravel turn ammonia into nitrite, and then other bacteria also living on the gravel turn nitrite into nitrate. This only works when plenty of oxygenated water is flowing around the grains of gravel and that cannot happen if solid fish waste is clogging up the filter bed.

Keep the water flowing

To prevent this happening you need to clean your filter bed on a regular basis. This is best done once a week when you are doing your water change. Instead of just removing some water and replacing it with fresh water, of the correct temperature, which has been treated with a water conditioner, you

can carefully siphon out the muck which has been building up in your filter bed. By the time you have gone over the whole filter bed, you should have removed about 20% (1/5th) of the water. Just about the right amount needed each week to keep your tank in tip-top shape.

Siphoning - how do you do it?



Plunge the siphon tube deep into the gravel bed and suck up any solid waste. The flow can be controlled using your finger over the open end. If the water flows too fast you will siphon out all your gravel.



Plunging the tube into your gravel in different places you will remove much of the dirt in your filter bed.



It is really surprising how much dirt can be removed this way!

Siphoning - what do you need?

Most fishkeepers use a piece of hose as a siphon tube. This should be long enough to reach from the bottom of your tank, over the rim and right down into the bucket. If it is too short the end will flap all over the place and spill water on your floor. If it is too long it will hang over the bucket's side and may slip out altogether. So measure carefully before you cut the tube down to size.

The choice of bucket is also important. Too small and it will fill rapidly and need emptying very often. Too large and you won't be able to carry it comfortably. Never underestimate how heavy water is. Lifting a full bucket badly may cause you serious harm. Many aquarists, particularly those with more than one aquarium, don't lift buckets around unless they can help it. A powerhead, such as Maxijet, can be attached to a garden hose and the water pumped out of your bucket and straight down the drain. No mess and definitely no heavy lifting.

Using a powerhead such as the Maxijet to pump water out of your bucket or tank saves you having to lift heavy buckets of water around.



How to start a siphon

When starting the siphon don't plunge your tube into the gravel. Keep one end in open water and suck on the other end until water has been pulled through the tube and nears the sucking end. Making sure the submerged end is below the water's surface before removing your mouth and allowing the siphon to start. Sounds easy? It is when you get the hang of it, but to start with you will end up with the odd mouthful of water and puddle on the floor!

The easier and the healthier way

Buy a commercial siphon set. There are many on the market and most have a pump system to help start the flow.

Sea view

Andrew Caine spotlights the important issue of captive breeding for the marine hobby and has another fish and invertebrate for you



GOOD EVENING LADIES AND GENTLEMEN, it's a special time for your local current affairs programme, and in today's episode we won't be boring you with the usual rubbish about rail disputes or if your shares fell, but something a little more interesting. More and more marine species are now being bred in captivity, more and more corals are being cultivated, so tonight we will be looking at the latest breakthroughs, a new organisation for cultured corals, and culturing at the main extraction sites around the tropics, and why it is not expanding as fast as it could be.

Three new species to add to the list

OK, the latest news in breeding programmes comes from Hawaii where not one but three species of Angelfish have been bred and, most importantly, reared for the first time. The Masked angel, (*Genicanthus personatus*), Flame angel (*Centropyge logicus*) and Fisher's angel (*C. fisheri*) now join the list of captive bred fish. Exciting news indeed, but don't expect to see farmed Angels in the UK for many years. The truth about the whole matter is, at the moment, companies do not have the expertise to raise brood after brood of many marine fish.

Isolated spawnings and rearing of individuals do not make for a successful business. Believe you me it is not through any lack of trying. If these fish could be farmed they would be.

Flame angels are beautiful but don't expect their price to come down just yet.

Let's look at some fish prices. A Salmon farmer can expect to rear Salmon year after year at high density stocking and fetch around £3.50 per 0.45kg. If we say the average Flame angel weighs 32g, that's 14 adults to 0.45kg and this retails at £950.00/0.45kg. If you were a Salmon farmer, wouldn't you switch to farming Angels? However, at the moment captive breeding for most fish cannot be achieved commercially but I did say 'at the moment'.

Cultured corals

Now over to the plants of the sea, OK so corals are indeed animals, but we do cultivate them like plants, taking cuttings, grafting and using other methods. Now this is still not as prolific as it could be, however, great strides are being taken. Cultured corals are coming from two sources, the hobbyist and commercial culturing in the tropics. Those from the tropics are now becoming more and more common in the trade, and it is

good to see a wide variety of corals not just *Acropora* sp. It is now common for the more exotic Mushroom *Discosoma* sp, Pumping pulse corals *Xenia* sp and many more. The good thing is that of all the different corals, it is the exotic, highly coloured forms that are being grown.

However, don't expect to see a drop in price. In fact, expect to pay a little more for a cultured corals.

Remember a lot of this is experimental on a commercial basis, it costs a mind blowing amount of money for the facilities to grow such animals, costs have to be recuperated, so pay the price. These corals are often better than wild

pieces so you will get good value for money. A wild Blue mushroom stone may have six Mushrooms on a medium stone, cultured you will find 12 - 15 on the same size stone. This makes a far better display in your aquarium and worth a few pounds extra.

Corals are also being cultivated on a much smaller basis by hobbyists in the UK. Some grow five cuttings a year and swap with club members. Others pay for their hobby via their sales, all are worthwhile. Reefs UK have undertaken an innovative programme entitled 'Coral Farm Partnership Programme' encouraging small scale coral propagators to register. This would provide hobbyists with an accurate source of farmed corals across the UK, visit the web site www.reefsuk.org for more information.

We are still in our infancy in culturing exotic non-food species, but it is getting better. Ten years ago very little was happening, now it is exciting. Ten years from now, who knows?

Stichodactyle gigantea (green variety) with *Amphiprion ocellaris* Clown fish. This is an aquarium photograph.

An invertebrate for you

Sea
view



Carpet anemones

This is one serious animal. It's a killer, it's very fragile, it's coloration is one of the most vivid you will ever come across, it's expensive, and it's just great! Indeed one of the best Anemones you can have, but take heed it's not an animal to take lightly. This beast has good points and bad points, it's up to you to assess the risk.

So, to the good points. Firstly the colour, what more could we ask for? Just stunning! Secondly, when introducing any Anemone you take a risk. Most will roam all around the rock work, over your corals and, if you are lucky, will settle in a good position. If you are unlucky, it will hide behind rocks until you have to dig it out to save its life. This is where the Carpet comes into it's own, if provided with rubble or a crevice in the rockwork to protect its vulnerable body, it is far less likely to move, therefore reducing any risk or roaming.

Now to the bad points. Firstly, the cost. For a good sized animal expect to pay £60.00 for a green, £70.00 for a blue, and

if you can get it, £150.00 or above for a red. Secondly, if a fish hits most other Anemones it will be stung but has a good chance of swimming off. If it hits a Carpet, good night Vienna, they do not come out and the Carpet has a nice feed.

So now you know the risk, but there are risks with every addition to any aquarium. If you do decide to add one you should consider the following.

When placing in the aquarium, after correct acclimation to your water, place a fish bag over your hand as these babies are sticky, and I really mean sticky. I have seen a Carpet wrapped around a hand hanging above the aquarium. When I released it from its owner, his hand was covered with the tips of the tentacles, the animal recovered and regenerated new tips. This beast packs a mean sting, it will not penetrate most hands but will sting you on the forearm where your skin is thinner, so take care.

Now, who lives in a house like this? The first rule is to purchase an Anemone at least three times the diameter of the fish length, smaller and the fish could batter it

to death. Fish inhabitants include *Amphiprion* clowns and *Descyllus trimaculatus*, the Domino damsel, with inverts such as Anemone crabs, *Neopetrolisthes* sp.

PROFILE

Phylum	Cnidaria
Name	<i>Stichodactyla gigantea</i>
Location	Red Sea to Indo-Pacific
Feeding	Meaty foods at least once per week
Size	Up to 75 cm across
Water	Flow moderate
Lighting	Metal halide or high intensity tubes with the animal in the top area of the aquarium.
Difficulty	Easy if all its requirements are catered for, as always very good water quality.

A fish for you

Sea view



Picasso triggers have great personalities

Picasso trigger

People often fall in love with fish that feed out of their hand such as Puffers and Boxfish. Well this beauty fits the same bill if you get a small one and train it. They are good fun, a great sight to behold and, to top it off, have great personalities but when they get older can be a bit grumpy. Its common name, I wonder where that came from!

If you put this beast into a reef aquarium you will have a large satisfied Trigger and no inverts left, the only survivors would be Carpet anemones. Their natural food are inverts and they have a particular liking for Crustaceans, which can cause problems when they get bigger. Their teeth are designed for crunching, and as such are hard plates. These form powerful pincers that can hold onto any rock, which they lift up to look

underneath for any hiding morsels, so they will topple your rockwork if not secure. This is also a problem when we think of wires in the aquarium, heaters and powerheads have all fallen victim to this set of gnashers, so feed the wires down hand, food grade piping to avoid a shock!

This is a peaceful colourful little fish which normally behaves itself, however, it can fight with members of it's own species. Saying that, if you introduce more than one at the same time and they are all small they will accept each other, but you could be sitting on a time bomb. Two things happen with age, firstly the vivid coloration fades and then it can get aggressive to other tank members.

Despite this they are a great conversation piece in the aquarium when you have guests They will follow your finger around the front glass and even dance with your finger. The best bit and

this is always fun with any beast, is that they will feed from your hand. When they are learning this trick be careful since they are energetic feeders with the capability to nip an unsuspecting finger. It's great fun to get your dinner guest to feed them!

PROFILE

Family	Balistidae
Name	<i>Rhinecanthus aculeatus</i>
Location	Indo pacific
Feeding	Anything, meaty foods, a pig of a fish.
Reef compatibility	Not recommended
Tank mates	Peaceful fish
Size	25 cm
Difficulty	Easy

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Loricariids

The large Loricariids are known for their toughness, so it is difficult to imagine that the giant Loricariids are actually difficult to transport. Our common "Pleco" is a popular food fish that is offered on the barbecues of street vendors in every Amazonian market. Yet, other large Plecos are rarely seen because they come from very fast moving waters and the local fishermen try to avoid having the destructive spiny giants in their nets. Adult Panaque and Acanthicus can tear nearly any net, or snare the net on submerged wood and rocks.

By promising to buy all of the large Carachama (Pleco) they could catch, we managed to persuade a group of local fishermen to try for some of these giants. The fishermen surprised us by casting their 300 foot nets right in the Amazon mainstream. The spot is a popular site to catch a food fish called Gamitana (Black paco, *Collosoma macropomum*) by the locals. Sure enough, the first haul of the net brought more than a dozen giant Pacu to the surface. These food fish can

fetch great prices at the morning fish market in Iquitos. Dragging the net over the sandy bottom in the extreme current was a difficult job and the net snagged often on submerged trees. The current here is too strong for swimmers, losing the net is a constant danger because the fishermen are not able to untangle a snagged net by diving to the bottom. They caught enough of the giant Plecos with the first haul to fill our needs. There were Carachama mama (*Acanthicus hystrix* and *A. adonis*) as well as Carachama Papa (*Panaque spec. juveniles* which are sold as *P. spec. L90*) in the area, and we selected six fishes over 45cm of each species from the net.

The trip to their newhome

The fish were badly entangled and the net had to be cut in many places to free the Plecos. Unprepared for this number of spectacular but giant fishes, we wrapped the fish individually in wet T-shirts and placed them in the bottom of the boat. The return journey to the city was nearly two hours (the Amazon is



The local fishermen are casting their 300 foot nets in the Amazon mainstream.

difficult and dangerous to navigate in the dark), and another hour by taxi before the fish, that were kept wet the whole time, would be back in the water. At the station the big fish proved to be in fine shape and ready for shipment to Europe the following week.

For transportation, all of the spines and fins had to be secured with foam pads, duct tape and elastics. The fish were shipped in just two inches of water with an ammonia binding chemical (Hiatt's Ammonia Destroyer). The bottom of each bag was lined with a thick, plastic wash basin, because the spines along the

bodies of the fish would still puncture the bags at the slightest movement of the fish. The giant Plecos arrived alive and well in Europe and the *Acanthicus* have since spawned and produced over 300 young!

Loricariid care in captivity

In the aquarium the giant Plecos need powerful filtration and plenty of wood for their digestion. They need plenty of foods such as raw potatoes, zucchini, worms and salad. Most large Loricariids die of starvation in captivity.



Adult Panaque spec. "utan"

Cichlids

Large Cichlids are more difficult to catch than one might expect. Most do not live in open water and most have greater flight distances than other fish. Large Cichlids are usually a surprise in the net and only a few species can be caught by regular methods. Pike cichlids easily slip through the mesh of most nets because of their body shape. Adult Pike cichlids, especially the larger species, are best caught at night, when they are sleeping in the shallow water. Some species such as *Crenicichla cincta* are so elusive that there are few photos of adults in full colour, and almost none in our aquariums. Large Peacock bass (*Cichla spp.*) are best caught by line fishing and carefully taken from the hook. Most of the fish survive this ordeal quite well and can be acclimated to aquarium conditions.



Crenicichla cincta There are few photos of adults in full colour.



The Redtail catfish which ended up as dinner for 12.

Pimelodiids

Large Pimelodiid catfish are the most difficult fish to transport. Many of the most interesting species live in fast moving water, or even rapids. The best place to see the big Pimelodiids is at the fish market where many species, as popular food fish, are offered every day. In Iquitos most are caught in the Amazon or Marañon mainstream. The boats catching the giant Catfishes employ huge nets, electric winches and freezer tanks. Some species such as the Amazon cat (*Pseudocoraspora spec.*) can attain lengths over 2 m and weigh over 300 pounds.

The transport of the Pimelodiids is very difficult and animals caught on hooks often die from stress or exhaustion before they can be shipped. Only smaller specimens, generally under 40cm in total length fare well in transport and acclimation to aquarium conditions.

Trying for a big Cat

Our attempts to bring back a live Redtail catfish (*Phractocephalus hemiopterus*) over 1.3m in length were foiled by a tiny *Trichomycterid* species that would enter the wounds of the large Catfish, kept in a holding net in the river, and fill itself

revealed that the parasitic Catfish had burrowed into the wounds caused by the hook on the mouth and head of the Redtail cat.

Some of the large Pimelodiids have proven to be easier to maintain and transport than others, with a number of species proving to be very difficult. Providing enough space for many species in captivity is impossible for normal aquarists, so none of these fishes are suited for the hobby aquarium and their maintenance should be left to zoos and public aquariums.



This tiny *Trichomycterid* catfish caused the death of our Redtail catfish.

with the blood of its host. The large Catfish eventually died of internal injuries. Close examination of the host (which ended up as our dinner)

Special thanks to Dirk Ottik (Germany) and Segundo (Peru). The fishes collected in this expedition and mentioned in this article can be seen at the Aquarium in Luxembourg.

Today's Surgery

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Today's vet,
Lance Jepson, looks
at Lymphocystis



What causes the disease and what does it look like?

Lymphocystis is caused by a particular type of virus known as an Iridovirus. This virus can live for many days free in the water and fish may become infected either through cuts and abrasions or by eating infected material. It invades individual cells and triggers a massive enlargement of that cell, often up to five hundred times its original size. This enlargement is often so extreme that these cells can be easily seen with the naked eye as whitish or greyish nodules that can be several millimetres diameter. Some of these nodules may have a very good blood supply and obvious blood vessels may be seen - such nodules can appear pinkish. Nodules can also occur internally and may act as space occupying lesions, affecting those organs around them although no evidence of any such effect has ever been put forward.

A thick capsule forms around each cell and an inflammatory response is mounted by the fish. Eventually the fish will eliminate the virus from its system and it would appear that immunity is usually solid as recurrence is rare in healthy fish. The time for this whole process can be from several weeks to months.

Lance's tip



Keeping your fish in the best of health will help them to resist infection and to eliminate it as quickly as possible should it happen. Quarantine all new stock for at least four weeks. Ultraviolet sterilisation may reduce the risk of waterborne transmission.

What makes a fish easy prey?

Any damage that allows the virus to enter tissue provides a possible means of infection. Many years ago, as a schoolboy, I first came across it in my own fish. Some Sunfish (*Lepomis gibbus*) that had been arguing had damaged each others fins. As their fins healed, up cropped these peculiar cauliflower-like growths. A more celebrated case was the linking of this viral infection with coloured Glassfish (*Chondro ranga*) where it seemed that these fish were becoming infected following the injection of the coloured dyes.

It would seem that it can pass between closely related species easier than between fish of different genera. This may mean that there are many different species or genus-specific strains of this disease. Stress increases the chances of infection and it is not uncommon to see it in newly imported marine fish.

This coloured Glassfish was injected a weeks ago. Most of the dye has gone now but some of the sites of injection can be seen to have whitish Lymphocystis nodules.

Diagnosis

Species susceptibility. Both marine and freshwater fish appear to be susceptible. However it would appear that members of the cyprinid (carp-like) families do not become infected.

Recognisable signs of disease. The large growths seen are typical of this infection. Occasional reddening due to haemorrhage are occasionally seen when these growths are accidentally damaged.

Microscopy. Usually unnecessary for diagnosis, but on a squash preparation of sample tissue clusters of the hugely enlarged individual cells can be seen. Each affected cell appears as an obvious circular structure.



This Batfish has several Lymphocystis nodules in its tail.

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Disease Lookalikes

Very characteristic in appearance, it could possibly be mistaken for tumours. Another possibility is epitheliocystis, which is a disease caused by a very different, bacterial-like organism that infects the mucus secreting cells of the skin and gills. Well recognised in cyprinids such as carp, if lymphocystis-like masses are seen on these fish then treat for epitheliocystis! Tapeworm cysts and fungal granulomas may also be confused with this condition.

How do you treat it?

Fish appear to be able to mount a strong immune response and with good care and nutrition the growths will spontaneously disappear. Be patient - do not be tempted to cut or otherwise remove the growths because doing so is likely to trigger even more growths at that site.

+++NEWS JUST IN+++NEWS JUST IN+++

Recently iridoviruses have been in the news, implicating American goldfish as possible carriers of an iridoviral infection that is wiping out many frog colonies in the UK. The inference is that these goldfish have carried this virus, presumed to be the same iridovirus that causes problems in North American Bullfrogs, into this country because goldfish were invariably present at the site of such outbreaks. Certainly members of the iridovirus family are thought to be able to cross significant species barriers - in one study it was thought that both tadpoles and sticklebacks in the same pond housed the same virus. However a much more obvious

route would have been the direct importation of bullfrog tadpoles (now thankfully stopped) for release into garden ponds. Aside from the obvious direct transmission of this virus into ponds with these tadpoles, if goldfish are carriers then there would have been plenty of opportunities for cross-infection at the exporters, importers and retailers beforehand - no need for the goldfish to be American. Add to this that American Bullfrogs are farmed in Asia and other parts of the world as a food source and the trail becomes hazy. As far as I am aware this particular virus has not been isolated in goldfish.



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There are Rainbows over my Catfish

Ian Fuller keeps more than Catfish in his tanks. This month he looks at one of his favourite groups of non-catfish.

Boeseman's rainbowfish really is a stunning beauty.



FOR ANYONE LIKE ME WHO specialises in Catfishes, in my case it has been Corydoras for more than twenty-five years, there can be a lot of tank space, which is totally unoccupied. To be more exact, I would say that 80% of any specialist Corydoras tank is devoid of fish save for the catfishes occasional foray to the surface for a gulp of air.

Rewarding Rainbowfish

Over the years, I have introduced many types of fish into my Corydoras set-ups, and by far the most rewarding are Rainbowfish. They come in many shapes and sizes not to mention colours, the vast majority of which can in my opinion be compared to those of marine fishes.

Boeseman's rainbowfish

My first acquisitions were six young Boeseman's rainbowfish (*Melanotaenia boesemani*) from Irian Jaya, Northwest New Guinea. These fish were about 4cm long and didn't look too colourful at that size. However, it was the colour pictures of a group of adults that had sparked my interest in the first instance, so I knew what their potential was. It wasn't many months before they had almost doubled in size and had taken on some fabulous yellow/orange and blue/green colouring, which they seemed to be able to switch on and off at will, especially the blue, which would almost disappear and become light grey with dark grey and black blotches and vertical bars.

When you give them a little thought, Rainbows have got a lot going for them, they are moderately sized, ranging from as small as 3cm up to around 15cm for some of the larger species. Other major pluses with these fishes are that they will eat just about anything that is offered to them and, when settled, will even take food from your fingers. They are very active, always on the move and do not seem to have any aggression in them. This, for me, is a definite plus as they can be put into tanks with smaller fish. Their tolerance to water types is, in the main, fairly wide. There are, of course, those that require more specific conditions but those species I would leave to the specialist.

There are a considerable number of species to choose from but what really determines the species to keep is the size of the tank, or tanks, that are available to keep them in. In my case, most of the tanks in the fish house are relatively small, with the exception of eight stock/growing on tanks which are about 90cm long. It is in four of these tanks that I decided to try my hand at keeping a few Rainbowfish species and maybe even try my hand at breeding some of them.

Lake Kotubu rainbowfish in normal coloration.



Neon rainbowfish

The third species, which I decided to buy, were a group of six Neon rainbowfish (*Melanotaenia praecox*) originating from Irian Jaya in northern New Guinea. The colours of these fish, even when quite small, can only be described as

absolutely brilliant; the whole of the body is a metallic sky blue and the fins are bright red on the males and orange on the females. As soon as I saw them I made up my mind that I must have some and promptly purchased three pairs. This is a stream dwelling species, so I decided to house them in a tank that had a good flow

of water created by a fairly powerful internal filter. Their other tank mates were to be a group of eight Whiptail catfishes which spend most of their time rooting about amongst the leaf litter and pieces of bogwood on the bottom. The tank was 45cm deep so there was plenty of free-swimming space for them.

Lake Kotubu rainbowfish

My second acquisitions were seven fish that were just listed as 'Blue rainbows' these came at a very reasonable price especially as the shop is not renowned for its low prices. Like the Boeseman's rainbowfish, these fish were not very large and had very little colour. There was just a hint of blue on the back of five of them, the other three were just silvery grey. Within a few days the new fish had settled down and one or two of them had started to give a hint of things to come. Two of them, in particular, started to show some bright blue/green colouring on the upper half of the body. At the end of six months they were 7cm in length and were displaying some brilliant colouring. One minute they would be showing brilliant blue on the upper half of the body with snow-white undersides, then, within a split second, the blue would change and the whole body would become iridescent sea green. The most striking feature of all was a bright golden yellow flash which ran down the head from the dorsal fin to the tip of the snout. This they could turn off and on according to the mood they were in. Once these fish had started to show their mature colours, it was not very difficult to put a name to them. I did this with the aid of Dr Gerald Allen's excellent book 'Rainbowfishes in nature and in the Aquarium'. They turned out to be Lake Kotubu rainbowfish (*Melanotaenia lacustris*) which originates from central Papua New Guinea.



Neon rainbowfish are one of the most gorgeous new introductions of recent years.



Lake Kotubu rainbowfish showing its lovely yellow flash.

All three species were housed in tanks at the same level in the fish house, giving them all the same temperature range of between 24.5°C and 26.5°C. The Boeseman's rainbowfish were tank mates to eight *Corydoras robustus* and a *Baryancistrus* sp. Sucker mouth catfish. The Lake Kotubu rainbowfish had a male Black lancer catfish, *Bagrichthys macrocanthus* and a pair of Snowball plecs *Ancistrus* sp. for company. ■

**Next month
Ian will try
breeding some
of his new
Rainbowfish**

Case History 5 The marine aquarium Tranquillity

The Fishkeeper

Yousef Mofidi works a stones throw away from Tranquillity Aquatics as a Project Analyst for American Express. Yousef and his girl friend Rachel were ambitious individuals opting to go straight into marine fish as novices. They were so attracted by the sheer beauty of marine fish that they purchased a complete set up in June 2001. Choosing a Vision 180 Jewel tank and using R/O water they followed Tranquillities initial instructions. The tank matured and everything appeared to be fine for the first 6 months or so. Yousef and Rachel settled down to life as aquarists carrying water changes every 3-4 weeks and enjoying their new arrivals. Their starter fish, Dansels, Cardinals, Clowns, Sweetlips and lobsters all seemed to be doing OK. After a little time they became more ambitious and added larger fish.



The Problem

This is when tragedy struck. All of Jousef and Rachel's fish (new and old) quickly began to look extremely unhappy. The fish stopped feeding and became much less active. The couple began to think they could lose some of their fish! Rachel in particular was very concerned to see them looking so poorly. So, they went back to ask Dave and Khurt at Tranquillity what to do. Tranquillity explained that they had access to a new marine version of Aquatest via the Internet that would produce a detailed report of their water quality. So they brought a water sample in to the shop straight away!

In order to run a report of Jousef's water quality Tranquillity tested for Ammonia/Ammonium, Nitrite, Nitrate, pH, KH, Phosphate, Conductivity, Magnesium and Calcium. Once the results were fed into the computer the button was clicked and a detailed report appeared like magic on the screen. The report showed that the situation was not good. They scored an overall 60% showing a red danger signal accompanied by the words DO NOT ADD FISH!

The Retailer

Tranquillity Aquatics & Reptile Centre is a family run business in the centre of Kemp Town very near to Brighton's Palace Pier. They stock tropical, coldwater and marine fish as well as reptiles. Manager Dave Ford is particularly well known for his knowledge of both marine and freshwater fish of which the store has good regular supplies and well cared for stocks. David and his team were one of the first retailers to begin offering the Aquatest facility from their shop counter. Jousef and Rachel dealt mainly with Dave's assistant Khurt Kruger who they found to be a godsend in their hour of need.



Tranquillity Aquatics & Reptile Centre of Brighton

The Solution

The report produced by the computer was printed in colour and given to the couple for reference. Along with an over all score and a colour coded report, Yousef and Rachel's report explained where their results fell compared to the ideals. It told them what treatment was required with the correct doses and pictures of the products they needed to use. The report showed high levels of Ammonium, Nitrite and Nitrate. Their pH was too low at 7.5 and their conductivity >47. The magnesium levels in their tank were too low and calcium too high. Four red scores out of 9 parameters added up to a frightening report. The couple bought all the products suggested by Aquatest and carried out the suggested treatments exactly during the following week. Sera Ammovec and Sera Nitrivec along with water changes were used to control the pollution levels along with Sera Siporax in the filter. They added Sera Magnesium Plus to the water daily along with magnesium testing. Advice was also given for preparing the R/O water correctly.



When Jousef returned to Tranquillity one week later for another Aquatest everybody was really chuffed with the result. Their tank had improved amazingly, now showing a green 93% score! And, their fish were now looking happy, active and feeding. An amazing improvement in one week!

Jousef and Rachel have now become much better fish keepers and learned quite a bit about water chemistry. They now plan to return to Tranquillity monthly to run

their water through the Aquatest programme just to check everything remains on track. They are also taking water changes more seriously carrying one out much more regularly. When asked about his experiences Jousef said "I am so pleased with the service Tranquillity provided and found the Aquatest report really helpful. The programme was so easy to follow and we are both very relieved that our fish are now look so well".



The network

A network of conscientious forward thinking aquatic retailers offers Aquatest to their customers. Because correct water quality brings out the best in your fish, keeps them healthy and living a long life, we recommend you test your water monthly. For an Aquatest health check take about 200ml of aquarium water to one of the following stores and see what score you get. We know your fish will appreciate it!



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Product Reviews

Today's Fishkeeper tests ZM Brine shrimp eggs



Z.M. Brine shrimp eggs are supplied in a silver foil vacuum pack.

NEWLY HATCHED BRINE shrimps are a vital food when rearing young fry or feeding many marine animals. In the past, good quality eggs were readily available at a cheap price (about £15 for 500g) but in recent years poor harvests in America have sent the price soaring to about £60 for 500g at its peak. Add to this a number of suppliers have stopped selling eggs because the quality could be so variable, regular supplies difficult to secure and you have something of a nightmare situation. Indeed, many aquarists have had to turn to alternative foods such as Microworms because of this problem.

Thankfully, things seem to be settling down now and regular supplies are gradually coming on stream again, although the price for good quality eggs will remain high for some time yet. With this in mind we decided to test ZM Fry Feeds, "Premium Grade Artemia". ZM tell us that every shipment of these eggs is tested at the Artemia Reference Centre, State University of Ghent, Belgium for product consistency and hatching efficiency.

That way they can be sure that "Premium" really does mean a good hatching rate every time.

Unlike most Brine shrimp eggs in the past, which came in sealed cans or glass vials, these eggs are supplied in a silver foil vacuum pack. The eggs should be kept dry and stored in a cool room or refrigerator. This is very important if you feed only small amounts and may take many months or even a year to use up all the eggs you have. If they are kept damp or too warm then they will fail to hatch after a few months.

Our verdict

Quality: Having tested two different packs now, the hatch rate of both has been excellent.
Price: It may be possible to buy cheaper eggs, however, this really is a "Premium" egg and worth the extra money you may have to pay to get them.

CONTACT DETAILS

ZM Fry Feeds,
26, Harrow Down, Winchester,
SO22 4LZ. Tel 0780 858 4375.

How to hatch Brine shrimp eggs

Hatching Brine shrimp eggs is easy. Half fill a 1 litre plastic pop bottle with fresh tap water and add 17g of aquarium salt. Then put 2.5g eggs in the jar and drop an airline in it to circulate the eggs around. After a day and a half the eggs will have hatched (at 25°C) and the airline can be taken out. The shrimps collect at the bottom and the shells float to the surface. After 30 minutes you can siphon out the shrimps and filter them through some kitchen towel. Then, wash them into some freshwater and feed them to your babies. For larger amounts of shrimps work on 35g of salt per litre and 5g of eggs.



Use aquarium salt rather than table salt.

Well washed plastic drinks bottle.

The eggs are fine sand grains.



Remove the airline after 36 hours. The shrimps gather near the bottom, swimming with a jerky motion, where they can be siphoned out into another container.

Keep the eggs in constant motion with some air. Rigid airline is best for this, but flexible tubing will also work if you position it properly.

Trade talk

UK Pondliners and DKS become Aqualife UK

Aqualife UK Ltd

The company formerly DKS UK Pondliners, a Lincoln based firm, has changed its name to Aqualife UK Ltd. The company has supplied quality materials for lakes, reservoirs and ornamental ponds for the past 20 years.

See their web site for further information www.aqualifeuk.com

New TUNZE Catalogue 2001 / 2002

The new TUNZE catalogue 2001 / 2002 is now available. Unique in its layout, the 64-page colour catalogue is available in the following languages: German, French, English and Italian. The latest technology is presented under the title of "Better Quality Of Life In The Aquarium". Products with electronic equipment are given priority in the TUNZE programme - scoring a point in control versatility and safety.

The new layout shows a mature overall programme with many pictures, details and short descriptions. 3D illustrations underline the practical notes on



how to set-up individual solutions using kits and accessories.

The new catalogue gives you the key to successful and natural aquarium - one reason more to ask for the new TUNZE catalogue immediately. The new colour catalogue is available at your specialist dealer or at the manufacturer.

CONTACT DETAILS
TUNZE Aquarientechnik GmbH
Seeshaupter Strasse 68
D-82377 PENZBERG
Germany
www.tunze.com

Melbicks Garden and Leisure

This garden centre has undergone major expansion and has more than doubled in size. There is a craft and hobby department, extensive gift centre, garden machinery and furniture and children's play area. There is a new pet and aquatic centre. A 300

seater licenced restaurant opens in mid-March. The new development features an original glass atrium design, in a landscaped setting.

Melbicks will be holding a grand public opening the weekend of 13/14th April with something for all the family.

Melbicks, Chester Road, Coleshill, Warwickshire, B46 3HY
Tel 0121 782 2683

Fresh Delica from Tetra

This is a new range of tasty and nutritious treat foods from Tetra.

Fresh Delica has all the benefits of fresh food but doesn't need to be kept in the fridge or freezer.

The three flavours Bloodworms, Brine shrimps and Daphnia, are enriched with vitamins and minerals. Easy to use satchets can be squeezed directly into water. Delica does not need to be kept in a fridge or freezer so it can be stored in the cupboard. Tetra recommend its use twice a week instead of flake foods.



The Glass Aquarium

The Design Museum is to stage an exhibition of the glass replica sea creatures designed and made by the 19th century German glassworker Leopold Blaschka and his son Rudolf.

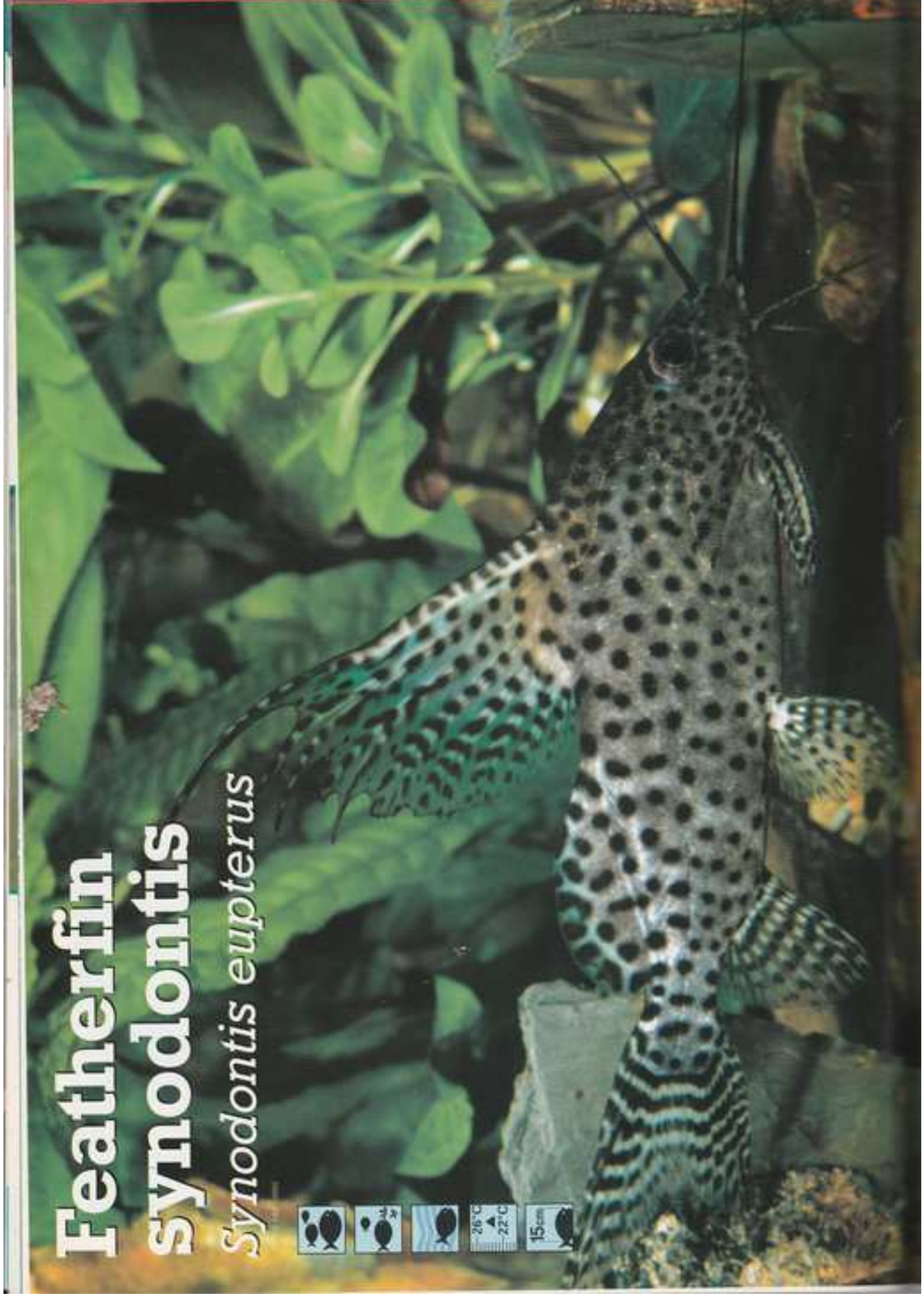
The glass aquarium will be exhibited from 1st March to 26th May 2002. From their dry Dresden workshop the Blaschkas have made all kinds of sea creatures for Natural History museums all over the world. Their glass sea slugs and jellyfish were studied as specimens by students. By the late 1880s replicas of more than 700 sea creatures were listed in their catalogue.

After its presentation at the Design Museum, The Glass Aquarium, a touring exhibition, will open at the National Glass Centre, Sunderland in July 2002.

Design Museum, 28, Shad Thames, London SE1 2YD
Admission £6.00 Concessions £4.00, £16.00 Family ticket
Opening times 10-17.45 Daily

Featherfin synodontis

Synodontis eupterus



Copy for Today's Diary Dates

Copy for Today's Diary Dates should be sent to Today's Fishkeeper, Westchester Court, 1 Forum Place, Hatfield, Hertfordshire, AL10 0BN Telephone 01573 885352, fax 01707 269333 or e-mail andpeddon@btinternet.com copy deadline 6 weeks before publication date.

Today's Diary Dates

April's show, auction and club meeting dates

Mon 1st	Kirkcaldy A.S. meeting: Contact 01738 634689 Selwey A.S. meeting: Contact 01387 750606 St Helens A.S. meeting: Contact 0151 42604213 Ayrshire Fishkeepers Association meeting: Contact 01294 605272	Fri 12th	Yorkshire Cichlid Group meeting: Contact 01974 Basingstoke A.S. meeting: Contact 01188 970 1461 Sutton A.S. meeting: Contact 01302 702181
Tues 2nd	Dunstable & D.A.S. meeting: Contact 01582 707280 Greenock D.A.S. meeting: Contact 01475 704219 York & Dist. A.S. meeting: Contact 01904 414272 Telford & D.A.S. meeting: Contact 01951 409721 or 01952 616410 Bangor Aquarists and Breeders Society meeting: Contact 028 9873539 The Irish Tropical Fish Society meeting: Contact 01 4561836 Halton A.S. meeting: Contact 0151 2898190	Sun 13th	Washington A.S. Auction: Contact 0191 417 0768
Wed 3rd	Conry & D.A.S. meeting: Contact 01536761736 Oasis Fish Club (Sunderland) meeting: Contact 0191 3844433 Hounslow club meeting: Contact 01784 259230 Perth A.S. meeting: Contact 01 738 621704 Clacton Fish Keeping Club meeting: Contact 01355 428005 Workington A.S. meeting: Contact 01900 679915 Petersmouth A.S. meeting: Contact 01673 884352 Mersy-side Aquarist Society meeting: Contact 0151 201 5969 Thameside A.S. meeting: Contact 0161 339 6593 Bracknell A.S. meeting: Contact 01346 485587	Mon 15th	Kirkcaldy A.S. meeting: Contact 01738 634689 Thorpe & D.A.S. meeting: Contact 01953 605394 Selwey A.S. meeting: Contact 01387 750606
Thurs 4th	Palrctly A.S. meeting: Contact 01738 561391 Paley & District A.S. Contact helena@norththamesfishclub.co.uk	Tues 16th	Greenock D.A.S. meeting: Contact 01475 704219 Greater Manchester Cichlid Society meeting: Contact 01622 942 155 Midlands Marine Aquarists Society: Contact 0121 359 4469 Wed 5th West Yorkshire Marine Aquarist Group meeting: Contact 01924 420101 Mersy-side Aquarist Society meeting: Contact 0151 201 5969 Clacton Fish Keeping Club meeting: Contact 01355 428005 Tongham Aquarists Society meeting: Contact 01252 350886 Petersmouth A.S. meeting: Contact Gill Utting 9, Inverness Rd., Gosport, Harms. Thameside A.S. meeting: Contact 0161 339 6593 Perth A.S. meeting: Contact 01 738 621704
Fri 5th	North West Cichlid Group meeting: Contact 01922 707 593	Thurs 18th	May 2002: TODAY'S FISHKEEPER on sale
Sat 6th	Sutton A.S. meeting: Contact 01302 702181	Fri 19th	Eastbourne & District Pondkeeping: Contact 0132377 11369
Sun 7th	Northampton open show: Contact 01604 415591	Sat 20th	Sutton A.S. meeting: Contact 01302 702181
Mon 8th	Kirkcaldy A.S. meeting: Contact 01738 634689 Bristol Aquarist Society (Goldfish) meeting: Contact 01292 207467 Ilford & AD A&P Society meeting: Contact 020 85507329 Grimsby & Cleethorpes meeting: Contact 01472 349178 St Helens A.S. meeting: Contact 0151 42604213	Sun 21st	British Cichlid Association Convention: Contact 01487 740305 Oldham D.A.S. Open Show & Auction: Contact 0161 281 3725 Kirkcaldy Open Show & Auction: Contact 01738 634689
Tues 9th	Southend Leigh & Dist A.S. Contact 01702 305740	Mon 22nd	Kirkcaldy A.S. meeting: Contact 01738 634689 Ayrshire Fishkeepers Association meeting: Contact 01294 605272
Wed 10th	Llanthgo Aquarist Society meeting: Contact 01506 510558 Hullfax A.S. Contact 01274 880471	Tues 23rd	Northwich A.S. meeting: Contact 0161 281 3725 Oleham A.S. meeting: Contact 0161 281 3725 Cyde Aquarist Society meeting: Contact johannah@freemove.co.uk
Thurs 11th	Tameside A.S. Contact 0161 339 6593 Bradford A.S. Contact 01174 652542 or 01118 2577709 Sandgrounders A.S. Contact 01704 545177 Mid-Sussex AS meeting: Contact 01273 602487	Wed 24th	Workington A.S. Contact 01900 679915 Hullfax A.S. Contact 01274 880471
		Thurs 25th	Mid Sussex A.S. meeting: Contact 01273 602487
		Fri 26th	Discos Ireland meeting: Contact 0661 38593
		Sat 27th	Sutton A.S. meeting: Contact 01302 702181
		Sun 28th	Catfish Study Group Meeting:
		Mon 29th	
		Tues 30th	

Out & About: Shop Visit

Solesbridge Mill Watergardens

There is more to TMC than marines. On the same site as their marine wholesale business they also have a watergarden outlet

ON A CHILLY very early spring day, we set off for Solesbridge Mill Watergardens. It wasn't raining or snowing, but it was one of those damp, dark, dank days that leaves you feeling like summer will never come. This was certainly not the time to be visiting a watergarden if you want to see it looking at its best.

Finding the place was not too difficult and there is ample parking at the first car parking area you come to. Don't go right down the lane to the TMC buildings themselves - they will not let you in unless you are a shopkeeper!

The watergarden centre itself is well laid out with a main tunnel like building being full of water features and other dry goods as well as tanks of coldwater fish. These included a full range of Goldfish and other pond fish. It was outside, however, that really impressed us. Row upon row of ponds full of water lilies. Each pond contained a



Just a small selection of the display vats.

single variety and a card giving you all the details about that particular water lily. Solesbridge Mill Watergardens grows about 60

A small part of the dry goods available. Anything you want can be ordered in.



Solesbridge Mill Watergardens is easy to find - just look for this sign on the right-hand side of the road if you are coming from the M25 direction.

Shop details: Solesbridge Mill Watergardens, Solesbridge Lane, Chorleywood, Herts., WD3 5SX

Shop opening hours: November - February 9.30am - 4.00pm, March - October 9.00am - 5.00pm.

Manager: Jane Pursey

Staff: 4 full time & 3 part time staff

Number of tanks: 12

Number of vats: Huge number all over the place!

Show tanks and ponds: Many displays of water features and ornamental ponds.

Specialties: Waterlilies - over 60 varieties are grown on the premises.

Brands stocked: TMC, Oase, Stuart Turner, Blagdon, Lotus and Cloverleaf. Any product can be ordered in specially for you.

Which groups of fish do you sell?: Coldwater.

different varieties on site and these range from pygmy varieties through to the very large ones in all colours and hues. Other pond plants abound, mostly grown on site and of a very high standard. A visit here should satisfy all your water gardening needs.

The centre is managed by Jane Pursey who started in the aquatic industry some 13 years ago, having originally trained as a riding instructor. She says the range of equipment they stock from six of the major U.K. manufacturers should satisfy any customer's needs and has been carefully chosen for its reliability and quality. She will, however, also obtain any other brands or specific pieces of equipment if a customer requests it.

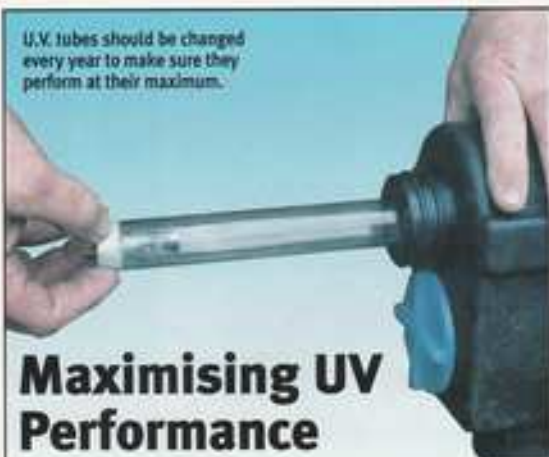


One of the excellent labels which tells you all you need to know about that variety.

Our verdict

Solesbridge Mill Watergardens is an excellent watergarden centre well worth visiting at any time. If you are looking for a specific colour and size of water lily, however, this is most definitely the place for you.

U.V. tubes should be changed every year to make sure they perform at their maximum.



Maximising UV Performance

UV lights have a longer life when operated continuously with the expected life of most bulbs now being 12 months, however, for health and safety reasons, the bulb must be turned off for any maintenance and during any medication as UV can unpredictably alter the chemical nature of medications.

As UV clarifiers are not 100% efficient at destroying bacteria, the colonisation of a biofilter will not be affected if positioned before or after the filter, as some nitrifying filter bacteria will pass through the UV to colonise the filter. However, a UV must always be pump-fed to ensure full bulb coverage as maximum use of the UV radiation will not occur in a partially filled gravity-fed UV unit. The unit will also overheat if run partially filled.

Slime can build up on the quartz sleeve, reducing UV penetration within the unit. The sleeve must be cleaned regularly to maintain optimum radiation. Some more advanced units are available with a built-in meter to detect a drop in UV radiation. This indicates the need for a new bulb or a clean!

The speed of water flow also affects the efficiency of the UV unit. Flow rate can be reduced so that water spends longer under a lower watt bulb or increased in higher watt systems. The latter has been shown to have better germicidal performance with the added benefit of the faster flow reducing the build up of slime on the quartz sleeve.

During the natural life of a UV bulb,

the mercury vapour within the bulb gradually becomes deposited on the interior of the bulb, darkening the glass and in extreme cases causing the glass to 'silver-up'. This solarisation reduces UV output and is an indication that the bulb is at the end of its useful life and must be replaced.



U.V. Clarifiers like the Vortron from Hozelock are designed to spin water around the U.V. tube so it stays in contact longer and is more efficient.

Factors affecting UV efficiency

The effect of a UV steriliser on free floating microbes is largely dependent on 3 factors:

- 1 Wattage of the lamp
- 2 Contact time under the lamp
- 3 Lamp area

UV output can be described as $\mu\text{w}/\text{sec}/\text{cm}^2$ (microwatts of UV (millionth of a watt) per second per cm^2).

Research has shown that different microbes have different minimum lethal doses depending on their size. A general trend exists to which there are exceptions where larger organisms require more radiation to be 'killed', i.e. the DNA within a bacterium is affected easier than that of a protozoan. (See Table)

Table showing the required UV exposure to 'kill' various micro-organisms

Micro-organism	Exposure of UV radiation (254nm) required to 'kill' each organism ($\mu\text{w}/\text{sec}/\text{cm}^2$)
Chlorella (algae)	22,000
Fungi	45,000
White Spot, Tomite	336,000
Paramecium (Protozoa)	88,000
Trichodina (Protozoa)	158,000
Salmonella (Bacteria)	10,000

It is inaccurate to compare UV sterilisers by Watt ratings in the same way it is inaccurate to assume the performance of cars by their engine size. Performance of UVs of the same wattage will differ due to design and tube diameter. Some UV designs encourage turbulence of water within the unit increasing contact characteristics between water and radiation, improving lamp performance. Other units have different chamber diameters affecting radiation and disinfection rates.

It is due to design improvements such as these that different manufacturers rate UVs of identical wattage as having such vastly different disinfection rates. i.e. an 8W UV by two different manufacturers may be rated at treating 1000 gallons by one manufacturer and 2000 gallons by the other.

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Swedish
Aquarist **Tor**
describes
two
Suckermouth
catfish

Vampires and Knobnoses



Knobnose Whiptail Catfish

Family	Loricariidae
Size	14cm
Water conditions	pH 7.0
Temperature	25-30°C

The Knobnose whiptail catfish

Most Whiptails look the same, long slender body with even longer tail and a sandy brown body colour, sometimes spotted and occasionally striped. But there is one which differs in appearance, it's the Longnose whiptail *Hemiodontichthys acipenserinus*. The exporters back in Peru call it the Loric pinoco the "Pinochio lorica".

The genus *Hemiodontichthys* was described by Bleeker in 1862 but it took more than a hundred years for these fish to reach aquarists. The first fish to reach Europe came to Germany in 1993.

In fact, this genus is monotypic consisting of only one species and anyone would agree that the Knobnose is the one and only one of its kind. Isbrücker & Nijssen noted in 1974 that this species had a distribution over most of Amazonia. It can be found in the



Fry of the
Hemiodontichthys
acipenserinus.

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The Vampire pleco was a sensation when introduced to Europe in the mid 80s



states of Amazonas, Pará, Mato Grosso, Tocantins, Goiás, Rondônia and Acre in Brazil and is also found in those parts of Peru and Bolivia where the Amazon-river flows. This vast distribution means that there are differences both in coloration and body markings.

The Knobnoses are not too difficult to keep in aquaria if you pay attention to a couple of wishes they have.

Firstly they enjoy digging into a sandy substrate. Therefore part of the bottom should always be covered with very fine sand. The other thing is reported by aquarists. These fish easily hurt themselves by swimming into very narrow places from which they cannot get out of by themselves. They swim into driftwood holes or behind filters where the spiny rostrum fixes it firmly and if the fish is not saved it will perish.

They have been bred in aquarium conditions and are

reported not to be too difficult to get into breeding condition. The male takes care of the brood and should be removed into a peaceful, own tank with the eggs. Reports from Germany show that if eggs are separated from the male before hatching the remaining fry are far fewer than when the male is allowed to care for the eggs until the hatching.

Vampire plecos *Leporacanthicus galaxias*

When this magnificent pleco first reached Europe in the middle of the 80's it was a bit of a sensation. It was named L 007 and it was in the very beginning of a real new pleco species boom that started at that time. The German magazine DATZ started giving the new plecos arriving into Germany these L-numbers to get some order into the fish. *Leporacanthicus galaxias*

was described scientifically and named in 1989.

The hobbyists today know it by the common name Vampire Pleco. A name which was given because of the extraordinary teeth this fish has. On the upper side it has a few big brown teeth and below some smaller teeth. At first these teeth were believed to be for eating snails but soon aquarists discovered that the fish ate everything. They loved vegetables but would happily eat all sorts of foods in any form, tablets, pellets, meat and greens as well as homemade mixtures including shrimps and beefheart.

The Vampire can grow up to 30 cm but it is easy to keep and happy in most tanks as long as extremes are avoided in water parameters. It comes from Brazil, the Rio Tocantina and from a district up on the Rio Madera.

It looks like some of the bigger sailfin plecos like *Glyptoperichthys* species but

THE VAMPIRE PLECO

Family	Loricariidae
Size	40cm
Water conditions	pH 6.2-7.3
Temperature	24 - 29°C

the coloration is very distinct. On a black or dark brown background it has lots of clear white or whitish yellow spots. It can sometimes be quite territorial, so keeping a few of them means you have to give them a lot of space. The Vampire is a striking fish which does not require any special treatment to do well. Regular water changes and a good filtration which makes the water flow is good enough. Provide them with some pieces of driftwood that make good hiding places.

The Vampires have been bred in Germany but not much is published on the breeding habits or requirements. ■

Sea Pens

AMONG THE MOST BEAUTIFUL CORAL animals in phylum Cnidaria are the Sea pens. With their delicate feather or pen shapes, long feeding polyps and often bright red, orange or yellow colours, they attract aquarists, divers and visitors to the coral reefs.

Where are they found?

Sea pens are, however, not only animals of coral reefs. In fact, many species are found in cold and temperate seas and are adapted for a life in soft sediments. The cosmopolitan genus *Ombellula* has been found at depths greater than 6000 metres and represents the deep-water Sea pens. Indeed, many species occur in the abyssal, but there are also a number that occur in shallow waters. Sea pens occur at nearly all depths, from the shallow soft bottom patches on the coral reefs to the abyssal of the great oceans.

Sea pens are the most highly organised of the order Octocorals and have been placed in their own order "Pennatulacea". Their fossil record dates more than 500 million years back in time. However, since many species live in deep water and are difficult to collect, the group must be regarded as insufficiently known. Of the more than 430 nominal species, about 300 are valid and grouped in 15 families. The best paper to study for those who want to read details on the group's biology and systematics are those of Williams (1993 and 1995).

Body structure

Many, but not all, Octocorals typically have two main forms of polyps - feeding polyps and polyps that propel water through the colony. The main difference between the Sea pens and the other Octocorals is that, in addition to the common feeding polyps (autozooids) and the water-pumping polyps (siphonozooids), they also possess an oozeoid, which is the primary, axial polyp. Each oozeoid consists of two parts: a foot (peduncle), which is dug into the sand or mud bottom, and an upright part (the rachis), which sways freely in the water and bears the feeding polyps. The feeding polyps have well-developed tentacles, while the smaller pumping polyps have greatly reduced or even absent tentacles. Some Sea pens, like those in the genus *Pennatula*, also have additional mesozooids, which are an intermediate in form between autozooids and siphonozooids. These are specialised polyps through which the water, which streams in through the siphonozooids,

Impossible animals

Alf Nilsen looks at a fascinating but almost impossible to keep group of animals

Part
two



The feeding polyps have retracted leaving only the primary, axial polyp (oozooid) visible. However, a close look shows the tiny water pumping polyps (siphonozooids) dotted numerously in between the larger feeding polyps.

subsequently passes out of the colony. Many, but not all, Sea pens have an axis interior in the colony.

In principle the Sea pens can be grouped in two different groups based on their shape. Members of the genera *Covermularia*, *Urtularia* and *Verecillum* (among others) are tubular (pen shaped) while members of *Ptilosarcus*, *Pennatula*, *Gyrophyllum* and *Panoploides* (among others) are pinnate or feather-shaped.

Shine a light

A most interesting feature with sea pens is their ability to shine by bioluminescence. "Bioluminescence" is the emission of light from living organisms (without the emission of heat) caused by catalytic chemical reactions in certain organisms, such as Glowworms, Fireflies, Jellyfish, many Sea pens, some Fungi and even more than 200 species of fishes. Best known are probably the many planktonic organisms that glow, such as "Living light of the Seas" (dinoflagellates from the genus *Noctiluca*). This feature among the Sea pens could really be studied up close in a special aquarium. I saw Sea pens shining in 1979 when I had my first marine aquarium. Sea pens were frequently offered for sale then and naturally I tried them out. They expanded enormously during night and when I touched them carefully with a glass tube, they glowed and shone like crazy - a powerful sight!

Cold water species and mass-synchronous spawning

In the coastal waters of northern Europe, we find several species of Sea pens. Best known are the "Large sea pen" (*Funiculina quadrangularis*) and the "Slender sea pen" (*Virgularia mirabilis*). The "Large sea pen" occurs down to a depth of 2600 meters and can reach a size of more than 1.7 metres in height while the "Slender sea pen" reaches a height of about 60 cm and occurs in shallower water with a maximum depth of about 360 metres. The latter species is also known from the Mediterranean. Off the coast of Norway, Sea pens normally occur in depths greater than are accessible to most divers. However, in the fjords of western Norway, much of the deep-water fauna naturally occurring on the continental shelf are also found inside the fjords in relatively shallow water. This is also true for the Sea pens. Consequently divers have been able to study the Sea pens up close and have reported an interesting reproductive behaviour where the Sea pens seem to release their gametes all at the same time when there is a full moon. This behaviour is

Ptilosarcus gurneyi is commonly found along the western coast of USA and in the Gulf of California. Here photographed in Monterey Bay Aquarium, California.



Pennatula phosphorea dredged from 30 metres depth off Bergen, Norway.

Food and nocturnal activity

Sea pens completely depend upon catching their own food by the use of their feeding polyps and do not have symbiotic algae like many soft- and stony corals. During the night they expand and open their feeding polyps, which sometimes are long and supported by a relatively large tentacle. If one takes a close look at a Sea pen when being fed, it is relatively easy to see how the polyps close when a food particle - such as a Brine shrimp - hits the polyp. During the day, especially in shallow water and in a home aquarium, most Sea pens contract and disappear under the sand, but at night, the colony rises again from the substratum. This only happens if the Sea pen thrives and is exposed to currents that carry sufficient food past the colony's feeding polyps. In contrast to other Octocorals the Sea pens are not permanently attached to the substratum, but only loosely anchored in the mud or sand. If the conditions become unfavourable, they are even able to move. This can often be spotted in a reef aquarium, when a Sea pen that has carefully been placed in a position favourable to the aquarist himself (who wants to view the colony from the best possible position!), desperately tries to move to a location where the current and supply of food is better.

MARINES: ALF'S COLUMN

very similar to that reported from coral reefs of the central Pacific where Stony corals (and other invertebrates) are known to mass-spawn in this way.

Another common species from northern Atlantic is the cosmopolitan *Pennatulid phosphorea*. This species is deep red in colour and not very big, reaching a maximum size of about 25 cm. Like the other two mentioned species *P. phosphorea* naturally occurs in deeper water, but this species is also found in relatively shallow waters in the fjords of western Norway.

Some genera and species

The most common genus of Sea pens seen in the trade is *Cavernularia* from the family Veretillidae. When I started out with marine tanks Sea pens were often sold as "*Cavernularia obesa*". This is the type species of the genus and has a typical cylindrical shape. However, detailed studies of the colony and its internal calcareous spicules (sclerites) are necessary to verify the species identity of *Cavernularia*. This also goes for species of most other genera of Sea pens. Members of *Cavernularia* are common in the Indo-Pacific and can be seen on sand flats where they even open fully during the day. There are 13 species in this genus which are considered to be valid.

Occasionally specimens from the genus *Cavernularia* can be found available in the trade. Four species are considered valid

Close Up of the feeding polyps of *Cavalunaria* sp.



today. These are very close to those in *Cavernularia* and the two genera can only be separated by the presence of branched and bilobed sclerites in *Cavernularia*, which are lacking in *Cavernulina*.

In *Phyllosarcus*, the colonies are stout and feather-like. The polyp leaves are kidney-shaped, often with sinuous margins. The genus is distributed in the eastern Pacific, and occur occasionally in the trade.

Phyllosarcus gurneyi is a common species found from Alaska to southern California.

I have also kept specimens of *Pteroides* in my research tank, but with little success. In this genus the colonies are, mostly, stout and feather-like, with an axis present throughout the colony. The genus contains about 25 valid species. In those specimens that I kept, several symbiotic animals (Crabs and Brittle stars) lived among the Sea pens' polyp leaves.

Sea pens are interesting organisms with a biology that is relatively unknown. The marine aquarium can be a potential tool for studying this group of animals, but Sea pens are in general organisms for the experienced and advanced aquarist only. ■

Aquarium requirements

Should Sea pens be kept in the home aquarium? In general "no"! Sea pens are difficult to keep and unless provided with ideal conditions will soon die. If kept they must definitely be given a special tank where the following requirements are met:

- 1 A rather thick substratum consisting of mud and fine sand where they can dig themselves in.
- 2 Rather weak illumination; such as one daylight light-tube in combination with blue tubes.
- 3 An almost continuous supply of live Plankton; enriched Brine shrimps, Rotifers, Copepods and other minute food.
- 4 Steady and relatively strong water flows that can keep the food suspended and transport the food to the animals.

Cavernularia cf. obesa fully expanded in the author's aquarium where it was kept in the sump.



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Discus problem solver

Tony Sault answers your questions on Discus

Slow growing Discus

Q I have recently purchased my first small shoal of six Turquoise discus all around 5cm in size. The shop told me to feed them on frozen blood worm and flake food but they do not seem to be growing as I thought they would. Can you tell me is there anything else that they will eat, and how often should I be feeding them?
Graham Peters London

A Discus need a high protein varied diet so whichever food you select for them always check the analysis on the container, and if it is below 50% protein you can find something better. For example, frozen Bloodworm is intended to be a treat food as the analysis on the back of the pack shows it is only 5% protein and 92% water. There are specialist Discus diets available which should be used as staple. These have all the correct vitamins and minerals and a high protein base. As a general rule the size of the fish and the number of feeds follow an inverse pattern e.g. 5cm fish need six feeds, 7.5cm fish five feeds, 10cm fish four feeds, 12.5cm fish three feeds, 15cm fish two feeds. Whichever food you decide to feed them the best rule to follow is small amounts as often as you can.

New additions cause problems

Q I am a long term fishkeeper for over twenty years and I have been keeping Discus for the last three years with good success until recently. I am in possession of the medication C.Q.D. but do not know how to use it. I have five assorted Discus of various colours and sizes, the two largest look terrible they have lost colour and seem to be covered in a light grey coating. The smaller fish are recent additions and are not affected as yet. All my readings are normal e.g. pH 6.5 Nitrite 0 Nitrate 20 Ammonia 0 Temperature 30 °C. I know it is difficult to solve a problem described by letter but please can you help.
Alan Wilkie, North Lanarkshire

A I am sorry to hear of your problem, and you are correct, it is often very difficult to diagnose the cause of a problem from the details supplied because symptoms that may point you in the correct direction are often missed. First of all, the grey coating on your Discus is mucus and, very often, Discus secrete mucus for a variety of reasons. From the facts you have given, it seems reasonable to assume that the new additions have definitely introduced some unwanted organism into the tank. This may be bacterial or parasitic but with so little to go on it is difficult to determine which, as the new additions are not affected. The dosage for C.Q.D. is, at a temperature of 32.2 °C and a pH of 6.5 or over add 10 ml per 100 litres of water on day one, 10 ml per

100 litres on day three and then a water change on day ten, but please be sure as to what you are treating before you medicate because the use of a wrong medication can only stress the fish even more.

Fungused eggs

Q I have a pair of Discus that have now spawned fifteen times and each time the eggs turn white. I don't know if it is the male or the water that is the problem, I don't age my water and I use baking soda for the pH. Do I need a reverse osmosis unit, what am I doing wrong?
Mark Chan, Vancouver, Canada

A If your male is fertile and this usually comes with age, he needs to be approximately fifteen months old, then the fault probably lies with your water quality. My tap water has a conductivity of 500-600 micro siemens and at this the hatch rate of the eggs is very small, so I have to lower the conductivity of the water by using a reverse osmosis unit to 150-200 micro siemens just to get the eggs to hatch. The addition of sodium bicarbonate to water that has not been aged can only compound your problems. As I am not familiar with the quality of water in your country can I suggest that you contact your local water supplier and ask for an analysis of your tap water. I am sure you will find them very helpful. This will tell you if you need a water purifier or a reverse osmosis unit, look for the conductivity to be around 200 micro siemens or less. The very best of luck in your future endeavours. ■

A beautiful group of Turquoise discus.



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Tate's Gallery

As the coldwater season begins **John Tate** has a few suggestions for your pond and also a great plant for your tank

Irises that like wet feet

There are only a few true Irises happy with their feet in water. The most well known being the Yellow flag iris (*Iris pseudacorus*), however other species of water loving Irises are often available from your aquatic retailer. One such is the American water iris (*Iris versicolor*).

This species has various varieties with many sporting fantastic early leaf colours. They have a compact growing nature and the sword like leaves rarely reach over 60cm tall. This makes them ideal for the small pond. The flowers bloom in early summer and are supported on thickened stems. These are smaller and subtler than those of the Asiatic water iris (*I. laevigata*) and often produce more flowers once established, as well as flowering over a longer period.

At this time of year, look for a plant with 'promise'. That is, strong shoots appearing from around the old growth, and a good root system. Avoid plants that appear too advanced for the time of year, as these may have been forced and may perish if we have a heavy frost. Plant in a sunny position in 10-20cm of water. Use a slow release feed yearly to ensure good growth and bloom.

Iris versicolor 'kermesina' produces dark blue-green leaves with strong white margins early in the season which

RIGHT: *Iris versicolor* 'kermesina' produces beautiful flowers which are often described as claret in colour, but I would say they are deep velvet purple.

turn to a grey-green as they age. The beautiful flowers are often described as claret in colour but I would say they are deep velvet purple. *Iris versicolor* 'Gerald Derby' is an old favourite. It has rich green leaves which have bright purple to almost scarlet bases early in the season. This colour fades slightly as they age. The fuller flowers are mauve-purple with light lilac edges and yellow throats.



Four seasons in one plant

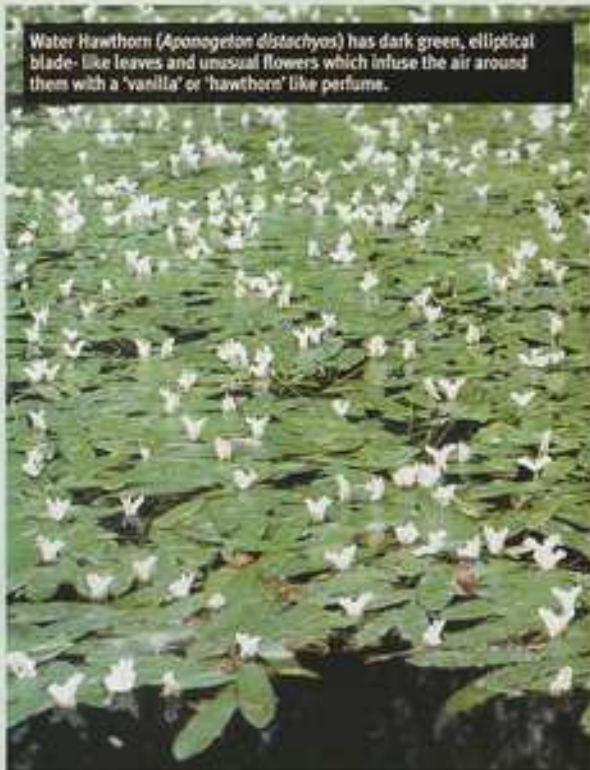
At this time of year pond plants are just beginning to show signs of life, however, there are one or two that remain semi-evergreen all year round, including the Water Hawthorn (*Aponogeton distachyos*). This deep marginal plant is a member of the Aponogetonaceae family, of which a number of tropical aquarium plants also belong. It originates predominantly from South Africa, however, many tubers are grown in the UK and Europe.

The dark green, elliptical blade-like leaves, are long and leathery. Growing up to 25cm in length and 7 cm in width, with occasional black and brown flecking over the leaf surface. The leaves are connected to a bulbous tuber below the substrate surface, via an umbilical like petiole used for transporting food and water to and from the leaf.

The unusual flowers bloom during Spring and Autumn, infusing the air around them with a 'vanilla' or 'hawthorn' like perfume. Each floating flower spike, has approx. 10-20 flowers, with white waxy petals and black anthers, arranged in a 'wheat ear' like 'V' shape 5-10 flowers to each 'Ear'.

Occasionally some Water Hawthorns will die back during the summer period in a state of rest, but should come back in the Autumn. This summer rest means that it leaves the 'floor' clear for the other big hitters, Water lilies. The two combined will give you interest and colour all year round. This plant is commonly available from most aquatic centres during the Spring. Choose a strong healthy plant with plenty of leaf showing and to come. Lift the plant from its display pond and check for new leaf and good root growth. Once home, treat it much like a lily, lowering it down in stages over a period of several weeks to a depth of 30-60cm. This way you will not shock the plant.

Water Hawthorn (*Aponogeton distachyos*) has dark green, elliptical blade-like leaves and unusual flowers which infuse the air around them with a 'vanilla' or 'hawthorn' like perfume.



MARTIN BIRD / GARDEN

Trick up its sleeve

More familiarly associated with the aquatic margins of the garden pond, *Loeile cordifolia* is also happy growing in a submersed state in the aquarium. However, the change in environment has meant a change in appearance by means of adaptation. Gone are the thicker dark red, almost black lanceolate leaves, replaced by thinner, light green, rounded lobular leaves, more suited to photosynthesis and gaseous exchange under water.

It's true that the terrestrial form is more impressive and stronger, but the aquatic form is also very useful to those that love aquascaping their aquariums with plants. We are all familiar with 'Background', 'Mid-ground' or 'Foreground' planting, but there is another method known as planting in 'Streets or 'Waves'.

This is where a type of plant is grown in both the mid-ground and foreground area, but trimmed regularly so that it descends towards the foreground. This gives the aquarium a sense of depth, and ties other planted areas of the aquarium together.

Again it is, sadly, not one of those plants stocked by the average aquatic dealer, but is often available by request.

John's tip



Look for plants with good strong growth, and healthy aquatic leaves. Often the plants are secured in pots with rock wool, this and the pot should be removed once home. Plant the delicate stems in a strongly lit mid to foreground area, setting them on a diagonal, or snaking them across one way and then back the other as they descend to the foreground. Don't worry about height to begin with, once the plants are established they can be groomed for the desired effect. *Hydrophilis polysperma* can be used similarly.



Loeile cordifolia grown emerge in the water garden.

MARTIN BIRD / GARDEN



Ponderings

Spring! and the pond really starts to wake up. **Dave Bevan** keeps us all up to date with the jobs that we need to do

Essential jobs

As the pond fish start to become more active, there is always a chance that the pond will spiral out of balance as the fish produce more waste than the system can cope with. This leads to higher than acceptable levels of ammonia, nitrite and nitrate in the water, which not only damages the fish's delicate gills but can lead to stress, which often precedes other serious conditions. For this reason, it is vital to test the water at this time of year.

How?

There are many test kits available which work on the principle of dissolving a tablet in a sample of the pond water and comparing the colour of the resultant solution against a colour chart. Different colours represent different levels.

As a minimum you need to check the pH (degree of acidity or alkalinity), ammonia, nitrite and nitrate. You will also need to know the water temperature, as this has a bearing on the levels that can be tolerated by the fish. There are a large number of companies which produce testing kits and most cover all the above tests and come with a booklet, which explains how to do the tests, interpret the results and recommends follow up action.



Here are a large number of different testing kits available.

Now is the time to check your pump before the season really gets underway.



CHECK YOUR PUMP

If you have not done it already, check your pond pump before the season really gets underway. Fortunately, with modern pumps, like the Aquamax range from Oase, all you need is a screwdriver to give the pump a once over.

- 1 Isolate the power supply and lift out the pump using the built in hand grip - no need to pull on the electric cable! The 360 degree swivel joint between the pump and outlet hose also makes the job much easier.
- 2 Disconnect the outlet hose and check the sealing ring.
- 3 Place the pump on a flat surface, remove the filter housing screw and split the filter housing.
- 4 Check the cable, particularly round the gland entry to the pump motor housing for cracks and splits. Check that the impeller moves freely.
- 5 If in doubt, undo the two screws and remove the impeller housing to check for build up of material behind the impeller.
- 7 Wash all parts and reassemble to complete the job in less than an hour.

FASCINATING Fact

The female Bitterling lays her eggs inside the Swan mussel. When it is ready to breed it extends a long ovipositor, which is inserted into the mussel's breathing valve. Protected from predators and nourished in the oxygen rich environment, the eggs hatch and the tiny fish swim out of the mussel. The mussel also benefits because the tiny Gloxina (baby Mussels) cling onto the Bitterling's fins and are carried to new areas where they drop off to form new colonies.



Bitterlings have a fascinating life cycle.

Below the surface

Changes in the law making it an offence to import Bullfrogs or their tadpoles have resulted in a significant decrease in the numbers offered for sale through garden centres and other outlets. But did you know that it is also an offence to release into the wild an alien species, which includes Bullfrogs and Terrapins?

Bullfrog tadpoles are huge when compared to our native species.



As far as the law is concerned this includes your garden or garden pond (unless adequately fenced).

Organisations like English Nature and Froglife have campaigned for these changes because, if established, the Bullfrog could pose a real threat to our water based wildlife. Easy to identify as a tadpole because of their large size, sometimes reaching 15 cm in length, they are black, brown or olive and may be mottled particularly along the long flat tail, which terminates in a long pointed tip.

The adult frog can be up to 20 cm, which is more than twice the size of our adult Common frogs. It can be identified by the large eardrum, often bigger than the eye, and a single fold of skin which runs over the eardrum and down the back.

Tadpoles are occasionally imported by mistake with consignments of coldwater fish and there are still some adult frogs at large. If you see either a tadpole or a full grown Bullfrog then contact Froglife on 0986 873733 who will be pleased to advise on how to deal with the situation.

COMMON GOLDFISH FACTFILE

Species: Common goldfish (*Carassius auratus*)

Other forms: Common goldfish come in a variety of colours and many named forms including Comet, London shubunkin, Bristol shubunkin, Jikin, Fantail, Redcap, Fantail and Celestial, as well as many which are unsuitable for ponds.

Size: Can grow to 30cms.

Weight: Up to 1 kg.

Availability: Best known and most popular pond fish are available from most aquatic outlets.

Habitat: Originating from China where it was kept in ponds. Prefers still or slow moving water.

Identification: Turning red, yellow or typically gold during the first two years, they are deep bodied fish with a long dorsal fin and can be distinguished from Carp by the absence of barbels on either side of the mouth.

Habits: Sociable fish coming to hand if fed regularly at the same time and place. Mixes well with other fish of all sizes and are at home in most ponds where they will co-exist with the plant life. They will eat other forms of pondlife but their diet should include a proprietary fish food. Feed up to three times a day in summer but they usually stop eating when the temperature drops below 8°C. Frequently breed at around four years of age laying their eggs on the aquatic vegetation. Few of the fry reach maturity since eggs and fry are eaten by other fish.

Pondfish value: Number one for the garden fish pond. Does little damage to plant life, so small numbers can be introduced to the wildlife pond, although some resident wildlife may be eaten.



Pond problem

Spring is here and things are starting to happen in the pond. The day lengthens and the temperature slowly starts to rise. Down in the pond the fish begin to move about as they react to the increase in light and temperature. Then, overnight, the crystal clear water has turned green and within a few days resembles a pea soup.

The first thing to remember is that it will not harm your fish and may even be beneficial, providing food and cover as they move towards spawning time. Ponds, particularly those stocked with fish, are artificial environments where maintaining the balance is difficult and the slightest change can trigger an algal explosion.

So what causes this explosion? The green unicellular algae are there all the time in small numbers and over the winter the nutrient levels in the pond will have increased slightly, particularly if the filter has been turned off. Oxygenating and floating plants have died back and, without any competition, the combination of extra light, warmth and a food supply causes these green algae to divide rapidly producing billions of individuals. They will continue to increase until they run out of light or food.



Green water looks unsightly but does not harm the fish.

The solution

Fit a UV Clarifier, treat with chemicals or add some Barley straw, add more submerged aquatic plants or just be patient. If your pond has enough plants growing in it, then the green water will clear all by itself as these kick into growth a few weeks after the algal bloom has occurred.



Bubbles of oxygen can be seen rising from this piece of Hornwort.

PLANT LORE

Fish need oxygen. Oxygenating plants put oxygen into the water when they photosynthesise in the presence of sunlight. Great! No need for mechanical aeration. The trouble is there is a snag. At night these plants continue to respire but they do not photosynthesise so they actually take oxygen from the water, competing with the fish, and on warm thundery nights can leave the fish literally gasping for air.

Nevertheless, they do have a place in the pond provided they are not allowed to become too rampant. Hungry, they remove nitrates from the water and their often-tangled growth provides spawning sites and shelter from predators for both fish and amphibians.

There are many plants to choose from including Starwort, Hornwort, Canadian pondweed and Willow moss, all of which will produce lots of underwater foliage.

Water violet is a good choice for its delicate finely divided, bright green, underwater foliage and pretty lilac flowers. A good stand of *Lagorospira major*, also known as fish weed, is great for the fish and in situations where there is running water, Water crowfoot will perform well.

Avoid the very invasive aliens like *Crassula helmsii* also known as *Tilix recurva*, Swamp stonecrop, Australian stonecrop and New Zealand pygmy weed. Plants like these will take over your pond.



A pond full of beautiful healthy Koi.

Koi world

Bernice Brewster discusses Koi and Pond treatments after a recent visit to a local water treatment plant

RECENTLY, I INDULGED MYSELF IN A VISIT to an open day at the local water treatment plant, which proved to be a fascinating few hours entertainment. The processing of the water to arrive at a product fit for human consumption is truly remarkable, even though the chlorination process renders mains water unsuitable for Koi, unless previously treated with water conditioners or passed through a water purifier.

What about pond treatments?

One of the areas which I found particularly interesting was the treatment to remove pesticides and other organic chemicals from our drinking water. Of course in addition to monitoring the drinking water, the Water Authorities are also responsible for the treatment of household waste water and sewage, before it is returned as clean water into the water cycle. Having an interest in domestic ponds and pet fish, I couldn't resist asking about the consequences of pond treatments and remedies in waste water. After all the majority of Koi ponds have the water discharge plumbed into the household drainage system! Our tour guide, who incidentally is in charge of the discharge water quality, groaned faintly before commenting on the vast range of

pond treatments which are available and the fact that the majority will end up in the waste water treatment plant. Bearing in mind that many of the chemicals we use to treat the Koi pond are quite noxious and often comprised of organic compounds which can leave persistent residues.

Until a few years ago, when it became illegal to treat Koi ponds with organophosphate medications, these were routinely used to combat fish lice, anchor worm and flukes. Once in the natural water system, these kill our native invertebrates including insect life and crustaceans such

as water fleas which form the diet of other aquatic life, including fish. These are among the pesticide residues which the Water Authorities go to great lengths to remove to avoid environmental degradation.

We are very quick to moan at the Water Authorities because levels of organic residues and pesticides in the mains water and which might harm our Koi but perhaps we have also contributed to their presence.

In conclusion, perhaps we should ask ourselves is that treatment really necessary or is it just taking a short cut in what should be an improvement in husbandry and hygiene? ■

MOST COMMON TREATMENT

The most popular Koi or pond treatment must be those based on malachite green or malachite green and formalin. It is a common misconception that malachite green is a copper based substance, derived from the mineral malachite, which is a bottle green coloured, carbonate ore of copper and for the budding chemists amongst us, the chemical formula is $\text{CuCO}_3\text{Cu}(\text{OH})_2$. The malachite green we use in the pond is an aniline dye, without a copper molecule in sight and I can't type in the chemical formula as my choice of text doesn't stretch to phenylalanine rings! However, malachite green is an organic chemical which we know to have unusual properties, that is it is typically bottle green colour in acid solution, with a pH below 7 but is colourless in alkaline solutions, with a pH above 7. It is also known that malachite green is an unpleasant substance. It is a respiratory poison, for which there is no antidote, causes mutations in genes and hasn't been used in the food fish industry for years because of its properties. Are the breakdown products persistent organic residues? Quite possibly!

Mark Wessels introduces a beautiful Dwarf cichlid

PHOTOS: MAX GIBBS



African gems

ABOVE: Male *Ptaeniatus*, there are 12 different colour forms of this fish.

BELOW: Female *Ptaeniatus* have more rounded fins and a different colour pattern to males.



KRIBENSIS BELONG TO A GROUP OF SMALL, slender Cichlids found throughout West Africa and western Central Africa in clear, oxygen rich waters.

There are at present five species in the group with the commonest one available to aquarists being *Pelvicachromis pulcher* or the common 'krib'. Although a lovely Dwarf cichlid to keep, the coloration and relative rarity of other members of the genus make them a challenge and delight. One of these is *Pelvicachromis taeniatus* which has approximately 12 known different colour morphs (or types).

This species ranges from southern Nigeria through to southern Cameroon with individual populations in different rivers showing marked variation in coloration, but having the same basic shape. The 'Molere' form is found in one small watercourse running through secondary rainforest and plantations between Limbe and Kumba in west Cameroon, near the villages of Molere and Mile 4. Numerous collectors have caught this variety over the years and the species has been maintained in captivity but breeding has often presented problems.

What do they look like?

The males only reach a maximum length of 8cm with the females being smaller at 5.5cm. As you can see from the accompanying photographs, the coloration of both sexes differs markedly. The males are much paler with a golden brown body. The upper portion of the tail has numerous black spots on a golden background, which contrasts strongly with the lower half which has a red and blue reticulated pattern. This coloration is also found in the anal fin and soft rear part of the dorsal fin. As with all members of this genus, the males have elongated and pointed pelvic fins in contrast to the shorter more rounded fins of

the female.

The females are equally if not more colourful than the males. Her abdomen is a deep rosy/purple colour which becomes more intense as breeding commences. The flanks have a metallic green sheen before becoming dark brown/black under the dorsal fin. Another sexual difference is the metallic gold coloration of the dorsal fin with black spots within the soft dorsal portion seen in the female. Her tail has the same colour pattern but is more rounded.

The distinct coloration, fin shape and size make pair selection straightforward. The trained eye can identify the different sexes at about 6 to 8 weeks of age although it's unlikely fish of this size are going to be for sale. An adult pair can be selected from a group and, provided they are introduced to the right environment, will settle down quickly and pair off with minimal aggression.

Aquarium conditions

All varieties of *P. toemias* are highly adaptable. The natural environment of the Malawi form has soft and slightly alkaline water but they will tolerate moderately hard water and a pH range of 5.5-8. I am very fortunate in having tap water GH3 and pH 6.5-7.0 which is ideal for this and other West African fish I keep. As with all Cichlids, adequate space should be provided and I keep one pair in a 90 x 30 x 30cm tank with about a dozen

killifish which act as dither and target fish. These latter fish help strengthen pair bonding and reduce aggression between the male and female especially after spawning. In the wild, they are closely associated with river banks and plant thickets as these provide secure and safe havens. A similar habitat should be created in the aquarium with pieces of bogwood and heavy planting. I tend to use Java fern, Anubias nana and Java moss in all my tanks as they only need the low level of light which the fish like.

Although tolerant of a wide range of water conditions, a good filtration system

and regular water changes (a third every two weeks) are necessary to prevent the build up of nitrogenous waste products. I currently run air driven sponge filters in my tanks but as these fish do little digging it is possible to use under gravel filtration. I prefer to use a black or dark brown coloured substrate as the fish seem happier and the colours are shown off better. A temperature 23-25°C approximates their natural environment and does not, in my opinion, need to be altered for breeding purposes.

Breeding

Captive breeding has sometimes created problems but with patience and attention to detail it is possible. All members of the genus are monogamous cave spawners and both parents care for the young once they are free swimming. A pair can be established following the purchase of a male and female or by growing on a group of half a dozen juveniles and allowing them to pair off naturally. Only use fish of the best conformation, colour and size for breeding.

A special breeding tank is not necessary but only keep one pair in the tank with some dither fish. Although they breed more easily in soft, slightly acidic water, sudden or drastic changes in the water chemistry will stress the breeding pair. Once paired off and a territory established the fish should be fed more heavily. In the wild most fish breed when food is more abundant. Increase the frequency and amount of good quality foods but always ensure that overfeeding does not occur. When

a deep purple colour as she ripens. Once a spawning site has been "approved" and cleaned she repeatedly swims towards the male presenting her belly to him and enticing him into her cave. Spawning usually takes place first thing in the morning with up to 50 large, (2mm diameter) slightly ovoid, yellow eggs being stuck on the roof or the sides of the cave. On completion both parents take turns to fan the eggs for 2 or 3 days. Upon hatching, the "wrigglers" are transferred to a small depression on the cave floor where they are cared for. The young are continually moved to different sites within the cave for a few days until their yoke sac is absorbed. The fry become free swimming at 0.5cm and the parents take them on a guided tour of the tank. →

Diet

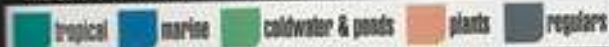
Feeding presents few problems, even wild caught fish quickly adapt to dry foods such as flake and sinking pellets. It is quite easy to overfeed these fish which leads to obesity and poor reproductive activity along with water pollution problems. The dither fish provide competition for food which is no bad thing. My fish are fed twice daily, flake in the morning and a variety of frozen or live food in the afternoon. They relish bloodworm and adult brine shrimp but seem indifferent to Daphnia. Whiteworm and Grindalworm are fed once a week but only in small amounts. If I'm conditioning for breeding, I will step up the feeding of these worms to give the female the extra energy required for egg production. Spawn size seems to increase slightly when the worms are fed in greater numbers. It is variety in their diet, however, that is important as it helps with digestion and does not lead to dependency on unsuitable foods.



The distinct coloration, fin shape and size make sexing this fish easy.

the female's abdomen starts to swell and the pair can be seen clearing under pieces of bogwood or other enclosed sites, water changes should be increased to intervals of 3-4 days using slightly cooler water, thus simulating rainwater flooding into a stream. These basic methods all help to induce even the most reluctant pair to spawn.

The coloration of the female intensifies to





Only breed from fish which have a good body shape, and are well coloured.

Caring for the youngsters

Aggression against the dither fish increases at this stage with both parents chasing those fish which stray too close to the brood. At this stage fry should receive a steady supply of readily digestible foods such as Micro worms or Brine shrimp. After a couple of weeks I introduce finely crushed flakes, Grindal worms or Daphnia. With this heavy feeding I tend to change 30% of the water every 4 to 5 days which encourages rapid fry growth.

Initially, the fry stick close to the parents and if danger is sensed by either adult a series of short head shakes acts as a signal to the fry to remain still and sink to the floor of the tank.

“a real challenge to breed but their lovely colours and interesting behaviour makes the extra effort really worthwhile”

Once the risk is over the fry return to foraging over the substrate, plants and bogwood. As time goes by the adults become less protective as the brood becomes more unruly and the fry larger. I remove the fry when they are about 5-6 weeks old and 1-2.5cm long. They have a cross patched green/brown coloration but after a further two weeks the

females start to develop a rosy sheen on their abdomens and a slight metallic colour in the dorsal fin. The young are housed in a 115 x 30 x 30cm tank, fairly heavily fed for good growth and have regular, large water changes. By the time they are 4-5 months old they can be passed on to other aquarists. They mature at about a year old.

All in all these fish are a real challenge to breed but their lovely colours and interesting behaviour makes the extra effort really worthwhile. When you've mastered that colour variety there are the other dozen or so to try. ■

How many babies do they have?

Brood numbers can vary and seems to depend on the pairs themselves plus the system of management.

I've had pairs produce 20-30 fry every month regularly whereas others have spawned every 6 months with 50 to 60 fry in each batch.



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Renewed awakenings

Bob and Val Davies kept marines 30 years ago and have just returned to try their hand at this rapidly evolving sector of our hobby

AFTER AN ABSENCE OF THIRTY YEARS WE recently returned to keeping marines. Although during that time reptiles and amphibians have dominated our interests, we did not lose all contact with fishkeeping having kept various freshwater tropicals, coldwater and pondfish. Our early attempts with marines met with varying success but the hobby has moved on since those days. Increased knowledge, apparently improved capture and freight methods, together with a greater range of specialised equipment today have made it easier. Nowadays, it is even possible to buy some captive-bred corals and fish.

Early days

In the early days, the sudden advent of marine fish and other reef life in the shops was mind-boggling - the shapes and colours were incredible. Then (as now) keeping

marines was not cheap but nowadays there is more chance of success. Thirty years ago the marine fishkeepers' 'bible' was a paperback by Graham Cox. He also wrote some magazine articles and was a proponent of the 'natural system'; piles of living rock and a small bubble-up box filter for mechanical filtration accompanied by regular water changes. Some thirty years later this is the basis of one method of maintaining a reef tank. The majority of marine keepers used an undergravel filter, a deep layer of crushed cockleshell and in some cases a layer of filter wool sandwiched in the cockleshell. This latter was a recipe for disaster - the filter wool soon became clogged and polluted the tank with disastrous results. Much use was made of copper cures - regular additions of vitamins, trace elements, calcium and algae fertiliser, whether needed or not, made the hobby a case of 'hit or miss' for many

people. Around the time we gave up, protein skimmers were coming into use; although they were relatively primitive they did remove some 'muck' out of the water. Today's skimmers work on the same basic principle but are more efficient.

Renewed interest

During our years 'in the wilderness' we had not really kept abreast of developments in marines; what little we read seemed to point to ever more complex and expensive systems of water treatment and our interest lay dormant until recently. During visits to various aquatic outlets we occasionally looked at the marines with pangs of regret remembering the 'inverts only' tank, the Butterfly tank and two other tanks with various creatures. Marine articles in *Aquarist* and *Pondkeeper* (now *Today's Fishkeeper*) began to attract more of our attention and →

Equipment

Having chatted to Dave at Calico we purchased a Red Sea 'Prism' protein skimmer, a JBL R.O. unit and Kent sea salt. Water movement was to be provided by a powerhead fixed high up on one side of the tank and a Fluval 303 external canister filter under the aquarium for mechanical filtration. This also contains a small amount of activated, marine charcoal to give the water 'polish' and a bag of Rowaphos to help remove any phosphates which might occur. It is worth noting here that only Reverse Osmosis (RO) water is used. From the start we decided it was worth buying our own RO unit as regular water

changes and top-ups would mean frequent trips to shops to buy RO water. At the time we did not know that a nearby shop supplied it. Again Dave at Calico was helpful showing several models. For lighting we use 1 marine actinic, 1 marine white and 1 50/50 white/actinic. All three are fitted with reflectors. The switching on and off is staggered i.e. first actinic, then 50/50 and finally the white. The process is reversed for switching off. Lights are on for a total of about 12.5 hours.

The tank was filled with RO water, the heater switched on and salt added. The specific gravity was adjusted to 0.0124 and the temperature set at 24°C. A few pieces of tufa rock were positioned as a base for

the living rock. An underwater adhesive might be useful for reef building although we did not use one. A stable base for your reef is necessary to prevent it sliding on the glass base. Tufa rock can be smoothed down to provide a flat surface on the underneath which helps to provide stability. A very thin (2mm) layer of coral sand was then spread over the base of the tank.

Then it was back to Calico for 14 kilos of cured living rock. This is an essential part of our system as the living rock with its coating of coralline algae and various other micro-organisms provides the biological filtration. The tufa and living rock was placed so that there were plenty of

spaces behind and underneath to assist water circulation and avoid stagnant pockets. Six small Red-legged hermit crabs and six Turbo snails were added at the same time. Using RO water and keeping our 'reef janitors' (Hermits, Turbos and a Brittle star) we have had no problems with unwanted algae. A thin layer tends to form on the tank walls but is eaten by the Turbo snails. They and the Hermits also graze the rocks and sand but leave the macroalgae untouched. There are currently three species of *Cladophora* growing well, although a careful watch is kept on these since one dense clump of grape *Cladophora* died off overnight causing extremely cloudy water for a couple of hours.

Our Flag-tailed pipefish (*Doryrhamphus* species) feeds on all manner of small animals which arrived with our living rock.



Living rock

Good quality living rock usually brings with it a population of small creatures although some may be undesirable. Seaweeds may develop - ours has two thriving clumps of *Halimeda* which appeared spontaneously. Small green brads have developed, both in clumps and singly. Occasionally one grows to almost 2.5cm across. Small clumps of red Algae have appeared - some wiry, others with 'fleshy leaves'. We have also spotted a baby brittle star emerge from a hole and disappear around the rockwork.

Living rock is fascinating stuff, it sprouts tubes from which minute tentacles appear, larger tentacles reach out of holes searching for small particles of food, tiny shrimp-like creatures can be seen flitting about and are the staple food of our Pipefish. The purple Coralline algae which encrusts the rock assists filtration and provides an attractive sight. It soon begins to coat clean tufa and even the heater, thermometer, filter inlets/outlets as well as the tank walls. Miniature fanworms of various colours also develop - some with their body encased in the rock, others in curved, calcareous tubes on the rock.

A reef janitor (Red-legged hermit crab) - useful for removing unwanted algae.



tropical marine coldwater & ponds plants regulars

were read more closely; a local shop opened up a marine section and suddenly we were well and truly hooked again.

Not being complete beginners we had a grasp of the basics; the main unknown was the latest equipment. In our previous articles in this magazine we have often stressed the advisability of reading up beforehand and asking advice from experienced people. To bring us up to date we drove up to Calico, near Penrith in Cumbria, after seeing an advertisement in Today's Fishkeeper (in between several visits this shop was featured in an 'Out and About').

Conclusion

After nine months the tank is functioning very well. 22.5 litres of water are changed monthly. All the Corals and Mushroom anemones are flourishing and in some cases reproducing. One in particular, sold to us as a Yellow xenia, is spreading rapidly onto other stones and now needs harvesting - this was something only dreamed of 30 years ago. Using this system we were able to add the first Mushroom colony only two weeks after the living rock. At no time have we had a nitrite reading. Nitrates and

The project is providing many hours of interest and is a pleasure to watch

phosphates are negligible which means that unwanted algae has never been a problem either. The project is providing many hours of interest and is a pleasure to watch. At the time of writing we are now doing another set-up into which we hope to move some of the home-grown Corals and Mushrooms and at the moment are seriously considering a pair of Clownfish for it.



Partial view of the aquarium after five months.

We would like to thank Dave and Dot at Calico Aquatics in Cumbria and Tristan Lougher at Cheshire Waterlife for their advice in starting up and stocking our aquarium. ■

Other inhabitants

After two weeks we added a stone covered with bright green Mushroom anemones (*Discosoma* sp.) which were soon followed by an attractive blue form and later a bright orange/red species. When purchasing the blue Anemones we were given a few loose ones which were positioned in between pieces of the rock and soon became established. Various colours of *Zoonthid* sp. colonies have been added and some three months later, when everything was judged to be working fine an attractive green, hard coral (*Galaxia* sp.) was introduced, followed a couple of weeks later by a Trumpet coral - both are doing extremely well. More recent additions have included Tree polyps, Sun coral, (*Tubastrea* sp.) a red Geogonian which is a magnificent sight with its white polyps extended giving the appearance of hoar frost on twigs and a white Sea whip (thought to be *Plexura* sp.) which also provides a nice display when extended.

There was no argument over the few fish we wanted. Over a period of a few weeks we bought one Purple firefish (*Nemateleotris decora*) one Red/Common firefish (*Nemateleotris magnifica*) and one Yellow goby (*Gobiodon citrinus*). When the aquarium had a good population of tiny crustaceans a true pair of Flag-tailed pipefish (*Doryrhamphus* sp.) were purchased, followed by a Crocodile pipefish. After reading that Rainford's goby or Court jester (*Amblygobius rainfordi*) were good sand sifters we bought one. Some goby species recommended for this task grow rather large and seem to be sand sifters rather than sifters. Although it does some sifting the Rainford's seems to prefer added foods.

Rainford's goby (*Amblygobius rainfordi*) is a good sand sifter rather than sand sifter which some of the larger species seem to be.



A recent addition has been a Spotted mandarin (*Synchiropus picturatus*) which glides peacefully round the aquarium, peering in all the nooks and crannies for tiny invertebrates. The little yellow goby is comical - he spends much of his day lying on some Trumpet coral making occasional forays to hover in the current to seize passing food.

Other fascinating occupants are four Boxer crabs which wave tiny anemones at anything that approaches them. The filter-feeding Porcelain crabs wave their brushlike chelipeds to trap food but often seize large pieces in their claws. The Feather duster worms, Stick polyp colony (*Acrozoanthus* sp.) and some Polyp colonies occasionally trap food particles as does the Sun coral. The Blood shrimp, Cleaner shrimps and Brittle star will readily thief pieces of food from these static creatures which cannot prevent it unless they have enfolded the oral disc before the thieves get it.

Blood shrimp (*Lyssmannia helodes*) is an expert thief who nibbles corals.



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Close encounters of the fish kind

John Dawes investigates small water features in Singapore and has some interesting information on sex, diet and parasites

Small to become big in Singapore

When small water features first made their appearance in significant numbers in the UK well over a decade ago, new designs hit the market almost on a weekly basis. I remember one UK manufacturer commenting to me at the time that the only factors controlling the 'explosion' of further designs were the limits of the human imagination. In other words, anything we could imagine in terms of water features could be manufactured...and would sell, such was the almost-insatiable demand in those days.

This was the period when small water features - first developed for confined spaces like balconies, backyards, porches, etc. - were entering their 'second phase'. This second stage in their evolution saw small water features being adopted by gardeners in general, and water gardeners in particular. These enthusiasts already had sufficient space for a good-sized pond...or several...but, obviously, saw such features as welcome additions to their overall garden design. As a result, the market boomed, as witnessed by the ever-more-numerous water features appearing at important gardening events like the Hampton International Flower Show.

Outside the U.K

Away from the UK, the level of interest for small water features has been somewhat less enthusiastic. In the Far East, for example, most of the designs I have seen over the years have tended to be quite basic, or have consisted of the 'even-smaller-water-features' designed for tabletop or shelf use within the home.

It's not that there hasn't been any interest in the UK-type water feature. There has always been some, but at a surprisingly (in my view) modest level. However, on a recent visit to Singapore, Vivian (my wife) came across a dazzling display of elegant water

features...right in the middle of one of Singapore's busiest shopping malls.

Needless to say, this was the first item on my 'must-see' agenda following my return from a day trip to neighbouring Malaysia.

I have to say that I was hugely impressed by this first-ever display of what, to me, appear to be excellent minimalist designs. Conceived and manufactured by GardenAsia Pte. Ltd., the range of designs "marry natural beauty with modern aesthetics to evoke a sense of calm and impart a feeling of tranquility - a holistic sensory experience...our gift of a little peace in your living space."

I spoke at great length to the company's representative who confirmed what I suspected (going by the constant through flow of interested shoppers): that the Singapore public had responded with great enthusiasm to the display. They also informed me that demand for this type of water feature is very much on the up in the Far East.

Since the company plans to exhibit at the next staging of Aquarama (due to be held in Singapore between 29 May and 1 June, 2003), and since buyers fly in from all over the world - including substantial numbers from the UK - we could therefore well see the home market experiencing yet another surge, this time based on totally uncluttered Oriental designs.

Surprisingly, the manufacturers make no mention of their designs being aimed at the outdoor market, referring instead to their products as "providing contemporary lifestyle interior decor" and as a means of imparting "...the elements of water, stones and scents to any interior living space."

No doubt, the fact that the vast majority of Singaporean's live in apartments and therefore do not possess gardens, has a great deal to do with this.

I'm certain, nevertheless, that, by the time Aquarama '03 comes round, the net will be cast more widely to embrace the outdoor sector. ■





One of a collection of Far Eastern minimalist small water features exhibited in the heart of Singapore.

Contact details

Anyone interested in seeing further designs to the one shown in the accompanying photograph should visit GardenAsia's website at: www.gardenasia.com

Sex, Diet and Parasites

As Spring Viraemia of Carp (SVC) and the currently notorious Koi Herpes Virus (KHV) infections vividly demonstrate, certain species of fish are highly susceptible to some infections but may be totally immune to others. This is hardly surprising, of course, bearing in mind the diversity of fish hosts and parasites known to science. What is perhaps less well known is that males and females of the same species may exhibit different rates of infection by one and the same parasite.

Take the Three-spined Stickleback (*Gasterosteus aculeatus*), for example. In populations studied over a 15-year period in Boulton Lake, Graham Island, off the coast of British Columbia, males suffered heavier infestation with the tapeworm or cestode, *Schistocephalus truncatus*, and a species of *Bunodera* flatworm (flake) or trematode, than females. For their part, females were more heavily infested with the cestode, *Schistocephalus solidus*, and a number of Eustrongylides

species of roundworms or nematodes. Overall, though, males were found to carry a heavier parasitic load.

While accepting that the stresses that males endure during the spawning season may have some influence on overall loading, the fact that, despite this, females can be more heavily infested with particular parasites led two Canadian-based researchers to look for other causes or reasons for these apparent 'anomalies'.

Koi Herpes Virus (KHV) infections vividly demonstrate that certain species of fish or specimens are highly susceptible to some infections but may be totally immune to others.



Habitat has an effect

T.E. Reimchen, of the University of Victoria, and P. Nosil from Simon Fraser University, discovered that a major factor in these differential infestations was the ecological niche occupied by males and females, respectively. Males, for instance, spend much of their time close to the shore, as well as to the bottom of the lake. Their diet consequently consists of organisms that also occupy these regions. Interestingly, the tapeworm *C. truncatus* uses bottom-living amphipods (crustaceans that have laterally compressed bodies) as its primary hosts. The parasitic fluke *Bunodera* also uses such crustaceans, as well as molluscs, as its primary hosts.

It is therefore not surprising that male Sticklebacks which include amphipods, other crustaceans and molluscs in their diet end up being infested with these parasites. Females, too, become infested with these two parasites, but they spend considerably less time in similar habitats and carry correspondingly lighter loads.

However, the more open waters which females tend to frequent are also the preferred habitat for the tapeworm *Schistocephalus solidus* which uses pelagic (surface or midwater) copepods (tiny free-swimming or parasitic crustaceans) as primary hosts. Equally, the species of the roundworm Eustrongylides which infest female Sticklebacks more heavily than males, use aquatic oligochaetes (Annelid worms related to the Earthworms) as primary hosts.

The inevitable conclusion that Reimchen and Nosil came to was that - at least in the Boulton Lake Sticklebacks - infection rates are generally associated with dietary habits, which, in turn, are associated with the different ecological niches occupied by males and females. Therefore, it is not the sex genes themselves that directly influence infestation or render the sexes differentially

susceptible. However, they do so indirectly by influencing the differing lifestyle that the sexes exhibit.

REFERENCE

For the full text of this interesting study, consult: Reimchen, T.E. and Nosil, P., Ecological causes of sex-biased parasitism in Three spine stickleback. *Biological Journal of the Linnean Society* (2002), Vol. 77: pp. 51-61.

Three-spined stickleback males (upper fish) are more likely to be carrying one type of parasite than females (lower fish).



Bob & Val's Top Tips

Bob and Val have some important tips for amphibian enthusiasts



What to avoid

- Never site the vivarium in direct sunlight or near a radiator - overheating soon occurs. Draughty situations should also be avoided. Temperature control is all important. In outdoor enclosures there must be plenty of deep hides so the occupants can escape hot sunlight when they wish to do so.
- Use aquarium-type light fittings in your vivarium and avoid using them in hot weather - they can raise temperatures when the heater thermostat cuts out.
- If any degree of permanent moisture is necessary avoid using materials such as wood or melamine-veneered chipboard. Glass or fibreglass are obviously the best materials for resisting moisture. Lining plywood vivaria with laminated plastic sheet (floor and part of sides and back) makes them damp-proof. Kitchen work tops (offcuts) make an ideal base.

Some good ideas

- If slugs and snails are introduced with plants a piece of lettuce, left overnight, will often attract them. Checks must be made early in the morning.
- Leave living plants in their pots - they are easier to replace if they fail to thrive. Puppy/cat litter trays make useful pools where required. A small heat mat placed underneath helps to increase the Relative Air Humidity (R.H.) where needed.
- A 'rain chamber' will sometimes stimulate breeding in frogs/toads which normally experience a rainy season. Use a circulatory pump or external canister filter leading to an aquarium spray bar, watering can rose or perforated container to produce 'artificial rain'. Switch off the pump when spawning commences to prevent eggs being sucked in.

Some musts

- If the keeper has respiratory problems it is advisable to wear a face mask when cleaning out dusty substrates.
- Water for spraying or water changes should be allowed to stand for twenty four hours to allow chlorine to dissipate and should be at the vivarium temperature when used.
- Most Turtles (and Terrapins) will bask out of water (there are a few exceptions). If they cannot dry out completely fungus disease often develops on the soft parts. To encourage basking fit a thermostatically-controlled spot bulb over a basking site.
- Full-spectrum light tubes must be inside the vivarium to be beneficial and control units must not be inside the vivarium as they produce a substantial amount of heat.

Some frogs are perfectly camouflaged to fit in with their background. This is *Scaphiophrynus marmoratus* sitting on a moss encrusted log.



- Dying amphibians may secrete skin toxins. To remove them place a polythene bag over the hand and turn it down to enfold the dead body.
- The daily routine (servicing, feeding etc.) should start with healthy animals, moving on to sick or quarantined specimens. Ideally the two latter should not be housed in the same room as healthy animals. Some disease organisms can be airborne and mites, which are suspected of being vectors of disease, can travel considerable distances to neighbouring vivaria.

Siamese fighter

Betta splendens

By Richard Friend

Siamese fighters can suffer from fin-ripping in a community tank.



THE RICE FIELDS AND CANALS OF Thailand are the home of the Siamese fighter, but the fish that swims there bear little resemblance to the spectacular fish that we have available in the hobby. The vivid reds, blues and greens that we have come to expect from the trade are insipid in the wild fish, and the flowing fins of the aquarium Siamese fighter, are short based and more practical in the wild.

Sadly, the reason for this difference is the result of the cruel 'sport' of betting on the fish to fight to the death, now fortunately banned in Thailand. The fact that male fish confined together would fight so ferociously did not escape the notice of would be fight promoters. However, the need for these fights to be swifter than they might otherwise be in the wild, resulted in breeding that produced the vivid colours and flowing fins that aid aggravation and attack.

The natural home of Siamese fighting fish, is small shallow pockets of water in Thailand and the Malayan Peninsula. The tank bred male can live in a small tank 40 x 30 x 30cm by himself. These fish, however,

will adapt to a community tank, but suffer from shyness and are often plagued by fin rippers. The water temperature should be around 25°C with a pH 6 - 8. Fighters can jump as well as fight, so keep a tank cover in place. They ask for no specific decor, although tall plants are appreciated.

In the wild, these fish live for little more than a year, and this fact has little improved with hobby fish and they tend to have a much shorter life-span than other community fish. They are not fussy eaters and will take flake and small pellets that will fit into their mouths. They also adore large amounts of live Brine shrimp and other live foods.

These fish are easy to sex but males can be very aggressive towards females if they are kept together in a community tank. If you want to breed them, then a small separate tank should be provided. The male will build a nest of bubbles on the surface although many males are happy to build their nest against the side or front glass. If the female is accepted and ready (the male can be fussy about who he breeds with) he will twist and embrace the female under the

nest as they release eggs and milt. The eggs sink downwards and have to be collected up and blown into the nest. As soon as the pair have finished spawning you must remove the female. The male cares for the young until they are free swimming at which time he must also be removed. ■

PROFILE

Scientific name	<i>Betta splendens</i>
Aquarium type	Small tank with one fish, or community with slow moving peaceful fish
Origins	Thailand, Malayan Peninsula
Diet	Flake, small pellets, Brine shrimp and other live foods
Temperature	23 - 26°C

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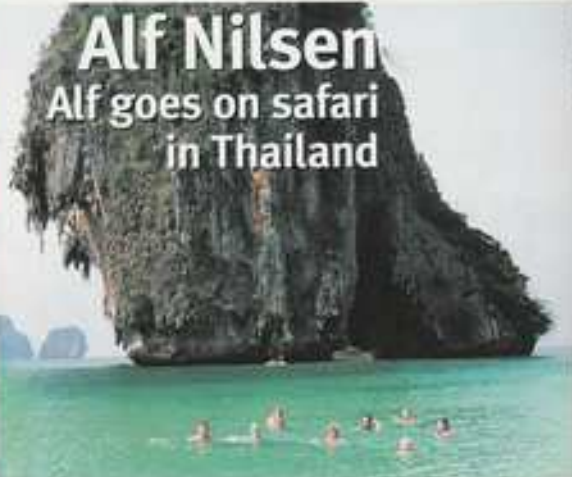
Derek Lambert

Betwixt and between.
Derek looks at the fish half way
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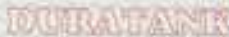
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...End Point

Only a few killifish are regularly available in aquarium shops, Peter Capon highlights one popular species, the Striped panchax, which beginners should be wary of

Golden wonder panchax are a beautiful new colour form.



Golden wonder

In the last few years a new colour form of this fish has become available in aquarium shops. It is a stunningly beautiful golden form of *Aplocheilichthys lineatus*. This new colour form has all the attributes of the original species, being hardy, easy to feed and suicidal if given the chance to jump out of the tank. You will usually find them offered for sale as Golden wonder panchax but may turn up under other common names.

IN THE EARLY DAYS OF THE AQUARIUM hobby the Striped panchax, *Aplocheilichthys lineatus*, was one of the few killifishes regularly available to the aquarist. Today, despite the advent of a wider range of species it is still one of the few found in aquarium shops, although its popularity has waned. Contributing to its lessening popularity has been its ability to take and swallow many of the smaller fishes kept in our community tanks.

My first experiences

In the early 1950's I was given my first pair of these fish because of the gusto with which they were consuming Neon tetras, which at that time were worth a king's ransom. Another drawback with these fish is their interest in jumping. While other Killis will make the occasional foray onto the carpet, Striped panchax seem to rate jumping as second only to swimming as a normal occupation.

It has been kept in aquaria since 1909 and has had a variety of common names such as: Striped panchax, Sparkling panchax, Lined panchax, Blue panchax, Decan panchax, and even just plain Panchax, which serves to show why scientific names are a necessity to both ichthyologists and aquarists when referring to any given fish.

What do they look like?

Striped panchax grow to about 7.5cm with occasional specimens reaching 10cm. The fish is elongated with a slightly flattened head. The jaws are large and open widely to engulf smaller fish. The body is olive with a brown or rusty cast becoming a pale yellowish on the

Diet

By nature it is a carnivorous top swimmer that prefers plenty of plant cover from which it will dart out at a good speed to take mosquito larvae or smaller fish. One specimen of mine would

take any living thing that was small enough to engulf and was particularly fond of earwigs which it swallowed partially so the pincers on the rear of the insect were left protruding from the fishes mouth.

belly. There are rows of greenish gold spots from the gill plate to the caudal peduncle. Some males have black vertical bars above the anal fin while others lack them.

The unpaired fins are blue to yellow and speckled and streaked with green and have a red border. The females are plainer and always show six or more vertical bars and a black spot at the base of the dorsal. Males have pointed anal and dorsal fins while the females fins are more rounded. The ventral fins in both sexes have the first few rays

extended to form points.

Between the eyes in the centre of the flattened head a small structure can be seen, this is the pineal gland, sometimes called the parietal eye or referred to as the third eye. This has been shown to be involved in secreting an adrenal hormone, aldosterone. This is responsible for salt and water balance in the fish. An extract of this gland has also been shown to effect levels of pigmentation. The gland is also reputed to be able to detect day length from sunlight. Many other fishes have the pineal gland but in this species it is easily observed.

Striped panchax are native to Southern India and Sri Lanka. They prefer a temperature of about 24°C, soft and slightly acidic water, although it is quite able to accept hard, slightly alkaline water without obvious distress.

Striped panchax make interesting fish which have been kept since the early days of the aquarium hobby but are liable to jump and will devour smaller tank companions. Kept with fish of 5cm or larger, however, they make ideal inmates for a community tank. ■



Striped panchax are pretty surface dwellers but have a large mouth and will swallow small Neon tetras whole.

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