Today's Fishkeeper

OCTOBER 2002 £2.95

FISH HUNTING IN THE PHILIPPINES

FREE!
Beginners' guide to tropical fish

PLANTS
Madagascan Lace plants

MARINES
Feeding invertebrates

TROPICAL
Discus communities

FROM BEGINNER TO ADVANCED

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Welcome

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With this issue you will be receiving the first of two beginners guides to fish keeping. If you have been keeping fish for the last 30 years then you probably won't need to read them, however, since new people start in the hobby all the time it is vital for a magazine to cater to all its readers needs. These beginners guides will be available to *Today's Fishkeeper* readers all the time now, so if you know anyone just starting in the hobby then get them to write in and we will send them a copy free of charge. Next month the marine guide will be with your magazine. If you have ever thought about starting to keep marines but been frightened off by all the horror stories and conflicting advice then this is the guide for you. It takes you through all the essential information you need to be successful in a simple to understand way.

The pond season is winding down now and with the weather this summer most people seemed to have ponds in their gardens - albeit only very shallow temporary ones. Looking at my devastated Hostas it is clear the slugs and snails have reached epidemic numbers in my garden. I hate using chemicals but if something is not done before winter really sets in then next spring there will hardly be a plant left standing. Even the poor old Marigolds completely vanished this year.

On the plus side it has been a good season for newts, frogs and toads in my area. With all the baby slugs and snails more amphibian youngsters than usual have survived to see their first winter and the ones I have found look to be fat and well fed which will give them a better chance of surviving the winter.

Until next month,
Happy fish keeping

Derek

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

As usual we have a packed magazine for you this month. In "Bringing Home the Discus" Mary Sweeney creates a community based around Discus. Many aquarists remember when Discus were considered very difficult fish to keep but, as Mary explains they are not so difficult now and make a wonderful display.

Lance Jepson, our resident vet, deals with a very serious disease which is one of the very few which can cross the species barrier and infect humans. Over the years I have met various people who have contracted this disease. Once diagnosed it was easy to treat but it does underline how important it is not to put your hands in an aquarium when you have an open cut or wound on them.

Despite the pond season winding down, we are entering a vital stage for many pond fish. Some fancy Goldfish need moving indoors if they are to survive the winter and those that are to stay out doors must be fed correctly to prevent health problems a few weeks down the road. Check out page 9 to see which fish you need to move indoors and read Dave Bevan's column to find out all you need to know about feeding your fish at this time of year.

For marinists we have 4 articles this month. Alf Nilsen completes his look at Stony corals, Max Gibbs looks at the effect collecting has had on the marine life of the Philippines, Antony Calfo shows you how to feed your invertebrates and Andrew Caine looks at some essential chemistry.

Enjoy!

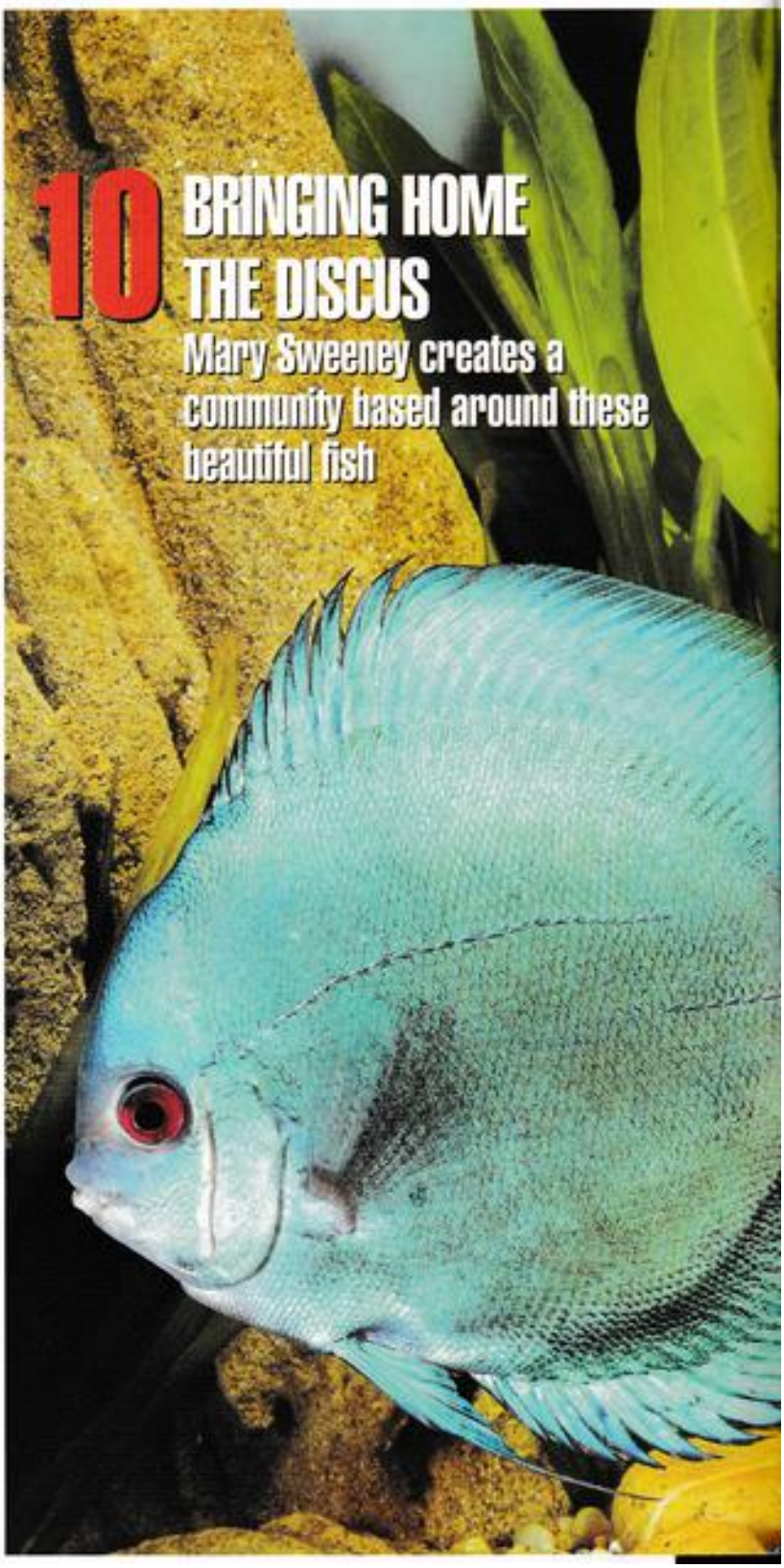
OCTOBER inside this i

TROPICAL/MARINE/COLDWATER

MARINE

Cut out and keep
83 Blue Ribbon Eel

PONDS & COLDWATER



10 BRINGING HOME THE DISCUS

Mary Sweeney creates a community based around these beautiful fish

ssue of Today's Fishkeeper

TROPICAL

BEGINNERS

NEWS & PRODUCTS

PLANTS

REPTILES & AMPHIBIANS

REGULARS

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

Starting Point...

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

The Three-lined pencilfish is a peaceful fish which at 5.5cm can be kept in a community of small fishes with a similar temperament.

MANY FISH KEEPERS I KNOW ARE also keen gardeners so out and about activities occupy much of their time. This does not mean they neglect their fish and aquaria indoors, but as the days shorten and the weather gets colder outdoor activities become less appealing and the aquarium becomes the focus of their attention. I suppose this is why September onwards is called the tropical season. It is a time when equipment is overhauled and renewed and stocking levels are reviewed. Maybe some ideas in your new set-up have just not worked and some changes need to be made. You may decide that you need a larger tank and have to make the decision as to whether you replace the current tank or buy an additional one. This is also a time when the wise fish keeper sets out to breed fish. Young fry need very close and careful nurturing and this is impossible in the holiday season. Youngsters cannot be left for several days without food as adults can. Dietary needs have to be satisfied and regular supplies of Brine shrimp, or other live foods, during those first few crucial weeks make all the difference. Cultures need maintenance. So, if you want to try your hand at breeding fish, now is the time to do it.

PEACEFUL COMMUNITY DWELLERS

Pencilfish are not so widely promoted as many of the other Characins yet they are gentle, beautiful species that are suitable for community living. Some are rather small but the two I would suggest for a community tank of small fishes are the Golden pencilfish and the Three-lined pencilfish. Sexing is fairly easy as males are very slim, a fact which gave them the common name of Pencilfish. Females are much plumper and a little less colourful. The Golden pencilfish at 6.5cm is one of the larger ones and at that size is able to cope with more lively companions and adapts easily to normal planted aquarium conditions. The Three-lined pencilfish, as its name suggests, has three distinct lines running from the snout to the tail fin. It is best to purchase at least six of this shoaling species. Brightly lit tanks are not appreciated and a well planted tank suits them best.

Silver needlefish are carnivores totally unsuited to small fish community tanks.

WE ALL MAKE MISTAKES

In our fascination for fish we sometimes purchase something which appeals because of its unusual appearance. Purchasing without forethought can be a very dangerous thing. In my early fish keeping days some needle like fish were spotted in a dealer's tank and, on the lookout for something a little different, I purchased one for my community tank. I soon found out I had made a big mistake. Looking through the literature I found it to be the Silver needlefish *Xenentodon cancilla* which would grow to 30 cm. The books told me that it was not a fussy feeder but ate mostly fishes and frogs. This fish was very skittish and easily frightened, dashing around the tank and hitting the aquarium lid and sides at great speed. Fortunately, it was in my quarantine tank from whence it went back to the aquarium shop the next day. I've seen an adult one of these since and when it opened its jaws and showed its mouthful of teeth I became fully aware of the big mistake I made. This stresses the importance of finding out as much as you can about a fish before you buy. There are some mistakes you should never make!

SEVERAL EASY, UNDEMANDING PLANTS

Dwarf bacopa *Bacopa monieri* is an undemanding plant which needs to be planted in a group of about 20 to look good. It needs quite good lighting but will tolerate a wide temperature range 18-26°C. The opposite small, mid-green leaves have slightly ragged edges. The Giant bacopa *Bacopa caroliniana*, although tolerant of temperature and hardness, is a little more demanding in its light requirements and also needs a nutrient enriched environment. Neither of these plants are difficult to grow and are good beginners' plants.

The Giant bacopa (*Bacopa caroliniana*) is a good choice for beginners.

Lost for Words

Adsorption The process by which a solid collects substances on its surface. In a filtration system contaminants are taken from the water and collected on the surface of a chemical filter medium such as activated carbon. This process should not to be confused with absorption where a substance is taken in and retained like water is soaked up by a sponge.

Annuals Some killifish live for a season in temporary pools where they lay their eggs which survive through the dry season when the adults die. The eggs hatch out when the rainy season comes.

Nothobranchius rachovii, like this blue form male, are considered annual killifish.

Cable tidy Commercial junction box for neat and safe connection of electrical supply circuits.

Hydra This pest is small but dangerous to young fry. It has a thin long body with several long tentacles spreading out from the mouth. It can capture several victims at a time, stinging and paralysing them until it's ready to eat them.

Lamella Thin plate like structure found in fish gills which is often referred to as a gill filament.

Selective breeding In which the breeder chooses which fish will be bred for his specific purpose. This method is often used to produce robust, healthy stock. Selective breeding of egglayers needing special set-ups to breed is the norm. Selective breeding of livebearers is much more difficult. This can involve line breeding of related stock if certain characteristics are to be fixed.

Stratification Layering effect which in water consists of warm layers laying above cold ones.

T piece T shaped pieces of plastic tube used to separate an air supply into two which, unlike gang valves, have no control over air flow.

FRIEND OR FOE?

Great pond snails can be a real menace once established in your pond.

PHOTO: DAVE BEVAN

It is much easier to introduce snails into your aquarium than it is to get rid of them. They are often transported in on plants and you can wash your plants with a molluscicide before planting them in the aquarium.

Most snails thrive in hard, alkaline water as calcium is needed to maintain their shells in good condition. Snails can become a real problem in a tank of livebearers as I have learned to my cost.

It is thought by some that snails will act as scavengers cleaning up the uneaten food and algae. Unfortunately, they will add in their own waste products, and many species of snails will decimate plants whose rotting vegetation will add to the waste pile. Dead snails, which may lie undiscovered, will quickly add to the pollution of the tank. Add a few snails to the aquarium and they can increase at an alarming rate leading to a population explosion. I have found that the only way to get rid of them is by hand, scooping them up in a net or siphoning them out. Most snails are nocturnal so it is a good idea to go on your snail hunt after the aquarium lights have been turned off for a while.

Malayan livebearing snails can cause major problems, although they do not harm plants or fish. These snails were a problem to me some years ago. The Malayan livebearing snail has an elongated cone shell with about eight whorls. It grows to about 2 cm. and buries itself in the substrate and only comes out at night, so you may be totally unaware of its existence. Bodies can lie rotting in the substrate and add to pollution. I first became aware that there was a problem with these snails when I looked in the tank at first light and discovered hordes of them climbing up the aquarium glass. This snail is **very** difficult to eradicate and I had to remove the fish, treat the tank with a molluscicide snail destroyer, completely clean out the tank, set it up with a new substrate and get rid of the old.

The Apple snail *Ampularia cuprina* is a useful snail to keep if you are breeding fish that require infusoria as a first food. If you keep them on their own in an unplanted tank and feed them on lettuce leaves, an infusoria is produced from their droppings. Apple snails have also been used by aquarists to rid their tanks of Hydra infestations. Snails in a tank can create more problems than they're worth.

Moving in for winter

Jan Wilkins from Edinburgh wrote in to say that every winter she loses all the Fancy goldfish in her garden pond and asks why

Celestials bred in ceramic bowls were meant to be looked at from above

Top tip

At least four weeks before you move your fish indoors set up their aquarium.

THE REASON THAT JAN'S FISH KEPT DYING when all the Common goldfish and Shubunkins were fine was that many Fancy Goldfish are just not hardy enough to survive the rigours of our winter. Those most at risk are any short bodied Goldfish with two tails. This means Orandas, Pearlscales, Lionheads and Moors are all at risk. Those which should survive are all the single tails like Common, Shubunkin, and Comet goldfish. Of the twin tails only Wakins should be considered hardy, if you look at their body shape it is similar to a Common goldfish's body.

Why the difference?

To answer this question you have to go back nearly 1000 years when Fancy goldfish breeding first became popular. At this time the Common goldfish colour first appeared followed by Shubunkins and other colour forms. These were all bred in ponds outside and had to survive harsh Chinese winters. The first twin tail forms appeared next and these are the fish we call Wakin goldfish today. Other even more exotic mutants appeared from time to time but could not survive in the harsh environment of a pond outside.

The next stage of development had to wait for technology to catch up and this came during the Ming dynasty when large ceramic bowls were being produced. These bowls enabled people to keep goldfish inside for the first time. Now the more exotic varieties were developed. Lionheads, Orandas, Bubble-eyes and many others were soon being produced. These fish were originally bred to be viewed from above and that legacy is most apparent with Celestials (their eyes point upwards to look at the sky) who may have trouble finding their way around a glass box but are perfectly adapted to life in a ceramic bowl. ■

WINTER CARE

In early autumn you need to sort out an aquarium for your Fancy goldfish. This should be as large as possible and have the best filtration you can afford. An external canister filter is ideal for goldfish because it can handle all the waste they produce. Sub-gravel filtration will usually clog up unless well maintained, and many of the small internal filters just cannot cope with the work load. Apart from a good filter you can really leave the aquarium bare . The fish really don't mind. If it is sited in your living room then you will want to furnish it. This can be simplicity itself. Five centimetres of aquarium gravel on the bottom, a few smooth rocks or other decor (but nothing with sharp points which the fish may bump into) and a background stuck on the outside. Add a fluorescent light above and you have a nice picture which is simple and easy to put together. If you want a planted aquarium then you will need two fluorescent tubes (one a plant growing tube) and be careful which plants you select. Vallis is probably the best in this sort of tank since they root quickly and deeply so goldfish are less likely to uproot them. Any of the oxygenators from your pond can also be used, but take cuttings of younger shoots and when you plant them use lead weights to initially hold them down.

TRANSFERRING THE FISH

Aim to bring your fish indoors shortly after the first frosts occur. At this time their metabolism will still be fairly active and they will not have gone into hibernation.

There are two main differences between the indoor aquarium and outdoor pond. Obviously temperature, which in many ways is the least of your problems and pH which may need some adjustment. Either way empty out 4/5ths of the aquarium water and refill with pond water. This is going to be mucky and may look a little green but will bring the tank water roughly in line with your pond conditions. Now carefully catch the fish out of the pond into a bucket of pond water and bring the fish inside. Carefully transfer them into the aquarium.

Over the coming week change 1/5th of the water every other day with fresh tapwater which has been treated with a water conditioner. After this you can switch over to a normal routine of 1/5 th of the water every week but make sure you go over the gravel with a gravel cleaner each week as well.

Feeding should not start until after the fish have been indoors for two days. Be careful not to over do the food. Although the fish may eat everything, their digestion may not be up to full speed yet. By the second week they should be ready for normal rations, but remember these are only as much as they can eat in 5 minutes twice a day and no more. Pondkeepers often overfeed their fish but get away with it because of the volume of water in a pond. Do that in an aquarium and your fish will be dead.

You can return your fish to the pond when all danger of frost has passed.

Bringing home the Discus

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

Mary Sweeney creates a community based around Discus

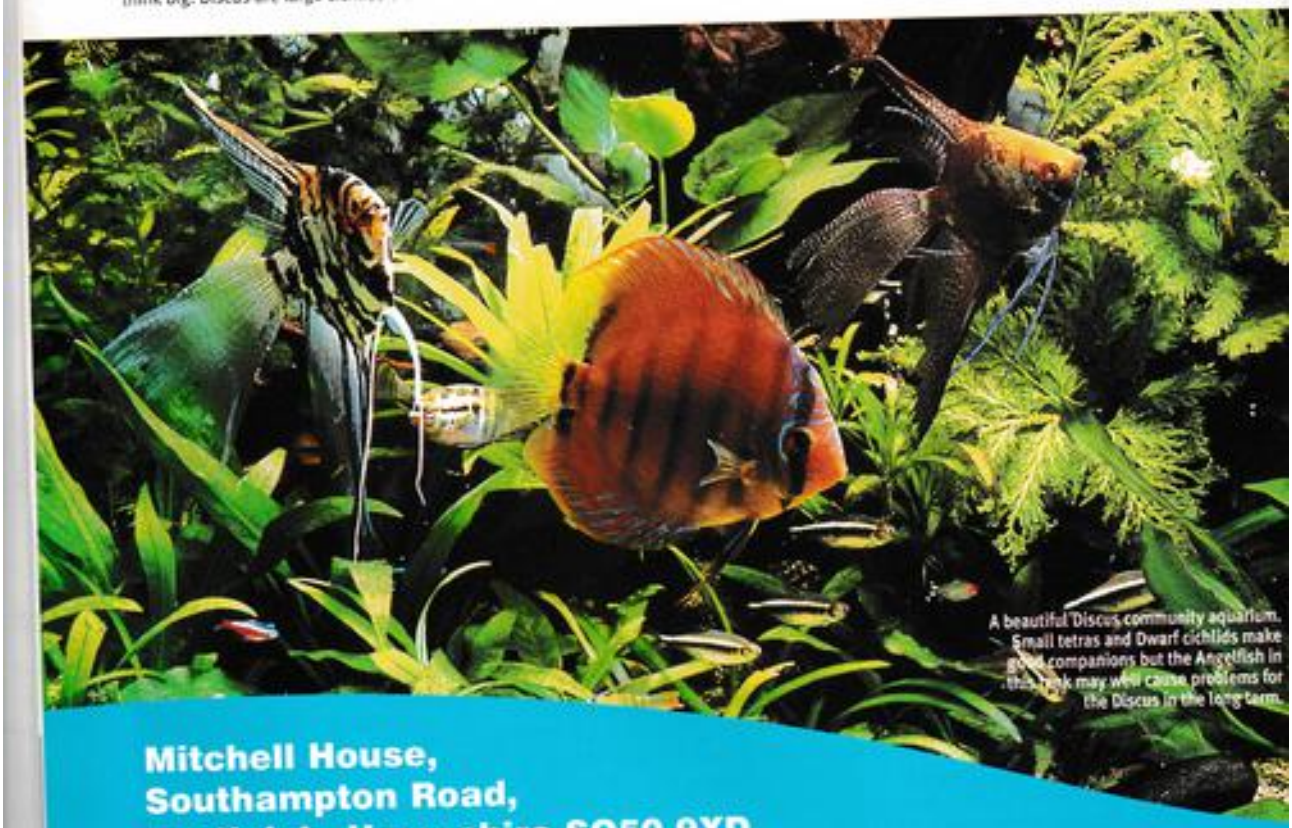
THE DISCUS IS ONE OF THE MOST SOUGHT-after fish in the aquarium hobby to this day. In spite of the enormous amount of political intrigue and misinformation surrounding the care and breeding of this highly attractive cichlid, there are many people who can and do keep Discus without any difficulty and certainly without losing either their minds or their mortgages. It's really quite simple: first, you find some healthy Discus.

Size does matter

Doing Discus right usually involves that you think big. Discus are large cichlids that absolutely require wonderful water quality. It does Discus a disservice when they are photographed by the pair in 20-gallon aquaria. A false impression is created. While Discus can be and often are bred in small tanks, this feat is achieved only through obsessive attention to detail on the part of the breeder and huge daily water changes. I'm not going there. Much as I admire Discus and enjoy keeping the fish, my days of lugging and slopping water about are long over. Still, I can and do keep Discus, and for what it's worth, they live long and prosper (and spawn regularly.)

An ounce of prevention

Before any fish goes into the Discus community aquarium, it must be quarantined and treated if necessary, and this includes the Discus. It is very difficult and risky to treat diseases in a planted community tank, so take the time and the effort to reduce the chance of disease in your pride-and-joy aquarium. Space forbids that I go into an involved discussion of quarantine at this point, but if you need help with the concept, please do the research before introducing any strange fish into this setup. Quarantine may not



A beautiful Discus community aquarium. Small tetras and Dwarf cichlids make good companions but the Angelfish in this tank may well cause problems for the Discus in the long term.

Discus come in many different colours, these are Blue diamond discus.

guarantee success, but it sure beats the alternatives. With sick Discus, a cure will absolutely cost more than a pound.

Size *really* does matter

Here's where I start getting into deep water. Give each adult Discus 70 to 90 litres of water. Am I saying that six adult Discus *need* a 500 litre tank? Not exactly, but add in six adult Discus with some schooling Tetras, Dwarf cichlids, some Corys, an Ancistrus or two, and a load of live plants, and all of a sudden that 500 litre tank looks just about right, and a very beautiful 500 litres it would be too. Not all of us, however, are so expansive that we need or want a 500 litres of water in the living room. Beyond the water quality issue, which can be managed with water changes and one or more of today's terrific filters, tank size comes down to a matter of proportion. Large fish look silly in small tanks. Small fish look silly in big tanks (unless there are a lot of them, in which case they can look wonderful, especially if there are some large fish as well.)

So let's talk about what we can do with 250 litres. I see three Discus, four if they're small, no more. Discus, like people, come in different sizes. Some breeders proudly produce dinner-plate sized Discus, but most wild Discus are somewhat more modestly sized at about 12.5 to 15 cm.

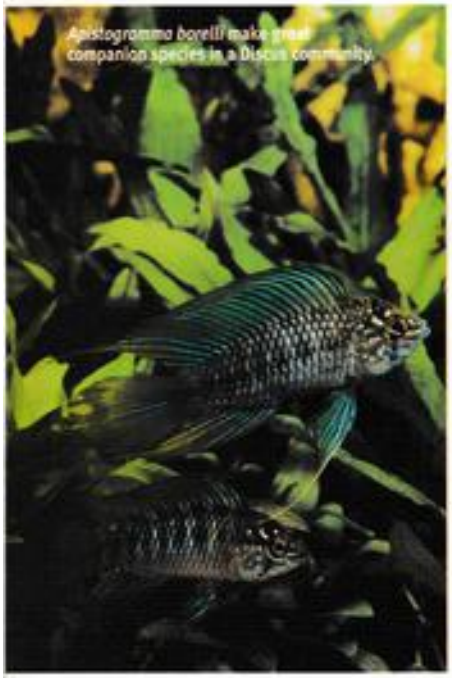
Ultimately, the choice of how many fish to put in a given tank size relates to how easily the water quality can be maintained. One Discus purveyor I know puts two or three hundred 7.5cm Discus in a 500 litre tank. It's quite a sight, wall-to-wall Discus. His knowledge of the fish and how to maintain perfect water quality, however, are without peer, and these fish are flawless.

The supporting cast

A lot of Discus experts scowl at the notion of tankmates for Discus. This is reasonable if the goal is to breed Discus. In this case, Bristlenose plecos (*Ancistrus* spp.) and/or just about any of the species of *Corydoras* that can take the heat, are about the only realistic tankmates. If the keeper is careless about quarantine, it is also inadvisable to keep other fishes with Discus, as there are times when fish carry diseases but do not exhibit the symptoms themselves. That is why you sometimes hear about serious fishkeepers putting one of their own fish in with the quarantined fish. If the "homey" fish gets sick, you know not to introduce the newbies to the general population.

It goes without saying that we don't want to team Discus up with fishes that annoy or harm them, but there are plenty of benign tankmates that can be kept with Discus. Once it has been determined that the species are compatible with the Discus, it remains to be seen whether they will do well in the conditions preferred by the Discus, most importantly, the temperature and water chemistry. While Goldfish would certainly not annoy or harm Discus, they would be severely challenged if kept in the 26 to 30°C water temperature of the Discus aquarium. It's also worth mentioning that Discus, cichlid that it is, will eat any tankmate small enough to swallow. Cute, baby Cardinal tetras are expensive Discus food; adults are not.

Schools of South American tetras, such as the Cardinal and Neon tetras, the Rummynoses, Lemons, and even the African Congo tetras are all delightful especially when there is a proper school. This means a minimum of six fish of the same species with eight or more fish being even better. When adding Tetras to the established Discus community, be aware that they may not have been kept in water quite as warm as the usual Discus tank and should be acclimated carefully. Tetras, believe it or not, can be much more delicate than the Discus themselves. In fact, the colour of the Tetras can give you a quick read on your →


Apistogramma borelli make great companion species in a Discus community.

water quality. Rummynoses especially will not look very rummy if the water's not right.

Ancistrus spp. (Bushynose, or Bristlenose plecos) are the loricariids of choice for the discus aquarium, and the only suckermouths I trust with Discus. And they do a fabulous job of keeping the tank free of green and brown algae (brown algae—diatoms really—can be a nuisance in the Discus aquarium because we generally prefer to avoid really bright lighting.) Bristlenoses are about the only suckermouths that can be trusted not to rasp the slime off the sides of the Discus which is a bad habit of the other pleco species, particularly *Hypostomus*—which is fatal for the Discus. Chinese algae eaters (*Gyrinocheilus aymonieri*) behave similarly, only worse! *Crossocheilus siamensis*, the Siamese algae eater, however, is fine with Discus.

South American dwarf cichlids (*Apistogramma, Microgeophagus, Laetacara, Aequidens*) and the Flag cichlid, *Mesonauta festivum*, are all good candidates for the Discus community as well. It's tempting to try to keep a pair of each of these beauties in the community, but be aware that Dwarf cichlids don't generally play well together and stick to just one pair of your favourite species.

READY, STEADY, GO!

Having procured the aquarium and other necessary equipment, set the aquarium on a flat surface with a piece of cushioning material between the tank and the stand. Make sure the tank is level. It is really quite aggravating (and very noticeable) when the waterline is slanted relative to the top frame of the tank. The cushioning material also serves to conserve heat in the aquarium, and this can be a lifesaver in some older, drafty homes.

The "ABCs of Setting up an Aquarium" are addressed elsewhere in *Today's Fishkeeper*. I will only mention elements that I see as being different ,or especially important, for Discus, such as the use of the cushioning material under the tank for preservation of warmth. It may behove you even to consider the use of undergravel heating for this community. By all accounts the plants thrive with this heating and it would be one less piece of visible equipment disturbing the visual serenity of your magnificent creation.

Caveat, caveat

While it seems that Angelfish should keep well with Discus, it just doesn't work out in the long run. The Angelfish really are too aggressive for the Discus and are too competitive for both space and food. The Discus may be larger and seem well able to hold their own with the Angelfish, but it's just flirting with disaster to try to keep them together for any length of time. The same holds true for Clown loaches. Many people feel compelled to try to keep these jovial and generally excellent community fish with Discus, but it appears that Discus are not easily amused and do not take kindly to being wakened by the nocturnal antics of the Clown loaches. All too often the Discus will be found on the floor in the morning, having leapt from the tank through the smallest of openings after having been startled from sleep by some rowdy insomniac on the prowl for a bit of excitement. Now that I've brought it up, Discus should never be wakened rudely (The same goes for me). It's always best if you can turn on a low room light ten minutes or so before turning on tank lights over sleeping fishes.

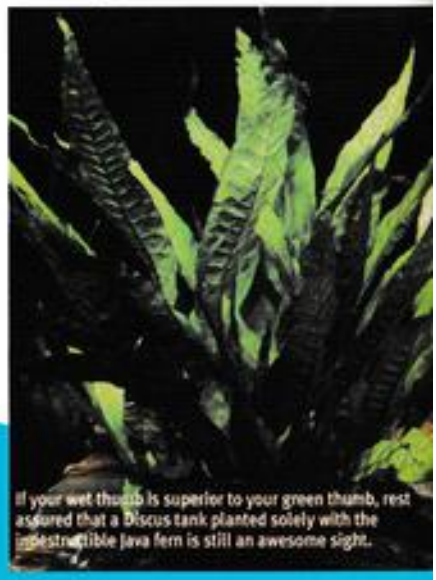
Filtering for Discus

If the ammonia is rendered impotent by low pH in Discus tanks, why all the fuss about massive water changes? In my opinion, Discus do not need 100%, or even 50%, daily water changes to be healthy. I believe this to be one of the biggest fallacies in fish keeping. I do, however, advocate excellent mechanical filtration, not only to remove particulate matter, but also to substantially reduce the possibility of disease. Gill flukes, those ubiquitous Discus pests, are significantly reduced in water that has been micron or diatom filtered. Parasite eggs, bacteria, dissolving organic matter, all are removed by fine-particle filtration. Good mechanical filtration is the forefather of the 25 to 50% weekly water changes that suffice for a well-kept Discus community aquarium. If your aquarium requires larger water changes to maintain water quality, try not to change more than 25% at a time, and that change should be with warmed and chemically similar water. And if the aquarium does require large, frequent water changes, look carefully at how much, how often, and with what you are feeding the fishes.

When fine mechanical filtration is provided, the need for biological filtration is relatively less. Plants also contribute to a reduction in the need for heavy biological or chemical filtration. By this, I am not saying that you don't need a biological filter, but more that it need not be disturbed so often, and this increases the stability of the water chemistry enormously.

Plant life

Plant heavily from day one. In every aspect, the Discus community will be improved by planting fully from the outset. Like with Discus fishy companions, your choice of plants is largely based on which ones thrive


If your wet thumb is superior to your green thumb, rest assured that a Discus tank planted solely with the indestructible Java fern is still an awesome sight.

A WORD ON WATER

The water you use in the Discus aquarium would ideally be soft and acidic like in the Amazon, but generations of Discus have been kept in water with less than ideal ,but very clean and consistent chemistry. In a perfect world, every Discus keeper would use reverse osmosis and deionized, minerally reconstituted water, but this is not an absolute requirement to keep Discus. Knowing how far you can push the envelope on the water chemistry is usually acquired with experience, but it helps if you know what type of water the fish you purchased are accustomed to, and make any changes very gradually.

While Discus may be willing to compromise on water hardness and even pH, they are less likely to forgive being chilled, so be sure to keep the water warm enough. Thirty degrees centigrade is not too high for general keeping. Thirty two degrees is therapeutic. It is often advised that these temperatures be achieved through the use of two heaters rather than one in case one of the heaters fails. It's wise advice and well followed.

On the subject of pH, aquarium water has a tendency to become acidic over time, which probably has a lot to do with why Discus look so happy in old, established tanks. If your tap water is alkaline, it is best to lower the tap water to the pH of the aquarium water before intermingling. Fish suffer more from increasing pH than from decreasing pH. In acidic water, ammonia is in its non-toxic form, ammonium. To suddenly raise the pH from 6.0 to 7.0 will cause ammonium to convert to toxic ammonia. Even if the ammonia levels aren't lethal, the sudden increase in ammonia will certainly stress your fishes.

(not just survive!) in the conditions preferred by the Discus. Some species that work well include Pygmy chain swordplant (*Echinodorus tenellus*), Dwarf anubias (*Anubias nana*), Corkscrew val, (*Vallisneria torta*), Java fern (*Microsorium pteropus*), Amazon swordplants (*Echinodorus amazonicus* and others). There are many other plants that can be used, but then we move more into the realms of aquatic gardening.

Use fine dark gravel or coarse sand for your substrate. Builder's sand is not appropriate. The bright, light substrate sounds like a good idea, but it gets very dirty-looking and Discus look and feel their best against a dark substrate. A black substrate and background can be stunning.

I hope this article will give you a bit of confidence in dealing with Discus. There is much more that can be said about these remarkable fish. They're well worth the small amount of extra attention they require, and frankly, I feel the Tetras will be more challenging than the Discus. ■

Tropical Q&A

BROUGHT TO YOU BY NUTRAFIN & FLUVAL

It is very easy to build stocking levels up to a dangerous point just by adding one or two new every so often.

Over the limit

Star Letter

I have for quite some time been interested in keeping tropical fish but never had the nerve to do so as the thought of it was quite daunting, however, about six months ago I was given a complete tropical set-up including fish by an elderly lady who could not cope with the upkeep any longer. I immediately went out and purchased a couple of magazines and a couple of decent books and started to swot up on the subject. I have been carrying out weekly 40 litre water changes with the use of a couple of old 20 litre beer making barrels and cleaning the filter sponges weekly in old aquarium water - so far so good. The tank is 90 x 30 x 37.5cm, filtered by 2 x fluval 3 plus and the test results show pH 7.8, Ammonia 0.0, Nitrite 0.0, Nitrate 40, Temp 24°C. I believe, however, the tank I have inherited is slightly overstocked. I currently have 6 *Corydoras sterbai*, 6 Tiger barbs, 5 Zebra danios, 5 Harlequin rasboras, 5 Black neon tetras, 5 Cardinal tetras, 2 large Scalare angelfish, 1 25cm Plec, 1 5cm Tiger plec and 1 10cm Red tailed black shark. Am I overstocked ?

Mark Brinson, *Weston-Super-Mare.*

It does appear as though you are over your limit. I suggest that your aquarium has only been able to handle this quantity of fish by virtue of its maturity. It would take many months to be able to achieve similar stocking levels should you wish to do so in a new aquarium and if any problem developed in the filter system your fish would be in serious trouble very quickly.

Ben Helm.

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

Which substrate?

Q **This weekend I purchased a *Rena* 1200 x 500 x 700 (440 litre) set-up, with the purpose of setting up a sort of Amazon tank using slate, bogwood and natural plants. Should I add a substrate fertilizer under my gravel or add a gravel mix that was recommended by a retailer. Can you also tell me what the life span of the substrate fertilizer is and if it will leak toxins back into the tank once its reached the end of its lifespan?**

A A planted tank should have inert gravel mixed with an inorganic iron-rich clay additive (laterite) in a ratio of about 1:6. I have used this material for a planted tank that is now nearly 4 years old and the iron-rich clay particles are still very evident. If you use this type of inorganic substrate you will not have any problems. However, should you choose to use an organic peat-based substrate, you will experience anaerobic problems 6 months down the line which will mean having to strip your tank down.

Ben Helm

Female Guppies should produce broods every 4 weeks - but not always.

Forever pregnant

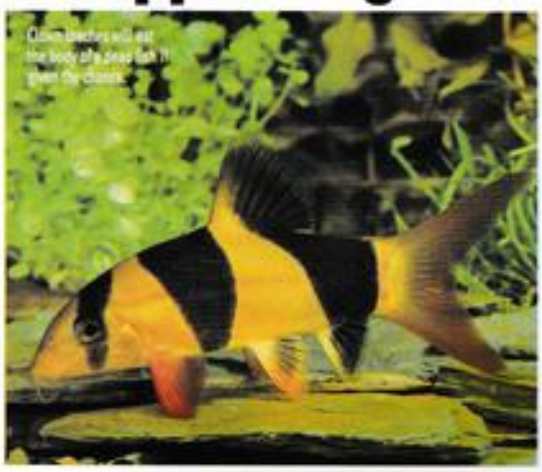
Q **I have a pregnant female guppy who seems to have been pregnant for ages. She has looked like she is about to drop for the last couple of days but hasn't. Is there any way in which I can induce pregnancy?**

Mathew O'Neill *via e-mail*

A There is no safe way to induce a female livebearer to give birth. They will drop their young when they are ready not when you want them to. What might help is providing her with plenty of cover so she can get away from the other fish. If she feels threatened, or the environment is not suitable for the babies to be born in, then she may well hold on as long as she can before giving birth.

Derek Lambert

Disappearing fish



Q **Is it normal for quite a large Gourami to just disappear without a trace (I mean everything)? We think that a Clown loach has eaten it but the loach is only a sixth of the size!**

Mark George *via e-mail*

A Your Gourami almost certainly jumped out through a tiny gap you thought it could not have escaped through. Once on the floor it would live quite some time and flip around eventually moving some distance from the tank. Check all round and see if you can find the body. A Clown loach a sixth the size of the Gourami would not be able to consume the whole of the body very quickly.

Derek Lambert

Today's Answers Expert Panel

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

Questions by Post

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

Internet Service

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

Tropical

Q&A

Driven to distraction by algae

Q I wonder if you could help me with a problem I've been having for the past few months. I'm having a lot of problems with a hair type algae which is covering the whole of my tank. The tank is in an alcove in main lounge area and never gets direct sunlight at any time of the day, the room is west facing and the tank would on a good day receive plenty of daylight. It has twin 30 watt standard natural fluorescent tubes, at the minute they are on from 9.30am - 8.45pm, one long period. I was informed by my local aquarium shop to reduce this timing to help my algae problem and for one month it ran from 13.00pm - 17.00pm, but this adjustment in timing didn't help so it's back to it's original settings. Tube Age = 11 months approx. I have a mixed community of 31 fish including 4 "algae eaters". At the moment I don't have any plants due to this continuing algae problem. They have slowly been taken out, as it grew over all the foliage until they looked so unsightly that they have been done away with. The test results after two weeks are as follows :- pH 6.5, Phosphate = 0 ppm mg/l, and Nitrate = 40ppm mg/l. I've tried some of the well known algae treatments and yet it still comes back every two weeks. I clean the tank out every two weeks, cleaning glass, remove everything from it, scrub the rocks, bogwood, even remove the plants and clean the foliage but still it returns. After weeks of this I took all the fish out, emptied the tank, cleaned it from top to bottom, renewed the gravel, new filters, new plants, set it up again, two weeks later it was back again. The tank seems to remain clear after cleaning, but into the second week it begins with spots of it appearing on the glass, stones and bogwood. Then as the week goes on it grows very quickly covering everything. 20% of the water is changed every two weeks while I'm cleaning the gravel, if I leave it any longer the job of cleaning the tank turns into hours of cleaning and scrubbing the decor. Please help if you can !!

Robert Mayne, *Ireland.*

A Right, you have plenty of fish - probably well fed, plenty of daylight, and no growing plants. Result algae. I do hear that the plants were originally removed because they became unsightly with algae but I suspect you never had a great many. The nitrate level you quote will be enough to feed plenty of algae. The solution is lots of growing plants plus patience and tolerance. First of all replace your tubes. They are over the hill and not producing light of the correct spectrum. Replace them with 1 plant growing tube and 1 colour enhancing tube. Next buy in lots of plants. Try Vallis, Amazon swords, Java fern, and Cryptocorynes. Not the odd one of each but 100 Vallis right along the sides and most of the back, a group of Amazon swords , Cryps a nice sizable group, and Java fern. This can be tied on to your bogwood with fishing line until it gets a grip of its own accord. Once all your plants are in position set your lights to come on from 12pm to 9pm. With the amount of daylight reaching your tank you should have just about the correct lighting. Now come the other two ingredients - patience and tolerance. Be patient with the set-up and tolerant of some algae. This is most likely to grow on the front and side glasses. Clean it off when you do your normal water change. Otherwise let the internals of the tank settle down. Don't remove and scrub the decor. You may still get an algae bloom and some plant leaves will have a growth. Once your plants really start to grow, however, you will find the algae is slowly starved to death. It takes about 6 months to fully mature such a system and it will be at its worst in the first 2 - 4 weeks. Why some tanks are more prone to this sort of problem than others is a complete mystery but usually it means you have a tank that once it has settled down will grow plants just as rampantly as it did algae.

Derek Lambert.

Can old tank water help mature my new aquarium?

Q **Can I use the old water from my existing tank to speed up the cycling of my new aquarium ?**

Peter Gladstone, *London.*

A Using old aquarium water will help speed up the maturation of a new aquarium. Also squeezing or exchanging some of your mature filter media with that in the new filter will help. Even so it will still take weeks to mature your new tank.

Ben Helm.

Disturbed by noise

Q **I am thinking about getting a fish tank for my room (a Juwel 180), and was just woodering about how music from a stereo would effect the fish. I was worried that if the music was too loud it could be disturbing to the fish?**
David Paterson, *via e-mail*

A Your fish will adapt to normal levels of music. For them it will sound much like a waterfall in the wild does. My own fish used to line up along the front of the tank to watch TV when action films and Top of the Pops was on! They ignored dull dramas and political programmes.
Derek Lambert

Switching filter media

Q **Can you use Sintered glass, Biotic rock etc, or any filter media that has been used in a marine set-up and then use it in a tropical set-up and visa - versa?**
Paul Leeman *via e-mail*

A Sintered glass products are inert and will not cause any cross contamination or water quality problems between the two set ups. My reservations would be when transferring it from Marine to Freshwater, as calcareous sessile invertebrates would soon colonise the material. This can prove difficult to remove and would buffer the water in another aquarium, making it difficult to achieve an acidic or soft water environment. Furthermore, there may be a risk when transferring it from freshwater to marine of transferring copper from copper-based treatments that may have been used in a freshwater aquarium. These could leach out in a marine set up, proving toxic for marine invertebrates.
Ben Helm.

Star Letter Prize from Hagen

This month the writer of our star letter wins a 2 Litre bottle of Nutrafin AquaPlus and a 2 Litre bottle of Nutrafin Cycle worth over £60!

Nutrafin AquaPlus removes the chlorine, chloramine and heavy metals present in tap water which can be harmful to fish.

Nutrafin Cycle is the most powerful biological supplement currently available. Each millilitre contains 100 billion friendly bacteria, which help destroy harmful toxins such as ammonia and nitrite.

www.hagen.com

Marine

Q&A

Andrew does not know of any person being bitten by a Black line fang blenny but that does not mean, that it has never occurred.

Star Letter

Blennies with bite

Q **I have just purchased a fish called a Beaver blenny at my local fish shop, however, the shop did not know much more about the fish than I did. I have since done some research and found it is called *Meiacanthus nigrolineatus* (Black line fang blenny). I currently have mixed inverts (Starfish, Peppermint, Boxing and Cleaner shrimps, Hermit crabs, Mithrax crab, snails, polyps and several hard and soft corals). I know I have taken a chance by not having all the facts on this fish. Can you help me with more details as none of the info I could find related to their aquarium compatibility and size .They were just facts on the wild animal and one web site stated they are venomous. My fish stock is one Clownfish, one Court jester, one Mandarin fish and the Beaver blenny**

Nick Honor via e-mail

A We all fall for the trap you have dropped into, only the most restrained of us will ask for the fish to be reserved until we have researched it. Let's say you have been lucky on this occasion as your little beauty should cause you no trouble at all, unless it bites you. *Meiacanthus nigrolineatus*, also known as the Black line fang blenny, contrary to the impression of the common name, is indeed a very peaceful fish which will not bother any of your current fish stock. It will grow to around 9.5 cm and ,as with all fish, requires a varied diet of vitamin enriched foods. Normal water conditions for a reef aquarium are required, with a minimum size of 100 litres. There is a small risk that when it grows up to be a big boy it might, and I state might, pick on some of your small shrimps but this is a small risk.

Like all Fang blennies we have the situation of a venom carrying animal injecting toxins via a pair of fangs. Intoxication only occurs when the animal bites which is normally only utilised in defence. It has been observed on many occasions to be engulfed by a predator, only to be spat out rapidly, swimming off unharmed leaving the predator with a severe case of toothache.

Andrew Caine

Q **I am sending you a picture of a fish which I have had for around 10 months now. It is about 7.5cm long and at first everyone, including the fish shop where it was bought, thought that it was a juvenile Yellow tang. As it got older it developed the spots and stripes and has gradually taken on a much darker hue. It's obviously an algae eater but also takes flake and frozen foods. It's never still and is always browsing on any algae it can find, but doesn't seem to bother with the Coraline. It is forever chasing other fish around no matter what size they are, and has annoyed two 10cm Blue cheek gobies so much that they keep jumping over the outlet comb and dive down the 4cm overflow pipe into the sump. In fact they have done this so many times that I have left them there until I move the offending fish.**

Ian Goulding *via e-mail*

A The beautiful fish you have is a Caribbean Blue tang *Acanthurus coeruleus*. I can see why you and others thought it was a juvenile Yellow tang *Zebrasoma flavescent*, especially if you purchased it in its juvenile coloration as, when young, the Blue tang is indeed yellow with a blue edging to all the fins and around the eye. That, along with a striped appearance over the body, is the most common visual difference between the Yellow tang and juvenile Blue tang.

From your picture I see that yours has now grown up a little, but is not yet in the full adult form. When it is, boy oh boy are they are stunning! The Blue tang requires a very large aquarium, at least 2 m in length, as it will grow to 35cm and requires loads of open space to swim with acres of grazing surfaces. This species has evolved a very thin walled stomach so it is very choosey in what it eats. You can observe them taking algae and spitting out any accompanying detritus. So feed it well, many times a day or leave seaweed in the aquarium attached to a lettuce grip for grazing, all tangs like this.

This fish lives in small groups in the wild ranging from two to around fifteen. When introducing them to captive care the group is often split up. This results in some, but not all, single specimens developing an aggressive nature. Other reasons include too small an aquarium, lack of diet or mainly because the aquarium is now its territory. Remember this fish requires plenty of open space, so when we are talking about territory the whole aquarium is exactly that, unlike a Blenny which requires a small space around a rock hole.

I feel that you should sell this individual on, but please remember to let the purchaser know of its nature. When transported to a new home, with a good fish stock this fish might not be able to establish a territory so it may lose the aggressive behaviour. This is quite common and stranger things have happened.

Andrew Caine

When to skim?

Q **I have set up a 400+ litre tank which includes a Prism skimmer. According to the skimmer instructions, it can be used on new set-ups. What is the point of this? I have tried it, but I might as well just take the water straight out of the tank with a jug as all I am getting is clean water. Surely the instructions are wrong and you have to wait until the tank is well on its way to maturing and there is some "dirty water" to remove.**

Paul Leeman *via e-mail*

A New systems may not require a skimmer on from the start, however, if a quantity of live rock is introduced then a skimmer is required from the day you introduce it to remove the resulting surge of organics. The Prizm is a very good skimmer in the 400 litre class, and requires a 'running in period'. This is to allow for a bacteria coating to develop over the surface of the reaction chamber. Only when this has developed will good skimming occur, until then, a clear liquid is retained in the collection cup. You also have to balance the flow rate through the skimmer, too fast and only water collection occurs, too slow and no collection occurs, you have to balance the flow rate when the equipment is run in. Once you have done this your skimmer should perform well.

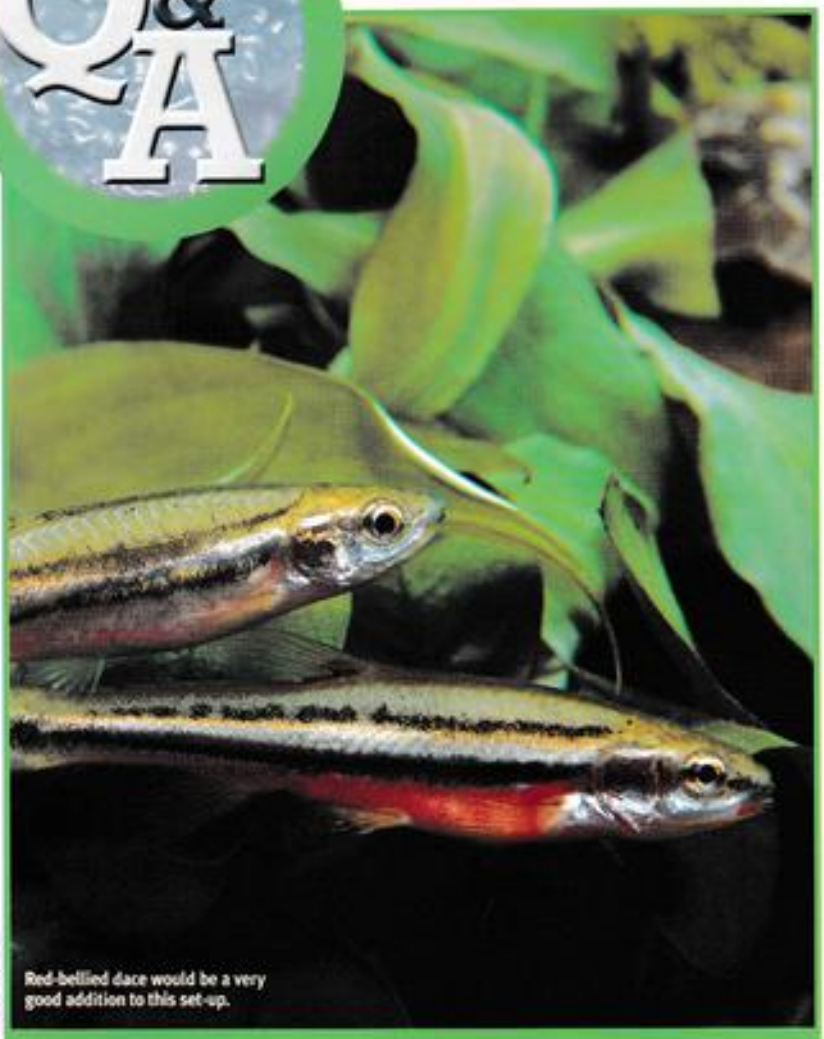
Andrew Caine

Star Letter Prize from AQUA MEDIC

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

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

Coldwater Q&A



Red-bellied dace would be a very good addition to this set-up.

What other fish and plants can I keep in my aquarium?

I have an aquarium containing five Minnows, a coldwater Plec and two Bitterlings. Can you advise me on what other fish I can keep in this aquarium and what sort of plants would be suitable for this set-up?
Craig Mason *via e-mail*

There are quite a few different fish you can keep in this tank. Apart from Red shiners and some of the North American cyprinids, a few of the so-called tropical fish could be added to a coldwater indoor aquarium. A really good addition would be Rosy barbs, or one of the Mexican livebearing Goodeids. Be careful, however, not to overstock your aquarium.

Plants for a coldwater aquarium can be a bit thin on the ground in many aquarium shops. Obviously all the oxygenating plants sold for ponds can be used. Hornwort and Elodia are really good choices, as is Vallis. *Ludwegia brevipes* is another excellent plant but difficult to obtain, however, any of its relatives are worth trying. Likewise *Hygrophila* and *Bacopa* species can be tried. Depending on the species, lighting and temperature range they may be successful.

Catfish quandary

I have just set up a 90 litre aquarium and have four Fancy goldfish, two Red-bellied dace and a Weather loach. I would like to add a blue Channel catfish but have been told by one shopkeeper that they grow too big and will eat the other fish which is why he will not sell them. Another shop just down the road has them in stock and says they are peaceful community fish which will fit in my community perfectly. Who do I believe? Is one shopkeeper ignorant of the nature of this fish or is the other shopkeeper wrong and only wants to put me off buying fish from his nearest competitor? I really don't know which way to turn since these are the only two shops within easy travelling distance of my home.
James Headley
via e-mail.

At least this conflicting piece of advice will give you a guide as to which shop to buy from in the future. Channel cats are nasty predators which grow far too large for normal aquaria. In a pond they will slowly devour all your fish, but since you never see it happen you will probably blame a Heron!

Can I keep a Ghost koi indoors?

I have a mixed collection of Goldfish in my aquarium but would like to try adding a Ghost koi. The tank is 90cm long and filtered by an internal power filter. Would my new addition cause problems with the Goldfish?
Jane Grimshaw, *Leeds*.

Your aquarium is far too small to house a Ghost koi long term, they simply grow too large and too quickly for the average indoor set-up. Koi, of all types, belong in large, well filtered outdoor ponds. Sadly most do not end up in that sort of environment and live far shorter lives than they should because of it.

Sea view

In his regular marine column **Andrew Caine** introduces a lovely but difficult fish, a great invert and touches on some essential chemistry for a marine keeper

A fish for you

FATHEAD ANTHIAS *(SERRANOCIRRHITUS LATUS)*

Anthias, what beauty abounds our coral reefs and there is none more so than in the sub family Anthiinae, for here lie the Coral perches, without a shadow of doubt the most beautiful and delicate fish. No artist alive could create such vivid beauty but slam on the brakes ,do not go out and purchase just yet.

There are a few aspects to consider when looking at this group of fish, forget about the colour and the reef compatibility, let's look at their other traits. First and foremost is their diet. In the wild they hover around coral heads picking off small planktonic animals as they pass by. In the aquarium you will have to feed at least twice per day, the more feedings the better, or they will stress out and quickly die. They also exhibit great shoaling behaviour, one that must be met in the aquarium. Purchase no fewer than five but ten is better. These will take up quite a bit of stocking space and put pressure on the pocket.

Another unusual fact is that, like the Clown fish, they can change sex. If the large male dies then the largest female changes sex. In some large groups scientists removed all the males at once, the exact number of females then started to change sex.

I have chosen the Fathead (also known as Sunburst basslet) because they are the more hardy of all the family even though they are not the most colourful. These will live happily on their own or in small groups of less than five. They shimmer in the light and are a fantastic sight to behold in any aquarium.

You will have to feed at least twice a day with small meaty foods such as Brine shrimp, Mysis, chopped cockle and mussel, and don't forget those vitamins to enhance vitality and coloration. Live Brine shrimp once or twice a week will be gratefully received.

They originate from deeper down the reef slope so are not used to intense light. When acclimating to your aquarium, turn off the lights and leave them off for the rest of the day. In the morning you will have a de-stressed fish, that will live without light stress for the rest of their days.

The more hardy species will still need a very high level of water quality, with total oxygen saturation, so they are only fish for the more experienced marinist. Expect to pay around £30 - £40.00 each. If you decide to keep them it is a good idea to order some as they are not common and you will probably have to wait a while for your dealer to acquire them for you. You won't be disappointed with this beast, I personally would sell my body for one, but there are not many blind dealers around!

PROFILE

Family
Serranidae

Name
Serranocirrhitus latus

Location
Indo Pacific

Size
9 cm

Feeding
Small, meaty, vitamin enriched foods at least twice per day.

Reef compatibility
Great reef fish

Difficulty
Medium/Hard, for the more dedicated aquarist

THE FINGER SPONGE (*HALICLONA* SP)

Sponges that are brightly coloured and have great shapes, what more could anyone want and just look at this beast. They have a reputation of dying easily in captivity, so why keep them? You need to know your animal, then you will be able to keep them for many years in the aquarium. So my friends, let's look at what makes this little baby happy.

Go to the bathroom, get down that sponge you bought on holiday and never used yet, chop a bit off and you will see that it is full of holes. These are part of a complex water transport system within the animal and as water passes through it is filtered and then exhaled.

The Finger sponge is full of microscopic stiff hairs all lining the water canals through the animal. These are constantly beating, drawing water in through the beast into a much larger exhalent canal. The aperture or 'hole at the top' of this canal extends up into the water column. Here, a localised pressure drop occurs as the sea passes over the sponge. This results in the filtered water within the beast being sucked out . So, when placing it in the aquarium look for a strong current to help the water flow through the animal.

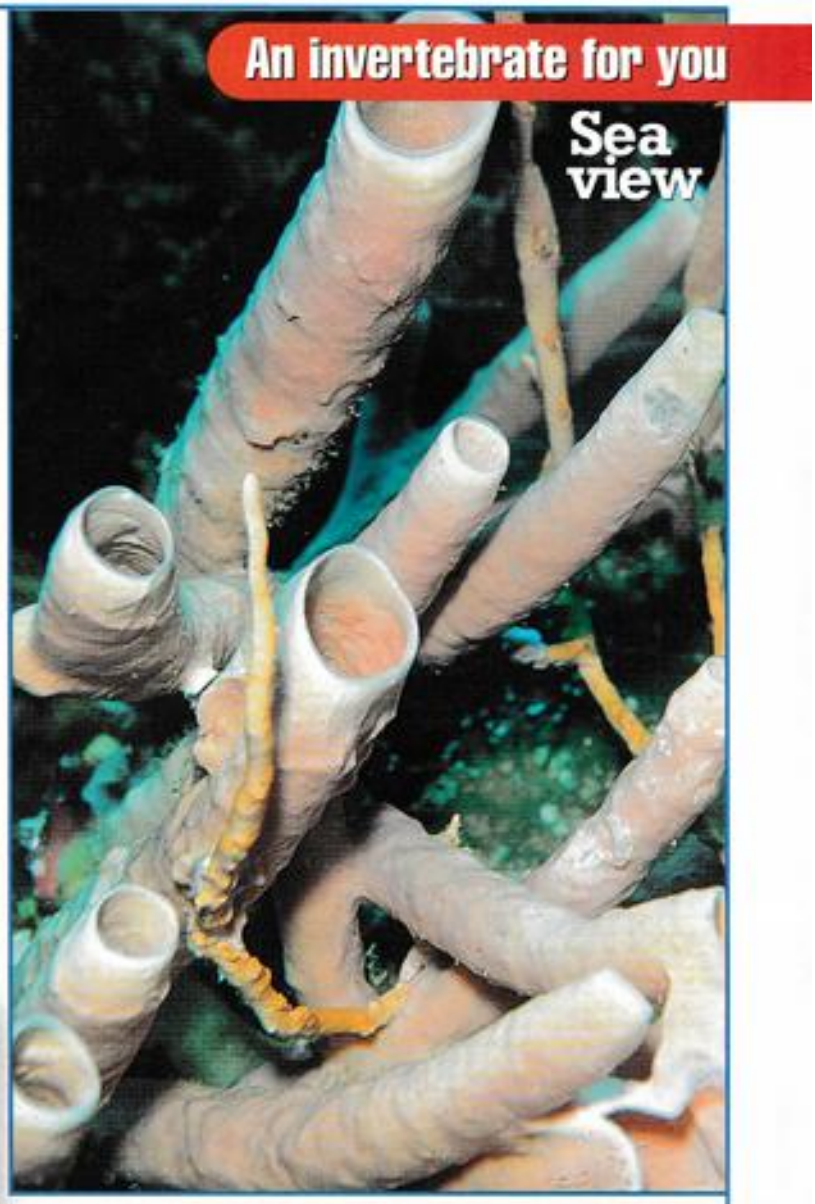
Filter feeders indeed they are , but these are fussy about what they eat, fussy that is in particle size. Large particles are rejected at the surface of our beast, finer particles are trapped inside and consumed More importantly, dissolved organics are the main source of food, tiny sizes indeed. Our baby also contains symbiotic algae to pass nutrients via photosynthesis, like the corals.

Our blue sponge then requires strong currents, strong illumination and plenty of the right food. The juices of melted frozen food are great, as well as small particle size food resting on the shelves of your local shop, look for the words, "for fine filter feeders". Feed daily, for best results via a dosing system, 4 times per day. Have a heavy stock of corals to take the excess food in the system and a good skimmer is essential to avoid organic overload problems.

Our blue sponge will die if it is exposed to air, so when you see one reserve it for a few days. If it has been exposed you will see the effects within this time scale. If everything is OK, bag it up underwater and have no air in the bag when transporting it home. Given the right treatment you will be rewarded with a magnificent sight within your aquarium for many years.

PROFILE

Phylum Porifera
Name Haliclona sp
Location All tropical seas
Size Up to 60 cm
Reef compatibility Great
Feeding Filter feeding liquid foods
Lighting Strong lighting required
Difficulty For the more advanced hobbyist and mature system only



Many inverts use large quantities of calcium carbonate to grow and thrive in captivity. This needs to be replaced - but how?

Calcium Water or Kalkwasser

Last night I had terrible nightmares, I just could not sleep, the constant thought about getting up at 5 am just to sit down and write about chemistry. Unless you are pleasantly disturbed and actually like chemistry, this is undoubtedly the most boring part of the hobby. Boring it maybe, important, it definitely is, so bite your lip and read.

Calcium water or Kalkwasser is a solution of calcium hydroxide which when added to sea water reacts with free carbon dioxide to produce calcium bicarbonate. Big deal, what does this actually mean to my aquarium?

In our water we have a pH buffering capacity known as the carbonate hardness scale. When acids or bases are added the chemical reactions that follow ensure that the pH of the water remains constant, this is known as the buffering capacity. If the acids or bases that are added reach a critical value the pH starts to alter and the buffering capacity is lost.

Our carbonate hardness is reduced in many areas within the marine aquarium most notably by acids released when ammonia is converted to nitrite and nitrate, or carbon dioxide is released from algaes. Calcium carbonate is sucked out of the water by Stony corals, calcareous algae, snails and Soft corals, all eating away at our big pie of carbonate hardness, reducing the buffering capacity, and growth rate of our corals as the calcium carbonate falls to low levels. We have to ensure that this does not happen.

Buffering and feeding

There are many sodium carbonate and bicarbonate additives on the market that many use to increase this level. However, no calcium is added to the water, so the animals gain no benefit. Calcium carbonate additives only release a low amount of calcium because the molecule is only slightly soluble within a pH of 8.2. Many, therefore, recommend a pH range of 8.0 - 8.2 .The fact that calcification rates thus coral growth is the fastest in a pH 8.4 is ignored. So how can we help the buffering capacity and calcium levels in the target pH value? Simple, we need to convert the calcium carbonate, to calcium bicarbonate, which is highly soluble in our pH range.

Enter calcium hydroxide, which when added to purified water produces a white calcium rich milk called Kalkwasser. Calcium hydroxide when exposed to free carbon dioxide reacts to produce calcium bicarbonate, highly soluble in our pH range, easily assimilated by corals, and increases our carbonate hardness.

The bottom line is that Kalkwasser is the best buffering agent you can get, long term use is recommended. However, as with everything in this game, if you make a mistake you can do so big time. Just monitor what you are doing, be careful and everything will be just fine. ■

HOW TO ADD KALKWASSER

Kalkwasser can be purchased from your local store.

Mix the powder in a container, stir and then leave alone to settle.

The resulting milk can then be siphoned off. It should then be dripped in slowly overnight. Do not, on any account, dump the whole lot in or add the solid settlement, the resulting pH shock will kill your tank.

You must also make sure that the carbon dioxide level in the water is sufficient or the above chemical reaction cannot take place. Calcium carbonate falls out of solution covering the aquarium, corals and concreting the substrate, when carbon dioxide levels are low.

The best way to add Kalkwasser is via a mixer or stirrer and used in conjunction with a calcium reactor, where the reactor is utilised during the day and the Kalkwasser added during the night. This acts in a balanced way. Carbon dioxide is then always in excess for the reaction to take place, the carbonate hardness value remains constant and calcium is always available in a form for biological up take.

Metriaclima sp. "zebra gold" OB male from Lions Cove.

More Malawi Cichlids

Ad Konings moves on to examine the sediment-rich rocky biotopes and some of the fish that live in them

THE SEDIMENT-RICH ROCKY BIOTOPE CAN BE divided into two sections: one comprising the deeper (more than 10 metres) rocky habitat which is usually, but not always, sediment-rich, and the other which is clearly sediment-rich but situated in areas that are not very deep. Instead of treating these biotopes in separate articles I prefer to combine them, because many of the species are found in the deeper rocky habitat at one place and in somewhat shallower but sediment-rich areas at another.

The chief occupants of the deeper region of the rocky habitat are the Mbuna. Many species have yellow as their main colour. It is not clear whether this relates to the yellowish colour of the aufwuchs (i.e. the fishes are better camouflaged) or is caused by elements in the aufwuchs that stimulate yellow pigment after digestion by the fish. While female Mbuna from the upper layers of the habitat have a mainly grey-brown coloration (to make them inconspicuous), those in the sediment-rich region are predominantly yellow or yellowish.

The population density of Mbuna in the sediment-rich or deep rocky habitat is much lower than in the upper rocky habitats. The probable reason is availability of food, which seems to be less in deeper areas. This would further mean that most Mbuna are dependent on the algae or on food items which in their turn are dependent on algal growth. If this is so then the view that the Mbuna of this habitat are less specialized in feeding on algae than their cousins in the upper layers of the habitat seems to be justified. Better-adapted species would find a niche in an area with more food.

WHAT IS THE SEDIMENT MADE UP OF?

The sediment consists of particulate matter that precipitates from higher levels, e.g. decaying micro-organisms, wastes, and stirred-up sand. A layer of such material covers the algal mat on the rocks and only certain algae are able to survive the reduced light conditions. Reduced light conditions are also found at deeper levels on rocky coasts that are largely sediment free. Possibly the Cichlids prevailing in the sediment-rich habitat have specialised in feeding on the type of algae which grow in poor light. The algal strands, growing through the sediment-rich coating, give the biocover a firm texture and may thus provide a habitat for many insect larvae and benthic crustaceans. The Cichlids feed from the biocover by plucking, nipping, nibbling, jerking, and scraping it from the rocks. Many species present in this biotope are often seen crossing sandy patches between rocks (where they border the sand), but a distinction is made between the species of the intermediate habitat and the species discussed here. The latter normally occur at deeper levels and are found predominantly among the rocks, whereas species from the intermediate habitat can also be encountered in shallow water and over the sand, which plays an important role in their behaviour (e.g. foraging techniques and spawning-sites).

Golden zebras

Several species of the genus *Metriaclima* (the 'zebras') are encountered in the purely rocky habitat at deeper levels, with a few apparently restricted to levels below 10 metres. One of these is *Metriaclima* sp. "zebra gold" which is better known under its trade name 'Pseudotropheus mustardi'. It is found from Chirombo Point to Charo, but is caught for export mainly at a location just north of Nkhata Bay (Chadagha). The 'Zebra gold' is frequently found at depths of more than 15 metres and also occurs over sandy patches between rocks.

Plankton is often abundant at a depth of

15 to 25 metres and many Mbuna from these regions are regularly found dining on it. Territorial males forage more frequently from the biocover which, of course, is eaten by females as well. Aggression in sexually active males is directed only towards conspecifics. Females and non territorial males occur singly or in small groups.

Some territorial males occupy areas on the sand next to rocks and dig their nest beneath a rock. Such behavior is normally seen in areas where the rocks meet the sandy bottom at a depth of 10-20 metres. Spawning usually takes place in the privacy of caves among the rocks or an excavated spawning-pit under a stone.

One would expect that species from deeper and/or sediment-rich areas would be able to better cross longer stretches of sand between two rocky habitats than the Mbuna of the sediment-free habitats. If true, geographical variation among species of the sediment-rich rocky habitat would be less pronounced. This is in reality only partly correct, because many such habitats can support only a limited number of fishes and small founder populations are more likely to produce a geographical variant or new species. This seems to be the case with the 'Zebra gold', which is known to occur in several different geographical variants. As usual this variation can be seen only in the male's territorial coloration. Normal female coloration is brown in all known populations. Polychromatism occurs in the 'Zebra gold' and although it is usually seen only in females it is also present in males – Marmalade cats of the 'Zebra Gold' are among the most beautiful Mbuna in the lake.

Metriaclima lombardoi female from Mbenji Island.

Pseudotropheus sp. "ndumbi gold" male from Ndumbi, Likoma. This fish was originally known in the hobby as M-12.

Metriaclima lombardoi male from Mbenji Island

One of the most popular Mbuna

At most other locations the deeper, sediment rich habitat is close to the sandy bottom and usually only one species of *Metriaclima* is present. Only at Mbenji can two species, *M. lombardoi* and *M. barlowi*, be found together in the sediment-rich and intermediate habitats. *Metriaclima lombardoi*, however, seems to be more restricted to the rocky part of the biotope, with its highest population density at a depth of approximately 10 meters.

Metriaclima lombardoi enjoys widespread popularity among aquarists and is one of the Mbuna most frequently shipped from the lake. An unusual feature of this species is that males are yellow and females blue (barred). Blue females are found in some other species too but the combination of blue females and yellow males is unique to *M. lombardoi*. Before its formal description this Mbuna was given several names in the aquarium hobby. The first was "Golden Zebra" followed in the USA by "Pseudotropheus Kenyi" and in Europe by "P. Lilancinius".

Its distribution is not restricted to Mbenji alone, as it is encountered at Nkhomo Reef as well. According to Grant (pers. comm.) this population has a somewhat less →

intense coloration after it has been captured. Underwater observations, however, reveal no difference between the two populations. The 'reversed' coloration can be regarded as unusual for Mbuna, and furthermore in captivity it frequently happens that the offspring of normally coloured parents include females with yellow coloration, and these are fertile (pers. Obs.).

The habitat around the Mbenji Islands seems to be crowded and increased competition for food and space is thus the order of the day. Occasionally, mouthbrooding females are observed which have (partly) adopted male territorial coloration (i.e. yellow). This apparently signals to other fishes the aggressive nature of their brood-defending behaviour.

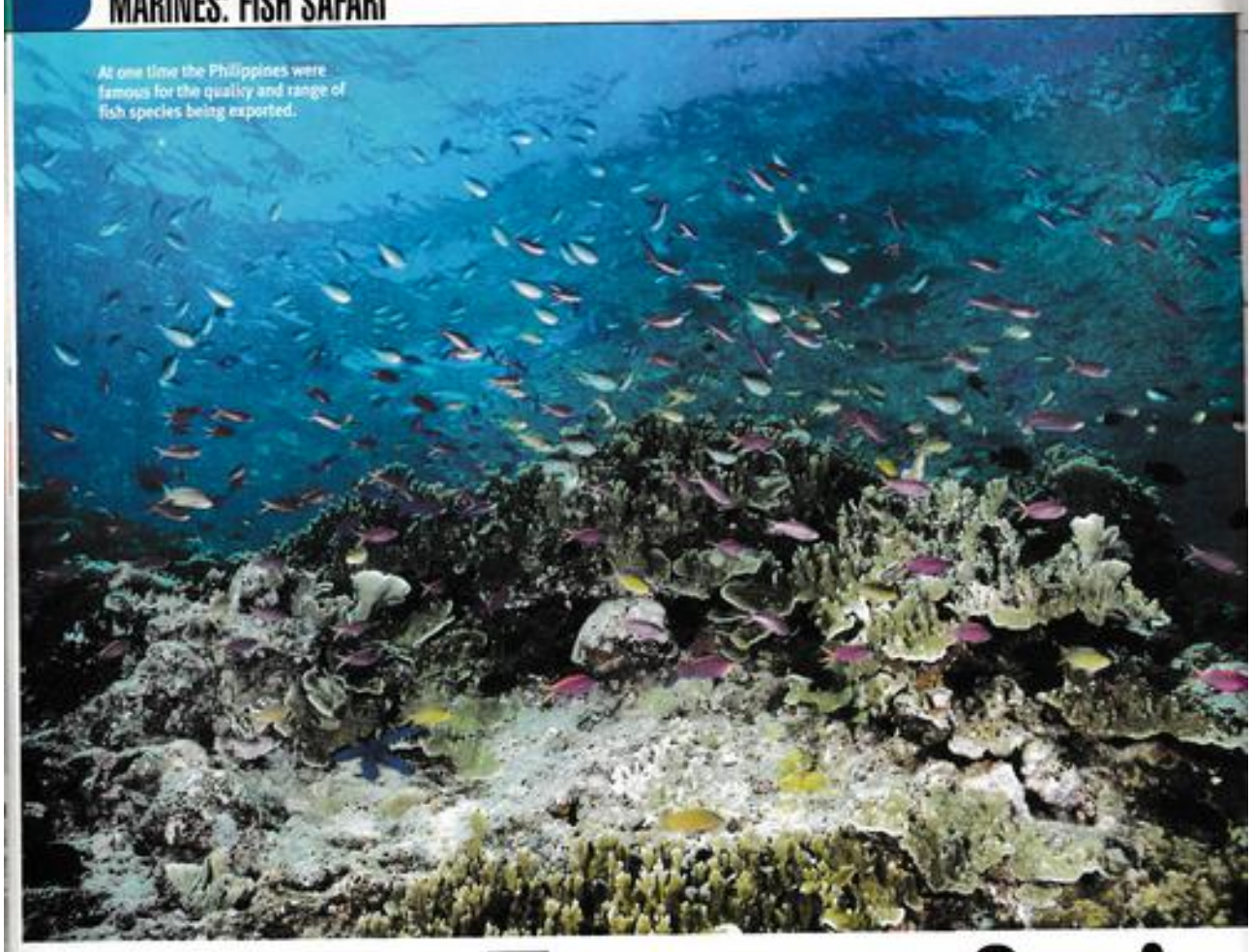
A case of mistaken identification

Pseudotropheus sp. "ndumbi gold" is an attractive species which is endemic to the rocky areas around Ndumbi Rocks, Makulawe Point, and Maingano, at Likoma Island. It was previously thought that both male and female shared the conspicuous golden colour (Ribbink et al., 1983b), but Spreinat (1997) has established that the blue Mbuna known in the aquarium hobby as 'M-12', and *P.* sp. "ndumbi gold", are the male and female, respectively, of one and the same species. The adult male is blue and resembles a large individual of *P.* sp. "elongatus omatus".

Pseudotropheus sp. "ndumbi gold" is an opportunistic feeder which dines on anything available: aufwuchs, plankton, debris, and stirred-up particles are among the items on the menu. Both sexes are solitary. The very limited distribution and omnivorous feeding habits are indicative of an old, non-specialized species – not necessarily

Pseudotropheus sp. "ndumbi gold" female from Ndumbi, Likoma.

inhabiting the same areas over the years, as the lake level fluctuates and areas inhabited at present may have been dry land several hundreds of years ago (Owen et al., 1990). *Pseudotropheus* sp. "ndumbi gold" does not seem to be closely related to any other Mbuna; at least there is no obvious candidate with matching behavioral and/or anatomical characteristics. ■



At one time the Philippines were famous for the quality and range of fish species being exported.

A sea safari out of Cebu

Max Gibbs was the first importer to bring Filipino fish to the British aquarium market. Years on he has been diving in this area of the world to see just what impact collecting has had

ALL PHOTOGRAPHS BY MAX GIBBS

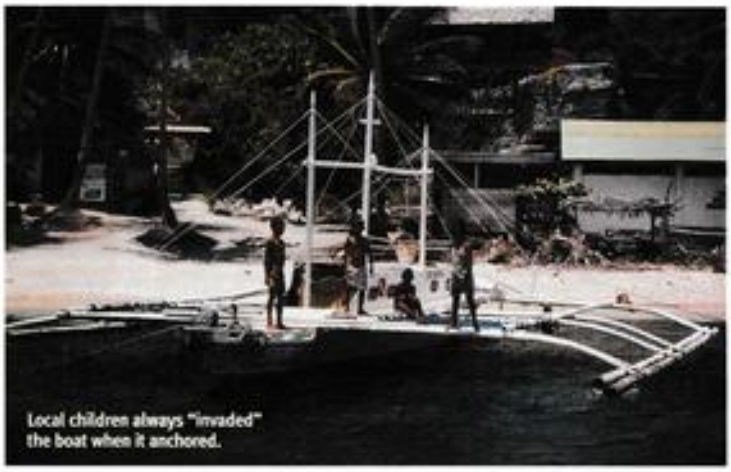
I REALISED A DREAM MANY YEARS AGO when I became the first importer to bring Filipino fish to the British aquarium market. For the very first time the hobbyist was able to see and buy fantastic marine fish species which had been just pictures to wonder at in books until then. Clown trigger fish, Blue and yellow ribbon eels, Marine bettas, Mandarin fish, Red faced batfish, and other amazingly beautiful fish suddenly became accessible to the U.K. market that until that time had been supplied from Singapore, Ceylon (now Sri Lanka), Florida, Curacao, and erratically from just a few other sources. For about four years the quality of those Filipino fish from that particular source was superb, and that result was down to the impeccable care they received from the exporter based in Manila at that time. Part of that care was to ensure the fish had been net-caught with thoughtful techniques, transferred by public ferry boat services back to Manila, and tended along the way by the people who had caught them. More than that, those fish collectors and the exporter were from the same large family.

Dynamite and cyanide

But in a very short time demand pressure built and the scramble began to supply the world's aquarium hobby market with more and more of these prized species. Collectors increased in numbers, and resorted to using catching methods that created a serious hazard for the fish collected and potential bitter disappointment for the hobbyists who would buy them. The destruction of those fish not collected and left to rot among the

dying corals, was another sad legacy of this crazy period. Cyanide and dynamite bombs had been used for debilitating and stunning fish to be gathered up for consumption as food for years, and it was a natural extension of this practice to use cyanide to flush out fish from the protection of hard coral formations, nooks and crevices in the coral rock, or any otherwise inaccessible hiding place. Depending on the degree of exposure suffered by the fish caught in this way for marketing and export, the method could be anything from "acceptable" to lethal, and everything in between!

Those fish which were stupefied by a light exposure would revive quickly when placed in uncontaminated sea water, and go on to potentially live out a normal life span - albeit in aquarium conditions and not in the ocean. However, where exposure to the cyanide was excessive many fish would die before they could be revived away from the noxious chemical, and those which did survive would suffer irreparable damage to the flora of the digestive tract, as I have been given to understand, which caused them to lose their body fat and reserves even though they might have been observed to be apparently eating normally and beneficially. The resulting disappointment and financial losses suffered by traders and hobbyists alike, from seeing many beautiful fish waste away and die, gave Filipino fish a bad reputation. The hobby was also vulnerable to criticism for being involved in such "dirty" practices. It was not just the fish abuse that brought justifiable complaint, but also the reef



Local children always "invaded" the boat when it anchored.

destruction that cyanide exposure was causing. The fact that this destruction had been going on previous to collecting for the ornamental fish trade was forgotten, and the whole issue seemed to focus on the aquarium hobby. At that time the greater destruction being wrought by dynamite fishing, which blasts the corals to pieces and kills indiscriminately huge quantities of fish, became overshadowed by the outcry about the use of cyanide. My vision was of terrible desolation in the reef areas around the major collecting centre, Cebu. Thus, many years on, it was with this impression still implanted in my mind that I had the opportunity to go on a diving programme around several islands out of Cebu. I truly wondered just what sort of condition the reefs would be in after so many years of intensive fish collection from that area. What I found was vastly different to my expectations.

On board and all set for adventure

Our transport was a big outrigger boat, with a similar craft in attendance, carrying provisions and the compressors for refilling the SCUBA tanks. Mike Ross, an ex-pat →

This pale blue Frog fish posed beautifully for its picture to be taken on a tubular sponge of the same colour at Olango island.

Spawning Three-lined corydoras

Breeding any fish is a rewarding experience but when they are as cute as Corydoras then they are doubly worth the effort. *Corydoras trilineatus* is one of the commonest wild caught species in the trade, so **Derek Lambert** tried his hand at breeding them

PHOTOS: M.P. & C. PIEDNOIR

OVER THE YEARS I HAVE BRED A NUMBER OF different *Corydoras* species, none of which seem to have read the books or magazine articles! Corys, as we are frequently told in general books, lay their eggs on flat leafed plants or on the aquarium glass. Well mine don't and never have. It turns out many other Catfish breeders have found the same thing and we now know that each species (or even individual within a species) will select its own spawning site which may range from an artificial spawning mop placed on the substrate through to grooves in a piece of bogwood, one breeder even found most of the eggs stuck on the underside of the aquarium cover well above water level. Oh! and I do have to admit some will lay their eggs on broad leafed plants and on the aquarium glass.

So what do you do when you want to breed a different Cory? Ideally you buy a copy of Ian Fuller's *Breeding Corydoradine Catfishes* book and look it up there. Not all species are included, but suggestions on how to tackle those that aren't are given. This I did when I wanted to tackle *Corydoras trilineatus*. Ian gives a full account of his fish's spawning so I followed his set up pretty closely.

THE BREEDING SET UP

Aquarium size:	60 x 30 x 30cm
Substrate:	Thin layer of sand
pH:	7-5
GH:	12°dH
KH:	4°
Temperature:	25°C
Filtration:	Bubble-up sponge filter
Decor:	Bogwood, pieces of slate, clump of Java Moss on substrate, Java fern, artificial spawning mop hanging from surface and a few broad leafed plants.
Water changes:	50% weekly
Diet:	Flake, granular and small live foods.

Breeding stock

When selecting potential breeding stock I always prefer to buy youngsters and grow them on. With Corys, however, I find it much quicker and easier to buy well grown, wild caught fish. With a little extra tender loving care they seem to come into spawning condition fairly quickly. In this case I purchased a trio which turned out to be 2 males and 1 female. I wasn't originally planning to breed them but just enjoy looking at them in a community aquarium. However, the female soon filled up with roe and it would have been a pity to let the chance of breeding another Cory go to

A pair of Three-lined Corys checking out their new home. This pair were set up to breed by Marie-Paule and Christian Piednoir in France.

At this point the female is passing sperm through her gut and out through her anal opening over the eggs held in her pelvic fins.

waste. So I set up the breeding tank and transferred my little group into it.

My tap water is very hard and alkaline, so it took a couple of weeks to change their home tank water over to the conditions in which they eventually spawned. They were fed on a mix of flake and granular foods a couple of times a day and some small live food once a day. Newly hatched Brine shrimp was fed most days but some Daphnia and Grindal worm was also fed.

FACTFILE

Scientific name
Corydoras trilineatus

Common name
Three-lined Cory

Distribution
Colombia, Ecuador and Peru.

Size
Maximum aquarium size 5.5cm. The type specimen was 4.49cm in body length.

Colour forms
This species of *Corydoras* has many different colour variations in the wild. They are also often sold as *Corydoras julii* despite clear differences in colour patterning between the two species.

Frustration sets in

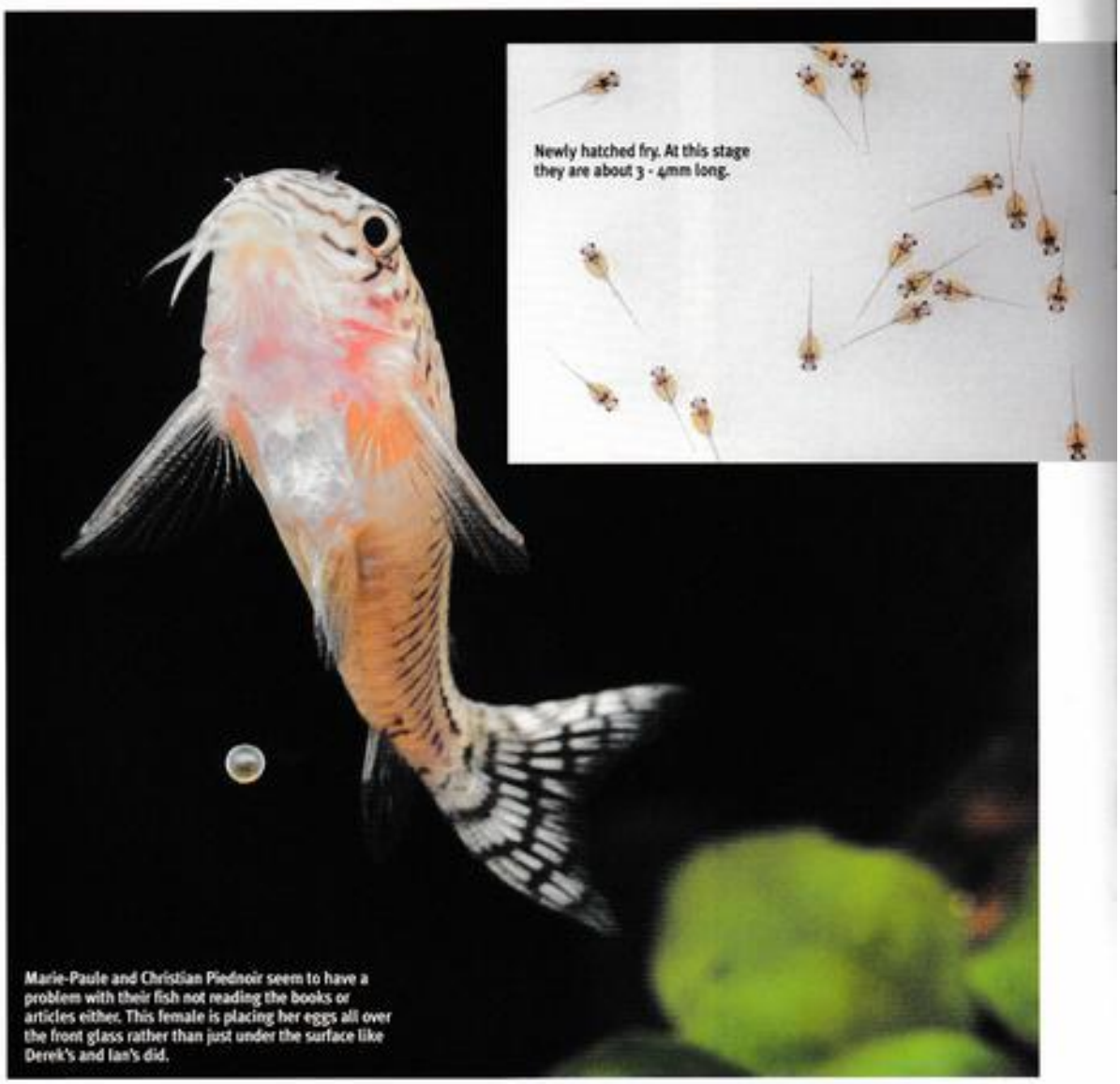
The weeks passed and nothing happened. I tried the old cooler water technique. This is where you change about 50% of the water with water a few degrees cooler than that in the aquarium. This, in theory, replicates what happens in the wild during the rainy season and should act as a trigger to spawning. Nothing happened, as usual, I may add. None of my fish have every really reacted to this technique, but then they do get big water changes on a regular basis and I am not always that fussy about the temperature.

Time passed, and the female looked ready to go any day now. The days turned into weeks which turned into months. Finally, just when I was about to throw in the towel and chuck the stupid fish back in their community tank (sorry ,what I mean is carefully transfer them back home), they spawned.

As already mentioned, up till now, none of my Corys have done what any of the books say they do when spawning. This time, however, they did exactly as Ian described in his book (perhaps I'm reading the right book now) and laid well over a hundred eggs right up near the surface and mostly concentrated in the corners.

The mating

Interestingly, my female only seemed to mate with one of the males rather than both, although the smaller male did try to take →



Newly hatched fry. At this stage they are about 3 - 4mm long.

Marie-Paule and Christian Piednoir seem to have a problem with their fish not reading the books or articles either. This female is placing her eggs all over the front glass rather than just under the surface like Derek's and Ian's did.

part in the 'orgy'. It was only the larger male that the female mouthed at the vent in the typical "T" position and induced to release sperm into her mouth. This was then swallowed and passed through her gut and passed out of her anal opening to spray over the eggs held in her pelvic fins. Each batch contained 3 or 4 eggs (could have been more or less but the spawning lasted a long time and I didn't have the time to watch the whole thing). The eggs were pushed onto a spot on the aquarium glass which had been previously cleaned by the mother.

This mouthing of the spawning site could well transfer some extra sperm on to the surface and ensure as many of the eggs as possible were fertile. This batch seemed to have nearly 100% fertility and started to hatch late on the 3rd day after spawning. The parents had been removed as soon as spawning was complete. Some species of Cory certainly do eat their own eggs and newly hatched fry ,so it is best to remove the adults as soon as possible.

Initially the fry look just like newly hatched tadpoles with a big head and the dorsal, caudal, adipose and anal fins joined into a long fin surrounding over half the body. The body colour is also very different from the adults with a large black blotch covering much of the main body sac. I was never too sure how long after hatching the fry started to feed. I put a little newly hatched Brine shrimp in once I saw the fry had hatched. They were certainly feeding by the third day. This was their staple diet over the coming weeks and they grew at a very rapid rate. Water changes were started when they were about three weeks old. By this time the dorsal, caudal, anal and adipose fins had separated. By the age of three months they had attained their full adult coloration and were about 3cm long in body length. ■

RECOMMENDED READING

Breeding Corydorine Catfishes by Ian A.M.Fuller

Published and distributed by Ian Fuller Enterprises.

68 Canterbury Rd.,Kidderminster, Worcs.DY11 6EU

EHEIM KICK OFF THE TROPICAL SEASON WITH A NEW ACQUISITION AND LAUNCH A RANGE OF NEW PRODUCTS

For over 50 years Eheim have been internationally known for their high quality products and particularly their range of filters. Now they have followed several other manufacturers on to the acquisition trail and taken over another German firm well known for its high quality products. Jäger is not a name many in the U.K. will be aware of, but our German contributors tell us they are well respected in their own country for high quality products and the coming together of these two companies will be good for aquarists everywhere. Eheim plan to promote the combined range under the slogan 'Aquariums and Technology'. As yet, none of the Jäger products are available in the U.K. but that should change in the near future.

Apart from this acquisition Eheim are launching some great new products this season. Here are the highlights.

You can purchase an upgrade kit to increase the size of your exsisting *aquaball* filter.

TOP GEAR

All the new products and news from the aquatic trade

THE *EHEIM AQUABALL* - A REVOLUTIONARY NEW INTERNAL POWER FILTER

The spherical head of this new internal filter makes it possible to adjust the flow in any desired direction so you cannot only direct it from side to side but up and down as well. This means you can create more surface water movement if you want to. The flow rate is set by the output regulator and the oxygen enrichment of the water can be dosed by the diffuser as required.

Inside the filter contains foam cartridges which perform both mechanical and biological filtration and an integrated filter box that contains a separate filter pad for mechanical fine purification. The box can also be used for *SUBSTRATpro* for additional biological filtration or with *EHFIAKTIV* for selective adsorbent water treatment.

Due to the modular design of the filter, the *EHEIM aquaball* is available in four different versions with a regulated pump output and various filter volumes. The smallest is the 2206 which is for tanks less than 45 litres in size. The 2208 is for 30 - 60 litre aquaria, the 2210 for 60 - 160 litre tanks and the 2212 takes you from a 100 up to 200 litre tank. The powerhead by itself has a flow rate of 650 litres per hour.

INCREASED OUTPUT WITH *EHEIM'S* UNIVERSAL PUMPS

The new EHEIM universal pump series is available with three different outputs: The 1260 at 2400l/h, the 1262 at 3400 and the 1264 at 4500 l/h. The maximum head is quoted at between 3.5 and 3.7 m depending on the model and they can be used submerged as well as outside the water depending upon what you want to use them for. They come equipped with an integrated pre-filter, priming muffs for the hose connection and variable attachments.

All universal pumps are suitable for sea water and freshwater use.

The new compact pumps have a low power consumption saving money on electricity.

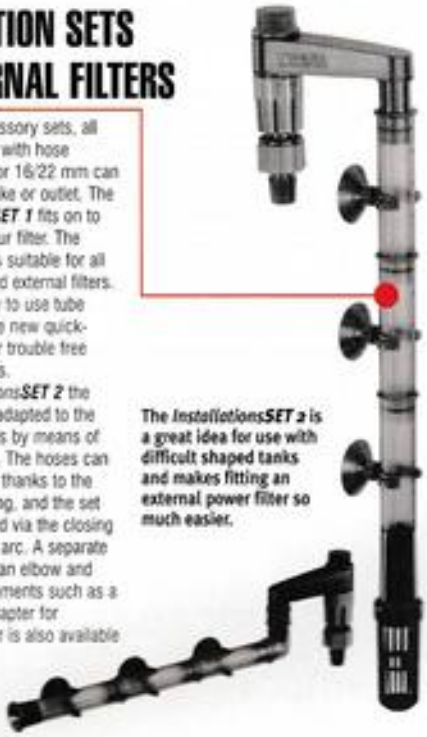
EHEIM COMPACT PUMPS

The new *EHEIM* compact pump series is for use underwater and is available with three different outputs: 300, 600 and 1000 l/h as the model numbers indicate. They are suitable for use in aquariums, keeping and rearing tanks or anywhere reliable water flow is required. The flow rate can be adjusted by the slideable output regulator as required. The maximum head varies greatly from model to model. The 300 has a maximum head of 0.5m, the 600 goes up to 1.3m and the 1000 can manage 2.0m. Thanks to the small dimensions the immersion pumps can be installed in the smallest of spaces and are easily attached by suction holders to the inside panel of the tank.

INSTALLATION SETS FOR EXTERNAL FILTERS

With these two accessory sets, all external filter makes with hose diameters of 12/16 or 16/22 mm can be optimised for intake or outlet. The *EHEIM Installations**SET 1*** fits on to the intake side of your filter. The modular assembly is suitable for all aquarium heights and external filters. The simple and easy to use tube connections have the new quick-release couplings for trouble free cleaning of the hoses.

With the *Installations**SET 2*** the water outlet can be adapted to the aquarium dimensions by means of plug-in nozzle tubes. The hoses can be connected safely thanks to the quick release coupling, and the set can be easily cleaned via the closing cap on the overflow arc. A separate nozzle set including an elbow and three different attachments such as a wide jet, outlet or adapter for connecting a diffuser is also available as an accessory.



The *InstallationsSET 2*** **is a great idea for use with difficult shaped tanks and makes fitting an external power filter so much easier.**

NEW FILTER MEDIUM *SUBSTRATPRO*

The main advantage of the new biological *EHEIM* filter substrate is the pore system of the surface which is adapted to the size of bacteria to guarantee fast and intensive development of bacteria cultures. Thanks to its enormous colonisation area of approx. 450 m2 per litre, *SUBSTRATpro* provides the basis for the efficient biological breakdown of harmful substances. This filter medium consists of sintered glass spherically shaped to create a current-like flow to ensure optimum water flow and thus maximum utilisation of the filter volume.

This new filter medium is said to produce fewer nitrite peaks than many others because it is so efficient.

NEW PUMPS AND FILTERS FROM *HOZELOCK CYPRIO*

TWO NEW PUMPS

Hozelock Cyprio has extended its popular range of Titan solids handling pumps to include two powerful new models which deliver a maximum flow of 12,000 and 15,000 litres per hour respectively. With the addition of the new heavy duty models, there are now six Titan pumps, from 2,000 litres per hour upwards. These are able to handle solids up to 10mm, the Titan 12000 and Titan 15000 can generate a maximum head of 4 metres. The new Titans are also well suited to driving waterfalls where a high flow rate is required at low or medium head heights.

The Titans are made from polypropylene which is tougher and less brittle than other plastics such as ABS. An integral carrying handle which is attached to the pump housing rather than the detachable cover make it is easier to lift out of deep ponds in one piece. The cage is kept securely in place by new locking latches which can be finger tightened for security and are just as easy to release, without tools, when maintenance to the pump is required.

An outlet ball joint which allows for easy hose attachment and can be swivelled to whatever angle is required to permit the hose to exit the pond easily. To protect wildlife — especially during the spawning season — Hozelock Cyprio's Wildlife Protection System enables the intake apertures to be adjusted down from 10mm to 2mm via a simple lever.

The new Titan 15,000 solids handling pump.

TOP GEAR

In readiness for the next coldwater season Hozelock is extending its pump and filter ranges

COMBINATION FILTERS

Hozelock Cyprio's market-leading range of Bioforce pressurised pond filters has spawned two new ranges of gravity-fed combination filters featuring both mechanical and biological filtration systems in an integrated unit. These new filters are called Ecomax and Ecopower and cater for ponds of up to 9,000 litres. The new filters offer a choice of sophisticated features including integral ultra-violet water clarification, mechanical filtration and biological removal of pollutants. They also carry Hozelock Cyprio's Clearwater Guarantee.

The new filter with the highest specification is the Ecomax fast-acting all-in-one fishpond filtration system — a bottom-up combination filter with a built-in UVC and turbulator which forces the water to spin as it passes through the UV chamber, thus ensuring that it is evenly exposed to the UV lamp for optimum treatment efficiency. The quartz-sleeved UV lamp is double-ended and neat retaining collars at either end of the quartz are easy to slacken off for quick and safe removal when necessary. Designed to clean ponds of up to 9000Litres, the Ecomax comes in three sizes, 2200/6W, 4500/8W and 9000/16W.

The new Ecopower range comprises two all-in-one Clearwater systems — 2200/6W and 4500/8W — both of which offer the alternative top-down filtration method whereby the water from a non-turbulating UVC is sprayed directly onto the mechanical foam filter below and then finally drains through to the biomedia in the base. To deliver the water widely and evenly over the foam, Hozelock Cyprio have developed a new circular spray head with staggered outlets. According to the company, this design innovation overcomes a major problem with conventional filters which rely on spray bars to disperse the water and can therefore only distribute it over a limited area of the foam.

Features common to both all-in-one ranges include translucent hosetails for instant verification that the UV lamp is on, high and wide 40mm outlets to maintain flow rates and to facilitate partial burying of the filter for a more discreet installation and integral moulded carry handles.

Both ranges — together with spare parts including double-ended UV lamps, quartz sleeves and foam filers — will be available from January 2003, superseding the company's older Biofloc and Biozorb ranges. A small model, the Ecocell filter, based on the Ecopower but without UVC, will also be available in 2200, 4500 and 9000 litre sizes.

At the same time, Hozelock Cyprio has announced an upgrade to its premier Bioforce 9000UVC model which adds bayonet fittings to the UV sleeve and quartz glass for easy access for cleaning and lamp changing.

TOP GEAR

All the new products and news from the aquatic trade

NEW CO_2 SUPPLIER

The new CO_2 system from *D & D Aquarium Solutions*

D & D Aquarium Solutions are launching two new CO_2 units. These are specifically designed for aquarium use and are of a good standard of workmanship. CO_2 is used in freshwater aquaria to enhance plant growth and for a long time has been perceived as expensive and rather difficult to obtain from your local aquarium shop. *D & D Aquarium Solutions* aims to change all that with this keenly priced model which will retail at only £104.90. The unit comes complete with a disposable 500gm CO_2 cylinder and stand, bubble counter with ceramic CO_2 disperser, 3m of hose connections, pin wheel adjuster, solenoid valve, low pressure gauge, regulator at 0.9 bar and teflon tape. Since algal blooms can be a problem when CO_2 is first used on an aquarium, the model comes with a free 100ml packet of *Rowaphos* phosphate remover worth about £8. By eliminating phosphate in this way algae is unable to grow. A converter for a large cylinder of CO_2 is available priced £5.90.

The other model is for marine use. This set is similar to the freshwater one but includes a controller with 2 gauge regulator. Once again it is priced at only £104.90 complete and includes a packet of *Rowaphos* phosphate remover.

GIVEAWAY

We have one each of these sets to giveaway. Simply answer the question "How can I stop algae growing in my aquarium?". Answers on a postcard to "CO_2 Giveaway", *Today's Fishkeeper*, TIMG magazines ltd., 1 Forum Place, Winchester Court, Hatfield, Herts. AL10 0RN. Please state which set you would like to win.

NEW OVERTANK LUMINAIRE

The overtank *Luminaire* from *Arcadia* is a new concept in aquarium hood design for the UK. The slim profile of the unit is based on the already popular Series 3 metal halide pendant range, and is constructed from polished aluminium. Rather than sitting directly onto the aquarium rim, the unit is raised on adjustable supports, creating an open top aquarium, without the need to suspend the unit from the ceiling or from wall brackets. In the case of a freshwater planted aquarium, this gives the opportunity to see plants growing beyond the water surface, as many would do in nature.

When access to the aquarium is required, the unit simply lifts from the front, and tilts back on the hinged rear supports, where it will remain until lowered back into place. A range of sizes are available form 60 cm to 120 cm.

All models accept at least two fluorescent tubes, some more, and models which utilise the new T5 high output tubes are included in the range. The 60cm unit holds two T8 tubes for either freshwater or marine use. The 90cm model comes with either two T8 tubes for freshwater or marine use or two T5 tubes for marine use only. The 120cm model can have either two or three T8 tubes for either freshwater or marine use, or can have up to four T5 high output tubes for marine use. The three or four tube units have dual switches, so the light levels can be increased/decreased in steps. All models come fitted with *Arcadia*'s excellent quality tubes.

OUR VERDICT

What a great idea. Something similar has been available from other companies in Asia for a while but this is the first time this innovation will be available in the UK. Coming from a specialist lighting company like *Arcadia* the research and development has been done with painstaking care and the build quality will be to a very good standard.

MAJOR RE-FIT AT MAIDENHEAD AQUATICS@EAST GRINSTEAD

The store has two fish houses containing a total of 361 aquaria, 22 pond vats and 56500 litres of water.

Maidenhead Aquatics @ East Grinstead was acquired on the 1st October 2000 and after four months a large scale re-fit was undertaken. This incorporated a repair/re-fit of the existing Koi/Goldfish system, installation of a new fancy goldfish system, 7 new tropical systems, shop fittings, ceiling, carpets etc. This was a huge task that took many months to complete. In the spring of 2002 it was time to move outside and construct pond plant tables, waterfall display, water feature display, fibreglass pools, pond liners etc. By late spring everything was complete and the new Maidenhead Aquatics@East Grinstead was ready for business.

Store details

Address: Maidenhead Aquatics@East Grinstead, Beaver Farm, Eastbourne Road, Newchapel, Lingfield, Surrey, RH7 6HL.
Opening hours: 9.30am - 6.00pm Mon - Sat & Bank holidays 10.30am - 4.30pm.
Proprietors: David Lawrence, Paul Walden & Kieran Bates.
Staff: Michael Edwards (Deputy Manager) Ben Hollis (Full Time) Nick Marsh (Part Time)
Directions: A22 between Newchapel temple & Felbridge (Next to Hobb's Industrial Estate).
Specialities: Discus & pond plants. Unfortunately we don't stock marines/ inverts.

Discus

Discus are the main specialist area and they stock a large range from 6cm - to adults & breeding pairs. Regular imports come from Malaysia, Thailand and Holland / Germany. All pairs are spawned in the system to prove they are fertile and occasionally their own home bred fish are offered for sale. They also carry a good selection of "L" No. Plec's which are proving very popular.

Shirley's Octoberfest

EVERY YEAR SHIRLEY Aquatics hold an event to mark the end of the coldwater season. This event incorporates a huge variety of Koi and coldwater fish with one of the biggest selections of aquarium and pond related goods and features in the country. This year is no exception as Shirley plans on finishing the season with a bang! The event takes place at the Shirley Aquatics Superstore in the West Midlands starting on Saturday 5th October. Last year the doors opened at 6 am with hundreds of crazy Koi and pond enthusiasts queuing to get in. Our Editor staggered in two hours later as he did not believe the hype. The doors are opening at the same time this year Our Editor will be in Denmark but other members of the *Today's Fishkeeper* team will be there with the added attraction of the following manufacturers attending to give advice and demonstrations: *Bioclaire, Pump House, Hozelock, Interpet, Hikari, Underworld, Casco, Juwel, Nishikoi, Tetra* and *Arcadia*. Even if you're just after a bargain it is worth while visiting as there is always something on offer for everyone. Shirley's will also be signing people up for their forthcoming Koi filtration and Koi health road show which will be visiting Birmingham, London, Bristol, Manchester and Glasgow. For further information on Shirleys Octoberfest please contact them on either 0121 744 1300 or info@shirleyaquatics.co.uk

Pond Plants

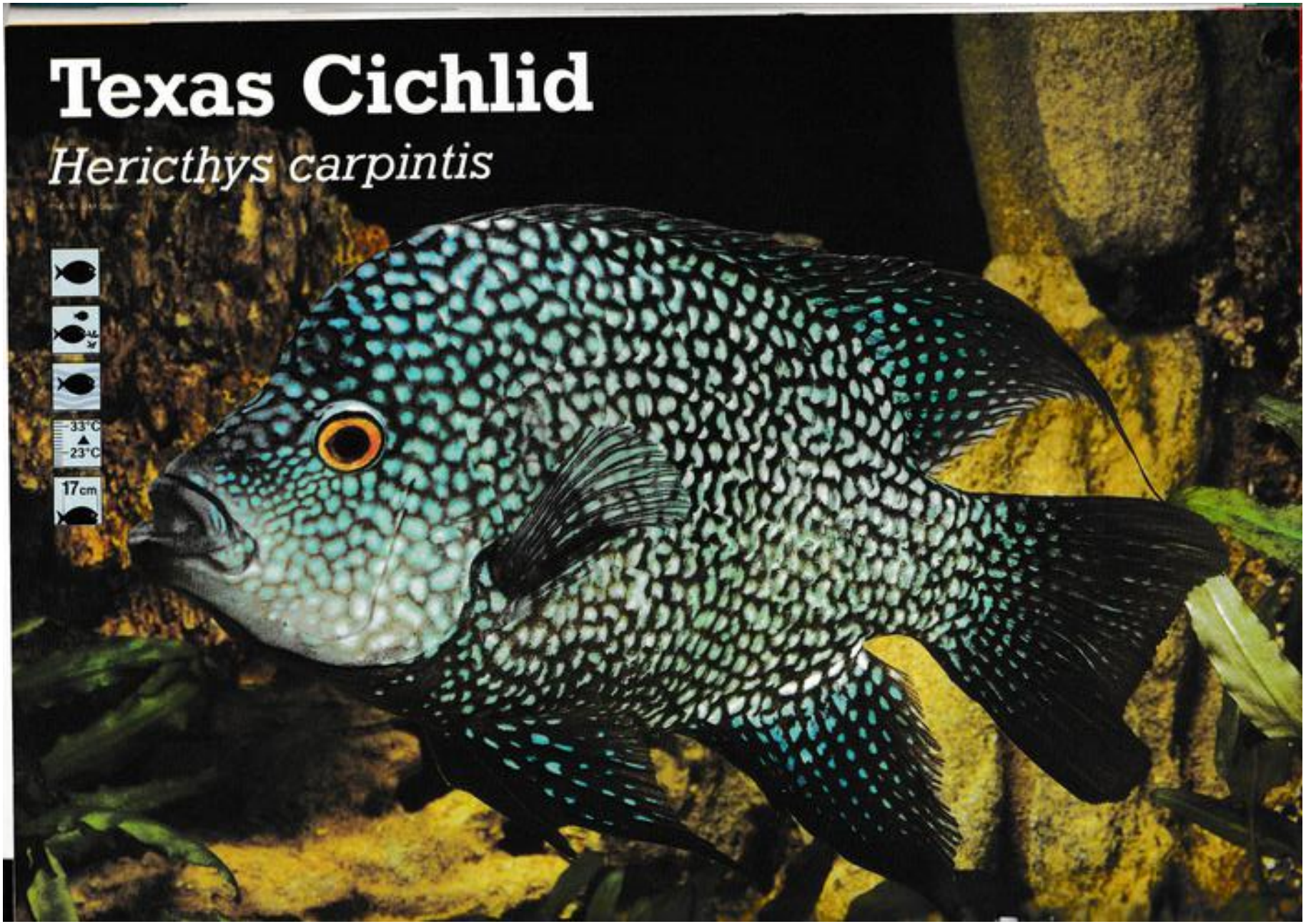
They have a massive selection of pond plants being situated on one of Europe's largest aquatic nurseries, this allows them to have fresh delivery every day if required. They also have some of the larger more established plants on sale from time to time.

Dry goods and other services

A huge range of dry goods are stocked including *Hagen, Hozelock/Cyprio, Interpet, Blagdon, Rena, A.P.I. Tetra, Aquarian, Hikari, N.T. Algarde, D-pak, A.D.C., JBL, Water-life, Oasis, Atlantis, Seashell* and *Classic Cabinet Co*. They also sell R.O. water, do water testing, custom-built aquaria and skin scrapes can be undertaken.

Disabled access is extremely good in all areas of the shop, however, there is no disabled toilet.

After the re-fit the store is up to Maidenhead Aquatics high standard.


Texas Cichlid
Hericthys carpintis
33°C
23°C
17cm

Today's Diary Dates

October's show, auction and club meeting dates

Copy for Today's Diary Dates

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

Tues 1st

Southend Leigh & Dist A.S. Contact 01702 305740
Paisley & District A. S. meeting.
Contact helenburns@thefreeinternet.co.uk.
Dunstable & D.A.S. meeting. Contact 01582 707280
York & Dist. A.S. meeting Contact 01904 414272
The Irish Tropical Fish Society meeting. Contact 01 4561836
Halton A.S. meeting Contact 0151 2898190
North Bucks A.S. meeting. Contact 01908 377333
Oldham A.S. meeting Contact 0161 281 3725
Preston A.S. meeting. Contact 01772 32114
Lang Toun Aquarists and Pondkeepers Group meeting.
Contact 01592 595825

Wed 2nd

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

Thurs 3rd

Glenrothes meeting. Contact D. Smart, 4 Lochty Ave., Kinglassie, Fife.
Faircity A.S. meeting. Contact 01738 561291
Sandgrounders A.S. meeting. Contact 01704 541177

Fri 4th

NorthWest Cichlid Group meeting Contact 019422 707 593

Sat 5th

Sun 6th

Grangemouth A.S. Open Show and Auction. Education Unit, Community Hall, Grangemouth.
Halifax Open Show & Auction. Contact 01274 531 418
Basingstoke Open Show. Contact 0118 970 1461

Mon 7th

Kirkcaldy A.S. meeting. Contact 01738 634689
Solway A.S. meeting Contact 01387 750606
St Helens A.S. meeting Contact 0151 4260423
Ayrshire Fishkeepers Association meeting. Contact 01294 605272
Reigate & Redhill A.S. Contact 01293 781282
Merseyside Aquarist Society meeting. Contact 0151 260 3664

Tues 8th

Darwin A.S. meeting. Contact 01254 703925
Northwich A.S. meeting. Contact 01606 882966
Caer Urfa A.S. meeting. Contact 0191 5237464
Telford & D.A.S. meeting. Contact 01952 409721 or 01952 606410
Lang Toun Aquarists and Pondkeepers Group meeting.
Contact 01592 595825
Northern Goldfish and Pondkeepers meeting. Contact 0161 9697567
Greenock D.A.S. Meeting. Contact 01475 704199

Wed 9th

Linlithgow Aquarist Society meeting. Contact 01506 510558
Halifax A.S. meeting. Contact 01274 880471
Tameside A.S. meeting. Contact 0161 339 6593
Bradford A.S. meeting. Contact (01274) 652542 or (0113) 257 7709
Hounslow D.A.S. Meeting Contact 01753 645675

Thurs 10th

Mid Sussex A.S. Meeting Contact 01924 602407
Kings Lynn Fish Club meeting
Contact 01553 769522 or 01553 763743

Fri 11th

FESTIVAL OF FISH KEEPING AND WATER GARDENING.
Contact 020 8847 3586
Yorkshire Cichlid group meeting Contact 01924 367086
Basingstoke A.S. meeting Contact 0118 970 1461
West Cornwall fishkeepers meeting Contact 01209 717880

Sat 12th

FESTIVAL OF FISH KEEPING AND WATER GARDENING.
Contact 020 8847 3586

Sun 13th

FESTIVAL OF FISH KEEPING AND WATER GARDENING.
Contact 020 8847 3586
Doncaster Open Show. Contact 01274 531 418

Mon 14th

Kirkcaldy A.S. meeting. Contact 01738 634689
Bristol Aquarist Society (Goldfish) meeting.
Contact 01792 207467
Ilford &D A&P Society meeting Contact 020 85507329
Grimsby & Cleethorpes meeting. Contact 01472 349178
St Helens A.S. meeting Contact 0151 4260423
Otley A.S. meeting. Contact 01274 531418
Robin Hood A.S. meeting.
Contact maltalbot@corydoras.freeserve.co.uk

Tues 15th

Southend Leigh & Dist A.S. Contact 01702 305740
Greater Manchester Cichlid Society meeting
Contact 01422 942 155
Midlands Marine Aquarists Society Contact 0121 359 4469
Oldham A.S. meeting Contact 0161 281 3725
Lang Toun Aquarists and Pondkeepers Group meeting.
Contact 01592 595825

Wed 16th

West Yorkshire Marine Aquarist Group meeting.
Contact 01924 420101
Clacton Fish Keeping Club meeting. Contact 01255 428065
Tongham Aquarists Society meeting. Contact 01252 25686
Portsmouth A.S. meeting. Contact Gill Utting 9, Inverness Rd., Gosport, Hants.
Perth A.S. meeting. Contact 01 738 621704
Bracknell A.S. meeting Contact 01344 485287

Thurs 17th

NOVEMBER 2002 *TODAY'S FISHKEEPER* ON SALE.
Glenrothes meeting. Contact D. Smart, 4 Lochty Ave., Kinglassie, Fife.
Bristol Tropical Fish Club meeting. Contact 0117 973 2145
Croydon A.S. Meeting Contact 0208 654 0984
Sandgrounders A.S. Contact 01704 541177
Faircity A.S. meeting. Contact 01738 561291

Fri 18th

Sat 19th

Sun 20th

Washington A.S.P. Open show and auction. Contact 01325 466630

Mon 21st

Kirkcaldy A.S. meeting Contact 01738 634689
Thorpe & D.A.S. meeting. Contact 01953 605394
Solway A.S. meeting Contact 01387 750606
Merseyside Aquarist Society meeting. Contact 0151 260 3664

Tues 22nd

Northwich A.S. meeting Contact 01606 882966
Clyde Aquarist Society meeting.
Contact John@farnurf.freeserve.co.uk
Lang Toun Aquarists and Pondkeepers Group meeting.
Contact 01592 595825
Greenock D.A.S meeting Contact 01475 704 219

Wed 23rd

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

Thurs 24th

Mid Sussex A.S. meeting. Contact 01273 602407

Fri 25th

Eastbourne & District Pondkeeping Contact 01323731369
Discus Ireland meeting. Contact (060) 38593
West Cornwall Fishkeepers meeting. Contact 01209 717880

Sat 26th

Sun 27th

West Yorkshire Marine Aquarist Group Convention.
Contact 01924 420101

Mon 28th

Kirkcaldy A.S. meeting. Contact 01738 634689

Tues 29th

Wed 30th

Thurs 31st

Club News

All the news from around the aquatic scene

We now have the final schedule of speakers and events taking place over the weekend and it looks like it will be one of the best festivals for many years. With people booking in from all parts of the country and several overseas visitors attending as well it will be the ideal opportunity for aquarists to meet each other and talk about their hobby. For those unable to stay for the whole weekend the festival is open for day visitors from 10am to 5pm each day with only a small entry fee being charged.

For those staying the weekend there will be the usual goodie bag. This contains something from most of the U.K.'s major manufacturers with the retail value being almost the same as the cost of staying the weekend.

FESTIVAL OF FISHKEEPING AND WATER

OCTOBER 12TH & 13TH

Dr Peter Burgess of *Aquarian* will be on hand over the weekend to deal with any fish health or nutrition questions you may have.

Rupert Bridges of *Tetra* will be available to deal with any general fishkeeping or pond questions you may have.

SATURDAY'S PROGRAM OF EVENTS

Viviparous Livebearer Convention - members meeting and fish exchanges
Goldfish Society of Fish Show
Inter club Koi Display - South Hants & District - Hastings Koi Society
"Jinchu Kai" Ranchu Society Display

Lectures

10.15	John Negus (regular contributor to *Water Gardener* magazine) speaking on creating a pond.
11.15	Alf Nilsen (regular contributor to *Today's Fishkeeper* magazine) from Norway speaking on marines. This lecture is sponsored by *Aqua Medic*.
12.15	Dr Peter Burgess (Consultant to *Aquarian*) speaking on Fish Growth
14.00	Harro Heironemus (Editor of Germany's foremost water gardening magazine) speaking on Water lilies.
14.00	First round of the "Aquachamp Final" sponsored by *Aquarian*.
15.00	Paul Davis (*Aqua Medic*) Beginning with marines seminar.
16.00	Pete Liptrot (*Today's Fishkeeper* oddball expert) lecture on oddball fish.

The evening meal will be followed by live entertainment and a fancy dress competition.

Booking Hotline: 0208 847 3586

Hagen are a major sponsor of this event and this year are sponsoring the *Hagen Masters* Open Show and the Goldfish Society of Great Britain Fish show. Hagen and Maidenhead Aquatics have also got together to offer a £15 voucher for a sweetshirt or Hagen products at any of the Maidenhead branches.

THE N.I.R.A.H. TEAM

Ronnie Murning (Project director), John Dixon DSC (Curator of Amphibians & Reptiles) Chris Duffy (Chairman) & Dr Steve La Thangue (Curator) have a huge amount of knowledge on all things aquatic and will be available throughout the weekend to advise you on all aspects of the hobby.

GARDENING WEEKEND

MARINE CONVENTION

West Yorkshire Marine Aquatic Group will be holding their convention at the Gilbert Murray Hall, Leicester University, Manor Road, Leicester on October 27th. The following speakers will be present :-

Dr. Bruce Carlson - Director of the Waikiki Aquarium.

Dr. Ellen Thaler - Professor for Ethology at the University of Innsbruck, Austria. Dr. Thaler has been doing extensive research on the behaviour of coral fishes, and recently published a book on the subject (Ulmer 1995).

Dr. Elizabeth Wood - A Marine biological consultant and coral reef conservation specialist at the Marine Conservation Society and has led the development of a Conservation Programme for the Semporna Islands and reefs in Borneo.

Dietrich Stüber - Originator of the 'Berlin System' and probably the first aquarist who managed to keep an *Acropora* sp. Successfully. Fragments from his colony (a.k.a. Stüber Acropora) now exist in tanks in many different parts of the world.

Tickets: £15, by post from: WYMAG, 31, Henconner Crescent, Leeds, W. Yorkshire. LS7 3NS. A complimentary buffet is included in the price. £2 from each ticket sale will be donated to the Semporna Islands reef conservation project.

Enquiries: Roy, 01924-420101 (general) or Christine, 01132-624087 (ticket).

SUNDAY'S PROGRAM OF EVENTS

"Hagen Masters Open Show" Tropical & Coldwater fish.
Supreme Championship Final sponsored by "Tetra".
Inter club Koi Display - South Hants & District - Hastings Koi Society
"Jinchu Kai" Ranchu Society Display

Lectures

10.15	Rupert Bridges (*Tetra*) speaking on fish health.
11.15	Viviparous Livebearer Convention Introduction
11.30	Harro Heironemus (President of the German livebearer association) speaking on livebearing Goodeids
11.30	N.I.R.A.H. Team talking about the Eden project and the proposed new public aquarium which will be the largest in the world once completed.
12.30	Booking in of Viviparous/Southend auction fish
14.00	Start of auction.
14.00	Wincy Willis (Regular columnist in the Water Gardener magazine) wildlife ponds.
15.00	"Aquachamp final" sponsored by *Aquarian*.
16.00	*Hagen Masters* Trophy Presentations (sponsored by *Hagen*) Supreme Championship Winners (sponsored by *Tetra*)

Alf Nilsen of Today's Fishkeeper together with Paul Davis of *Aqua Medic* will be available to answer any marine questions.

FESTIVAL OF FISHKEEPING & WATER GARDENING WEEKEND

11th - 13th October 2002

Day Visitors Saturday 12th and Sunday 13th

The FBAS "Supreme Championship" Final
(Final on Sunday)
"Hagen Masters" Open Show
(On Sunday - Sponsored by Rolf C Hagen)
Goldfish Society of Great Britain Fish Show
(On Saturday - Sponsored by Rolf C Hagen)
"Jinchu Kai" UK Ranchu Specialist Gold Fish
South Hants & Worthing Koi Society
Catfish Show with Southern Catfish
Conservation Rescue Society (Saturday)
"Aquarian" Aquachamp Final
"Maidenhead Aquatics" Aquarium Display
Show Rabbit display by The Kalian Stud
A Multitude of Speakers from both the
Aquatic and Water Gardening World
(Sponsored by Today's Fishkeeper and The Water Gardening Magazines)
Quizzes and Competitions in all subjects
Aquatics, Water Gardens ,Water Features
Interclub Show, Display and Trade Displays
And Much More

A host of exciting attractions for both residents and day visitors including:

Everything you need to know about
Keeping Freshwater Tropical Fish
Keeping Marine Fish
Water Gardening
Introducing Water into your Garden
Keeping Freshwater
Coldwater Fish
Water Features
Visit local Gardens and Aquatic Shops on both days on a Vintage Royal Blue Coach

Full Board

From

£78.00

Three Night Weekend £98.00

Cabaret Entertainment
&
Dancing on all three nights

Bracklesham Bay Weekend
New Horizon Holidays South Downs Holiday Village
Bracklesham Bay Near Chichester Sussex

Sponsor

Hotline Bookings: Please contact Grace Nethersell
8 Acacia Avenue Brentford, Middlesex,TW88NR
Tel/Fax form direct to: 020 8847 3586

£15 Voucher

Nature World

Today's Fishkeeper visits *Nature World* in South Yorkshire

Nature world has been established for 35 years.

NATURE WORLD IS JUST the sort of pet shop where many fishkeepers first become interested in keeping fish. This one has a wonderful selection of pets of all types and has just expanded its aquatics section to a whole room full of tanks. These are divided into freshwater tropical, coldwater and marines. All the fish and invertebrates on display were in perfect health and reasonably priced although most of what was on sale could be termed "Bread and butter" species rather than the rare and unusual. At this stage, however, the system is only a few months old and only hardy species were being stocked, in fact the first invertebrates had only just started to arrive the week we visited. No doubt the range will expand in the coming months.

In the reptile and amphibian room there was a great selection of weird and wonderful creatures ranging from snakes, lizards and tortoises, through frogs to axolotls, and even snails and spiders (not for the faint hearted these). Certainly something for everyone and well worth the trip just for these. If you are more of a furry person then look out for the Dagu's (cute little mammals just a little smaller than a Chinchilla).


This type of pet shop is a magnet for children.

Ray Nicolls started *Nature world* some 35 years ago and has built a thriving business based on good customer service. Looking around all the cages and vivaria in the shop you will find lots of notices explaining all about the animals for sale. On the aquatics side he has installed the computerised *Sera Aquatest* system. ■


Using the *Aquatest* system customers can have their water checked and the readings explained in clear and easy to understand manner.


RO water was on sale for marine tanks.

Dawn's verdict on the manufacturers

Which manufacturer has the best range of products in your opinion? *Sera* and *Interpet*

Which company gives your customers the best service? *Interpet*


Our team nearly walked out with several "furry" creatures as well as one of these tortoises and a beautiful lizard.

Shop details: Nature world, 86 High st., Maltby, S66 7BN. Tel 01709 812408.

Shop opening hours: 8.45am - 5.30pm Mon - Sat, Sun 10am - 4pm.

Proprietors: Ray Nicholls

Manager: Dawn Wilson

Staff: Annette, David, Donna, Jane, Kelly, Lee, and Lynne

Staff knowledge: David is your man for Reptiles and Lee for marines. Both Ray and Dawn have a good knowledge right across the board.

Number of tanks: 110 split between Tropical, coldwater and marines

Specialities: Reptiles, Amphibians and Aquatics.

Additional services: Computerised *Sera* aquatest system installed.

Brands stocked: All major brands. For marines *Aquamedic, Kent* and *Deltec*.

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

Our verdict

What a wonderful pet/aquarium shop. The marine side will be up to full speed in a couple of months time and no doubt be just as good as the rest of the shop.

INTERESTED IN RUNNING THIS SHOP?

Ray has been in the business for 35 years now and is looking to retire in a few years time. Rather than sell the business outright, he would rather have someone take over the shop on a rental basis. The right person must have management experience on the aquatics side and would work alongside the existing team initially before taking over the whole business in about 5 years time. If you are interested in this wonderful opportunity contact Ray on 07710 467717.

Letters in association with Tetra

Today's Postbag

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

How the hobby has changed

Star Letter

Dear Sirs,
Having retired, I would dearly like to take up freshwater tropical fish keeping again, the difficulty I face is in convincing my wife that the art and science of fish keeping has significantly moved on since her recollections of my tropical aquariums of the fifties and sixties. She remembers the awful, ugly tanks, formed of plate glass, framed with black hand-painted angle iron and the inferior cements, which invariably resulted in drips onto the carpet.

In addition, the box like hoods were made of wood that were hand-painted green on the exterior and silver painted on the interior to act as a "reflector" to aid the lighting, which was provided by two ordinary, every day, light bulbs. These domestic quality light bulbs, constantly blew due to the propensity with which condensation accrued, further more, this form of lighting produced concentrations of algae upon the glass nearest to their respective filaments, which left shadows like inverted fir trees across the viewing glass.

The perspex cover, used in an attempt to reduce the condensation, burned a reddish brown at the epicentre of each bulb due to the concentration of heat radiating constantly upon the same spot; these bulbs were a further disadvantage, as they had the effect of layering heat within the aquarium's water stratum.

The general aesthetic look of the tank was also disrupted by the dangling heaters, in addition, the layering phenomenon meant that an independent thermostat that "automatically" controlled the water temperature had to be set well away from the heat sources, as did the thermometer.

Plants were used in the attempt to camouflage but what could not be disguised was the filtration system, this piece of apparatus, consisted of a glass container that was clipped on to the side of the aquarium, its contents of cotton wool, charcoal, small gravel and fine sand visible as was the complex of the system's tubes. The filtration and aeration elements were serviced by an air-pump, which throbbed and pulsated at a rate of decibels that would make Concorde seem silent.

The whole system was not an integrated system, it was an assembly collected and collated piece meal. Unfortunately, my wife saw it as an eyesore and this retained picture is her frame of reference and she does not want such an unsightly object.

Yet I loved that twenty years of fish keeping, a fascinating and exhilarating hobby, and the "Just add water" concept of *Hagen's Fluval Duo 800* complete set up featured in May issue I hope has convinced her of how far the art and science of fish keeping has advanced.

Mr James Wilson,
Nottinghamshire.

Editor's reply

Reading this letter brought all of my very early days of fish keeping back to me. I started with Goldfish in a plastic tank in the sixties and my parents bought my first tropical aquarium for me in 1969. This was one of the new generation of tanks sealed with silicone and remarkably it still holds water to this day. I did have my share of the old putty sealed angle iron tanks which leaked regularly because they turned up in auctions and I could expand the number of tanks in my set up much faster this way rather than waiting for the next birthday or Christmas to come along. My tanks were never really attractive but they did the job of holding water for my fish to live in.

Not just an aquarium but a beautiful addition to any room.

Looking back on it, my family were remarkably tolerant of my hobby but then both my parents were interested as well. I had no idea how interested until my mother traded in her beloved piano for a 2m tank for the lounge! The hobby really has come on in leaps and bounds over the years and an aquarium is now as much a beautiful piece of furniture as a window on the fascinating world of fish. Hopefully James's wife has relented and let him set-up one of the new generation tanks after seeing just how attractive they are now.

Derek Lambert.

JUST SAY NO! to GM fish

Today's Fishkeeper's campaign against GM aquarium fish seems to have worked so far. No GM fish being sold in the UK, however they have been on display in Germany at a large trade show just a couple of months ago so now is the time we need to be extra vigilant.

THE SUBJECT OF GM crops has been all over the press in recent weeks and generated a lot of heated debate on aquatic web sites. The pro and anti camps each have their own view points and nothing will ever bring them together. With our campaign against GM aquarium fish we have been accused of siding with the anti's and ignoring the pro's point of view. That is definitely not the case. The view which has come across loud and clear from the majority of shop keepers and readers is very similar to that put forward by Mathieu Frenette in this e-mail :-

As a "scientist", I am all for GMs. At our present rate of population growth, more and more babies in third world countries are born just to die before the age of five. Now we have been given a gift. The gift of science. And since science is now able to provide safe ways to produce more food faster, I don't see why we shouldn't. Salmon that grows twice as fast should not be released into the wild, but should be bred in fish farms and raised. We can now protect the environment by manipulating genes. Just make the salmon sterile and raise them in fish farms, the new genes won't get into the wild. We have manipulated so many things so far, always for our benefit, why stop when we can now make it faster and better. Now my point is simple. GM corn. Sure. GM salmon. Sure. GM fishes for aquarium, not a necessity, not useful...should not be done, nor should there be non-allergenic cats...

JOIN THE CAMPAIGN

Please add my shop to the list of those who are saying no to GM fish.

My name.....

Shop name.....

Shop address.....

.....

.....

Post code.....

Shop phone number.....

Roll of honour

Andies Aquatic and Petstore	0151 645 8939
Anglia Aquatics, Attleborough	01953 457150
Aquacadabra, Bexley Heath	01322 345242
Aquatic Habitat, Gloucester	01452 862791
Aqualite, Harlow	01279 436929
Aqua-world Partners	01925 483879
B.A.S. Manchester	01204 534343
Clearwater Aquatics, Leicester	01162 743426
Gilberts Pet & Garden supplies, Torquay, Devon	01803 329149
Holly Bush Aquatics	01922 418050
Home Marine	0208 367 4191
Maidenhead Aquatics	
@ Ascot	01344 875031
@ Aylesbury	01296 623335
@ Bourne End	01628 528882
@ Bracknell	01344 453666
@ Bristol	0117 977 2955
@ Cardiff	029 2084 2666
@ Chichester	01243 771077
@ Chipperfield	01442 834941
@ Cwmbran	01633 873533
@ Dartford	01322 291221
@ East Grinstead	01342 835373
@ Enfield	0208 3648617
@ Guildford	01483 281678
@ Hare Hatch	0118 940 1122
@ Havant	023 9249 8401
@ Henley	01189 402123
@ Hereford	01432 344887
@ Hickstead	01444 882040
@ Hillingdon	01895 810050
@ Iver	01753 630130
@ Mill Hill	020 8201 1999
@ Morden	020 8646 1066
@ Newbury	01635 869900
@ Northampton	01604 592044
@ Osterley	020 8568 0030
@ Polhill	01959 533519
@ Ramsgate	01843 597597
@ Shepperton	01932 781500
@ Southampton	023 8069 6383
@ Swansea	01792 882287
@ Swindon	01793 526888
@ Syon Park	020 8568 7776
@ Wembley	020 8200 3545
@ Weybridge	01932 821199
@ Woking	01483 740180
@ Worthing	01903 244532
Nature World	01709 812408
Pier Aquatics, Wigan	01942 236661
Prestwood Petzone	01384 877150
Riversdale Fishfarm, Lincolnshire	01790752410
Riverside Aquaria, Stirling	01786 473450
Shotgate Aquatics, Billericay, Essex	01268 531287
Spire Aquatics, Chesterfield	01246 278957
The Aquastore	01935 423438
The Water Zoo, Peterborough	01733 312142
Tisburys Aquatic Centre	01708 341376
Tropica, Knaresborough	01423 869590
Sedgley Road Aquarium	01902 670098
Ultimate Discount Aquatics, Fife	01334 656699
Waterworld Aquatic Centre, Aberdeen	01224 631164
Waterworld Aquatics, Glasgow	0141 427 955
Wet Pets, Romford	01708 744880
Wet Pets, Southwell, Notts	01636 816910
Wet Pets, Sutton-in Ashfield, Notts	01623 556341
Wholesale Tropicals, Bethnal Green, London	020 77395356
Wings and fins, Stockport	0161 432 5799

Recent imports

Top German aquarist **Erwin Schraml** has been trawling through recent Catfish imports looking for something a little out of the ordinary. **PHOTOS: ERWIN SCHRAML**

Chaca bankanensis a death trap just waiting to go off!

Chaca bankanensis

This 'Angler' catfish can be found in many books, but it is so rarely imported , that its re-importation is worth mentioning here.

C. bankanensis is one of three recognised species of Angler catfishes. Its distribution is spread over Malaysia, Indonesia and Borneo. These fish are ambush predators. Well camouflaged, they lie on the bottom and wait for small fish and shrimps to pass by. Their large muzzle then shoots open like lightening and the suction created pulls the surprised prey down into their throat.

The species can reach a length of 20 centimetres. It lives in stretches of water with a pH 6.0 to 7.2. Temperatures from 24 to 28°C suit this fish best. So far they have not been bred in captivity. Unlike the other two Angler catfish species, *C. Bankanensis* does not make a noise. The species is very sedentary , moving little more than a few centimetres, even if something bothers it.

Megalancistrus barrae

The genus name *Megalancistrus* indicates that the fish which belong to the genus must be rather large. This has to be taken in context because there are some truly gigantic species of Catfish, however, *Megalancistrus barrae* will grow to over 30 centimetres.

This species (with no scientific identification) was recently imported by Aquarium Glaser with Rio Sao Francisco named as the location Luckily, I had the chance to examine some type specimens in the Natural History museum of Vienna recently and the syntype of *M. barrae* was one of these specimens. It is described from the same Brazilian river and appeared identical to this fish, so I am sure that I have identified the fish correctly.

This species was described by Steindachner in 1910 as an *Ancistrus*. Unfortunately, it is not a very pretty fish and will probably never be very popular. Only the teeth are strikingly coloured yellow.The relatively few teeth have an interesting structure. they are large and flat with one large and one small tip. This species is similar to *Pseudacanthicus* in having a series of sharp thorny extensions found at the side on the plates, especially around the caudal peduncle. They are dificult to distinguish from the better known *Pseudacanthicus*.

Up to the present time there has been no experience with *Megalancistrus barrae* in captivity.

A new member of Auchenipteridae from Peru

Another new import from Peru is a member of the family Auchenipteridae, which was labelled *Trachycorystes trachycorystes*. According to bibliographical references, however, this species occurs in British Guyana. A drawing in Mees (1974) also shows a somewhat different looking fish with a truncated tail fin. This species has a rounded caudal fin. The cleithrum is likewise different. However, from a Brazilian exporter in Belem *Trachycorystes brevibarbis* (Cope, 1878) has been described. Unfortunately, I have not seen the original description , but I think we should probably compare these fishes with that species. Originally Cope described his fish as a member of Auchenipterus, Ortega & Vari (1986) placed it in *Trachycorystes*, while Burgess (1989) transferred it to *Parauchenipterus*.

They have very small eyes, a comparatively gigantic muzzle and a very flexible stomach They are mostly active at night or half light when they are very predatory and extremely piggish, eating any fish they can gobble down.

Catfish like this *Trachycorystes brevibarbis* must not be kept with smaller fishes, like Tetras. They would treat them as food!

All the fins on this fish have a dusky black edge, therefore, I have given this fish the common name of Black ribbon - *Pseudoconthicus*".

The "Black Ribbon *Pseudacanthicus*"

Recently, from a Brazilian exporter in Belem, Aquarium Glaser has received some fish which belong to a group of *Pseudacanthicus* species which are similar to *P. spinosus*. The basic coloration of all of these animals is greyish with black spots on their body. Besides *P. spinosus* itself, there are L 79, L 96, L 160 and L 283.(I do not include L 113 with them, because I have always believed that this might turn out to be a smaller individual of a *Megalancistrus* L 234). Unlike all the other known fishes of this group, they have a large number of dark spots very irregularly placed and irregular in form. On the somewhat lighter coloured stomach the dark markings contrast strongly

The fish pictured is approximately 10 centimetres long (measured from the head to the base of the caudal fin). It is, of course, uncertain whether the colouring will stay, or change if the fish is immature

Top of the Pops the Livebearers

Who are "*Top of the pops*" in the fish world? Livebearers have always been there, but there are lesser known cousins who are the "Wannabes" of the fish world just waiting for their chance to topple one of the big four.

PHOTOS: DEREK LAMBERT, M.P. & C. PIEDNOIR, LAURENCE AZOULAY

Guppy

OUR VERDICT
Popular from the very beginning of the aquarium fish hobby and still ranking as a "Top of the pops".

Scientific name	*Poecilia reticulata*
Aquarium type	45 x 30 x 30cm
Distribution	Originally South America and the Caribbean, now world wide.
Diet	Not fussy. Flake, small pellet, frozen and live foods.
Companion species	This species is the perfect community fish. It does well when combined with any other small community fish.

Celebes halfbeak

OUR VERDICT
Could easily have been a "Top of the pops" but for being labelled a brackish water fish. In fact they are happy in clean freshwater, probably always a "Wannabe" now.

Scientific name	*Nomorhamphus ebrardti*
Aquarium type	90 x 30 x 30cm
Distribution	Celebes
Diet	Flake, granular and pellet foods whilst they are at the surface. All types of live foods.
Companion species	Other medium sized peaceful species.

Swordtail

OUR VERDICT
A well established "Top of the pops". Can be a bully at times but otherwise a good community fish.

Scientific name	*Xiphophorus* hybrid
Aquarium type	90 x 30 x 30cm
Distribution	Central America
Diet	All foods including commercial flake and granular.
Companion species	Other medium sized community species.

SEE KEY TO SYMBOLS ON PAGE 5

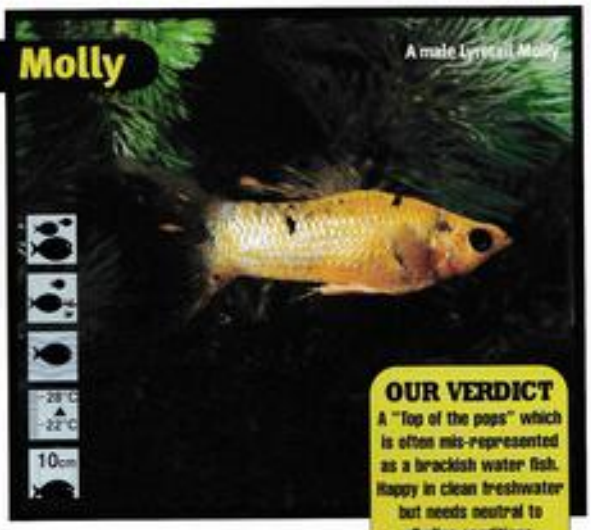
Platy

Both sexes of Platy are just as brightly coloured.

OUR VERDICT
A real "Top of the pops", no bad habits, hardy and beautiful. Justly deserving its number 1 spot.

Scientific name	*Xiphophorus* hybrid.
Aquarium type	60 x 30 x 30cm
Distribution	Central America
Diet	Flake, granular, frozen and live foods. Easy to feed.
Companion species	Other small to medium sized fish.

Molly



A male Lyretail Molly

OUR VERDICT
A "Top of the pops" which is often mis-represented as a brackish water fish. Happy in clean freshwater but needs neutral to alkaline conditions.

Scientific name	*Poecilia* hybrid
Aquarium type	60 x 30 x 30cm
Distribution	Central America
Diet	All commercial foods, plus any live foods they can get hold of.
Companion species	Other medium sized, lively community fish.

Bold characodon

Male Bold characodons are very attractive fish.

OUR VERDICT
A "Wannabe" which may make it to a "Top of the pops" rating if enough commercial breeders take it on board.

Scientific name	*Characodon audax*
Aquarium type	90 x 30 x 30cm
Distribution	Mexico.
Diet	All foods including some live foods.
Companion species	Other medium sized community fish.

Crescent zoe

Male Crescent zoe.

OUR VERDICT
An excellent choice for a small to medium community which could definitely be a "Top of the pops". Few commercial breeders produce this fish yet, so lack of easy availability has limited its popularity.

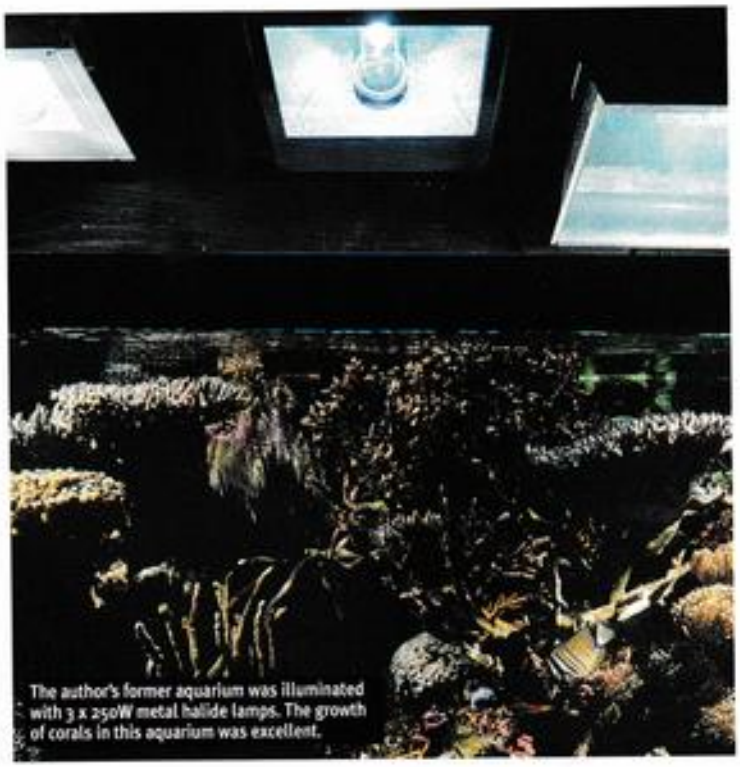
Scientific name	*Zoogoneticus tequila*
Aquarium type	60 x 30 x 30cm
Distribution	Mexico
Diet	All foods including some live.
Companion species	Other small to medium community fish.

Experimental aquaria for Stony corals

In the last part of this series on Stony corals **Alf Nilson** tells of two experimental aquaria he set up for Stony corals and tabulates his findings

MY FIRST EXPERIMENTAL AQUARIUM FOR keeping Stony corals (a tank that ran for 10 years, from 1988-1998), was not very big - only 850 litres, measuring 167 x 85 x 60 cm (L x W x H). The tank has undergone much experimenting regarding the technique. A lot of different methods and equipment have been tested, some kept and others thrown away. The main filtration was a Bioquatic protein skimmer with a diameter of 110mm and a water flow of about 1000l/h. This was the only outside filtration. However inside the aquarium was decorated with 120 kilograms of live rocks. The rocks were surrounded with 20,000 l/h water movement in variable directions, and did in fact make up a kind of biological filter. The concentration of nitrate and phosphate in the system were both less than 0.5 ppm. Once a month a 48 hour period of filtration with over 250 grams of activated carbon was carried out. Ozone was available, but rarely used.

The aquarium was illuminated with 3 x 250 W metal halide lamps (Osram HQI-TS/250WD) 10-13 h/day, and with 2 x 40 W Phillips TL 03 "actinic blue" light tubes used 14 h/day. The metal halide bulbs, which were mounted in specially made reflectors that spread the light over the whole surface with an intensity of about 40,000 lux at the surface, were changed with new ones every 10 months. Each day about 5 litres of water evaporated from the aquarium and was replaced with calcareous water through a



The author's former aquarium was illuminated with 3 x 250W metal halide lamps. The growth of corals in this aquarium was excellent.

Colony B *Acropora formosa* grown in a closed aquarium system. This colony was collected legally in Fiji, in late June 1992.

Bioquatic Calcareous Reactor. In order to avoid a dangerously high pH, the pH was controlled automatically through the inlet of CO_2 when pH increased above 8.45. About 2000 grams of CO_2 was used in 4 months. This also stabilized the KH-level around 7o KH, (it should be noted that our freshwater used for making calcareous water has a pH of 4.5 and a KH of zero !).

A water change was rarely done and was kept at less than 5% per year. Each week 20 ml Marinvit from Sera (containing Caliumjodod, Calsium Fluorid, Rubridium Chloride, Liticium Citrat, Strontium Chloride, Boric Carbonate, Natrium Carbonate and various vitamines including B12) and 20 ml (o.6M) $SrCl_2$ were added. Trace elements in the form of Combisan were also added irregularly.

Growing the colonies

The growth rate among the majority of the Stony corals in the aquarium was magnificent. I have measured the growth of specific colonies in "length", "width" and "height" and from these values calculated what we call "colony volume". "Colony volume" is actually the water volume which a colony in the aquarium occupy and control biologically. In this area no other corals will settle and grow due to the chemical defence. The "colony volume" must not be confused with "colony mass" which is the mass of the solid skeleton of the colony. The "colony mass" can only be measured by submerging the colony in a chamber with water and calculating the increase in water level, a method which means that the colonies must be removed from the aquarium. This is difficult, as the majority of the colonies have attached themselves to the live rocks. (Such a method might be interesting to try if small offspring were grown on an artificial substrate, which could easily be removed). Two colonies with the same "colony volume" might have very different "colony mass".

There are distinct differences to be observed with respect to colony growth. First we can compare the growth of two colonies of *Acropora formosa* placed in very different illumination. Colony A was placed in app. 25,000 lux increased its volume in 516 growth days with 13,755 cm3 (800 cm3/month) while colony B was placed in app. 8,000 lux increased its volume in 557 growth days with 5.368 cm3 (289 cm3/month). The shapes of the colonies were also different. Colony A developed thicker and more upright branches while colony B developed a tighter colony form with a more flat colony top. It is likely that the different shape of the colonies resulted from different response to the difference in light intensity, but it might also be a response to water current or some other parameters.

One can also compare the growth rates of corals with naturally different growth forms, such as the branching *A. microphthalmo* with the laminar formed *Acropora cythera* (both placed in app. 25,000 lux and in the same current). Other potential observations are to compare the growth rate of a typical shallow water species like the *A. microphthalma* with the typical deep-water *Acropora cf. formosa* (offspring from the famous "Stüber's coral", which was the first *Acropora* to be grown in a closed reef aquarium. Stüber grew the corals in Berlin from 1984/85 and still grows it to day) under identical light conditions. To observe the variations in growth rate from the settlement of a newly cut offspring until a well-developed colony has formed is also interesting. At last it is possible to study variations in growth between different genera or even families.

The second aquarium

The second aquarium was even smaller, only 285 litres including the sump-volume. It was designed to measure various changes in a closed system when no water changes were done, and was in operation for a little more than 500 days. The technique followed that of the tank described above, →

Colony B 18 months later (in January 1994). As can be seen the growth is considerable. This colony was placed close to the bottom of the aquarium in weaker light than Colony A.

Stüber's Acropora (possibly *A. formosa*) was the very first *Acropora* to be grown in captivity. This picture from 1985 shows the original colony that grew out of live rocks in the aquarium of Dietrich Stüber, Berlin.

but was arranged on a smaller scale. Even in this aquarium the Stony corals, which were implanted as tiny fragments, grew. The table gives further information on the growth result. However, when examining the skeleton's element composition, using an Energy Disperse X-ray Fluoresces, (a method that can track all elements in the periodic table and show which elements are present relative to the others, but that does not give exact data for the amount of the individual element), it was clear that the skeletons differed chemically very much from that of corals of the same species growing in the wild. This tells us that corals growing in captivity do indeed grow, but they can very well grow a skeleton that is far from natural!

One should, however, be very careful about drawing conclusions just from growth in one or two tanks. Such experiments are not scientific. In order to do really valuable work we need several similar tanks where individual parameters can be varied. Never the less one has to start somewhere, and I hope my preliminary results can be an incentive to other aquarists and scientists. ■

TABLE

The table shows the growth of corals and a Giant clam in a 285 litres, closed aquarium operated for about 500 days. No water change was done. The growth of many of the corals as well as of the single specimen of the giant clam, *Tridacna gigas*, was measured by comparing their initial weight with their final weight:

%Increase in volume/day = (Final weight - Initial weight / Initial weight) x 100 / #days

It is difficult to measure growth among corals. Big corals will show a larger growth because they accumulate more $CaCO_3$ on their bigger surface than tiny corals. Dividing by initial weight gives a semi-correction for varying initial sizes. Jokiel & al. (1978) discuss the problems linked to measuring coral growth. They compared growth measures using buoyant weight, linear extension, surface area (very difficult for some species) height, etc. and found that the former (buoyant weight) was the best indicator.

Families and Species	Initial weight (grams	Final weight (grams)	# Days	Growth (%/day)
ACROPORIDAE				
Acropora formosa	15	77	545	0.785
Acropora latistella ("surface")	235	635	418	0.407
Acropora latistella ("bottom")	155	235	484	0.107
Acropora tenuis (?)	8	45	514	0.900
Seriatopora hystrix	3	17	425	1.098
AGARICIIDAE				
Pavona cactus	12	45	510	0.539
MUSSIDAE				
Lobophyllia hemprichii	845	970	484	0.031
FUNGIIDAE				
Herpolitha limax	145	260	420	0.189
Fungia fungites	605	660	444	0.020
Polyphyllia talpina	145	285	420	0.230
Fungia sp.	75	110	420	0.111
MOLLUSCA, TRIDACNIDAE				
Tridacna gigas	330	1075	420	0.538

REFERENCES

FOSSÅ, S. A. & A. J. NILSEN (1998): The Modern Coral Reef Aquarium vol. 2. 1. edition. Birgit Schmettkamp Vertag (BSV). Bornheim, Germany.

VERON, J. E. N. (1986): Corals of Australia and the Indo Pacific. Angus & Robertson Publishers, North Ryde NSW, Australia & London, U.K. (2. edition 1993)

VERON, J. E. N. (1995): Corals in Space and Time. Comstock/Cornell, London.

VERON, J. E. N. (2000): Corals of the World, volume 1-3. Australian Institute of Marine Science (AIMS) and CRR Qld. Pty. Ltd.

WALLACE, C. (1999): Staghorn Corals of the World. A revision of the genus Acropora. Csiro Publishing, Collingwood, Australia.

Ponderings

Dave Bevan's regular column on ponds and pondlife features a beautiful but unusual pondfish and how to feed your fish correctly at this time of year.

WINTER FEEDING

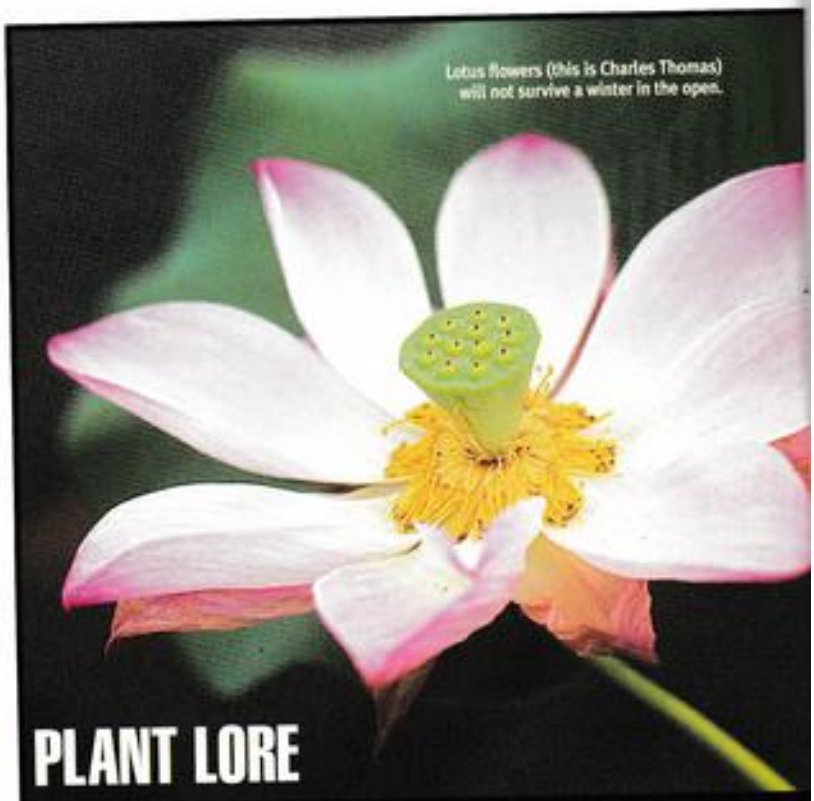
Fish are much more in tune with their environment than we are and as the temperature of the water drops so does their metabolic rate. This will lead to a reduction in their food intake and a slow down of their digestive system.

Special diets are available which can be safely fed at this time of year. These are wheatgerm based and will not cause problems if a sudden cold snap causes your fish to stop feeding altogether.

As winter approaches watch for signs that they are not clearing up all the food within a few minutes and reduce the amount accordingly. Scoop any surplus food from the surface before it sinks adding to the pond's biological load.

Once the water temperature drops to 6°C, then stop feeding the fish altogether because ,even if they are prepared to feed at these temperatures, their digestive system will not be able to digest the food.

Be very careful when feeding your fish at this time of year. It is all too easy to overfeed.



Lotus flowers (this is Charles Thomas) will not survive a winter in the open.

PLANT LORE

Were you tempted earlier this year to add a few exotic plants to the pond? Those large, healthy looking floaters like the Water lettuce and Water hyacinth provide some welcome shade and the tangle of roots is great for the fish fry.

However, these plants are unlikely to survive the winter and the first decent frost will reduce them to a blackened, dying mass. When they sink they will add significantly to the biological load on the pond, polluting the water and storing up problems for next spring.

Other plants which may not survive the rigours of a British winter include Salvinia, Lotus and Tropical lilies. Incidentally some exotic introductions to wild habitats which are now causing consternation among conservationists, like Azolla, are also killed off by a good frost.

Some of our native plants are also frost tender, so how do they survive the winter? Many marginals simply die back to the crown and send out new growth in the spring. Others like the pondweeds are safe, provided they remain below the ice level. Frogbit produces bulbils in the autumn, which sink to the bottom where they are safe in the mud

RED SHINER FACTFILE

Species: Red shiner (*Cyprinella lutrensis*)

Other Names: Rainbow dace, Red horse minnow

Other forms: None

Size: 8 to 10 cms

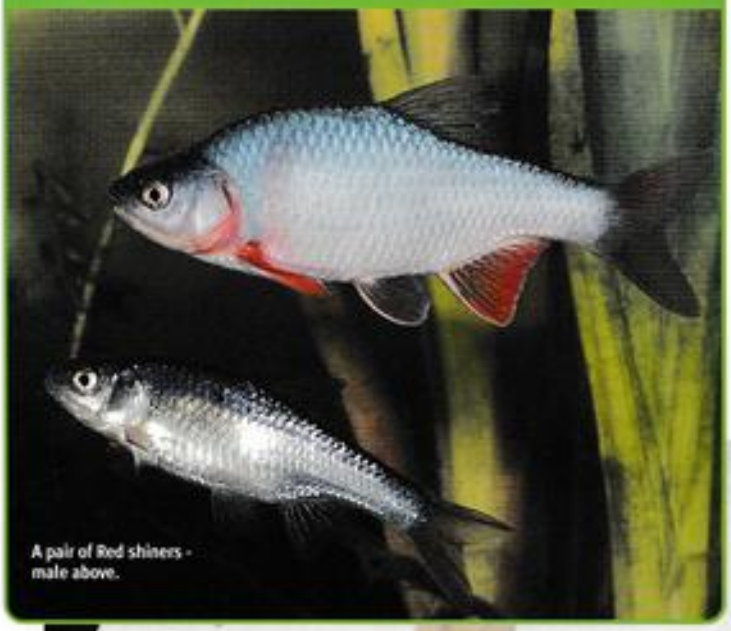
Availability: Stocked by larger aquatic outlets in spring.

Habitat: Prefers clean well oxygenated rivers with plenty of cover.

Identification: The male in breeding season is a match for any tropical species, with his steely blue grey back and red tinted fins. A chunky fish with white tubercles round the head which are very pronounced during the breeding season. The female is smaller and more streamlined with a silver grey back and silver sides.

Habits: A fast moving fish which eats insect larvae and lays its eggs in shallow depressions on the river bed.

Pondfish value: An excellent choice for the larger well oxygenated pond. Avoid situations were the water can warm up quickly.



A pair of Red shiners - male above.

BELOW THE SURFACE

One of the simplest forms of life, bacteria are unicellular organisms roughly characterised by shape into rods, spirals and cocci, although from the pond keeper's point of view the distinction between good and bad is far more important.

Bacteria are responsible for many of the diseases we are likely to find in our fish including fin rot, septicaemia, ulcer disease, fish tuberculosis and dropsy.

Conversely there are some helpful bacteria as well and the pond would not be able to maintain a natural balance without the nitrifying bacteria, nitrosomas and nitrobacter. The main players in the nitrogen cycle they ensure that the harmful waste products produced by fish and other pond creatures are converted into less harmful nitrates. These nitrates are then absorbed by the pond plants allowing the system to become self-perpetuating, maintaining the water as a safe environment for our fish.

POND ACTIVITY

As autumn approaches the plant life around the pond starts to die back reducing the cover available to fish. This also coincides with reduced fish activity as they slow down in preparation for winter.

Then as we move into winter predators, like the grey heron, finding it difficult to make ends meet out in the wilds, lose some of their natural fear and move in for an easy meal.

A piece of 50mm thick polystyrene (costing a few £'s from the D.I.Y. store) can be cut to size and either allowed to float on the surface or can be anchored in position using nylon string and a small stone.

Alternatively 7 - 10cm diameter clay drainage pipes (make sure there are no sharp edges) can be allowed to sink to the bottom of the pond were they provide excellent cover.

It may not look pretty but it will give the fish some cover.

There are many different types of Caddis flies each with a distinctive case as a larvae. This is probably Glyphotaelius which rolls dead leaves into a case resembling a tiny cigar.

DIPPING DEEPER

Although the Caddis flies themselves are all fairly insignificant little moth like flies the larvae are much more interesting. They spend their life underwater, the majority feeding on plant material, but being soft-bodied need some protection against predators. Each species makes itself a hard but distinctive case, which it carries round with just the front end sticking out allowing it to move and eat.

It is this case which not only aids identification (all the names are long and unpronounceable) but also makes this group interesting. Anabolia uses pieces of pond detritus like broken twigs and plant stems which makes them almost invisible on the bottom, that is until they move and then you wonder how a piece of twig can move against the current! Glossosomatidae makes a case out of small unevenly sized stones whilst Sericostomatidae makes a smooth case from sand grains.

Like so many of the smaller water creatures Caddis larvae are an important part of the food chain where their hard cases do not prevent them being eaten by larger pond fish.

MEDICATIONS

There are proprietary medications available for most fish ailments and in theory, nothing could be simpler than adding a bottle of chemicals to the pond. All medications, however, are stressful and a careful watch must be kept during and after administration.

Overdosing or the application of more than one remedy at a time may result in even more problems and stress to your fish. Always explore all other avenues, particularly water conditions and stocking levels, before resorting to chemical treatments. Never apply these treatments in very hot weather because many will further reduce the oxygen levels. Their effectiveness is also reduced in cold weather due the fishes and parasites much slower metabolic rate.

Koi world

In this months column **Bernice Brewster** asks the question "Why dont we visit the vet with a sick Koi?"

It is all too easy for ponds to become over crowded with fish causing major health problems

DURING THE COURSE OF THE SUMMER months, I spend more of my working time helping Koi hobbyists who are struggling to cope with fish health problems. Often the first contact is made by a telephone call and it is important to realise that without seeing either the affected Koi, or the pond system it is impossible to know what might be wrong with the Koi. We would not expect either our Doctor or Vet to guess at what illness is making ourselves or our other pets sick without a consultation and yet this is often what is expected for our Koi. I also get very frustrated with those callers who start the conversation with the phrase "I only want advice.". There are other issues here, firstly, I run a business to earn money and the 'free' advice actually costs me money, if I am with another customer when the call is made, it is actually this person who pays for my time, while I am on the 'phone.

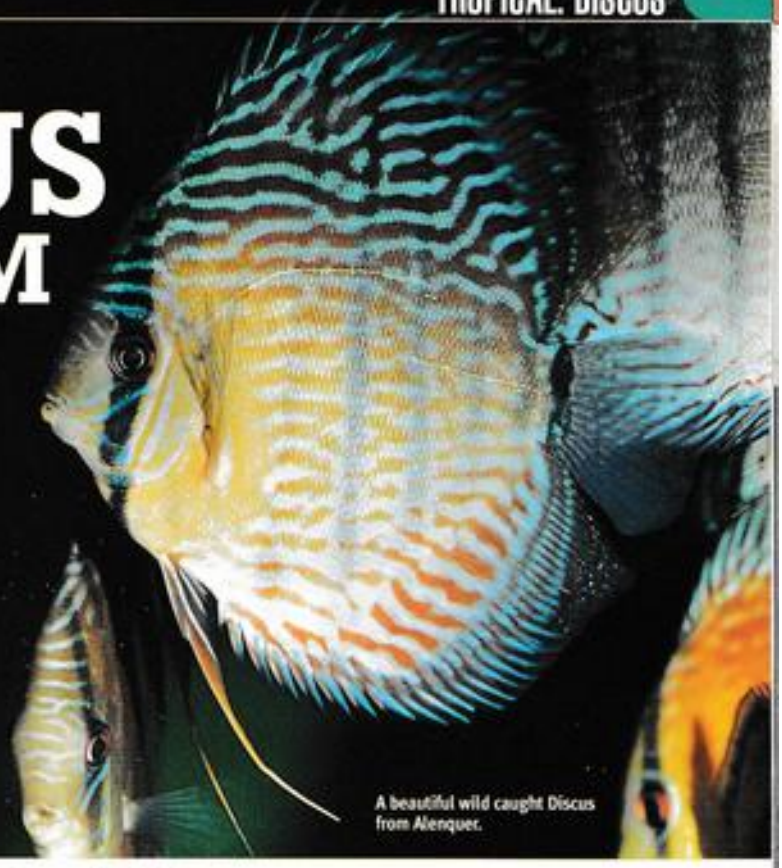
Often my advice is to contact a local Vet, who I am immediately informed knows nothing about fish. Is this really true, or they simply avoiding a professional or could I cynically add, payment? The Veterinary profession is very aware of the increase in numbers of people who keep fish as pets and run very comprehensive courses on fish health, husbandry and management. Even in the event of a Vet acknowledging they do not wish to get involved with treatment of Koi, there is a list of those willing to help, available from the Fish Veterinary Society.

I still regret that many of these calls revolve around the management of Koi and are not true problems of outbreaks of disease. Although much information has appeared on the importance of dissolved oxygen concentration, this is probably the most common cause of the problems which I encounter during the warmer months of the year. Throughout the year, I get to see outbreaks of *Trichodina* sp. and flukes caused by badly maintained filters and not through resistance of these animals to chemical treatments. Of course, I should also add the numbers I routinely see, where Koi are dying as a consequence of pond water polluted with ammonia or nitrite. The sad truth is that we are very good at killing our Koi. When Koi become sick, the most important question to ask ourselves is 'What have I done to cause this problem'. ■

Simple aeration will help in the short term but only removing some of the fish will solve the problem long term - otherwise nature will solve it for you by killing some of the fish.

DISCUS PROBLEM SOLVER

Tony Sault answers more questions on Discus



A beautiful wild caught Discus from Alenquer.

Discus losing colour

Q **I recently bought a small shoal of Discus and they were put into a tank that had been set up for Discus only, all the readings from my test kits are normal, pH 6.5 temperature 28-29°C, Nitrite and Nitrate both zero, they were fine for about 10 days feeding O.K. and a good colour. Now they have all lost their colour but what is fooling me is that they have not turned dark as I have read Discus do when they have a problem, but they have gone very pale in colour, can you help?**

Thomas Graham, *Manchester.*

A Your fish certainly do have a problem, though I suspect not a life threatening one. If all your tank parameters are normal, have you been using a medication? Some medications tend to make the fish lose normal colour and this will return after a short period when the medication has been removed. Another common cause of colour fading is your lighting may be too bright. If so either reduce the amount of light or provide your fish with shaded areas. Finally the cause may simply be their diet. Are you feeding them with a varied high protein diet? I am sure when you find and remove the cause that your fish will return to normal.

Do I need a UV steriliser?

Q **I am in the process of setting up my first Discus tank and I am having doubts now I have been told that I must have a UV steriliser. Is this true?**

C.Turnbull, *Sheffield.*

A The simple answer to your question is no, I have kept Discus since 1966 and never had a UV Steriliser. Actually that is a little white lie, I once had a bacterial bloom in a large 600 litre tank and try as I may I could not remove it, so the final resort was a UV which cleared it in 24 hours and was never used again.

First spawning

Q **My Discus have bred and I am the proud owner of 40-50 fry almost four weeks old. Will I be able to keep some of these for myself to breed from as I have read that you should not breed brother to sister as this will produce too many deformities?**

Mrs.M.Shephard, *Grimsby.*

A Firstly, I must congratulate you on your success. For many years it has been a long held tradition that breeding brother to sister was taboo as it could produce deformities but also mutations. Today's breeders realised this and now purposely breed brother to sister for generation after generation looking for that one new colour mutation that can be fixed into a new strain.

Centralised filtration system

Q **I have been keeping Discus for 2 years now and even though I have had the odd problem I feel confident enough to have a go at breeding them. I have, therefore, decided to set up a few breeding and rearing tanks. What I would like to know is your opinion of centralised filtration systems?**

Chris Duffy, *Wolverhampton.*

A Centralised filters have many advantages, fish will grow and develop much better in say 2000 litres of water than 10 x 200 litres individually filtered tanks. The down side, as there inevitably is, is that if you get one sick fish in your system then all fish are exposed to it. So if you do decide on a centralised system then please install a quarantine facility for all new stock. This could be as simple as on/off isolation valves on a number of the tanks to isolate them from the main system, or completely separate tanks. Whichever you choose, in my opinion, could save you a lot of heart ache in the future. Good luck with this project.

Simple recipes for success

Anthony Calfo explains how to feed reef invertebrates

ALL PHOTOGRAPHS BY ALF NILSEN

IF THE TOPIC OF ARTIFICIAL LIGHTING FOR reef invertebrates is most likely to start a fist fight among aquarists, then any debate about feeding reef invertebrates is at least worthy of a good food fight. Through the slurry of marketing misinformation, legends, popular traditions and actual hard science, an aquarist must distil a plan for feeding their sessile reef denizens. I can assure you that success in doing so is easily achieved and really quite simple for the overwhelming majority of popular corals and like cnidarians.

Form follows function

The first step towards understanding and addressing the dietary needs of a reef invertebrate is identifying the dominant feeding strategies of a given specimen. Even for the layman, it is not difficult at all to see what a coral is likely to feed upon with the casual observation of polyp behaviour and structure (physiology). In terms of natural science, there is a reliable adage that "form follows function". Looking at the form of a given feature, one can reliably surmise its function.

Most corals need to be Fed!

The crash course on coral feeding is that most symbiotic corals need to supplement the products of photosynthetic activity from hosted zooxanthellae. To be clear, know that these corals will starve, albeit slowly, if they are not fed in captivity. Very few species are truly autotrophic (able to derive all necessary nutrition from symbiosis with zooxanthellae). Unfortunately, the condition is not always apparent to an aquarist when so many corals are surviving at a net daily deficit of only a few per cent. How can one tell when a coral has lost ten per cent of its mass to attrition when polyp cycles (swelling and retracting with water) can be so variable from day to day? Let me explain further. We might fairly say that most popular coral in the aquarium trade are 75-95% photosynthetic. That is to say that they derive 75-95% of their nutrition from the products of symbiosis with

Caulastrea sp. are LPS corals. This one is growing well in an aquarium.

LARGE POLYPED STONY CORALS

The so-called LPS species are some of the hungriest and most carnivorous cnidarians. They include many corals that can digest minced meaty foods (although this is still too large for most) and even eat the popular, prepared invertebrate food suspensions. Categorically, most LPS feed on zooplankton, larvae/eggs, faeces and are surely nourished by absorption. It is not clear how much if any phytoplankton is favoured by LPS corals.

LPS Recipes

Very finely minced meats of marine origin will be accepted by many LPS corals. Note: Although some species will sting and draw whole prey or large pieces of meat it is not necessarily useful or even safe for them to do so. We must remember that corals are sightless stinging animals that may not be able to initially assess the suitability of prey size. Often prey that is too large appears to be grabbed and ingested but is later (at night) regurgitated in a mucous ball of waste. As with all corals, the particle size of prey is a critical matter. For guidance, offer no zooplankton substitutes larger than 6mm. Smaller is most always better as a plankton substitute. Nutritious staples include thawed fresh-frozen gammurus, mysids, pacifica plankton, minced shell-on shrimp (much protein to be had in the chitonous shell), and minced krill. Live natural plankton from a refugium is an excellent supplement as well. Course media in fish less refugia for the cultivation of amphipods and like fauna is highly recommended. Refugiums plumbed upstream will overflow nutritious creatures nightly into reef aquarium displays.


Porites cylindrica is a SPS coral. Here you can see a close up of the branches and polyps.

SMALL POLYPED STONY CORALS

The so-called SPS species are also largely carnivorous although you wouldn't guess by their name. They present a unique problem for aquarists attempting to feed them. Particle size is quite critical to most SPS and even with sharp discrimination between species. Most require zooplankton prey sizes smaller than prepared foods can conveniently offer and, short of collecting or culturing live plankton, it can be a challenge to feed the small polyped carnivores. Even most live cultured prey is too big for many species. Rotifers are relatively effective but fresh baby Brine shrimp is largely unacceptable (fine for many *Acropora* and some *Pocillopora* but almost useless for Poritids and most *Montipora*). SPS corals tend to be more "successfully" photosynthetic and less dependant on supplemental feeding than LPS corals. No doubt, this has contributed to the great success of aquarists keeping and propagating this group of corals in modern, well-lit, heavily skimmed aquarium systems.

SPS Recipes

Perhaps the most successful strategy for feeding planktivorous SPS corals is the employment of mature refugiums. Fishless rubble zones and seagrass refugia provide copious amounts of zooplankton and epiphytic material. Occasional feedings of live rotifers and/or baby Brine shrimp would be ideal (weekly to begin with) and a slight source of nitrogen will be necessary as well (to nourish zooxanthellae). A reasonable fish load and regular fish feedings may provide adequate supplies of nitrogen and ammonia for corals and their symbiotic algae through faeces and other dissolved organics. Pale pigmentation and "bleaching" in coral tissue (when not caused by elevated temperatures or salinity shock) may indicate a lack of nitrogenous "fertiliser" for zooxanthellae. Phytoplankton has been observed to elicit a weak-stinging response in some SPS corals but few if any corals are believed to consume much plant matter. In fact, many species observed to grasp phytoplankton in their polyps have been witnessed to release said plant matter shortly afterwards. Rely on high quality illumination and zooplankton for most SPS diets. Feeding by absorption is inevitable with a reasonable bio-load.

SOFT CORALS

The Octocorallians are the most difficult to make a gross generalisation for regarding feeding protocol. Families within this group run the gamut from being almost fully autotrophic (some Pulse corals and Star polyps are suspected) to aposymbiotic and fully dependant on supplemental feedings (some Neptheids). More than any other group of corals, soft corals will require that an aquarist thoroughly research a given species or at least its family for some indication of necessary feedings. Alcyoniids, including the popular Leather corals, are believed to derive most of their nutrition from photosynthetic activity and dissolved organic matter (absorption). We know from practical applications that many Leather corals like *Sarcophyton* sp. will grow very well (and to great sizes quickly!) under intense lighting and without target feeding. Many Neptheids however, are believed or known to feed heavily on phytoplankton and like substitutes. The non-photosynthetic species, so-called "Coloured Cauliflower" corals, are perhaps the most mysterious and demanding. They depend entirely on their environment for nutrition and sustenance. For these animals the purchase or construction of a good live phytoplankton reactor will be priceless. Regularly stirring the sand substrate (begin weekly) in Neptheid displays has been demonstrated to be a very useful feeding strategy, liberating bacteria, organic slime/mucus, mulm, plankton and much more for hungry filter feeders. Seagrass refugiums may also be measurably instrumental in providing nutrition for Octocorals.

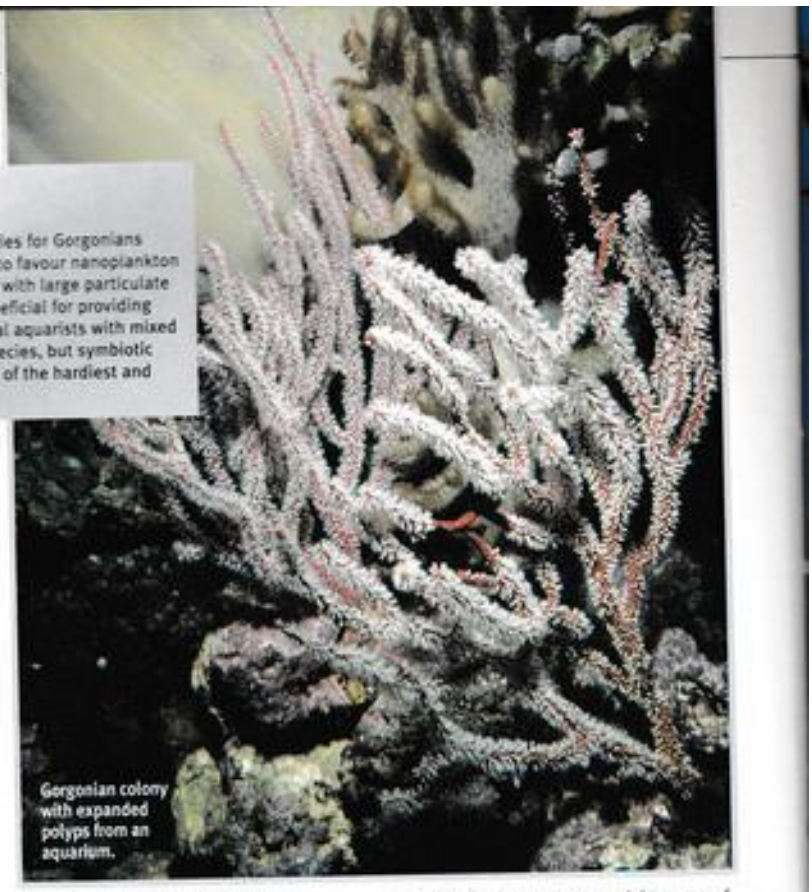
Soft Coral Recipes

A case-by-case basis:- Mostly light (symbiosis) for Alcyoniids.
Mostly phytoplankton for Neptheids.
Some sand stirring for many species in general.
Mature fishless refugiums and dissolved organics for all.
Very little target feeding with large particulate food (bottled supplements) is required or even possible for Branching or Toadstool leathers.


Small colony of Sarcophytons from the Maldives.

GORGONIANS

In many ways, the current feeding methodologies for Gorgonians mirrors that of Nepthelds. Most need or seem to favour nanoplankton and phytoplankton. Very few can be target fed with large particulate foods. Seagrass refugiums are likely quite beneficial for providing natural plankton and epiphytic material. Casual aquarists with mixed garden reefs should avoid all aposymbiotic species, but symbiotic species (including encrusting forms) are some of the hardiest and most rewarding Gorgonians to keep.



Gorgonian colony with expanded polyps from an aquarium.

zooxanthellae and the balance through other means (feeding by absorption or organismally, for example). This assumes that water quality and light conditions (age of lamps, delivery of light through potentially discoloured water or dusty lenses, etc.) are optimal always and without interruption to maintain such efficiency. Now even if we take an unfed animal that is satisfied 99% by photosynthesis in an otherwise "perfect" aquarium system, that still leaves a net daily deficit of 1% of its dietary needs that is not met. Such corals appear to carry on quite well and may even seem to grow as they become established in the aquarium and full polyp extension is realised (tricking one to suspect "growth"). The facts, however, remain unchanged: a one per cent shortfall is still a daily deficit and such corals are starving... albeit slowly. Attrition is one of the very plausible explanations for corals that seem to be faring well for many months or even a couple of years and then die "mysteriously". Often times it is a simple matter of consumption from the slow deficit in feeding.

Now consider that our aquarium systems do not run at peak performance every day to afford optimal photosynthetic activity. Lamps age (the useful colour spectrum strays), salt creeps, dust and debris significantly impede the transmission of light (through bulbs, lenses and canopies), water clarity is often compromised by turbidity or discolorants ("aging" yellow water between water changes), and overall water quality fluctuates such that captive corals and their symbiotic algae cannot possibly flourish at peak activity every day. Combined with the fact that the overwhelming majority of corals are not even remotely close to being autotrophic, we have a situation where feeding is not a question of "if" but rather "what" to feed.

Typical *Protopalythoa* colony from an aquarium.

Polyp structure and behaviour

Most popular coral in the aquarium trade feed upon zooplankton. Zooplankton predominantly comes out at night on a reef and corals extend their polyps then to capture them. Such organismal feeding necessarily requires larger polyps to capture the larger prey (in particle size relative to phytoplankton and microscopic nanoplankton). And so, if your coral tends to extend its polyps at night and has larger polyps relative to other corals, you likely have a carnivore that feeds on zooplankton.

Corals that extend their polyps by day, full time or indiscriminately usually do not depend significantly on zooplankton as a staple in their diet. Instead, they are more likely to feed by absorption if the polyps are very small and minimal in design, or upon other nanoplankton (bacteria, floc, mucus, etc) if the polyps have complex polyps structures like feathery pinnules (ancillary side "branches" to the polyp tentacles that help to filter feed and trap finer particles). ■

ZOANTHIDS AND CORALLIMORPHS

By nature, Zoanthid polyps are quite hardy and durable. As a rule, the smaller "buttoned" species (like *Zoanthus*) require little or no feedings. They do not seem able or inclined to feed upon large particulate matter. They are mostly photosynthetic enjoying moderate to bright illumination and clearly benefit from the dissolved organic matter of a healthy bio-load. Larger polyped species (*Palythoa* and *Protopalythoa*) tend to require somewhat lower light and larger feedings including deliberately targeted particles. Some species like the deep water (and toxic!) *Protopalythoa grandis* demand frequent and large feedings to stay in optimum health. For species that can feed organismally, finely minced meats of marine origin are appropriate. Corallimorphs, the Mushroom false-corals, are rather variable like Zoanthids but feed similarly. They tend to favour low to moderate light and higher levels of dissolved organics or target feedings. Pimpled or Hairy varieties are more likely to need and accept particulate feedings in contrast to species with a smooth crown (capitulum).

Today's Surgery

IN ASSOCIATION WITH
AQUARIUM PHARMACEUTICALS (UK) LTD

Our resident vet, **Lance Jepson,** tackles one of the only fish diseases which humans can catch

Fish Tuberculosis

Xiphophorus sp are particularly prone to fish TB

What causes the disease?

Fish tuberculosis is caused by a particular group of bacteria known as mycobacteria, hence the technically more correct name of Mycobacteriosis. Those mycobacteria that usually cause disease in fish are *Mycobacterium fortuitum, M. marinum* and *M. chelonae*. These bacteria can be found as free living environmental organisms, often in the mud and muim at the bottom of any given body of water. A similar disease can be seen with another bacterial environmental contaminant, *Nocardia asteroides*. This is not a mycobacterium but it is usually considered alongside this group.

The usual means of entry is via the mouth, either whilst grubbing around in the substrate or by eating infected prey or dead bodies. The mycobacteria then invade the gut wall, triggering the host's inflammatory response. Alternatively cuts and abrasions can act as a doorway for infection. The best temperature for the growth of fish mycobacteria is around 25oC, with an average incubation period before the onset of clinical signs of around six weeks.

In the face of an infection, the immune system of the fish will attempt to contain and eliminate the mycobacteria by surrounding it with white blood cells bent on destruction. These aggregates of cells can be visible to the naked eye on post-mortem and are called granulomas and usually appear as grey-white nodules. Unfortunately this defence is often only partially successful. If one such granuloma erodes into a blood vessel then mycobacteria can be carried to any structure or organ of the body.

The liver and kidneys are commonly infected because these very active organs have a huge blood supply. Granulomas develop in these organs and infective material can then be passed out from the kidneys in the urine. Kidney damage may affect the ability of the fish to osmoregulate so that in freshwater fish a build up of fluid in the body cavity (ascites) may be seen. If the liver is infected, mycobacteria can invade the gall bladder and bile ducts, to then be passed down into the gut along with bile, to be eliminated in the faeces. Granulomas in the muscles of the body wall can erode through to form ulcers. Infections in the brain may trigger abnormal behaviour, whilst granulomas and fluid build up behind the eyes can force them out of the sockets so that they noticeably protrude. Occasionally some mycobacteria will travel in the blood stream to eventually lodge in one or more of the bones of the back. These vertebrae are eventually eroded away by the infection to such an extent that they collapse, causing obvious spinal deformities.

Serious damage to the guts and related organs such as the liver and pancreas will affect how the fish is able to digest and utilise its food, thereby causing a gradual wasting of bodily condition. The actual clinical signs seen will reflect which organs are infected.

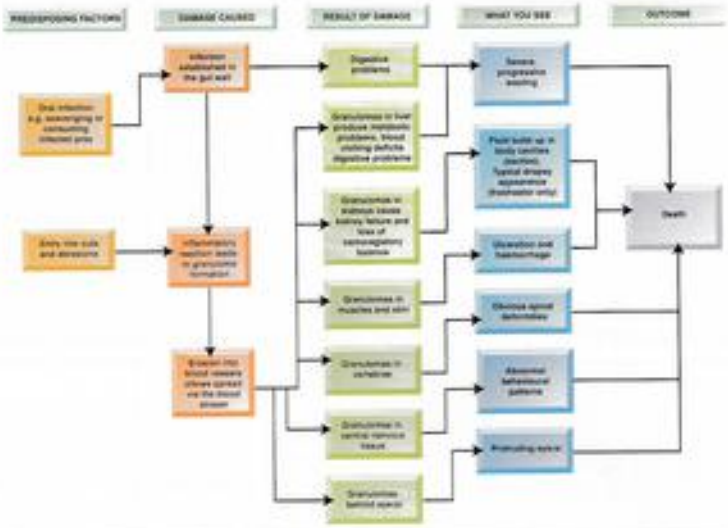
PREDISPOSING FACTORS

The presence of mycobacteria in the environment is an obvious predisposing factor, and they are probably very common. Also infected fish will shed large numbers of infective bacteria into the surrounding water and substrate, increasing the likelihood of other, in-contact fish developing the disease. Any stress or concurrent disease process that suppresses the fishes' natural immune resistance will also predispose. Mycobacteriosis is one of the main reasons why predatory fish should not be fed on live feeder fish or "trash" fish as this, along with scavenging of corpses, is an ideal way of transmitting the infection. High stocking densities will increase the risk of infection.

Disease lookalikes

Because there is a wide range of clinical signs linked to this disease, then many parasitic, bacterial and fungal diseases can mimic mycobacteriosis. In mollies (*Poecilia* sp.) *Flavobacteria* can cause multiple internal granulomas. *Aeromonas* or *Vibrio* bacterial infections can produce ulceration and signs of septicaemia. *Ichthyophonus* is

MYCOBACERIOSIS



DIAGNOSIS

Species susceptibility.
All species of both freshwater and marine fish are susceptible. Of the freshwater fish, Anabantoids seem to be particularly susceptible. Aquatic reptiles, amphibians and crustaceans can also harbour the disease.

Recognizable signs of disease.
These can be very variable depending upon where the infection becomes established. Some fish will just waste away, whilst others will develop ascites (dropsy). Ulcers may form on the flanks and head, or there may be an obvious exophthalmus (protrusion of the eye out of the socket) that can be one-sided or alternatively both eyes may be affected. Sudden deformities of the spine may be seen. On post-mortem granulomas may be visible, often in several different organs.

Microscopy.
Not applicable to the hobbyist. Although lesions can be obvious, the bacteria can be hard to find even on microscopy of prepared tissue samples. Special staining of these slides is needed to see the mycobacteria.

Treatment
Problematic. In fish mycobacteriosis is highly resistant to the usual anti-mycobacterial antibiotics. Certain antibiotics can be effective but administering these treatments at an appropriate dose rate can be difficult and expensive. In addition the aquarium or pond must be stripped out and thoroughly cleaned, which may include having to dispose of any gravel, coral sand, plants etc that cannot be reasonably cleaned and sterilised. In addition the fact that it is a potential zoonosis (see Note 1) does beg the question of whether we should treat it at all or is humane euthanasia the most appropriate action?

NOTES

Note 1 : Mycobacteriosis is a potential zoonosis. This means that it has the potential to infect people. It can invade cuts on the hands and arms where it can establish itself, triggering an area of thickened inflammation known as a granuloma. Diagnosis may require the removal of a small amount of tissue and for this biopsy to be submitted to a laboratory. Fortunately these granulomas do usually respond well to antibiotics. Normally these granulomas are limited to the cooler extremities such as fingers and hands, because the mycobacteria that infect fish cannot tolerate the comparatively high core body temperature of humans. If you have any concerns please consult your GP, who may refer you on to a dermatologist.

Wearing gloves and observing basic hygienic precautions should virtually eliminate any risk of infection.

Note 2 : You do not need to keep fish to become infected. An alternative name to "Fishkeeper's Finger" is "Swimming Pool Granuloma", so called because of the occasional infections seen in those who maintain swimming pools.

Note 3 : Mycobacteria can be an important conservation issue. I know of at least one colony of endangered livebearers (*Girardinichthys viviparus*) that have to be managed as a closed colony because mycobacteriosis is endemic within that colony. Certainly in Platies (*Xiphophorus* sp) cross over of mycobacteria from a mother's infected ovaries into her unborn young has been demonstrated.

an internal fungal infection that can produce a progressive wasting condition, as can internal parasites such as heavy intestinal worm burdens. Vitamin C deficiency has been linked to spinal deformities in livebearers such as swordtails (*Xiphophorus hellen*). Spinal deformities in Orfe following the use of certain medications is well documented, as are the similar results seen in Koi of electrocution, classically from lightening strike to ponds!

Prevention

Quarantining of all new arrivals is a must. Prompt isolation of sick fish along with treatment of any problems will help to eliminate other possibilities. Consider euthanasia of strongly suspect fish. ■

Malcolm has one halogen light over the top of the tank, about 30cm from the water surface.

Success with Madagascan lace plants

Malcolm Goss points the way to success with these beautiful aquarium plants

APONOGETON IS THE ONLY GENUS IN THE family Aponogetonaceae. All of these beautiful plants have very decorative leaves some of which are bizarrely latticed which is unique in the plant world. The most common of the genus is the Madagascan lace plant and the name is the only thing about it that many fish keepers know, but then how many fish keepers know much about Madagascar?

So here is a little extra information about these fascinating plants. All grow in fully submerged conditions and have very decorative flowers. They are usually seen for sale with just one or two leaves appearing from the corm. We purchase one or two(they can be expensive compared to other aquatic plants), and place them in the gravel of our aquarium and wait for them to grow and look like the pictures in the books. We wait and we wait! If we are lucky, two or three more leaves will grow and it is probable that nothing further will happen. I stand corrected. The leaves you had on your plants when you bought them will die back and that is the last you see of them. True plant lovers, however, never lose their fascination with this plant, and when they see them in their local aquatic shop the next year they buy them again. Guess what! the same thing happens all over again. The clue to growing this plant is in the statement "when you see it in your local aquatic shop next year" Yes , it is a seasonal plant , just like our daffodils and tulips.

Natural environment

Whether we are keeping, growing and breeding fish or growing plants we need to know the environment of their natural habitat if we are to look after them correctly. These plants come from the tropical and subtropical areas of what we know as the "Old World" and are not found on the continent of America. They grow in India and farther east, to the eastern coast of Asia and to the north as far as South Korea.

Hailing from Australia, *Aponogeton elongatus* produces translucent light green leaves that are gently crispate in appearance and not laced at all. There are lots of species growing throughout the African continent, but many of these are not suitable for growing in the aquarium. *Aponogeton fenestralis* and *Aponogeton madagascariensis* are found in Madagascar

and these are the most commonly seen of the lace plants in our aquatic outlets. In their natural habitat they live in slow running, soft acidic waters with subdued or dappled sunlight.

After a short period of growing followed by flowering, the plant dies back going into a dormant period. It is during this resting period when the corms are collected and appear in our dealers' tanks. These corms come back into growth and make larger and stronger plants the next year.

How to succeed

How can we encourage them to do this in our community aquarium? Well ,to be honest we can't. In a community aquarium with fish and other plants requiring normal temperature and water conditions they soon fade away.

We must not let this stop us from growing these fantastic plants. I grow my Aponogetons in a separate tank. This is a 60 x 45 x 60cm in the bottom of which I placed two planks of oak from an old barrel. These are held down with a brick at each end of the plank.I filled the tank with rainwater collected in a plastic garden barrel. This water was then filtered for a week and had only activated carbon and filter floss in an external power filter. I later changed this to a small internal filter with only a sponge as the filter media. Aponogetons do not like fast water movement and this internal filter gave them the much slower turnover of water that they need.

I added an easy to adjust heater so I had full control over the water temperature, this was set to 22°C. Even in their growing season Aponogetons do not like a high temperature. The water soon had a brownish tint to it from the planks of oak. This not only coloured the water but made it slightly acidic with a pH of 6.9 . I placed a corm in a 12.5cm plastic flower pot with some clay in the bottom followed by some soil with a covering of aquarium gravel.

I placed the corm just under the gravel with some of it just showing. This was in May and the light was kept on for 12 hours per day. Within a few weeks the leaves had almost reached the water surface.

It was soon after this that an inflorescence (flower) appeared at the water surface, fantastic. The flower consisted of two spikes, that had grown to the surface on the end of a long stalk coming from the base of the plant. These flowers protruded out of the water and were creamy white in colour.

By the time October had come, the leaves were dying back, turning brown and slowly rotting away. Now was the time to switch off the lighting and turn down the water temperature to 18/20°C. The plants were in their resting period and wished to be left alone. Later I removed the decaying leaves but I did not pick or cut them off but waited until they fell away naturally. In the following year during March I turned the water temperature up to 22°C. but did not switch on the light till that month had passed. Very soon the plants started back into their growing cycle and were bigger and better then ever. ■

Top tip

When buying Aponogeton corms feel them first, if the corm is soft it is dead.

Like so many other aquatic plants, the true identity of an Aponogeton can only be certain when the plant is in flower. African species nearly all have flowers consisting of two spikes though they may have three. Single spiked flowers indicate the plants are from another continent.

The leaves just grew and grew and were soon the largest Aponogeton leaves Malcolm had ever seen, each leaf reaching 30cm in length after a couple of months.

Top tip

By growing plants in pots like this they can be transferred to your display aquarium when they are at their best. The pots can be hidden behind bogwood, rocks or other smaller plants.

Pete's Parade

Pete Liptrot searches through some recent imports for something a little different

CHOPRA'S DANIO, *DANIO CHOPRAE*

In recent years there have been numerous wonderful additions to the aquarium hobby originating from the Indian subcontinent. This stunning little fish has to be near the top of the list, as it is suitable for aquaria of practically all sizes. It comes from the Irrawaddy river system in Myanmar, where it lives in streams and at the edges of larger rivers. They do not grow much bigger than about 2.5cm and make perfect aquarium fish. A small shoal of around five makes a splendid addition to a 60cm community or a larger shoal is fantastic as the main inhabitants of a bigger tank.

Although the first importations were relatively expensive at £5 - £6 each, the price has dropped and is now comparable with that of most small aquarium fish. UK tank bred stock is also available, as this fish very quickly attracted the interest of knowledgeable members of aquarium societies. Unlike most Danio species which scatter their eggs widely, this species prefers to spawn over plants or mops.

Neutral water of low to medium hardness, with a temperature of about 24°C and good filtration is ideal. Regular water changes will be needed to ensure good water quality and high oxygen levels . They will eat small commercial and live foods.

Chopra's Danio is also called the Glowlight Danio.

The sexes of Candidus' dwarf cichlids are easily identified as males grow at least 30% larger than females and have a pointed tail.

CANDIDUS' DWARF CICHLID *TAENIACARA CANDIDI*

This is a delightful fish for the aquarist seeking a bit of a challenge. As youngsters they give little indication of the delicate colours they will show later in life but are worth buying at this size since they are cheaper and adapt more easily to aquarium conditions.

They are found naturally in small streams in the Amazon and lower Rio Negro region. If wild caught they may be undernourished by the time they reach the retailer and in need of some TLC to bring them back to full health.

They need soft, slightly acidic water and will not tolerate any pollution. A temperature of about 26°C is ideal as lower temperatures make them susceptible to disease.

Feeding should largely consist of quality frozen and live foods, although fine granular foods may be taken.

They prefer a well planted tank, or you could set up a leaf litter display tank to reflect their natural habitat. They will spawn under a leaf, or in any other easily defendable small space. Males can be rather tough on females when housed as a pair. It is, therefore, better to maintain them as a large group with small Tetras to act as dither fish .Here their behaviour can easily be observed since they will happily display in full view.

The fry are unusually small for a Dwarf cichlid, and may need a short period on infusoria before being able to accept baby Brine shrimp.

LACERDA'S WOLF CHARACIN OR TRAHIRA *HOPLIAS LACERDAE*

This is a magnificent creature from Brazil, where it is found in the Rio Ribeira do Iguape in São Paulo and Parana States, as well as Minas Gerais. At a maximum length of 75 cm this fish would require a gargantuan aquarium all to itself where this lurking predator would be the only inhabitant since other fish would not survive, no matter how well armoured.

If anyone is wealthy, dedicated or insane enough to want to keep this animal, then think in terms of an aquarium 3m in length, 1.5m wide and 1m deep. A secure cover is necessary since they can jump and the task of picking up a large struggling individual of this species is not one to be taken lightly.

They are territorial, particularly during breeding, when the male guards the nest site, and have been known to attack wading humans when threatened. As an ambush predator, they feed on more or less anything that comes within reach, from fish and crustaceans, through young water birds, mammals or reptiles, including newly-hatched Caiman.

There are smaller members of the genus *Hoplias* which occasionally become available, and these can be housed in smaller (but still substantial) aquaria. Beware though, the Giant trahira, *Hoplias macrophthalmus*, can reach a length of up to 1 metre, and should definitely be avoided by the home aquarist!

Imagine over 60cm of bad-tempered muscle, with a set of jaws to match, and you pretty well have this fish!

MOUTHBROODING ACARA *BURJURQUINA VITTATA.*

The Mouthbrooding acara belongs to a wide-ranging genus found from Colombia and Peru down to Argentina. The species in this genus are difficult to tell apart, but other members of the genus show the same range of interesting behaviour, and all make good aquarium fish.

They will feed on a wide variety of foods and are not destructive towards tank décor. Like many Cichlids, they may uproot the occasional plant while searching for food or during breeding. At a maximum length of around 14 cm they will mix well with other placid medium-sized fish and are not fussy about water conditions as long as extremes are avoided.

Breeding is where this fish stands out as an aquarium inhabitant. In nature they lay their eggs on a dead leaf or other movable object and transport the clutch from place to place. Given suitable spawning sites in the aquarium they will do the same. Once the eggs hatch this cichlid turns into a mouthbrooder. This is termed delayed or larvophilous mouthbrooding, as it is just the fry and not the eggs that are cared for in this way. The parents will be seen to carry the young from one area to another, releasing them for feeding, until they grow too large to fit in the mouth. The fry will grow well on a diet of fine frozen, live and prepared foods, and should be removed from the parent's aquarium once the adults lose interest in guarding them.

This pair of mouthbrooding Acara have a shoal of recently released young swimming around them.

BLUE RIBBON EEL
Rhinomuraena quaesita
26 C
1.2m
TFSH 83A
PHOTO: MAX GIBBS
TODAY'S FISHKEEPER
TFISH 83

...End Point

Anabantoid expert, **Tan Heok Hui,** focuses on the Eye-spot fighter (*Betta ocellata*)

PHOTO: CHAN LI CHIK

The Eye-spot fighter, *Betta ocellata*, was described by de Beaufort from one specimen collected from Bettotan, Sandakan, Sabah.

THE EYE-SPOT FIGHTER, *BETTA OCELLATA* DE Beaufort, 1933, belongs to the *B. unimaculata* group. It has the typical elongated body profile, with a black spot on the caudal peduncle of males, females and juveniles. This species is currently the most broadly defined and misidentified species in the trade. Most of the aquarium literature on *B. unimaculata* actually refers to *B. ocellata* or an undescribed species.

Specimens of *B. ocellata* have a little to full body iridescence, depending on distribution. From personal experience, specimens from the northeastern of Sabah have little body iridescence and specimens from southeastern of Sabah have the most. *Betta ocellata* can be differentiated from *B. unimaculata* in having a sharper lateral head profile and more cone-like dorsal head profile.

How do they breed?

Betta ocellata is a paternal mouthbrooder but the female plays no part in the egg transfer. The specimens observed for breeding were from a lowland swampforest in the Kinabatangan basin in Sabah. The male has very little iridescence on the body, the green iridescence being concentrated on the operculum. The female is usually larger with less iridescence. The basal body colour in both sexes is dark brown dorsally and lighter brown ventrally. In the mating dress, the male is uniformly dark brown, with a darkened operculum area with the green iridescence ; the female is lighter brown overall with an undarkened operculum, two longitudinal black stripes on the body, one on the dorsal ridge and the other running through snout to eye to base of caudal peduncle. The female initiates spawning by nuzzling the male in the belly region. There is some fin flaring and open gape actions. When the male is ready, the mating embrace is carried out. A total of about 8 flattened pear-shaped white eggs are extruded during each embrace. After extrusion of eggs, the female appears to be stunned and the eggs are gathered on the male's curved body. The male recovers first and takes the eggs into his mouth. The female does not take part in the egg transfer and appears to eat up the left over eggs or eggs unnoticed by the male. Fry are released after about two weeks and are about 6 to 7 mm size. These fry are easy to rear and are not too quarrelsome. ■

DISTRIBUTION

Betta ocellata is restricted to northeastern Borneo, found only in Sabah (Bettotan, Sandakan, Kinabatangan, Lahad Datu, Tawau and Bongon) and the northern part of East Kalimantan (Sebuku basin) (de Beaufort, 1933; Inger & Chin, 1962; pers. obs.; M. Kottelat, pers. Comm.).

FIELD NOTES

Specimens collected from Sabah were mainly from headwater habitats. The fishes were usually obtained from ravines and isolated elevated pools. A single adult and several juveniles are usually obtained from the submerged leaf litter. Adults may take cover under floating leaves. They are excellent jumpers, which may explain their presence in isolated elevated pools. Their diet consist mainly of terrestrial insects and occasional aquatic invertebrates (Inger, 1955; Inger & Chin, 1965).

Specimens collected within the Kinabatangan basin were from lowland forest streams and ox-bow lakes. The waters in these habitats were murky. This species inhabits the shallow parts of ox-bow lakes among the flooded grass banks; and among the submerged leaf litter and tree roots in the forest streams.

Other species collected from the forest streams included: *Rasbora sumatrana, Puntius sealei, P. Banksi, Pangio mariorum, Lepidocephalichthys sandakanensis, Nemacheilus olivaceus, Ompok sabanus, Clarias teijsmanni* and *Trichogaster trichopterus*. Many juveniles, but only a few adults, were collected from this habitat.

Specimens collected from Lahad Datu (Danum valley) were in stagnant or slow moving clearwater pools along headwater streams. Syntopic species include *Garra borneensis, Homaloptera stephensoni, Gastromyzon danumensis, G. lepidogaster, G. punctulatus, Protomyzon griswoldi, P. whiteheadi,* and *Nemacheilus olivaceus* (Martin-Smith & Tan, 1998). Specimens from Tawau were from quiet murky pools along the coast in oil palm plantations. Numerous specimens of *B. ocellata* inhabit these quiet pools and this is the predominant species.

REFERENCES

de Beaufort, L. F., 1933. On some new or rare species of Ostariophysi from the Malay Peninsula and a new Betta from Borneo. Bulletin of the Raffles Museum, Singapore, 8: 31-36.

Inger, R. F., 1955. Ecological notes on the fish fauna of a coastal drainage of north Borneo. Fieldiana, Zoology, 37: 47-90.

Inger, R. F. & Chin P. K., 1962. The freshwater fishes of north Borneo. Fieldiana, Zoology, 45: 1-268.

Martin-Smith, K. M. & H. H. Tan, 1998. Diversity of freshwater fishes from eastern Sabah: annotated checklist for Danum Valley and a consideration of inter- and intra-catchment variability. Raffles Bulletin of Zoology, 46 (2): 573-604.