

FREE INSIDE: Beginners' guide to goldfish

**WIN A £200
TETRA FILTER:
FOUR TO GIVE
AWAY**

Today's Fishkeeper

APRIL 2005

£3.25

PASSIONATE ABOUT FISH

**ASIAN
TSUNAMI**
What it means
to the fish trade

**KILLIFISH
OF KOS**

**BREEDING
THE L147
CATFISH**

IN THE RED
Swimming with the
Red Sea fishes

ROOM WITH A VIEW
Create your own small desk tank





INCORPORATING
AQUARIST
AND FONDKEEPER
The magazine for every fishkeeper - since 1924

Designed & Published by

PS Magazines Ltd
7 The Rickyard
Clifton, Ryves
Olney, Bucks
MK46 5LD
Tel: 01234 714644
fax: 01234 714633

Editor

CHRISTINA EVATT
(01234 714784)

Advertisement sales

DARREN FINCH
(01234 714454)

Production director

MICHELE SWALES
(01234 714637)

Designer

RACHEL WOOD
(01234 714637)

Publisher

KAREN PICKWICK
(01234 714644)

Group sales manager

MARK LIGHTFOOT
(01234 714454)

SUBSCRIPTIONS

(01234 714644)

Printed by

NEWMAN THOMSON

Distribution to the news trade
COMAG SPECIALIST
01895 433800

Opinions expressed in any article remain those of the author and are not necessarily endorsed by the Editor nor by PS Magazines Ltd.

Correspondence requiring response or return of any material supplied must be accompanied by a stamped addressed envelope.

While every care is taken to ensure accuracy of content, PS Magazines Ltd will not be held responsible for any inaccuracies, distortions, copyright infringements or otherwise commercially-damaging claims in respect of products advertised. Any such instances are liable to fast action by third parties suffering as a result. Advertisers are reminded to refer to conditions of booking.

This publication is declared for purposes of Zoological Nomenclature in accordance with the International Code of Zoological Nomenclature, Fourth Edition, Articles 8.3 and 8.4. No new names or nomenclatural changes are available from statements in this publication. ISSN 1475-8709
©PS Magazines Ltd 2004

Cover picture by: M-P & C
Piedinic, *Sturtonia aurea*
with eggs.

Welcome!

After reading Erwin Schram's article this month about killifish on the Greek island of Kos, it became clear to me that there are probably a whole host of fish widows/widowers out there who have to compete for attention on holiday. How many of you out there have been duped into a romantic/relaxing holiday only to find yourselves knee-deep in some alien waterway, chasing fish with a net? I speak from experience; the only thing resembling a holiday I've had in the last three years has been a week in Japan trawling koi breeders. OK, so I happen to enjoy it and I don't expect pity, but I have a feeling that any holiday that does come my way will involve searching out indigenous fish species. I wonder what type of marines they have in St Lucia...dream on!

So from thoughts on exotic species, I now turn to the humble goldfish. This month we have a free supplement on this well-loved fish, looking at the most popular varieties, buying healthy fish and showing fish, just to name a few of the articles. When looking into the goldfish hobby it showed me that there's more to this fish than meets the eye – there are so many varieties to choose from and they certainly transcend the view of the bog-standard, orange pond fish that we all know. Also, if you're looking for coolwater fish for your aquarium, but want something a bit different from goldfish, Mary Sweeney has some great ideas on page 14.

We're all very proud in the *TFK* office at the moment because our mollies have had babies! How could so many small fish fit in one female? However, there they were, wriggling about in the Amazon sword, dodging the attentions of the other fish. As we don't have a separate tank we decided to take the fry back to our friendly local fish shop where we bought the original fish. We couldn't resist keeping a couple though – the other fish seem to completely ignore them and they're growing at a great pace. We'll keep you posted...

See you next month

Christina



APRIL

inside this

TROPICAL/MARINE/COLDWATER

6 Starting point

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

MARINE

22 Fishkeeping answers

All your marine questions answered by our resident expert Andrew Caine

28 Sea View

Andrew Caine continues his look at water movement in the reef aquarium

32 Deep in the Red

Ever wondered where your marine fish originate? Mark Taylor Hutchinson visits one of their home environments, the Red Sea

Cover Story

46 Coral gardening

It's not as difficult to propagate corals as you might think. Anthony Calfo explains...

66 Live rock part 3

All Nilsen continues his series on live rock and discusses the types of animals you might see emerging from it

page 66



PONDS & COLDWATER

57 Koi World

Bernice Brewster has an update of all the latest goings-on in the world of koi, including the demise of a parasite

58 Ponderings

Spring into action! Dave Bevan takes a look at your pond and the tasks for this time of the year

28 SEA VIEW



TROPICAL

14 Coolwater tanks

Mary Sweeney says you don't have to keep only goldfish in coolwater aquariums – there are many more fish to consider

18 Fishkeeping answers

All your tropical questions answered by a panel of experts

20 Discus Problem Solver

Our resident discus expert, Tony Sault, solves your problems

page 32



24 Killies of Kos

Erwin Schraml visits the Greek island of Kos and searches out some killifish

38 Breeding L147 catfish

Janne Ekström talks us through the breeding efforts of her L147 catfish

49 Blue-spotted beauty

Juan Miguel Artigas Azas profiles the *Thorichthys callolepis* cichlid

74 End Point

Kathy Jinkings profiles the unassuming freshwater soles

WIN one of four pressure filters from Tetra (UK) worth over £800! Turn to p65 for your chance to win



TODAY'S FISHWORLD

36 Brief encounters

John Dawes looks at the affect of the Asian tsunami on the fish trade

41 Today's Diary dates

42 Club News

News from around the club scene

PLANTS

62 Room with a view

Peter Hiscock creates a small, but perfectly formed tank

page 62



REPTILES & AMPHIBIANS

52 Charming chelonians

Roy Osmin takes a look at terrapins

70 Indonesian pythons part 1

Val Davies looks at some pythons for the more experienced keeper



REGULARS

3 Editorial

56 What's happening in next month's issue of *Today's Fishkeeper* – and subscribe to your favourite fishkeeping magazine and have it delivered straight to your door every month

BEGINNERS

6 Starting point

Pat Lambert says patience and observation are what you need to be a good fishkeeper...

14 Creating a community

Mary Sweeney looks at some fish that are happy in coolwater conditions

18 Fishkeeping answers

All your questions answered on both tropical and marine

28 Sea View

Andrew Caine continues his look at the importance of water flow

32 Deep in the Red

Mark Taylor Hutchinson dives deep into the Red Sea

58 Ponderings

Dave Bevan rounds up all the seasonal happenings in the pondkeepers' calendar

62 Plant a biotope

Peter Hiscock creates a room with a view with a small, planted tank

NEWS

10 Today's news and views

All the new products and news from around the trade – plus the latest fish from the tropicalfishfinder website



Starting Point...



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

Sitting patiently and quietly observing your fish is the key to fishkeeping



You need to wait before introducing the Mandarin fish (*Synchiropus splendidus*) fish to your aquarium

If there are two words that would apply to the best of fishkeepers, they are patience and observation. Many good fishkeeping practices can be gleaned from books and the Internet but neither patience or observation can be obtained there, and these qualities separate the best from the rest.

Patience

You need to be patient in the beginning when you are staring at a newly set up planted tank with no fish in it. If you can't wait to go out and get your fish, disaster will surely follow. Having the patience to wait until the tank water matures, particularly with marines where a lot of patience is required. If you long to have particular species in your set-up you need the patience to search for them, wait if you have to and do not take second best. For example, if you want a Mandarin fish in your marine set-up you will have to wait at least nine months before introducing it to your established aquarium (who would not be willing to wait for such a fish) and some marine species cannot be introduced for two years after set-up. Fish do not breed to order and if you wish to breed the more difficult fish, often by trial and error, you will certainly need large helpings of patience.

Observation

This is the key to it all. You can learn a lot from the written word but sitting in front of your fish tank and observing the behaviour of your fish will give you indications when all is not well and when fish are ready to breed. What is the point of the written word telling us the things to look out for when we don't keep watch? Are some fish being left out when it comes to feeding, don't just put the food in to see that the food is eaten quickly but observe if there are any of your

charges that are not reaching the food, then you can take the appropriate action. Signs of bullying such as nipped fins and lost scales need close observation to find out who is doing the bullying. It can really surprise you when you find out which fishes are the culprits, as it's not always the ones you suspect or the ones that the books tell you are aggressive. It's surprising the things you can find out by observing fishes' behaviour in the environment in which they find themselves. (This is why opinions vary somewhat about some of the species that we keep, different conditions, different behaviour etc.). Andrew Caine, in his column on marine fish, will tell you about some species that will settle happily in a set-up when they have been passed on by another mariner because they were behaving badly. Some behaviour changes at breeding time – meek and mild fishes become aggressive in defence of their territory. This is why it is important to observe signs of breeding and set-up a breeding tank to avoid trouble. Many community gouramis are like this.

Whitespot is a notorious killer but close observation and immediate treatment can save a tankful of fish

Deep bodied fish for the larger aquarium

Metynnus maculatus, the Red-bellied pacu belongs to the same family (Serrasalminidae) as the piranha they are very similar in body conformation, but do not have the same flesh eating tendencies. They need a high vegetable content in their diet and if the diet is deficient in this, they will set about enjoying your planted aquarium. In fact, it is best to furnish the tank with plastic plants. The body of the fishes in the metynnus group is almost disc-shaped and the Red-bellied pacu can grow to 18cm, so a small school of these fishes will require a larger tank. These are peaceful, shoaling fish so are best kept in a group. The metynnus and myleus species are very similar in shape and dietary requirements.

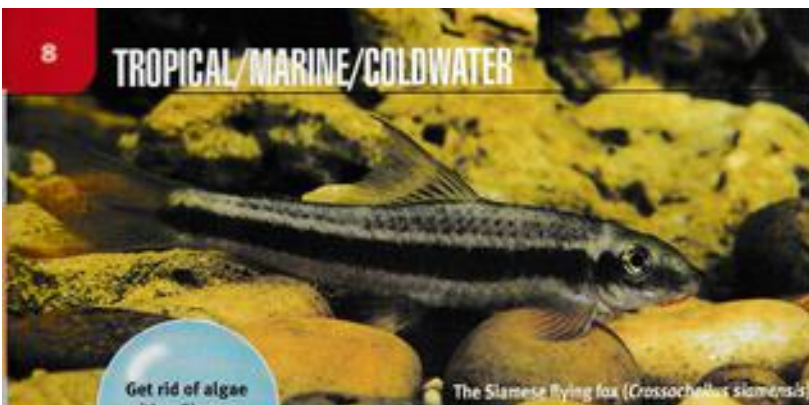
Silver dollars is a name coined for several of the silver, disc-shaped metynnus, mylossoma and myleus species. Confusion arises because the juvenile fish are nothing like their parents and only start to develop their adult coloration at three months old, which makes identification difficult. Illustrations in books often give different names to the photos of a particular fish. They are however, strong tough fish who



Metynnus maculatus is not a fish for the plant lover



AQUARIAN
www.aquarian.com



Get rid of algae with a Siamese algae eater

adapt to a wide range of aquarium conditions, although extremes should be avoided. These are fast swimmers inhabiting the mid to top levels of the tank and are best kept with fishes of a similar size. They are not fussy feeders eating a wide range of foods, but small fish could be considered a food source.

The Siamese flying fox (*Crossocheilus siamensis*)

Siamese algae eater

Also known as the Siamese flying fox (*Crossocheilus siamensis*), here we have a fish that does not eat plants but is one of the best algae-eaters around. The species can grow to about 14cm, although it is often smaller. It sometimes fights with other Siamese algae eaters but is a peaceful

community dweller although the ultimate size to which it grows will be a limiting factor. Although it can consume copious amounts of algae, it also enjoys live foods of all kinds. It is said to eat planaria worms which can be introduced into the tank but I have had no personal experience of this.

The fishkeeper is not attracted by the coloration of this long slim fish that is similar to the Flying fox (*Epalzeorhynchus kollarpterus*), which is a torpedo-shaped, neat looking fish with white-tipped fins and a black-based dorsal. A bright yellow stripe runs the length of the body as does the dark stripe below it. The bright yellow stripe is missing in the Siamese algae eater and its colourless fins make the fish appear much duller in coloration than its common namesake. Sexual differences are not apparent. Keep in a temperature range of 24-26°C. ■

LOST FOR WORDS

Aestivation: Some species like the African lungfish have a summer dormancy period. During the summer drought they surround themselves with a mucus cocoon and lie buried in the ground until the rains come.

Ampularia cuprina: Apple snails can grow to the size of a cricket ball. Although many snails are more pests than helpers, apple snails can be useful allies in certain situations. If you are breeding fish that require infusoria as a first food, keep apple snails on their own in an unplanted tank and feed them on lettuce leaves and their droppings can produce an infusoria for tiny fry. Fishkeepers have also used them to clear Hydra infestations.

Cyprinidae: This is the largest family of fishes in the world whose distribution area is extensive. North America, Africa, Europe and much of Asia is home to these almost exclusively freshwater fishes, commonly known as carp and carp-like fishes. They come in all sizes, a large one being Barbus tor, fully grown at 2.5m. The family includes some of our native freshwater species, goldfish and widely-kept tropical aquarium fishes like barbs, rasboras, danios and minnows.

Diskworms: These are light brown in colour and if you overfeed your fish there can be a population explosion which will need to be dealt with. Some gouramis eat them, but an uncontrolled infestation may mean that you have to dismantle the tank. This means removing the fish and thoroughly cleaning the tank and all its furnishings, gravel and rocks.

Foam fractionation: This is a method of separating out proteinous substances from water by foaming action. It is also known as protein skimming.

Lux: Brightness or intensity of light is quoted in lumens, and lux is the scientific measurement of the number of lumens falling onto a



The Apple snail can be a useful ally in certain situations

square metre of surface area. A lux metre will measure the intensity of light called luminescence. Cloudless tropical daylight will give a high lux reading at noon, but there are many variables that affect this reading such as clouds, shade, turbidity and water depth. In an aquarium the intensity of light needed depends on the type of light used, depth and size of the aquarium and planting scheme. Buy good quality tubes or lamps and the manufacturer will have done all the necessary work for you. Light intensity is very important for corals and other light sensitive invertebrates.

Reverse flow: Biological filtration system in which water flows up through the base covering instead of the downward direction.

Turnover: This is the rate at which water flows through a filter. Some species need a high turnover to keep the water sweet. Messy feeders need efficient filtration with a high turnover.

The Flying fox (*Epalzeorhynchus kallopterus*) is brighter looking than the Siamese flying fox



Dangers: beware!

- Paint, varnish and strong disinfectants can all be harmful as the water in the fish tank absorbs them and this can cause fatalities.
- Hands that are washed in highly scented soap and not rinsed thoroughly before dipping them in a fish tank can cause problems.
- Aerosols and other sprays such as insecticides should never be used in the aquarium environment.
- Furniture polish can cause problems.
- Lack of careful washing of decor items such as rocks, wood and other items. These may have a residue of minerals toxic to fish.
- Ornaments which contain copper should never be placed in a pond or aquarium which contains fish.

The importance of oxygen

Fish need oxygen to live, just as we do. However, fish must obtain this gas from the water, rather than from air. Fish use their red feathery gills to take up oxygen from their surroundings, hence the gills are the aquatic equivalent of our lungs.

Adequate levels of oxygen are vital for the survival and health of our fish. Listed below are some important facts about oxygen, plus a few tips on how to ensure that your aquarium or pond contains plenty of this life-giving gas.

OXYGEN LEVELS IN WATER

1. Water can hold only so much oxygen before it becomes saturated with this gas. The oxygen carrying capacity of water is greatly influenced by temperature: the warmer the water, the less oxygen it contains.
2. Even richly oxygenated waters contain only about one twentieth (or less) of the oxygen concentration of air. The respiratory systems of fish must therefore be very efficient in extracting these meagre amounts of oxygen from their surroundings.
3. Some types of fish need more oxygen than others. For example, scientific studies have shown that the oxygen requirements of trout and orfe are higher than those of goldfish and koi.

SIGNS OF A LOW OXYGEN PROBLEM

4. Low oxygen levels may cause fish to go off their food, and young fish may suffer from poor growth performance if reared under poorly oxygenated conditions.
5. If oxygen levels fall critically low the fish will tend to remain at the water surface, gasping or gulping. (Don't confuse this behaviour with surface gulping during feeding times!) Their gill covers will open and close much faster than normal, only and never fill them with soaps, detergents or other household or garden chemicals.



MAINTAINING WELL-OXYGENATED WATER

6. Keep your fish under clean conditions. Dirty water conditions or dirty gravel will create a breeding-ground for bacteria and other microbes that will compete with your fish for vital oxygen.
7. Refrain from housing fish in small bowls or tiny aquariums, and do not overstock with too many fish. In general, the larger the surface area of an aquarium or pond, the more fish it can hold.
8. Provide artificial aeration. Most modern filters both clean and aerate (hence oxygenate) the water. It's a good idea to also invest in an air-pump and air-stone (= diffuser or "bubbler"). Running an air pump will ensure that oxygen levels are kept high at all times, even if the filter should become blocked and lose efficiency.
9. Never rely on aquatic plants to oxygenate your aquarium or pond. At night the plants stop photosynthesising and switch from being oxygen-producers to oxygen-consumers.
10. Ensure there is good aeration during hot spells, especially in the case of ponds and indoor coldwater aquariums.

FISH OUT OF WATER
Given that air is relatively rich in oxygen it may seem surprising that fish will die of suffocation if stranded on land. This is because the fish's gills collapse when out of water, thereby greatly reducing the gill surface area available for oxygen uptake.



For your free beginners guide please call:
0208 843 1766
or visit our website: www.aquarian.com



Today's news

All the latest news and products from the world of aquatics

Algizin P back on shelves

After a lengthy registration process, one of the industry's top-selling garden pond algicides has returned to the pond market.



Algizin P was one of the many algicides removed from sale under the recently-enforced Biocides Directive.

Registration has been a lengthy and costly exercise that Waterlife chose to complete because it says Algizin P has been so popular among pondkeepers for the past 30 years.

Now Waterlife is delighted that Algizin P – in its original formula – has gained HSE (Health and Safety Executive) market approval for sale and is again available to retailers in 125ml, 500ml and 2-litre sizes.

Medizin P will continue to be sold for fish ailments whitespot, velvet and fungus.

Room with a view

A new undersea hotel is planned in the Bahamas, promising five-star luxury on the ocean floor. For 1,500 dollars a night you might soon get a chance to come face to face with marine animals from the comfort of an undersea hotel room. This project is being undertaken by a Florida-based entrepreneur, Bruce Jones.

The hotel, located off the Bahamian island of Eleuthera at a depth of 15m (50ft), will be connected to the mainland through two tunnels and an escalator, and pressure will be the same as at the surface - so no need to don wetsuits to get to your room.

Jones is convinced the market is there. "Everybody who comes off a tourist submarine loves the experience. Last year in America over 100 million people went to aquariums, so there's tremendous amount of interest in the subsea world, it's growing all the time."

And by opening up the underwater world to those who can afford it, he believes he would be helping protect it. "Only in really experiencing what it's like underwater can you really motivate somebody to protect the natural resources of the sea," says Jones.

NEW-LOOK DISCUS DELIGHTS



It has been a year since Chris Ingham of Plymouth Discus launched Discus Delights, the discus gourmet hamper with seven different foods for each day of the week. Because of high demand a manufacturing company will now be employed to produce the hampers. Up until now the hampers have been made with 'no frills' packaging designed for mail order and made on a small scale. But with shops and mail order companies now on board something had to be done to keep up with ever raising demand.

Apart from a fresh new look it will now come in one size. At 250 grams total weight it will be bigger than the old starter pack, and at £14.99 is still economical to use. In each gourmet hamper is seven different 30 gram packets of high quality discus food, making the price under £2.15 per packet. It still needs no freezing or fridge storage, just a cool dry place to store and can be used straight from the box. Each hamper should last between four to six months feeding six discus, depending on the size of the fish.

Discus delights can still be ordered by mail order or bought from good aquatic outlets, or log onto www.plymouthdiscus.com for more information and secure online shop.

New rules give rights to fish

New legislation that will give new rights to pet and farmed fish has been condemned by some as the next step towards Britain becoming 'a nanny state'.

The Western Morning News reported that: "People across the West Country castigated the confirmation by the Government that people who mistreat fish kept in aquariums and for 'farming purposes' could be prosecuted."

Jean-Michael Kennaway, who opened the Escot Aquatic Centre in Ottery St Mary, Devon, in 1984, described the proposed law as "nothing short of Big Brother."

He said: "It is nothing short of ridiculous, how are they going to determine whether something happens out of malice or by mistake? So many factors can lead to fish

dying, including weather conditions and parasites, which people may not necessarily know about but that doesn't make it malicious."

A Defra spokesman said: "It is misleading to concentrate on the impact of the welfare offence, i.e. a duty to promote good welfare standards, on goldfish. There is already a welfare offence for farmed animals, which covers horses, dogs, cats not just goldfish."

He continued: "The concern is that a person responsible for an animal should ensure that it is treated in such a way that suffering will not be an inevitable consequence of neglect or other poor husbandry. Whether the animal is being treated inappropriately through wilful neglect or honest mistake is irrelevant. The outcome will be the same."

Marine seminar

D-D Aquarium Solutions is presenting five major international speakers at its marine seminar on April 24 at the University of Birmingham.

The event is intended as a thank you to the company's current and future customers and to improve general awareness and knowledge within the hobby.

To ensure the event is not oversubscribed, D-D Aquarium Solutions is asking for a commitment-to-attend fee of £10. This money will be reimbursed on the day by way of RowaPhos and RowaCarbon products worth more than £20 to all those who attend.

Speakers:

Helmut Debelius – on fish



The Aquarium Solution

Sanjay Joshe – on lighting systems
Greg Schiemer – on general reefkeeping

Tony Vargas – on growing corals in a reef aquarium

Joe Yalullo – on the 20,000-gallon Atlantis Marine World in New York

To buy a ticket simply post a cheque or postal order for £10 to: D-D Aquarium Solutions Ltd, 11-17 Fowler Road, Hainault, Essex IG6 3UT

■ For updated information or to pay online visit: www.d-daquariumsolutions.com

25TH ANNIVERSARY EXTRAVAGANZA

Forty Fathoms is holding a week-long 25th anniversary extravaganza from April 9, with many special offers, prize draws and give-aways.

The business was set up as a small, family-run company in 1980, based in a small shop in Kidderminster.

With a growing nationwide reputation for quality livestock and service, Forty Fathoms ran out of space and in 1995 expanded into its present location in Green Street, complete with an import area and two large showrooms.

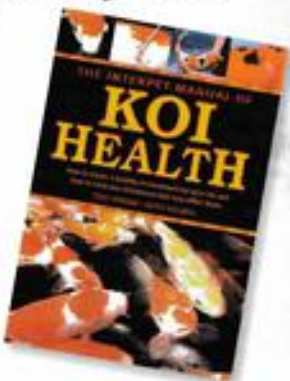
The company then had room to expand further into the pond and water garden sector as well as importing and the wholesale and retail of tropical fish, exotic marines, coldwater fish and aquatic plants. Forty Fathoms, which is still family-run, also offers a vast selection of aquariums, accessories and pond equipment.

Guide to healthy Koi

The *Interpet Manual of Koi Health*, by Keith Holmes and Tony Pitham, is aimed at the serious hobbyist and explains how to create a healthy environment for koi and how to recognise and treat disease.

The new book joins its sister publication, *The Interpet Manual of Fish Health*, which is not only sold to enthusiasts, but also kept in many stores as a reference book.

The Interpet Manual of Koi Health, a hard-backed, 160-page book, which retails at £14.99, is arranged in four parts. Part one covers disease prevention, focusing on providing the optimum environment and diet for health. In part two, the reader learns the 'essential skills' needed to monitor the health of koi, giving a simple overview of their anatomy and biology, the use of a microscope for diagnosis, tips on netting and handling, and safe transport. Part three moves on to koi health problems, including a diagnostic



guide to various viral, bacterial, parasitic and other disease conditions that follow in A-Z order. The final section describes various methods of administering treatments to koi, including some fairly advanced techniques such as sedation and injecting antibiotics.

tropicalfishfinder.co.uk
The easy way to find your tropical fish

What's new?

The first fish this month is *Corydoras loretoensis*. These are rarely seen in the UK and we have only come across them twice in the last year. They are unusual in that they have an elongated dorsal fin which develops as they get older. They make great additions to community tanks and you should always try to buy a group to make them feel comfortable.



Another interesting catfish this month is *Ageniosas mogoí*. They originate from the Orinoco Basin in South America and are more commonly known as the Slopehead catfish or the Orinoco driftwood catfish. They are reported to reach a maximum size of around 18cm. Despite their interesting shape, they are also unusual in that they have very short barbels, which are almost indistinguishable.



An interesting fish which has been turning up at one or two shops is *Barilius bakeri*. They are one of several *Barilius* species that can be a little difficult to identify. *Barilius* originate primarily from India and Myanmar. This particular species will reach a size of around 15cm. An active swimmer that should be kept in a group and in a tank with plenty of free swimming space.



Hypoclinistrus zebra are probably the most talked-about fish in the hobby at the moment. What is clear is that exports from Brazil have now been banned and sadly we are unlikely to see these fish in dealers' tanks for some time. On a more positive note the ban should give the fish time to recover their numbers in their local habitat which is far more important. It is possible that exports will begin again, but not for the foreseeable future. So, if you have a group of these fish in your tank now is the time to get your breeding project under way.

From time to time different colour variants are developed in fish and one we spotted this month is a marbled variant of *Dimidiochromis compressiceps*. These were available at Swallow Aquatics in Gravesend. They originate from Lake Malawi in Africa and will reach a size of around 20cm so do make sure you keep them in an adequately sized tank.



Other interesting fish during the month include an aggressive-looking South American characin called *Merkiano nigripinnis* (only keep these with fish of a similar size)



and *Osteochilus noshii*, commonly known as Nash's barb which originates from India. Both of these fish were available for the first time on Tropicalfishfinder this month.

All of the fish mentioned here were available at one or more of the shops using the Tropicalfishfinder service at the time of writing. To find out more go to www.tropicalfishfinder.co.uk or alternatively call 020 8297 4599.

NEW APPROACH TO MAINTAINING SHOW TANK WATER QUALITY

Water quality within the show vats at kol shows is something that every organiser and exhibitor worries about. Essentially, you are placing fish that have come from an established and stable environment into a much smaller body of water, which will, over the course of a show, deteriorate significantly in quality.

'Water teams' at the shows are working constantly to keep water quality at a safe level.

AquaHydrotech's Pond Nuggets have, for a number of years, been used by kol enthusiasts to 'kick start' and maintain good water quality in their ponds and display tanks. They are completely biological, containing only *Nitrosomonas* and *Nitrobacter* species of bacteria which are blended into small 'nuggets' of gel. They contain no chemicals or enzymes and are a true form of nitrification.

Now the company has come up with an innovative enhancement, for use in both show systems and in ponds – a combination of the Nuggets and a cartridge unit which retains the immobilised bacteria in the system and maximises their activity. The NitroGEN is a compact inline system, which activates immediately on installation and takes up little space while providing optimum conditions for maximum effectiveness.

AquaHydrotech now produces Ammonia Removal Nuggets (containing *Nitrosomonas* sp bacteria) and Nitrite Removal Nuggets (containing *Nitrobacter* sp bacteria) to enable fishkeepers to target specific ammonia or nitrite problems, as well as Pond Nuggets, which contain both species of bacteria, for general maintenance of water quality. For more information contact AquaHydrotech on 0295 273676.



New Sera counter displays...

Today, attractive presentation of high-quality brand products is more important to the retail trade than ever. Sera supports the specialised trade with tailor-made displays for the strong-selling Sera brand products.

There are four new Sera counter display versions. One version each is available for Sera Flake Menu, Sera Granulate Menu and Sera Toxicvec. Sera Nitrivec and Sera Turbo-clear share a display, using the name Bio-Power.

The displays create high product awareness with minimum space requirements. Therefore, they provide an ideal opportunity to stimulate and make use of customers' spontaneous purchase impulses for additional sales in a targeted way.

The displays for Sera Granulate Menu and Sera Flake Menu each hold 12 150ml cans. The new quick seller Sera Toxicvec is also available in a display (24 pc. 100ml bottles). The Bio-Power display for Sera Nitrivec and Sera Turbo-clear holds 12 100ml bottles and 14 50ml bottles.



Something for the weekend!

Building on its commitment to making fishkeeping easy, Tetra has launched TetraPond Pond Kits. There are two, easy-to-follow pond designs, offering a wildlife or goldfish pond. The kit contains everything necessary to create the pond of choice making it ideal as a weekend project.

Designed specifically to encourage new entrants into the market place by selling the concept of a themed pond that can be built in a weekend, the kits dramatically simplify the process of buying and installing a pond. Each kit comprises a pond liner, pond pump, water treatments, food, and a step-by-step guide.

Both TetraPond Pond Kits offer two potential pond layouts. The wildlife pond offers the option to include a waterfall within the pond design whilst the goldfish pond includes a formal or informal layout offering a flexible water gardening approach.

Chris Nickson, UK marketing manager,



Tetra comments: "The new TetraPond Pond Kits fill a gap in the market place, offering the concept of a strongly themed pond with a definite design plan, rather than simply selling a collection of equipment. The offering also presents an excellent sales opportunity for retailers looking to maximise their profit margins."

Available with immediate effect, TetraPond Pond Kits can help boost sales for retailers at a time when interest in water gardening is at its peak with the onset of spring.

...and help with pond pollutants

Sera Pond Toxicvec contains the innovative QuickClean Formula and immediately removes dangerous pollutants threatening fish and filter bacteria from the pond water, the company says. The parallel efficacy against different kinds of pollutants makes it especially valuable.

The quick effect of Sera Pond Toxicvec removes ammonium and nitrite in no time. Therefore, it prevents the conversion into nitrate and immediately supports prevention of annoying algae growth.

Furthermore, it removes aggressive chlorine from tap water. Also, it is effective against remainders of disinfectants or medications applied.

However, Sera Pond Toxicvec can do even more: it also binds toxic heavy metals such as copper, zinc, lead or even quicksilver/mercury. Therefore, these pollutants cannot harm the fish, and the frequency of water changes will be reduced.

If need be, such as with particularly high pollution levels, a safe higher dosage is possible with Sera Pond Toxicvec.



NEW FISH MATE PUMPS AVAILABLE

The latest range of Fish Mate pond pumps can be seen in store this season. The Fish Mate 5000 (RRP £169.95), Fish Mate 7000 (RRP £199.95) and Fish Mate 9000 (RRP £259.95). All models come with a three-year guarantee and have the following features:

- Anti-clog filter design
- Include fountain set with four options
- Single-control knob adjusts flow to fountain and waterfall/filter
- Fully encapsulated electrical parts for safety
- High-efficiency pump turbine handling solids to 6mm, ensuring low running costs
- Strainer filter less prone to blockage and easier to clean than conventional foam filters
- Open handle for easy placement/retrieval from pond

Visit www.pet-mate.com for further details.

Cool fishes

Coolwater tanks don't have to be the goldfishes' domain. **Mary Sweeney** has some suggestions for a planted display to be proud of

An aquarium doesn't always have to be a tropical fish tank to be a beautiful addition to your home. The coolwater aquarium is a lovely kind of tank that has a lot of advantages, especially if you're concerned about your electric bill or if there are too few electrical points in the house to squander extra outlets on the aquarium. The lack of need for a heater on the coolwater aquarium is a big asset for many who otherwise would not be so keen to get into keeping fishes. I'm not just talking about goldfish now, but other exotic species

that add beauty and action to a tank of water with live plants (or not, depending on your preference), and the additional bonus of knowing that this is how early fishkeepers kept their pets and that your aquarium is historically authentic.

Decor was everything

In the early days of the aquarium hobby, the decorative aspect of fishkeeping was a big part of the appeal. So, not much has

changed there, has it? People, it seemed, were more interested in the highly decorative containers than the fishes that abided within. The diminutive Paradisefish was an early aquarium resident because it was a hardy species that was quite comfortable in normal home temperatures. Their vitality was an utter necessity in the days before the study of fishes in captivity had become science. People relying on trial and error soon discovered that the use of live plants and a few snails kept an aquarium in some kind of 'balance', and it

Decorative coldwater aquascape with fancy goldfish, 'rainbow' rock and natural plants





Puntius bimaculatus, the Red striped barb can handle cooler temperatures

was and still is, quite common to see cool-water fish kept in containers that are too small with a couple of snails and perhaps some *Anacharis* (*Egeria densa*). That's generally where the term 'hardy' or 'vitality' enters the equation. I do not endorse keeping cool-water fishes, or any fishes for that matter in containers that are too small simply because it has been done before. No, it is far better if you are going to use a ceramic vessel or a decorative glass vase, to see that there is enough water for the amount of fish one is dealing with. I have so often heard of people who keep fish without even a filter, but through the use of very large daily water changes and the use of handfuls of aquatic plants. That is fine when you are dealing with a large staff... No, seriously, sometimes exotic bubble-eyed goldfish in some breeding facilities where

each fish is priceless and watched like a hawk all day are kept in large ceramic tubs, with 100 percent daily water changes, but this is not generally done in the home.

Cool-water species

In talking about the cool-water aquarium, (without the goldfish) there really are quite a few species that can be re-acclimatised to this natural temperature for them. If they have been kept at tropical temperatures in the shop, and this is quite normal, as the shopkeeper is seeing them as tropical fishes. Sorry, they may be exotic and imported, but tropical, they ain't, at least not unless tropical is a temperature around about 15-20°C, as the water can be in the mountain streams in China, parts of Asia,

parts of the southern US, Central America, and other temperate locale. The species involved include many of the barbs; *Puntius bimaculatus* and *Puntius nigrofasciatus* are two of the many and very attractive species. Many of the danios, including the Giant danio, are also temperate-water fishes that can be re-acclimated to the cooler waters of their native mountain streams. The temperatures that these fishes will thrive in are between 15-22°C. This is going to require a definite re-acclimatisation, as the shopkeeper has likely not been keeping them in the cooler water that they would have been found in nature. Most people, even professionals, look at anything other than a goldfish and automatically assume, 'tropical'.

The White cloud mountain minnow is a classic example. So often this fish is kept in tropical aquariums, but even its name tells

Tanichthys albonubes, the White cloud mountain minnow is well-known as a cool water lover



Tetra 

The experts at making fishkeeping easy

Tetra UK Ltd, PO Box 271, Southampton SO18 3ZX

us it is a mountain minnow and as such is accustomed to cool waters. The Paradise fish, *Macropodus opercularis*, has been seen as tropical for far too long. These are the first really exotic fish – I leave out goldfish here, because they didn't need to be imported; carp are ubiquitous – to be imported from Asia to Europe, where their ability to survive cold, low oxygen levels, and small amounts of water made the fishkeeping hobby what it is today. (See Peter Capon's article in the March 2005 issue of *TFH*). These tough little anabantoids really brought fish into the parlour and out of the kitchen. Many of the North American poeciliids as well, are not truly tropical, especially those, like *Xiphophorus variatus*, which even if it weren't bred for toughness, would be quite comfortable on a cool night, just like in the old country. *Xiphophorus maculatus* is also a good fish for cooler waters. I would, however, not jump to conclusions where mollies are concerned. They definitely need to be kept at higher temperatures, so don't necessarily jump on a livebearer bandwagon and think that all fishes that are found around the Southern US swim together. The Black molly, *Poecilia sphenops*, from Central America definitely needs tropical

temperatures or it will decline either from ich or shimmy. It is not

Though I offer suggestions about some species to keep in a cool-water aquarium, do your homework on recommended temperatures for your fishes

difficult to look up the recommended temperature for a new fish you

are considering purchasing. But be careful. It is unfortunate, but mistakes do get into the literature, and if it doesn't sound right to you, say the fish is a native of Brazil and the author has the temperature range as between 15-18°C, check another reference as well. You are likely right in your questioning of the reference. Mistakes do happen.

Planting the tank

So, you have the tank all set up and ready to go. The filter has been running long enough that the water is crystal clear and you have your plants and ornaments in place. If you are keeping live plants, please plant heavily from the beginning. It's the most successful way to deal with keeping live plants. Trying to add one or two plants at a time doesn't really work well. That's how you add the fishes! For the plants, it's always most advantageous to go with the full planting at the outset. It is tempting to purchase only one or two plants and hope that growth will take care of the rest, but that it generally not the most successful course. Of course, there's nothing wrong with keeping a tank full of plastic plants. They are very realistic in this generation of aquarium accessories and there's no worry about the fish eating them or having the live plants die off due to lack of light or fertiliser questions. Not everyone has green fingers,

but that doesn't mean they can't have an aquarium if they want one!

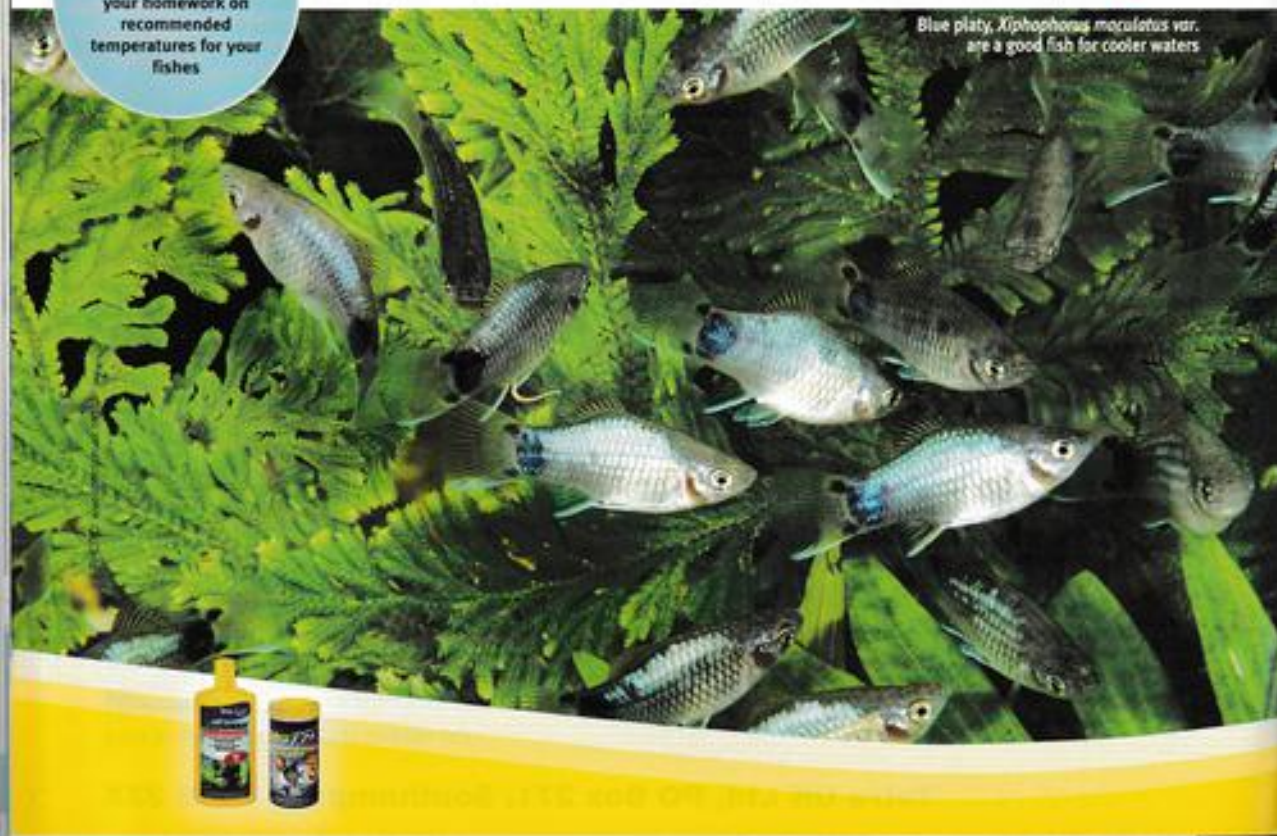
Gradually is the key word in any change you make in your fishes' environment, even when that change is for the better

Adding the fish

When you start to stock the tank, the temperature needs to be what it was in the shop. Then you would gradually reduce it to the normal temperature for the fishes. It's amazing to see fishes removed from horrible conditions to much better ones only to die from the stress of it all. Try to keep your fishes from such stresses and enjoy your easy-keeping new aquarium.

One thing to keep an eye out for when going from warm water to cooler water is ich (whitespot). The ich parasite is most often encountered when fish have been chilled. This is not the change in water conditions we are trying to simulate. Cooler water keeping conditions and "chilled" are not the same thing. Chilled suggests a situation where the fish had experienced a sudden reduction in temperature and an equally sudden increase in temperature. You may be able to avoid this if you can convince your shopkeeper that the normal temperature for the fish you have in mind is indeed 20°C and ask him to lower the temperature over time with the understanding that you will be purchasing a shoal from the tank and you wish to keep them properly. What do you think? Will your shop do that for you and the fish it sells? It's a test of good faith. ■

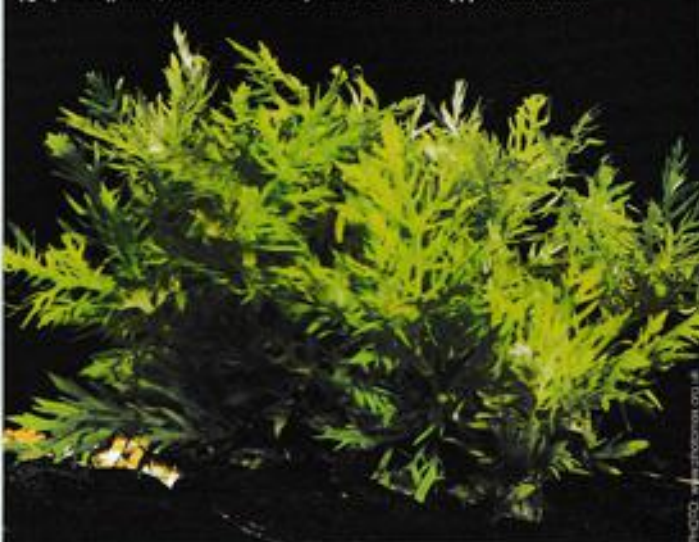
Blue platy, *Xiphophorus maculatus* var. are a good fish for cooler waters



COOLWATER PLANTS

If you are going to be using plants, though, do pay attention to the species light and warmth requirements. They are serious. As I mentioned earlier, *Egeria densa* is good. *Myriophyllum* is also good. *Hygrophila* is good. The pretty pennyworts and spatterdock are also happy in cool water. Many of the plants you know well from your local pond will do well in the temperate aquarium, though you may not want to take them from there due to the likelihood that you will also be bringing home all manner of undesirables. Not from your local pond, you say? Ha! Betcha. Locally-collected plants, at the very least, will have pond snails travelling with them, which is sometimes not a bad thing – but what if it's leeches? Do you want to remove leeches from fishes? Not I. Mainly, these days, we have to worry more about whether it's legal to lift a piece of plant matter from the local pond than anything else to do with the critters.

Hygrophila difformis, Water wisteria is a plant that will be happy in cooler water



10 Community Cautions

Big fish will usually eat small fish

- 1 Be aware of the size to which the species in your community set up will grow and try to keep them even

Fish require different water temperatures

- 2 When creating a community, always ensure that the fish you are choosing can live at the same temperature and adjust your thermostat accordingly.

Fish have varying dietary requirements

- 3 Remember to cover the scope of dietary needs within your feeding regime and add extra filtration if you stock carnivorous species.

Do not mix riverine and still water fish

- 4 Riverine fish require higher oxygen and filtration levels than still water fish. Still water will kill them. When exposed to fast moving water, still water fish quickly become distressed and lose condition. Choose either a still water OR a riverine Community.

Fish have different water requirements

- 5 Always ensure that your community tank only contains species that need the same water pH and hardness.

Fill all the levels

- 6 Different fish live in different areas of the tank. There are top, middle and bottom dwellers. A good community tank will include each of these.

Create your community with Tetra's Virtual Aquarium at www.tetra-fish.co.uk



Tetra

The experts at making fishkeeping easy

Never over stock

- 7 Cramped conditions can lead to aggression in otherwise placid species.

Keep your eyes open

- 8 Look for bullies in your community and remove them immediately. Prevention is always better than cure.

Provide sufficient territory

- 9 Always ensure each species in your community has it's own territory. For example if you have 5 species of cave dwellers, ensure there are 5 caves...

Differing dispositions

- 10 Quiet tranquil species can easily become distressed when in close proximity to lively boisterous tank-mates. Keep the temperaments of your community fish similar.

Tetra

The experts at making fishkeeping easy

Tetra UK Ltd, PO Box 271, Southampton SO18 3ZX

Q&A Tropical

Today's Fishkeeper Expert Panel

Peter Hiscock General – tropical fish

Andrew Caine General – marines

Ben Helm General – coldwater

Lance Jepson Health

Tony Sault Discus

David Armitage Anabantids

Pat Lambert Livebearers, Rainbows and breeding fish

Ian Fuller Catfish

All Stalsberg Cichlids

Andy Gabbott Killifish

Bernice Brewster Koi and ponds

Val Davies Reptiles and amphibians

Pete Liptrout Oddballs

Questions by Post

All letters must be accompanied by a SAE and addressed to:

Fishkeeping Answers, Today's Fishkeeper, 7 The Rickyard, Clifton Way, Okehampton, Devon PL20 7TA

Internet Service

Send your queries to: questions@today-fishkeeper.com

When looking for angelfish, go for good quality specimens as they are less likely to have deformities

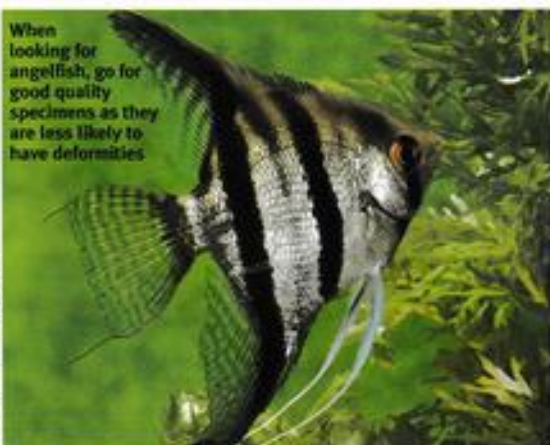


PHOTO: WETA PHOTOS TO AQUARIUM

Are skimmers used on tropical tanks?



Can you use a skimmer on a tropical set-up? And, if you can will it help get rid of nitrates as my nitrates are pretty high (20-40ppm). My tank as been set-up for over eight months now I am doing regular water changes but the nitrates never go any lower. I do a 25% water change monthly all my other readings are low (nitrites 0ppm, ammonia 0ppm, pH 7.2). Some fish have died but mostly they are staying alive.

Some people have said I'm not doing enough water changes and they have said to do 25% weekly, but the place I get my fish from said this is way to much.

I have a 100-litre tropical set-up with two internal filters. Would adding a good external filter be a good idea or would this just create to many nitrates?

Lee, via email



The technology used for protein skimmers on marine aquariums depends on a very fine bubble size which can only be produced in denser salt water. Although there are freshwater skimmers, these are designed for very large volumes of water, so an 'off the shelf' skimmer would have almost no effect in a freshwater aquarium. Regarding your water changes, because the water values of an aquarium dictate the amount of water changes required, a 'standard' rule cannot apply to all aquariums. Almost every source you ask will probably recommend a

different amount because differing conditions are rarely taken into account, and the recommendation is likely to be whatever works for that individual, rather than for your tank. A good general guide however is the 'little and often' rule, whereby a smaller weekly change is much better than a larger monthly change. I would agree with your shop that 25% a week is too much, but you could try 10% a week, and you would still be almost doubling the overall water changed each month and at the same time causing less disruption to your fish and the aquarium balance. Having said this, your nitrate levels of 20-40ppm are within the acceptable range for almost all freshwater fish, excluding only the very sensitive fish. At these fairly low levels you may even find that your test kit might not be providing accurate readings, and your source water may well have nitrates at these or even slightly higher levels anyway. If your source water has high nitrate levels, you will only be able to reduce them in the aquarium easily, by having either plenty of healthy growing plants, or by using a chemical filter media such as activated carbon or a dedicated nitrate remover. These medias are easier to use in an external filter, which would provide better overall filtration, but they can also be adapted to work with most internals. Considering your other readings are all good, I would say adjust your water changes to the little and often rule, consider using a nitrate removing media, and as for the rest 'if it ain't broke, don't fix it'

Peter Hiscock

Where can I buy angelfish?



I recently changed my stock and bought in a new tank – a much bigger one than I had before. I'm very interested in angelfish. The local fish shops don't stock a good variety of colours. I would like to ask if there is any shop in UK that specialises only in angelfish?

Marcelo, via email



Specialising in specific fish types requires a certain following for the fish and also a level of expertise for that fish which is 'above the norm' of standard good advice. Discus have quite a following, require specific conditions, and a really good quality discus will come from expert breeders, rather than the standard mass-bred stock, so there is a market there for shops to specialise.

Angelfish on the other hand, are relatively easy to care for, and because most fishkeepers probably wouldn't be able to tell the difference in quality, the market for specialising is not as large. Personally, I actually prefer naturally coloured angelfish to the artificial forms, and I would much rather spend the time looking for a quality fish (angel, discus, or any other) with natural markings than one with a different or unusual colour. A good quality, natural coloured angelfish, is far more likely to reach a good size whilst keeping its form and shape without developing deformities, and is more likely to breed successfully than the heavily-bred colour variants.

I do not know of any shops which focus mainly on angelfish, although any which advertise as specialists in 'cichlids' or 'South American cichlids' might be preferable. You should try if possible to get specimens with at least 5cm (2in) of body length and avoid any with slight 'bumps' in the dorsal fin ray, these will probably develop into 'kinks' in the dorsal fin. Also keep a keep eye out for missing gill covers and pelvic fins (the trailing fins at the front) which are common in heavily bred stock. The better, or more specialist shops are likely to advertise in the magazines, and you can get a list of all the shops in your area at thinkfish.co.uk/shops.html

Peter Hiscock

Jaguar cichlids

Please could you send me some information on the Jaguar cichlid from Central America. Could you tell me at what size do they get their adult colours and how fast do they grow?

Via email

Unfortunately, I can't send you all the information as it would be too much! Since you didn't give me information about your tank, I guess you haven't bought the fish yet. The Jaguar cichlid (*Nandopsis managuense*) comes from the Atlantic slope of Honduras to Rio Matina in Costa Rica, and you will also find the fish at Pacific slopes of Nicaragua in the crater lakes and the Great Lakes of Nicaragua. So, basically all over Central America. This fish grows to at least 25cm, but I've also heard about species up to 50cm. In its native habitat, it's a popular fish for supper! The water parameters should be pH 7.5-9, the GH from 2-10, but it will live in harder water too. The fish feed on small fishes in nature, but will eat almost anything in the aquarium. They resemble the much smaller tetracanthus from Cuba. The fish is not difficult to keep and will spawn

when they are relatively small – female around 12cm and male around 15cm. So, basically you need to have room for this fish and don't keep it with smaller fish if they

are not meant to be food! You can find further information about this fish (and many others) on www.fishbase.org.

Aif Stalsberg



A swarm of newly hatched fry with the parent Jaguar cichlids

Is my catfish the culprit?

I recently purchased a so-called Clarys catfish for my 400-litre community set-up. It was 2in when purchased about four weeks ago and has more than doubled in size. Several tetra's have disappeared – could the catfish be the culprit? Please could you give me any information about this fish?

Marc Terry, via email

The name of this catfish is *Clarias batrachus* (the Walking catfish) because of its ability in nature to move across land (usually at night when the atmosphere is moist) from one body of water to another. This is not good. Was the fish purchased from a reputable aquatic shop? If it was, did they offer any advice about its requirements, its habits, or even how large it gets? Did they ask what it would be kept with? Or indeed did you ask for any advice?

First of all it is a fish that grows very quickly and will reach its full potential of 12-14in in no time at all, and anything less than half its length will be considered as food. These are not a community fish by any stretch of the imagination. If you were told it would be OK in your community tank, I would return the fish as soon as possible and request replacement for all the fish lost.

It is totally irresponsible for any shop to sell one of these fish without first informing the customer of the potential size, their diet and the fact that they can and will escape from almost any aquarium that does not have a tight and close-fitting cover glass. I believe shops should refuse to sell them other than to experienced fish keepers. At 2in they are pretty little fish, but soon become large and undesirable, except for the specialist aquarist.

Ian Fuller



Community Conundrum

Young angelfish are quiet, peaceful, slow moving creatures and complement a community tank well. As angelfish reach maturity however, they will seek to establish a territory and pair up. In order to possibly breed. When an angel starts showing aggression it will be initially directed at other angelfish. If you have an established pair or a group of six or more, there will be little trouble, but if you have only three or four angels, the dominant fish of the group will constantly bully the weaker angel(s). Once a

pair of angels begins to go through the motions of spawning behaviour, all fish that venture too near will be chased away. This situation occurs more if there are only a few 'targets' rather than several.

Angelfish can grow to 14cm (just under 6in) and for a single pair of angels, the aquarium should be at least 90cm (3ft), for a group of six, you will need a tank of 120-150cm (4-5ft). Tankmates can include peaceful but



Angelfish *Pterophyllum scalare*

robust fish such as larger tetras, peaceful loaches and catfish, rainbowfish, larger gouramies, and slower barbs. Avoid mixing angels with delicate fish, or small fish with long flowing fins, and avoid troublesome loaches (notably sucking loaches/algae loaches), which will try to feed from the mucus coating on the angelfish.

www.thinkfish.co.uk

Check your fish compatibilities with the Think Fish Community Creator



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

DISCUS PROBLEM SOLVER

Oxygen depletion

Q My tank is 400 litres with external canisters for filtration, which are run on a reduced flow to minimise the amount of turbulence in the water. The fish consist of a number of tetras, corydoras catfish, and a shoal of eight young discus. Recently, I found one of the discus dead and all the others up near the surface.

I have tested all the water parameters: pH

6.5, temperature 30°C, nitrate 25ppm and nitrite 0. I have also done a couple of water changes and the fish appear fine for a day or two, then they are back up to the surface. They have now stopped feeding and I've been advised to turn up the temperature as this will make them feed. Is this advice right?

T. Johnson, Southampton



A Firstly, the problem of the fish not feeding at this moment is not as



Keep an eye on your discus - if they start gasping at the surface then oxygen depletion could be the problem

My discus will only eat bloodworm

Q I recently (early Dec 2004) bought three small (8cm) discus which I've added to my 180-litre Juwel community tank. The problem is the only food I can get them to eat is bloodworm and to a lesser extent live daphnia. All other foods (Brine shrimp, flake, Prima) they refuse to take, even when I've starved them for several days to attempt to overcome this reliance on bloodworm.

I enquired at the shop that I purchased the fish from as to the food they were fed there... answer live bloodworm.

Any idea's on how I can get the fish to accept other food types as I've read that bloodworm alone is not sufficient to provide a balanced diet? The fish at present seem relatively healthy, colours are bright, looking alert and they are always at the front of the tank waiting for food, although they don't seem to have grown in the eight weeks I've had them.

Steve Lowe, Warrington.



A Bloodworm is intended to be an occasional treat and should be used as such, but as you are finding out, discus will refuse all other foods when fed bloodworm. I am not surprised that your fish haven't grown in the eight weeks you've had them as they need a diet containing high amounts of protein and bloodworm is only 5% protein and 92% water. I'm afraid you have to be cruel to be kind - discontinue the bloodworm and feed the other foods. They will eat when they are really hungry, and this may take a while to achieve, but you have to do it now because if they don't get the correct diet soon, their growth will become stunted.

Sponsored by:

PLYMOUTH DISCUS

HOME OF THE GOURMET
DISCUS DIET HAMPER

DISCUS DELIGHTS

For all your discus and discus needs

Tel: 01752 784671
or 07976 200454

Lowest prices

Secure online shop

Website: www.plymouthdiscus.com



important as removing the cause of distress. As the fish react positively to a water change, I am sure your problem is oxygen depletion in the water - this is why they are all congregating at the surface.

Do not raise the temperature as this will only make the problem worse. Clean out your filters and restore the flow to the maximum, it is a fallacy that discus don't like water turbulence. It will also help if you can add some surface water movement either with the positioning of the return from the filters or adding an air stone temporarily. When you have removed the problem causing the stress, your discus will return to normal and being feeding again.

Put off by too much equipment

Q I have considered keeping discus for some time, but always seem to put it off as I have been told many times that they can't be kept in tap water. I have also been told they need lots of expensive equipment such as a reverse osmosis unit and trickle filters. Can you tell me if this is the case?

C. Charles, Birmingham



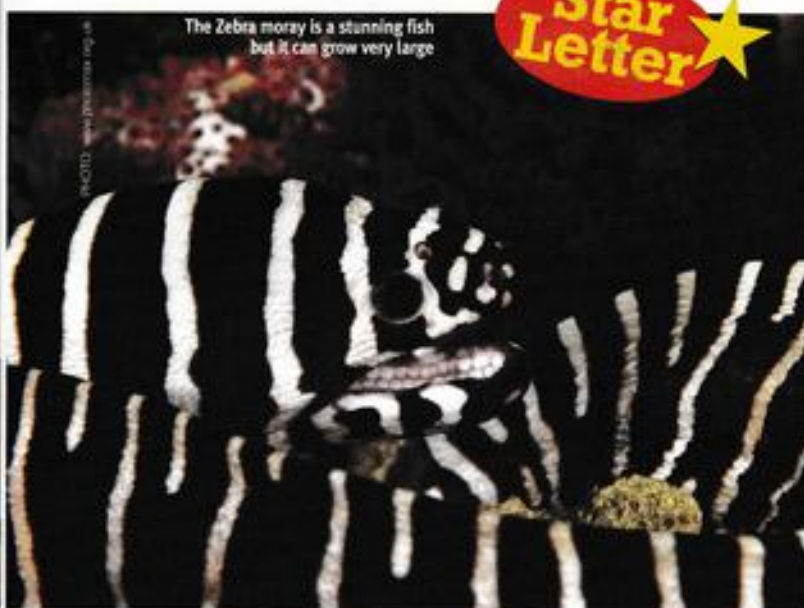
A A lot of fishkeepers successfully keep discus in tap water which has been filtered through activated carbon to remove the chemicals detrimental to the fishes' health. Discus are a potentially long-lived fish and if you remove chemicals from the water you will have more chance of giving them a long and healthy life. In my opinion you don't need to go as far as reverse osmosis as these units are mainly for breeders, where water quality is paramount. All my tanks are filtered by internal power filters containing sponges, but the water quality is excellent as it is passed through a triple cartridge water purifier to remove all the nasties but leaves in the essential minerals that the fish need.

Q&A Marine

Andrew Caine answers your questions

A tang too many

Star Letter



The Zebra moray is a stunning fish but it can grow very large



I have just set up a 48 x 18 x 18in marine fish-only system. The filtration is an external filter with 20kg of live rock. I also have a protein skimmer and a UV. The aquarium was set up five days ago with RO. water and in about three weeks I would like to stock the following: a Flame angel, Pyjama wrasse, Emperor tang, two Yellow tangs and a Zebra moray eel. Is the stocking compatible and will I be at my stocking limits?

Pete Brown, Huddersfield.



You will have about 45 gallons of water within your aquarium. Your filtration is good and I am pleased that you are using live rock as well. You can safely stock 1in of fish (excluding the tail) per two gallons of aquarium water, giving a total of 22in of fish. Your total fish stock when adult will be 56in because the Zebra moray will grow to about 36in long if not bigger so go for a smaller eel. Your Emperor tang and Yellow tangs are incompatible unless in a much larger aquarium, so you will have to lose the eel and a tang species. Replace these with peaceful fish. Also, the Flame angel and Pyjama wrasse should be added last as they are very territorial species.

Starting up...

I have two aquaria. One is 60 x 15 x 18in and the other measures 72 x 18 x 24in.

Allowing for a 3in layer of cockleshell and coral-sand, how many gallons will each tank hold?

Second, how many fishes would you suggest each tank can hold? I shall buy only adult fishes and no specimen will exceed 5in in overall length.

Finally, I live near the coast. When examining rock pools I often find shrimps and sand hoppers under rocks. Can I use these for feeding my marines?

Dave Grice, Newport



The 60 x 15 x 18in will have a gross capacity of 58 gallons. The coral-sand layer, freeboard at the water surface and rocks/corals and the like, would reduce this to a net capacity in the order of 47-48 gallons of sea water. The 72 x 18 x 24in tank would have a gross

capacity of 112 gallons. Similarly, after displacement of sea water by the filter-bed and other items, you could expect to have about 92-94 gallons of sea water net.

During the first six months I would not exceed 1in of fish to each six gallons of sea water. Please remember that during the first six months, feed the fishes in an exceptionally miserly fashion.

Feed only once per day, and even then each fish on average must receive no more flake food than would cover a one penny piece one flake deep. You will never meet a failed marine aquarist who starved his fishes to death – but you will meet thousands who killed their fishes due to the direct or indirect results of overfeeding.

It is not safe to place any live foods or decor objects from our own coastline into a tropical marine aquarium. Tropical marine fishes have evolved no natural defence mechanisms against pathogens and parasites from North Atlantic system waters.

Take the stress out of holidays



I have Rio 180 marine set-up. There are a few corals, two clowns, one scooter blenny, one Midas blenny, two starfish, nudibraches and a clean-up crew of around 25 snails and five hermits.

I am going on holiday for a week soon and would like to know what to about looking after my tank.

My lights are on timers and I have a friend who could come in to check on it who has no fishkeeping skills.

Would my skimmer be OK not getting cleaned out for a week?

Wayne Evans, via email

Calcium reactor confusion

Q Please could you help me with a problem that I have regarding my calcium reactor. I read an article about reactors and it stated that the CO₂ should be set at 10-14 bubbles per minute, but after reading the makers' instructions, they recommend starting off as you say but to increase the number of bubbles daily by a max five bubbles per minute until the correct CO₂ level is reached. Could you please tell me how I would know when the correct level is reached?

Thomas Ham, Swansea

A I can see where your confusion has come from. In these types of articles authors often have to give information that is correct for the whole range of producers and models. As you can appreciate several companies produce high quality calcium reactors and each one has its own little quirks on a general theme. This is where the purchaser should read and follow the instruction manual in the first instance. If still confused, go to the retailer for advice. If the retailer cannot help then the last point of call will be either the manufacturer or UK agent. Regarding CO₂ levels, the fluid returning from the reactor to the system should have a high calcium content and be at a pH of no less than 6.5.

Q When you go on holiday the aquarium goes onto skeleton staff, so you will have to get a friend to feed the animals every two to three days, it is easy to avoid overfeeding if you place each feed in a container so the person only has to pick this up and feed. I find the pots that photographic film come in handy for this purpose. Also remember to keep the food refrigerated if it needs it. This means that your friend will know that they are not overfeeding and you know that they are not overfeeding, which is a huge stress relief. You should fit an air valve to the skimmer air inlet so then the air can be turned off, the water level will then fall below the skimmer so the cup can be emptied easily without turning off any pumps. So the skimmer cup can be emptied just in case it goes mad and overflows. Another good thing to do would be to leave the contact details of your local dealer so that if there's an emergency, your friend can call them. Remember to ask if it's OK with the shop retailer first though!

ARE SEAHORSES EGGLAYERS?

Q I hope you can settle an argument I have been having with one of my local club members.

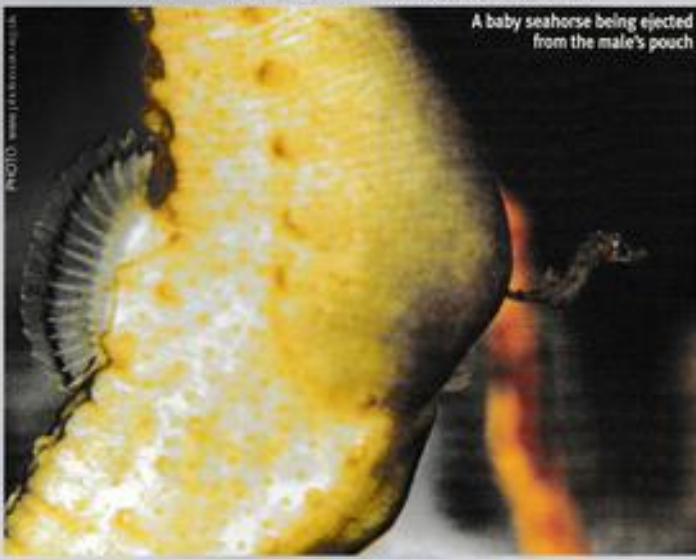
He says seahorses are egg layers, not livebearers. I have bred seahorses myself and I have seen them give birth to fully formed baby seahorses – so therefore they must be livebearers. However, I am always prepared to listen to the experts, so what do you think they are?

John Simms, Bournemouth

A I am sorry to have to disagree with you, but seahorses are classed as egg layers by scientists.

The fact that the eggs and fry are held in the pouch until they are born doesn't mean they are livebearers.

The problem is the pouch is classed as external to the body, and internal fertilisation of the egg is a vital characteristic of livebearing. Nonetheless, an interesting matter to ponder – seahorses really are fascinating.



A baby seahorse being ejected from the male's pouch

WHEN CAN I ADD FISH?

Q I have recently set-up my own marine tank and I would like to know how long I should allow my tank to cycle, and when I should start adding fish. Also, how regularly should I change my water and can I use tap water to mix with the salt?

Simon Everett, London

A Congratulations for taking the plunge into marines! It is impossible for me to give you an accurate timescale as all tanks are different depending on the tank size and set-up, and what you hope to keep. Some can be ready to stock in 30 hours and some can take over five weeks. However, test your water every two days for ammonia and nitrate - when both readings are zero for at least a week, then you are ready to go. During this maturation cycle don't turn your lights on as this will cause a massive algal bloom. I advise water changes little and often, say 5% a week, but don't use tap water as you will be taking two steps forward and one step back each time. Either get a purified water source from a local retailer, failing that, your own water purifier will be essential.

Star Letter Prize from

AQUA MEDIC



Modern Coral Reef Aquarium books, written by Ail J Nilsen and Svein A Fossa are regarded as probably the most authoritative series of books for the marine hobbyist in years. ab Aqua Medic, the leaders in Marine Aquarium technology, is pleased to present whichever of the three volumes, normally £55 each – desired to this month's star letter.



The Saline lake in Kos with its flamingos

The killifish of Kos

When **Erwin Schraml** and his wife went on holiday to the Greek island of Kos, little did they know Erwin's fascination for fish would follow them there!

Anyone who wants a slice of this kind of life must house the dog with a friend, and stick the children in a Boy Scout camp. This is what my wife and I decided to do so just the two of us could spend the Whitsun holidays (a little more than a week) on vacation away from the rest of the family. The island of Kos seemed to be the right choice destination. My wife has

no objection to a little bit of snorkelling, and she thought she wouldn't have to worry about her "fish freak" husband being heavily engaged with his hobby. If a good friend, on the day of departure, hadn't said that there were killifish on Kos, this idea would have worked out. However, I had time to get a small scoop and secretly hide it in the luggage!

Aphanius found in a freshwater brook



Where is Kos?

The Greek island of Kos lies far in the east of the Aegean, just 5km away from the Turkish mainland. With an expanse of 43km at a maximum width of 9km, it is small enough to be explored within a few days, but big enough not to be boring from the beginning. Although I have never been a fan of motorised bicycles, we found it quite exciting to explore the terrain on a rented scooter. Even in May the island was beginning to fill up with tourists. The isle on which 31,000 inhabitants live is invaded every year by over half of a million holidaymakers. However, you can still find some very quiet surroundings, especially in the mountains which range high up to 842m. At this time of year even the tourist destinations like the fort of Antimáchia, are visited by very few tourists. This 13th century fort seen from the outside has well preserved walls with amazing looking battlements. The interior however has returned almost completely to nature.

Local wildlife

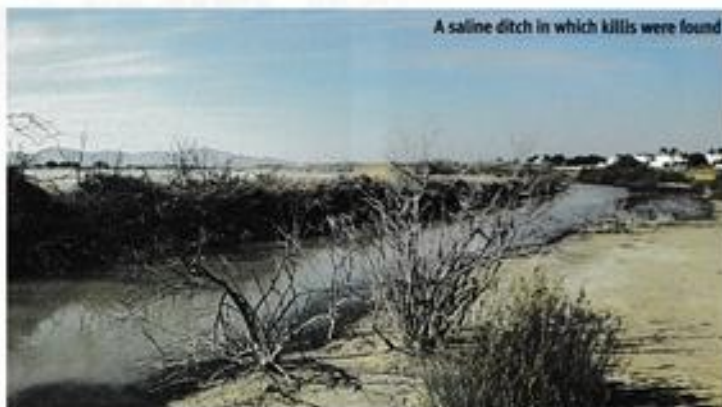
There are many reptiles and amphibians on Kos. As well as Greek turtles and lizards, which one sees occasionally, there are also a lot of snakes, including poisonous ones. A visitor with an interest in herpetology would probably be highly delighted to track all the occurring species.

During my travels on the scooter I was always in search of open freshwater. For instance, near the mountain village of Zia there was once 20 water mills powered by the water of the founts located there. Today, unfortunately, the water is conducted in pipes to the hotels in the coastal plain but it was too high there for any fish.

The largest frustration was a wetland south of Kos city, which is the only hideaway for swamp plants to be found on the island. The small lake, however, harbours no fish or frogs, even though it

NATIVE AMPHIBIANS AND REPTILES FOUND ON KOS

Bufo viridis, *Hyla arborea*, *Rana bedriagae*, *Anguis fragilis*, *Cyrtopodion kotschyi*, *Laudakia stellio*, *Memidaktylus turcicus*, *Ophisaurus apodus*, *Bilanus strauschi*, *Ablepharus kitaibelii*, *Mabuya aurata*, *Lacerta viridis*, *Lacerta trilineata*, *Lacerta oertzeni*, *Algyroides moreoticus*, *Ophisaps elegans*, *Typhlops vermicularis*, *Eryx jaculus*, *Coluber caspius*, *Coluber najadum*, *Coluber nummifer*, *Elaphe situla*, *Malpolon monspessulanus*, *Natrix natrix*, *Vipera xanthina*, *Testudo graeca*, *Mauremys rivulata*.



A saline ditch in which killis were found



Adult killifish found in one of the saline ditches

does not dry up completely throughout the year. A cottage with viewing slots for the observing waterfowl, which appear on the lake occasionally, was rarely used by visitors because of the lack of birds.

The allegedly only, all year long water carrying brook on the island, is found in a small pine forest (Dáfos Plákas). Actually, it has only a modest runnel. The forest is a popular destination for locals and is idyllic, except at weekends when many go there for barbecues and family meetings. The small brook didn't seem suitable to harbour fish, but there were frogs and tadpoles. The species were probably *Rana bedriagae*, a frog, which is very similar to our Lake frog, *Rana ridibunda*, and differs genetically and through its croaks.

Fish at last

At the crossing of the street of Antimáchia to Kos city, at the junction to Pili, there is a village pool – the only one which I could find on the whole island. Although it is used by all kinds of poultry, its water is still crystal clear. It is fed by a brook and I think it is possible that the water runs all year long. Here, finally, I found fish. Unfortunately it was *Gambusia*, which have been translocated around the whole Mediterranean for mosquito combat. If killifishes ever lived here before, they are there no more. I felt that the freshwater

shrimps, which occurred here were more interesting than the livebearers. They appeared to have no problems sharing this living space with the *Gambusia*. Whether this is a native or a translocated species could not be detected, neither could the species be identified.

I believed that I had now searched all the places on Kos with permanent freshwater, and if there were any killifishes on the island they would have to be in saline habitats. The killis would not be pure freshwater inhabitants, they would live in the brackish water, as is the case in various *Aphanius* around the Mediterranean. The saline water is found on the northern side of the island in the vicinity of Tigáki. Nowadays, it is included in the travellers' guide as a habitat for flamingos. Actually, from some distance these birds are visible on the lake. It is not possible to gain access to the saline area from all sides, because a large part of it is surrounded by a ditch. Therein *Gambusia* bustled again in gigantic quantities, mostly united in bunches. They struggled for air at the surface in the relatively warm, and therefore oxygen-low, water. In the southwest of the saline the ditch was interrupted and one could wade directly in the lake.

Besides the *Artemia*, available in incredible quantities, I saw small fishes whizzing off, which differed in their escape behaviour from the more tottering shrimps. And this time they were definitely not



Gambusia, evidently the salinity was too high for them here. With the scoop the fishes could be caught quickly and, as expected, they were *Aphanius* species. But here only juveniles could be found, so where were the adults?

I took the trouble, to scoop for the larger kills in the surrounding ditch and they could be found there, especially between the 'salt plants'. They appeared to have a higher tolerance in the low oxygen concentration, as they did not need to struggle for air at the water surface like the *Gambusia*. But the number of them was far inferior to that of the *Gambusia*.

At the outlet of the saline however, the proportion was different. Here I found almost only adult kills, which now emerged in large numbers, united in schools. The water here was so low, that the fish had their backs sticking partly out of the water as they fled here and there between the negligibly deeper puddles when my presence startled them.

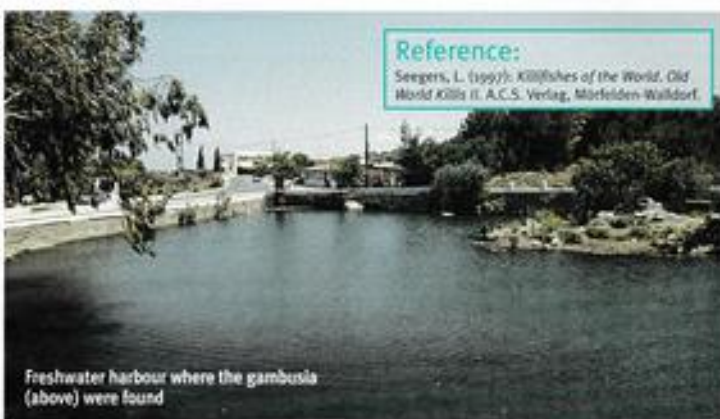
Freshwater killis

A surprise occurred at the southern part of the brackish water lake, where a small brook flows into the saline surrounding ditch. This brook, really was no more than a drainage ditch. It carried pure fresh water, which was obvious by the aquatic plants as well as by the tadpoles occurring in it. A scoop strike here produced a mature pair of the killis. Evidently there is also a pure freshwater population of this species.

Now the question arises as to which species it is. The males look like *Aphanius fasciatus* from the Greek island of Corfu, as they are illustrated in the *Aqualog Old World Killis II*. However, the females are different – they have a differently patterned stripe when compared with the females of the Corfu population, as this population has interspersed points in the lateral stripe. Are we dealing with a subspecies on Kos? Without detailed examinations however, this cannot be clarified. It amazes me that the very industrious killifish scene has reported nothing up to now about the *Aphanius* population on this popular holiday island.



Two top photos: *Gambusia* found in a freshwater harbour



Freshwater harbour where the *Gambusia* (above) were found

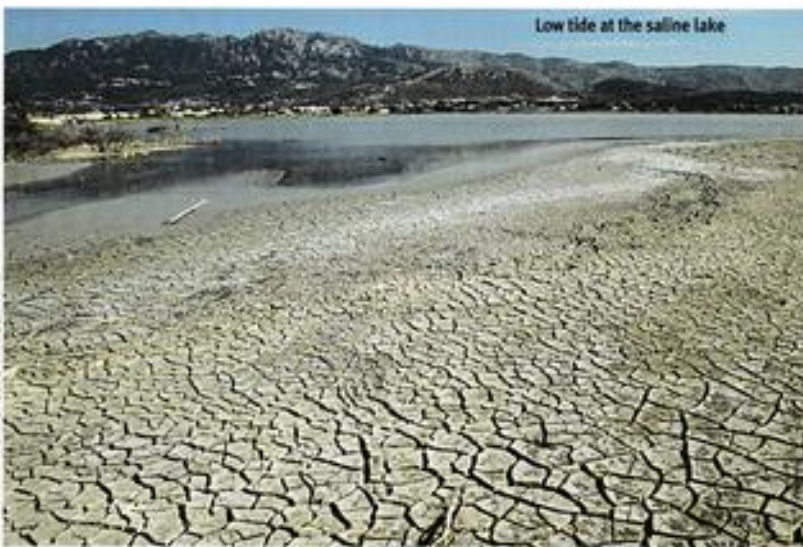
Reference:

Seegers, L. (1997): *Killifishes of the World, Old World Killis II*. A.C.S. Verlag, Mörfelden-Walldorf.

Underwater experiences

The snorkelling mentioned at the beginning of the article also happened – after all what else is an island surrounded by water for? Despite its noted lack of fish which is based on its lack of nutrients, the Aegean sea offers some fish that can be found in the western Mediterranean. This is due to the fact that immigrants from the Red Sea have passed into the

Mediterranean via the Suez Canal. Around Kos the two Rabbit fish species, *Siganus luridus* and *S. rivulatus*, could be observed everywhere. As it was the beginning of June the sea wasn't as warm as it would be later in the summer, and the visibility was too poor for photos. The sea was also quite rough and I kept postponing the underwater photography from day to day until it was too late. Apart from that, everybody can guess that I want to repeat my holiday to Kos soon. ■



Low tide at the saline lake

Welcome to Water Gardens UK

With the popularity of water gardening on the increase, Maidenhead Aquatics has responded by opening two new water garden stores



Maidenhead Aquatics is opening two new mega stores in Oxford and St Albans. They will stock everything you would normally expect to find in one of the existing shops but will have a much stronger water gardening emphasis and, because of this, will be rebranded under the title Water Gardens UK.

Maidenhead@Oxford

The Water Garden Centre in Oxford has 5,000 sq ft of indoor space and an impressive 10,000 sq ft area outside, which includes a natural stream that will be landscaped. A large proportion of the outdoor area has been devoted to impressive landscaped gardens with plenty of moving water included in the design. There are also large water feature displays and the largest selection of pond plants in the group. There are plenty of pond fish to choose from with 22 vats for species other than koi, and five large koi vats dedicated to Japanese fish sourced from the group's own closed farm. Inside there's 130 tropical and 26 coldwater tanks.

Maidenhead@St Albans

The Water Garden Centre in St Albans will be the largest store in the Maidenhead Aquatics group. It is often said that size doesn't matter, that may be true, but there is something impressive about the scale of a store that can boast a mile of shelving.

This store will have everything you could possibly need for your garden pond. There is a 20m preformed waterfall display, a 20m water feature display and a separate area to demonstrate fountain heads. A dark room will also display pond lighting systems, so you can get an idea of what your pond will look like at night. And, if you're looking for aquarium inspiration, there's a series of living spaces set out so you can sit down in a mock-up living room and see how your prospective tank will look at home before you buy it...

There will be a large tropical fish section with a huge selection of tanks, cabinets and essential equipment. There is also 300 ft of tank decor... And, with 400-plus aquariums, they will have room to stock just about everything. The plans include a 10ft display tank in which they hope to continue the stingray breeding success from the store at Maidenhead Aquatics @ Hillingdon.

The tanks will be divided into 11 systems catering for virtually all types of fish from marine, tropical freshwater and coldwater, including a softened water system for the more delicate tank bred soft water fish such



Just some of the tanks on display in the St Albans' shop



TOP: St Albans' impressive 300ft of tank decor

ABOVE: The front view of the St Albans shop. There will be a cafe in the front section shortly

as apistogramma, pelvicochromis and killifish, which are a particular passion of Andy Gabbott, who is running the store.

Unfortunately, the fish house is unlikely to be fully stocked before May, but the shop should be open from the weekend before Easter, with the official opening later in the year when the livestock is fully stocked.

Also...

The existing Maidenhead @ Weymouth, which opened last year will also be rebranded under the same title due to its predominant water gardening feel. It's also worth visiting two new shops at Derby and East Bridgeford just outside Nottingham as Maidenhead Aquatics increases its expansion in the north of the country. ■

The 11 different systems that will be running at The Water Garden Centre @ St Albans

- Marine fish
- Invertebrates
- Discus
- Fancy goldfish
- African cichlids
- Soft water system for catfish
- Livebearers
- Brackish water fish
- Rainbows and gouramis
- Tetras, barbs and rasboras
- Soft water system for more delicate species such as killifish

■ Visit www.fishkeeper.co.uk for more information on Maidenhead Aquatics stores nationwide



Good water movement is essential to keep your corals happy but do you know why? Andrew Caine explains all...

Tank turbulence

When you look at a reef you will find distinct areas of water flow ranging from high energy sites to low energy ones. Different species of corals inhabit different areas – some like high flow, some like low flow – but they all like flow of some description. So, I have to generalise here as I don't have room to be specific to each species.

There are many types of water flow – the one word we are looking for in the aquarium is 'turbulence'. This means good mixing and movement in all directions – that is what corals love. The reasons are many and I will explain a few.

The first is stimulation, 99% of corals depend on prey capture and organics in the water as a food source, since our corals do not move they depend on food being brought to them (much like myself when I get home, if the dinner is not provided by my good lady, then we will go to the pub sit down and food is brought to us!) But seriously, water flow brings planktonic animals and suspended and dissolved organics to the coral. This flow stimulates the coral to extend the polyps awaiting a meal, and that is the main reason for polyp extension. As the coral extends it alters the

flow of water around the animal and produces what is known as micro eddies – here the water moves in a circular motion around the coral polyps. Any food particles trapped in the eddies remains trapped in this flow until it is captured by the coral.

How the water behaves in the micro eddies is not what we humans perceive as water – to a small planktonic animal or algae, water is like ourselves swimming in a thick warm tar, it's all to do with size. This was worked out by an esteemed physicist, Dr Reynolds, who gave us the Reynolds Scale, now I won't go deeply into this, but take my word for it, a small planktonic beast is swimming in 'tar water' as we know it. So they are easily trapped in these eddies, which are so important for coral health.

Importance of eddies

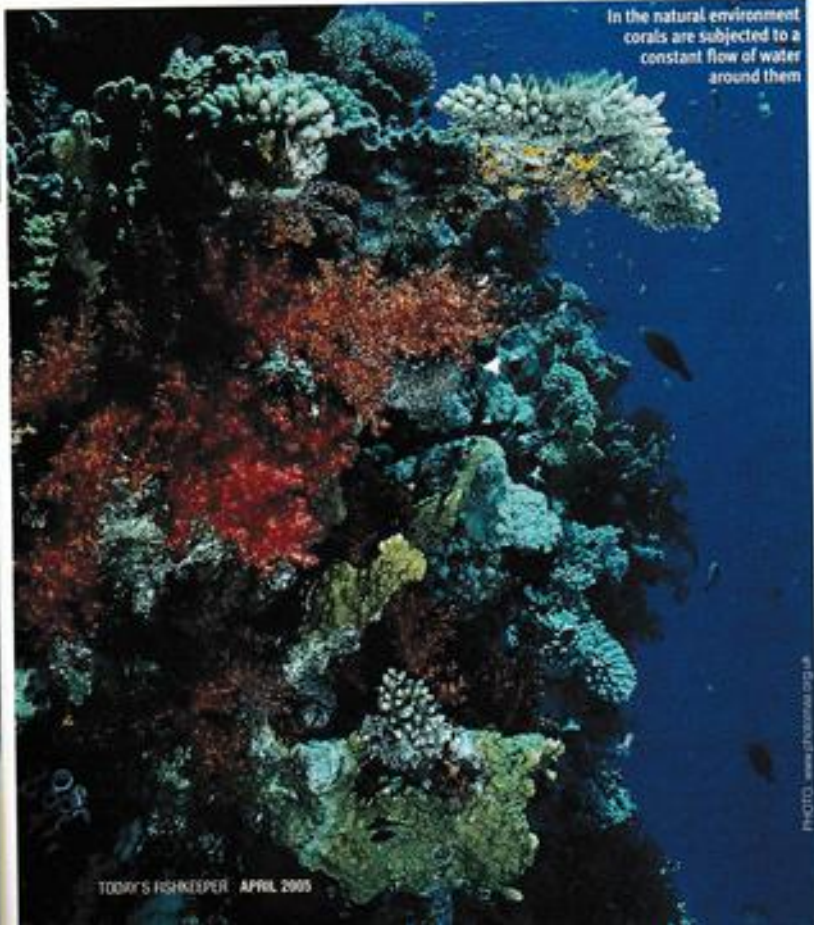
The result here is that if you do not have enough flow and turbulence the micro eddies lose their power or fail to develop, then the polyp extension is often low or the coral shuts down with no polyps visible. No polyp extension means a reduction in food, this then adds a sediment layer over the coral and it gets worse and worse.

Corals also produce a mucus layer, which can exist over the whole animal, and mucus is a good thing for many reasons. It provides a barrier against bacterial and viral invasion, it prevents larval animals settling on them and abrasion from sediment. You will have seen this mucus in action as when a coral gets stressed the production goes into overdrive and the excess mucus is shed into the water.

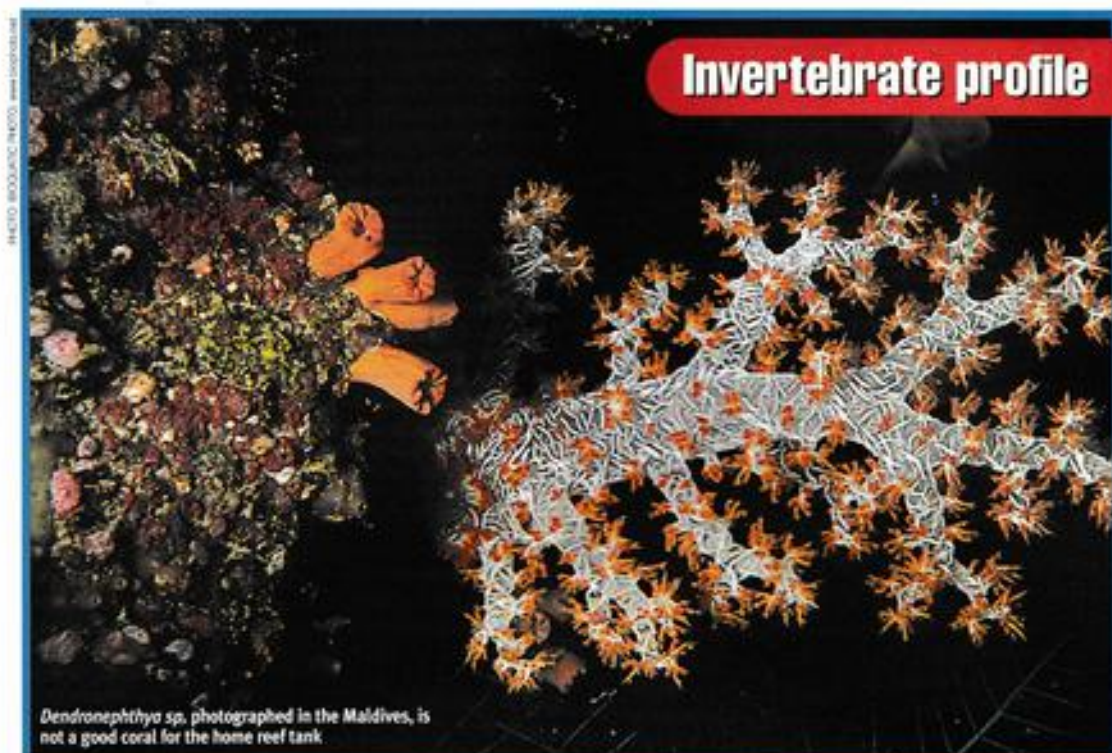
Water movement helps to shed this mucus layer and with it any bacteria or other nasties, thus cleaning the coral. Then the coral will produce fresh mucus to keep the layer intact. If water movement is low then this mucus layer remains on the coral and acts as a food source for the bacteria which multiply and eventually kill the coral, which is obviously not good news.

So there we have it, a whistle stop tour on why the correct water movement is required in your aquarium, next issue I will attempt to explain exactly different ways it can be created, oh happy days!

In the natural environment corals are subjected to a constant flow of water around them



Invertebrate profile



Dendronephthya sp. photographed in the Maldives, is not a good coral for the home reef tank

DENDRONEPHTHYA SP., CARNATION CORAL

When you see reef aquariums with the most colourful of the hard corals you go weak at the knees, yet only 20 years ago these were only a pipe dream for the most experienced. However, they are now a common sight in our hobby. The hard coral aquarium is the goal of most reefkeepers today as you cannot surpass its visual beauty.

The hard coral aquarium lacks something and that is quite simply movement. The small-polyped stony corals have fantastic colours but little movement – the swaying to and fro that we get with the less colourful soft corals is just not there. Enter our beast and what a beast it is. Think of the rainbow, and you have got an idea of the coloration displayed by this beast, yet it is a soft coral so it will move and sway, making it quite simply the best display ever.

So, we are in a situation where if I had an aquarium full of these beasts the small-polyped stony coral tank is nondescript in comparison. Imagine if you can colours in vivid shades, flowing in the currents with fish darting in and out of the reef... that is the goal and a goal it is, as currently we cannot keep these animals alive in the reef aquarium.

25 years ago the goal was *Acropora* now it is *Dendronephthya* – not just to keep them, but to cultivate them in captivity.

So why write about them? Well, they are an aquatic animal of such beauty that they should grace any page, but more importantly they arrive in their hundreds every year doomed to a slow death in captivity. Not only are they doomed but their visual beauty commands a high price – commonly £45 each. I see campaigns to stop GM fish and dyed fish for sale, with great publicity in all the aquatic press, but never for marine animals that we see in the trade but are commonly-known not to survive. The list includes many more species that are doomed if taken from the wild and I think it is about time it stopped and we let them live on the reef.

We should be working with conservation in mind, not just talking about it. There is a lot of good work being carried out by many in the cultivation of corals, sustainable hand-net fishing, and much more. People are all taking great strides to improve the image of this hobby yet sometimes this can be undermined by the collection and importation of animals unsuitable of the home aquarium.

ANIMALS WHICH SHOULD NOT BE IMPORTED

Fish

Sharks, large moray eels, some *Anthias* sp., large groupers and Jacks, Obligate corallivore butterfly fish and filefish, large wrasse, large surgeon and puffers. If they do not die of starvation or disease through stress, then they just get too big.

Corals

Our beast today and its close relations which caused me to vent my spleen (felt good though!), non-photosynthetic gorgonians, and sea fans which are gob smacking but die, any other non-photosynthetic coral.

Invertebrates

The list is quite endless, so please do your research as to what an animal requires. It really doesn't take long to look on the internet and just imagine how much money you would save with a little knowledge.

Fish profile

Antennarius commersoni, the Giant frogfish – ugly but fascinating!



PHOTO: www.profisha.org.uk

ANTENNARIUS COMMERSONI, THE GIANT FROGFISH

The great thing about this hobby is that what we can do is endless if we just think about it. Only a few years ago Mantis shrimps were the dread of the reef tank, now these beautiful beasts are being kept in species-only aquariums and bringing great joy to the hobbyist and indeed our hobby in a whole. More people can see them in the dealer's aquariums and appreciate the beauty of these beasts.

After nurturing a reef tank and realising it's fully stocked, people are thinking "What do I do now?". These reefkeepers are turning to small species-only set-ups which are relatively cheap to start up (as we are talking small volume in capacity) and a great extension to the hobby. Enter our fish...

I am in total admiration of this fish – its behaviour is amazing when it is fishing for food as the lure or 'esca' dangles in front of its enormous gaping mouth. A word of warning here – I have a cracker, it's only 6cm long, yet the other day I found a 14cm Clown tang, *Acanthurus*

lineatus whose head was inside the mouth of the frog fish! The tang did recover but this example shows that even very large fish are in danger from a small frogfish.

So what do they require? As always, excellent water conditions as they are susceptible to bacterial infections (have a bottle of Melafix on standby), and no stress please. A 500-litre tank is fine as they don't like to swim, and arrange some live rock so they can perch and blend in. Make sure the fish you buy is feeding as they can be difficult to get on to a frozen diet, then feed twice a week with krill or other large meaty foods. They have bred in captivity but watch out if you try to pair them as one may end up as a meal – the best way is to separate them with an egg create for six months then they will chemically and visually know each other and a spawning might just take place.

Go on have some fun, they are crackers and all you need is the space for a small tank.

PROFILE

Phylum:
Antennariidae

Name:
Antennarius commersoni

Location:
Indo-Pacific

Feeding:
Vitamin-enriched krill or lancefish

Size:
30cm

Reef:
Compatibility species-only tank

Tank mates:
None are truly safe unless really big

Difficulty:
Only for the experienced

Deep in the Red

Ever wondered where your marine fish come from? Steeped in history and mystique, the Red Sea is universally regarded as the showplace of the marine world. **Mark Taylor Hutchinson** takes a closer look at the many species of fish and coral

As far as a sea goes, the Red Sea is relatively small, with a modest length of 2,350km and maximum breadth of 350 km (off Ethiopia). But with a central depth of 3,040m the Red Sea contains a massive volume of water in comparison to other small seas.

Its origins began 20 million years ago when a split occurred along the central rift – a widening which still continues to this very day. Consequently, the Red Sea lies along a northern section, known famously as part of the Great Rift Valley. The Red Sea is, in effect, a 1,930km section of this huge depression.

Virtually closed in the north by the Strait of Suez and Gulf of Aqaba, to the relatively shallow opening to the Indian Ocean in the south via the Strait of Bab el Mandeb with maximum depth of 100m, what the Red Sea lacks in stature it certainly makes up for beneath the waves. Its dazzling displays of marine life attracting diving aficionados and snorkelers from every part of the globe.

A success story

The topography of the Red Sea in many ways contributes to its uniqueness. For instance, marine life is ultimately supported at the bottom of the food chain by the presence of nutrient salts, which facilitate planktonic growth via the process of photosynthesis, which in turn spiral up the feeding ethology of the food chain. The usual main sources for distributing nutrient salts are river outflows, which the Red Sea lacks. Another source of salt distribution is

via oceanic currents, but the Red Sea is virtually an enclosed system, with only the Straits of Bab el-Mandeb as an opening for the interchange of waters; the result is that through the course of evolution, 17% of the Red Sea fish species have remained endemic. So it would appear that the abundance of sunlight, clear water and warm temperatures down to considerable depths, facilitates planktonic growth like no other sea and that recycling of salts by comparison is highly efficient. Conversely, perhaps the absence of river outflows and oceanic currents has reduced the Red Sea's exposure to man-borne pollutants.

Surrounded by desert and experiencing little rainfall, the salinity content of the Red Sea is unusually high (approximately 40‰), but does tend to vary along the length of the Red Sea, being higher in the northern reaches and lower in the south towards the somewhat limited influence of the Indian Ocean.

But whatever it is that makes the Red Sea efficient at sustaining the conditions for growth, one cannot be anything but overawed at the abundance and myriad of technicolor fish on display, nor the variety of coelenterates on offer, including high numbers of both soft and hard corals. Perhaps not quite the same volume of species in terms of its parent, the Indian Ocean, nonetheless the Red Sea supports a wide variety of life in its own unique conditions. Sadly, being a somewhat unique closed ecosystem does have some disadvantage in that the fragility in some respects is ever more susceptible to over-exploitation by Man.

The lion's den – Scaefin anthias and lionfish survey the hard coral formation



MARINE LIFE HIGHLIGHTS

Masked butterflyfish
(*Chaetodon semilarvatus*)



Giant moray (*Gymnothorax javanicus*)



Scalefin anthias (*Pseudanthias squamipinnis*)

Common on all fringing and reefs. Although males maintain harems, usually males and females stay in separate groups.

Masked butterflyfish (*Chaetodon semilarvatus*)

Found in the Red Sea and Gulf of Aden, usually found in pairs under overhangs and for butterflyfish fairly photogenic. Arguably one of the most elegant of the butterflyfish family.

Lionfish (*Pterois miles*)

Although cautious by day, a fairly common species around reef coverage. Often to be seen stalking smaller fish, such as the translucent glassfish.

Bluespotted stingray (*Taeniura lymma*)

Considered very common, particularly in shallows up to the first shelf. Can be seen on wall dives frequenting sandy patches. A very distinct blue spotted coloration, which gives the appearance of paint spots over the dorsal side.

Giant moray (*Gymnothorax javanicus*)

The largest and most commonly seen of the morays. Various reports abound of specimens up to 300cm. Found in coral, debris or wreck sites, by day morays do very little. Although considered dangerous (the sharp inward pointing teeth serving as one reminder), most incidents are human caused usually via extreme provocation to the moray.

Two-bar anemonefish (*Amphiprion bicinctus*)

Endemic to the Red Sea, and probably the most photographed fish specimen in the region, the Two-bar Anemonefish is strongly associated with its anemone in a close symbiotic relationship. Anemone City at the famous Ras Mohammed wall is a good site to see concentrations of Anemonefish.

All coral reefs of the world have been affected to varying degrees by the El-Nino phenomena, but the Red Sea has fared better than most, which scientists have attributed to the Red Sea's unique changing water temperatures from summer to winter, which offers some rudimentary counter to the general global rise in water temperature which has caused so much of the hard coral bleaching.

Beneath the waves

It would be sacrilege to come to the Red Sea without a mask and snorkel, but to get a full appreciation of what lies beneath then diving is a must. The Red Sea, for diving purposes, is virtually split into three locations. At the top end, funnily enough some of the deepest waters, is an area collectively known as the Northern Red Sea, this then leads to the middle/southern reaches and finally what has been termed the 'Deep South', which is adjacent to the Sudanese coast and beyond. The middle reaches and Deep South are usually served by liveaboards, where basically people remain on the boat for the duration of the trip. The Northern reaches involve a mixture of shore-diving and day boats and in some

cases liveaboards too. This latter area is where people usually learn to dive in the first instance before venturing further afield.

One could be forgiven for thinking the Northern parts are the poor cousin to the South, but with world renowned sites such as Ras Mohammed and the various seamounts which make up the Straits of Tiran on the Egyptian side, these sites are far from poor and offer superlative diving opportunities to see the Red Sea at its very best.

Native population

In terms of endemic species, the Two-bar anemonefish (*Amphiprion bicinctus*) has to be one of the most photographed species in the whole of the Red Sea and there is rarely a dive site where this species cannot be spotted. Although there are some eight species of angelfish. One of the most difficult to approach is without doubt the Arabian angelfish (*Aruetta asfur*) with its distinctive yellow bar running vertically down its body, not to be confused with the Yellowbar angelfish (*Pomacanthus maculosus*), which by contrast is less conspicuous.

Most of the life tends to be concentrated in the reef areas, but with various types of reef to choose from, what species can be

expected will depend on the type of reef visited. At the fringing reef and reef face is perhaps the best area to observe the greatest concentration of fish species. The Anthias, which have almost become synonymous with the Red Sea, particularly the Scalefin anthias (*Pseudanthias squamipinnis*) are a common sight huddled around the coral growths, with their day-glo orange lighting up the reef, as are the damselfishes, small groupers, butterflyfishes, angelfishes, porcupinefishes, squirrelfishes, sweepers and cardinalfishes. The Broomtail wrasse and varying technicolor parrotfish can be observed amongst the plethora of small fish on or at the fringing reef. Of course certain sites tend to become noted for certain encounters. For instance, diving the tank wreck in Jordan, is an ideal site in which to observe lionfish (*Pterois miles*) stalking the translucent glassfish (*Parapriacanthus ransonneti*).

Walls of life

Heading for the wall reefs, such as those in the Straits of Tiran and Ras Mohammed, are phenomenal sites from a diving perspective. Here desert cliffs, particularly in the case of Ras Mohammed, shelve vertically into deep



As the sun sets, the true nature of how the Red Sea probably acquired its name becomes all too apparent

blue oblivion. In the upper reaches, the usual suspects abound, but as the open sea sweeps over the reef wall, such sites are ideal locations to observe sweeping gorgonians, which at sites like Ras Mohammed and Abu Ramada Plateau near Murghoda reach mammoth proportions in both size and quantity. Carefully watching amongst the fronds may lead to a lucky encounter with the predatory longnose hawkfish (*Oxyurhites typus*), another photogenic specimen. Here the corals benefit from the sweeping currents bringing nutrients, hence the prolific concentration of soft corals. Not surprisingly with direct access to the open sea, larger pelagic species visit the reef, such as the snappers, chub, emperors, tuna, jacks and barracuda, which in turn, certainly at certain times of year, bring in the super apex predators, the sharks.

Wall diving is not for beginners, but for accomplished divers, the prospect of encountering two distinct environments at the same time makes for exciting diving. With a shoulder to the wall, it's always worth glancing into the blue, as you never know what may swim by. During the plankton blooms, mantas and whale sharks do show up from time-to-time. But I've yet to visit Shark Wall at Ras Mohammed and not see massive schools of Midnight snapper congregating in the blue, nor witness fleeting schools of Blackfin barracuda (*Sphyraena geniv*) disappear into the murk.

Wrecks as ecosystems

Another ecosystem, not necessarily unique to the Red Sea by any means, but certainly unique in the life attracted, is the wreck diving. Wrecks of course provide ideal artificial reefs often in areas with little or no other surrounding cover. Many of the Red Sea wrecks also have the added dimension of historical significance. The now world famous British warship the *Thistlegorm* is a mecca for divers, as is her sister ship, the

Rosalie Muller, which lies slightly deeper, both sunk during World War 2. When diving these wrecks, along with the cargo, expect to see interesting biodiversity. There is something uncanny about observing a Clearfin lionfish (*Pterois rodolata*) gliding over cartons of orange juice with a sell by date of 1942, or witnessing a nudibranch sliding over a Wellington boot. Glassfish often frequent the hold and mast areas, which in turn attract the attention of sweeping jacks. Morays, including the Giant moray (*Gymnothorax javanicus*), also frequent the wreck vicinities. Not only does the twisted hulk provide cover for the muscular eels, but also serves as ideal hunting ground for night time missions.

Oasis of life

The final type of reef to consider are the large coral formations rising from the sea mounts in the middle reaches of the Red Sea. World-renowned sites such as the Brothers (Big and Little Brother), Rocky Island and Daedalus are again not for the inexperienced diver, but people dive here to observe the greater concentrations of pelagics and reefs replenished by the open sea. Off the southern tip of Big Brother for instance, where the ridge connects to Little Brother Island, it is possible to observe Big-eye thresher sharks (*Alopias vulpinus*) at fairly close quarters, normally a shy retiring species.

Scarlet realm

One of the final questions often asked is why the name the Red Sea? A number of explanations have been offered, but relatively few substantiated. One explanation is the concentration of algae blooms, which as a result leaves a floating red/brown scum, which can often stretch for miles, which could account for the name,

Take the plunge!

If you would like to swim with marine fish in their natural habitat, learning to dive in the Red Sea couldn't be easier. To find a suitable operator consult the diving press. The following organisations are Red Sea diving specialists:

- Longwood Holidays Tel: 020 8551 4494 Website: www.longwoodholidays.co.uk
- Emperor Divers Tel: 07005 946 937 Website: www.emperordivers.com
- Onas Divers Tel: 01323 648924 Website: www.onasdivers.com



A school of Midnight snapper congregates just off the wall at Ras Mohammed

but this is by no means a regular occurrence. Another explanation is the preponderance of Scaefin anthias along the reef fringes in conjunction with the scarlet shades of certain sponges in the same vicinity, which offers red contrast against the azure blue and ochre desert. Finally and perhaps the most plausible reason is the bright orbiting sun setting over the Sinai mountains, enhanced by airborne reddish dust, which casts a warming red shade over the whole landscape and adds to the areas overall mystique and charm both above and below the waves. ■

THE AUTHOR

Mark Taylor Hutchinson has been diving in excess of 30 years. He writes regularly for a number of diving and travel publications. His particular speciality is shark photography, but he is also an accomplished landscape photographer. Some of Mark's images have featured at various locations worldwide. He describes his first tropical freshwater aquarium as the inspiration in which he became captivated with the underwater world. "I couldn't believe that a tank containing Neon tetras and guppies could inspire so much!" See Mark's work at: www.deepfinart.com

Brief encounters



John Dawes reports on the early effects of the tsunami on ornamental fish supplies and Australia's battle with exotic invasive plant species

Some seven weeks have now elapsed (as I write these lines) since the horrific tsunami catastrophe that hit southeast Asia on 26 December, 2004. Even now, as we continue to attempt to come to terms with the enormity of the disaster and its devastating toll of human lives, it is extremely difficult to obtain any detailed, up-to-the-minute news regarding its effects on the ornamental aquatic industries of the countries that were most affected by the tidal waves and, hence, supplies of ornamental fishes from these countries.

Obtaining reports from Indonesia, in particular – the worst-hit country with a death toll of well over 100,000 – is proving exceptionally difficult, with most emails remaining unanswered. In general terms, though, it appears that exporters based in the island of Java around the Jakarta and Surabaya regions are relatively unaffected, especially those who deal exclusively or predominantly with freshwater species.

At least some marine exporters who receive stocks from the Sumatra region, however, have been badly affected, while other Sumatran suppliers (probably those along the south-western and eastern coasts of the island) are still able to operate effectively. It will be sometime, though, before a fuller picture emerges from this region.

In Sri Lanka, the second-worst-hit country with a death toll rising towards 30,000, the freshwater industry sector is pretty much unaffected. However, the marine sector, especially along the southern and eastern coasts, has suffered badly.

Damage assessment

One of Sri Lanka's leading exporters, Vibhu Perera of Lumbini Aquaria Wayamba Ltd., has been working ceaselessly since the disaster, trying to assess the overall damage. In the course of his early enquiries, he visited no fewer than 18 suppliers of ornamental marine fish in the worst affected areas.

Altogether, these suppliers employ around 300 divers. Yet, despite this large number, loss of life has – almost

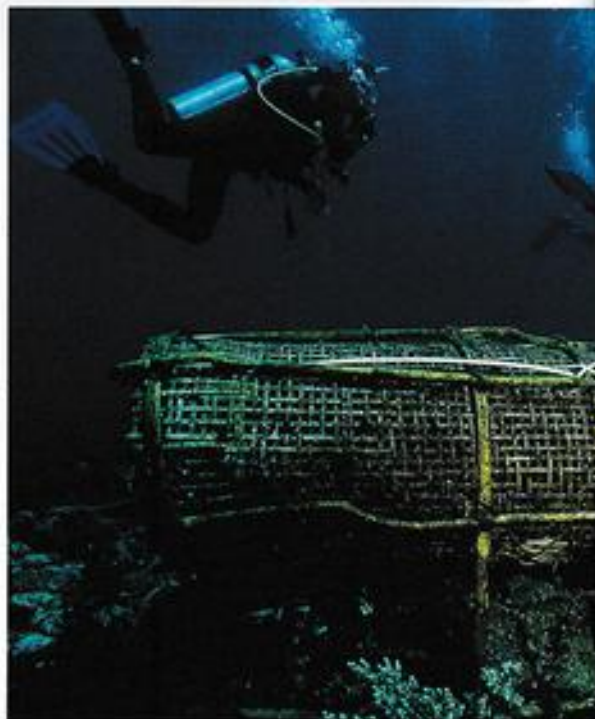
inexplicably – been low, with the death of five people (three adults and two children) confirmed. Loss of property and equipment has been extensive, with buildings (homes, holding and packing huts, etc.), boats, boat engines, diving cylinders, aquaria, compressors and a whole host of other collecting/holding-associated equipment washed away or damaged beyond recovery.

The news from India is very sparse. All that I've been able to gather at the moment is that fishermen and their families who lived and worked close to the sea were caught (as almost everyone) totally unprepared and that "they were swept (away) by the severe tidal waves". The news from Malaysia is also minimal at this stage, but the bulk of its ornamental aquatic industry appears to be unaffected. The Maldives was flooded out completely and, although – as I write – I have no official news of its marine suppliers, the indications are that they will have suffered badly...but I'm only speculating.

In Thailand, the industry is, reportedly, in full operation because it is exclusively freshwater-based (the export of marines from the country is currently illegal). However, early reports indicate that about 30% of the shallow-water reefs has been damaged, along with about 5% of their deep-water counterparts. If – as seems likely – similar damage has been experienced in other countries in the region, collection of marines for aquaria will be likely to be affected for a considerable time, even after collecting equipment and facilities have been restored to full operating capacity.

ASSESSMENT REPORTS

Although details relating to the ornamental aquatic industry are currently very difficult to obtain, those relating to fisheries in general (the vast majority being represented by the food fish sector) are more widely available. The Food and Agriculture Organisation (FAO) has produced an assessment report for each of the countries in the affected region and this can be accessed at: www.fao.org and www.reliefweb.int.



Australia's 'Green Tide'

Australia, as ever, continues to be in the news in connection with exotic invasive species. According to Dr Tony Grice of the Co-operative Research Centre (CRC) for Australian Weed Management, the country is "...fighting against a green tide of invaders."

It is estimated that over 28,000 exotic species of plants have been introduced into Australia over the past 200 years. Although some introductions may have occurred accidentally, most exotics were intentionally introduced for a variety of purposes. Some were used as pasture for cattle, while others were destined for human consumption or for use as ornamental plants.

About 300 introduced plant species are known to have become established in Australia between 1971 and 1995 and, of these, three quarters are ornamentals. This is of particular significance to the ornamental aquatic industry and hobby because it includes some well-known species, such as the floating fern, *Salvinia*, the ubiquitous water hyacinth (*Eichhornia crassipes*) and the alligator weed (*Alternanthera philoxeroides*) which grows

Below: A bamboo weave fish trap set in the Banda Sea, Nusa Tenggara, Indonesia



Above: 'Crispa' - seen here growing among hornwort (*Ceratophyllum demersum*) - chokes watercourses 'from below'

in moist ground, from where it spreads, via rhizomes, as a thick floating mat over the water surface.

Choking waterways

All three species can cloak the water surface with their dense growths to the extent that they prevent light from reaching submerged aquatic vegetation which, subsequently, dies. In addition, floods can dislodge individual plants or clumps and transport them elsewhere, thus spreading these prolific species to new locations.

A fourth invasive species that is feared in Australia is a popular aquarium and pond plant in many countries: the submerged oxygenating plant often sold as 'crispa', i.e. *Loganisophon major*. This plant does not form floating mats, but nonetheless chokes waterways 'from below' owing to its vigorous growth and the ease with which it can spread (even the tiniest fragments will produce new plants). When fully grown, stems can attain a length of well over 1m.

Loganisophon major is a serious pest in New Zealand and is naturalised in several European countries, including England, the Channel Islands, northern France and Italy. At the moment, there are no major established infestations in Australia, but minor ones have been reported, raising serious concern in official circles.

Control of aquatic weeds is, of course, very difficult and expensive, while eradication is virtually, or actually, impossible.

According to Dr Grice, "Many weeds have become so well established...that the best we can hope for is containment. For most, eradication is

probably impossible." Prevention and education are also, apparently, high on the agenda. *Loganisophon major*, for example, was the "Weed of the Month" on the CRC website (www.weeds.crc.org.au) in February 2005 and is included in the list of plants whose import and sale are now prohibited in Australia.

Awareness needed

Dr Grice further believes that, "The aquarium industry...needs to be more aware of the environmental risks posed by the plants that still circulate in the trade and amongst fish fanciers. It could play a greater role, for instance, in educating their customers not to empty their fish tanks into lakes and streams."

Taking up this last point, it is worth highlighting the fact that the ornamental aquatic industry does, indeed, take the matter, both of invasives and exotics, very seriously indeed. In fact, both the UK's Ornamental Aquatic Trade Association (OATA - www.ornamentalfish.org) and Ornamental Fish International (OFI - www.ornamental-fish-int.org) have their own awareness-raising programmes. In OATA's case, it includes special posters,

such as: 'Keep Your Pond Plants in Your Garden' and 'Pet Fish Belong...'; while in OFI's case, items dealing with these subjects are regularly posted on the organisation's website and backed up by frequent up-to-the-minute reports and advice circulated internally to all its members. The whole field of exotics and invasives is therefore a 'hot potato' which the industry is getting to grips with on an ever-more-vigorous basis. So...Dr Grice's hopes may not be as forlorn as he may perhaps think they are. ■

It is estimated, for example, that Australian weed control programmes cost the authorities more than four billion Australian dollars per year

CATFISH: BREEDING ANCISTOMUS SP.



Close up of a male and his cheek odontodes



One-day-old fry



Three-day-old fry



Four-day-old fry



Five-day-old fry

TODAY'S FISKEEPER APRIL 2005

In spring last year I bought some L147 *Ancistomus* sp. from a friend that imported them as L124 from Colombia. When the 8-cm fish arrived he was disappointed because they weren't what he expected and they didn't look as pretty either. As I grew them, they became more and more beautiful and changed in colour to become rusty orange brown with large black dots covering the body, with small dots on the head – now they really look like L147 should.

There have been many discussions about what genus (and indeed sub-family) this group of plecos should belong to. Jon Armbruster described *Peckoltia sobajii* (including L301, L75 and L124), so the genus *Peckoltia* should logically also be the home for L147. However, I am not an expert on ichthyology so I leave this to the ones who know better!

All I can say is, "I just breed them" and they don't look like 'classic' *Peckoltia*. With this distinction to hand I can safely say they don't act as a *Peckoltia* and they grow bigger than *Peckoltia* species. They are often mixed and exported together with Clown plecos (*Panaque maccus*) by mistake and I think they can have the same origin as them; namely the border region between Colombia and Venezuela in the Orinoco basin and llanos. For more information see www.planetcatfish.com/cotm/2004_05.php in the Catfish of the Month section of Planet Catfish.

Preparing the pair

I placed a pair in a 200-litre tank with a good water current and what I thought were some appropriately-sized caves. The size of that initial pair was 15cm for the male and the female was 11cm standard length (SL) and at this size the male displays fairly heavy odontodes (appendages that look like bristles) on his cheeks and along the first pectoral fin.

To condition the pair and allow the female to ripen her eggs it's important to give them good food with some proteins daily. They are omnivores so are not picky with food but, if you're serious about attempts to breed them, then care and attention to diet is essential. Good foods for them are a varied diet of green tablets

Breeding

Janne Ekström talks us through breeding her L147 catfish. It seems to be a popular choice for customers if the conditions

and frozen foods (black mosquito larvae, small shrimps and pieces of mussel). I just feed them once a day in the evening and it's better to give them a little more than you expect they will consume. If there is food left in the morning then you have been giving too much. Many people underestimate the amount loricariids need to eat to be healthy and to grow and breed as they should.

Water quality of course needs to be good but the water parameters in terms of pH or conductivity are of lesser importance for many of this species in this catfish group. Sure, there are exceptions in some genera, but nearly all species I have breed have done so in my ordinary tap water that has a pH of 7.5 and 300 µS in conductivity. L147 was not an exception.

Worth the wait

After several weeks of conditioning the female started to look gravid and show some interest in the male. One evening when I was in my fish room there was activity in the L147 tank; the male was trying to get the female into his cave but in a very gentle and caring fashion – this was not at all like my experiences with *Peckoltia* species in the past. Although he tried to follow her it appeared that the cave was too small and that both could not enter and have enough room to spawn. Eventually, I interrupted them to put a new, slightly bigger, cave into the tank beside the old one. I hoped they would choose that instead but I disturbed them and they called a halt to the breeding attempt.

It's always the female that seeks out the male when she feels ready for spawning and, if she finds a healthy male with a suitable cave, they will spawn sooner or later. I have yet to witness a male in any loricariid species trying to find a female or hunt her into his place – so it's important that males have caves that the females can accept for breeding. If there are two males in the tank of the same size they will fight over the best cave for breeding, sometimes they can hurt each other quite badly, but usually the most dominant male wins before the other male gets too damaged or wounded. When it comes to this species

g L147

through the breeding of
as they're easy
ions are right

and relatives it's always best to put just a pair together.

Spawning

It took almost a further fortnight before they started to show new interest in breeding and they started the procedure once again. I was surprised to notice they chose the old, smaller, cave over the new one; so if I hadn't interrupted them in the first place they may have spawned the first time.

This time they didn't take as long and they spawned side by side in a backside position. The female deposited all the eggs at once and the male fertilised them directly using his ventral fins to spread his milt over the batch of eggs. Immediately after all eggs were laid the male left the cave to let the female out – he didn't chase her away like males do in other species, e.g. *Hypancistrus*.

L147 produce between 70-100 eggs per spawn and the male guards them very carefully. He doesn't leave the cave at all during this time between spawning and until the fry have consumed the yolk sac. They hatch at between five and six days, depending on the temperature, and they have a yolk sac that sustains them for further eight days before they are free-swimming and need to be fed.

The fry are small upon fully-consuming their yolk sacs and are just below 15mm total length (TL). At this point, as with most fry, they are sensitive to nitrates and

they need to be fed with the smallest food possible. The first food that worked best for me is squash. I prepare this by cutting it into small pieces and removing the seeds and then I boil it for one or two minutes before freezing it in plastic bags.

After two or three days I complement this diet with micro food for fry and with this they are fed through the first week. Once they start to eat this they grow quite fast and after a month they will reach 20mm total length (TL).

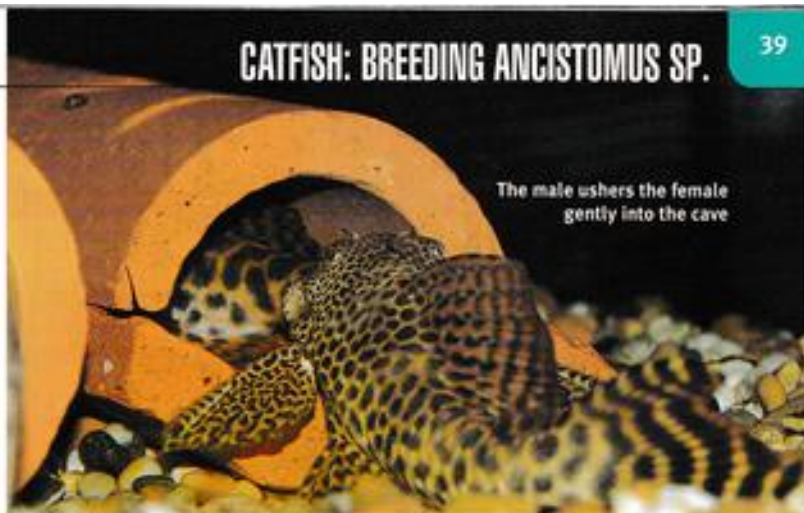
The fry grow fast and reach 35-40mm TL in four months and should be ready for sale in six months. At that point they should have reached between 50-60mm TL if you just keep the water quality high with frequent water changes and feed them twice a day.

Caring for L147

This is an easy and harmless catfish for every tank as they tolerate a wide range of water parameters and can be kept with success in a pH range of 6-8 and a dGH up to 15 and a temperature of 25-28°C. They don't require any really strong currents, don't eat any plants but will eat almost everything you offer (the main diet should be vegetable) and they don't even touch the smallest fish so they can be kept in every kind of community tank. L147 is almost as easy to breed as the common *Ancistrus* – if aquarists just take notice of how beautiful a species these are then I'm sure they will become widely spread. ■

Tank set-up for breeding

The size of my L147 breeding tanks are 100 x 50 x 40cm. The sole current comes from a powerhead that pumps 1200 L/h. The powerhead is placed on one side with the outlet near the surface and the inlet near the bottom, the current hits the other side and in that way you force the current to be near the bottom of the tank when it returns to the pump. Place the cave at a point close to where the current turns back – if you do this you will have a slight current facing the entrance to the cave. The size of the cave is important for most species and the one they used here was 20cm deep with the entrance measuring 5cm wide and 4cm high. Of course if your fish differ in size then this has to be taken into consideration. When my pair spawn the following water parameters measured were more or less equal every time, pH 7.3 conductivity 290 µS, temperature 28.6°C. Good luck!



The male ushers the female gently into the cave

If you boil the squash first it will sink when you put it into the water

Six-day-old fry



20-day-old fry



Four-month-old youngster



ALL PHOTOS: JAWA EDITION

Once the fish have spawned once, there'll be no stopping them!



APRIL 2005 TODAY'S FISHKEEPER

Friday
 Maresfield A.S. meeting. Contact 0111 910 1414
 South East Marine Aquarist Society. Contact 01273 20542
 Yorkshire Cichlid Group meeting. Contact 01924 307086

Sat 2nd
 Carr Urie A.S. Auction. The Charles Young Centre, South Shields. Contact: Bredie Kerrigan 0191 422 3919

Mon 4th
 Kirkcaldy A.S. meeting. Contact John Reid on 01738 634689 or jo.reid@nhs.uk after 6pm or email: jo.reid@nhs.uk
 Selway A.S. meeting. Contact 01387 750606
 St Helens A.S. meeting. Contact 01924 671463
 Ayrshire Fishkeepers Association meeting.
 Contact 01294 605272
 Redgate & Redhill A.S. Contact 01293 381812
 Mersydale Aquarist Society meeting. Contact 0151 260 3664
 Warrington A.S. Contact 01925 483979
 Southend Leigh & D.A.S. Contact 01702 395740
 York & District A.S. meeting. Contact 01904 442772
 hebrews@northteesnet.co.uk
 The Irish Tropical Fish Society meeting. Contact on 4561836
 Halton A.S. meeting. Contact 01931 286830
 North Bucks A.S. meeting. Contact 01928 377333
 Preston A.S. meeting. Contact 01772 321743
 Lang Toun Aquarists & Pondkeepers Group meeting.
 Contact 01592 595825
 Wyle A.S. meeting. Contact 01482 445543
 Carrby & D.A.S. meeting. Contact 01536 790932
 Ryedale A.S. meeting. Contact 01751 422715
 Dutch Fish Club (Sunderland) meeting. Contact 0191 3841433
 Perth A.S. meeting. Contact on 738 621704 or 01506 510538
 Clarton Fish Keeping Club meeting. Contact 01255 428665
 Portsmouth A.S. meeting. Contact 01673 885352
 Barchwell A.S. meeting. Contact 0189 732874
 Tameside A.S. meeting. Contact 0681 339 6973
 Plymouth & District Aquarists & Pondkeepers Society
 meeting. Contact 0795 6421510
 Thurs 7th
 Fatchly A.S. meeting. Contact 01738 646291 or 07774 188907
 Kings Lynn Fish Club meeting. Contact 01553 799522 or 01553 761743
 Isle of Wight meeting. Contact 01933 721246
 Fri 8th
 Dickens Ireland meeting. Contact 064 318593
 Sat 9th
 Greater Manchester Cichlid Society Auction. Littleborough Conservative Club. Contact Alan Waterfield 01206 849335
 Kirkcaldy A.S. meeting. Contact John Reid on 01738 634689 or jo.reid@nhs.uk after 6pm or email: jo.reid@nhs.uk
 Bristol Aquarist Society (Goddish) Meeting.
 Contact 01792 207467

Greenley & Cleethorpe meeting. Contact 01473 349718
 Port Talbot & District A.S. Meeting. Contact 06199 770736
 St Helens AS meeting. Contact 01924 671463
 Oldby AS meeting. Contact 01274 531418
 Robin Hood AS meeting. Contact: robinhood@robinhoodsociety.co.uk
 Derby & District Aquarists meeting. Contact 01332 773416
 Thurs 13th
 Darwin A.S. meeting. Contact 01254 709795
 Northwich A.S. meeting. Contact 01666 882966
 Carr Urie A.S. Meeting. Contact Bode Kerrigan 0191 422 3919
 Telford & D.A.S. meeting. Contact 01922 409721 or 01922 664410
 Lang Toun Aquarists and Pondkeepers Group meeting.
 Contact 01592 595825
 Northern Goldfish and Pondkeepers meeting.
 Contact 0161 9697967
 Greenock D.A.S. Meeting. Contact 01475 719219
 Bangor Aquarists & Breeders Society. Contact 028 9087 3539
 Clyde Aquarist Society meeting.
 Contact: john@claydonsociety.co.uk
 Hull A.S. meeting. Contact 01964 562387
 Stroud & D.A.S. meeting. Contact 01634 22191
 Aberdeen A.S. meeting. Contact: abdn@abdnfishersociety.co.uk
 Leeds A.S. meeting. Contact 0113 2639 438 or 0113 2961 098
 Hounslow D.A.S. meeting. Contact 020 8890 6933 or visit
 http://fryweb@scall.co.uk/hounslowfish
 Lathlogun Aquarist Society meeting. Contact 01506 520558
 Halifax A.S. meeting. Contact 01274 880471
 Bradford A.S. meeting. Contact 01274 663542 or 0113 237 270
 Doncaster & D. A. S. meeting. Contact 01924 795564
 Harrogate & D.A.C. meeting. Contact 01975 64064
 Plymouth & District Aquarists & Pondkeepers Society
 meeting. Contact 0795 6421510
 Thurs 14th
 Glenrothes meeting. Contact D. Smart, 4 Lorchy Ave.,
 Kinrossie, Fife
 Mid-Sussex A.S. meeting. Contact 01273 602407
 Bristol Tropical Fish Club meeting. Contact 0117 973 2145
 Fatchly A.S. (Perth AS) meeting. Contact 01738 562881
 Sandgraves A.S. Contact 01704 541177
 Eastbourne & District Pondkeeping. Contact 01323 7731369
 West Cornwall Fishkeepers meeting. Contact 01209 644518
 Sat 16th
 Robin Hood Aquarists Open Show. Highpark Community Centre, Huddersham. Contact Clive Heaton 0152 951 1615
 Preston & District A.S. Auction. Leyland Motor Social Club. Starts 12pm. Contact Steve Evers 01772 121743
 Cardiff Society. Talk on pinks. Contact Ian Fuller 01976 814287
 Mon 18th
 North East Yorkshire Kill Group meeting. Contact 01653 618971
 Kirkcaldy A.S. meeting. Contact 01738 634689 or 01592 205465
 Norwich A.S. meeting. Contact 01603 416559
 Solway A.S. meeting. Contact 0187 750606

Mersydale A.S. meeting. Contact 0151 260 3664
 Ayrshire Fishkeepers Assoc meeting. Contact 01294 605272
 Oldham A.S. meeting. Contact 0161 652 6207
 Midlands Marine Aquarists Society. Contact 0121 349 4469
 Castlefield Auction. Contact 01927 710754
 Lang Toun Aquarists and Pondkeepers Group meeting.
 Contact 01592 595825
 Wyle A.S. meeting. Contact 01482 445543
 South Park Aquatic Study Society. Contact Eric 0208 6795880
 West Yorkshire Marine Aquarist Group meeting.
 Contact 01924 420101
 Clarton Fish Keeping Club meeting. Contact 01255 428666
 Tyngham Aquarists Society meeting. Contact 01252 25686
 Portsmouth A.S. meeting. Contact Gill Utting, 9 Innesness Rd.,
 Gosport, Hampshire
 Perth A.S. meeting. Contact on 738 621704 or 01506 510538
 Barchwell A.S. meeting. Contact 0189 732874
 Worthington A.S. meeting. Contact 01900 67915
 Bristol Tropical Fish Club meeting. Contact 0117 973 2145
 Thurs 21st
 Fatchly A.S. (Perth AS) meeting. Contact 01738 562881
 Sandgraves A.S. Contact 01704 541177
 Eastbourne & District Pondkeeping. Contact 01323 7731369
 West Cornwall Fishkeepers meeting. Contact 01209 644518
 Sat 23rd
 Sun 24th
 Kirkcaldy A.S. meeting. Contact John Reid on 01738 634689 or jo.reid@nhs.uk after 6pm
 Port Talbot & District A.S. Meeting. Contact 01619 770736
 Carr Urie A.S. Meeting. Contact Bode Kerrigan 0191 422 3919
 Greater Manchester Cichlid Society meeting.
 Contact 01706 625975 or 01706 849335
 Northwich A.S. meeting. Contact 01666 882966
 Lang Toun Aquarists and Pondkeepers Group meeting.
 Contact 01592 595825
 Greenock D.A.S. meeting. Contact 01475 719219
 Croxson Aquarist Society meeting. Contact 020 8654 0984
 Stroud & D.A.S. meeting. Contact 01634 22191
 Hounslow D.A.S. meeting. Contact 020 8890 6933 or visit
 http://fryweb@scall.co.uk/hounslowfish
 Halifax A.S. meeting. Contact 01274 880471
 Worthington A.S. Contact 01900 67915
 Tameside A.S. Contact 0161 339 6973
 Glenrothes meeting. Contact D. Smart, 4 Lorchy Ave.,
 Kinrossie, Fife
 Thurs 28th
 Bristol Tropical Fish Club meeting. Contact 0117 973 2145
 Fatchly A.S. (Perth AS) meeting. Contact 01738 562881
 Sandgraves A.S. Contact 01704 541177
 Castleford A.S. meeting. Contact 01977 710754
 Fri 29th

Copy for Today's Dairy Dates should be sent to Today's Fishkeeper, 6-7 The Rickyard, Clifton
 01224 714633 or e-mail editor@today's-fishkeeper.com. Copy deadline for May issue April 6.

All the latest news from aquarist clubs around the country

Hard work gets rewards

An annual perpetual trophy-with-a-difference will make its debut at the Festival of Fishkeeping this year.

The Organiser's Award has been raised to reward, and recognise sustained effort in producing, maintaining and exhibiting quality fish. It will be awarded via a simple system of cumulative 'Place Points' and, correspondingly, competitors for this trophy might well be regarded as the Grand Prix drivers of the fish world.

Here's how it will work:

All residential competitors in the FBAS Supreme Championship and the British Open Fish Championship competitions will be eligible.

Place Points will be awarded in the usual proportional manner, i.e. first place gets 6 points, 6th place gets 1 point.

At the conclusion of the two competitions, all place points will be totalled with the owner of the highest total winning the award. In the event of a tie, the trophy will be shared. You can see that a good sustained effort over the current show season running up to the festival will give a



determined exhibitor a good number of qualifying entries into these two prestigious competitions (FBAS Championship Class Trophy winners and Best in Show winners respectively).

Under certain circumstances, it would be quite possible to carry off the Organiser's Award without actually taking a first place!

Producing regular prize-winning fishes relies on a lot of hard work over many months and years. Whilst it may be easy to simply flood the Showbench with entries (some of which may be of dubious quality), in order to finish in the 'Top 6' of two such

prestigious Competitions requires some extra effort and consistency of fishkeeping.

This is what is to be recognised, and rewarded, by The Organiser's Award.

More top rewards

Sponsors of the FBAS Supreme Championship and British Open, Tetra, have generously increased the rewards for these two competitions.

Apart from the prestige which comes with achieving such high aims, winners will receive great prizes too. Not only will each winner will receive one of the new TetraTec EX External Filters and a silver trophy, they'll also win a free accommodation (one bed) for the 2006 Festival of Fishkeeping. The other high-placed competitors in these two events will not miss out either. Each of the 2nd to 6th placed winners will each receive a product from the comprehensive Tetra range.



KOI SHOW DATES FOR YOUR DIARY

The British Koi Keepers Society (BKKS) are gearing up for the 2005 show season. Amongst their already published agenda are the following shows, and there are others still in the planning stage. Koi shows are a great way to learn more about these fish and many of the shows have trade stands that cater for the pondkeeper and water gardener too. You can keep abreast of developments via the news page at www.koi-clubs.com/SouthEast where details of all UK koi shows as well as those abroad are kept up to date.

Don't be put off by the words 'closed show' this just applies to the exhibitors. An open show is open to any exhibitor. A closed show requires the exhibitor to be a member of the club.

May 29/30, 2005
South Hants 14th Annual Open Show
South Downs College, College Road,
Purbrook, Waterlooville, Hampshire PO7
8AA. Contact: Glenys Cambridge (Show
Chairman) Tel: 023 9225 4279

June 4/5, 2005
Ireland BKKS Show. Venue: Coleman's
Nursery.

June 4/5, 2005
East Pennine BKKS Open Show. Venue:

Elsecar Heritage Centre, Elsecar, Barnsley
Contact: Betty Koerner Tel: 0114 2341151

June 11/12, 2005
Worthing & District BKKS Open Show. New
Venue: Clapham Village Hall, Worthing,
West Sussex. Contact: Alison Prior, Show
Sec Tel: 01903 725346

June 18th/19, 2005
Crouch Valley BKKS Closed Show/Garden
Show. 10am-5pm. Barleylands, Billericay,
Essex. Contact: Graham Hall Tel: 01277
653579 Email: ghall@btinternet.com

June 19, 2005.
Suffolk & North Essex BKKS Annual Closed
Show. Langham Community Centre &
Recreation Ground, Langham, Colchester,
Essex. Contact: Mavis Carter Tel: 01206
515677 or 07752 284851 Email:
alancarter@ntlworld.com

July 9/10, 2005
Potteries & District BKKS Koi Weekend at
Trentham Gardens off A34 Stoke on Trent.

June 25/26, 2005
UK National BKKS Show (30th Anniversary
Show) at the Newark Showground,
Nottingham

July 17, 2005
Middlesex and Surrey Borders Section
Closed Show at Walton upon Thames
Surrey (next to the Marina). Contact: Allen
Dyke Tel: 020 864 28594 Email:

GET IN FOR FREE!

Lest it seems that you 'have to be in it to win it,' there is excellent news for anyone wishing to visit the Festival of Fishkeeping as a day visitor (Saturday and Sunday, October 15/16).

Thanks to the generosity of Aquarian, who are sponsoring the Goldfish and Catfish Shows, day visitors can enjoy their day with the fishkeepers absolutely free, as the company – celebrating its 30th anniversary this year – will be sponsoring the admission fees.

TFK Champions of Champions

The Today's Fishkeeper Champion of Champions and National Show League awards will be held at the Southend Show on May 7. The people who have won will be contacted personally in February/March. And those who have won Best in Show from any federation, please send your lists in to:
Pat Lambert, Northside, Spridlington Road, Faldingworth, Market Rasen, Lincolnshire LN8 3SQ.

First impressions

Andrew Collins visits the recently refurbished Swallow Aquatics site at Gravesend

Swallow Aquatics started life in 1976 and over the years it has developed into a very well respected aquatics outlet which now has four branches based in Rayleigh in Essex, East Harling in Norfolk, Gravesend in Kent, and Colchester in Essex.

I decided to visit the Gravesend branch which is run by Gavin Marlow and has recently been the subject of a major refurbishment. I knew the shop in its previous guise which was probably a third of the size that it now is. The old shop always had a good selection of fish, but with the refurbishment the number of tanks has grown significantly and there is now a substantial marine section as well. The space devoted to dry goods is also much larger and there is a sizeable pond section which includes a large outdoor area.

Presentation is everything

The first thing that strikes you upon entering Swallow Aquatics is the presentation, which is immaculate. Apart from the fish section which looks impressive, the dry goods are also well laid out with plenty of room to wander around and choose what you want. The fish section is significant and includes in total over 220 tanks which are split with around 75 tanks devoted to community tropicals, 35 tanks for cichlids, 21 tanks for softwater fish and an extensive marine section with 65 tanks, as well as a very impressive display tank. There are two 7ft tank sections for plants and, for the coldwater enthusiast, an array of tanks and vats covering fancy goldfish right through to koi.

The dry goods section has everything you would expect to see and there are a good range of tanks on display from Seabray and also a brand called Boyu which manufacture some complete set-ups.

The shop is well staffed and they pride themselves on only taking on people with a good knowledge of tropical fishkeeping, even the part-time staff. On my travels I often hear the criticism that some aquatic shops lack knowledgeable staff, but quite the opposite is true at Swallows – all members of staff can talk for as long as you like on the hobby and will help you in selecting appropriate fish for your tanks.



There are 17 members of staff in total, nine of which are full time.

All fish quarantined

Another major plus at the shop is that they have a full quarantine facility, which is always good to see. It really does give you confidence in knowing that the fish you are buying are strong and healthy. In terms of the range of fish available, they stock a full range of the "bread and butter" species, but there is also a good contingent of the more unusual and oddball species. On my trip I found some nice Motoso stingrays, Gold stripe corydoras and a whole range of interesting cichlids including some marbled *Dimidiochromis compressiceps*, which are an interesting variant of the normal coloration these fish have (see the tropicalfishfinder news section for further details). If they don't have a fish in stock that you want, Gavin said they would always endeavour to get it for you.

The shop sells live food, reverse osmosis water and also offers free water testing during week days and charges £2 per test at weekends. What was really impressive is the "water testing advice sheet" they give to

people after their water test. It explains the findings and also goes into detail about the water conditions present in your aquarium and the impact this will have on your fish. This kind of thing in my opinion is brilliant, the more people are educated about the fish they keep and how they should keep them, the better it will be for all concerned, especially the fish.

Future plans

The recent refurbishment means that there really isn't much more to do to the shop in the future. However, one interesting plan is that there will be a section devoted purely to plecos and L-Number catfish. This is a good idea because, as is always the case with these fish, they have a habit of hiding away in dealers' tanks. A full set-up that meets their requirements will help to bring them out and make them far more accessible for viewing.

The shop is easy to find, has plenty of parking and stands next door to a large garden centre so there is plenty to keep the green-fingered members of the family busy as well. I would not hesitate to recommend a visit to Swallow Aquatics and of course you do have four to choose from. ■



Vital Statistics:

Opening hours: Monday to Saturday – 9am-6pm, Sunday 10am-4pm
 Contact details: Swallow Aquatics,
 Millbrook Garden Centre, Station Road,
 Southfleet, Gravesend, Kent DA13 9PA
 Tel: 01474 561123
 Website: www.swallowaquatics.co.uk

Coral gardening

The technique may seem aggressive, but the sawing of some stony corals is a very easy and effective means of both propagating and simply pruning vigorous species. The hand of expert aquarist Steven Pro demonstrating on a hardy *Turbinaria cup* coral here

PHOTO: ANTHONY CALFO



Anthony Calfo takes a look at coral propagation in the modern day reef tank and says it's not just for coral farmers! More next month...

It is a delight to see so many aquarists engaged in the keeping and study of reef creatures. In a relatively short period of time since the 'birth' of popular reef aquarium-keeping in the 1980s, tens of thousands of hobbyists now have thriving slices of the living reef growing in their own homes. Reef type aquariums run the gamut from nano-sized desktop adornments to swimming pool-sized captive reefs. And the collective interest of aquarists now extends beyond the wonderful pastime of ornamental use to endeavours of science and even revenue generation with some folks earning part- or full-time incomes from propagating corals. Whichever way you choose to celebrate the care of reef creatures in captivity, one thing is certain - reef tanks are excellent learning centres. We have progressed from the days of wondering how to keep some corals alive to now contemplating how best to control the excess growth of the same species.

And so, everyone participating in the keeping of corals will have to learn fundamental coral propagation techniques, if only to prune their growing display. In many ways, coral propagation is like gardening. There is a complex relationship between animals in the garden as revealed by small changes to any one aspect, which

can easily influence another. For example, a piece of coral growing larger over time will change the dynamics of water flow around it and the light under it. Neighbouring corals can be influenced significantly (usually for the worse) by the encroachment of others like this, yet the keeper often fails to realise just how fast or large the offender has

WATER TURNOVER & LIGHTING

Reef aquariums need a minimum of 10-20 x turnover of water in the display - systems featuring small polyped stony corals like Acroporids may need twice as much! Photosynthetic corals, polyps and anemones are furthermore dependant on the quality and quantity of light that reaches them.

Provide at least 5 watts of daylight per gallon of water for a rough guide to illuminating reef corals properly. (do not count actinics or heavily blue coloured bulbs). When so many systems are already modest or lacking in these parameters, any additional compromise as with overgrown, neighbouring corals can harm other corals and lead to their demise in short time.



Many soft corals can simply be pruned away from healthy parent stock and then stitched for tying them off securely to a piece of rock or rubble

grown without looking back at photographs, for example, in the typically crowded confines of home aquaria, this can quickly become a problem. Corals are mostly sessile organisms (they do not move around) and their very lives depend on water flow to carry food and nutrients to them and carry waste products away.

Unnatural tankmates

The animals that we call 'corals' comprise a wide range of organisms that one might say are

actually more distantly related to each other than mice are to elephants! They come from tropical oceans spanning the globe and from niches with wildly varying physical parameters. This reality is one of the very things that makes the keeping of casual displays without themes or biotopic restrictions so difficult. The unplanned and random mix of corals that some aquarists make is not only unnatural, but harder to succeed with. There are several distinct reasons for this. The first and most obvious reason is that a low light animal like some mushroom anemones (Corallimorphs) collected at 60ft of depth cannot be expected to survive long term, or at least thrive, in the same 24in-deep aquarium with an Acroporid (small polyped stony coral) collected in less than soft of water. The extremes of water flow, temperature and

lighting between these cnidarians' natural niches can be extraordinary.

To make matters worse, we are beginning to learn more about the silent chemical warfare that corals, plants and algae conduct on each other (allelopathy). Preliminary observations suggest that putting together unnatural tankmates in 'garden reef' displays can make some corals exude excessive chemical deterrents, which in the confines of a closed aquarium system contributes to their own demise as well over time. The energy spent to produce such chemicals is done so at the biological expense of other more desirable functions like reproduction, growth and perhaps overall vigour. Unfortunately, since the toxic effects of crowding corals and unnatural tankmates can take many months or even a couple years to take its toll, the weight of



Fragmenting small-polyped stony corals like Acropora species is successful and easy to do. Fixing divisions to rock with thick, gel-type super glue works nicely here

the problem is lost on many aquarists. We cannot forget though that a coral that survives two, three or even five years in captivity cannot be regarded as a success when the natural life span is many decades or potentially infinite (for some).

Being practical

As a mentor and advisor to fellow hobbyists, I too must take into account some practical realities. Despite best intentions, it's true that most aquarists will not set up geographically natural or niche-specific biotope displays. Frankly, with science and 'perfect-world' scenarios aside, I must admit that I too like the eclectic and often artistic displays assembled by some folks with random species in a mixed garden reef style. It's quite fine (wonderful

PRISTINE WATER QUALITY

Faithful attention to water quality is one of the best ways to succeed in keeping mixed species coral tanks over time – invest in the best protein skimmer you can afford, conduct regular partial water changes, and use at least one kind of chemical filtration daily/full-time.

indeed) to simply just want a hobby tank... so long as you can ensure the overall health and welfare of the animals you take into your charge. And so, the question then becomes – how do we deal with the challenges of mixed garden reef displays?

Water quality issues can be handled reliably with frequent water changes (small weekly exchanges are much better than large monthly events), aggressive protein

skimming (tune your skimmer to produce near daily cups full of skimmate) and chemical filtration (using activated carbon full-time in small amounts changed weekly rather than 4x amounts changed monthly). From a husbandry point of view, corals should also be given enough minimum space between each other for safe growth and to temper aggression. Place corals in the aquarium with a minimum distance of 6-10in between each other – more space is better. These basic guidelines will be a tremendous help for succeeding with mixed reef aquariums at large.

With this primer, I invite you to follow up reading the forthcoming parts of this series when we explore the specific and illustrated techniques for pruning and propagating hard and soft corals, polyps and corallimorphs, and anemones. ■

A pair of *Thorichthys callolepis* guarding their tiny babies. The fry hide under the littered sunken leaves presumably to prevent being targeted by predators. The female stays just above them, showing her menacing extended fins

ALL PHOTOS BY JUAN MIGUEL ARTIGAS ASAZ



Blue-dotted beauty

As far as cichlids go *Thorichthys callolepis* is a peaceful fish that is easy to breed, given the right conditions. **Juan Miguel Artigas Asaz** takes a closer look

This cichlid was originally described as *Heros callolepis* by Charles Tate Regan in 1904. Regan was a reputable British ichthyologist, who was director of the British Museum of Natural History in 1938. He based his description on two specimens collected by Dr A. C. Buller in 1890 in Santo Domingo de Guzman, Mexico, and purchased by the British Museum of Natural History.

Diagnosis

One particular trait that distinguishes *Thorichthys callolepis* from all other *Thorichthys* species is the lack (or just the faint presence) of the conspicuous black blotch in the subopercular area. *T. callolepis* is also the more slender (2.7cm height in standard length) of the *Thorichthys* and has the smallest depth of the preopercular area.

Initially, *T. callolepis* was placed in the genus *Heros* by Regan, as most Central American cichlids were at the time. Their unique morphological traits granted however, that Seth Eugene Meek (1904) established the new genus *Thorichthys* for the group, with a very clear diagnosis. One year later however, Tate Regan of the British Museum of Natural History published his work, *A Revision of the Fishes of the Genus Cichlasoma and of the Allied Genera*, where *Thorichthys* was reduced to a section of the then powerful genus *Cichlasoma*.

After the *Cichlasoma* restriction

(Kullander, 1983), it was Robert Miller (1996), then curator of the Ichthyology section of the Zoology Museum of the University of Michigan (second biggest in the world) who declared the resurrection of *Thorichthys*, and thus the current validity of the *T. callolepis* name combination.

Distribution

This cichlid is found in Santo Domingo de Guzman (Santo Domingo Petapa), Mexico.

The type locality is in the higher reaches of the Rio Grande, Coatzacoalcos river system in the southern part of the Tehuantepec isthmus; Oaxaca, Mexico.

Thorichthys callolepis has the smallest distribution range of any *Thorichthys*. It is restricted to fast or moderately flowing Atlantic slope headwater affluents of the Rio Coatzacoalcos drainage in the middle and southern part of the Tehuantepec isthmus. Although it has been reported in the past to be from the higher reaches of the Rio Grande, it can also be found (in fact more numerous)

in higher reaches of Rio Coatzacoalcos itself and at least the rivers Grande, Malatengo, Almoloya, Carolino and Coatzacoalcos – areas still remote from mayor settlements. I have not yet found them in the Uxpanapa drainage, eastern arm of Rio Coatzacoalcos.

Habitat

Two groups comprise the genus *Thorichthys*: one group consists of three species with a characteristic straight frontal profile, a longer snout and prognathous jaws, this group is represented by *T. meeki* and includes *T. passionis* and *T. affinis*. The second group has a slightly rounded head profile, isognathous jaws and the presence of a black dorsal blotch normally held by the females and includes *T. helleri*, *T. maculipinnis*, *T. aureus*, *T. socolofi* and the subject of this article, *T. callolepis*.

Beyond the morphological differences between the groups, they have completely different ecological preferences. While the group represented by *T. meeki* (the finemouth), favours mud-water swamps, lagoons and backwater areas of rivers, with warmer water, high fish densities and less oxygen content, the group represented by *T. helleri*, to which *T. callolepis* belongs, just inhabits in riverine and low fish density habitats. *T. callolepis* is probably the extreme case in terms of riverine preferences, and it is just found in areas of clear, oxygenated water normally in fast flowing rivers and creeks.

ETYMOLOGY
Callo = beautiful
(Latin) + lepis = scale
(Latin). This probably refers
to the blue dots found in
the scales on the sides,
referred to by Regan in
his description of
the fish

T. coliolepis is normally associated to jungle-bordered sandy-bottomed courses of water without aquatic vegetation in most cases. Water is normally clear or very clear, alkaline with a pH over 7.5 and hard. Temperature ranges narrowly from 22-26°C, according to my own measurements. The warmer temperatures are registered during the end of the dry season, between March and May.

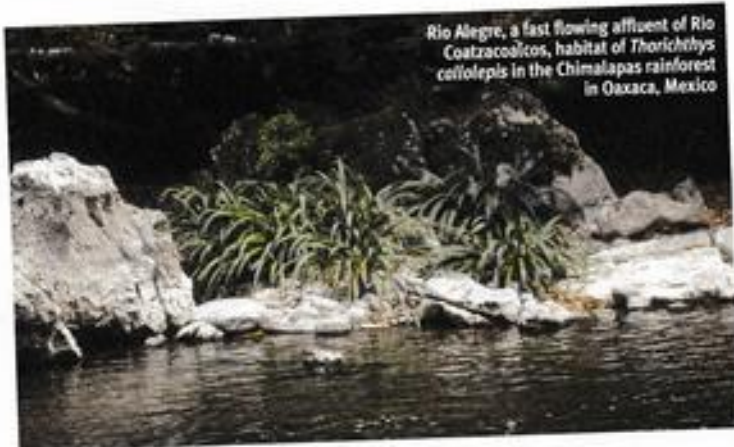
Thorichthys coliolepis shares its habitat with five other species of cichlids; namely *Thorichthys* sp. "Coatzacoalcos", *Paraneotroplus nebuliferum*, *Vieja regani*, *Vieja zonota* and *C. solvini*. Besides, there are at least 12 more species of fish in six families present at the *T. coliolepis* habitat, including representatives of Characidae, Pimelodidae, Belontiidae, Poeciliidae, Atherinidae, Mugilidae and Eleotridae.

Natural history

Thorichthys coliolepis is probably the larger of the *Thorichthys* with adult males reaching close to 16cm in total length in the wild (many fish grow larger in aquarium). Males grow larger than females (large females hardly reaching 12cm), and have longer fin threads on the fins. Unlike other species of *Thorichthys* of the helleri group, the females do not hold distinctive black blotches on the dorsal fin.

Body is compressed and rather elongated, its deeper area at the base of the dorsal fin. The mouth is small with the caudal fin slightly rounded in females, and slightly lunated in adult males. The pelvic fins extend beyond the start of the anal fin. The eyes are remarkably large in comparison with the shallow head. The caudal peduncle in *T. coliolepis* is as long as it is deep.

Overall coloration is creamy with lines of sky blue dots present on each scale on the flanks, alternated with red dots in the lower half. Dots are denser in the anterior part of the flanks. A black blotch is seen just above the beginning of the posterior segment of the lateral line, in the sixth dark vertical bar seen on dominant or breeding individuals, and extends to the base of the dorsal fin. The base of the caudal fin is adorned with short sky



Rio Alegre, a fast flowing affluent of Rio Coatzacoalcos, habitat of *Thorichthys coliolepis* in the Chimalapas rainforest in Oaxaca, Mexico

blue lines that run between the tail rays. The dorsal and caudal fins of *Thorichthys coliolepis* are distinctly marked by a conspicuous submarginal sky blue band and a narrow distal red band. The same feature is present in the anterior part of the pectoral fins, on the hard rays. The rest of the dorsal fin is red with just some blue markings on the rear. *T. coliolepis* also has a row of blue dots under the eyes. Another peculiar colour trait of *T. coliolepis* is a blue rim present on the upper lip, as well as blue lines on the lower part of the head from the chin to the opercula and in the lower margin of it.

Breeding coloration brings a contrasting pattern of nine broad equally spaced vertical dark brown bars that run vertically from the top of the body to just below the lateral line. The first three bars are found on the upper part of the head, first two ending on the eye orbit. The flanks coloration becomes much lighter in tone when breeding, with a creamy tonality.

Breeding

Thorichthys coliolepis starts breeding efforts at the ending months of the dry season around February, when water is clearer, warmer and the flow is slower. Breeding may extend to October but is drastically reduced after May, when rains come. In my personal

observations, they set territories normally in open areas in the slower currents or on the sandy areas that accumulate in river curves, where silt is also present. Pairs are normally isolated from each other although *T. coliolepis* is not such a plentiful fish that could make breeding colonies apparent. I have never witnessed pair formation in the wild but in aquarium they normally form prior to the establishment of territories, which pairs loosely defend. The pair quiver to each other once they have established a territory at one point get side by side while males, with undulating movements of the body, throw water to the females on an apparent effort to show their strength. Once pairs are coupled, they clean the exposed surface of the rock that acts as nest with their mouths. An exposed surface of an isolated small rock is a preferred spawning site.

Eggs hatch in about 48 hours under aquarium conditions at 26°C. Pits are excavated by the pair to place their newly-hatched wrigglers, and are transported normally by the female from one to the other several times a day. Five to six days later the yolk sac, with which the babies are born, is fully consumed and the little babies start making swimming attempts inside their pits. The next day, with all the wriggler now swimming, pairs school them around the territory.

Pairs herd their babies as do other Central

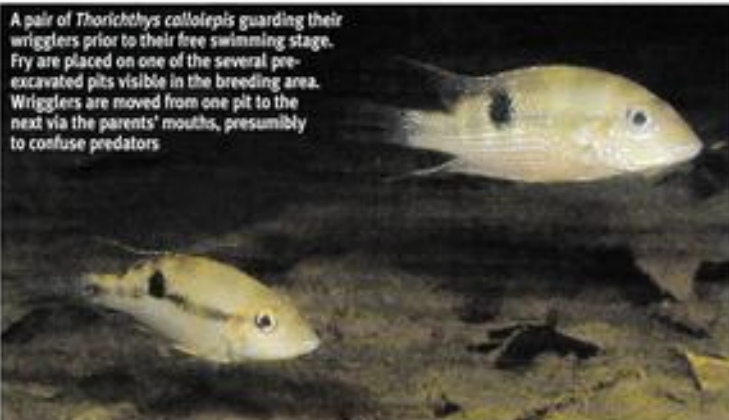


A pair of *Thorichthys coliolepis* in Rio Grande, Coatzacoalcos river system in Oaxaca, Mexico

SPAWNING

T. coliolepis eggs are ovoid 1.7mm in length and 1.4mm in width, slightly wider than in the rest of the *Thorichthys* species. Eggs are yellowish, translucent and blend incredibly well with the spawning surface. I would estimate spawns in about 100-300 eggs depending of the female size. Females take the closest guarding of the spawn, making water circulate among them with her pectoral fins, while males chase intruders away from the territory.

A pair of *Thorichthys callolepis* guarding their wrigglers prior to their free swimming stage. Fry are placed on one of the several pre-excavated pits visible in the breeding area. Wrigglers are moved from one pit to the next via the parents' mouths, presumably to confuse predators.



American cichlids, with the female guarding the babies closely and guiding them. Signalling is achieved with spasmodic body shaking and closing and opening of the fins. Males, also signalling, take the lead of the pair.

Fry decrease in number with the passing of the days and when babies reach about 1cm, about four weeks post spawning (aquarium time), they are normally much less in number. Predation pressures, especially by other fishes like *Astyanax* spp., are very hard on them.

Babies feed by picking on the surfaces by which they pass, and females don't seem to make any special effort (unlike other Central American cichlids) to provide food for their babies.

When babies abandon their parents, a little over a 1.5cm in length, about after two months post spawning, they congregate in covered shallow areas of the habitat, where many are seen in the company of many other young fish.

Aquarium keeping

Thorichthys are rather mild tempered cichlids, and *T. callolepis* should be the gentlest of them all. They rarely pose a danger to any other fish in the aquarium, conspecifics included.

When keeping this cichlid, keep in mind what I mentioned about habitat preferences. *T. callolepis* is probably the harder species to properly keep in the home aquarium. In my particular experience and, unlike with the rest of *Thorichthys* species, I have never been able to make them look nearly as good in aquarium as they look in the wild, which has been a problem for very few of the cichlids I have kept. *T. callolepis* hates low oxygen, poor water quality and warm (over 28°C) conditions. They like cool oxygenated water, within their natural parameters. If water loses quality, bacteria infections and hole-in-the-head are around the corner.

I would not recommend anything less than 300 litres for housing a group of these fish. As for decoration, I prefer a natural looking aquariums with boulders and driftwood, with



A female *Thorichthys callolepis* guarding her large babies, visible around her. At this time babies are larger, fewer in number and less prone to hiding.

a fine sand substrate that allows them (and me) to enjoy their natural picking behaviour. You can then notice that at feeding time many small pits are dug on the sandy surface of the aquarium.

Dither fish help bring out the keen personality of *Thorichthys callolepis*. I use *Poecilia* spp. and *Prisopella intermedia* and they work perfectly well. Any other large dither fish would do just fine – just try to avoid fish that bite on the fins, as they can produce a counter effect of what you are looking for.

Food is no problem; they are eager eaters when conditions are right. I consider *Thorichthys* of the *T. helleri* group a delicate fish in terms of diet, and although they are carnivorous in nature, I tend to avoid diets with terrestrial animal proteins to avoid clout.

FEEDING IN NATURE

Thorichthys callolepis feeds in shallow areas of the habitat and in sandy areas they wander close to the bottom and pick around the rocks base and on the substrate, creating small pits on it, more than diggers, *Thorichthys* are pickers. Material picked is scrupulously examined in the mouth and inedible matter expelled through mouth and gills – softer material is filtered by gill rakes. *Thorichthys* are carnivorous and are never to be seen collecting vegetable matter.

It works good for me.

As for breeding, if conditions are right, nothing will stop them. *Thorichthys callolepis* will spawn on the aquarium floor (once sand has been cleared out) or on the sides of the aquarium. They do not become too aggressive in breeding time and in fact you can raise a group of babies in the home aquarium, if conditions are right. You may, however, fail the first few occasions as they are quite shy and nervous but eventually succeed, and it is wonderful to observe their full pattern behaviour in the home aquarium.

Comments

Thorichthys normally bring to my mind idyllic memories of wonderful rainforest landscapes with beautiful rivers and lakes, and this is true of *Thorichthys callolepis*. The fish habitat is home to an incredible assortment of unique species, now partly protected by the Chimalapas rainforest biosphere reserve.

However, with the accelerated deterioration of all ecosystems because of abuse, caused in my view by human overpopulation and greed, the circle is closing ever-tighter around the *Thorichthys callolepis* delicate environment. It is a race between human consciousness and the arrogant belief that all natural resources are there for us to exploit. I just shiver to think about the possible destruction of the upper Rio Coatzacoalcos area. Let's hope that we can do something about it before it's too late...■

REFERENCES

- Coleman, Ron; 2004; The Cichlid Egg Project; Cichlid Research Home Page (www.cichlidresearch.com)
 Kullander, Sven, 1983; A revision of the South American Cichlid Genus *Cichlasoma* (Teleostei: Cichlidae), Stockholm.
 Miller, R.R. and Bernard C. Nelson; 1961; Variations, life colors and ecology of *Cichlasoma callolepis*, a Cichlid fish from southern Mexico, with a discussion of the *Thorichthys* species group. Occasional papers of the museum of Zoology, University of Michigan, Number 622.
 Miller, Robert Rush; 1996; *Thoraps wesseli*, a new species of cichlid fish from the Caribbean slope of Northern Honduras; TFM Vol XLV No. 50 pp:179-183.
 Miller, R. R. and J. N. Taylor; 1984; *Cichlasoma socofoffi*, a new species of cichlid fish of the *Thorichthys* group from northern Chiapas, Mexico; *Copeia* 1984 (no. 4): 933-940.
 Regan, C. Tate; 1905; A revision of the fishes of the American cichlid genus *Cichlasoma* [sic] and of the allied genera. *Annals and Magazine of Natural History* (7) 36: p1436-437.

Charming Chelonians



ALL PHOTOS AND CAPTION TEXT BY IAN DAVIES

Roy Osmint takes a look at some of the misconceptions about terrapins

Attractive appearance, fascinating behavioural characteristics and charmingly inquisitive personality are perhaps not attributes that everyone would automatically bestow upon all members of the reptile fraternity, especially those more sinister representatives.

In the case of one particular member of the group, however, few would probably disagree that such accolades are entirely appropriate. The creature to which I refer is the terrapin and it is little wonder that it has long remained among the most popular and widely kept of all reptile species.

In many respects the term terrapin is itself somewhat misleading, having little or no true scientific relevance. As with many other animals, confusion of identification can easily occur when popular names are applied which can mean different things to different people.

For example, this creature that we know in the UK as the terrapin is likely in the United States to be generally referred to as a turtle. Whilst in Australia the all embracing term tortoise is the more common appellation. Further confusion arises in various regions of Europe where a variety of other local names are frequently applied.

It is, of course, for this reason that the use of universally accepted scientific nomenclature is the only truly positive form of animal identification. For the purposes of this article terrapins should be taken to mean semi-aquatic freshwater Chelonians (shelled reptiles) of the family (Emydidae). These include: False map, Reeves, Painted, Soft-shelled and Asian leaf turtles – some of which are more readily available than others.

Asian leaf turtle grows to 22-24cm with attractively marked plastron



Red-eared turtle. Importation of these has been banned due to large numbers dumped when owners tired of them or they became too big and their care too demanding. Have become a nuisance and threat to local wildlife in many ponds and watercourses

Maltreated

Terrapins make really fascinating pets and, to many aquarists, they are frequently seen as an almost natural extension to the fishkeeping hobby. Unfortunately, their lot is often not a happy one!

All too often these wonderfully appealing little creatures suffer short and miserable lives at the hands of their caring, though misinformed, keepers. Problems usually occurring simply through a lack of proper

understanding of the animal's nature and basic day-to-day requirements.

Always remember, when keeping any captive animal it is the clear responsibility of the keeper to do his or her initial homework through reading and communicating with experienced people, so as to ensure a broad appreciation of the creature's complete needs.

Moreover, terrapins are in many cases imported into the country as hatchlings in huge numbers, frequently in far from ideal conditions. The almost inevitable consequence being that even those fortunate enough to survive the journey may suffer potentially irreversible health damage.

That said, good conditioned specimens are available if you seek them out. Visit only specialist retail outlets that have a sound reputation for offering healthy stock and that employ knowledgeable and caring staff. Look out for specimens that appear bright, active and alert!

Natural characteristics

Most of the terrapins inhabit warm, mainly slow moving freshwaters where they feed on a whole range of edibles. It is important to bear in mind, however, that although this may include a certain amount of vegetable material, predominantly these creatures must be regarded as carnivores!

Fish, meat, snails and other invertebrates will all be enthusiastically taken both in live form, when the opportunity presents itself, or perhaps more frequently in the form of carrion.

When the terrapin is not either feeding, or in search of food, it likes nothing better than to find a safe, conveniently situated above water rock, where it spends long periods simply sunning itself. Though this is undoubtedly a



Reeves turtle from Asia, occasionally available. Grows to about 20cm and needs temperatures of at least 24°C.

most pleasurable experience, it in fact also serves a far more important and fundamental function.

Unlike mammals and birds that have the capacity to generate warmth from within their own bodies, reptiles have to rely entirely on extraneous sources to heat the system. This is why basking and bodily absorbing the warmth is such a vital constituent to their overall well being.

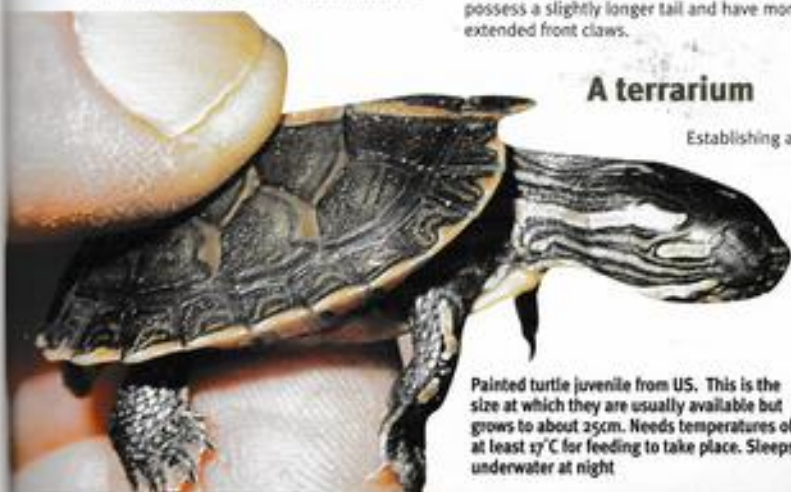
The shell consists of two sections, the upper known as the carapace which in this species is usually bright green in healthy specimens. The underbody shell is called the plastron. The yellow neck markings are usually also present on the limbs, especially in young specimens.

Sex differences are apparent to the trained eye. Broadly speaking, females tend to be larger than the male, though males possess a slightly longer tail and have more extended front claws.

Red-eared terrapins derive their common name from the red stripe located behind the eye. A characteristic feature only normally fully revealed when the attractively yellow marked neck is stretched fully forward.

A terrarium

Establishing a



Painted turtle juvenile from US. This is the size at which they are usually available but grows to about 25cm. Needs temperatures of at least 27°C for feeding to take place. Sleeps underwater at night.

satisfactory home for terrapins is quite straightforward and relatively inexpensive, for despite advice sometimes proffered to the contrary, functional simplicity is by far the best policy! Having said that, certain fundamentals must be borne in mind if your charges are to enjoy happy healthy lives.

Obtain the largest aquarium that circumstances permit. Remember, when in good condition terrapins are, for much of the time, extremely active and inquisitive creatures. We want, therefore, to provide an interesting environment with sufficient swimming space.

Water in the terrarium need not be deep. An ideal depth probably being one that allows the inmate's head to just break the surface when it's rear feet are on the bottom, but this is really not too critical. What is critical, however, is that an area of land about one fifth of the total tank area be incorporated into the design so that when desired the terrapin can easily leave the water.

There are various ways in which this can be achieved. One of the best, I feel, is to construct a platform using rock. Slate being particularly useful for this application. Not only will this make a very suitable above water basking area, but the space beneath can be imaginatively used to create a few underwater caves for the terrapins to explore and use as a retreat.

The water should be heated to a temperature of about 24°C. For this purpose use a standard aquatic heater/stat. In the aquarium hood install a normal tungsten light bulb situated immediately over the land area, this will be used as a heat source for basking. A spotlight is another possible option, but fluorescent tubes are unsuitable.

Some trial and error will be called for in establishing the most appropriate light bulb wattage. This will clearly be determined by various local factors such as the height of the aquarium. It must, however, always be remembered that too much heat is as potentially damaging to terrapin health as too little.

TERRAPINS: THE MYTHS

Make certain that the aquarium hood is constructed in a manner that provides plenty of free ventilation. This is extremely important as it will ensure proper air circulation and prevent any build-up of stale or stagnant air above the water level.

Although some form of water filtration system is often advocated for a terrapin tank, in my opinion this is generally unnecessary and in most instances likely to prove more trouble than it's worth. Many like to incorporate a gravel substrate on the base, sometimes in conjunction with an undergravel filter, but this too is, in my view, both unnecessary and undesirable!

Diet

The necessity for basking in order to absorb body heat has already been stressed. The other principal contributory factor to lasting health is, not surprisingly, diet – and here I would issue a word of caution! Do not be tempted to rely on the commercially prepared terrapin foods normally packaged in small tubs and frequently found on sale in pet shops. In most instances these are just not satisfactory as a staple diet!

Suitable foods that will normally be enthusiastically accepted include fish (particularly oily varieties such as herring, sprat and mackerel), meat (but not too much red meat), worms, maggots, snails (including the shell) and cat and dog foods (in moderation).

Calcium is especially vital to the diet of all chelonians, not only for the development of healthy bones as with all vertebrates, but also in this case for the shell. In the natural habitat the consumption of whole animals (bones and all) provide this essential element.

Soft shell, is a very frequently seen health complaint among captive terrapins resulting from a deficiency of calcium in the diet. A simple way to overcome this potential problem is to include a piece of cuttlefish bone in the tank (as used for caged birds).

It is for me a matter of profound sadness that so many of these endearing little creatures have their lives prematurely terminated through ignorance and misunderstanding. Given reasonably favourable conditions and an appropriate diet they are really quite hardy animals that present few problems. Do take the time to research any animal before you make a purchase.

They make excellent pets and quickly become tame, breaking out into feverish activity at the front of the tank whenever their keeper approaches. Treat them well and they will provide an enduring source of fascination and pleasure! ■

Messy feeders

It should be borne in mind that terrapins are extremely messy feeders that create quite large quantities of waste matter. There is no substitute, therefore, for frequent manual tank maintenance, a job that needs to be made as easy and straightforward to carry out as possible.

By far the best option is to leave the tank floor devoid of any substrate material. In this way it is a simple matter to siphon out all the water and detritus. A task that ideally should be carried out twice a week. Water replaced, should of course, be at the same temperature to that removed.



Soft-shelled turtle from the US. This particular sub species only grows to 30-35cm! Adults can be aggressive. Rocks with sharp edges should not be used in their accommodation to reduce risk of cutaneous injury and subsequent infection. This is particularly important in the 'hatch-out' area.

Painted turtle sub-adult



Koi world



Bernice Brewster has an update of all the latest goings-on in the world of koi, including the demise of a parasite

Is it possible to regret the disappearance of a parasite, I wonder? Do we care whether some noxious little beast has been wiped of the face of the earth, or indeed should we care? Whilst many koi keepers will vehemently disagree with me, I have to say that as a biologist, I regret the disappearance of any species, be it parasite, plant or whatever, as I think it is just one more degradation of our planet. My reason for posing these questions is of course related to a parasite – a tapeworm, its scientific name is *Caryophyllaeus loticeps* or commonly and rather quaintly as the Carnation-head worm. Of course, there is a villain in the piece, a tapeworm which comes from the Far East and known as *Khawia sinensis*. Both of these worms infect carp but strictly speaking the Asian tapeworm should pose little threat to carp or the Carnation-head worm here in the UK but of course it has been introduced to this country. Initially, the Asian tapeworm was found in a few isolated places in the UK but

it seems to me that within a matter of years, it swept countrywide. What seems apparent to me is that as the Asian tapeworm conquered carp up and down the country in the UK. It displaced the smaller Carnation-head worm and, I realised the other day, I hardly ever seem to see the smaller worm any more. In the great scheme of things it probably doesn't matter a great deal that a small white worm is less common than it was 10 years ago and many of you are probably saying good job.

Wise to be cautious

Probably many aquatic importers find it increasingly frustrating the hoops and loops which DEFRA seem to make everyone negotiate in order to import koi into the UK. The demise of just one small tapeworm, is enough to make me appreciate that the caution with which CEFAS allows koi or other coldwater fish to be imported, is

perfectly justified. As a race we are great at being very sorry after the event and there have been quite a few occasions to rue the accidental release of something noxious into the wild. Keep up the good work CEFAS!

Filter evolution

Despite all the deluges of water in localised parts of the country, overall there really isn't enough freshwater to go round in the UK and especially in the south east. Indeed I shall be interested to see how the Office of the Deputy Prime Minister proposes to supply water to all the new houses in the region, whilst improving the flow rates of the rivers to ensure that migrating species such as salmon return to these waters to spawn. Cake and eating it comes to mind. Water is at a premium folks and whilst we koi keepers have been satisfied with biological filtration to cope with our ponds, the likelihood is that the systems we currently use are quite wasteful of water and that in future we might be forced to look for ever yet more efficient ways of treating the water to remove ammonia, nitrite and even the phosphate and nitrate nutrients. New sewage treatment plants are getting ever more efficient and, let's be honest, aquaculture and the koi hobby, we benefit from the advances made in water treatment works. With the likelihood of all households being subject to water metering I look forward to the evolution of the biological filter with interest. ■



With the promise of water shortages in the future, koi keepers may have to find ways to conserve water

SADLY MISSED

I was greatly saddened to learn of the death of Andrew McGill in January of this year. Andrew was most often seen patiently photographing the koi displayed at the shows and indeed many of us are extremely grateful for the professional quality of the pictures, which have appeared in both books and magazines. Whilst Andrew was photographing the koi, Kate, his wife, was usually seen in the inner sanctum of the arena judging the entries in the show. Andrew did much to promote koi and will be sadly missed by all of us in the koi keeping hobby. My condolences go to Kate and his family.

Ponderings

Dave Bevan's monthly round-up of all things 'pondy'



TEST YOUR POND WATER

If you keep fish in your pond then there is a good chance that the pond is close to or above its ideal stocking level. As the pond 'wakes up' in spring this can be a recipe for disaster. Waste products build up more quickly than the bacteria can break them down causing rapid increases in toxic products like ammonia and nitrites. Regular testing allows you to take action before the problem spirals out of control. You will need to be able to check the pH as well as ammonia and nitrite levels.

There are many test kits available, all of which are fairly complex, either involving dissolving a tablet in a measured amount of pond water or adding various liquid chemicals to the pond water. The resultant colour is then matched against a test card to determine the level in the sample. Most kits have comprehensive instructions covering both the method and interpretation of the results together with suggestions for rectifying the problem.



Testing for nitrite in pond water



Polecat (*Mustela putorius*) female at her den entrance

Frogs beware

The polecat, one of our larger, but still rare carnivores often hunts frogs. However, it does not always eat its prey immediately. After disabling the frog with a bite to the neck it stores it in its underground den. Caches of over 100 live, but disabled frogs, have been found. However, unless your pond is located in a fairly remote part of the west of the country this carnivore is unlikely to be a visitor.

BITTERLING FACTFILE

Species: Bitterling (*Rhodeus sericeus*)

Other names: None

Other forms: Golden morph

Size: Up to 10cm

Weight: 20 grams

Availability: Bitterling occasionally found in specialist fish keeping outlets but the Golden morph is readily available.

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

Identification: A small fish with a high backed body and a blue green side stripe. During the breeding



Bitterling with mussel

season the male is stunning as it takes on a red/purple sheen.

Habits: The bitterling is best known for its symbiotic relationship with the freshwater mussel. The female develops a long ovipositor and deposits her eggs inside the mussel. Here they hatch and eventually are exhaled by the mussel. Meanwhile, the tiny mussels attach themselves to the bitterling's fins and are carried to new areas.

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

HOW DOES BARLEY STRAW WORK?

When the pond is murky green or you are pulling out stringy blanketweed by the metre, it is hard to believe that a large handful of barley straw could be the answer to your problems.

How does it work? Rotting barley straw releases algal inhibitors under aerobic conditions. These complex phenolic compounds inhibit the growth of most algal species but there is a catch – it is not an instant cure and may take from one to three months, depending upon temperature, before any effect is seen and the effectiveness reduces with time.

The best results are usually obtained if the straw is loosely packed in a net and placed in a water flow or at least just under the surface in the early spring well before the algal populations start to build up. A natural cure which really is a win-win situation (if it works) as the rotting material boosts invertebrate numbers providing welcome snacks for your fish.



Straw bale used to try to eliminate blanketweed

Floating plants



Water hyacinth



Water lettuce produces a large root system



Azolla is very invasive

Fish produce waste products that are broken down by bacteria to form nitrates. High concentrations of soluble nitrates are poisonous to the fish and in combination with sunlight is the main cause of green water. Floating plants dangle their roots in the water, taking nutrients like nitrates out of the water, growing and dividing rapidly to cover the pond surface and shut out the light. Our native duckweeds and the alien azolla (a pretty red and green water fern) can both kill a pond. Once established they are extremely difficult to remove and may require weekly

netting in the summer months.

Less invasive and much prettier are the alien water hyacinth and water lettuce, but the catch here is that they cannot survive our cold winters and must be overwintered in a frost-free greenhouse or replaced with new plants each spring. However, their extensive root systems are great for fish and wildlife. For the wildlife pond our native water soldier and frogbit are both maintenance free as they sink to the bottom each autumn and resurface in the spring.

Marsh frog
(*Rana ridibunda*)



The Marsh frog

The Marsh frog is the largest of the native European frogs and it was introduced into this country in the 1930s. The introduction was so successful that it has now colonised more than 100 square miles of the Romney marsh area with colonies in other parts of the country as well.

The body length can reach 6-7in and is recognised by its long hind legs, pointed snout and a warty covering to its dorsal

surface. Although the colouring can be extremely variable the ground colour is always olive green or brown and the large eye has a golden yellow iris.

They colonise all types of water but favour thick marginal foliage. They are diurnal, spending a lot of time sunbathing but disappear with a plop into the water if disturbed. Feeding both in and out of the water they will eat almost anything they can catch and swallow including young frogs which is why there is usually a decline in common frog numbers when the Marsh frog moves in.

UNWELCOME GUEST

These days it is not unusual for brown rats to turn up in the garden, particularly during the winter months, and try to make it their home. They are happy to live in close proximity to water, digging holes and making runs in the soft soil.

Although they do not pose a great threat to the fish themselves as they are unlikely to hunt and catch them they will make short work of any fish food which has been left uncovered. They do, however, pose a real threat to the pond keeper as more than 50 percent of the

brown rat population carries a disease called leptospirosis, which is potentially lethal and can be transmitted from rat to human via the pond water.

Watch out for the tell tale signs which include well worn tracks round the pond perimeter often leading to burrows, particularly on banks and in hedgerows. The disappearance of bird food at night and the presence of current-sized droppings in sheds and out buildings also indicate this rodent's presence.

Poisoning using any of the proprietary baits is usually the quickest and safest way of removing the problem. Spring or live traps can also be used.



Catching fish safely

Occasionally it is necessary to catch and remove a fish from the pond. An operation which can not only prove stressful for the fish in question but also for the other inhabitants of the pond and the pond owner.

Two nets, or a net and a pole, are always better than one net for a quick result. Once netted bring the fish slowly to the pond edge and lift clear putting the net into a pre prepared container of pond water.

Soak an old towel in pond water and lay it on top of the fish whilst slowly gathering up the surplus net. Wrap the towel round the fish making sure the head is completely covered and lift clear of the net.

The fish rarely struggles once covered and can be easily placed in a transport container or laid on a flat surface for examination and treatment.



Room with a view



Peter's new office with a view!

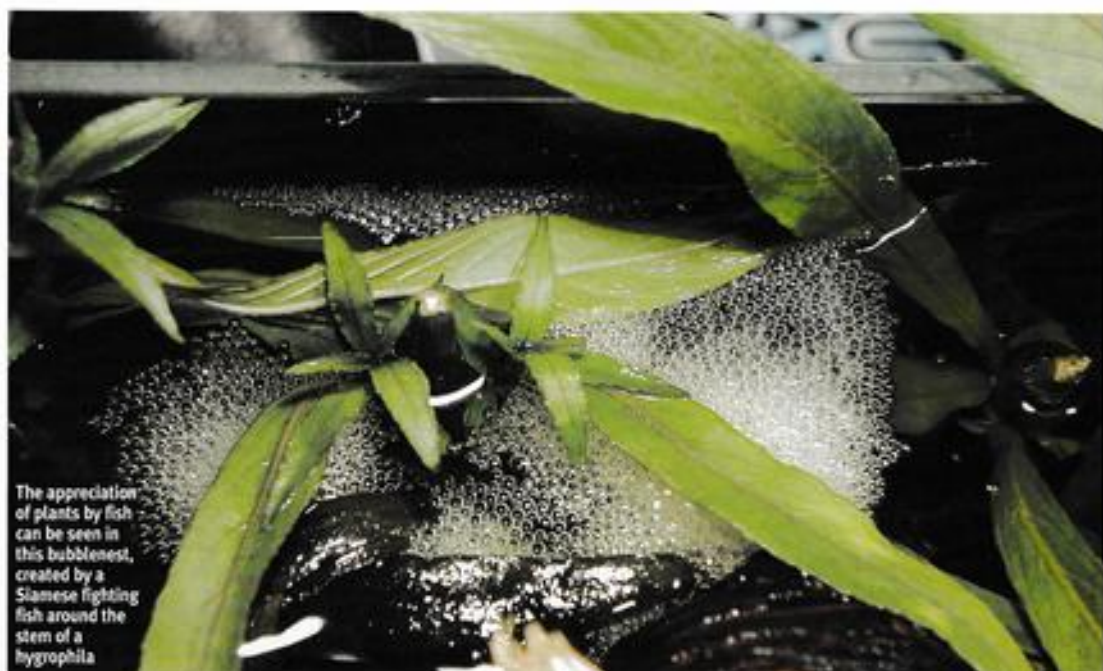
If space is an issue then **Peter Hiscock** has the perfect solution – a 3-gallon tank which is small but perfectly formed

After finally clearing out my spare room (a.k.a. fishy equipment junk room) and converting it into a proper office, I soon realised that something was missing. The extra space has been a godsend and everything was sorted in a semi-organised manner, much better than the previous cramped corner of the living room, but yet the proper 'office experience' just wasn't the same. The problem soon became apparent however – there were no fish in this room! In my previous 'work' area I had a planted tank with rainbowfish in one corner becoming overly excited at any movement I made, whilst in the other corner was a reef tank with a pair of clownfish continually deciding whether I was a threat or the bringer of food. How could I possibly

work without this sort of constant encouragement? Attempting to avoid refilling the room with all manner of fishy things, I had to think small, but small can be beautiful, and you will find no tacky aquarium affairs in this house. This month's plant piece then will be slightly different as I explain the ways in which you can set up a tiny aquarium on a budget and still allow for a green and pleasant tank.

The problems with being small

Anything that might alter water quality has a much larger effect in a small tank than the



The appreciation of plants by fish can be seen in this bubblest, created by a Siamese fighting fish around the stem of a *Hygrophila*

same event in a bigger tank, because of the much reduced water volume. For instance, the addition of a gram of substance to 100ml of water is a much greater addition (10%) than the addition of a gram of substance to 1000ml of water (1%). This is the main reason why small tanks and new fishkeepers simply do not get along. The usual mistakes such as overfeeding, cleaning sponges in tap water, and doing a too large water change, have a much more damaging effect in small tanks.

Plants are actually a good balancer in small tanks because they will 'soak up' a lot of these changes and restore the environment to a stable condition for the fish. On the other hand, taking the stability factor in mind, a lot of the traditional advice for keeping plants goes out the window when small volumes of water are involved. Firstly, we can forget about carbon dioxide, the addition of which will cause rapid fluctuations in pH, and instead provide good surface movement (normally avoided for planted tanks) through a small pump. The moving surface water will allow a good exchange of carbon dioxide and oxygen throughout the day and night, maintaining a balance, and because there are only a few plants, they should not out-compete each other for the gasses. Fertilisers are also out, simply because it is too easy to overdose in a small volume of water. To compensate for this a good nutrient-rich substrate will hold, release, and recycle the nutrients provided by fish waste and tap water. When it comes to water changes, it is easier and better for the fish and plants to do a daily change with very small amounts. For this tank I am changing 500ml on a daily basis, using two

mineral water bottles and normal tap water, which is left overnight for the chlorine to dissipate. This method provides the plants with a daily addition of nutrients and minerals, produces minimal disturbance for the fish, but still allows a total of about 3 litres (20% of the tank volume) to be changed each week. Every other day would probably be sufficient so it does not matter if you miss the odd day or two.

Lighting

As we should all know by now, the right lighting is essential to good plant growth, and there are all kinds of specially designed fluorescent tubes and lamps with finely tuned light spectrums for this purpose. In a small tank however, the rules change, and lighting actually becomes less important. In most tanks, a significant amount of light is lost as it travels through the water and it is the specially designed lights and light spectrums which compensate for this, giving the plants exactly what they need. In only a few inches of water however, much more light will reach the leaves and even if the light spectrum is not ideal, there will still be plenty of light for the plants to utilise. For this tank I have simply used two cheap halogen desk lamps and positioned them a foot above the water's surface, allowing for heat to dissipate. Algae should not be a problem in this tank, even with this lighting – any excesses of nutrients will be taken up by the plants, and a team of algae-eating shrimps will take care of any algae when and if it appears. A problem with having an open topped tank lit in this way is

that above the water there will be little humidity and lots of heat produced from the lights, so the plants situated above the water must be able to cope with this. If you live in a centrally heated house like mine, you will also find that the air is generally quite dry, making the problem worse, and also causing lots of evaporation. Houseplants should be able to cope with this providing they are well watered, whilst the mosses will draw moisture from the aquariums water.

The right plants for the job

Obviously, huge Amazon swords or tropical lilies are out of the question for such a small tank, but you will need to do a little fact-finding to find the plants that will not outgrow such a small environment. Small foreground grass-like plants are best and the background plants can be tall bog, marsh, or terrestrial plants which will both cope with the lower halves being submerged and the above water parts being

Mosses, ferns, and creeping plants are ideal for placing on the bogwood, and over the tank's edges. Providing these plants have some of their root structure placed in the water they should grow well. A daily spray of water will help a great deal to keep the plants moist and cool, and it will also benefit the leaves of most house plants, just don't do what I did and spray the computer as well!

Planting your tank – step-by-step



STEP 1. The substrate is a simple mixture of silica sand, which is a 1-2mm grain inert sand, and a clay based, or laterite additive. The bogwood is positioned so that it takes up very little space in the aquarium, but will allow an area to grow plants on very near or at the water's surface.



STEP 2. The background *hygrophila* and *Acorus* sp. are hardy enough to tolerate the 'dry air' created by the lamps and provide a good backdrop for the wood. Don't worry about the 'messy' appearance of the leaves, once the plants are settled the leaves will change position according to the light source.



STEP 3. The feathered java fern (*Microsorium pteropus* 'Windelov') should have its roots slightly trimmed (but not the main, thick root or rhizome) and it can be wedged into position around the submerged piece of bogwood. Only a very small portion should be allowed above water or the leaves will dry out.



STEP 4. Once the foreground *lileopsis* and *Bacopa* sp. are in place the aquarium begins to look quite densely planted. At this point it is easy to overdo it and leave little space for the fish.



STEP 5. Adding some mosses and alpines to the top of the bogwood really finishes off the aquarium. You can get these plants from garden centres and I have used some pieces of moss scavenged from rooftops and gutterings! Make sure that at least part of the root for each piece is resting in the water.



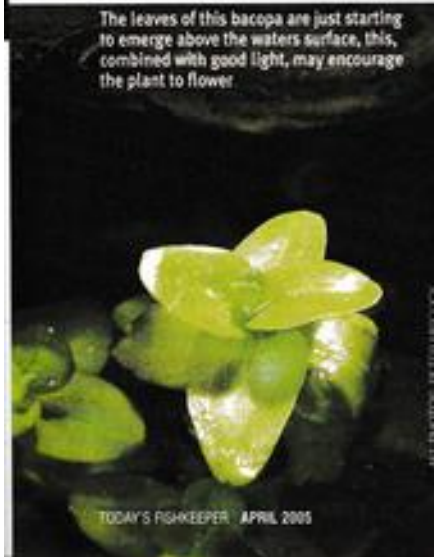
STEP 6. Finally, position some houseplants around the aquarium to hide the edges. You can even go one-up on this display by positioning some pieces of rock, cobbles, and bogwood around the base to hide the lower portion of the tank and cover-up some of the pots.

in warm, dry air. I have used the Fountain plant (*Ophiopogon japonicum*) at the rear of the tank to emerge behind the bogwood and in-between the houseplants. This particular plant has very tough leaves, which is a good indicator that they will

survive warm and/or dry air well. I have also used a little *hygrophila*, which I have trimmed so that the new leaves will grow above the water, and will adapt to the environment. The *hygrophila* should grow well above the water although it is a bit of an experiment as I have only previously grown it above water in humid conditions rather than dry.

swimming room and water movement so a heavily planted tiny tank like this might not be ideal. Look for fish that naturally come from small pools, ditches and swamps and you should find some suitable candidates. Siamese fighters, small anabantids, killifish, and even some small barbs are good places to look. And don't forget to add some japonica shrimps to provide a clean up and algae-eating team. ■

The leaves of this *Bacopa* are just starting to emerge above the water's surface, this, combined with good light, may encourage the plant to flower



TODAY'S FISHKEEPER APRIL 2005

Small tank – small fish?

Choosing the fish for a tank this small is tricky, and it is not simply a case of choosing small fish. In this particular tank I have made sure I have planted no more than half of the tank's substrate area, although it looks significantly more because the plants are mainly at the front and the plant-covered bogwood is above the open tank area. This allows a decent amount of space for the fish, but just because a fish stays small does not mean it is suited to a small tank. Fish such as corydoras catfish, danios and White cloud mountain minnows may be tiny, but they also like plenty of

Special note

The tank I used in this article measures 38 x 20 x 20cm (15 x 8 x 8in) and holds 15 litres (3 gallons). This is the absolute minimum size and volume for any aquarium and no fish should ever be kept in a smaller environment, with the rare exception of expertly controlled situations. All fish and aquariums also need a form of filtration without excuse, and if you see smaller aquariums for sale without filtration (including goldfish bowls) you should voice your opinion and take your custom elsewhere!

Magic rocks!

Alf Jacob Nilsen takes a look at the animals that you can expect to 'catch-a-lift' on live rock in your marine reef tank



ALL PHOTOS: BIOQUATIC PHOTO
www.bioquatic.net

Sponges

Sponges are the simplest of the multi-cellular invertebrates. They lack internal organs but have specialised cells that co-operate to form a living sponge. Many sponges are introduced to the aquarium with live rock, but most of these are dead on arrival as most species don't tolerate being exposed to open air. This does not mean that sponges do not develop from the rocks, however. In fact they develop nicely and can form large stands over time. And 'time' is a key word when it comes to sponges, as they need several years to get well established in a reef aquarium.

Fragments of sponge colonies or even just a few sponge cells remain living on the rocks as they are introduced to the aquarium, if the conditions are right, and more importantly, if the rocks are not moved, the fragments will grow into beautiful colonies. Most species of sponge prefer shade or weak light, but a few contain symbiotic algae (blue-green bacteria) and live in strong light where they grow fast.

When we wrote our book series *The Modern Coral Reef Aquarium* a few years back, we did a survey of which genera had established themselves in our private reef tanks and, with the help of scientists who were specialists on sponges, we found that 8-10 genera commonly established themselves in old reef tanks. These include *Acanthodendrilla* sp., *Chondrilla* sp., *Cinachyrella* spp., the well known and photosynthetic *Collospongia auris* and *Carteriospongia* sp., *Maliclonia* sp. (Soft blue sponge), *Pseudosuberites andrewsi*, *Pteraplysilla* sp. and *Thetys* spp. These all belong to the class Demospongiae. Species belonging to the calcareous sponges (class Calcarea), such as *Sycon* spp. and *Leucosolenia* spp., also occur from live rock. Please see Chapter 3 in *Fosså & Nilsen (2000)* for further details.

Corals and allies

When I first wrote in American magazines about corals growing from live rock in private aquariums during the eighties, people found it hard to believe. At that time, no-one in the States had kept corals alive



Heliopora coerulea, the Blue coral growing from a piece of live rock

for a considerable period of time in captivity and they definitely didn't know that corals could grow from primary polyps found on live rock! Simply too good to be true!

But corals do indeed pop up from live rock. Most common are species of the genus *Euphyllia*. *E. glabrescens* in particular. But even stony corals from the genera *Porites*, *Montipora*, *Galaxea*, *Psammocora* and *Fungia* are relatively common growing from live rock. The Blue coral (*Heliopora coerulea*) which is an Octocoral, frequently occur and can build large colonies from small ones that are introduced with the rocks.

Animals to look out for

Other animals also appear from live rock. These include a couple of animals to look out for as they can reproduce to uncontrollable populations. Beside the well known *Aiptasia* sp., the small anemone *Anemonia majano* is really dangerous. If this species is allowed to settle in the aquarium, the tank will most likely be totally overgrown sooner or later. This is one of the few animals that I really advise aquarists to destroy! Another animal with the same destructive potential is the small, but still beautiful, hydrozoan *Myrionema* sp. Like the small anemone it grows like crazy,

covering everything in its way.

But luckily, as with most other groups, the majority of organisms in Phylum Cnidaria growing from live rock are harmless and beloved animals. Several star polyps (often from the genus *Briareum*) can grow to form beautiful colonies. Occasionally the polyp stage of the jellyfish *Nausithoe* sp. grows from the rocks. These polyps look like hydrozoans, but are in fact stages in the life cycle of a jellyfish. If observed closely you can even see the polyps releasing the small, free-living medusa.

Worms

As some of you might have realised, worms are one of my favourite groups of animals! They are found numerously with live rock – big specimens as well as several almost microscopic ones. But again, the group is so well represented that we can only cover a small selection of the most common ones. The large, free-living bristle worms in the families Eunicidae and Nereidae always occupy holes and crevices of live rock. The biggest ones usually emerge from the rocks during transportation and end up in the bottom of the styrofoam box, smaller specimens will remain in the rocks. They grow fast and you can hardly avoid having a population of free-living bristle worms in

your aquarium decorated with live rock. In my tanks, they have never presented a problem, but there are stories of monster worms that have fed on soft corals and other invertebrates and algae. Another group of worms that can be potentially boring is the small parasitic flatworms (order Acoela) where some species parasitize corals and others live freely on the substratum where they feed on microscopic algae. These worms are brought in with the rocks or with corals and are very hard to remove.

Most worms appearing from the rocks are pleasant and interesting animals, though. Among the totally harmless free-living polychaets are the scale worms such as the commonly seen *Lepidonotus carinulatus*, which is always present on live rock. It grows to only a few centimetres in length and feeds from detritus and food remains. The friendly worms also include the many species of tiny tube-dwelling feather-dusters that expose their colourful tentacle crowns if not disturbed. They feed on organic material and live plankton suspended in the water and do need a continuous supply of nutrient to survive and reproduce. In heavily skimmed and rather nutrient poor aquariums, these worms can have a hard time surviving.

Another group of worms always present in live rock, but rarely observed, is the Peanut worms (*Phylum Sipunculidae*). These worms live inside the rocks where they occupy holes and burrows. Many species can also drill holes and channels through the rocks. Peanut worms are among the most numerous organisms in live rock with densities of 700 specimens per square metre recorded in Hawaii. Use a torch and look at the rocks during the night to see the Peanut worms. In general the fauna seen during the night is much different from that seen when the light is on in your aquarium. Again, please see *Fosså & Nilsen (2000)* for further details on worms.

Crustaceans

Crustaceans are numerous on live rocks. Small and larger crabs nearly always hide in



A large, free-living Polychaet from the family Eunicidae. Worms from this family are common with live rock.

holes and crevices and follow the rocks into the aquarium. Some of these can grow to considerable sizes and a few can act rather predatory when they're fully grown. Among these are the "hairy crabs" in the genus *Pilumnus*.

Sometimes these crabs are very predatory, feeding on corals and other invertebrates, while in other cases they are not predatory at all and live in harmony with the other inhabitants of the aquarium. Other species frequently introduced with the rocks are the "Red-eyed crabs" from the genus *Eriphia*, they too can sometimes be rather predatory when grown. Peaceful and most interesting are the "coral crabs", members of family Xanthidae, frequently introduced with live rocks and always present among the branches of *Acropora* and *Seriatopora* corals.

Beautiful, but a bit dangerous are the many species of mantis shrimps that potentially can be found in live rock. Some of these are small, but big species occur such as *Odontodactylus scyllarus*, a well-known and most predatory species that will kill small and medium sized fishes easily. Even the smaller mantis shrimps are potential enemies to the smaller fishes kept in a reef aquarium.

If you here "bangs" and "clicks" from your reef tank, it is a sign that the rocks have introduced small pistol shrimps to your aquarium fauna. The pistol shrimps, or snapping shrimps as they are also called, belong to the genera *Alpheus* or *Synalpheus*. Personally, I have never experienced trouble with these regarding predation on other animals. The "bangs" are created when a peg

Small tubeworms like these two individuals from the species *Blaspia viola*, can build beautiful stands in the reef aquarium if they are not decimated by fishes



on the larger claw very quickly is snapped into a socket on the fixed digit.

The many microscopic crustaceans introduced with live rock (as well as with the water for those few aquarist being lucky enough to have access to natural sea water) are perhaps the most important group of crustaceans in the aquarium. Copepods and amphipods are important detritus feeders and act as a food source for many organisms. Use your torch and study the surface of the rocks during night time and you will most likely discover a lot of tiny crustaceans in holes and small crevices as well as close to the surface of your tank.

Molluscs

Among the molluscs, the boring clams from the genera *Arca* and *Pholas* are obvious. They live embedded in the rocks but expose their mantle, which is often coloured dark red, out of the opening. They live well protected and as long as they have access to suspended nutrients that they can filter from the water, they can live for years. Just as interesting are the tube-dwelling snails from the family Vermetidae that resemble tube worms (and were mistaken for being just that for a long time). In the aquarium where predation often lacks, the tubes develop long, thin cylinders while they remain short in nature. The Vermetid snails collect nutrient by secreting a string of mucus to which particles adhere. Free-living snails, often introduced with live rock, include the greenish *Turbo brunneus*. This species is most interesting, as recent studies from Norwegian aquariums have shown that the snail, which is a pure algae grazer, reproduces extremely well in captivity.

Echinoderms

Only a few Echinoderms follow live rock to the aquarium. In the wild the group is most

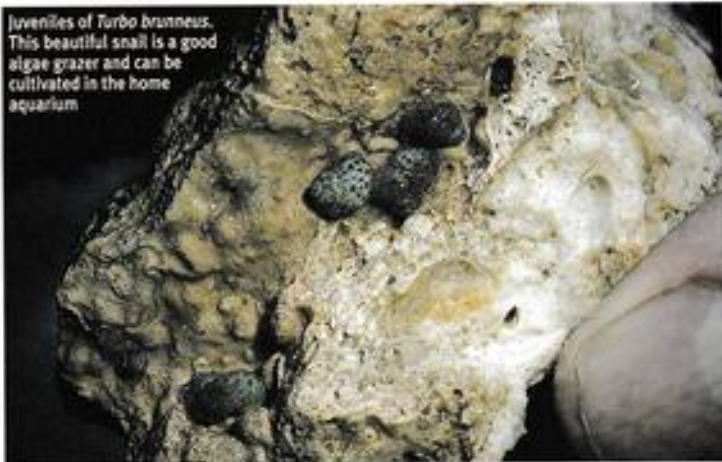
common on shallow reef flats, but most echinoderms, such as sea urchins, sea cucumbers and sea stars, are so large that they do not fit into the holes in the rocks. A few smaller brittle stars and occasionally small sea cucumbers can occur on the rocks, and are both harmless creatures. However, one group of sea stars that are added with the rocks can multiply to enormous populations in captivity – these are the members of the genus *Asterina*. Probably due to asexual reproduction (division) the small sea stars, reaching a size of only a few centimetres across, can multiply efficiently and become very numerous in the reef aquarium. They feed on algae and smaller invertebrates, but do not seem to harm corals and other larger invertebrates, though.

Just as interesting are brittle stars of the species *Amphipholis squamata*, a cosmopolitan species that live in the substratum reaching a size of maximum 1-2cm across. These tiny echinoderms feed on detritus and multiply efficiently in the reef aquarium where they act as important detritus feeders in the bottom layer. They are introduced with live rock, natural seawater and with invertebrates. In the wild they are numerous and can count up to 500 specimens per square metre!

Tunicates

Usually the live rock contain one or more populations of tunicates. Tunicates are advanced invertebrates linking the

Juveniles of *Turbo brunneus*. This beautiful snail is a good algae grazer and can be cultivated in the home aquarium



invertebrates to the vertebrate animals as the pelagic larvae contain a nerve cord (notochord) resembling that of adult vertebrate animals. The tunicates are true filter feeders that are totally dependent on access to suspended nutrient. In the reef aquarium the amount of available nutrients is usually too low and the tunicates therefore vanish. This is sad as they are a group of highly interesting animals that can be grown in the aquarium if sufficient nutrient is available. In tanks, which are not heavily skimmed, I have observed colonies of tunicates develop nicely, especially the species *Ecteinascidia nexa*, but also other species such as

Ascidia archaia, *Monandrocarpa plana*, *Didemnum psammatoides* and the cosmopolitan *Botrylloides leachi*. Please refer to Chapter 4 in Fosså & Nilsen (2002) for detailed information of this interesting group of animals.

This survey of the life on live rock should be regarded as only an introduction to the many life forms that show up from this beautiful decoration material. The rocks are magic! They show us something new every day. Keeping them in the reef aquarium allows us to study all sorts of life forms up-close. You can even have an aquarium designed for the life forms developing from live rocks only... a really different kind of aquarium. ■



Odontodactylus scyllarus taking a closer look at the aquarist from his burrow in live rock

Indonesian Pythons part 1

Val Davies takes a look at some pythons for the more experienced keeper

At one time, shipments from Indonesia arrived into the UK at frequent intervals and included several species of pythons from that region. Although there are still occasional imports, specimens of these creatures are often available as captive-bred thus providing access to disease/parasite-free animals. A common factor, as will be apparent, is that in terms of behaviour and housing these are snakes for those with some experience. Taxonomy for many is confused with some authorities placing all species in the genus *Python* whilst others recognised the genus *Morelia* as separate to *Python* – hence frequently two scientific names are given.

Amethystine python

Morelia amethystina or *Python amethystinus*, frequently referred to as the scrub python, is the largest python in the New Guinea – Australia area. In captivity this slender-bodied snake can reach lengths

Green tree python



of 2.5-4m. Three colour forms have been recorded of uniformly golden to reddish brown, pale brown with broken or complete dark brown X shapes over the back and dark brown specimens with irregular pale spots or cross bars. The scales are iridescent and the skin feels soft. In adults, females tend to be darker with a shorter snout than males giving the head the appearance of being wider.

Native to New Guinea and various islands such as the Tanimbar, Aru and Kai as well as the Moluccas, young specimens are athletic snakes and frequently found in trees as well as on the ground. Adults tend to be more terrestrial in habit. These are very adaptable creatures, as well as rain and monsoon forests they also inhabit more open drier forest. In captivity young specimens are very alert and have hearty appetites. They quickly learn to associate food with the keeper's presence. They also react rapidly and can strike a distance equal to about half the total body length – this has obvious safety implications for the keeper. However, they do become more docile with age.

Green tree python

Morelia viridis, *Python viridis*, and in older literature *Chondropython viridis*, is perhaps one of the better known pythons from the Aru Islands, New Guinea and Indonesia. The green tree is an arboreal snake growing to



Amethystine python – showing typical pose on a branch with head drawn back ready to strike

1.6-1.8m. Its characteristic position is to rest with coils draped over a horizontal perch. Adults are green, the depth of colour varying with the particular region and may be emerald green dark green, olive or yellowish green. Some specimens may be patterned with random white, yellow or pale green scales. Females tend to be larger than males, adults of the latter easily sexed by their large spurs.

The natural habitat of these snakes is tropical rain and monsoon forests and dense thickets of bamboo on forest margins. Humidity is an important element in their care requiring 70% which should be raised to 90% when shedding in order to avoid problems. Some literature describes them as impossible to handle and quick to strike and, whilst we have found this to be true of wild-caught adults, captive-bred youngsters quickly tame down and become reasonably docile. However, prospective keepers should be aware that they are quick to strike and have enlarged anterior teeth.

Hatchling green tree pythons have two colour phases – yellow and red. Both colour phases can hatch from the same clutch of eggs. Yellow hatchlings have yellow eyes, red hatchling red eyes. Gradually the skin coloration changes to the adult green. This process is more straightforward and may take only a matter of months with yellow hatchlings, whilst for red siblings the transformation is more complex and may take two or more years. ■



SOUTHCOAST
EXOTICS

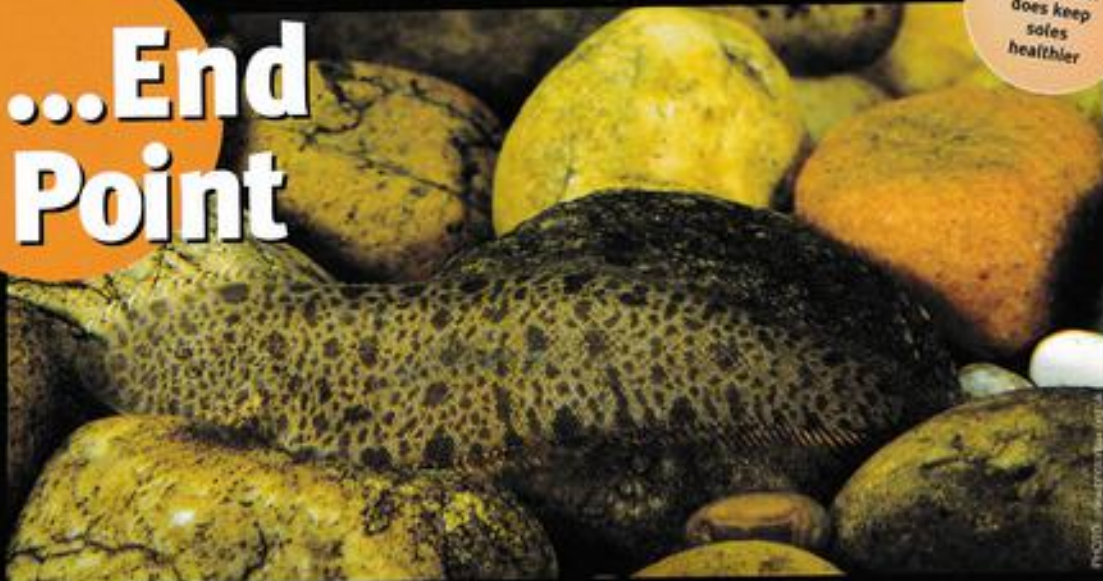
TOP TIP

Young arboreal snakes, which are excellent feeders and quick to strike, will often, until tamed, strike at the front glass when the keeper or other persons are present with possible injury to nose/mouth resulting in the potential for outbreaks of infection such as mouth rot. Green 'curtains' made from cutting green bin liners to form ribbons gives the snakes a greater sense of security and obscures their vision so reducing this behaviour. To feed these creatures safely long-handled forceps are useful aids.

SOUTHCOAST EXOTICS – Reptiles • Amphibians • Invertebrates • Exotic Mammals

Tel: 02392 269362 Email: sales@southcoastexotics.com Website: www.southcoastexotics.com

...End Point



A little salt in the water does keep soles healthier

Kathy Jinkings has some pointers before you buy a freshwater sole

Sometimes, while peering into tanks stocked with an array of brightly coloured fish, the eye might glance away from all the flashing fins and notice a flat brown patch on the gravel or rock. This unassuming smear might just be a freshwater sole.

As yet freshwater soles have not been bred in the aquarium. This is probably due to the fact that most "freshwater" species which belong to predominantly marine families do not actually do that well in fresh water. Many such species are actually on the move from or to estuaries, and are unlikely to spend their entire lives in freshwater. Many other fishes not long, in evolutionary terms, emigrated from the sea actually return there to spawn – perhaps the freshwater sole would also prefer to spawn in a marine environment. A committed aquarist with the resources and imagination to try a wide range of triggers might succeed in spawning them.

Keeping soles

They are quite hardy little fish, as fish who move between water chemistries tend to be. Although water chemistry changes rapidly where the seas meet rivers in estuaries, it is a common mistake to assume that a fish tolerant of chemistry changes will also be tolerant of bad husbandry and pollutants. They won't – there's a lot of water in the sea (and in estuaries come to that), and the high volume of water means that a natural build up of nitrates, ammonia, and the other products of normal fish life is very unlikely. If you do choose a sole, then it does need clean water. Then there is a place to live.

Soles like to bury themselves. Their configuration makes them very vulnerable, and their main defence against larger predators is not to be seen in the first place. To this end they tend to be coloured in variants of browns and blacks – as good an imitation of the river/sea bed as they can manage, and where possible to just leave their eyes sticking above the surface. This makes the choice of a substrate slightly tricky. Sand or a fine gravel should allow the sole to bury itself when it wants without damage. Being very busy about staying still and hiding, the soles are most active (or least inactive) after dark, when you can't see them, and this is when they need to be fed. Although they are vulnerable to predators, the soles themselves are no slouches in the "kill or be killed" cycles. The small fish that are usually available in the aquarium stores are unlikely to attempt anything more ambitious than tubifex or bloodworm, but larger fish may well take small fish. They will need regular feeding of live food – you can try frozen, but some prefer their dinner to be wriggling.

When it comes to choosing tankmates, it would be helpful to know how big your freshwater sole is likely to grow. This is easier said than done, as there are several species that appear as "freshwater sole". *Trinectes fluviatilis* is a 5cm fish from the eastern Pacific, where it ranges from Costa Rica to Peru. It could better be described as "freshwater tolerant" – it does sometime enter freshwater for extended periods, but is still a marine fish. *Achirus lineatus*, the lined sole, is also sometimes referred to as the "freshwater sole" – this nearly 1ft long fish

from the western Atlantic naturally only goes as far as brackish waters. The Selheim sole, *Sympturus selheimi*, also occasionally misnamed the Solheim sole, is a medium sized fish (for a sole) at 15cm. It is endemic to Australia, and does enter freshwaters naturally. The Brazilian freshwater sole, *Achirus errossi*, is slightly smaller at 10cm, while the Salt-pan sole, *Brochilus salinarum*, is a 15cm fish from Northern Australia. All little soles look pretty much alike, and the odds of identifying your inch-long specimen are minimal. Large freshwater soles are not seen in the shops, a fact that should give potential buyers pause for thought. However, if you do manage to care for the fish until it reaches full size, be prepared for that size to be quite substantial.

The freshwater soles have a deserved reputation for being short-lived and demanding to keep. Before you buy a curiosity from the shop, remember that a little brown fish is as deserving of a quality of life as prettier one, and give some serious thought as to whether you are able or willing to meet its requirements. ■

TEMPERATURE?

The variety of species (of which there are undoubtedly quite a few more) doesn't help when deciding the temperature for them either. The Salt-pan sole prefers 72-77°F, while the Brazilian freshwater sole likes it just that bit warmer, at 79-85°F. The Selheim sole bridges the gap, preferring 72-79°F.