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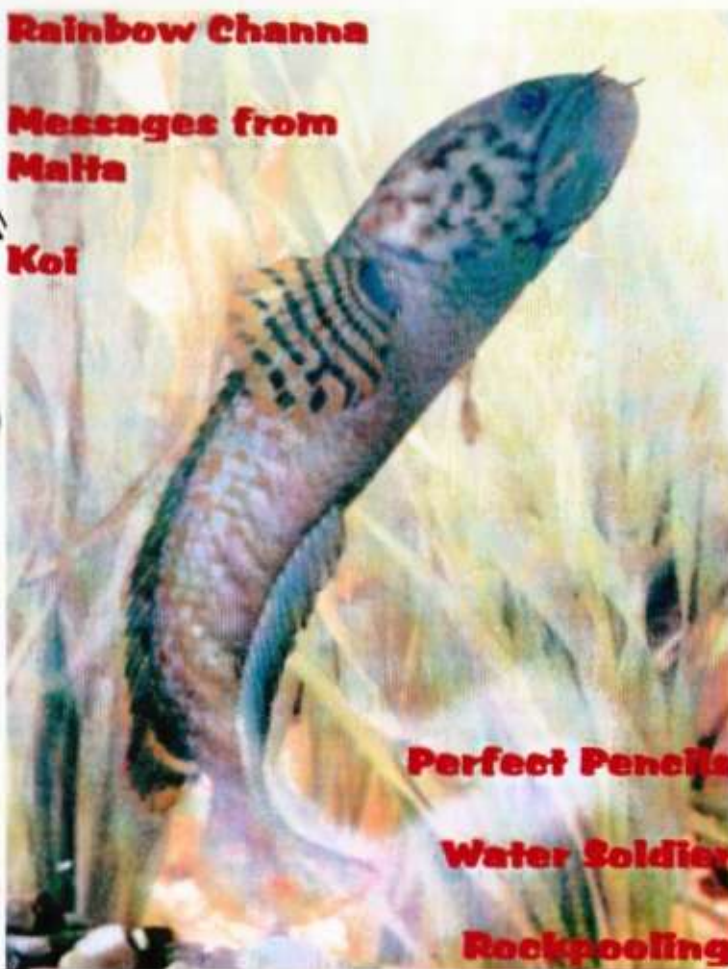
SPRING 1999

FISHWORLD

Rainbow Channa

**Messages from
Malta**

Koi



Perfect Pencils

Water Soldier

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Dear Readers,

Thanks to all our sponsors and advertisers for the past year (Aquarian, Interpet, Hagen, T.H. London Aquarium, BTC Copnor Tropicals and Tetra). Thanks also to the regular contributors (Jack Stillwell, Dr. David Ford, Dr. Peter Burgess, Roger Winter and Malcolm Goss. There are new regular writers coming 'on stream' for 1999, which I am sure you will enjoy.

There has also been a change in the style of sponsorship for "Fishworld" and I believe you will be pleasantly surprised by the input from our sponsors in this issue and those to come this year.

We have become quite 'multinational' with input from India and Malta in this issue and from Australia in the last issue. I would welcome input from abroad as well as the UK.

When I was looking back over the last year I suddenly became very aware of the number of fishkeepers we have lost. Don't let us lose all the knowledge that this generation of fishkeepers has built up over the years. Talk to them and take on board what they have to say or it may be too late! If you have an 'elder statesman' in your Club, why not get him/her to make audio cassettes of some of their experiences?

To end on a more positive note: there are still many plans 'in the pipeline' for the further development of "Fishworld" so watch this space! 1998 was a very successful year for "Fishworld" with subscriptions and contributions growing. Keep it up in 1999!

STOP PRESS: Having sent off his form for MAFF licensing of his fish, Roger Chew has now received a letter asking why he has not submitted the form they sent him. This was after he received an acknowledgement of his application, so beware and keep a photocopy!

Sue Crew, Editor

Contributions for the next issue should be posted to me by 25th April, 1999 at the address in the F&O Year Book (1999) or Sue Crew c/o Albany Print & Design - address below Federation of British Aquarists Societies 1999 The Editor accepts no responsibility for views expressed in any article which remains the property of the author. ELOE Printed by Albany Print & Design, HMP Albany, 55, Parkford Road, Newport, Isle of Wight, PO30 5RS (Tel: 01983 526655 Ext. 483)

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COVER PHOTOS

Rainbow Channa (Channa bleheri) (See article "Aquatic Rainbows" on page 39) Courtesy Roger Chew

MALTESERS by Linda Lewis

Some people will go to great lengths to attend a good fishkeeping show. Over the weekend of 30th October to 1st November, 1998, the "Supreme Festival of Fishkeeping" was held at Weston-Super-Mare. People often travel the length and breadth of Great Britain to be there, but visitors from abroad are much rarer. I was, therefore, very pleased and surprised to meet Clementine and Francis Aveta, a father and daughter who had come all the way from Malta.

In the UK we are privileged to have several large shows to choose between, plus even more Open Shows. There are lots of fishkeeping societies, too. The situation in Malta is different. Over there an event such as the "Supreme Festival" would be unheard of. There is just one fishkeeping society, the membership of which is 100% male - they made it clear that Clementine would not be welcome as a member.

To keep fish in Malta must require a huge amount of dedication. Over here we take for granted the ease of supply that we have, not only of a huge range of fish, but also of accessories from the likes of Rolf C Hagen. Clementine and Francis were overwhelmed by the range of equipment they found at the show, especially heater/thermostats and good quality tank hoods. Things we would not think twice about. They told me how they had several pumps and other pieces of equipment that they could not use, simply because they could not obtain any spare parts for them.

What also struck me about this couple was their sheer enthusiasm. Although they had been keeping fish for many years (Francis has 33 years fishkeeping experience) they still retained that first flush of excitement

about the hobby that so many people lose all too quickly.

Like most of us, they began by keeping mixed community tropicals. Then, about ten years ago they began to specialise so they now only keep Angelfish of the marbled veiltailed variety. For the first few years they found breeding angels very difficult, but they persevered and now achieve high levels of success, feeding the fry on home grown newly hatched brine shrimp. The adults also take shrimp, as well as flake and granular food.

Clementine teaches from home and her classroom boasts a 50 gallon tank. Elsewhere are kept a further eight tanks, all full of Angels. I asked how they disposed of excess stock, as in the UK this would often be achieved either through a fishkeeping society or retailer. Clementine advised me that she had built up a network of contacts and friends over the years with whom she could barter or exchange. "Why Angels?", I asked them. "For their beauty, delicacy and personalities" was the delightful reply.

From what the couple said, I gathered that retailers in Malta often suffer from the same faults as the worst of Britain's do. In other words, they are only interested in making a sale, and not in giving good advice. Further difficulties come from that most basic of fishkeeping requirements - water. In Malta this leaves the tap with a pH of 9, meaning that 6.5 buffers are essential. If this were not had enough, regular power cuts can be expected throughout the winter, on an average of once every week, and not just for an hour or so - up to ten hours at a time! The couple have amazingly got used to this 'little' problem and seem to cope well. Francis mentioned a material called "Jablo" which they use to insulate the tanks, something I had never heard

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of. It turned out that this is 'common or garden' polystyrene foam sold under a trade name.

Clementine and Francis seemed to enjoy every minute of the Festival, taking pleasure in every event and every stall, sharing their enthusiasm with anyone who would care to stop and talk.

The time I spent with them really made me appreciate what we take for granted in the UK. Would events such as the "Supreme Festival" be packed out and over-subscribed if they were rarer? Probably. It's just another example of only appreciating what we have when it's no longer there! Maybe we should all try fishkeeping in Malta for a while, then we might discover how fortunate we are to live here.

FISHY BUSINESS ACROSS THE MILES by Clementine Aveta

My father and I have just returned from Wonderland ... Weston Super Mare, the venue of the FBAS Supreme Festival of Fishkeeping in their Diamond Jubilee Year. We were, indeed, most privileged to attend this prestigious show of tropical beauties (finned ones, I mean!).

We arrived at the holiday resort in pitch darkness and pouring rain (it was almost as weird as "Macbeth's" introductory scene, but what looked 'foul' was to turn out impressively 'fair'!

We were soon to be regenerated with a double change - a warm welcome by Joe Nethersell and members of his Committee - and a well-sized brandy at the bar! After a couple of waltzes in the ballroom, we felt at home.

Next morning the ballroom had disappeared ... transfigured by the touch of the organiser's magic wand (and it's not the brandy speaking!) into an idyllic

countryside scene, complete with the lapping ripples of a river fall, quaint mahogany bridge, colourful Koi pond and lush greenery. We stood speechless. It had cost! Officials and their collaborators a whole night's toil and trouble. What wonderful teamwork! Well done, boys (and girls)!

Pontin's resort looked like a bee hive, each participant keenly intent on setting up his/her tank, stall or aquascape - and that's what also impressed me: the quasi-amorous manner whereby the hobbyists handled their little gems! Indeed, not one of the latter felt like a fish out of water! By the time all was ready, it was a spectacular sight of rare species and colourful old dears. (I must say that my heart went to a soft coral, marine tank, with its breathtaking, natural aspect, brightly-coloured little inhabitants and, above all, its clockwork-perfect motor. Well done Marion and Simon!)

On the weekend, the festival attracted crowds of families; it was lovely to see how carefully displayed animals and plants could bring so much joy into people's lives! However, among the main attractions were the lectures: I particularly enjoyed Dr. Steve La-Thangue's on water quality - in thirty-three years of reading and attending lectures on this topic, rarely had complicated scientific points been expounded so simply to the lay listener ... Thank you, Steve! The constructive exchange of views was invaluable!

Well, I am running out of superlatives - undoubtedly well-deserved ones for Joe and his hard-working gang. Heartfelt thanks to you all for making our stay so pleasant; thank you for honouring us in the way you did! All our friends in Malta will hear about it!

Ed's note: It was our pleasure, Clementine. We would all be pleased to see you both in the future.

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STRESS RELIEF FOR EXECUTIVE FISHES

Stress is a natural reaction to adverse conditions. Stress causes biological changes that prepares an individual to respond in order to protect itself from harm. The response is that the body enters into a condition that is commonly known as the 'fight or flight' syndrome.

Stress is caused by physical or psychological stimuli, (known as stressors), which threaten the individuals well being. The symptoms of stress can be physical, mental or behavioural. There are also varying degrees of stress that an organism can exhibit.

A highly stressed organism may be suffering from shock - a condition affecting the heart and blood supply, that can lead to death. An organism suffering from a moderate amount of stress runs a high risk of catching a disease. An organism suffering from a low level of stress may suffer a loss of appetite. The cause of a stressful situation may be minor, but when it is experienced over a long period of time the overall amount of stress increases. The result of this is stress fatigue, or chronic stress.

A fish suffering from stress will in the short term, exhibit abnormal behaviour such as either rushing wildly about the aquarium or lying listlessly on the bottom with its fins clamped up. If the source of the stress is not removed, the fish usually succumbs to a disease such as whitespot and, before long, death.

What causes stress in fishes?

A fish is immersed in water; therefore, any adverse conditions in this environment will affect the fish and cause stress. Plus in the closed environment of the aquarium, the fish often cannot escape the stressor unless the fishkeeper removes it.

Poor Water Quality is the major stressor that affects the well being of fish. The following are some of the factors that can and often do contribute to poor water quality.

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Stressor	Effect
Waste Materials	Solid material in the water leads to poor visibility and irritation/clogging of gills. Dissolved pollutants such as ammonia, nitrite and nitrate will affect the general health of the fish.
Heavy Metals	E.g., zinc, lead, copper and so on as well as other trace elements, even in very small amounts, can poison fishes.
Low Oxygen Levels and High Carbon Dioxide Levels	Occur when there is poor water circulation, in an aquarium.
Raw Tap Water	To make it suitable for human consumption this undergoes many treatments. Unfortunately these procedures leave toxic residues like chlorine and chloramine which are detrimental to aquatic life. Chlorine and chloramine not only harm fish but will also kill off the beneficial bacteria that are so important in the processing of soluble wastes.
Excessive Vibrations	Because fish have a very well developed sense of "hearing" via their lateral line or pressure sensing organ excessive vibration will result in stress.
Outside Pollution	Solvents and aerosol sprays are dangerous to fish. These pollutants may be removed from the aquarium by filtering the water through activated carbon, but the best way to avoid this form of pollution, is to keep them away from the fish tank.
Sudden Changes in the Environment	Changes in temperature and/or pH are frequently a cause of stress in fishes. This often occurs during partial water changes when no effort is made to renew the tank water with water of similar characteristics.
A Poor Diet	This may be simply uninteresting or it may be deficient in some essential components required by the fish. Providing a poor quality diet will eventually lead to disease and internal damage.
Injury	Poor handling techniques, fighting with or bullying from tank mates or the inclusion of sharp objects in tank will all contribute to increasing the stress level for aquarium occupants.
An Unsuitable Habitat	This can contribute to long term stress or stress fatigue. For example, a catfish which requires plenty of concealing and hiding places, will not thrive in a bare tank with bright lighting.
Abnormal Social Interactions	These occur due to boredom or over-stimulation by overstocking or mixing incompatible fishes. It is important to plan which fish you intend to keep in the aquarium and avoid the impulsive purchasing of fish with unknown habits or requirements.
Putting too many Fishes into a Tank	This puts its occupants under a lot of pressure. Not only is there a greater production of waste, but the constant attack from disease causing organisms is multiplied.

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"Remember when the bin men went on strike?"



by Les Holliday
Aquatics Advisor
to Hagen (UK) Ltd

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Waste disposal is probably something we all take for granted, until we're occasionally reminded how important it is. Do you remember the dustbin men's strike in the 70's, with the mounting piles of stinking rubbish in our streets? It wasn't just unpleasant, it was also a situation that provoked public health warnings from the Government.

In a more acute way your aquarium can become a hazardous place for fish if waste materials are left to build up and decay in the tank.

Rotting vegetation, fish waste, leftover food, all create pollution which is extremely harmful to fish. **Waste Control** organic waste eliminator and **Cycle** biological aquarium supplement contain complementary teams of bacteria



which clean up dirty aquariums and maintain healthy water conditions for fish. Waste Control uses bacteria and mineral substances to rapidly break down organic waste, cleaning gravel, filters, decorations and interior aquarium surfaces where sludge accumulates. It also helps to suppress the growth of algae too. Use Waste Control and Cycle together at every water change, in new tank set ups and after the use of medications. The high concentrations of good bacteria in Cycle utilise the end-products of Waste Control as well as dramatically reducing levels of ammonia and nitrite. In new tank set ups Cycle is unparalleled and is the ideal way to rapidly mature sterile water and prevent 'New Tank Syndrome' and fish fatalities. Regular use of Cycle in an established system can ensure an active bacterial colony to maintain healthy water quality.



STRESS RESPONSES

All vertebrates respond to stressful situations by releasing hormones into the blood. Various physiological changes then take place in the body which includes the release of extra energy, an increase in blood flow and an increase in respiration. However, the production of these hormones can also have negative effects on the body.

In fishes their release results in:

- * Osmotic stress. Osmoregulation is the process that controls the fish's internal water balance. The osmotic stress is due to the negative effect of the fight or flight hormones.
- * Immuno-suppression. The release of hormones causes a reduction in the number of white blood cells. White blood cells are a main line of defence in the fight against disease.

In response to the hostile nature of the aquarium Hagen has provided the fishkeeper with the Total Care range of products. A small armoury in the fight to reduce the causes, consequences and symptoms of stress.



This tap water conditioner eliminates chlorine and chloramine. Even traces of residual chlorine as low as 0.010 ppm in tap water can greatly disturb the well-being of aquarium inhabitants.

Minute traces of metal like iron, mercury, copper, lead, cadmium and manganese can be toxic and Aqua Plus contains a special reagent that reacts strongly with these undesirable metals to neutralise their destructive power.

People have long known about the positive results derived from the use of multiple vegetable and herbal extracts. Aqua Plus water conditioner contains a rich supplement of essential oils. These Pure Herbal Extracts contribute a positive sedating effect against stress. Plus this special mixture of selected ingredients, promotes healing.

Aqua Plus should be used when initially filling the aquarium, carrying out partial water changes, when adding new fish to the aquarium and when transporting fish.

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waste Control

Organic Waste Eliminator

Food deposits, fish excrement and dead leaves or algae are all rapidly eliminated from the aquarium by Waste Control. These wastes are solubilised into mineral matter which is then controlled by Cycle.

Waste Control also helps to reduce algal growth by interspecific competition. Nitrogen and phosphate, present in the tank from the degradation of fish food, are used by the bacteria in Waste Control as a food source. This reduces the availability of these nutrients for the algae to use for growth.

Dose on installation and weekly to establish and maintain bacterial levels. Also use for waste accumulations, however, it is important to note that the breakdown of large amounts of waste material may result in a temporary ammonia/nitrite peak. This should be counteracted by the addition of Cycle.

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Cycle employs a team approach to biological water purification, by blending together 11 different strains of bacteria including Nitrosomonas and Nitrobacter strains.

Cycle is extremely efficient when initiating biological filtration in new, sterile set-ups and provides the proper bacterial strains to reduce ammonia and nitrite before either can cause stress to fish. Addition of Cycle to temporary accommodations such as show aquariums or emergency and hospital tanks make brief stays less stressful and dangerous to prized fish.

Bacteria are the most predated living sector; bacterial populations evolve and change over time. The best way to ensure that the right bacteria are available at the right time is to continuously inoculate with the right strains. Weekly Cycle addition biases the aquarium towards Nitrosomonas and Nitrobacter, making it inhospitable for invading strains and algae. They ensure the overall aquatic environment has the best possible water conditions and the strongest disease resistance possible for your fish. Scientific studies also show that the weekly addition to beneficial bacteria controls the population growth of pathogenic bacteria, (responsible for many illnesses), by competitive exclusion.

Use Cycle at the installation of a new aquarium, and temporary tanks. Weekly doses will help to maintain beneficial bacterial populations. Also use when adding new fish.

Medical treatments may occasionally knock back beneficial bacterial populations. Adding Waste Control and Cycle will help restore them to normal levels.

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TARQUIN'S OWNER TRAINING GUIDE!

by Tarquin Kisser



I don't suppose I need an introduction being the most famous fish in the country, if not the World. For those who don't know me I am the most talented, beautiful fish in the World and would like to help you attain my perfection.

Aquarists concentrate so much on water quality, which I'm sure is important to us, but what of our psychological well-being? Magazines carry advice columns for every imaginable problem that could befall us, but there is no 'agony' aunt or uncle. This gives the impression that fish don't have brains. I think the time has come to let it be known that we are highly intelligent creatures and to let us have our say. Write to me with your problems and hopefully I can help you.

You may wonder what gives me the right to set myself up as an expert in these delicate matters (make no mistake I am an expert)? I know it's been said I'm stupid, brainless and even psychotic. This I put down to ignorance on the part of humans. Your owners have cats and dogs that are probably kept in the house as part of the family. Humans talk to them, stroke them and give them lots of attention. We can be shut away in the fish house, visited twice a day and what do they do? Gaze into the tank for a while, throw in some food, test the water, water change you and not once do they speak

to you. If you are a show fish, you are the one who really needs help. All your owner is interested in is your size, fin condition or good colour and deportment. They haul you from your nice, comfortable home and dump you in a bucket or small tank and drive you for miles hitting every pothole on route.

When you get to the show you are stuck on a bench with lots of other fish - all unhappy like you - and you spend the next few hours having to sit there. You might be queasy from the bumpy car ride, but you are expected to look happy. That's not likely, either, with people sticking their faces to the front of your tank, discussing your dorsal fin being a bit tatty, perhaps. You want to scream that it was OK until they chased you round the tank and caught you in a horrible rough net, but of course you can't.

These humans, who assume that we fish don't have brains, have a strange way of using their own! To be a good show fish we have to reach a certain size. So what do they do before we are taken to a show? They stop feeding us for a few days because those delicate creatures called Judges don't like to see that unthinkable stuff in the bottom of the tank. It appears Judges - unlike the rest of humanity - don't go to the toilet. The Queen does, but Judges obviously don't.

The next confusing bit is the way they calculate our measurements. How many animals, plants or people do you know whose measurement does not include the whole body? This Judge thing doesn't realise that the tail stuck on your body belongs to you, so what do they do? They don't count it in the length of your body measurement! And they call us brainless!! Consider that breed of humans called Judges. They who sit in judgement of us, gaze at us to see how many faults they can

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find. Take a good look next time you're on the show bench. How many of them would get full points? I bet there isn't even a norm size book on the species. If there was there would be a lot of disqualifications. How many would get points on department? They are all shapes and sizes with bellies that bulge so much they can't get close enough to see us so they stick those things called glasses on the end of their nose. It's them who should starve a few days before a show.

Some have even got bits missing. That stuff that comes out of the top of their heads is missing on some of them. On some it even comes out somewhere else, like around the mouth. I can't answer for the other end of their body. Perhaps that's the reason they keep it covered. Perhaps they haven't even got a tail! Yes, friends, this is the species that sit in judgement of us fish.

Then comes the most humiliating part of the day. What happens if you have won? Is that honour bestowed on you? Is it hell! All the credit goes to your owner. They hold the trophies aloft, suck in their bellies and puff out their chests, while everyone admires the human for having such a good 'specimen'. They pat him on the back, say "Well done" (which they don't really mean because they think their fish is better). You get ignored and can only look forward to a bumpy ride home, but at least when you get home you'll be given something to eat!

It needn't be like that. I could set up an owner training scheme so you can train your owner or our own union and call it FRASH (Fish Revolt Against Show Harassment), but I'm open to suggestions for the name of our union which would also welcome coldwater and marines.

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WATER SOLDIER (*Stratiotes aloides*)

by Sue Crew

The first in a regular series of water plant profiles to bring colour and interest to your pond or water feature.

This is a native plant to Britain and whilst it was common at one time in East Anglia it is now rarely seen. It is only thanks to the water gardener that there is little danger of extinction, but we should still try to propagate this plant to ensure its safety.

Because the Water Soldier is a native British plant you do not need to lift it in the Autumn.

You may also hear this plant called the "Pineapple Plant" owing to its similarity to a Pineapple plant with its spiny leaves. Its structure and appearance is also very similar to some succulent plants and bromeliads.

The plant grows in a rosette with 1" wide tapering leaves which can reach a length of 9", which means the diameter of the plant can reach up to 18". Because of its size it is obviously not a plant for a small pond or water feature. The dark green leaves are edged with recurving prickles so you should take care when handling this plant.

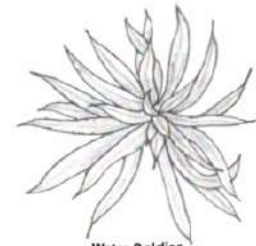
Elderly plants can become quite brittle.

Young plants are produced from the centre of the rosette on runners similar to the houseplant commonly known as the Spider Plant and are comparably soft in texture. The centre of the rosette also produces long, white roots, which, if planted in shallow enough water will anchor themselves to the substrate. These roots and also the rosette of the plant itself form safe havens for fry and small fish to live in as well as insects.

During the summer the Water Soldier stands slightly above the surface of the water and will produce white flowers. In the Autumn, the leaves produce a slimy secretion and the plant sinks towards the bottom of the pond where it remains safe from the elements until the spring when it rises towards the water surface again.

There have been fossils found of this plant and it is unique in that it is the only surviving member of its genus. I believe seven originally existed.

I have kept this plant myself and would recommend it to others. Whilst it is a British native plant it looks as though it might be of tropical origin and will certainly contrast well with other plants you may have. Once established I have found the Water Soldier needs little care except to occasionally split the young plants away from the parent plant to propagate the species.



Water Soldier

Huddersfield Tropical Fish Society - new venue from 16/3/99 - Primrose Hill Liberal Club, Style Common Road, Primrose Hill, Off Newsome Road, Huddersfield. Tel: 01484-328045

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FEDERATION OF BRITISH AQUATIC SOCIETIES
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My Fish House

by Mike Marriott (Solent AS)

I have been keeping fish for over 29 years now. As with most people, I started with one small tank and having become infected by the "fish bug" and "showing bug" I 'needed' more and more tanks. Lately I had nine 24"x8"x8", three 24"x10"x8", eleven 14"x8"x8" and one 10"x8"x8" tanks. I maintained all of these in the dining room until three years ago when I was forced to erect a fish house.

I made my fish house out of tongued and grooved Cedar wood and it measures 12' x 6'. It has two windows at the front and one on either side, which are all double glazed and have net curtains to diffuse the bright sunlight.

The walls are insulated with Rock wool and polystyrene sheeting which is then covered on the inner side with half inch marine ply. The floor consists of one flooring grade polystyrene sheet which is again covered with half inch marine ply, followed by another polystyrene sheet and another half inch marine ply layer, thus giving four layers in total. This is then covered by two layers of foam backed kitchen carpet and a shower curtain (to prevent water seepage).

Space heating is used via a thermostatically controlled electric fan heater, with a calor gas fire as a standby as I had a nasty experience last winter and lost all of my stock!

The tanks listed above are all situated on four metal stands measuring 65"x28"x12" with four shelves on each stand.

There is a lot of natural light from the windows, but I also use a 4 fluorescent strip light on a time switch to save the trouble of remembering when it needs switching on or off.

All of my tanks have gravel in them and are planted with *Cryptocoryne beckettii*, *Cryptocoryne wendtii* grun and *Hygrophilla polysperma*. Each of the tanks has its own sponge filter which are connected to one Whisper 1000 air pump and two Whisper 300's.

At the moment I have *Xiphophorus maculatus*, *Xiphophorus helleri*, *Poecilia chicha*, Bottom Sword Guppies, Red Cofer Tail Guppies and *Heterandria formosa* all breeding. I have also recently acquired some *Corydoras panda* which I hope to be able to breed at some time in the near future.

I have made many friends over the years through the hobby of fishkeeping and have had many hours of enjoyment from it. I would advise anyone who has just one tank at present, to keep the hobby going for future generations so that they may have the same enjoyment and experiences that I have had.

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**Left:
Kin-Gin-Rin
variety**



**Right:
Showa
variety**

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SIZE MATTERS?

by Ray Kilham

Ray provides us with some valuable insight into the judging of Koi to BKKS standards.

When judging Koi as opposed to say, tropical or coldwater fancy fish, size for the Grand Champion does matter.

Koi are normally judged in the UK in the following size groups:

- Size one - up to 6"
- Size two - 6"-10"
- Size three - 10"-14"
- Size four - 14"-18"
- Size five - 18"-22"
- Size six - 22" and over

There are also fourteen different variety classifications.

So, why does size matter? Let us have a look at the three basic criteria normally used to judge a fish:

1. Pattern
2. Body/volume
3. Colour

The pattern on two Koi is never the same. The pattern overall should be well-balanced and consistent over the body of the fish, thus giving an overall pleasing effect. As an example, take a Kohaku (a white fish with red markings). The edges of the pattern such as the border between the red and the white should be clear, crisp and well-defined. Here we have the first part of how size matters, because as the fish grows the pattern stretches with the fish, so the fish that achieves a greater length and still maintains a good pattern becomes a more valuable asset.

Body and volume are of primary

importance when viewing from above, as judging Koi is carried out by using this method. The body must be symmetrical and the backbone straight and without bending or twisting its body.

The fins should always be in balance with the body size. The head should always be clear and free from any marks or indentations.

Volume on a fish is an imposing sight and is a factor that the Judges take into account. The Grand Champion of a show is nearly always a jumbo Koi and because of this in the majority of cases is a female fish. A Koi in a jumbo size with all of the required factors (i.e. good colour, imposing pattern, good body shape and skin quality) is a testament to the keeper's skill, for it is exceptionally hard to maintain these qualities in a larger fish.

As a Koi grows, the colour pigmentation can - on lower grade fish - either fade or develop 'white windows'. This is especially true on the Hi (red) skin fish.

The white skin on the fish must remain a "...delicate, creamy white...". On a lower grade Koi the white skin can take on a dull off-white look to it. In addition, it should not contain any small, dark marks known as 'shimis'. The Sumi (black) should take on the appearance of ebony.

The skin should have an overall lustre to it, giving the appearance that the Koi has been covered with a coat of clear varnish.

To summarise:

Size does matter. For the Koi-keeper who grows his stock in tip-top condition, the correct water conditions coupled with a good diet can produce a large/jumbo-sized fish that falls in line with the above criteria that will always look imposing to the Judges.

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INTERPET QUESTIONS AND ANSWERS MANUAL THE WATER GARDENING HANDBOOK

Author: John Dawes

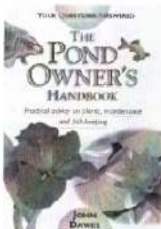
Publisher: Andromeda Oxford Ltd. (distributed by Interpet Ltd.)

Reviewed by: Roger Crew



Obviously the companion volume to the above publication. This book, however, did live up to the expectations I had of it when I read the author's name.

John Dawes is a man with a wealth of experience and expertise in a great many areas, but his name is synonymous with the water garden, and John has done justice to the subject here. Not as many fish 'photos' as the previous volume, but a full treatment of the subject is delivered in a well written style that should satisfy any reader. Buy it or regret it!



YOUR QUESTIONS ANSWERED THE POND OWNERS HANDBOOK

Author: John Dawes

Publisher: Andromeda Oxford Ltd. (Ward Lock UK)

ISBN: 0 7063 7765 6

Reviewed by: Roger Crew

Now, here is the easiest review I have ever written! I might get into trouble if I were to suggest that this was the same book as the one reviewed above, as I notice the title and at least the photographs in the back cover differ between the two. Oh, and this one has not only an ISBN number, but it is priced as well. £14.99 will buy you a book equally as good as "The Water Gardening Handbook"! If, like me, you have them both in front of you, you may wish to play 'spot the difference', but I would simply suggest you buy whichever you can find at the lower price and read the contents not the cover. Happy hunting.

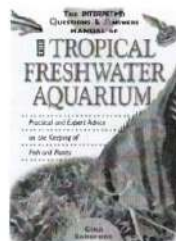
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INTERPET QUESTIONS AND ANSWERS MANUAL OF TROPICAL FRESHWATER AQUARIUMS

Author: Gina Sandford

Publisher: Andromeda Oxford Ltd. (distributed by Interpet Ltd.)

Advisory Editors: Lee Finley and Brian Walsh



OK, that's enough - the names and pedigree should sell this book on their own. 208 pages of 'photos, text and containing a little of everything'. In fact, that is what surprised me. Given the persons listed above there was a somewhat disappointing content for me. This is a perfectly respectable book, but it has little novel, new or different to offer. I was searching for a depth of coverage of - yes - catfish that is just not there! Cats there are, but not covered in the depth I would have expected and this did detract from the strengths of the book for me. So, to be fair, what are the strengths? Well, the fish covered do include several not frequently covered within a generalist book such as this, and it is certainly as good as any of its contemporaries. Ironically the only thing I found really irritated me was the Q and A format included as the 'closer' of each section. I felt this is a much over-worked and over-rated format. Do check it out for yourself though if you want a reasonable, general introductory book for a friend or relative.

THE AQUARIUM FISH HANDBOOK

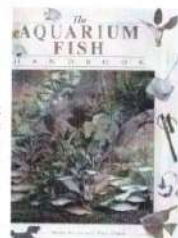
Authors: Mary Bailey and Nick Dakin

Publisher: New Holland Publishers (UK) Ltd

ISBN: 1 85368 788X (hard cover)

ISBN: 1 85974 190 8 (soft cover)

At first glance you could be forgiven for thinking that this was just another 'run of the mill' book aimed at the 'new' aquarist setting up their first tank. The cover gives little indication of the well thought out, presented and written contents. As might be expected of a book co-authored by the name in cichlids there is a fair emphasis on cichlids amongst the illustrations in particular. Offset as this is by an equally disproportionate marine content, those fishkeepers who keep neither should not be put off buying this book. Beginner and 'experienced' aquarist alike will find this a compelling read due to its strong emphasis on creating an empathy with the natural world and drawing this into the hobbyist tanks. This is a book about fishkeeping, not about fish. A truly refreshing approach which can captivate the newcomer just as strongly as a 'catalogue of fish pictures' might. Well illustrated with both photographs and diagrams, the authors should be well pleased to have produced a quality product. Unfortunately I am unable to tell you the retail price!



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RAINBOW FISHES KEEPING AND BREEDING THEM IN CAPTIVITY

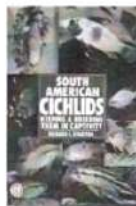
Author: Derek Lambert
Publisher: TFH Publications Inc.
ISBN: 0-7938-0376-4
Reviewed by: Roger Crew



A sixty-four page publication of the print quality and standard of photographic reproduction which we have come to expect of TFH publications, and are second to none. The format is familiar, including the 'obligatory' feature of two Takashi Amano planted tanks to boost the sales of another TFH publication. Yawn, yawn! However, unlike many TFH books, this is not merely a collection of pictures, this is a book which, thanks to the enthusiasm and expertise of Derek Lambert goes well beyond that, to not only give a sound introduction to Rainbows, but also serves to become a serious treatise on the subject. Whether or not you keep these delightful fish, you will find this book compelling reading. A handy-sized book for that sensible bed-time read!

SOUTH AMERICAN CICHLIDS KEEPING AND BREEDING THEM IN CAPTIVITY

Author: Richard F. Stratton
Publisher: TFH Publications Inc.
ISBN: 0-7938-0364-0
Reviewed by: Roger Crew

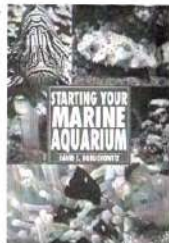


The same size, similar quality and even more Amano tanks for your money! Incidentally, I don't know why it is, but nobody seems to want to tell us how much their books cost lately. Of six reviewed this quarter, only one is priced, so don't think I'm not telling you for any other reason than I do not have this information. However, back to the book. I found the introductory chapter "Finding a Niche" overly full of photographs of Cichlids from everywhere but South America. There was justification for some 'scene setting' and comparison drawings, but this section was largely wasted, and the relevant information could well have been included in later text and the 'photo space devoted to what the book purported to be about. The remainder of the book is fine, but I can't help but reflect on how much better it might have been. Suitable material for the 'beginner' to the Cichlid scene.

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STARTING YOUR MARINE AQUARIUM

Author: David E. Boruchowitz
Publisher: TFH Publications Inc.
ISBN: 0-7938-0360-8
Reviewed by: Roger Crew



This book is similar in size and presentation to the two described previously. I checked - somewhat tongue in cheek - but couldn't find any Amano tanks and only a subtle suggestion of an advertisement for another TFH publication. These 'subtle' digs aside, I can't fault the book. As an avowed freshwater fishkeeper, this was the ideal book to whet my appetite for a marine set-up. (OK Editor, don't panic, I'm not hooked.) If... if I were to be tempted into the marine scene, then I think this would be the ideal guide to start me off. Hide it quick!

PERFECT PENCILS

by Dr. David Pool, Tetra Information Centre

The pencil fish are a small group of fish which deserve to be more popular than they are. They are brightly coloured, small and have a peaceful nature. Added to this, they are also relatively straightforward to breed and have a number of interesting behaviours, making them ideal inhabitants for the community or specialised aquarium.

separate the *Poecilobrycon* from the *Nannostomus*. However, fish from the same batch of fry in both genera have been found with and without the fin.

For the aquarist the complexities of the arguments are unimportant and it is sufficient to realise that the different names exist and may be used from time to time.

Maintenance - water conditions

The pencil fish originate from the Amazon basin and the Guyana islands where they are found in sluggish, overgrown streams and in shallow back waters. The water in these areas varies from season to season, but it is generally soft, slightly acidic and discoloured by the presence of tannic acids. In the aquarium soft acidic conditions are ideal but, given a gradual acclimatisation period, the pencil fish will survive in water that has a pH of 7.5 - 8.0 and a moderate hardness (10°dH). This is in keeping with many of the other Amazonian species such as the tetras and angelfish. Water temperature is also not critical and anywhere in the range from 23° to 28° C is ideal.

Pencil fish are particularly susceptible to the presence of raised pollutant levels (ammonia, nitrite, nitrate and chlorine). Therefore good filtration and regular partial water changes are essential, as is the

Classification

There is some confusion over the exact classification of the pencil fish and they have been assigned to several different families and genera since their discovery by Gunther in 1872. The pencil fish are all in the same sub order (the characoidei) and are therefore closely related to the tetras, piranhas and headstanders.

The pencil fish have formerly been placed in the *Nannostomus*, *Nannobrycon* and *Poecilobrycon* genera. Although opinions vary, it is widely accepted that all of these genera should be combined in the one genus *Nannostomus*. The reason for the confusion stems largely from the variability of the group. For example, the presence of the adipose fin was used to

Life with 'Goldie' by One



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use of a good quality water conditioner to remove any traces of chlorine from the water.

The Aquarium

Because of their small size (maximum 6.5cm) the pencil fish can be kept in small aquaria of 18"x12"x12" (45x30x30cm) and above. However, they should be kept in small groups of three or more individuals for them to behave normally, even in the smaller aquarium.

In the wild, pencil fish live in overgrown areas where their very streamlined shape allows them to swim between the plants and roots without any problems. These are also the best conditions for the aquarium and areas should be densely planted with Amazon Swords, Hygrophilla, Cabomba, Cryptocorynes, etc. Surface plants are also useful as they provide shelter and subdue the lighting. The lighting is important and if too bright, the fish will now show their true behaviour or colouration. To encourage the colours many aquarists who specialise in pencil fish use dark coloured gravel as substrate.

The colouration and patterning of the pencil fish shows an interesting and species specific change from light to dark conditions. So much so, that if you suddenly turn the aquarium light on in the middle of

the night, the pencil fish resemble a different species. For example, *Nannostomus trifasciatus* will exhibit horizontal lines in the light which will change to vertical blotches in the dark.

Despite their streamlined shape, the pencil fish do not like fast flowing water, particularly if this causes disturbance on the water surface. To reduce this, carefully aim the filter outflow against the side or back of the aquarium and turn down the airstones. The dense planting and surface plants will also help to reduce any turbulence.

Feeding

In the wild the pencil fish feed largely on aquatic invertebrates in mid water or flies which fall onto the water. They can often be observed hanging motionlessly close to the surface waiting for suitable food, or slowly stalking the food through the plants. The tube mouthed *N. eques* and one-line *N. unifasciatus* pencil fish adopt a characteristic angled position in the water with their head pointing towards the surface. This allows them to feed easily off surface dwelling insects.

In captivity, the pencil fish readily accept good quality flaked and freeze dried foods. The size of the food should be taken into account when feeding. The pencil fish only have very small mouths, therefore large particles of food simply

cannot be ingested. Live foods are readily accepted, but because of their limited nutritional value and the disease risk they should only be used as an occasional treat rather than a staple diet.

Breeding

Most of the pencil fish are easy to breed if the conditions in the aquarium are suitable. They can be easily sexed by the means of the anal fin. In the male it is rounded at the front end and has a slight lobe, whereas in the female it is straight edged and pointed at the front. In addition, there are the universal features such as the females being fuller in the abdomen and the males more intensely coloured.

A pair of pencil fish will spawn in an aquarium which is only 12"x8"x8" (30x20x20cms), although double this size is more likely to result in success. The water in the breeding tank should be soft (2°-6°dH) and slightly acidic (pH 6.0-7.0). This can be achieved by using rainwater and mixing it with tap water or by acidifying the tap water using peat as a substrate or in the filter. It is important that the water is free from pollutants, therefore take care not to overfeed the fish in the breeding tank and conduct regular partial water changes.

The aquarium should contain

dense clumps of plants but the type of plant depends on the species of fish to be bred. Dwarf pencil fish (*N. marginatus*), Harrison's pencil fish (*N. harrisoni*) and Golden pencil fish (*N. beckfordi*) are egg scatterers and the aquarium should contain fine leaved plants such as *Myrophyllum*, *Riccia* or *Cabomba*. The barred pencil fish (*N. unifasciatus*) will often attach their eggs to the underside of plants, therefore broader leaved plants such as *Hygrophilla* should be added.

The parents should be conditioned using higher protein foods such as Tetra Ruby Flaked Food, freeze dried foods or live foods. After 7-10 days of conditioning one or preferably 2-3 pairs of fish should be introduced to the breeding tank in the evening. The fish will often spawn the following morning. If they do not, slowly raise the water temperature 1°C each day up to 28°C and the addition of a Blackwater Tonic will often start the spawning. In some cases it may take several days or even weeks before the fish start to spawn. The egg scattering species are prone to eating their own eggs - particularly *N. marginatus* - and so should be removed soon after spawning.

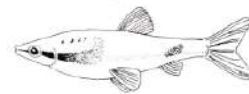
The breeding behaviour involved the male chasing the female around the tank and displaying to her.

Eventually, they press together, the flanks quiver and 1-5 eggs are released and fertilised. In those species which attach the eggs to a plant, the male then breaks off and catches the eggs in his anal fin and selects a suitable leaf onto which he sticks the eggs. This process is repeated a number of times until 50-80 eggs are released. If in good condition, the whole process can be repeated after 4-5 days. However, it is advisable to remove the parents and use a separate tank for the next spawning.

Raising the fry

Although breeding the fish is relatively easy if you can achieve the correct conditions, raising the fry is more difficult. This is largely due to their very slow growth. The fry hatch after approximately one day at a temperature of 27°C and one day later you should see them attached to plants and the glass. In between they will be laying on the gravel where they are difficult to see - so do not clean out the aquarium at this stage fearing the worst! The fry are free swimming after five days and should be fed initially on infusoria followed three days later by newly hatched brine shrimp and when they are large enough, with dried fry food. The growth is very slow and it may take 9-12 months for them to reach the adult size.

The slow growth rate of the fry and inaccessible areas where the parents live result in the pencil fish not being as commonly available as the tetras, for example. However, if your local aquarist shop has several specimens they are well worth adding to your collection, particularly if you have a small aquarium.



Two Banded Pencil Fish
Top: Day Bottom: Night colours



Golden Pencil Fish
Top: Day Bottom: Night colours



Three Banded Pencil Fish
Left: Day Right: Night colours

TABLE 1

Commonly available pencil fish

Scientific name	Common name	Max size
<i>Nannostomus beckfordi</i>	Golden pencil fish	6.5cm
<i>N. bifasciatus</i>	Two banded pencil fish	6cm
<i>N. diagrammus</i>	Two striped pencil fish	6cm
<i>N. eques</i>	Tube mouthed pencil fish	5cm
<i>N. espei</i>	Barred pencil fish	4cm
<i>N. harrisoni</i>	Harrison's pencil fish	6cm
<i>N. marginatus</i>	Dwarf pencil fish	4cm
<i>N. ocellatus</i>	Tail eye pencil fish	5cm
<i>N. trifasciatus</i>	Three banded pencil fish	6cm
<i>N. unifasciatus</i>	One lined pencil fish	6.5cm

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SINGAPORE FISH

by Sue Crew

1999 again sees "Aquarama" in Singapore and intrepid aquarists from Britain will, in June, pack their bags to make the journey. This article is just to 'get you in the mood' for the resultant write-ups when we return.

Singapore's natural environment has altered considerably in the last 100 years - initially due to British influence. Many areas which were important to the fish of Singapore have now been lost. Perhaps the most obvious changes for the visitor to Singapore are within the urban habitats - the monsoon drains and canals. Anyone visiting Singapore cannot fail to notice the massive building programmes going on throughout Singapore city. It is a wonder that any fish at all survive in these bodies of water as they are often heavily polluted with water levels varying drastically at certain times of the day reducing canals to virtual streams. There is no cover from predators and the pH fluctuates a great deal.

Many of the fish surviving these conditions have been introduced to Singaporean waters. The most typical species to be found are tilapia, guppies, mollies and sometimes snakeheads.

As more of the natural streams become upgraded to concrete monsoon drains to cope with the drainage problems associated with such a heavily populated area, it will be again at the expense of native species.

Reservoirs are another common source of freshwater on Singapore island of which

there are two main types: the catchment reservoirs surrounded by secondary forest and the estuarine reservoirs (dammed up river mouths). The species found in the catchment reservoirs are more diverse, but many of them are still introduced species. In the estuarine reservoirs the fish are confined to freshwater even though they are estuarine species.

Ponds provide another habitat for fish and here you will find Tilapia abundant together with snakeheads, eels, labyrinth fish and some carp species.

There are three different types of natural flowing water available within Singapore - open country waters and the primary and secondary forest streams. The open country or rural streams are the most common, but the species found here are more generally restricted to the hardier labyrinthine fish, catfish, snakeheads, swamp eels, guppies and mollies. Where the streams drain from catchment areas, there is a wider diversity of species to be found including barbs and rasboras. The rural streams are generally less predictable because of the higher temperatures, higher silt levels and greater risk of pollution.

The primary forest streams only occur inside Singapore's last remaining area of primary rain forest mainly in the Jungle Falls Valley. The water in this area is extremely clean, but its only inhabitant is the Forest Betta (*Betta pugnax*). In the drainage ditches at the base of Bukit Timah Hill, some natural ponds are still to be found, which contain rasboras, barbs and snakeheads.

In the less disturbed secondary forest streams, more native fish are found

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including barbs, rasboras, snakeheads, eels, etc. and are often free from introduced species. This is where you might also find acid water streams and swamps, the area where Singapore's most rare fish are to be found and where you are most able to envisage what Singapore was like 100 years ago.

The estuarine waters are probably the most difficult for fish who have not been able to regulate their bodies to the associated osmosis problems. The tides, outflow of freshwater from drains and the high rainfall, all cause salinity levels to fluctuate continuously. This encourages scats, mollies and gobies. The mangrove areas present similar problems for fish. Most of these fish will exist in freshwater, but do better in brackish waters.

It is often difficult to decide whether a species is native to Singapore or introduced as many of the species currently found on Singapore can also be found in the surrounding countries. It is probable that over the years many aquarium fish have been released into the wild or escaped their captivity, but most have failed to breed locally. Those which have escaped and bred successfully are known as 'feral' species. These introduced fish have come about via several sources: the hobbyist, the fish farmer, those who introduced guppies and mosquito fish to control the mosquito problem, et al.

Singapore is now aware of the value of preserving its native species and realise that the main threat to indigenous species is development. Large areas of forest have been destroyed to provide housing and

factories. Forest streams have been lined with concrete and the water they contain polluted. Alternatively they may have been replaced with massive reservoirs. Because of the massive building programmes that have taken place, the native fish species are constrained to a few small streams in the Central Catchment forest and are much reduced.

Apparently two well known ichthyologists reported 52 indigenous primary freshwater fish in 1934 - only 29 now exist. This is almost a 30% loss of Singapore's native fish. Of the 29 species still in existence it is reported that a further 18 of these are threatened with extinction.

Singapore has an additional problem in that there is an abundance of commercial fish collectors in support of the aquarium trade. Species like the Harlequin Rasbora, Pygmy Rasbora, Six-Banded Tiger Barb and Banded Eel Loach have been depleted in such large numbers of late that they are difficult to find in the wild. Casual collection of fish for any purpose within the nature reserve boundaries is illegal and cannot be practised without a permit from the Public Utilities Board or the Nature Reserves Board.

Tilapia, guppies and mollies have been introduced into Singapore and compound the problems of conserving native species. These introduced fish often thrive in the concrete canals of urban Singapore. At the present time introduced species are found infrequently in the wild, but they still present a danger that they will oust native species or introduce diseases which could wipe out a whole indigenous species. The number of established exotic

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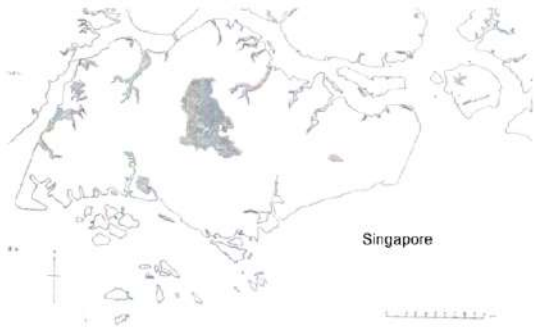
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species (feral fish) has increased from about 7 species in 1934 to at least 14 in 1990.

The following is a list of fish which have vanished from Singapore, unable to cope with the changing conditions, but which still exist in Malaysia at present: *Barbus dunckeri* (locally known as the Clown Barb), *Barbus schwanenfeldi* (Tinfoil

Barb), *Labeobarbus festiva*, *Hampala macrolepidota*, *Paraluciosoma cephalotaenia* (Head Banded Rasbora), and *Pristolepis fasciatus* (Banded Leaf Fish).

Singapore must learn to conserve the remaining indigenous species before these beautiful fish are lost for ever.



A DIFFERENT CLUB ACTIVITY

(for those who live near the sea)

A walk along the seashore can reveal many strange creatures without too much effort but you need to be aware of the high and low tides before you set out so that you do not become another Coastguard statistic! Ensure you arrive just before low tide, and remember two important points regarding safety - the tide can come in very fast and rocks can be very slippery when covered with seaweed.

Life on the seashore is fascinating to us partly because of the extreme conditions many of these little creatures have to endure to stay alive. When you realise that the animal's habitat is limited to a few inches of water for several hours, under changing climatic conditions, you begin to accept that they are very hardy creatures indeed. As the tide goes out the temperature of rockpool water rises in the sun (especially in the blazing heat of summer). When the water has heated up considerably the tide comes in with a blast of icy cold water again. In the summer there is also the added disruption of humans playing, shouting and thumping

about. Fish and invertebrates can move to safer hiding places, but the more stationary life such as Barnacles spend their time stuck to stones and get left in dry conditions at low tide.

Rockpooling requires patience in abundance. You need to be able to sit by a rockpool so that you do not create a shadow and after a while Shrimps and small Crabs may become visible or from beneath some seaweed a Blenny might appear. You may also be fortunate enough to see a Stickleback as they usually live in the shallow waters but occasionally some get left behind in a rockpool. The marine Stickleback (*Spinachia spinachia*) has fifteen spines on its back whereas the freshwater variety has either three or ten.

Another fish you might find is the Gurnel or Butterfish (*Pholis gunnellus*). It resembles an Eel more than a fish. The Father Lasher (*Myoxocephalus scorpius*) has several sharp spines on its body and fins so you should handle it with care!

Rockpools also house Sea-anemones, which when closed, look just like blobs of jelly, but open to reveal bright red tiny tentacles waving in the water to pick up microscopic foods, but will close up immediately you bend over for a closer look.

If you live near to the beach you may consider catching some of these species for a native marine setup in your home because replacing the seawater regularly would be no problem, but there are two main problems with keeping native marine fish.

getting them home in good condition keeping them cool enough in the summer months

If you do take some of your finds away from the shore you should bag each separately or ensure that they are

transported with similar species so that they do not become damaged or eaten on the way home.

Small aquaria can overheat quite quickly in the heat of the summer so it is best to set up a larger aquarium (at least 36"x12"x12") for native marines. You can bring the temperature down by floating a sealed bag of ice-cubes in the tank. Do not drop ice-cubes into the water because it will reduce the salinity of the water and harm the inhabitants. If you have recently won the Lottery you can use a cooler system. Many native marine aquarists use beer coolers. You will also need a filter to maintain water quality and add extra aeration to the water.

An advantage of keeping native marines is that if they get too big they can be returned (carefully) to the place you collected them and replaced with smaller specimens.

If you want to learn more about life on the seashore there are a number of very good books available (note that reviewed last issue on the seas around Guernsey) or you can invest in software if you have a computer. Dorling Kindersley offer some interesting titles both in print and on CD ROM.

Remember to be responsible rockpoolers and:

Replace stones removed to the original site so that the natural habitat is not unduly disturbed.

Never lever Sea-anemones, Limpets, etc. from their home, take the rock with its livestock intact.

Wear shoes when climbing on slippery rocks to give extra grip and protect your feet from sharp edges and debris in the sand.

Species to look for when rockpooling:

- | | |
|--|---|
| Blenny (Blennius gatterugine) | Common Crab (Carcinus maenas) |
| Butterfish/Gunnel (Pholis gunnellus) | Limpet (Patella spp.) |
| Father Lasher (Myoxocephalus scorpius) | Beadlet/Strawberry Anemone (Actinia equina) |
| Fifteen-spined Stickleback (Spinachia spinachia) | Mussel (Mytilus edulis) |
| Shrimp (Palaemon serratus) | Dahlia Anemone (Urticina felina) |
| Snakelocks Anemone (Anemonia sulcata) | |

APHYOSEMION GARDNERI

COMMON NAME: Steel-blue Aphyosemion
AGE WHEN BRED: Unknown, fish approximately 50% full size. Original eggs purchased and hatched.
CONDITIONING FOOD: Frozen bloodworm, Aquarian Tropical Flake, 3-day-old Brine Shrimp Nauplii
TIMESPAN TO CONDITION FISH: 4 months
SPAWNING ATTEMPTS: Fish allowed to flock breed
SPAWNING TANK: 12" x 8" x 10" - foam filter. Original eggs hatched in 4" x 4" x 4" on peat with no filter.
WATER CONDITIONS: pH 6, GH 0°, room temperature (approx. 70°F) - not heated for original eggs. Flock breeding adults heated to 78.3°F.
BREEDING MEDIUM: Bed of peat for original eggs. Flock breeding group large clump of Java Moss, but otherwise bare tank.
FRY HATCHING PERIOD: 1-2 days
NUMBER OF EGGS: Original eggs 24
FRY: Original eggs produced 5 fry. Flock breeding adults raise a couple of fry from each spawning.
FRY RAISING: First 7 days - Liquifry Egglayer. Introduced 3-day-old Brine Shrimp Nauplii and Microworm at day 6 with Aquarian Fry Food. Adult foods introduced as soon as fry large enough to ingest. Water changes carried out every other day to promote growth for first few weeks of life.

THE AQUATIC RAINBOW (Channa bleheri)

by Sumit Dutta (Angelo, India)

It was a very cloudy morning in May 1991 when one of my suppliers telephoned me to tell me that a terribly colourful Channa-like fish had been caught in his huge edible fish collection net. He told me that he had never caught this fish before in the seven years since he started fish collecting! This led me to wondering...

I told him to immediately despatch the fish to me. After a day spent in tension and anxiety, finally the fish reached me. Unfortunately it was terribly shocked and there was none of the remarkable colours to be found in it that I had been told of. I was very depressed at the sight before my eyes, but I decided to care for the creature as I would one of my own children.

After a few days of my devoted care food was gradually taken and it started showing colour and vigour after about ten days. I also noticed that the end of the gill cover was inflamed, which is a sign of a Channa's maturity. Soon my fish was totally healthy and I started work on the second part of my task.

There are very important and serious works on Indian Fish by Hamilton, Buchanan, Frances Day and some other Indian ichthyologists. After several sleepless nights during which I searched their publications, I still could find nothing about my brilliant fish.

Eureka! It is a new species which is a dwarf Channa. I felt this would encourage more field work for collectors like me.

In June 1991, this Channa was displayed for the first time ever at "Aquarama '91" in Singapore in the Aquatics International booth. It created a storm amongst fish lovers, although most were totally unaware of its name. Everyone at "Aquarama" asked me to collect more of this lovely fish so that it could be available throughout the hobby. Unfortunately this Channa died in Malaysia after about a year.

After returning from Singapore, I went to Assam to collect fish at the end of July 1991. Alas, nobody wants to talk about collecting this fish. Apparently it is known as a "God Fish" which is something like the Aruvokana is to the Chinese. Moreover, they advised

me that it is dangerous to collect this fish as suffering will follow and will probably catch up with the man who collected the first example.

It was impossible for me to talk them out of this superstition. I felt this was all unnecessary irritation for me, so I took the challenge of collecting the fish myself because the temptation was just too great for me. Only the man who collected the first example accompanied me on my expedition. We entered the jungle to collect fish from fast flowing Himalayan tributaries and caught Trout, Nemacheilus, etc., but nothing new for me.

I returned to Tinsukia, one of the most North-eastern cities of India in the Assam Province. Just before dusk we reached Guajan Village, which is about 30KM more North-east than Tinsukia. One important collection area I wanted to explore was a tributary of the Brahmaputra called the Dibra River, but local people have named it the Guajan River on the basis of its proximity to the Guajan Village. Anyway, we crossed this river and entered the Dibra Reserve forest. This is one of the biggest river deltas and reserve forests in Asia and is egg-shaped. The biggest problems are the Scorpion and Cobra, but we were lucky enough to hear a tusker elephant talking with his wives and babies. Happy families!

Finally, we found a very swampy area, where the Dibra River is very narrow. From my previous knowledge of collecting, I felt sure I would get some Dwarf Channas here as they like this type of place and rarely appear in big rivers and other areas of Assam. They are a really endemic species.

We put a traditional bamboo basket in the narrow water and settled to wait until the following morning.

Next morning when we pulled out the basket we found a lot of fish, but no Channa. Oh God! We have had to "bat" life for nothing (take risks)! We decided to repeat our activity for a second night.

Living in a forest at the foot of the Himalayas is a horrible experience, but the next morning's experience was far more bitter for us. On pulling out the basket we found three dead Channa. My fisherman friend explained that the high water level at midnight probably overtopped the top of the basket and choked this air-breathing fish.



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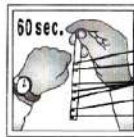
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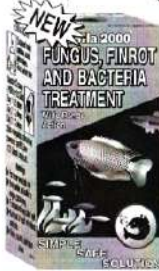
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JACK THE LAD

by Jack Stillwell

Over the next four issues I hope to throw some light on how fishkeepers coped in the days before it was possible to purchase 'ready made' from your local aquarist shop. In this issue I will deal with the raising of fish fry, but equally this advice could be used when raising other young (e.g. Newts). In days gone by we had to produce our own fish food - infusoria - for newly-hatched fry. The term 'infusoria' covers a marvellous field of microscopic life found in most water which is exposed to air. These creatures multiply rapidly when given the right food and conditions, the former usually consisting of some form of infusion of vegetable or organic substance.

The easiest method I know of starting a culture is with a small piece or slice of raw potato in a sweet jar of water, which is maintained at a temperature of 65-80°F and left exposed to the air. In a week the water should be teeming with life. You can accelerate the process by introducing another culture or by using water from a pond, aquarium or vase of flowers. There are many alternatives to using potato. For example lettuce leaves immersed in water, boiling water poured onto a handful of hay and left to cool or one of my favourites is a banana skin.

Many beginners make the mistake of using too much food at one time. It is better to use a small quantity e.g. a piece of potato the size of a walnut, a small lettuce leaf or sufficient hay to fill an egg cup, adding more as this is consumed. Half of the water should be changed on alternate days to prevent the mixture from smelling.

When feeding newly-hatched fry the culture should be strained and allowed to

drip into the aquarium through a syphon and a screw clamp control. A piece of absorbent rag hanging from the infusoria container and into the aquarium will also prove adequate.

The amount of culture to be put into the aquarium depends on the size and number of fry, the quality of the culture and also the fact that some cultures may have a predominance of large-sized infusorians (e.g. paramecium) which cannot be assimilated by very small fry. It is not sufficient to assume that you have a good culture from the cloudiness of the water as this might be due to minute bacteria which are smaller than the infusoria required by your fish.

I found the most satisfactory method where large amounts of infusoria are required, is to use a battery of tanks on the same level connected with syphons. In the series should be one tank with a culture of infusoria, and by using an air lift, a constant circulation of water containing various sizes of microscopic food is available to the fry. The circulation of the water tends to keep it pure and the culture tank can be kept going with additional infusions as required.

Some infusorians are much bigger than others. Colpoda is one of the smallest and is a round, lively little fellow. Conversely, Paramecium is cigar-shaped and slides around, growing to about ten times the size of Colpoda. In between these two there is the well-known Euglena, which is diamond-shaped with a whip-like appendage.

Many years ago Brine Shrimp was not available so the next stage (after feeding infusoria) was to sift Daphnia into various sizes and feed accordingly. Tedious it may seem now, but I raised many hundreds of fish in this way.

Jack.

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JUDGES CORNER



The Judges and Standards Committee for 1999 is as follows:

Chairman: Mr. K. Saxby
 Secretary: Mr. C. Pannell
 Members: Mr. P. Cottle, Mr. J. Carney, Mr. C. Cheswright, Mr. D. McAllister

If you have any queries you may contact any of these people when they are in attendance at shows or you can write to me at the address below.

If there is any Judge who has not sent in a workload form, you should now have received a letter from me chasing you for it! All workload forms are due in by the end of January. On next year's form could you please state who acted as Senior Judge at each of the shows you attended and I will amend the form for the following year.

With this year's Size Sheets all Judges will receive a sheet entitled "Senior Judges' Checklist". This is to be distributed to ensure that Senior Judges are aware of what is expected of them at the shows they attend in an official capacity and for all other Judges to be aware of what the Senior Judge is expected to be responsible for at Open Shows.

**Colin Pannell,
 9 Edwin Road,
 Hastings,
 East Sussex
 TN35 5JT**

Welcome to the March edition of the Judges' News Page.

As this is the beginning of the show season, all Judges should have received their new Size Sheets for the coming year. I would like to thank all Judges and competitors who have sent in requests for size adjustments. In all we have made nearly 160 changes (both increases and decreases in size).

One of the main amendments for this year is the class change for the genus *Badis*, which has been relocated from Class M to Class E. I would like to thank the Anabantid Association of Great Britain for their assistance and confirmation of this change. A number of other anabantid-related changes were put forward and these will be discussed during the coming year.

During the past year I have been urging competitors to submit changes they would like made to the Size Sheets and I would like to maintain this momentum during the next year. With regard to the format of the Size Sheets, I have again underlined every 10th fish so as to make it easier to read them. I know that the A5 format we sell is easy to read so the underlining may be superfluous, but on the Judges' A4 editions the underlining makes for easier reading and as both are printed from the same master it is a little awkward to have underlining on only one of the issues.

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There have been approximately 160 changes made to this year's Size Sheets, so don't miss out or make mistakes when exhibiting your fish during 1999!

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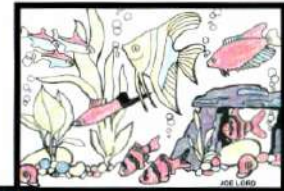


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1999 SHOW DATES AND EVENTS

Rule Codes:	A = A of 6, FB = FBAG, FN = FNAG, FS = FBAS, U = U of A, Y = YAAS, B = BKCS, BK = BKA (= International Golden Starfish), H = HRFAS, C = CAGB
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13.3.99	KAAS Convention/Auction (FB)
14.3.99	CAST 88 Auction
15.3.99	Cranington AS Auction
20/21.3.99	Yorkshire Festival (Y)
21.3.99	North Area Catfish Group Convention
28.3.99	Merseyside AS Auction, Northampton AS (FB)
4.4.99	Malvern AS (FB), Odham AS (FN)
17/18.4.99	Grow Garden Show, Sandown Park Racecourse (Pond Garden Show)
18.4.99	Kirkcaldy AS (U), Ryedale AS
23.4.99	Doncaster AS
25.4.99	Robin Hood AS (FB), Strood AS (FB)
1.5.99	Southend & Leigh AS (FB)
2.5.99	Aberdare AS (FB)
9.5.99	CAST 88 (FN), Corby AS (FB)
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16.5.99	IOW AS (FB)
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3.9.99	FBAS General Assembly - Detachable cards for free admission to view London Aquarium

NOTE TO SHOW SECRETARIES
The above dates are those available at the time of going to press. For the latest, most accurate dates and venue information (and trophy allocators where applicable), please refer to the Quarterly Supplement issued by the FBAS giving details of shows around the country. The Show Supplement is available, price 50p post paid from:

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