Aqualog news
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EVERGREENS

Rainbowfishes
bring colour to any aquarium

by Harro Hieronimus

The Goyder River rainbowfish is one of the species with a lot of red in its colour pattern; this has led to its trade name of *Melanotaenia trifasciata* "Red".

These fishes thus create a wonderful colour contrast with other *Melanotaenia* species commonly available in the aquarium trade, such as *M. affinis* (violet), *M. boesemani* (blue-yellow), *M. lacustris* (steel-blue), *M. maccullochi* (straw-yellow with black stripes), to name but a few.

The form is, however, just one of about 40 distinguishable colour variants of the species *Melanotaenia trifasciata* known to date.

As the name denotes, the home of this, perhaps the most attractive Australian rainbowfish, is the Goyder River, which lies in the Northern Territory. It is almost 300 km from the nearest large town to this remote river.

Another rainbowfish species found there is *M. splendida inornata*. It is not generally known that this taxon - like the other subspecies of *M. splendida* - occurs in numerous clearly distinguishable colour varieties.

In contrast to almost all other rainbowfish biotopes the Goyder River has rather hard alkaline water. For this reason the fishes also prefer hard water in the aquarium. As such water is available straight from the tap in many areas, its maintenance is very easy. The Goyder River rainbowfish also requires clear water. Thus regular partial water changes (totalling 50% every 2 weeks) are required as well as a powerful filter. The maintenance temperature should not exceed 24 °C , as then the fishes are less prone to disease.

Because they are omnivores these rainbowfishes - like the other members of the group - can be offered practically any food. They also like to eat duckweed (*Lemna*). The only mistake one can make is to overfeed them.

Rainbowfishes are trickle spawners which generally lay their very small eggs in the morning, on plants or spawning mops. The very small, slow-growing, fry hatch after about a week and can be reared on the finest dried food.


Goyder River rainbowfish, *Melanotaenia trifasciata* photo: G. Schmida

NEWSFLASH

We here bring you a brief glimpse in pictures of some oddities from Southeast Asia. The *Cardisoma* species is a land crab which should be kept in an aqua-terrarium. The spiny eel can grow to 50 cm in length and is a predatory fish, while the Burmese stickleback (*Indostomus*) is a dwarf that grows to just 3 cm and should be kept in its own mini-aquarium. The Burmese frogmouth catfish (*Chaca burmensis*), hitherto known from just 3 specimens, is an expensive fish for catfish specialists. Finally, this snail from the Philippine Islands is an unusual and very efficient algae-destroyer.

Cardisoma sp., Laos

1

Mastacembelus cf. *favus*, Myanmar 2

3

Chaca burmensis, Myanmar

4

Indostomus paradoxus, Myanmar

5

Snail (*Neritina*?), Philippine Islands

photos: F. Schäfer/Archiv A.C.S.

REPORT

New in.....
from kilometre marker 22 on the road from Iquitos to Nauta

(ugd) Recently the lovely characin *Pyrrhulina spilota* was at long last once again imported for the aquarium hobby, from Peru. Because Weitzman's original description was based on aquarium specimens of uncertain provenance, we have taken the opportunity to question the exporter regarding the origin of these specimens.


Pyrrhulina spilota Weitzman, 1960 photo: D. Bork

Unfortunately such enquiries are often unsuccessful, either because the exporter is himself ignorant of the source locality for the fishes, or has no particular interest in divulging information from which his competitors might profit. But luckily this time a quick reply was forthcoming. The locality is near to kilometre marker 22 on the road from Iquitos to Nauta. Syntopic fishes are said to include *Apistogramma atahualpa* (trade name *A.* sp. "Sunset", catalogue number S03775) and the colourful predatory characin *Erythrinus erythrinus* (see AQUALOG Special - The Highlights). This information also revealed the locality for *Apistogramma atahualpa*, as the description of this species was also based on specimens of unknown provenance.

While most aquarists may have heard of Iquitos, Nauta is less well known. The town lies on the Rio Marañon in the Loreto primary forest, not far from the place where that river joins with the Rio Ucayali to form the Amazonas.


Apistogramma atahualpa Römer, 1998 photo: D. Bork


Erythrinus erythrinus (Schneider, 1801) photo: E. Schraml / Archiv A.C.S.

REPORT

The Language of the Hunters

by John Dawes

Part 2: In Issue 26 of AQUALOG news we discussed the hunting habits of predators, and what defines a predatory fish as such. This time you will learn even more on this topic, as we explain the links between the morphology and the hunting strategies of such fishes.

If we compare the Pike-top (*Belonesox*) with a Piranha, there are some very sharply defined differences. Piranha are not sleek and streamlined - they are roundish, stocky and very robust. In other words, they are not built for speed. In addition, their teeth are so well adapted for cutting and fit together so well that they function almost as a single, serrated, precise cutting unit. The fit is so exact that, according to Jacques Géry in his book Characoids of the World, Piranha "are unique among the characoid fishes in having sharp interlocking cutting teeth forming a continuous saw on both jaws, well adapted to taking a good piece of flesh out of fishes or even mammals...The teeth are so well interlocked that an entire set on one side has to be replaced when a tooth is worn..." The jaw itself is very powerful and thickset - just the job for tearing through tough skin and tissue. One other factor that is highly significant is that Piranha occur in large shoals in the wild.

Putting all the above together, we end up with a fish that is most definitely not a 'lettuce eater'! Yet, what does its body and behavioural language tell us about its prey and hunting methods?

Well, for a start, we can say that Piranha are not particularly fast-swimming hunters. Therefore, their diet is likely to consist of relatively slow-moving prey or, by accident, normally fast-moving prey that becomes confused, disoriented or trapped. Secondly, we can say that, because their teeth and jaws are so well suited for cutting, Piranha will tend not to swallow their prey whole, but in chunks. Since they prowl in shoals, we could also probably conclude (as mentioned earlier) that Piranha use the advantage of benefiting from being in a group, i.e. an individual fish stands a much better chance of obtaining a meal if it belongs to a shoal. This advantage results from the fact that a shoal, however small, can scour a much larger area than any single individual. The behaviour of those fish that come across food is such that the message is quickly transmitted to other members of the shoal which, consequently, can obtain their share of the spoils. Yet another bit of deducible 'body language' is that fish that cut up their prey are likely to feed quite regularly on animals considerably larger than themselves. One of the best examples I can think of illustrating everything I have said above in action is a brief, distressing sequence screened many years ago in a BBC TV documentary series called The Living Planet in which an adult Capibara (a large South American rodent) was demolished by a frantic shoal of Piranha in just a few, blood-stained, torrid minutes.

An algae-covered Stonefish may not be a fast swimmier, but it is nevertheless an expert hunter.
photo: John Dawes

Although high speed chases, such as those of the Pike-top, and mob violence, such as that of the Piranha, are two effective hunting methods, there are, of course, many other strategies. The one crucial thing that they all have in common is that they result in predator and prey being sufficiently near to each other for an attack to be launched. However, this does not mean that the hunter needs to chase its prey. Careful, precise stalking can produce equally good results.

One characteristic often associated with this technique is an irregular or 'broken' body outline, as found in Lionfish (*Pterois*) which can look for all intents and purposes, like a bunch of floating seaweed. 'Leaf' Seahorses (*Phyllopteryx*) hunt much smaller prey but take the mimicry to such an extent that it is sometimes difficult to believe that you are actually looking at a fish and not at a strand of fucoid seaweed - even when you know the facts. Other fish either sit and wait for food to come to them, or, alternatively, actually attract unsuspecting victims by means of a lure. Excellent executioners of the first of these techniques are the Scorpionfishes and the Stonefishes (family Scorpaenidae, subfamilies Scorpaeninae and Synanceinae, respectively). The 'language' of the strategy they employ is so obvious that no-one could possibly misinterpret it. Eyes on top of the head, large, cavernous upturned mouth, 'squashed' appearance, mottled, camouflaged fins and body surface (even with what appear to be algae on some Stonefishes) and other features can only point towards a 'sit-and-wait-and-gulp' hunting strategy.

Anglerfishes (order Lophiiformes) belong to the 'sit-tight-and-lure-your-prey' category in which the first dorsal fin in many species is developed into a line and bait arrangement (an illicium) used to attract unsuspecting victims towards a lightning-fast death. Many Anglers have also evolved an incredible likeness to their surroundings, making their presence even more difficult to detect. Some, for example, appear to have their body covered in sand. These, not surprisingly, often sit on sandy patches in a reef. Others may look like gaudy sponges, others like seaweed-encrusted rocks...and so on. As I mentioned earlier, some of the 'Language of Predation' is difficult to interpret. Therefore, to illustrate the principles involved, the examples I have chosen are 'easy' ones, but they help to illustrate the basic requirements that a hunter needs. If we now look at those common, beautiful, 'peaceful' species like the Neons and Angels that I referred to in my opening section in the light of these requirements, then the messages carried in their teeth, behaviour, body shape, eyes or any other of a number of features, will leave little doubt that they too must carry the hunter tag, even though their victims may be creatures as tiny as *Daphnia* or *Moina*.

Black neon tetra (*Hyphessobrycon herbertaxelrodi*): delightful, peaceful community fish, or efficient predators? Well...both.
photo: Archiv A.C.S.

BRANDNEW

A new dwarf pufferfish from India

by Frank Schäfer

Since the end of 1996 the delightful "swimming pea", the smallest species of puffer known to date, has been imported from the south-west Indian state of Kerala.

This species was readily identifiable as *Tetraodon (Monotetrus) travancoricus* HORA & NAIR, 1941. But on closer inspection it was established that the imports consisted of two distinct, albeit very similar, species.

Ralf BRITZ of the University of Tubingen has tackled this problem and, together with Maurice KOTTELAT, has recently described the second dwarf puffer as *Carinotetraodon imitator*.

At the same time they also placed *T. travancoricus* in *Carinotetraodon*, which thus now contains 4 species: *C. travancoricus, C. imitator, C. lorteti* (TIRANT, 1885), and *C. salivator* LIM & KOTTELAT, 1995. The last-named species does not appear to be in the aquarium trade.

All *Carinotetraodon* species are freshwater puffers. The two dwarfs will tolerate a slight addition of salt, while *C. lorteti* appreciates soft acid water.

In all species the sexes are differently coloured. In addition males have a visibly longer snout. They are best kept in pairs or small groups, but beware - males can be territorial.

They will eat frozen and live foods. Snails are the staple diet of all puffers. They do not harm plants.

Literature:

Britz, R. & M. Kottelat (1999): *Carinotetraodon imitator,* a new freshwater puffer from India (Teleostei: Tetraodontiformes). J. South Asian Nat. Hist. 4 (1): 39-47

Carinotetraodon imitator, male

Carinotetraodon travancoricus, male

Carinotetraodon imitator, female

Carinotetraodon travancoricus, female

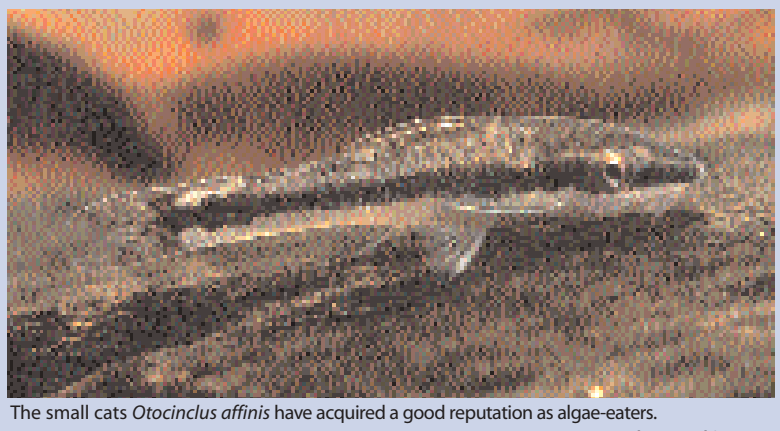
photos: E. Schraml / Archiv A.C.S.

TOP TEN

Top-Ten: Japan

In the Land of the Rising Sun there is a long-standing tradition of ornamental fish as status symbols and bringers of good luck. The Kamihata company has been so kind as to provide us with their top ten of the fishes sold most often in Japan. Japanese aquarists are among the most active any where in the world, such that there can be hardly a fish species that has not at some time been kept by their enthusiasts.

As regards the choice of species, for some years now there has been a distinct trend evident towards smaller brightly coloured fishes, undoubtedly linked with the popularity of the Amano underwater garden. The most commonly sold fish is, as so often the case, the guppy (*Poecilia reticulata*) with its multitude of fascinating colour variants. Cardinal tetras (*Paracheirodon axelrodi*), neons (*P. innesi*), and the coveted blue neon (*P. simulans*) also occupy high rankings in the hit list.



The small cats *Otocinclus affinis* have acquired a good reputation as algae-eaters.

photo: Archiv A.C.S.

Japanese aquarists set great store by interestingly-coloured catfishes, which are included in every aquarium as occupants of the substrate. Some of the smallest members of the species-rich family Loricariidae have acquired a good reputation as algae-eaters. These do best in well-filtered slightly acid water.

This applies equally to the splendid zebra cat, *Hypancistrus zebra*, whose black and white pattern captivates not only catfish enthusiasts. Although these fishes are nocturnal, one can marvel at them during the day as they repeatedly leave their daytime hidingplaces. They should always be provided with sufficient wood to rasp at, as this is beneficial to their digestion.

The lampeyes are reminiscent of glittering jewels, taking their common name from the gleaming irises of their eyes. They look their best in a well-planted, well-lit, aquarium. In constrast to most members of its genus *Aplocheilichthys normani* can be kept without difficulty with peaceful fishes. The water temperature should not be too high (22-25°C) to avoid shortening the already brief life expectancy of these fishes even further.

The Kamihata company imports its ornamental fishes from all over the world, and obtains its captive-bred stocks from countries that have specialised in developing high standards of quality. Thus, for example, guppies are imported from Sri Lanka, while large numbers of neon tetras are offered for export in Hong Kong. Japan obtains most of its discus and angels from its Asian neighbours such as Malaysia and Thailand.

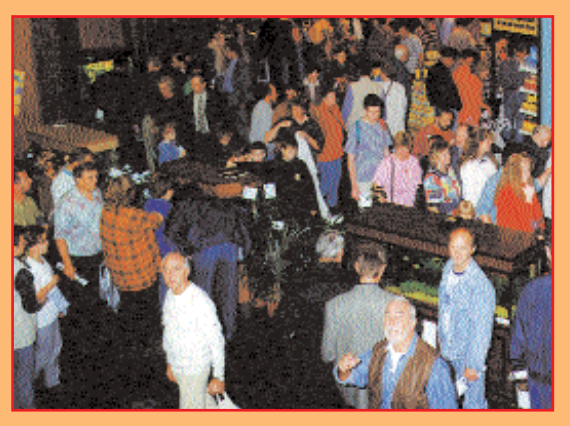
TOP TEN

1. Guppy — Poecilia reticulata
2. Cardinal Tetra — Paracheirodon axelrodi
3. Neon Tetra — Paracheirodon innesi
4. Algae Eater — Otocinclus affinis
5. L-46 — Hypancistrus zebra
6. L-18, L81, L177 — Orangefin Pleco
7. Blue Neon — Paracheirodon simulans
8. Lampeye — Aplocheilichthys normani
9. Discus — Symphysodon aequifasciatus
10. Angel — Pterophyllum scalare

newsflash

The 4th Ornamental Fish and Aquarium Fair, Duisburg, 7-10th October.

Fot the fourth time the largest aquarist fair in the world (according to the organisers) is to take place in the Mercator Hall in Duisburg. The last event of its kind in Germany this millennium looks a potential record-breaker already. With 50% more space for stands and exhibitors than in 1997, an even more varied event than in previous years awaits the visitor. Manufacturers, publishers, dealers, breeders, and clubs, occupying approximately 7,000 square metres of floor space, will provide a broad spectrum of exhibits.



One day will be too short a time for the committed aquarist - anyone wanting to see everything should allow at least 2 days! If possible, visit the exhibition on the Thursday and Friday - on the basis of previous years, the mass of visitors at the weekend will fill the Mercator Hall to bursting point. photo: Zoo Zajac

An extensive program of lectures by top-class speakers (5 lectures per day) will encompass practically every area of knowledge. Time has been allocated after the lectures for discussion with the speakers. Open discussion forums on various topics invite the participation of visitors. The organisers are planning huge display aquaria, as well as a freshwater pool filled with tropical aquarium fishes.

Further information can be obtained from the organisers,
Zoo Zajac: Tel. +49 (0) 203 450450, website http://www.zajac.de

INTERNATIONAL

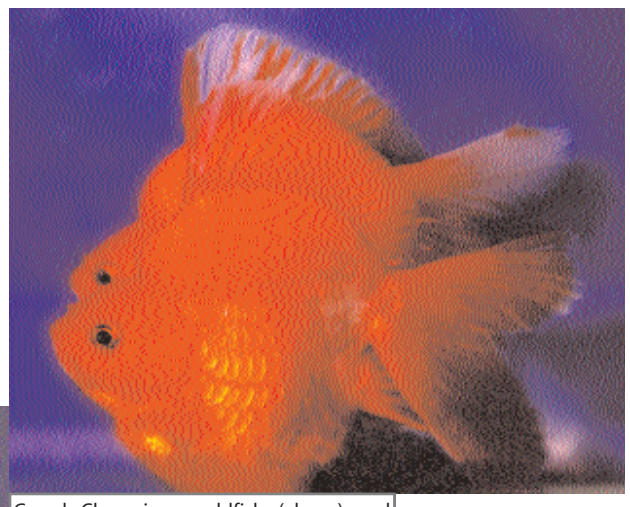
Singapore sweeps all five grand championships at Aquarama fish competition

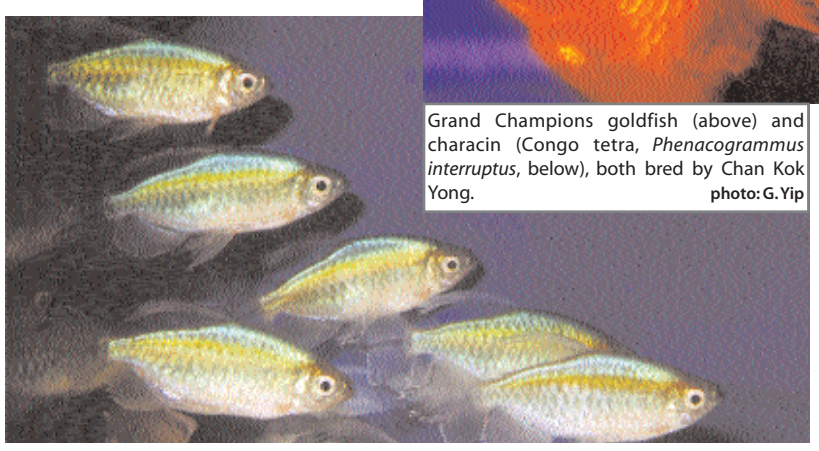
by Genevieve Yip

Discus category winner proves hobbyists can take on commercial farms.

Singapore entries in the Aquarama ´99 International Fish Competition, held at the World Trade Centre from June 3 to 6 1999, swept all the five grand championships in the Discus, Goldfish, Guppy, Tetra and Dragon Fish categories. The participants were all first-time grand champions in their category.

The local participants were amongst some 500 entries in the fish competition, which had a total of 5,000 fish, the biggest of ist kind in the world. The competition, held bienally since 1989, attracted more entries this year with the addition of five new categories, bringing the total number to ten. They were: Discus, Goldfish, Guppy, Tetra, Dragon Fish, Gourami, Molly, Play, Swordtail and New Species/Varieties.





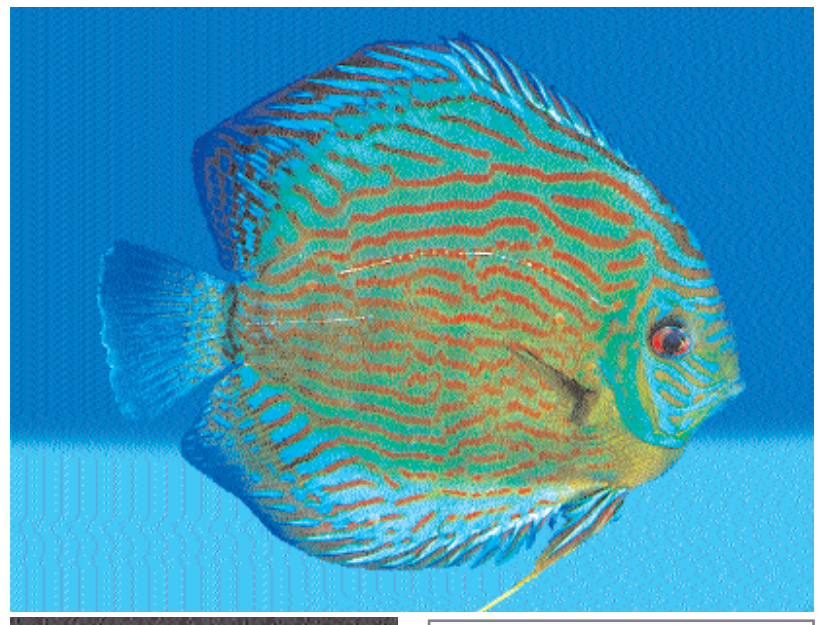
Grand Champions goldfish (above) and characin (Congo tetra, *Phenacogrammus interruptus*, below), both bred by Chan Kok Yong. **photo: G. Yip**

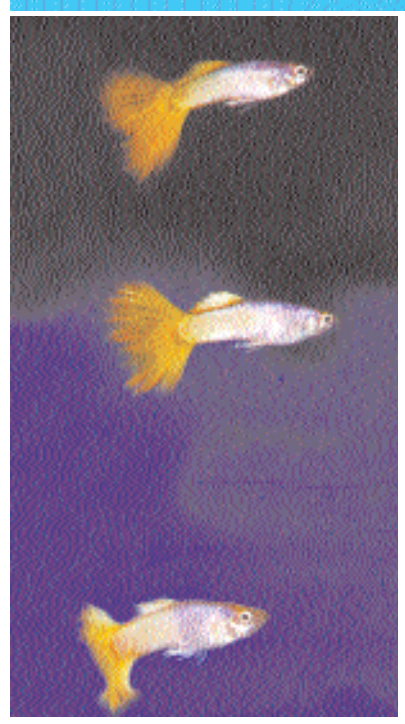
While the entries came from countries as diverse as China, Germany, India, Japan, Malaysia, Myanmar, Sri Lanka, Taiwan (R.O.C.) and Thailand, Singaporeput up an extremely strong showing, dominating the Discus and Guppy categories.

According to Mr Lim Lian Chuan of the Primary Production Department of Singapore´s Ministry of National Development, the Guppy is popular among breeders here because guppy breeding is lucrative. The Discus has quite a different appeal, being expensive. It is the most popular fish among local hobbyists.

The Grand Champions were Mr Andrew Ang for Discus, Mr Chan Kok Yong for both Goldfish and Tetra categories, Mr Soh De Wen for Guppy and Mr Yap Kim Choon for Dragon Fish.

While four of the five grand championships went to local commercial breeders, the grand championship for discus went to a hobbyist for his very first crossbreeding success at home. Acoording to the Chief Judge Mr Lim Lian Chuan, the grand champion won because of ist very unique colour pattern."This," said mr Lim,"was due to a process of very selective breeding -





Grand Champion discus bred by Andrew Ang. Read more about the winning fishes at Aquarama and the discus championships in Duisburg in the soon-to-be-published AQUALOG special "Majestic Discus" by Manfred Göbel. **photo: Johnny Yip**

Mr Ang had to pair the `right´ fish to produce such a pattern". His pattern and the fish´s high fins contributed to ist advantage over other entries.

Mr Ang attributed his win to beginners´ luck. He is a hobbyist who began breeding Discus in 1996. His stroke of luck began when he decided that he could not continue breeding Koi because of its size and the space it took up in his home. He turned his attention to the Discus and began to breed it at home.

Grand Champion Guppy (above); colours: grey metallic yellow (Log-No: S64224), bred by So Deh Wen. **photo: G. Yip**

Grand Champion dragonfish (*Scleropages formosus*) bred by Yao Kim Coon. This up to 60 cm long osteoglossid is extremely popular in Asia. Because of stringent international regulations regarding the trade in this species, individual fishes are identified with microchips and thus recognisable throughout their lives. **photo: G. Yip**

What is the real purpose ..

..of the swimbladder?

For many people it is the apparently weightless swimming of the fishes through the water that creates the very pleasing and relaxing effect of an aquarium. But fishes are, of course, not weightless. Their specific gravity is about 1.076. So weightless swimming is possible only for those fishes that possess a special organ: the swimbladder. If this organ is completely absent, as in, for example, the sharks, or is much reduced, as in many catfishes, then the fish will sink to the bottom if the fins stop making the movements necessary to swimming.

The swimbladder is a gas-filled, generally elliptical, sac positioned beneath the spinal column. It is a diverticulum of the gullet, and in some fish species there is still a connection between the swimbladder and the gullet - such species are termed physostomous. If this air passage is absent then the species is said to be physoclistous. The air passage is particularly important for rapid changes of depth. If the ambient pressure is raised then the physostomous fish can easily reduce pressure via the airway, while the physoclistous fish must use its blood to transport gas from and to the swimbladder as required. Moreover it is difficult for physoclistous fishes to rise rapidly from great depths, as in the absence of any method of venting the swimbladder to equalise pressure, the fish may literally explode. Not to mention the danger of embolism.

An African lungfish (*Protopterus*). These fish use their swimbladder as a lung. **photo: Archiv A.C.S.**

As well as for swimming, some fishes, for example cyprinids, use their swimbladder as a amplifier for sounds. In such fishes tiny, complex-structured little bones, the so-called Weberian apparatus, are sited above the swimbladder and are connected with the organ of balance , the labyrinth (do not mix up with the auxillary breathing organ of the Anabantoids!), and the ear. They can thus sense the slightest vibration in the vicinity. Carp hear exeptionally well by virtue of their swimbladder. In marine fishes the swimbladder is on average smaller than in freshwater species, as salt water provides greater "lift". If species such as scats (*Scatophagus*) or monos (*Monodactylus*) are transferred too rapidly from fresh to salt water then these fishes will initially have swimbladder problems and will constantly swim at the water's surface until the swimbladder has adjusted to the new environment.

In the Australian lungfish (*Neoceratodus forsteri*) the swimbladder is very thin-skinned and has a very good blood supply. If the oxygen content of the water decreases, the lungfish can breath atmospheric air through its swimbladder. Our own lungs are ultimately derived from the swimbladder of the fish; thus an organ that originally permitted effortless swimming first made possible the colonisation of the land by vertebrates.

TERRARISTIC

Tail, fins, and limbs grow back:

the astounding regeneration capabilities of aquarium and terrarium animals!

by Peter Hoffmann

Many aquarium and terrarium inhabitants constantly amaze their owners with their almost incredible ability to regenerate: fishes simply replace fins, amphibians entire limbs, and lizards tails shed for predators to eat. Reason enough to examine this phenomenal regeneration capability in closer detail!

In contrast to the original formation, at the embryo stage, of certain body structures, regeneration provides a means of healing injuries and replacing parts of the body lost during the course of an animal's life. A distinction is drawn between physiological and reparative regeneration. The former is a continuous process of renewal - in the normal course of things - of worn out body parts, for example dead skin cells. Reparative regeneration, on the other hand, replaces body parts that have been lost through injury. This is not restricted to injuries in the normal sense - eg the results of territorial battles or encounters with predators.

For asexual reproduction can also leave its mark: thus a number of starfishes (*Linckia, Coscinasterias*) are known to reproduce vegetatively by the breaking off of an arm. The subsequent process borders on the incredible, as not only does the starfish replace its missing arm, but the detached arm grows a new central disc and the arms required for a full set, and thus develops into a new, complete, animal!

photo: Archiv A.C.S.

Whereas batrachian larvae lose a large part of their regeneration capability at the transition to adult form.....

In various worm and polyp species even the tiniest piece of the original animal can grow into a fully-formed individual. The record for this is held by the freshwater polyp: if one of these approximately 2 cm long creatures is cut into 200 pieces then each one will develop into a new, complete, polyp.

In practice the ability to regeneration decreases in line with increased evolutionary development, such that in birds and mammals, for example, it is restricted to the knitting of bones and the healing of wounds. Even in the earthworm the capability is poorer than normally assumed. The widespread belief that a chop of the spade or determined slash of the knife will make one earthworm into two is quite simply wrong! So please refrain from employing this barbaric practice to try and increase your supply of live food. An earthworm consists of 120 circular segments and the following, immutable, rule applies: if you chop off the 38th to the 120th segments (or, of course, a smaller piece) then the head will indeed grow a new tail within a few weeks, but the chopped off tail part is doomed. Things are even more critical if the front end is lost - in this case the worm can survive the loss of at most 16 segments, and then grows only 4 new ones. Larger injuries are absolutely lethal!

In addition the age of the creature plays a significant role: in general the ability to regenerate decreases with increasing age! Thus a batrachian can replace entire extremities only during its larval stage. It is different in the case of the caudata (newts and salamanders), which retain full regeneration capability until their metamorphosis into the adult stage. In the case of newts and salamanders - true miracles of regeneration - scientists are able to stimulate the extremely bizarre formation of new "eyes": they implant tiny particles of eye tissue into wounds in the abdomen of the animal, and within a few weeks fully-formed lenses will have developed there - but lacking optic cells and nerves!

By contrast a normal wound immediately stimulates the growth of skin across the surface of the injury from the edges inwards. The aim is the most rapid possible closure of the wound. Only then does the true healing process begin: undifferentiated - or, rather dedifferentiated - cells unite to form a so-called regeneration blastemum. In the process various types of highly-specialised cells lose their normal form and structure and also their function: muscle, bone, cartilage, and connective tissue cells revert to an indentical embryonic structure. In the higher animals only those cells in the vicinity of the wound are involved. By contrast in the freshwater polyp *Hydra* cells migrate from all parts of the body to the wound where they unite to form the the regeneration blastemum.

Something similar is known from planarians. On attaining a particular size intensive cell division begins in order to augment the available stocks of cells, and subsequently the cells produce the type of tissue required. Nerve fibres grow in order to provide nerves for the replacement body part - and the injury vanishes without trace.

It remains unclear whether the dedifferentiated cells actually revert to the point of embryonic omnipotence. This is not absolutely essential in, for example, the case of the loss of an extremity. Each cell type - whether it be bone, cartilage, connective tissue, or whatever - will still be present in the stump. If these dedifferentiate and reproduce, then it is quite plausible that the subsequent differentiation will produce bone cells from bone cells, cartilage cells from cartilage cells (and so on and so forth). But the view that every other cell type can originate from a dedifferentiated cell can by no means be ruled out, if one considers that the nucleus of each cell contains all the necessary information for the lifeform as a whole. Every type of cell contains an exact copy of the genetic material that was created by the union of sperm and oocyte. A cell derives its particular form and specialisation simply because only part of this enormous "genetic library" is used by its nucleus. The information content of all cell types is basically the same.

Even the observations made on carp are really of no further help; individuals whose gills have been bitten, or fins torn off, can regenerate these body parts completely even when only tiny residues of tissue remain. At first glance this might seem to indicate that there must be a specific "structural plan" available for the replacement?! But, as already mentioned, in these rather highly-developed fishes it is only the cells around the wound that participate in the formation of the regenerative blastemum; if the fish dies then this may be the result of the size and severity of the injury rather than because the information for successful reconstruction was lacking!

On the other hand, experiments conducted using clawed frogs have failed to provide conclusive evidence for reversion of cells to embryonic omnipotence. It is true that cells which have had their nucleus removed, and replaced with nuclei from already completely differentiated cells from the gut lining of a tadpole, have formed perfectly normal frogs. At the same time all the frogs created in this bizarre fashion from a single source of parental material have resembled one another like identical twins (from a single egg), as their genetic material is identical.

But there is a catch! Naturally this demonstrates clearly that all the information required for the development of a lifeform is present in differentiated cells as well, but in addition oocytes contain substances which regulate the activity of the genes. Thus previously inactive genes in the gut epithelial cells may be activated, and at the same time the genes that were necessary to perform specific functions in the gut wall may be "switched off". If this regulatory process does not take place in a wound, then it may be that a differentiated cell may be unable to metamorphose into the requisite cell types.

But be that as it may, regeneration is, and will remain, a miracle, even as regards its very limited potential in Man. A surgeon can clean and stitch wounds - but they have to heal up by themselves!

photo: F.Teigler / Archiv A.C.S.

...in newts and salamanders the ability to regenerate is retained in full after the larval stage.

TECHNIC

NEW: Automatic water level regulation in the aquarium is now assured!

Electronic water level regulators have been used in the aquarium hobby for a long time. These devices have proved very susceptible to failure, particularly in the marine aquarium wheer splashing can rapidly lead to salt encrustations on sensors, and unfortunately this can lead, in the worst case scenario, to flooding of the livingroom.

SELZLE Technik is now offering a fully tested electronic water level regulator, which utilises a "double oscillator switching" system.

This technology, here seen in for the first time in the aquarium, is absolutely proof against splashing and salt encrustation and can thus be used in marine water without problems. An automatic retard mechanism prevents the equipment from being constantly switched on and off by waves. A further innovation is the facility for "inverse switching", ie the sensor can be installed so as to fill the tank up or empty it down to the "switching zone". The device is available through the pet trade.

REPORT

The import season begins

by U. Krüger

Many aquarium fishes are available year-round in the trade, but there are also species which are exported for only a few weeks or months each year. These include the zebra catfish (*Hypancistrus zebra* - "L46") and the altum angel (*Pterophyllum scalare*) from the Rio Orinoco.

Both species have already been bred successfully; however, the cost is relatively high, so demand for these fishes cannot be satisfied by tank-breds alone.

Hypancistrus zebra is still known to many aquarists by its DATZ code number "L46". In contrast to many armoured catfishes this species is predominantly carnivorous. Breeding is best attempted in soft but neutral water. The species is a cave brooder. Because the eggs are non-adhesive, a cave which is enclosed apart from the entrance is a prerequisite for breeding this species. Males and females can be distinguished by the development of their interopercular odontes. Maximum length is about 10-12 cm.

The altum angel, *Pterophyllum scalare*, grows appreciably larger; it originates in the Rio Orinoco system. In the literature there are repeated references to specimens up to 50 cm deep, but specimens of 25 cm depth are regarded as impressive. This species is rather more delicate than other members of its genus. A large, above all deep, aquarium, muted lighting, relatively high water temperatures (26-28°C), soft, slightly acid water, and frequent feeding with a varied diet (frozen foods are best) are unconditional requirements for the maintenance of this species.

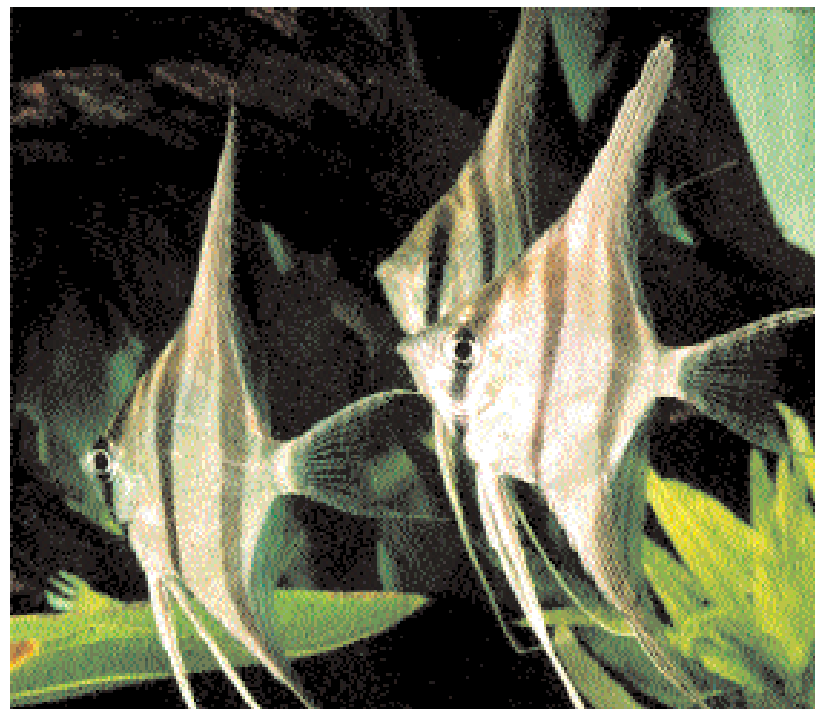
It is advisable to buy only top quality frozen foods such as the amtra-sano range. Manufacturers of cheap foods can never satisfy the high (and thus cost intensive) quality requirements needed to produce a high quality food.

It should also be borne in mind that fishes noted/notorious for their sensitivity to stress, eg the altum angel, react very positively to the use of good quality water conditioners such as amtra care. It is not for nothing that these products are used in large quantities in import stations oriented towards long-term husbandry. And what the professionals regard as important must have some bearing for the hobbyist as well!

TIP

All the wild forms of the angel can be found in the AQUALOG "South American Cichlids IV". And, of course, all the cultivated varieties.....

ISBN: 3-931702-75-8



photos: Archiv A.C.S.

FISHDOC

Egg fungus

What can be done?

by Marcus Biffar, fish veterinarian

photo: Archiv A.C.S.

Anyone breeding for the first time an egglaying, non-parental fish, for example the black phantom tetra (*Hyphessobrycon* (formerly *Megalamphodus*) *megalopterus*) pictured above, will often be confronted with the problem of part of - or even all - of the spawn fungussing. This can be prevented only if one observes the following basic rules:

1. The parent fish must be removed from the breeding tank immediately after spawning.
2. A large partial water change should be made, using water with identical(!) parameters.
3. Dead eggs (those that turn whitish) must be removed daily.
4. Finally, methylene blue should be added to the breeding tank at the rate of 1-2 mg/litre.

VIVARISTIC

The aquarium hobby and schools

We would like to offer teachers and pupils the opportunity, without obligation, to report on their aquarium experiences in the news. We start this time with a report on the week-long "Project Water" of class 1b at Pöcking primary school.

At the beginning of the year a staff meeting decided to implement a project week on the topic of water. A whole range of actual topics were suggested: water is life; thrifty use of water; irrigation and drainage; constructing a new fountain in the community; studies of water parameters; literature on the subject of water.

I decided on setting up an aquarium for my class. I had learnt from my own daughter how fascinating an aquarium is to youngsters, and how at the same time it can stimulate acceptance of responsibility and the broadening of knowledge. I hoped to achieve the same success with my class. At the same time I wanted my class to have a "class pet" to look after during the last weeks of their first school year and the subsequent ones, and the aquarium idea fitted in with this long-term plan. Because the project appeared to represent a not inconsiderable expenditure for the school, I wrote to both large and small companies involved in the aquatic trade. I outlined my plan and asked for support. To my great delight over the weeks that followed I received a series of generous gifts of equipment and informative material. Unfortunately the subject of the project week achieved an unexpected and vivid topicality by virtue of the Whitsun floods.

At the start of each day of the project I read the children a story from the book "Aquariland" (BeDe Verlag, ISBN 3-927-43-9), a very informative work well-suited to children. These stories introduced the children to new, related, themes on a regular basis. Thus the fishes acquired names, and their life in the aquarium became comprehensible to even a first year class. The children maintained worksheets on each topic, which they had to fill in themselves in each case. On the last day they were given back their worksheets bound into a little book. Handicrafts, painting, and collage work completed the project.

On the first day of the project (25.06.99) the children adopted "Project Aquarium" with great enthusiasm. Each pupil received a set of information leaflets. These were all studied with great interest. The content of the boxes - aquarium, internal filter, heater, thermometer, water conditioner), substrate fertiliser, and food samples - were examined with even more pleasure. Split up into pairs, the pupils began eagerly washing sand and putting it in the tank. Filling the tank with water with a small watering can was equally popular. It remained for me to add water conditioner to the newly-filled aquarium and install the electrical equipment. The next day was looked forward to with enthusiasm by all concerned. The children had just one concern - "Where are our fishes?"

On Saturday and Sunday I treated the aquarium water with the necessary water additives.

The second day of the project (28.06.99) was the day of the aquatic plants. After I had discussed the need for aquatic plants with the children, each group prepared a plant for planting, paying very careful attention to the individual processes, as it was very important to them that their plants should be "large and beautiful". Each group then introduced the plants into the tank. Slowly but surely what had started as a container of water was being transformed into a real aquarium. Unfortunately, however, I was unable to make the childrens' greatest wish come true: "Where are our fishes then?". As a palliative each child made his or her own fish, ie small imaginary fishes formed from modelling clay, baked in the oven, and placed in a screw-top jar of water with a cork for buoyancy. Thus each child proudly created his own "aquarium".

The third day of the project (29.06.99) was devoted to the fishes. The lifeform we term the fish was largely unknown to the children as far as biological function was concerned. So I answered the following questions in childrens terms: How do fishes breathe? Can fishes smell, breathe, taste, hear, and even sleep? Are there baby fishes? I found the childrens' worksheets a great help when it came to these questions. At the end of the day the children believed themselves to be diminutive fish experts and were even more impatient at the wait. But this day too had to end with "only" a home-made model fish, this time a paper mosaic.

On the fourth day of the project (30.06.99) all the important information on the aquarium environment was reviewed. The fishes were finally scheduled to arrive the next day if all the details of our aquarium were ready. The test strips made us very hopeful. I explained to the children that I would go to a dealer with our money and buy our fishes subject to his approval. To increase the excitement still further the children made a small cardboard aquarium with splendid colourful paper fishes and plants. In the afternoon I allowed myself to be advised in detail, as usual, by the Munich Aquarium Centre. Together we decided on variable platies and wagtail platies. These fishes are very robust and thus suitable for a school class. That evening I introduced the fishes into the aquarium, so they would have an initial period of peace to accustom themselves to their new environment.

On the fifth day of the project (01.07.99) almost the entire class was early for school. There was happy excited chaos outside the classroom door. But this morning the children had to wait outside the door for a few minutes, as first of all the parent representative was handing over - as already arranged - 3 young bristle-nose catfishes he had bred. And then I reminded the children to treat our fishes the way we had discussed the previous day. To my immense surprise they all behaved as we had decided. No shrieks, no tapping on the glass, but rather a respectful amazement. „There they are at last!" And as the catfishes were still waiting in a plastic container, the children now had the opportunity to experience the process of introduction. And now the fishes were at last in their new home, there was a new, more urgent, question: "Can I feed them?" Because everyone wanted to feed them I hung up a list of names, prepared in advance, and another for changing water.

The pupils of 1b at Pöcking primary school. photo: P. Greite

The sixth day of the project (02.07.99) was to be spent preparing our display. In the afternoon each class was to show all the parents and the other classes the results of their efforts during the school project week. Because we still had numerous catalogue pictures of fishes and aquatic plants, the children made brightly-coloured fish placards for their desks. This completed our exhibit. We displayed our aquarium and the placards, and each child had his or her own little aquarium with the modelling clay fish, the cardboard aquarium, and the worksheets. We built a book stand for our aquarium books in the middle of the classroom, together with an old, empty, aquarium with pictures and important words on cards. In case any parents were interested, I displayed my correspondence with the aquarium companies on the blackboard. Perhaps the helpfulness of the companies prompted the parents to be similarly generous, as by the end of the day our moneybox - we had asked for small contributions towards future expenditure - was full.

As a conclusion to Project Week the pupils were to run a question rally through all the classrooms. I was able to give my pupils a "real" aquarium ballpoint to use for their questionnaires. As a prize for completing the questionnaire they would also receive a small container of fish-shaped gums. The eyes of all the children were radiant after a successful week brought to a successful conclusion. During the rally I discovered that other pupils now wanted an aquarium like ours for their class. And the parents of some of my children said they would no longer stand in the way of a home aquarium for their children. So far a very great success. I hope that the childrens' interest will remain and increase further, and that all our fishes do well. There is already no shortage of offers of more fishes.

Pöcking , 10.07.99.

Petra Greite, class teacher.

PLANTS

Plants for the breeding aquarium

(rn) While in the "normal" aquarium the intention is generally to create a "landscape", and plants are used to this end not only for their biological function but above all for their decorative effect, in many cases plants are indispensable when it comes to breeding our fishes.

Ceratophyllum demersum
Tropica No. 021

When breeding livebearers hornwort (*Ceratophyllum*) is often the plant of choice. This plant, which is found all over the world, will tolerate almost any water conditions if acclimated gradually. It grows very rapidly, and the rather stiff, dense, fascicles offer the fry adequate shelter from the cannibalistic tendencies of their parents.

Vesicularia dubyana
Tropica No. 003

The universal spawning plant is, however, Java moss (*Vesicularia dubyana*). This plant not only tolerates any water conditions; even when it might be expected to die off, as in the unlit breeding tank with very soft acid water necessary for breeding neons, etc), it hardly ever rots away. It also usually survives any necessary disinfection procedures without problem.

Labyrinth fishes often build bubble-nests at the water's surface. The floating form of Indian fern, *Ceratopteris cornuta* is ideal for these fishes. The broad leaves provide the necessary protection from above, while the dense masses of fine hanging roots offer shelter for harassed females, and finally the air bladders provide a good foundation for the bubblenest.

Ceratopteris cornuta
Tropica No. 005

Ludwigia repens
Tropica No. 034

Many barbs and tetras like to spawn on fine-leaved vertical plants. Such plants are, generally speaking, rather delicate, as dirt easily collects on the feathery leaves and may cause die-off. Moreover they require quite a lot of light, while strong illumination is usually inappropriate for spawning. The plant best suited to such fishes is the stemmed plant *Ludwigia repens*; it may have relatively broad leaves, but forms numerous "aerial" roots which produce the desired effect.

newsflash

The "Back to Nature" series of books

The Sweden-based company Fohrman Aquaristik AB has for some time been publishing handbooks covering specific areas of the aquarium hobby. Each volume is of very high quality, with about 300 colour photos and written by a well-known author. Each contains 128 pages printed on very good quality paper, and thus represents excellent value for money. Published to date: Malawi Cichlids (Ad Konings), Tanganyika Cichlids (Ad Konings), Catfishes (David Sands), and Discus (Dick Au).

Full english version available from:

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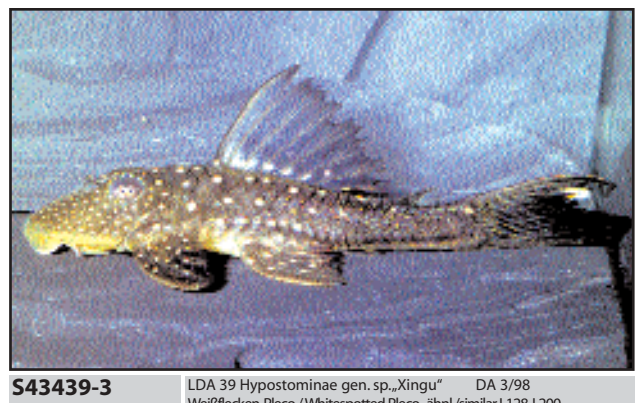
UUUUUUPS....

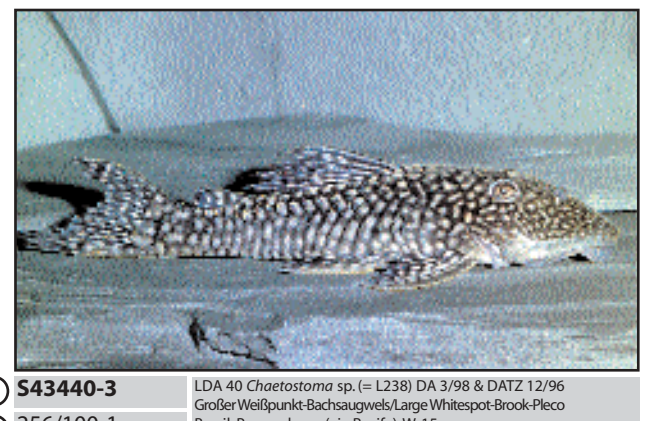
Dear Reader,

with the best will in the world, mistakes do sometimes occur. Unfortunately the stick-in location given for "L253" on supplement sheet No.10 for "All L numbers" was incorrect. The picture actually belongs in position 6 on page 96. We hope you will forgive the error.

Issue no. 28 of your AQUALOG*news* will be available in October!



S43439-3
255/99-8
LDA 39 Hypostominae gen. sp.„Xingu" DA 3/98
Weißflecken-Pleco / Whitespotted Pleco , ähnl/similar L128, L200
Brazil: Rio Xingú, W, 20 cm (?)
Photo: E. Schraml / Archiv A.C.S.



① **S43440-3**
② 256/100-1
③
LDA 40 *Chaetostoma* sp. (= L238) DA 3/98 & DATZ 12/96
Großer Weißpunkt-Bachsaugwels/Large Whitespot-Brook-Pleco
Brazil: Pernambuco (via Recife), W, 15 cm
Photo: E. Schraml / Archiv A.C.S.
④

① **Code number**

② **1.number**: continuous picture-number
2.number: page number in the book
3.number: picture number on the page (continuously numbered from 1–8 from the top left corner to the bottom right)

③ **Symbol-text Aqualog-books**

④ **Photographer**

These Stickups supplement AQUALOG „Loricariidae: all L-numbers"

impressum

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