

# NEWS

The Magazine for Aquarists and Terrarists

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a Fish that  
Changed the  
World**



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Swimming  
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## Cichlids

# Once again: Dwarf cichlids from Lake Malawi

## *Pseudotropheus demasoni*

by Andreas Jung

In News 106 we discussed various Lake Malawi cichlids that are well suited to small aquaria because of their small size and relatively peaceful behavior. These included *Pseudotropheus demasoni*, a species whose total length of 6-8 cm makes it one of the smallest of the mbuna, the name sometimes given to the rock-dwelling cichlid species from the lake.

We immediately received several communications from experienced keepers and breeders of Malawi cichlids - many thanks for that! They had come to regard *Pseudotropheus demasoni* as one of the most aggressive of all mbuna, whose long-term maintenance can present problems even in very large aquaria because of its marked aggression. So what lies behind these very different opinions?

### *Pseudotropheus demasoni* in the wild

Andreas Spreinat, book author and one of the world's top experts on Lake Malawi cichlids, writes on page 218 of his book *Lake Malawi Cichlids from Tanzania*, published in 1995 (Verduijn Cichlids, Zevenhuizen), that "Most specimens observed by us were solitary and in a given area were mostly loyal to one site. However, this territory was not defended against other fish. We also observed that the territory was sometimes abandoned. In some places, we found several specimens together. Intraspecific aggression appears to be quite weak; most of the fish behaved rather peacefully."

### Very aggressive in the aquarium?!

By contrast, experienced aquarist Werner Hieber of [www.malawipoint.de](http://www.malawipoint.de) writes (translated from German):

"On reading the article 'Dwarf cichlids from Lake Malawi / *Pseudotropheus demasoni*' I

was very surprised at what it said. A. Jung writes that *Pseudotropheus demasoni* is one of the most peaceful mbuna. But I refute that and assert that it is the most aggressive of all mbuna in the aquarium. I don't know the extent of its aggression in the lake. He also writes that this species can be kept in small aquaria and is well suited for beginners. I refute that as well and assert that an aquarium for *Pseudotropheus demasoni* should have a volume of 300-400 liters and a length of 150 cm. This species is best kept alone in a tank. Its behavior resembles that of the *Tropheus* of Lake Tanganyika, with all the males in the tank that

are weaker than the dominant one being killed. This also applies to females that aren't quick enough to find a hiding-place. I had my best experiences with this species in a 375-liter aquarium populated by 6 males and 15 females. After a while the surviving population settled down together, but I am certain there was only one male among them. There were then no further changes to the population."

### Different strains?

As can be seen from these statements, it is hard to imagine two more different views of the behavior of a single fish species. A pair even spawned during a photo session in a really small photographic aquarium in the editorial office and behaved very peacefully towards each other during the spawning and thereafter. So are there different strains of *P. demasoni* in the aquarium? Or is the aggression linked to other, as yet unstudied parameters (food, water, light, etc)? We don't know. To be safe we recommend following the suggestion of maintenance in a species tank, the more so because *P. demasoni* is sometimes rather fussy in the matter of food; the aggression can, of course, be avoided or spread in an overpopulated tank, but that is clearly not without risk. For the reasons given, the aquarium for *P. demasoni* should not be less than 80 cm in length, even for a species tank.

*Pseudotropheus demasoni*

Photo: Frank Schäfer





## Freshwater fishes

# Two of the best algae eaters... but who knows their names?

by Roman Neunkirchen

In the aquarium hobby, algae is a topic that is discussed almost as exhaustively as the weather. There is always something to say about it, and in the final analysis we are all subject to weather. The same applies to algae. One or another species of algae grows in every aquarium. This annoys many aquarists and they look for fishes that will eat these algae. Many aquarists have had good experiences with the Siamese Algae Eater and the Stonelapping Minnow, both of them from Thailand.



Like *Crossocheilus oblongus*, *Epalzeorhynchus kalopterus*, the Flying Fox, has four barbels. The two species are almost impossible to tell apart when, as in the photo, the dark dorsal-fin markings of *E. kalopterus* aren't visible.

All photos: Frank Schäfer

The two species are extremely similar in their coloration and hence have repeatedly been confused with one other. They can, however, easily be told apart by a number of color characters. In the Siamese Algae Eater the black midlateral stripe extends well onto the caudal fin, while in the Stonelapping Minnow this longitudinal band always ends at the base of the tail. The dorsal fin of the Siamese Algae Eater is always completely transparent and

colorless, while that of the Stonelapping Minnow is striped, albeit in rather delicate, pastel shades. And finally there is also an anatomical character that makes it possible to distinguish them: specifically, the Siamese Algae Eater has two pairs of well-developed barbels, one on the snout and one at the corners of the mouth, while the Stonelapping Minnow has only one pair of barbels sited at the corners of the mouth and none on the snout.

### The scientific names

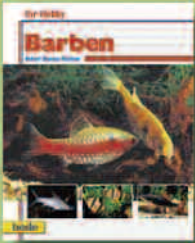
Scientific names have universal validity worldwide. Every species of animal bears only a single valid scientific name. If - for whatever reason - a species is described several times then only the oldest name has validity, and the others are so-called invalid synonyms. By contrast anyone can think up their own popular name, as there are no rules of any kind. In addition, every species has numerous different popular names



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worldwide. In Germany, for example, the Siamese Algae Eater is called the "Siamesische Rüsselbarbe" (= Long-Nosed Siamese Barb) and the Stonelapping Minnow is the "Gestreifte Saugbarbe" (= Striped Sucker Barb). These very different names can lead to entertaining soundtracks when natural history films are dubbed into foreign languages as the dubbing editor has no knowledge of fishes. Thus while the German for catfishes is "Welse", on German TV they are usually referred to as "Katzenfische" based on the English name of "catfish"... These problems don't occur with

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scientific names. The pronunciation of Latin or Greek words in other countries may take some getting used to, but sooner or later comprehension is possible.

### Siamese Algae Eater and Stonelapping Minnow

One of the most important students of the fishes of Thailand was Hugh McCormick Smith (1865-1941). To the present day his book *The fresh-water fishes of Siam, or Thailand*, published in 1945, remains one of the most important and valuable identifi-



*Crossocheilus oblongus* or an undescribed species? That is the question....

cation guides to the freshwater fishes of the region. In it the Stonelapping Minnow is termed *Garra taeniata* and the Siamese Algae Eater (or a closely related species, more of which anon) as *Epalzeorhynchus siamensis*. Smith had himself previously described both species as new taxa back in 1931. When the first algae-eaters were imported to Europe from Thailand around 1962 it was logical to identify them following Smith. Unfortunately Smith had overlooked the fact that his species *Garra taeniata* had already been described as *Garra cambodgiensis* by Gilbert Tirant in 1884. Because the latter name is clearly older it takes precedence over *G. taeniata*, a name

that should no longer be used. But unfortunately the Stonelapping Minnow is often still found under the incorrect name of *Garra taeniata* in the aquarium trade, as that is the name used in the majority of older aquarium books.

### Confusion reigns: the Siamese Algae Eater

Matters are somewhat more complicated in the case of this species, in that it has been transferred to another genus and is now called *Crossocheilus siamensis*. Such changes of genus are a nightmare for aquarists, but they repeatedly happen and are sometimes simply unavoidable, as they

Another photo of the Siamese Algae Eater. Only as adults do these fishes develop a green back.





*Garra cambodgiensis*, young male.

represent an improvement in knowledge. In addition, in 2000 ichthyologist Maurice Kottelat established that *Crossocheilus siamensis* corresponds to a great extent with a species that was described as *Crossocheilus oblongus* by Johan Coenraad van Hasselt as long ago as 1823, ie more than 100 years before *C. siamensis*, and declared the two species to be synonymous. So the Siamese Algae Eater is now usually known as *Crossocheilus oblongus*. Unfortunately, however, it isn't very likely that things will remain thus for long. In 2009, in a study of the fishes of the Batang Hari river in Sumatra, Tan Heok Hui and Maurice Kottelat established, during the description of a new *Crossocheilus* (*C. obscurus*), from that river, that there are apparently a whole series of different species in the genus, all very simi-

*Garra cambodgiensis*, young female.



lar in external appearance. And that includes *Crossocheilus oblongus*. This species was originally described from species, but unfortunately at present nobody knows what live *Crossocheilus* from Java look like, as important details can no longer be seen in the almost 200 years old museum specimens of *C. oblongus* and no specimens are being exported from Java for the aquarium hobby. But one thing is sure: Smith wrote that *C. siamensis* exhibits only one pair of barbels and actually examined his specimens very closely in this respect, as the only other *Epalzeorhynchus* species (*E. kalopterus*) known to him in 1931 has two pairs of barbels and this character had even been used in the generic diagnosis of *Epalzeorhynchus*. But, as can clearly be seen in the photo, the Siamese Algae Eaters maintai-

ned in our aquaria have two pairs of barbels. For the time being, at least, there is much to suggest that the Siamese Algae Eaters that swim in their thousands in aquaria all over the world belong to an as yet undescribed species, new to science!

#### Unimportant details?

Many people may think all this is just nit-picking. Two or four barbels, does it matter? Do we really need to alter names for that reason and make everything complicated? Well, that is quite simply a matter of viewpoint. Tiger and Lion differ in far fewer characters comparatively speaking, just in the coloration of their hides and through male lions developing a mane. It is impossible to tell a skinned Tiger apart from a skinned Lion unless DNA analysis is em-



ployed. But despite this nobody seriously doubts that Lion and Tiger are two different species. The study of small freshwater fishes is infinitely more difficult than that of large mammals. Without the aquarium hobby nothing at all would be known about the majority of fish species beyond the fact that they exist. Unfortunately animal and plant species are becoming extinct every day as a result of environmental changes caused by humans. Their loss can be compared to the destruction of a major work of art such as the Mona Lisa. Obviously there are innumerable reproductions of the Mona Lisa, but the original painting is and will always remain unique. The same applies to animal species. Even if they maybe appear unspectacular to us externally, they are still masterpieces of Mother Nature and every species is totally unique in its own special way. Hence the study of biodiversity, before it is too late, is one of the most important concerns of our times. Where freshwater fishes are concerned, aquarium observations are an almost indispensable part of the process.



## Wir lieben Labyrinthfische! Sie auch?

Labyrinthfische sind zauberhafte Pfleglinge. Die Kleinsten werden nur 3 bis 4 Zentimeter groß, die Großen bis 70 cm. Ihre Farben sind faszinierend schön. Faszinierend ist auch ihr Fortpflanzungsverhalten. Labyrinthfische brauchen wie wir die Luft zum Atmen. Ihre Pflege ist einfach, verschiedentlich aber auch eine große Herausforderung. Wenn auch Sie sich für diese ungewöhnlichen und zauberhaften Aquariumpfleglinge entschieden haben oder entscheiden möchten, kommen Sie zu uns. Werden Sie Mitglied im Arbeitskreis Labyrinthfische im VDA mit European Anabantoid Club. Für nur 21.00 € im Jahr (für nicht VDA-Mitglieder 31.00 €) werden Sie Mitglied im Kreis der vielen Europäischen Labyrinthfischfreunde. Unser Jahrestreffen mit interessanten Vorträgen bietet Gelegenheit zum kennenlernen und zum Erfahrungsaustausch.

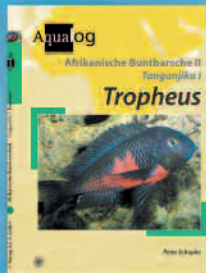
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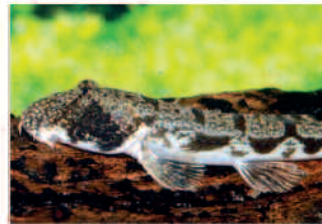
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### Maintenance and breeding

The maintenance of the Siamese Algae Eater and the Stonelapping Minnow is easy. Both species grow to around 15 cm long and should be kept in groups. Water chemistry (pH and hardness) is of subordinate importance as these fishes are very adaptable in this respect. In the case of *Garra cambodgiensis* only juveniles are very hard-working algae eaters, with adults preferring to eat "normal" fish food, while the Siamese Algae Eater is an excellent eradicator of algae life-long. Because both species develop an order of rank and thus exhibit very interesting social behavior, their maintenance in the aquarium can be recommended even where there isn't as much need for combating algae. These fishes aren't bred commer-



cially here in Germany as it is more economical to import them from Thailand. But fundamentally *Garra* species have proved relatively uncomplicated when it comes to breeding. Like barbs they spawn over coarse

Habitat of *Garra cambodgiensis* in Pak Chong, central Thailand.



*Garra cambodgiensis*

gravel and don't practice any brood care. By contrast *Crossocheilus* species, just like the members of the genus *Epalzeorhynchus*, have been induced to spawn only with the aid of hormone injections such as are used for food fishes (eg Rainbow Trout), as these fishes are thought to undertake spawning migrations in the wild and hence it is difficult to trigger spontaneous spawning in the aquarium. Even so periodic chance spawnings do take place in the aquarium. These fishes likewise don't practice any brood care. In *Garra cambodgiensis* males and females can be distinguished on the basis of head shape, while in *Crossocheilus oblongus*

females can be recognized only by their rather plumper shape (see photos).

#### Literatur:

Kottelat, M. (2000): Diagnoses of a new genus and 64 new species of fishes from Laos (Teleostei: Cyprinidae, Balitoridae, Bagridae, Synnathidae, Chaudhuriidae and Tetraodontidae). *Journal of South Asian Natural History* v. 5 (no. 1): 37-82.  
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## Lexicon

### Algae eaters

*Crossocheilus* means "fringed lip"  
*oblongus* means "oblong", "rectangular"  
*Garra*: from a name in common use in Bengal for one of the species  
*Epalzeorhynchus* means "with a powerful snout"  
*taeniata* means "striped", "banded"  
*siamensis* means "from Siam"; Siam is the old name for Thailand.  
*kalopterus* means "with beautiful fins"  
*cambodgiensis* means "from Cambodia".



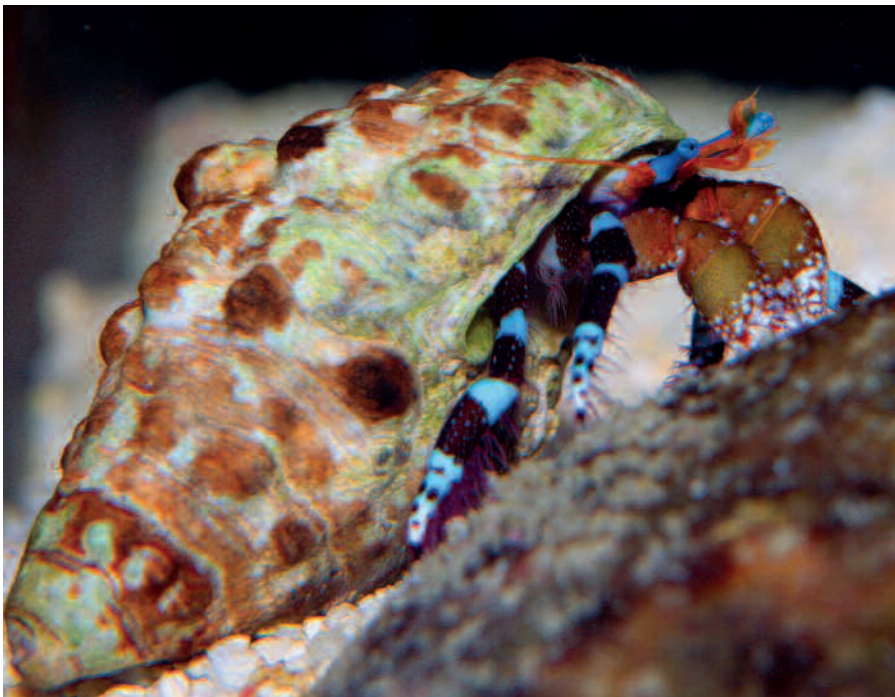


## Sea water

# As useful as lovely

by Levin Locke

There is no doubt that the main reason for setting up a marine aquarium is the legendary colorfulness of the fishes and corals. But once the tank is set up and matured it becomes clear that a few extra little helpers may be required, for example to keep down the algae, the *Aiptasia*, or the bristleworms, to loosen the substrate a bit, or to clean up uneaten food. In the sea there is a creature designed to deal with every such problem and some of them are, in addition, so delightful that it is worth taking a closer look at them.....



Australian hermit crab, *Calcinus elegans*.

All photos: Frank Schäfer

## Small but highly effective hermit crabs

Anyone who has collected seashells on the beach while on holiday and held them in the hollow of his hand, will undoubtedly have received quite a shock at some stage when a shell suddenly sprouted little legs and tried to force its way to freedom. In European holiday areas the legs will generally belong to members of the genus *Clibanarius*, which grow no larger than a centimeter or two long. In the marine aquarium these small hermit crabs are very entertaining, easy to keep, and useful little creatures, as they are constantly on the search for food and hence keep the tank free of wastes, while at the same time never causing any harm to other residents.

Another hermit crab species is *Calcinus elegans*, which may be considerably larger at a good five centimeters in length, but is just as harmless and beneficial. Moreover this hermit crab is a real beauty! *Calcinus elegans* is imported mainly from Australia and two points are particularly worth bearing in mind when keeping it in the home. Firstly the species may be omnivorous, but the focus of its diet is noticeably in the area of algae. Hence you shouldn't try to cultivate algae in the *Calcinus* tank as any such attempt may be counteracted by *Calcinus elegans*. Sometimes even *Caulerpa* will be regularly decimated. And secondly, *C. elegans* grows rather quickly, and because its shell doesn't grow as well, the hermit will need to "move house" regularly. In order to enable it

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to do so, the aquarist must provide a good selection of empty shells of various sizes in the tank. But that is the limit of the difficulties in dealing with these pretty crabs. They can even be bred in the aquarium, although the free-swimming larval stages usually have to be transferred to special tanks, as in "normal" aquaria they either end up in the filter or are regarded as a welcome supplementary food by other tank residents. The sexes cannot be determined in living specimens from the parts that protrude from the shell, but if the hermit is wandering around shell-less (eg after a molt) then the females can be recognized by the pleopods on the posterior body, as these limbs are completely absent in males.

### Square - practical - good

Coral-reef aquarists are usually as wary of crabs as the Devil of holy water. And normally justifiably so, as crabs are almost invariably omnivorous, which should be taken literally, as eating everything. Even though they don't find some livestock palatable, the crabs will keep on checking to see if the taste has changed, and sooner or later the corals stop opening and fishes fall prey to the crabs overnight when they are sleeping (the fishes, not the crabs, or else it might be the other way round!). In special aquaria, however, crabs are nice pets and interesting to keep, but that is another story. There is, however, a notable exception to the rule of "avoid crabs in the reef aquarium": *Percon planissi-*



*mum*. This crab, whose body is almost square in shape, grows to around 3-10 cm in size, depending on what you measure. If you take just the carapace width then you arrive at about 3 cm, but if you take the entire leg-span then the result is sometimes more than 10 cm. This crab leaves the majority of its tankmates in the reef aquarium completely in peace and prefers to feed on algae. Apro-

als, fishes, echinoderms, etc.) have been reported to date.

All crabs are escape artists, and this should be borne in mind as otherwise sooner or later you will either find a dehydrated crab, or (more likely) be deafened by someone in fear of their life screaming at the top of their voice when a dust-coated "giant spider" suddenly

in pairs, as individuals of the same sex won't tolerate one another. The sexes can be easily told apart by the form of the posterior body (the pleon). The species is distributed in warm seas practically worldwide if *Percon gibbesi* is regarded as being the same species, or in the eastern part of the Old World if *P. gibbesi* is regarded as a western sibling species. Since the late 1990s the latter has been regarded as an invasive species in the Mediterranean, where it is spreading rapidly.

#### The stars in the substrate

Sea-stars never cease to fascinate. This is, inter alia, because of their unusual symmetry. Almost all the animals on this planet are bilaterally symmetric, in other words if an axis is drawn the length of their bodies then we get a left-hand and a right-hand half that are very similar to one another. Not so with sea-stars and other echinoderms such as sea urchins, crinoids, and sea cucumbers. They have developed a five-way symmetry, termed pentamery, around five axes of symmetry. Nevertheless they belong to the Bilateria, that is animals with bilateral symmetry, as their larvae exhibit perfectly normal bilateral symmetry.



*Percon planissimum*, an outstanding algae-eater.

pos of which, the same applies as stated above regarding hermit crabs. You should be aware, however, that *Percon planissimum* also has a taste for gastropods. But no assaults by this crab on other aquarium occupants (co-

scuttles across the room. Neither is desirable, so aids to escape such as filter hoses, heater cables, etc should all be made crab-proof.

*Percon planissimum* should be kept singly or

With its neon-colored facial mask, *Percon planissimum* is rather attractive.



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Beautiful though many sea-stars may be, numerous species are of only limited suitability for the reef aquarium as they can be rather predatory. *Archaster typicus*, the Sand-Sifting Sea-Star is a species unlikely to be purchased on account of its colorfulness, but this species doesn't actually need to be colorful as it spends all the day buried in the substrate, emerging from this domicile only at night then only occasionally. But *Archaster* don't just hide in the substrate, they feed there as well. And that makes them extraordinarily useful, as firstly, they continually dig through the bottom to do so and prevent any harmful compacting; secondly, they can be relied on to eliminate uneaten food; and thirdly, they prevent the rather unattractive brown diatomaceous algae from colonizing the substrate, as these too form part of this sea-star's diet.



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Sand-Sifting Sea-Star, *Archaster typicus*

*Archaster typicus* grows to up to 25 cm across and comes from the Indo-Pacific. The genus *Archaster* contains three species, *A. angulatus*, *A. lorioli*, and *A. typicus*, which all look very similar. It can probably be assumed that as a rule it is *A. typicus*, which is the most widespread species of the genus, that is seen in the trade. It is collected for export in the Philippines in particular. Maintenance is problem-free, although it must always be strictly borne in mind that

all echinoderms must be transported under water, as otherwise air can get into their stomachs and prove fatal in the long term.

Sea-stars have separate sexes but these cannot be told apart externally. Although males remain smaller than females, this information is of little use in practice, so anyone who wants to breed them should buy several specimens as it will then be statistically pro-

bable that the group contains both sexes. Even so there are to date no reports of the successful breeding of this sea-star species in the home aquarium. However there is a body of scientific literature on the genus in which aquarists interested in breeding this type of sea-star will find a host of interesting information. For example, *Archaster* are noted for mating in large assemblies, with the males clambering onto the backs of the females and performing pseudocopulation. Anyone who is especially interested should consult Bos et al. 2011 and 2012.

The sea-stars clamber over one another prior to mating. This is termed pseudocopulation.



#### Literatur:

Bos, A., Gumanao, G. S., van Katwijk, M. M., Mueller, B., Saceda, M. M. & R. L. P. Tejada (2011): Ontogenetic habitat shift, population growth, and burrowing behavior of the Indo-Pacific beach star, *Archaster typicus* (Echinodermata; Asteroidea). *Marine Biology* 158 (3): 639–648.

Bos, A. R., Gumanao, G. S., Mueller, B. & M. M. Saceda (2012): Size at maturation, sex differences, and pair density during the mating season of the Indo-Pacific beach star *Archaster typicus* (Echinodermata: Asteroidea) in the Philippines. *Invertebrate Reproduction & Development*: 1-7



## Cichlids

# Peaceful herbivores? - far from it!

## *Tropheus* sp. "Kasanga"

by Sarah Nieten

Naturalists can only be glad that the dinosaurs went extinct. Because in an era when people are more inclined to believe in Hollywood fantasies than the realistic, albeit far from simple, views of science, there would undoubtedly be countless deaths because of the fact that herbivorous saurians were portrayed as peaceful giants in the film Jurassic Park.

This is the result of a very frequently observed linguistic misrepresentation. The carnivores of the animal kingdom are generally associated with the attribute "aggressive", and herbivores with "peaceful". But the mode of feeding has nothing whatsoever to do with the potential for aggression in an animal species. For example, the African big game species that kills the most people through its aggressive behavior is not the Lion but the Hippopotamus, which is exclusively vegetarian.

### Feeding behavior isn't everything

This misinterpretation of animal behavior is probably the result of the fact that in human society some people regard the killing of animals for food as aggressive and morally suspect behavior, while the killing of plants for food is seen as a peaceful and preferable alternative. But this definition of



Dominant male *Tropheus* sp. "Kasanga", also known as the "Red Rainbow".

aggressive behavior relates exclusively to predator-prey behavior, or, to put it somewhat more generally, feeding behavior. Other aspects of cohabitation, be it with conspecifics or with heterospecific life forms, are not taken into consideration. Many predatory fishes, for example, are completely peaceful towards both their own kind and other fishes as long as they don't represent food. Meanwhile some exclusively herbivorous species are regular tyrants in the aquarium, and tolerate neither conspecifics nor other fishes with a similar way of life in their vicinity. Example of these include numerous surgeonfishes (*Acanthurus*) in the marine aquarium, and in the freshwater aquarium the lovely mouthbrooders of the genus *Tropheus* from Lake Tanganyika in Africa.

### *Tropheus*

Although a some species of this genus are among the most popular cichlids from the great African rift lakes and one form or another is almost always available in the aquarium trade, no generally accepted popular name has been established for these fishes. As in the case of the Platy (*Xiphophorus maculatus*), whose popular name is an abbreviation of the older, now invalid, genus name *Platypoecilus*, aquarists discussing *Tropheus* cichlids refer to "Moorii" (for *Tropheus moorii*) or "Duboisi" (for *Tropheus duboisi*). There are probably some 13 species of *Tropheus* in Lake Tanganyika, divided into around 120 known subspecies or local variants (Schupke, 2003). But only six species have been scientifically described (*Tropheus annectens*, *T. brichardi*, *T. duboisi*, *T. kasabae*, *T.*

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*moorii*, and *T. polli*). One of the loveliest is undoubtedly the *Tropheus* from Kasanga (in the far south of Tanzania), which doesn't belong to any of the species described to date.

#### Nasty fellows?

All *Tropheus* feed on aufwuchs. The word aufwuchs is German in origin and refers to the multitude of micro-flora and -fauna

where they are usually seen in large groups, although things are far from peaceful in these groups. The fishes are constantly engaged in territorial squabbles or exhibiting courtship behavior, which itself isn't exactly all sweetness and light. It isn't easy to give a rational explanation of this high inclination towards aggression, as food is not only in short supply but also rather nutrient-poor.

all over the lake, their behavior is quite obviously a successful survival strategy - and that is all that matters.

#### Constantly on the move

There is always something going on in an aquarium with *Tropheus*. These fishes are hectic swimmers. And dominant males are extremely colorful. Juveniles and females of *Tropheus* sp. "Kasanga" are noticeably differently colored to males. While juveniles continue to enjoy a sort of immunity because of their age, the females develop an order of rank among themselves. For many aquarists this picture of a lively, very colorful community, in which there is constantly something going on, is the motive for becoming involved with the maintenance and breeding of *Tropheus* in the aquarium. But it may also possibly explain why the high potential for aggression in *Tropheus* has proved favorable in the course of their evolutionary history. As *Tropheus* are so-called agamous maternal mouthbrooders. That signifies that males



Juveniles and females are usually striped.

found on the surfaces of underwater objects - in the wild usually stones, wood, and aquatic plants. The bulk of the aufwuchs in the habitat of *Tropheus* consists of small algae. *Tropheus* are found on sunlit rocky shores,

So it isn't actually very sensible to immediately invest hard-won energy in exhausting battles. But Nature doesn't function so simplistically. Because *Tropheus* are commonplace cichlids of the rocky littoral and found

and females do not form any long-term pair bond and the females alone are responsible for brooding the eggs in their mouths.

#### An attempt at an explanation

A male in full color is exhibiting dominance behavior. He is saying, "I am strong and invincible". Every other male is a potential rival to be driven away. Subordinate males exhibit noticeably duller colors or even assume female coloration. A female is thus well advised to seek out the most colorful male as a mate, as he will pass on good genes. When a female approaches such an alpha male, then he interprets this as willingness to spawn. If, however, the female is not ready to mate, then the male will see the female as no more than a competitor for food, and to be driven away. Females in turn fight among themselves for the best feeding sites, as they are prevented from feeding during the time



This male is second in the order of rank.



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when they are brooding eggs in their mouths. Only those that have managed to eat their way to a good energy supply prior to breeding will be able to withstand the demands of the mouthbrooding period.

#### Kasanga in the aquarium

The high tendency to aggression in *Tropheus* and their urge to keep moving necessitate a large tank. This is also necessary because *Tropheus* are best kept in groups of 10 or more individuals, so that the aggression is spread and the battering received by each fish reduced to some degree. A nutrient-poor diet, rich in roughage, is important, as otherwise soo-

ner or later the fishes will become obese or suffer diseases of the digestive tract. *Tropheus* - and *T. sp.* "Kasanga" is no exception - require water that contains as little as possible in the way of metabolic wastes and has a low germ-count, as otherwise they won't show their attractive colors. The filtration must be designed accordingly. And Lake Tanganyika is rather warm, so don't skimp on the heating - 26-28 °C is best. Anyone willing and able to provide these conditions will get a lot of pleasure from an aquarium populated with *Tropheus sp.* "Kasanga" and be able to make lots of interesting observations.

Note that fishes of other species are usually

of no particular interest to *Tropheus*. It is nevertheless not very advisable to keep other species in the *Tropheus* tank, as in the long term the constant hectic activity will drive quieter species to the wall. In addition species that feed on small organisms, for example the *Lamprologus* assemblage, are difficult to feed as the fast-moving *Tropheus* are very quick to take the *Lamprologus* food, which in any case is unhealthy for *Tropheus*.

The most suitable tankmates are goby cichlids (genera *Eretmodus*, *Spathodus*, and *Tanganicodus*).

### Cold water

## Golden fishes - swimming jewels

by Frank Schäfer

The Goldfish was the first aquarium fish in the true sense and is the oldest ornamental fish in the world. The earliest reports of gold-colored fishes, known as "Chi", date from the period 968-975 AD; catching them was strictly prohibited by government edict. By the 16th century people in China had learned to keep and breed the Goldfish and its varieties not only in ponds, but also in earthenware containers. The Chinese can thus be regarded as the inventors of aquarium hobby, although the scientific principles of aquarium science were still unknown. In those days people worked entirely on the principle of trial and error. The genetic principles of animal breeding were also still completely unknown. Hence the "sports" already known back in the 16th century - double fins, telescope eyes, etc, and above all the much-prized color sports - were obtained by selection, without any understanding of the actual processes involved.

Piebald Dragon Eyes

All photos: Frank Schäfer



### The aquarium hobby has to be learned!

The first Goldfishes probably came to Europe in the 17th century. They were expensive creatures that were maintained and bred in ponds. Aquarium maintenance didn't become possible for people in Europe until the middle of the 19th century, after natural science had superseded superstition and brought greater enlightenment even to the common man. Because the same applied back then as today: it isn't possible for someone to care for a fish properly by feel and keep it alive. The aquarium hobby has to be learned! In addition a knowledge of natural science is just as indispensable as solid expertise based on experience. Both must be learned either from books or from a teacher.

#### Aquarists and Co. as conservationists

Aquarium science began in Germany





Red Dragon Eye

around 1850, with Emil Adolf Roßmässler being regarded as the "Father of aquarium science", who made the maintenance of animals and plants in the aquarium popular through numerous magazine articles. The foundations for organizations dealing with aquarium and terrarium science were likewise laid in the second half of the 19th century. The Hottonia in Darmstadt, for example, was founded in 1897 and is one of the oldest organizations of its kind still in existence anywhere in the world. Roßmässler's objective was to bring people closer to the natural history of Germany. The industrial revolution, and the associated urbanization of a large part of the population, on the one hand created a need for involvement with nature in a domestic setting, and on the other awakened fears among nature-lovers that the increasing distancing of city-dwellers from nature might have serious consequences for the level of education among the populace.

Unfortunately these fears proved only too justified. The catastrophic environmental destruction to be seen in our times, resulting from the ignorance and desire for profit of a small number of people and resulting in the extinction of entire habitats with the flora and fauna they contain, is a direct consequence of the separation of humans from nature. The natural science organizations - be they aquarists, terrarium keepers, breeders of birds, small animal enthusiasts, orchid and cactus breeders, butterfly collectors, and so forth - are the most important bastion in the battle against global environmental destruction and the worldwide extinction of species. We can only protect what we know about! For this reason nowadays natural science organizations are massively embattled

against a profit-motivated lobby that inter alia promulgates totally senseless, so-called animal protection and species conservation legislation whose long-term objective is to completely prohibit private ownership of animals and plants.

We must never forget that not a single animal species has ever been wiped out by collection for private maintenance, and that there is no need to worry that anything of the sort could ever happen, as the laws of economics also apply to plant and animal breeding. Specifically, if an animal or plant species becomes so rare in the wild that the price rockets upwards, then it makes far better economic sense to breed it than to continue collecting it. Nowadays we can, if need be, breed every species of animal and plant that is in demand for maintenance in a domestic setting. And for that reason it has been possible to preserve many species already extinct in the wild (the reason for this has always and without exception been environmental destruction) through conservation breeding before their eventual extinction took place.

#### The Goldfish - a trendsetter

But back to the Goldfish! Without the Goldfish there would surely be no aquarium hobby at all. This fish was and remains a

stroke of luck for aquarium science, as the genus *Carassius*, to which the Goldfish belongs (the scientific name of the original wild form is *Carassius auratus*, domesticated forms don't receive scientific names of their own, but have the same one as the wild form) contains outstanding survival specialists. The European Crucian Carp (*Carassius carassius*) is specialized on very small bodies of water and hence can even survive for a while in water containing no oxygen (it obtains life-giving oxygen from its body fat), is extremely resistant to toxins such as now regularly occur in deteriorating waters, and can even survive temporary drying-up of its habitat by burying itself in the mud of the bottom. It is a disgrace that this fish has had to be placed on the Red List of endangered species in Germany because the type of pools that the Crucian Carp requires as habitat aren't tolerated in our tidy cultivated landscape.

#### Goldfishes are tough fellows

The Goldfish shares some of the resilience of the Crucian Carp. And so it tolerates (almost) every mistake the novice can possibly make in the maintenance of fishes. In addition the Goldfish is an indispensable occupant of the ornamental pond. And since time immemorial Goldfishes have bred in such ponds, providing a magical attraction for mischievous

Calico Fringetail





children who catch the young. This is often the first and most important encounter that young people have with fishes, a hands-on experience with living creatures whose educational value cannot be valued too highly.

### The Goldfish is not an ornament

Goldfishes will even survive "maintenance" in a so-called goldfish bowl for a while. But because of their shape these containers are unsuitable for the maintenance of fishes, as in such globes the water's surface, via which gas exchange takes place in the aquarium (oxygen is taken up by the water, and carbon dioxide resulting from fish respiration is given off), is far too small in relation to the water volume. This not only results in a shortage of oxygen for the fishes, which have constantly to battle against suffocation in goldfish bowls, but there is also too little oxygen for the bacteria essential for an aquarium to function properly. The result is that fishes in goldfish bowls suffer slow poisoning as harmful metabolic wastes aren't broken down by bacteria. In addition the round shape of the goldfish bowl doesn't permit installation of the modern aquarium equipment that can be used to solve many of the problems described above. So please steer clear of goldfish bowls, even though they have a nostalgic attractiveness. Love of animals can never substitute for doing things properly!

Transparent Fringetail



Black Ranchu

### Cultivated forms

The fancy varieties of the Goldfish, such as the Veiltail, Telescope-Eye, Celestial, Pearlscale, Oranda, Fantail, etc, have divided aquarists since the aquarium hobby began. Ever since the 1880s, when Paul Matte of Berlin first started importing such forms from Japan and himself bred specimens of a beauty no longer seen today, the hobby magazines have been full of controversial articles. There are the opponents of such fishes, who despise them as deformed and unfit to live, as well as representing cruelty to animals, invariably pontificating loudly without actually having any experience of keeping such fishes, while enthusiasts seriously involved in their maintenance and breeding have a completely different point of view. From a

purely legal viewpoint no cruelty is recognized in breeding such fishes. Tolerance of those with different opinions is one of the fundamental tenets of a democratic society. As, in the final analysis, nobody is being forced to keep fancy Goldfishes and, from an objective viewpoint, these fishes do very well, nobody has the right to impose regulations on the Goldfish enthusiasts.

### Major exhibitions

One of the world's oldest organizations in the aquarium and terrarium hobbies, the Hottonia in Darmstadt, Germany staged a major exhibition on the topic of Goldfish over Whitsun 2013. To the present day interest in Goldfishes continues uninterrupted, even if this isn't to everyone's liking. An aquarium hobby without Goldfishes is totally unthinkable.

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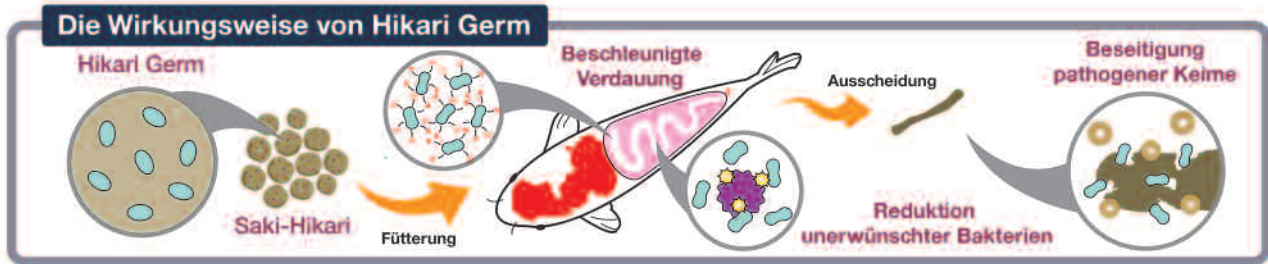
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## Evergreens

# The Neon Tetra - a fish that changed the world

by Tobias Körbel

The Neon Tetra, *Paracheirodon innesi*, can be found in every aquarium store in the world. It enables thousands of people to earn a living, either because they breed it or because they sell it. It epitomizes much of what makes the aquarium hobby one of the finest pastimes in the world: it is colorful, peaceful, interesting, and reflects the lively nature of the underwater world. But commonplace though the Neon Tetra may be nowadays, it wasn't always so by a long chalk...



Neon Tetra, wild-colored aquarium strain, male.

All photos: Frank Schäfer

If you want to go to Iquitos in Peru nowadays, you simply get on a plane and are there after a few hours comfortable travel. In the 1930s such a journey not only took a lot longer (several weeks) but was also

considerably more punishing and with involved danger to life and limb. There were virtually no medications for the sometimes deadly tropical diseases. Iquitos lay, if you will pardon the crude expression, at the

Neon Tetra, wild-colored aquarium strain, female



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arse end of the world. No wonder that no ornamental fish collectors went there.

The Neon Tetra was discovered only by chance. Auguste Rabaut, an adventurer and collector of flora and fauna of all types, was actually collecting butterflies when an Indian woman drew his attention to the Neon Tetra. Rabaut had instinct enough to scent a business proposition.

### Luxurious fish transport

Although Rabaut was no aquarist and had only very rudimentary transport facilities, he managed to get 13 Neons alive to the company Lepant in Paris, where they came into the hands of J. S. Neel. Neel invented the name Neon Fish. The fishes were sold for the incredible sum of \$ 6,500 to two Germans, Hugo Schnell and Walter Griem, in Hamburg. This was in 1935. In July 1936 five of these fishes were dispatched on the

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airship Hindenburg to the Shedd Aquarium in Chicago in the USA. Not without problems, as the transportation of live animals aboard an airship was prohibited. Walter Chute of Shedd had entrusted Fred Cochu with the task, and they solved the problem by declaring the cans containing



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the Neons to be "fish preserves". Only one of the five fishes arrived alive at Lakehurst, the airfield where the Hindenburg was to explode a year later, in 1937. The transport cost \$3,000 and was probably the most expensive fish transportation of all time.

#### A fish is "christened"

The "Last of the Mohicans" found an enraptured public and eventually received the popular name still in use to the present day: Neon Tetra. The Neon was scientifically described in 1936 by the American George Sprague Myers, one of the leading ichthyologists of his time, who had received the preserved specimens from William Thornton Innes III, the publisher of what was then the most important American aquarium magazine. Innes had in turn received preserved specimens from Rabaut in Paris with a request for identification. They were thus specimens from the first importation. Myers named the Neon *Hyphessobrycon innesi* in honor of Innes. The locality, which Rabaut understandably kept secret, was given as "vicinity of Iquitos".

#### The race for a fish

There followed a race. Everybody wanted to own this miracle fish. Importing it promised vast profits. And it was assumed that the Neon would soon prove possible to breed and then the price would fall considerably. Only the first to obtain it would



Long-finned wild-colored cultivated form of the Neon Tetra.

make a lot of money. There was even a short book written about the competition: Werner Ladiges, an ichthyologist in Hamburg who for many years worked with the ornamental fish importer Aquarium Hamburg, wrote his recollection of the exciting discovery of the Neons: *Schwimmendes Gold vom Rio Ukayali* (Swimming Gold from the Rio Ucayali). And it was the Germans that won the race ...

#### The eggs wouldn't hatch

But when it came to breeding the Neon proved a hard nut to crack. The fishes were willing enough to spawn, but the eggs didn't develop. Then came the Second World War and the German aquarium

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hobby practically died out and with it all attempts at breeding the Neon Tetra. Only after the end of the terrible war were aquarists able to devote themselves to breeding attempts once again. It was discovered that a combination of very soft water (KH below 0.3° dKH), humic acids, a pH between 6.2 and 6.8, relatively low temperatures (spawning temperature 23-24 °C, maintenance temperature 18-22°C), and darkness (the spawn is extremely light-sensitive) was crucial for successful breeding. If just one of these parameter was wrong then a breeding attempt was doomed to failure.

#### Don't forget to wash your hands!

There was more to be learned from the Neon Tetra than just the importance of water chemistry for breeding fishes. A microsporidian organism, *Plistophora hyphe-sobryconis*, the cause of the dreaded and still incurable "Neon disease" (it also attacks a whole host of other fish species, but Neons are particularly susceptible) wiped out whole populations of the precious little fishes. This pathogen attacks the skeletal musculature, which immediately dies off. This demonstrated that painstaking hygiene needed to be maintained when re-

Xanthic Lutino cultivated form of the Neon Tetra, "Mon Cherie".





## Lexicon

### Neon Tetra

Hyphessobrycon means "small Brycon"; Brycon is another genus of characin.

innesi: named in honor of William T. Innes

Paracheirodon means "close to Cheirodon", indicating a close relationship. Cheirodon is another genus of characin.

aring Neons in order to keep this disease at bay. And thus aquarists evolved maintenance protocols for the rearing of Neon Tetras (regular siphoning of the bottom, frequent partial water changes), using which they were able to keep Neon disease under control. You think such maintenance measures are obvious? But that wasn't the case back then! In those days there were still numerous devotees of "old water", who regarded every last drop of mature aquarium water as precious. We have observations and experience with the Neon Tetra to thank for the fact that we are able routinely to keep and breed so many delicate spe-

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cies in the aquarium nowadays.

#### Unexplained family relationships

Nowadays wild-caught Neon Tetras are hardly ever seen on the market and 99.9% of the fishes traded are captive-bred. Meanwhile new localities for these dainty little fishes have been discovered. Apart from the traditional locations on the Ucayali, there are also collecting sites known on the Rio Purus and the Rio Putumayo. To date there has been no research into whether these widely-separated populations (up to 1500 km apart) differ genetically, but it seems likely, as recent years have seen the appearance of a whole series of striking cultivated forms of the Neon Tetra, for ex-



Long-finned cultivated form of the xanthic Lutino cultivated form of the Neon Tetra, "Mon Cherie"

ample the "Diamondhead", which exhibits a brilliant head and an extension of the red coloration of the belly onto the back. Or the gold-transparent lutinos that have an almost ghostly appearance. These cultivated forms have already been bred into the long-finned forms that probably originated back in the 1980s but unfortunately (as with so many cultivated forms) without this being documented in the literature. Be that as it may, the accumulated occurrence of such unusual deviations from the norm is often an indication that different species, subspecies, or populations have been crossed.

#### A "golden" parasite

The Golden Neon isn't a cultivated form and is available only wild-caught. The gold-dust effect is a disease, caused by a skin reaction to infection with the larval stages of parasitic, multi-host metacercarians. Numerous characins are affected by it. The infection itself is harmless, but the gold-colored fishes are probably more susceptible to predation by piscivorous birds, the final hosts of the parasite. The offspring of Gold Neons are always normal in color, as they can't be infected with the metacercarian. Infection requires consumption of the

Long-finned cultivated form of the Diamondhead Neon Tetra





Neon Tetra with gold-dust disease. Such fishes are always wild-caught.

droppings of infected birds, which aren't generally available to aquarists. For this reason it can always be assumed that Gold Neons are wild-caught. The golden indivi-



Above: Albino cultivated form of the Neon Tetra

The Diamondhead Neon Tetra is a very popular cultivated form that first appeared in recent years.



duals retain their color lifelong, but aren't compromised in the slightest by the encapsulated metacercarians and can live just as long as normal-colored conspecifics.

#### A simply bewitching fish

The world has changed since the discovery of the Neon. Iquitos now has an international airport. The Neon Tetra has been transferred to another genus and is now called *Paracheirodon innesi*. Aquarium science has now reached a level of knowledge that couldn't even be dreamed of in the 1930s. But in the 78 years since the discovery of the Neon nothing has changed: it remains

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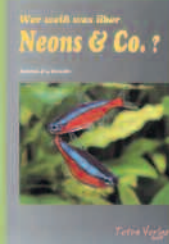
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The special coloration of the Diamondhead Neon Tetra can be seen particularly well from this perspective.

one of the loveliest fishes in the world and countless aquarists have entered the hobby through the desire to keep such jewels at home. Long may it remain thus!

#### Literatur:

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## Water chemistry

# Secondary plant substances: the power of Nature in the aquarium

by Heiko Blessin

In the first three installments in this series we looked at the chemical parameters that can easily be checked using everyday equipment and measuring methods: hardness and pH. Unfortunately it is not as easy with the substances discussed in this installment. But never fear, even if some of what follows sounds tinged with alchemy: it works!



The water is often colored deep brown in the biotopes of our aquarium fishes. The cause is secondary plant substances. Photos: Frank Schäfer

Our aquarium-hobby forefathers around 150 years ago had nobody they could ask how to run an aquarium successfully. They had to go out into the wild and observe how animals and plants live. They then applied the results of their observations to the aquarium. Sometime this worked, sometimes not. Unfortunately some of the most important knowledge from back then has been forgotten or is only just being discovered again.

### Peat

Peat is formed in bogs. Bogs are wet areas subject to heavy precipitation, where water collects and new plant growth is greater than the mass of decaying dead plant materials. In this way a bog grows constantly

upwards and the dead vegetable material is deposited in oxygen-depleted and/or anaerobic layers where further breakdown via bacteria no longer takes place to any noteworthy degree. The resulting material composed of only incompletely decayed plant remains is known as peat. Peat can derive from all sorts of plants, in our climes for example from heathers (*Calluna*, *Erica*), sedges, and other acid-loving grasses, but above all from peat moss (*Sphagnum*). Although we Central Europeans usually associate the term bogs with Nordic regions, that is incorrect. The entire Amazon region, for example, is boggy and the strongly acidic pH of many of its waters is attributable to the peaty, nutrient-poor soil. Peat is essentially nutrient-poor, but not always acid. Whether the pH in the aquarium can be lo-

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were using peat depends on the peat used. Only peat from upland bogs is suitable for acidification, and can produce a pH between 3.5 and 4.5.

### Secondary plant substances - even without lowering the pH?

But it isn't just a case of the pH when we attempt to influence the water with natural substances and provide our fishes with as natural an environment as possible. When we filter the water over peat then it takes on an amber- to brown-colored tinge. This is the result of so-called secondary plant substances that are released by the peat. The precise composition of secondary plant substances is highly variable and also subject to dramatic local fluctuations. But we are aware, empirically, from experience that these secondary plant substances have an overall beneficial effect on the vast majority of freshwater fishes. Fishes in whose aquarium water these secondary plant substances are dissolved become ill

The brown coloration of the water in the Rio Negro can be clearly seen in this photo of a freshwater dolphin. Photo: Heiko Blessin



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*Poecilocharax weitzmani*, a typical blackwater fish.

less frequently and exhibit more intense colors. However it isn't always desirable to implement this effect in combination with an acid pH, as in the final analysis some of our aquarium fishes tolerate a low pH only badly.

Various manufacturers offer products that add the substances described here to the aquarium water, color the latter a light amber, and don't actually have a pH-lowering effect. But oak extract, for example, is often added because of demand from aquarists and there is then a pH-lowering effect. Hence it is important to read the manufacturer's instructions carefully: does the product have a pH-lowering effect or not? In Lake Malawi or Lake Tanganyika aquaria the addition of such products would have an unnatural effect as the water in these lakes isn't measurably influenced by humic substances.

#### Leaf litter

Dead leaves from trees have a part to play in every aquarium, as they not only release secondary plant substances, which in the case of Sea Almond (*Terminalia catappa*) and Walnut (*Juglans regia*) even have a therapeutic effect in the treatment of various

fish diseases, but also represent a very important and often undervalued component in the natural diet of very many aquarium fishes. Although dead leaves are rather nutrient-poor per se, they fall in such large quantities as to form the basis of numerous nutritional pyramids in aquatic systems. The leaves themselves are also consumed by aquarium livestock, for example many suckermouth catfishes (*Loricariidae*), characins (*Characidae*), and cyprinids (*Cyprinidae*), and leaf litter is even the main food of some crustaceans. But far more important for the majority of fishes and dwarf shrimps is the biocover of bacteria, fungi, and other micro-organisms on the leaves. Very large amounts of detritus, ie the breakdown products of dead plants and animals, are found even in the stomachs of fish species that are known from the aquarium hobby to be predominantly carnivorous (flesh-eating), for example dwarf cichlids (*Apistogramma*); and the leaves of trees are the most important sources of detritus. Thus dead leaves represent the basis of the diet of very many popular aquarium occupants in the wild.

The leaves of almost all tree species can be used as long as they are known not to be poisonous. It is, however, very important to

use only leaves that have already fallen from the tree. Freshly picked leaves can be dried and used as food for certain aquarium occupants, but they have a quite different make-up to fallen leaves as trees cannot afford to waste nutrients. Hence they extract as many nutrients as possible from their leaves before shedding them (in autumn in temperate zones, before the dry season in the tropics). So if you instead use dried, fresh leaves, which are very rich in sugars and other nutrients, then water clouding may result from bacteria or other micro-organisms processing these nutrients. That doesn't necessarily have to be harmful to the fishes, but it isn't healthy and is far from desirable. Sea Almond leaves are available from various suppliers in the trade.

In conclusion it can be said that secondary plant substances represent a very impor-

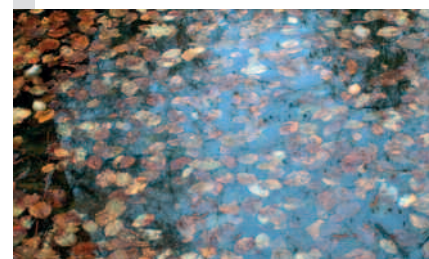
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tant component of water chemistry in natural waters and that they are increasingly receiving recognition as helping to prevent many problems in the aquarium and making the aquarium habitat more amenable for its occupants. And the industry has realized this such that more and more of the products mentioned above are available in the pet trade. Experiment without worries, as the nice thing about these natural products is that if used correctly there are no noteworthy side-effects to be expected.

Not only in central Europe, but also in the Tropics, the dead leaves that fall into the water are one of the most important sources of nutrients for the ecosystem.





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Mikroplankton (grün)	Kleinste Partikelgröße, hochwertiges Phytoplankton	Alle Aufwuchsfresser, vor allem Welse, Garnelen sowie für Wirbellose im Seewasserbecken
Garnelen (ganz)	Hoher Proteingehalt bei gleichzeitig günstiger Aminosäurezusammensetzung	Größere Buntbarsche sowie alle Fische die entsprechend große Futterbrocken bewältigen können, sowie Schildkröten, ebenfalls für Seewasserfische geeignet
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amtra premium vit	Futtertierorganismen angereichert mit allen essentiellen Vitaminen, hochwertige Proteinzusammensetzung, bei optimaler Futterverwertung durch den Fisch	Für alle Fischen mit erhöhten Energieverbrauch, wie kranken Fischen, Jungfischen, Zuchttieren, Wildfängen und gestressten Fischen u.ä. aber auch generell als energiereiches Futter für fast alle Fische geeignet
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amtra premium diskus	Protein und eisenreiche, speziell auf die ernährungsphysiologischen Bedürfnisse der Diskus abgestimmtes, naturnahes Futter ergänzt mit den hochwertigen Proteinen der Blütenpollen und Omega-3-Fettsäuren, besonders leicht verdaulich und formstabil für beste Wasserqualität selbst bei höchster Fütterungsintensität	Alle Diskusfarbvarianten, sowohl Wildfänge als auch „Asien-Diskus“, mittelgroße Cichliden, sowie alle mittelgroßen sich hauptsächlich carnivor ernährenden Fische
amtra premium crab	Speziell auf die vielfältigen, ernährungsphysiologischen Bedürfnisse von Crustaceen abgestimmtes Komplettfutter mit hohem Anteil an Chitin und Omega 3-Fettsäuren. Durch besondere Stabilität im Wasser auch für sehr langsame Fresser geeignet	Garnelen, Krebse und Krabben aller Größen
amtra premium junior	Angereichert mit wertvollen Omega 3+6 Fettsäuren, verschiedenste für Kleinfische wertvolle Futtertiere, wie Bosmiden und dekapsulierte Artemiacysten	Alle Jungfische in den kritischen ersten Lebenswochen. Kleinbleibende Fischarten wie Salmir, Bärblinge u.ä.
amtra premium wels	Angereichert mit Bio-mos als Immunstimulanz. Eine ausgeglichene Mixtur für die meisten Welsarten, durch die Futterbestandteile ein wertvolles Hauptfutter. Sowohl tierische, pflanzliche als auch Totholzanteile in ausgeglichener Mengenverhältnis enthalten	L-Welse, Corydoras Arten sowie alle Arten von Welsen



## Amphibians

# A weather-forecasting frog from North America

by Volker Ennenbach

The frogs of Europe inhabit swampy, inhospitable terrain - with one exception: tree frogs. These smart little creatures, which grow to around, 5 cm in size, live in bushes, where their fresh green coloration provides excellent camouflage.



*Hyla cinerea*, the Carolina Tree Frog.

All photos: Frank Schäfer

There are two tree frogs in Europe, though they look so similar that laymen can't usually tell them apart. These frogs have attracted the attention of people since time immemorial. Tree frogs were purportedly kept in the temples of Apollo, a Greek and Roman god who was responsible for, inter alia, healing, light, spring, and the fine arts, and were supposed to prophesy all sorts of things there. So just as the will of the gods and the future could be read from the flight of birds, the same could be effected with tree frogs. If the frogs hid away that indicated that there would be bad weather, but if on the other hand the frogs sat clearly visible among the branches then that was supposed to mean good weather on the way.

## Can tree frogs forecast the weather?

This interpretation of animal behavior isn't inherently wrong, although it isn't very accurate either. Essentially tree frogs, being poikilotherm creatures, have a body temperature that matches the ambient temperature. At the same time their activity temperature is higher than that of other, ground-dwelling frogs. If the weather is very cool and rainy then you will see very little of tree frogs. By contrast, on mild spring days they can even be seen during the day (these frogs are more inclined to be crepuscular and nocturnal) when they sunbathe. That type of spring day also entices us humans outside, we are very pleased when the winter is finally over and Nature re-awakens into life. So the tree frog

has a very positive emotional quality and its appearance has become associated with fine weather. In the Middle Ages there was a superstitious belief that a live frog kept in the cellar would bring the occupants of the house good luck and well-being. The combination of beliefs in the prophetic powers of tree frogs, handed down from days of yore, of observation of nature, and of the medieval superstition probably eventually led to people (presumably in the Biedermeier, starting 1815) beginning to keep frogs in jars with ladders as weather forecasters. If the frog sat on the bottom that meant bad weather, but if it climbed up the ladder then that meant good weather. Only the arrival of terrarium study at the end of the 19th cen-



tury put an end to this cruel form of maintenance: a tree frog cannot live long in a glass jar. The upright form of the jar prevents sufficient fresh air entering via the opening, so the creature in the jar would often be on the edge of suffocation. If the room became somewhat warmer and affected the frog's "operating temperature", then it would climb as far up as possible to where the freshest air was. On cool, rainy days (don't forget, there was very little heating and what there was usually restricted to individual rooms), the poor creature would hunch on the bottom, half suffocated and barely able to move. In addition, at times of low atmospheric pressure the substrate in the jar released a fog of foul-smelling gases that immediately prevented the frog from lifting itself from the bottom.

The question of whether tree frogs can forecast the weather must thus be answered with an unequivocal "No", they simply react to existing weather conditions. Hence even the most nostalgic frog fan should never countenance the idea of keeping tree frogs in a jar.

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### Europe vs. North America

As already mentioned there are two tree frog species in Europe, *Hyla arborea* and the Mediterranean *Hyla meridionalis*, and they are also widespread in Germany (although they have become rare due to biotope destruction). The taxonomic status of additional described forms, for example the Cretan Tree Frog and the Iberian Tree Frog, is hotly disputed among scientists in the field, but of no further interest here. Until the 1970s these tree frogs were the species usually kept in the terrarium, as they are very attractive and easy to maintain. But then all European frog species came under a ban on trading in wild animals (this was termed conservation) and they slowly but surely slipped into oblivion. Obviously tree frogs can be bred very



Like many tree frogs, *Hyla cinerea* can turn brown depending on its mood.

easily and effectively, but naturally captive-bred specimens are significantly more expensive than wild-caught, and for this reason nowadays it is the Carolina Tree Frog (*Hyla cinerea*), which is very common and widespread in the south-east of the USA, that is the commonest and cheapest tree frog species available in the trade. The main difference in coloration between the Carolina Tree Frog and the European species is that the flank stripe in *H. cinerea* is always snow-white as opposed to black in the Europeans.

Note that the trade ban has had no detectable beneficial effect on populations of the European tree frogs. Populations continue to decline in places where their habitats have been destroyed, and in addition there is the worldwide frog die-off. A healthy frog population cannot be endangered by the removal of small numbers of specimens - relative to population numbers overall - for the livestock trade.

### The Carolina Tree Frog

This attractive and very characteristic tree frog was described as long ago as 1799. Its distribution in the south-east of the USA is as follows: from southern Texas eastwards across the coastal plain to the Florida peninsula and Delaware; from eastern Texas and western Tennessee north to the Mississippi drainage and south-east Missouri,

central, eastern, and southern Arkansas, southern Illinois, western Kentucky, and the extreme south-west of Indiana. The species has been introduced to north-western Puerto Rico.

The coloration of the species varies to some degree. Usually these frogs are light green and have a white stripe on the side, extending along the upper jaw and the flank. This stripe can, however, sometimes be absent. Sometimes these frogs have small, dark-bordered, golden dots on the back. For some time a northern (*Hyla cinerea evittata*) and a southern subspecies (*H. cinerea cinerea*) were distinguished, with

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The Carolina Tree Frog crawls and climbs rather than hopping.

*Hyla cinerea evittata* supposedly lacking the typical lateral stripe and having a more massive head. But Reed (1958) showed that these differences occur everywhere as part of the overall variability of the species and don't qualify as a criterion of specific or subspecific status. Hence nowadays it is assumed that the Carolina Tree Frog doesn't include any subspecies.

Male and female are difficult to distinguish externally. Males possess a vocal bladder in the throat and grow to only around 3.2 cm long, while females achieve double the length at 6.4 cm long. Unfortunately, however, females are only very rarely seen in the trade. This is because males form large calling assemblies of several hundred individuals and are particularly fond of congregating in expanses of floating *Eichhornia*, where they are very easy to catch. Because the females approach the males only when they are ready to spawn, and then retire back into the local scrub, they mainly elude the collectors. The spawning season of the Carolina Tree Frog is from March to October in the southern part of its range, and from April to September in the north. The call of the male sounds rather like a

cowbell from a distance, but close to is more reminiscent of the cackling of geese. The species is very fertile and a female can spawn several times during a single season. The size of the clutch is extremely variable and fluctuates between 700 and 2150 eggs on average (minimum 478, maximum 3946), depending on provenance and probably also the size and condition of the female. On hatching the tadpoles measure around 4.5 - 5.5 mm long and grow to around 6 cm before metamorphosis, requiring 28 to 44 days to do so.

#### In the terrarium

*Hyla cinerea* is very adaptable and associated with human settlement. The most important ecological requirement posed by the species is the availability of permanent waters with as low a fish population as possible (as fishes eat tadpoles) and a wealth of vegetation. The males call from slightly elevated calling sites between 30 and 50 cm above the water's surface. Being typical tree frogs, Carolina Tree Frogs hardly ever jump, but instead climb and walk around. All this can easily be reproduced in the terrarium. Thus the terrarium for *Hyla cinerea* should be set up as a moist terrarium or

even an aqua-terrarium, with a large, well filtered water area and abundant planting.

These attractive frogs can be fed with soft insects such as houseflies or crickets. The Carolina Tree Frog is mainly crepuscular, but once acclimated can often be seen by. The temperature should drop below 20 °C only for overwintering, and at 16 °C the frogs start to become sluggish and in uncoordinated in their movements.

The Carolina Tree Frog has often been bred successfully and this only requires overwintering for a few weeks at a temperature of around 15 °C with a reduced period of lighting (8-10 hours instead of the normal 12-14 hours). Unfortunately, as already mentioned, females are scarce, so the best course is to obtain 10 to 15 half-grown specimens. There will then be a good chance of there being females in the group as well, rather than just a bunch of males.

If you are now filled with the desire to keep and breed Carolina Tree Frogs, your pet dealer can undoubtedly order them for you from a trustworthy wholesaler, for example Tropenparadies in Oberhausen, Fax +49 0208-665997

#### Literatur:

Reed, C. F. (1958): *Hyla cinerea* in Maryland, Delaware, and Virginia, with notes on the taxonomic status of *Hyla cinerea evittata*. *Journal of the Washington Academy of Sciences* 46 (10): 328-332

## Lexicon

### Tree frogs

*Hyla*: after the handsome Hylas, a companion of the mythical ancient Greek hero Heracles. During one of their adventures Hylas was lured into a pool by nymphs. Heracles sought for him long but in vain, repeatedly calling his name.

arborea means "of trees"

meridionalis means "southern"

cinerea means "ash gray"

evittata means "without stripe(s)"

*Eichhornia*: named in honor of the Prussian minister J. A. Fr. Eichhorn (1779-1856)





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## Lizards

## Red runners with little collars

by Thorsten Holtmann

From the early days of the terrarium hobby around 1880 right up to the 1970s, the native lizards of southern and central Europe (Lacertidae) were among the animals most frequently kept in the terrarium. Then conservation legislation largely banned these lizards from the trade and they then gradually slipped into oblivion.

Unfortunately, however, the ban on trade did nothing to preserve populations of these lizards. On the contrary, nowadays more species are more greatly endangered than previously. The prophesy by all those reasonable people, who stated at the time that small creatures will never be endangered by direct persecution, but invariably only by biotope destruction, remained unheard but proved to be absolutely true.

One of the few lizard species that still turns up regularly in the terrarium trade is the Common Long-Tailed Lizard, *Latastia longicaudata*. The specimens currently available originate practically without exception from Tanzania.

### The collared lizards

Before we look at *Latastia longicaudata* in

more detail, a few words on its phylogenetic relationships are required. It isn't so very long ago that the majority of the true or collared lizards of the family Lacertidae were called by the genus name *Lacerta*. All collared lizards (well, almost all, there are a very few exceptions but they are of no relevance here) share the common feature of a "collar" or neckband, a fold of skin between the scales of the throat and breast, with this fold itself usually covered with scales with a free posterior edge. At present 309 species are recognized (<http://reptile-database.reptarium.cz>), but new species are constantly being discovered.

In addition to the actual species, most have a number of subspecies. Don't worry, we aren't going to enumerate all the subspecies here as there wouldn't be enough space for

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that in the whole of the News. But one example should be cited: the Common Wall Lizard (*Podarcis muralis*), which also occurs in Germany, has - depending on the author - evolved eight to 11 subspecies. It is in fact quite common for collared lizards to develop local forms. But it hasn't been explained whether this is a result of their high reproductive rate, or whether collared lizards are simply undergoing an evolutionary thrust at the present time and are heavily involved in speciation.

Common Long-Tailed Lizard, *Latastia longicaudata*, from Tanzania.

All photos: Frank Schäfer





## JBL MACHT AUS NEODYM UND HALOGEN EINEN JBL REPTIL SPOT HALODYM-STRAHLER

Die Terrarienfreunde weltweit schätzen die brillante Farbwiedergabe durch den reduzierten Gelbanteil der Neodymstrahler, ärgern sich aber über die geringe Haltbarkeit der Strahler.

Die JBL Forschungsabteilung ist dem Problem auf den Grund gegangen und hat eine verblüffende Lösung gefunden: Die Leuchtwendel (Wolframfaden) der Neodymstrahler schwingt in ihrer Halterung so stark, dass sie reißt. Versuche, die Wendel mit einer weiteren Halterung zu stabilisieren, führten zu keiner Verbesserung. Halogenbrenner dagegen haben keine Leuchtwendel und sind wesentlich stabiler.

JBL hat jetzt Halogenbrenner als Lichtquelle verbaut, deren Licht aber den neodymbeschichteten Glaskolben passieren muss. So konnte die Zuverlässigkeit eines Halogenstrahlers mit dem Vorteil der Neodymbeschichtung kombiniert werden. Auch die 30 % Energieeinsparung sind ein starkes Argument, denn ein 70 W Halodymstrahler erzeugt die gleiche Lichtleistung wie ein 100 W Neodymstrahler.

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*Latastia longicaudata* hunts and captures relatively large food animals.

### ***Latastia longicaudata*: coloration and distribution**

In his monograph on the Lacertidae (1921), the brilliant systematist George Albert Boulenger wrote of *Latastia longicaudata*: "The coloration varies enormously. The ground colour varies from pale grey to brown, reddish-brown or brick-red. Some specimens are handsomely marked with dark and light shades and spots or bars, others are of a pale greyish sand-colour, with all the markings much effaced. There may be four narrow light streaks on the upper surface of the neck and body, the outer proceeding from the superciliary edge, and two broader light streaks on each side, the upper originating behind the eye, passing above the tympanum, and extending to the base of the tail, the lower from the upper lip, passing through the tympanum and above the fore limb to the thigh, on the posterior side of which it reappears and is continued on the base of the tail. These light streaks may be broken up into regular series of spots, either on the back and sides or only on the sides, where they may be separated by narrow blackish bars; series of black spots may run between them, as well as a series of blue, black-edged ocelli between the two lateral streaks, or they may be crossed on the back and sides by more or less regular, straight or wavy blackish bars. Very frequently there is a dark brown or black vertebral streak, extending from the occiput to the base of the tail, or disappearing or broken up into a series of spots on the posterior part of the body. In other specimens there is no trace of either light or dark longitudinal streaks,

and the back is irregularly spotted or reticulated with brown or black, and the sides of the head, neck and body are barred with black and white or bluish grey. A dark band usually runs along the side of the tail."

### **Distribution**

The Common Long-Tailed Lizard has a wide distribution: Senegal, Mali to Sudan and Egypt (including the Sinai Peninsula), thence to Ethiopia, Somalia, Yemen, Kenya, Tanzania, Cameroon, Central African Republic and Niger. The type locality is "Tor im peträischen Arabien" (= northern Arabia). At present four subspecies are distinguished: *L. l. andersonii*: SW Arabia, *L. l. lanzai*: Somalia, Kenya, Ethiopia, *L. l. revoili*: Ethiopia, Kenya, south to Ugogo, central Tanzania (type locality of this subspecies is Somalia). The major part of the species range is inhabited by the nominate subspecies.

### **The Common Long-Tailed Lizard in the wild**

There aren't many reports on the life in the wild of this widespread and apparently also common species. There is, however, a very interesting study by Parker (1942), who worked on the lizards of British Somaliland (now the Republic of Somaliland and part of northern Somalia). He listed five subspecies for the region, but assumed that there were actually very many more, as the forms he studied could be distinguished ecologically and also in part by anatomical details. But Parker also suggests that all the forms merge into one another (the technical term is "intergrade"), an important defining

character for subspecies. Leaving aside what the actual taxonomic status of these Somalian subspecies may be, Parker demonstrates very nicely how they are separated ecologically. Unfortunately it would require far too much space to summarize his work here. But on the basis of Parker's work it can be stated that in Somaliland and Somalia *Latastia longicaudata* sometimes inhabits dry to very dry habitats and that the individuals in each habitat look different, partly in terms of their (always variable) coloration, partly in terms of scalation characters.

### **A terrarium for *Latastia longicaudata***

Experienced terrarium keepers will be aware that the maintenance and breeding of reptiles from desert regions usually involves considerably more problems than that of reptiles from rainforest areas. There are, of course, a number of very prominent exceptions to this rule (leopard geckos, bearded agamas), but a rule remains a rule, regardless of exceptions.

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The reasons for the problems in maintenance and breeding are well known. In desert regions the lizards must constantly contend with considerable changes in conditions. The daytime temperature can rise to 50 °C and drop almost to freezing point at night. Drinking water is only rarely available in the course of the year, and then to excess. And the food supply is meager... These conditions can be reproduced to only a limited extent in the terrarium. A distinct drop in temperature overnight is very important for the successful maintenance of desert lizards like *Latastia longicaudata*. This can be achieved comparatively easily by turning off the lighting, which will usually result in a temperature drop of around 20 °C. The temperature should be around 45 °C beneath the main source of warmth in the terrarium, a heat lamp. The high light requirement of these lizards can be provided with fluorescent tubes and a UV lamp in the terrarium. HQI-lamps also provide good light, but aren't particularly economical because of their high purchase price and not inconsiderable running costs.



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The name "Long-Tailed Lizard" is apt, but they shouldn't be confused with species of the genus *Takydromus*.

A second point of enormous importance is the correct substrate. The majority of lizards from desert regions regularly bury themselves, partly for thermoregulation (to avoid greater heat), partly as protection from predators (at night), partly for moisture regulation. As mentioned, drinking water is only rarely available. But desert lizards can also take in moisture from the ground via their skin. Together with water contained in the food, soil moisture provides an appreciable part of the water requirement of the lizard. The substrate in the terrarium for *Latastia longicaudata* should thus be around 10 cm deep and consist of diggable material. The ideal is a sand-soil mix in the ratio 3:1 to 8:1, depending on the amount of clay in the soil. The soil will prevent burrows excavated from collapsing, the sand will prevent the entire substrate from compacting into a rock-hard mass. The ideal is soil from the upper layers of the ground as it will be rich in micro-organisms that will ensure the breakdown of droppings and urine so that the substrate doesn't need to be changed for years. Any droppings visible on the surface of the substrate should be removed once a week. The moisture in the substrate should be arranged such that it is slightly (!) damp at the bottom, becoming increasingly drier towards the surface.

## Lexicon

### Common Long-Tailed Lizard

*Latastia*: named in honor of Fernand Lataste (1847 - 1934). *longicaudata* means "long-tailed". The subspecies names *andersonii*, *lanzai*, and *revoili* are all honorifics.

The Terrarium should include plenty of cover (branches, rocks, bark, tussocks of grasses), as these lizards don't originate from sandy deserts.

The total length of the Common Long-Tailed Lizard is up to 40 cm, 30 cm of which is down to the tail. The terrarium should provide the lizards with plenty of room to move and ideally the bottom area will be no less than 100x50 cm for long-term maintenance. However, it can be sensible to acclimatize the lizards in smaller quarters, where they will lose their shyness appreciably more quickly and where it will also be possible to monitor them better.

#### Maintenance and breeding

*Latastia longicaudata* is not especially susceptible to disease if the important night-time drop in temperature is observed. These lizards are best kept in pairs, as males in particular can be quarrelsome among themselves. It is important always to introduce both individuals at the same time. Should a subsequent change to the population be necessary, then the terrarium should be completely re-arranged in order to avoid over-aggressive behavior on the part of the established individual, who will regard the terrarium as its private territory.

These lizards will eat all the usual living food insects, which should be regularly treated with vitamins. You can also offer sweet fruit (over ripe banana) occasionally, as some lizards like this. A water bowl won't come amiss and should be refilled every day with fresh water. A water bowl containing dirty water is far more dangerous than an occasionally empty one.

In order to trigger breeding in *Latastia longicaudata* you should keep them somewhat cooler (use a weaker spot-lamp) and with a reduced lighting period (8 hours) for around three months (January-March) and then return the lighting period to 12 hours and raise the temperature. The clutch comprises 5-12 soft-shelled eggs. Incubation takes place outside the terrarium at 24-28 °C in a moist, breathable substrate (Vermiculite, Seramis, or the like). The young hatch after 8-12 weeks and often have bright red tails. It is reported that the eggs often hatch irregularly, that is a single clutch over a period of several days. And

for this reason you should monitor the incubator daily, as the young, once hatched, need to be removed immediately so that they don't damage the unhatched eggs. Rearing the young is usually problem-free, but they need to be kept somewhat damper than adults. Intraspecific aggression is only slight among juveniles, so they can be reared together until sexual maturity.

#### Outlook

At present *Latastia longicaudata* is regularly available and at a reasonable price in the pet trade. It would be nice if this situation was exploited by terrarium keepers in order to evolve breeding protocols for these lovely lizards. Because regular breeding and publication of the associated observations made could be very helpful in answering the numerous open questions regarding the systematics of *Latastia longicaudata* that cannot be clarified by field observations (for example the genetics of the coloration and the scalation characters).

If you are now filled with the desire to keep and breed Common Long-Tailed Lizards, your pet dealer can undoubtedly order them for you from a trustworthy wholesaler, for example Tropenparadies in Oberhausen, Fax +49 0208-665997

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## Turtles

# Recognizable by its red belly

by Christoph Fritz, [www.reptilia24.com](http://www.reptilia24.com)

At present a softshell turtle species whose young exhibit a bright red coloration on their underside is increasingly available in the pet trade. This disappears with age and is replaced by a white color. These youngsters are juveniles of the Chinese Softshell Turtle, a species now found in many parts of the world because of its popularity as food.

Not all turtles possess a solid armor of horny plates. Thus the softshell turtles, for example, with 30 species in the fresh waters of Asia, Africa, and North America, have a soft leather-like armor. All species are predominantly carnivorous and very predatory. In addition they are usually very snappy, and hence they aren't very popular in the terrarium hobby as their intolerant behavior usually makes it necessary to keep them singly. Moreover the majority of species grow very large (more than 30 cm shell length) and require correspondingly large aquaria. But nevertheless one species turns up regularly in the pet trade, namely the Chinese Softshell Turtle, *Pelodiscus sinensis* (formerly *Trionyx sinensis*).

## Small and tasty

In India huge softshell turtles are kept in temple ponds and fed by the faithful. These specimens are very tame and also tolerant of one another. They include, for example, the species *Aspideretes* (formerly *Trionyx*) *nigricans*, which grows to more than 90 cm long and is actually regarded as extinct in the wild. Unfortunately, however, this peaceful state of affairs is a major exception among the softshell turtles.

They are persecuted everywhere and their meat eaten, and in addition their eggs are dug up - likewise for food. Hence nowadays many species are regarded as seriously endangered. But let us be quite clear about one thing: the trade in live specimens for terrarium and aquarium maintenance has no detectable effect on wild populations, as the demand is far too small. In addition

the softshell turtle species discussed here, namely the Chinese Softshell Turtle, is farmed commercially. With a carapace length of 12 to 20, rarely up to 25 cm, it is one of the smallest of all the softshell turtle species. This species too is eaten in vast numbers, but it is readily bred in aquaculture and the demand is satisfied by farmed stocks. Its importance as a foodstuff among Americans of Chinese origin can be measured by the fact that from the early 19th century to the outbreak of the Second World War the species was bred on Hawaii and in Maryland and feral populations still occur there today. Further populations at-

## Lexicon

### Chinese Softshell Turtles

Trionyx means "three claws"  
Pelodiscus means "mud disk"  
sinensis means "Chinese".

tributable to introduction by Man exist on Guam, in wide parts of South-East Asia, and in Japan. A population in Spain supposedly derives from released terrarium specimens, but there are apparently still no self-sustaining populations in France, Great Britain, and Madagascar, although the species has occasionally been recorded there. Because of these introductions the original distribution is not very easy to reconstruct, but it is thought that *Pelodiscus sinensis* originally occurred in south-eastern Russia, eastern China, Korea, Taiwan, and North Vietnam.

## Almost in Germany too

As long ago as 1913 experiments were conducted in Germany, in Bavaria, to see whether these turtles could be acclimated

Chinese Softshell Turtles are very good swimmers.

All photos: Frank Schäfer





The underside of juveniles is strikingly colored.

in order to breed them for their meat, as was then the practice in Japan. Juveniles were placed in a pond at the Wielenbach experimental pond culture station, but escaped and spread out into the carp ponds of the area. According to Klingelhöffer (1959) they survived there until at least 1923, as confirmed by finds. But, presumably because softshell turtles had never figured on the normal German menu, experiments of this sort were abandoned. Nowadays we realize that attempts to introduce alien animal species to areas where they do not belong can have frightful consequences for the indigenous flora and fauna. Hence it is strictly prohibited - and very rightly so - to simply release any animal that you cannot or no longer wish to keep at home. The introduced populations of the Chinese Softshell Turtle in North America, South-East Asia, and Europe are regarded with much concern; but it is virtually impossible to eradicate such an adaptable creature from an intact habitat.

The dorsal pattern is unremarkable.



### Chinese Softshell Turtles in the aquarium

Juvenile Chinese Softshell Turtles are very charming. It is also very interesting to observe their behavior. The tip of the snout in softshell turtles has developed into a trunk-like organ, and juveniles in particular like to use it as a snorkel. If they are given the opportunity - the finest possible sand - then juveniles of this turtle will bury themselves, and if the water level is low enough - at most 5 cm - then the youngsters won't need to leave the safety of their bed in the sand to take in air, but have only to extend their long necks for the "nose snorkel" to contact the water's surface so they can fill up with fresh air. As obviously Man isn't the only predator that regards softshell turtles as a delicacy...

Chinese Softshell Turtles are snappy and intolerant among themselves, so in many cases keeping them singly is the best option. The aquarium for this doesn't need to be particularly big and an off-the-shelf 60-cm tank, set up as for the maintenance of fishes, will suffice for a single specimen. But you need to make sure that plant or thread-algae growth isn't too vigorous lest youngsters get trapped in it and drown. Completely adult specimens can be kept either in an escape-proof (!) outdoor terrarium or a large aquarium of maybe 120 cm in length.

Although softshell turtles sometimes sun themselves in the wild, a land area is superfluous for maintenance. A piece of cork bark, simply placed on the surface of the water, will be perfectly adequate. Softshell turtles will normally use this opportunity to leave the water when they have skin problems. The substrate in the aquarium should consist of an layer of fine sand, sufficiently deep for the turtles to burrow. This is the best way to avoid skin diseases of all types. The filtration in the aquarium should be air-powered, as if a motorized filter is used the stirred-up sand will sooner or later inevitably cause damage to the impeller shaft. It isn't necessary to heat the water, but the aquarium should be fitted with a proprietary hood in which the aquarium lighting can be housed. The lighting

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will warm the air space above the water's surface, and this will suit the turtles very well. The UV irradiation advisable for many other turtle species isn't necessary for the maintenance of softshell turtles.

### Tankmates

As has already been mentioned several times, these turtles are often very snappy among themselves. They will also bite the human hand without hesitation if they feel threatened. In the case of small youngsters this isn't serious and is no more than a nip (turtles don't have any teeth but sharp horny processes that act like scissors), but with somewhat larger specimens the result is bleeding wounds. The sharp claws - softshell turtles have three on each foot - can also be used effectively as weapons. Of course there is individual variation when it comes to compatibility. But anyone who decides on the maintenance of several specimens must keep a very close eye on them and intervene in good time if necessary.

Single Chinese Softshell Turtles can be kept very readily with other turtle species provided sufficient space is available. Fishes are always in danger of their lives when kept with Chinese Softshell Turtles. Fish breeders often like to keep one of these turtles in order to be able to dispose of surplus fishes in a biologically sensible and ethical manner. Amphibians should never be





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kept with *Pelodiscus sinensis*, as sooner or later they will invariably fall prey to the turtles.

### Feeding

The feeding of Chinese Softshell Turtles can be accomplished without problem. Pelleted food such as is sold for aquatic turtles in the pet trade will provide a good, healthy, basic diet for juveniles. In addition they can be given frozen foods designed for ornamental fishes, above all bloodworms, freshwater shrimps (*Gammarus*),

rinse it under cold flowing water immediately prior to feeding. It doesn't matter at all if individual food particles are eaten before they are completely thawed. Earthworms are a particular delicacy for Chinese Softshell Turtles, and small freshwater snails are also enjoyed. But as regards the latter, only aquarium-bred specimens should be used, as wild aquatic snails can transmit a multitude of parasites. There are repeated references in the literature to Chinese Softshell Turtles also consuming vegetable material, but they do so only extremely rarely in the

that breed the species for food or religious purposes. The Hindu faithful regard the release of a juvenile softshell turtle, like the feeding of the huge temple turtles, as a meritorious religious act.

It is also known from breeding farms that Chinese Softshell Turtles are very fast-growing under tropical conditions and produce large clutches of 9-28 eggs several times a year and year-round. The eggs are round and weigh 5 grams on average. They are laid in sandbanks, often in several layers, one above the other, with the surface of the eggs lying furthest from the surface of the sand being at least 6 cm deep in the sand. The incubation period lasts for 40-80 days, depending on temperature. It has been recorded that embryonic Chinese Softshell Turtles can even move inside the egg in order to reach somewhat warmer areas, thus speeding up their development (Dua et al, 2011).

The sexes are easy to determine in adult Chinese Softshell Turtles on the basis of tail length, but juveniles are unsexable.

If you are now filled with the desire to keep and breed Chinese Softshell Turtles, your pet dealer can undoubtedly order them for you from a trustworthy wholesaler, for example Tropenparadies in Oberhausen, Fax +49 0208-665997



Chinese Softshell Turtles are always on the alert.

*Artemia*, and *Mysis*; when the turtles are somewhat larger they can be given whole frozen Stint as their basic diet. Contrary to the repeatedly printed nonsense about "stomach chills", there is no need to defrost frozen food to avoid the turtles catching a chill internally (that is physiologically impossible), but frozen food should be thawed in order to avoid polluting the aquarium water unnecessarily with the water that always results from thawing and which has a heavy organic content. The best method of thawing is to put the frozen food in a suitably fine-meshed net and

aquarium

### Breeding

*Pelodiscus sinensis* is hardly ever bred in central Europe, largely because of its unsociability. Although these turtles can be kept in outdoor units - depending on their provenance, even year round - where there is usually significantly more space available than in indoor quarters, the majority of turtle breeders prefer to use this space for the breeding of rarer species. All the juvenile Chinese Softshell Turtles in the pet trade are, however, captive-bred, but from businesses

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## Current new imports

# New characins from South America

by Frank Schäfer

There are characins in both Africa and South America. This demonstrates that they evolved at a time when the two land masses were still part of the same primeval continent known as Gondwanaland. South America separated from Africa around 100 million years ago. To put that in perspective: the mass extinction of the dinosaurs began around 60 million years ago.

In the at least 100 million years of their existence the evolution of characins in South America has followed a multitude of paths. Some of the best-known fish species of South America belong to the characins, for example Neon Tetras (*Paracheirodon*) and piranhas (*Pygocentrus*). Numerous new species continue to be discovered every year. In recent weeks Aquarium Glaser has been able to make a number of interesting and beautiful species available to the aquarium hobby.

## *Crenuchus* sp. "Venezuela" and *Crenuchus* cf. *spilurus* "Venezuela"

*Crenuchus spilurus* is widely distributed in South America. Or so it says in the textbooks. But is that really true? If we look somewhat closer then we will find that the *Crenuchus* from Brazil, Peru, Guyana, and Venezuela differ considerably from one another. But at present only a single species is scientifically described, namely *Crenuchus spilurus*, which was described from the Essequibo River in Guyana by A. Günther in 1863. From this it can be assumed that a revision of the genus would result in several new species having to be described.

*Crenuchus* are very noteworthy fishes. The males grow significantly larger than the females and develop greatly enlarged dorsal and anal fins that can be spread like sails during courtship or when males display to each other. And then these fishes look really splendid. The dorsal fin in females is always unpatterned, and even poorly developed males can be readily distinguished



*Crenuchus* sp. Venezuela, male

Photos: Frank Schäfer

from females by this feature. The species is commonly known as the Sailfin Tetra in the aquarium hobby.

Unfortunately only very little is known about the life of *Crenuchus* in the wild. They probably live by preference in small black-water streams with abundant leaf litter. Because males establish an order of rank in the aquarium it can be assumed that they also live in colonies in the wild. But they are far from being shoaling fishes. Every male possesses a potential brooding territory, an essential feature of which is the presence of a cave-like retreat. This is where spawning takes place and the male then assumes the duty of caring for the eggs until the young hatch.

*Crenuchus* can be maintained either in large numbers in large aquaria with a con-



*Crenuchus* sp. Venezuela, female

siderable amount of cover, or in pairs. The latter form of maintenance often takes place in very small aquaria, as although *Crenuchus* males can grow to a good 6 cm

long, they are not very active swimmers and usually move only a few centimeters from the breeding cave. *Crenuchus* can be fed almost all the usual types of food (dry, live, frozen) in the aquarium, although vegetable food is refused.

Aquarium Glaser has been able to import two species of *Crenuchus* from Venezuela that are clearly different in coloration. One of these species looks like *C. spilurus* and has the distinct caudal-peduncle spot so

*Crenuchus* cf. *spilurus* Venezuela, female





*Crenuchus cf. spilurus* Venezuela, male



*Bryconops cf. caudomaculatus* Venezuela

*Serrasalmus cf. altispinis*



typical of *C. spilurus* in both sexes. The males develop very large fins. The other species remains somewhat smaller, has a more reddish base color, exhibits the caudal-peduncle spot only indistinctly or not at all, and has less well-developed fins. The two species were imported mixed together. They purportedly originate from the Ventuari drainage. It is unknown whether they also occur together in the wild or in the same distribution region but different bodies of water.

***Bryconops cf. caudomaculatus* "Venezuela"**

Along with the *Crenuchus* Aquarium Glaser imported a new (at least to the aquarium hobby) *Bryconops* species. This very attractive species has a beautiful red longitudinal band. At present 12 described *Bryconops* species are known from Venezuela, but so far none of them has been imported regularly enough or in sufficiently large numbers for us to get to know them better. At present the coloration is known only from dead specimens preserved in alcohol. It is to be expected that the unidentified *Bryconops* species will attain 6-7 cm in length. The specimen in the photo is around 4 cm long and has been living for eight weeks in the company of other small characins, where it has proved peaceful and easy to maintain. Because of its attractive coloration it can be assumed that this *Bryconops* is also a blackwater fish.

***Serrasalmus cf. altispinis***

Aquarium Glaser has received this juvenile piranha, around 15 cm in length, from the Rio Xingu in Brazil. The rest of the consignment consisted of *Serrasalmus manueli*. The identification of juvenile piranhas of the genus *Serrasalmus* is exceptionally difficult, as the specific differences are often clearly developed only in specimens more than 30 cm in length. In addition many important diagnostic characters of the species can be seen only in dissected dead specimens. And obviously one doesn't kill such a valuable specimen solely for the purpose of identification. The fish does, however, exhibit many points of agreement with the only recently (2000) described species *Serrasalmus altispinis*



from the Rio Uatuma. From this it can be assumed that *S. cf. altispinis* is a solitary-living piranha that feeds mainly on pieces of the fins of other fishes in the wild. However feeding with small feeder fishes has proved unproblematic. *S. cf. altispinis* probably grows to over 30 cm long, although the largest specimen on which the scientific description of *S. altispinis* measures only a maximum of 18.2 cm long (not including the caudal fin). Like all *Serrasalmus* species, *S. cf. altispinis* is a fish for specialists who can learn a lot from such a fish. Unfortunately *S. cf. altispinis* seems to occur only exceptionally in the Rio Xingu where fishes for export for the aquarium are usually collected. As although a high premium has been offered for the capture of additional specimens, so far the specimen pictured here remains the only one known.



#### *Acnodon normani*

*Acnodon normani* likewise comes from the Rio Xingu, and is sometimes known as the Sheep Pacu. It is closely related to the piranhas discussed above, but is a herbivore. Piranhas, pacus, and silver dollars belong to the so-called saw characins (*Serrasalminidae*). This name doesn't, as one might think, refer to the sharp, saw-like teeth of the pir-



*Acnodon normani*

anhas, but to a saw-like row of scales on the ventral keel. A number of serrasalmids have specialized in biting chunks of flesh from their prey (piranhas of the genus *Pygocentrus*); others feed on the fins of other fishes (piranhas of the genus *Serrasalmus*); yet others feed on the scales of other fishes (piranhas of the genus *Catoprion*); some consume small organisms, others crack nuts, and yet others eat plants. *Acnodon* probably mainly grazes aufwuchs in the wild.

This attractive and comparatively small pacu (maximum length 13.5 cm) is imported only rarely. This is because *Acnodon normani* is an open-water species, as indicated by its pattern of vertical lines on a

light blue background, which provides outstanding camouflage in natural waters with sunlight entering from above. Their habitat means they rely on flight, and they are not only exceptionally difficult to catch, but in addition acclimatization by the collector requires great care and a lot of "feel". As is evident from what has been said above, these fishes require a comparatively large tank in captivity. *Acnodon* are not highly specialized herbivores like many other Pacus, and should be fed a varied diet containing a certain amount of vegetable fare - for example in the form of special flake foods designed for herbivorous fishes. Sheep Pacus are relatively peaceful among themselves and towards other types of fishes. They require warm (26-30 °C), clean, and oxygen-rich water and appreciate a strong current in the aquarium.

#### *Metynnis fasciatus*

This fish, again a serrasalmid, is currently still something of a puzzle to scientists. The species *Metynnis fasciatus* was described from a juvenile from Brazil (Rio Capiuru). The type specimen is thought to be lost. On the basis of counts the species is identical with *M. hypsauchen*, but differs in juvenile coloration by the regular stripe pattern of the species. To date no adult specimens with regular striping have been known to science, for which reason it has been assumed that *M. fasciatus* is just a juvenile color phase of *M. hypsauchen*. Aqua-

*Metynnis fasciatus*





rium Glaser has now managed to import a second batch of larger (8-10 cm) specimens of this lovely silver dollar from Brazil. Although each specimen exhibited individual differences in striping, the fishes were already sexually differentiated, ie no longer small juveniles. *Metynnis* species are herbivores and usually grow to around 15 cm long. Male and female differ in the form of the anal fin. Because a member of staff at

fishes are popularly known as shoaling fishes in the hobby, but this is both technically and linguistically incorrect. Rather they are social fishes and hence should be kept in groups of 10 or more individuals so that they can develop their full repertoire of intraspecific behavior. Individuals kept in smaller groups will be disappointing in their coloration. *Hyphessobrycon melanostichos* was first scientifically described in

and their size makes them worth catching by rod and line, but you have to beware of their teeth, as they bite hard and cause deep, bleeding wounds. Until a few years ago it was thought that there were just two or three very widespread and variable species. In the last 10 years, however, scientists have devoted themselves to the genus and at present 12 species of *Hoplias* are recognized, and there are undoubtedly a few more species still to be discovered.

The species shown here was imported by Aquarium Glaser from Venezuela, and may possibly be *Hoplias teres*. In any case, it is a world first import. The fishes were around 15-20 cm long and extremely aggressive. When a small stick was used to carefully



*Hyphessobrycon cf. melanostichos*, male

Aquarium Glaser has purchased some specimens for himself, then perhaps in a year or two, when the fishes are full grown, there will be more information to report on them.

#### ***Hyphessobrycon cf. melanostichos***

Aquarium Glaser has obtained this at first glance somewhat unremarkable characin not only wild caught but also captive bred. It belongs to the extensive phylogenetic assemblage of the Blackline Tetra *Hyphessobrycon scholzei*. On further examination, however, this around 4 cm long fish proves to be a real eye-catcher, as during courtship it develops beautiful red fins and a fire-red back.

This little tetra exhibits a behavior typical of the majority of small tetras of aquarium-hobby importance: these fishes live in loose groups and the males occupy small temporary territories for spawning. Such

2006. To date it is known only from the Rio Doze de Outubro, a small river in the upper drainage of the Rio Tapajos. It cannot be confirmed at present whether fishes shown here are actually identical with *H. melanostichos*, but there are a very large number of points of agreement.

#### ***Hoplias cf. teres***

Predatory characins of the genus *Hoplias* are found all over South America, and are known variously as trahiras or wolf characins. They are ancient fishes, very similar to the ancestors of the modern characins that lived 100 million years ago. Trahiras grow to between 30 and 100 cm long and feed exclusively on other fishes. Because trahiras possess an auxiliary respiratory system that enables them to take in and breathe air from the water's surface, they are often the only fishes to be found in drying-up residual pools, where they have eaten all the other fishes and are waiting for better times. Trahiras are tasty



*Hyphessobrycon cf. melanostichos*, female



*Hyphessobrycon cf. melanostichos*, courtship.



*Hoplias cf. teres*

Photo: Andreas Jekel

guide them into a favorable position for photography, they bit it so hard that I immediately abandoned the attempt to avoid any risk of the valuable fishes injuring themselves as a result of their attacks.



Be that as it may, this new trahira is an interesting fish for specialists. Despite its high (including intraspecific) aggression *Hoplias* can even be bred in the aquarium. They are sexually mature at around 20-30 cm in length and lay their eggs among aquatic plants. At Hottonia, the Darmstadt aquarium and terrarium club, specimens of the species *Hoplias malabaricus* have spawned several times in a 2500-liter aquarium. Both parents guarded the spawning site.

*Hoplias* can be very easily accustomed to frozen fishes as food, which means that their maintenance poses no problems when it comes to providing a food supply.

#### *Ammocryptocharax* sp. Venezuela

The concluding fish in our review of recent characin imports is this tiny, barely 3 cm long, darter characin from Venezuela. Dar-

## Lexicon

### Characins

Crenuchus means "protector of the spring".

spilurus means "with a caudal spot".

Bryconops means "similar to Brycon";

Brycon is another characin genus.

Serrasalmus means "saw salmon".

altispinis means "with tall spines"

Acnodon means "lacking the barbs of

a hunting spear", referring to the mis-

taken observation that the predorsal

spine was missing in the type species,

*A. oligacanthus*. But it is in fact pre-

sent.

normani: named in honor of John

Roxbrough Norman (1898-1944).

Metynnis means "between the

plowshare"; referring to the spine in

front of the dorsal fin.

fasciatus means "striped".

Hyphessobrycon means "small Bry-

con"; Brycon is another characin

genus.

melanostichos means "with a black

streak".

Hoplias means "weapon bearer", on

account of the powerful teeth.

teres means "cylindrical"

*Ammocryptocharax* means "Charax

that looks like an *Ammocrypta*"; both

are other fish genera.



*Hoplias* cf. *teres*

Photo: Andreas Jekel



*Ammocryptocharax* sp. Venezuela

ters lack a swim bladder and hence move around with a hopping motion. The genus *Ammocryptocharax* currently contains four described species, and the little fishes imported from Venezuela by Aquarium Glaser most closely resemble *A. minutus*, but could equally well represent a species new to science. Questions of this sort require a long time, often several years, to answer. With its tiny little mouth this *Ammocryptocharax* is completely harmless. This delicate fish is best kept over a substrate of fine sand, with a few pebbles and clumps of low-growing plants. To create healthy water and supplement the diet some dead leaves (Oak, Beech, Catappa, etc.) and a number of alder cones should be placed in the water - but that applies for almost all fishes. Ideally these dwarf characins should be fed fine frozen and live foods, but they

will also take dry food.

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