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# NEWS

The Magazine for Aquarists and Terrarists



 Checkerboard Cichlids



 Angels and Butterflies



 Corydoras schools

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Filialen mit Zoofachabteilung





## Dwarf cichlids from South America

# Checkerboard cichlids - very special dwarf cichlids

by Ursula Glaser-Dreyer

There are currently several species of checkerboard cichlids (genera *Crenicara* and *Dicrossus*) available in the trade. The majority of these species are not only gorgeous but also exceptional rarities. Reason enough to examine them in rather more detail here.

### History of discovery 1758, Stockholm

The Swedish naturalist Karl von Linné (who, as was usual among the learned in those days, referred to himself by his Latin name Carolus Linnaeus) publishes the 10th edition of his book *Systema naturae*, in which all species of animals and plants known up to that point in time are named and classified. Thereafter for the first time in the history of mankind there is a single system, accepted by all scientists worldwide, for the naming of animals and plants, and one which is still in use today.

### 1863, London

The Natural History Museum in London has become the center of the scientific world. The curators have accumulated a monumental collection of type specimens. Following Linné, it was quickly realized that it makes sense to base an animal or plant species on typical specimens used for the purpose of example. These are regarded as "types" of the species, and are, strictly speaking, the only specimens that can be identified as members of their species with 100% certainty. Albert C. L. G. Günther is an ichthyologist at the Natural History Museum. In the same year he describes a cichlid species from British Guiana (now Guyana) as *Acara punctulata*, based on three specimens from the River Essequibo in that country.

### 1875, Vienna

Franz Steindachner begins the publication of a major review of the cichlids of the Amazon, inspired by the rich and varied collection made by Louis Agassiz during the



Full-grown male *Crenicara punctulatum* from the upper Rio Guaporé. It started life as a female.

Thayer Expedition (1865-1866). Steindachner describes two new genera, *Crenicara* and *Dicrossus*, each containing a new species, *Crenicara elegans* (collected by the Thayer Expedition at Gurupa, Cudajas, and Curupira) and *Dicrossus maculatus* (again specimens from the Thayer Expedition, collected in the Lago Maximo and José Assu as well as in side-arms of the Amazon near Tocantins, in the Rio Hyavary, and in the Rio Tapajuru).

### 1905, London

Charles Tate Regan is now an ichthyologist at the Natural History Museum. He revises the cichlids of South America and discovers



Male (above) and female (below) *C. punctulatum* from Guyana, from where the species was scientifically described in 1863.



that Günther's *Acara punctulata* is based on two different species. He fixes one specimen as the valid type (the other two belong to the species that we now know as *Nannacara anomala* or the Golden Dwarf Cichlid) and discovers that the species is identical with Steindachner's *Crenicara elegans*. In such cases the older name, i.e. that used first (*punctulata*), is regarded as valid. Regan also combines *Crenicara* and *Dicrossus* in a single genus. In so doing he changes *Crenicara* to the linguistically



Male (above) and female (below) *C. punctulatum* from Brazil. These fishes have a striking head scalation.



better *Crenicara*, but this is not a permissible act. There are now two *Crenicara* species, *C. punctulata* and *m. maculata*.

#### 1935, Santarem

The aquarist Walter Praetorius describes the maintenance and breeding of a *Crenicara* species, and the editor of the magazine (Hugo Weise) unintentionally (he thought that the scientific description by Ernst Ahl had already taken place) performs the scientific naming of the species as *Crenicara praetoriusi*.

#### 1936, Berlin

Ernst Ahl of the Zoological Museum describes *Crenicara praetoriusi* as a new species on the basis of three preserved specimens from the Igarapé Irurà-Mapiry (Amazon drainage, Pará, Brazil) that he received from Praetorius in 1934.

#### 1958, Hamburg

Werner Ladiges describes a new species, *Crenicara filamentosa*, on the basis of two specimens from the ornamental-fish import trade. The provenance of the specimens is unknown to him, and he surmises that they originated from the upper Amazon. His new species can be

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distinguished by, inter alia, males having a forked tail with prolonged extensions. The new species soon receives the popular name checkerboard cichlid in the English-speaking hobby, and in 1959 Ladiges introduces the German version Schachbrett-Cichlide.

#### 1986, Stockholm

Sven O. Kullander, ichthyologist and in that regard the current successor to von Linné in Stockholm, confirms that the genus name *Crenicara* chosen by Steindachner is valid and its gender neuter, because it is derived from Latin *crena* (notch) and Greek *kara* (head) and not, as Regan (1905) assumed, from *crena* and the Tupi indian *Acara* (= cichlid), with a feminine gender. Adjectival species names must always have the

grammatically correct gender, hence *Crenicara punctulatum* (instead of the feminine *C. punctulata*). Kullander establishes that there at least three as yet scientifically undescribed *Crenicara* species.

#### 1990, Stockholm

Kullander separates *Crenicara* and *Dicrossus* from one another again, so *Crenicara* now contains only *C. punctulatum*, and *Dicrossus* *D. maculatus* and *D. filamentosus*.

#### 1990, Stockholm, Berlin, Paris

Kullander and Wolfgang Staeck, a cichlid expert from Berlin, describe a second



*Crenicara latruncularium* is most easily distinguished from *C. punctulatum* by the facial coloration.





Female (above) and male (below) of the currently most frequently imported form of *Crenicara punctulatum* from Peru. It is not very likely that all the different populations from all over Amazonia actually belong to the same species.



Only when they are upset do *Crenicara punctulatum* (here specimens from Peru) exhibit the checkerboard pattern that gives them their popular name. Under normal circumstances they look like the pair depicted above.



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Male *Crenicara punctulatum* from Colombia.

*Crenicara* species, *C. latruncularium*. It is very similar to *C. punctulatum*, but distinctly separated from the other species geographically, and they nowhere occur together. *C. latruncularium* is known only from the border zone between Bolivia and Brazil, in the drainages of the rivers Guaporé and Marmoré, while *C. punctulatum* has a huge distribution region in Brazil, Colombia, Peru, Ecuador, and Guyana.

#### 2008, Berlin

Ingo Schindler and Wolfgang Staeck describe a new *Dicrossus* species, *Dicrossus gladicauda*, from the drainage of the Rio Atabapo in Colombia. The males of the new species have the caudal fin prolonged only in its upper half. *D. gladicauda* was discovered in 2002 via ornamental fish importations.

#### 2010, Dresden

A team of scientists, consisting of Uwe Römer, Ingo J. Hahn, and Pablo M. Vergara formally describe two *Dicrossus* species already known to the aquarium hobby since 1981 and 1992 respectively. While the first species - which received the name *Dicrossus foirni* - was known under the names "sp. Double Spot", "sp. Rio Negro", and "sp. Red Fins" through the import trade, the second species had been discovered among museum material by Kullander in 1990. Frank Warzel traveled to Brazil two years later, collected the species in the Rio Tapajós, brought it back to Germany, and bred it there. It was given the provisional name "sp. Tapajós", and is described only now, 18 years later, as *Dicrossus warzeli* by Römer et al..

#### 2013, Berlin

Schindler and Hans-Joachim Paepke

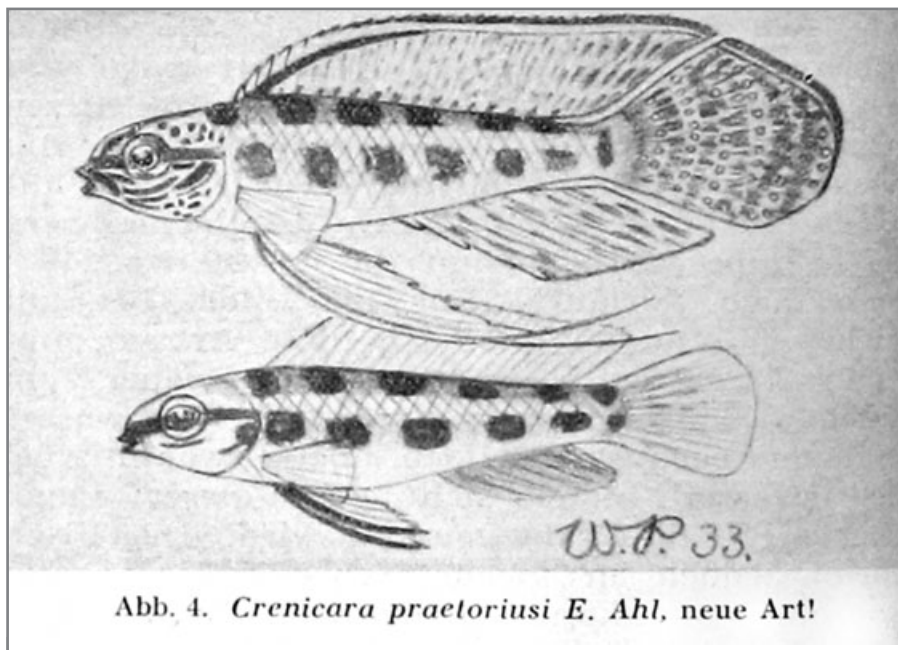


Abb. 4. *Crenicara praetoriusi* E. Ahl, neue Art!

Illustration from the unintentional first description of *Crenicara praetoriusi* in the magazine *Wochenschrift für Aquarien- und Terrarienkunde*, 1936. The drawing is by Walter Praetorius, who made it in 1933 in Santarem, the text by Hugo Weise.

publish a work on the type specimens of South American cichlids in the Museum für Naturkunde (Natural History Museum) in Berlin, including the three specimens of *Crenicara praetoriusi* which Ahl used as the basis of his description in 1936. Schindler and Paepke confirm the synonymy of *Crenicara praetoriusi* and *Dicrossus maculatus* already accepted by numerous earlier workers.

It has taken from 1863 to 2013 to attain our current state of knowledge regarding the checkerboard cichlid species. Aquarists and ornamental fish dealers have played a significant part therein. And the question of the number of species still remains unanswered (see below under *Dicrossus filamentosus*). Be that as it may, the checkerboard cichlids are a splendid example of the importance of free trade in the life forms on this planet and unrestricted opportunities for enthusiasts to keep and breed them, in order to learn about and conserve them. As we can only protect what we know exists!

#### Checkerboard cichlids in the aquarium

*Crenicara punctulatum* was the first species to be imported to Europe. Unfortunately this lovely fish has a decided disadvantage: it is almost always very shy. For this reason it has never been able to become properly

established in the aquarium hobby, although there are only a few cichlids that are as peaceful as this one, and hence exceptionally suitable for a community aquarium. A community aquarium is ideal for the maintenance of this species, as the other fishes somewhat reduce the timidity of the checkerboard cichlids.

Perhaps it is this shyness in *Crenicara*

All three photos show the same individual, a female *C. punctulatum* from Colombia. The ability of these fishes to change color is impressive!



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*punctulatum* that deters numerous aquarists from ever trying these attractive fishes. But there are also a number of nice myths surrounding *Dicrossus* species: they are regarded as extremely delicate and susceptible to problems. Usually the extreme water parameters that these species enjoy in the wild are held to blame: hardness barely detectable if at all, and a pH of less than 5. That means an extremely low level of germs. And checkerboard cichlids are in fact sensitive towards high bacterial populations. But in the past the main problems appear to have lain in the rather inadequate holding facilities in their native lands. The result was that numerous seriously compromised specimens arrived in the trade and could be acclimatized only with the greatest difficulty.

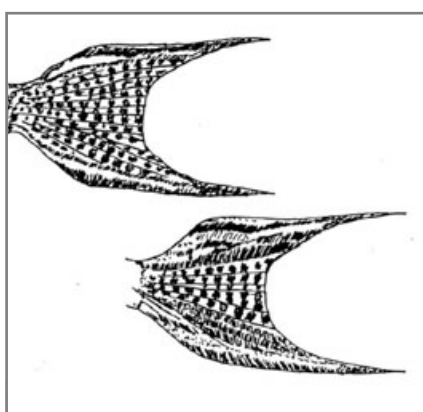
Nowadays things have changed and wild-caught *Dicrossus* no longer present reasonably experienced aquarists with any noteworthy problems. Water parameters are of secondary importance when it comes to maintenance, and a total hardness of around 20 °dGH and a pH between 5 and 7.5 are appropriate. Checkerboard cichlids don't harm either plants or other fishes. The water temperature should preferably be somewhat higher than usual, between 26 and 30 °C, if possible during the acclimatization period at least. All the usual ornamental fish foods are accepted, be they live, frozen, or dry. By far the most important factor in the successful maintenance of checkerboard cichlids is, however, the substrate: without fail there must always be areas of flat sand available! These will be constantly investigated for food. Checkerboard cichlids can't be kept successfully in the long term in the absence of sand.

#### **Crenicara punctulatum**

*Crenicara punctulatum* males grow to around 12 cm long and hence are no longer proper dwarf cichlids. But because the species is very peaceful that isn't really relevant. *Crenicara punctulatum* is one of the very few species among the freshwater fishes in which a genuine change of sex can take place. As far as is known all *C.*



*Dicrossus filamentosus* is a gorgeous fish that is regularly available in the aquarium trade.



The caudal-fin pattern in males of *Dicrossus filamentosus* varies according to their provenance. Above: Population from Colombia. Below: Population from Brazil.

*punctulatum* come into the world as females. Sexually active females of all checkerboard cichlid species can be very easily recognized by their intense orange ventral fins. If there is no male in the tank then the most powerful female will change from a functional female to a functional male. This phenomenon, which is very widespread among coral fishes, is termed protogynous hermaphroditism.

The maintenance of *C. punctulatum* is easy. The species is a harem-forming open brooder, i.e. a single male mates with several females and guards the territory, while the females are responsible for the eggs and fry.

#### **Crenicara latruncularium**

This species is extremely similar to *C. punctulatum*, but can be distinguished by two characteristics: only 15 spinous rays in the dorsal fin (vs. 16-17 in *C. punctulatum*)

and two greenish iridescent stripes beneath the eye. Maintenance and breeding are similar to *C. punctulatum*, although to date no change of sex has been reported in *C. latruncularium*; it is, however, very likely that *C. latruncularium* doesn't differ from *C. punctulatum* in this respect either.

#### **Dicrossus filamentosus**

This is the only species of checkerboard cichlid that is almost always to be found in the trade. It is widely distributed in Brazil, Colombia, and Venezuela and belongs to the dwarf cichlids: males grow to around 9



Female *Dicrossus filamentosus*. Following the first spawning the ventral fins become intense red.

cm, females 6 cm long. The habitat corresponds in some respects with that of the Cardinal Tetra (*Paracheirodon axelrodi*) and the Blue Neon (*P. simulans*). Maintenance is not difficult, but breeding is





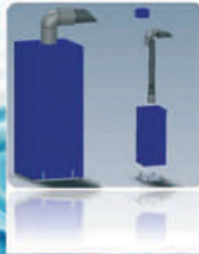

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Dominant male von *Dicrossus foirni* ..... courting male von *D. foirni* ..... and female *D. foirni* during brood care.

one of the real challenges of the aquarium hobby. The eggs can develop only in very acid, almost distilled water. This checkerboard cichlid is again a harem-forming open brooder, although males don't defend a territory. This species is perhaps the most peaceful of all cichlids. There are at least two color forms that differ in the coloration of the caudal fin in males. It may be that they are separate subspecies. Because the females can't be told apart, individuals of different origin should never be mated with one another.

#### **Dicrossus maculatus**

This *Dicrossus* again belongs to the dwarf



cichlids, and is one of the loveliest of them all! Males grow to around 9 cm, females 5 cm long. This species is an absolute rarity in the aquarium. Breeding is just as demanding as in *D. filamentosus*, but *D. maculatus* is a white-water fish and occurs only in the lower Amazon in Brazil.

#### **Dicrossus gladicauda**

The discovery of this checkerboard cichlid from Colombia was a real surprise. The species differs from *D. filamentosus* only in the form of the caudal fin: males have an unmistakable upper sword. Juveniles and females are, however, indistinguishable from those of *D. filamentosus*. Because checkerboard cichlids are imported almost exclusively as juveniles 2-3 cm in length, in which the caudal fin is not yet fully developed, every consignment from



*Dicrossus foirni*, old male (above) and young female (below).



Colombia is potentially full of surprises. Note that males of *D. gladicauda* find females of *D. filamentosus* very sexy...

#### **Dicrossus foirni**

This species has been known as the Red-Finned Checkerboard Cichlid or *Dicrossus* sp. Rio Negro since around 1980. Old males can grow to almost 10 cm, making *D. foirni* the largest of all the *Dicrossus* species. And one of the loveliest! *D. foirni* would be fairly easy to keep were it not for the problems breeding it.... This species too requires

extremely soft acid water in order to be able to breed successfully. At present there are acclimatized wild-caught imports in the trade.

#### **Dicrossus warzeli**

To date this checkerboard cichlid has been imported only very rarely. To the best of our knowledge it isn't currently available in the trade, if at all, and can be obtained only from specialist cichlid breeders. *D. warzeli* occurs only in the Rio Tapajós in Brazil.



*Dicrossus gladicauda*, male.



*Dicrossus maculatus*, male.



*Dicrossus warzeli*, Männchen.



*Dicrossus gladicauda*, female.



*Dicrossus maculatus*, female.



Male *D. maculatus* in normal coloration..



..and the same specimen of *D. maculatus* in courtship dress.



*Dicrossus warzeli*, Weibchen.



## Evergreens

# Shoals of mailed catfishes - do they really exist?

by Sarah Nieten

The mailed catfishes of the genera *Corydoras*, *Scleromystax*, *Brochis*, and *Aspidoras* are quite commonly termed shoaling fishes in the aquarium literature, combined with the suggestion that at least four to six individuals should always be kept together. But in the aquarium mailed catfishes swim in a group at best only now and then, so are they really shoaling fishes?

as flocks of Starlings (*Sturnus vulgaris*, a very common European bird) and swarms of bees. It is a characteristic of all these groups that they react like a single large organism. The flight maneuvers of a flock of Starlings and the swimming maneuvers of a shoal of Sardines are really impressive! The study of the mechanisms that permit these large groups to function is a fascinating area of research.

### Shoals in the aquarium?

There are hardly any fish species that swim in a shoal in the aquarium and behave as



The shoal provides protection, but the cost of this mustn't be underestimated: every item of food has to be shared with the members of the shoal.

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Now, in the first place four to six individuals are never a shoal, as in biology a shoal is defined as a large (!), usually anonymous (i.e. the individual members of the shoal don't know one another) group of fishes. The Sardine (*Sardina pilchardus*), a marine fish, is a typical shoaling species. Similar behavior is seen in other large groups of animals such

described above. The sole exception is the Red-Headed Tetra (*Hemigrammus bleheri*). If this species is kept in sufficiently large numbers (50 individuals upwards) in a suitably large aquarium (150 cm or more long), then genuine shoaling behavior will be seen, at least some of the time. All other so-called shoaling fishes, i.e. numerous characins, barbs, danios, rasboras, and , of



## ► Aquarienfische richtig füttern

Das Füttern der Fische ist eine der wichtigsten Pflegemaßnahmen im Aquarium. Die richtige Fütterung hängt stark vom Besatz, von der Anzahl der Fische und von der Größe des Aquariums ab. Nichtsdestotrotz gibt es einige Grundregeln, die es einfach machen.

### Die richtige Futtermenge

Oft wird zu viel gefüttert. Nicht gefressenes Futter belastet das Wasser und fördert den Algenwuchs. Um die Fische ausreichend zu füttern sollte man 1 bis 2 mal pro Tag so viel Futter zugeben, wie innerhalb von 2-3 Minuten gefressen wird. Dabei ist ein gelegentlicher Fastentag für ausgewachsene Fische durchaus empfehlenswert.

### Die richtigen Futterinhalte

Für ihre Gesundheit und Farbenpracht brauchen Aquarienfische eine ausgewogene und vitaminreiche Nahrung. Moderne Fischfutter enthalten kein billiges Fischmehl oder sonstige Füllstoffe. Stattdessen werden Zutaten, die dem natürlichen Nahrungsspektrum der Aquarienfische entsprechen, wie z.B. Krill und Insekten verwendet.

Neben bekannten Inhaltsstoffen wie Omega3-Fettsäuren und Omega6-Fettsäuren finden inzwischen Beta-Glucane zur Stärkung des Immunsystems Verwendung. Moderne Zierfischfuttersorten bieten inzwischen zur Verdauungsförderung Probiotik, das bedeutet lebende Milchsäurekulturen und Präbiotik, sprich: Substanzen zur Unterstützung insbesondere dieser probiotischen Kulturen an.

### Die richtige Futterform

Immer mehr setzt sich bei der Futterform das Granulatfutter gegen die althergebrachte Flockenform durch. Granulat hat gleich mehrere Vorteile: der Fettgehalt und der Energiegehalt sind höher, die Verdaulichkeit ist besser und durch die bessere Wasserstabilität ist die Wasserbelastung gegenüber Flockenfutter geringer. Für Bodenfische insbesondere Welse ist die Tabelettenform optimal.



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course, mailed catfishes, don't usually do so. On the contrary, even if you have six mailed catfishes in the aquarium, you will only rarely find them close together. These fishes always maintain a certain distance from one another. In particular the so-called saddle-snouts among the mailed catfishes are almost always solitary.

#### So what should we call this behavior?

Instead of shoaling fishes these species are better termed schooling fishes or social fishes. This means that individuals of the species in question are in constant, peaceful, intraspecific communication with one another. In the aquarium they



A shoal of Brazilian *Corydoras arcuatus*.

frequently even know each other personally (that is probably hardly ever the case in the wild). The fact is, such fish species often develop aberrant behavior if they are kept singly, and hence the advice that they should always be kept in a group is generally correct. But by contrast there are also lots of fish species that are tolerant of conspecifics but don't generally require their company in order to thrive, and then there are also the strictly solitary species that won't tolerate any conspecific except perhaps a mate, and then usually only at the time of breeding.

#### Shoals of mailed catfishes

It is a fact that in the wild some *Corydoras* species do occur in genuine shoals, i.e. groups of several hundreds or thousands of individuals. These species are frequently seen at reasonable prices in the trade, as they are easy to collect in large numbers. But unfortunately even these species exhibit their true shoaling behavior for only a few days in the aquarium. During this period they really do swim like a single large organism as if the members of the shoal were moving as one. But in reality each member of the shoal simply copies what its neighbor does immediately. Once they have settled in and learned that there is no real danger threatening them in the

aquarium, they very rapidly abandon the shoaling behavior. Its biological purpose - relative protection from predators - is redundant in the aquarium, as there are no predators there. And now the downside of shoaling behavior predominates, namely that any food has to be shared with neighbors in the shoal. Hence mailed catfishes very soon separate off and each goes about its everyday business alone. Even so, the presence of conspecifics has a positive influence, as it indicates to the mailed catfishes that if necessary they will be able to form a shoal again. This gives the fishes a feeling of security and hence

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*Corydoras delphax* from Colombia.

improves their well-being. But because mailed catfishes don't need to know each other individually and in all probability can't count either, four to six specimens are adequate in the aquarium. Each individual fish will meet conspecifics sufficiently often in the aquarium to get the feeling that plenty of them are present.

Even though only a few people (mostly staff in the wholesale trade who look after the fishes after importation) have the opportunity to observe genuine shoaling behavior in mailed catfishes in the aquarium and for only a short period of time, shoals of mailed catfishes really do exist!

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## Terrarium

# The community terrarium: a world full of wonder

by Thorsten Holtmann

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The terrarium literature is very comprehensive, and the hobby at an extreme high. Never before in the history of mankind have we known so much about reptiles, amphibians, bird-eating spiders, scorpions, & co - thanks to the terrarium hobby! But there is one topic that is as good as never discussed - the community terrarium. It sometimes seems almost as if there is something disreputable about this area of the terrarium hobby. But that is utter nonsense, a properly designed community terrarium is something quite splendid!

There are many different reasons for running a terrarium. Some people want to keep a particular pet such as a bearded agama, a Green Iguana, a tortoise, or a tame giant snake. Others get pleasure out of breeding and collect gaudy color forms of horned frogs, leopard geckos, or corn snakes. Yet others approach the subject scientifically and unlock the secrets of the life history of their charges. In all these cases the terrarium provides the appropriate accommodation and species-correct maintenance for the occupants, but to the uninitiated observer such a terrarium may seem rather dreary. In the case of large animals easy maintenance and cleaning must be at the forefront; anyone looking after a large collection of animals needs to consider easy monitoring; and in the case of species containers there is often nothing to be seen of the occupants.

### No more boredom

Matters are quite different with a community terrarium. Here plants and decorative objects can be used to simulate a section of a natural habitat. And immediately the terrarium itself, even without livestock, will be a real eye-catcher. The occupants will settle into this habitat just as they would in the wild. Even with relatively high population densities there will usually not be many of the occupants visible, but you will see a number of them every time. Various animals and plant species living together will provide constant new opportunities for obser-



In this terrarium, set up as described here, you can keep lizards, turtles, toads, newts, millipedes, and fishes together.

vation, and running a community terrarium never becomes boring.

### Are all species of animals suitable?

It must be made quite clear that very many animal species are not suitable for the community terrarium. Right from the start we can rule out all species that would feed on their fellow-occupants. A young Nile Monitor (*Varanus niloticus*), for example, would very rapidly turn a community into a species terrarium. Generally speaking, the livestock for a community terrarium shouldn't be too large (naturally this depends on the size of the terrarium; we are assuming a standard terrarium 80-250 cm in length here) and vegetarians are also of limited relevance. An adult Green Iguana

(Iguana iguana) will start by trampling everything flat and eventually turn the most beautiful rainforest terrarium into a dry forest biotope, as all the surviving plants will be eaten or at least chewed. The inhabitants shouldn't be too secretive, either, as otherwise it may easily happen that an animal will be seen only twice in the space of many years - once when it is

introduced into the terrarium and again when the latter is cleaned out. Shy creatures should be avoided, as they can be difficult to feed. The ideal occupants for a community terrarium are thus well-behaved, not plant-eaters, not too shy, not too large, and diurnal or crepuscular in their activity.

### The correct vegetation

A properly decorated biotope terrarium is a section of Nature. All too often planted terrariums look more like florists' displays than real biotopes. In order to avoid a plantation-like appearance, the selected plant species should be of various different sizes - somewhat irregular plant growth always looks a lot more natural than ideal-





sized pot plants. As in the wild, a collection of all sorts of different plants in a confined space is best avoided. It is better to limit yourself to three or four plant species, as different as possible in appearance but characteristic of the habitat, and instead - as already mentioned - select several different-sized specimens of each. The plants should, if humanly possible, be planted directly into the substrate. Only in specialized desert terrariums is it sometimes impossible to stick to this fundamental rule, as the essential watering of the plants can make the surrounding substrate too wet. The ideal terrarium plant is robust, doesn't



Can't make your mind up between lizards and turtles? Then just keep them both together in a terrarium like this one.



require too much light (bearing electricity costs in mind), and vigorous. It is better to have to prune back frequently than to regard every small leaf that appears as a cause for celebration, as it will never be possible completely to avoid overlooked food insects (crickets, grasshoppers, locusts) nibbling the vegetation, or any human activity necessary in the terrarium snapping off a leaf or twig.

#### The correct decor

Here too "less is more" applies. You should use just one type of rock, just as in the wild. It is important to use rocks of various sizes - beginning with relatively fine gravel, then larger pebbles and fist-sized rocks, and even single larger boulders. A colorful mixture of different types of rocks always looks unnatural. The same applies to any wood

used. It is true that some species of reptiles and amphibians usually live in compost heaps, but a terrarium à la compost heap is never going to look attractive. Hence both any bogwood used and branches and twigs used for additional decoration should all be the same type of wood .

#### Equipment

When it comes to equipment there is no difference between the community terrarium and a standard terrarium. The most important element of the equipment in the terrarium is the lighting. It must be appropriate for the light and temperature requirements of both animal and plant residents. It is highly advisable to also take running costs into consideration here. In some types of terrarium (desert and steppe terrariums) fairly high Lux values are

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Step 3: The moss-covered branches are put in place and small cushions of moss draped over the large stones.

required for the plants to grow well (10,000 to 100,000 Lux, at least in places), and there really is a difference as to whether 40- or 400-watt lamps should be installed. The amount of heat given off must also be considered, as using conventional light sources a lot of light also means a lot of heat given off. For this reason modern LED systems are the first choice here. They are very economical in their usage as far more of the power consumed is converted to light than with other lighting systems where a lot of electricity is converted into heat. Misting units are very useful where high atmospheric humidity is required. Any water area should be well filtered.

#### Maintenance

A properly set-up and operated community terrarium doesn't need much maintenance. The animals need to be fed, the plants watered (plus fertilized and pruned if necessary), and the front glass cleaned occasionally. If there is a water area then evaporation should be topped up, and the interior of the terrarium should be sprayed with hand-warm soft water every morning and evening. If instead there is a water dish in the terrarium then it should be cleaned and refilled with fresh water every day. In desert terrariums any droppings seen should be removed; in all other types of

terrarium micro-organisms will usually perform this task before any human intervention is required.

#### A river bay in China

A gorgeous community terrarium on this theme can be created even in a small space. The animals and plants are almost always available in the trade, and the decor objects can also be obtained without problem in the pet trade. It is intended to represent a gravelly section of shore in a water meadow. Inspiration can easily be gained during a Sunday stroll. The recommended terrarium size begins at around 90 x 50 x 60 cm (length x breadth x height); larger is, of course, always possible, but the accommodation should not be any smaller. The substrate consists of a 3-5 cm deep layer of Rhine gravel with a grain size of 2-8 mm. Fist-sized pebbles (again from the Rhine) or pieces of wood (Mopani is particularly suitable) are then used to separate off around half of the bottom area, which is then filled with gravel to the maximum depth possible (in the case of most terrariums available in the trade this will be 10-15 cm).

#### The bottom glass of the terrarium

If you have the terrarium made specially then it should have a bottom pan 15 cm



Step 1: In contrast with the method described in the text, a weight-sparing variant has been chosen here. Three specimens of *Ficus benjamina* Natasja' are planted on a 5-cm-thick sheet of styrofoam with their root balls protected by fist-size Rhine pebbles.

deep. The bottom glass should consist of glass 6-8 mm thick (the norm is only 4 mm), as the bottom pan of the terrarium described here will be used as a shallow aquarium. If the bottom glass splits then there will be a right old mess in the room. So it is better to invest a bit more money and ask the person constructing the terrarium to use thicker glass for the bottom, as this will greatly reduce the risk of breakage. If you already own a terrarium with a thinner bottom glass and want to set it up as an aqua-terrarium, then the following procedure can considerably reduce the risk of breakage: the bottom glass should be



Step 2: Rhine gravel with a grain size of 2-8 mm is used as infill around the root balls of the *Ficus*. Creeping Jenny is planted around the edge of the styrofoam sheet and again the root balls are infilled with the gravel.

spotlessly cleaned and then a sheet of styrofoam, trimmed to the same size, placed on top of it. The thickness of the styrofoam is of secondary importance, but should be as thin as possible (3 mm upwards). On top of this is placed a watertight Siebdruckplatte, 12-19 mm thick and again trimmed to the correct size. Neither the styrofoam



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*Ficus benjamini* 'Natasja' has smaller leaves than the parent form and grows very well in a moist terrarium.

sheet nor the textured coated board needs to be glued in place, the weight of the substrate will suffice to hold them down. Neither the styrofoam nor the textured coated board will release any substances poisonous to the livestock, although the textured coated board may initially color the water brownish. This is harmless and will disappear after a few water changes.

#### The water area

A block of blue filter foam measuring around 15 x 10 cm should be positioned in a rear corner of the water area. The thickness of the block will depend on the depth of the bottom pan: in the case of a 10-cm-deep bottom pan the block should be 10 cm thick, for a 15-cm-deep bottom pan 15 cm, and so on. A sharp knife is then

used to cut a hole in the filter block to accommodate a small aquarium powerhead. A pump with a rating of 4-7 watts will suffice. A suitably-sized hole is then cut for the outlet, again using a sharp knife.

This filter unit will provide a moderate current and very clear water in the water area. The filter unit is finally covered with 40-80 mm of Rhine gravel. The filter unit will need to be taken apart and cleaned from time to time, so the gravel covering should be only as thick as required to hide the blue of the foam. The bottom pan is then filled with water and the pump switched on.

#### The vegetation

In the wild the bank is lined with willows

(*Salix spp.*), poplars (*Populus spp.*), and alders (*Alnus spp.*), usually in the form of bushes. None of these species is suitable for long-term use in the living-room. The small-leaved 'Natasja' variety of the Weeping Fig, *Ficus benjamini*, has proved a good alternative. The species also occurs in China, and so using it isn't a complete departure from the theme. A small group of *F. benjamini* (3 or 5 plants, always an odd number as otherwise the group will look like a plantation) should be planted as the main vegetation on the land area. The plant, along with its soil, should be taken from the pot and the roots buried in the gravel such that 2-3 cm of the soil is still visible above the gravel. *F. benjamini* tolerates "wet feet" very well.

Next add sufficient compost or leaf mold to the land area to just cover the root balls of the Weeping Fig. Place a few handfuls of dead leaves (ideally European Beech, *Fagus sylvatica*) on top of the compost/leaf mold. The transition region between land and water can be planted with Creeping Jenny (*Lysimachia nummularia*), which in time will spread to provide ground cover on the land area. A group of Dwarf Sedge (*Acorus gramineus*) can be planted to create a little island in the water part. Sometimes it is necessary to search around a bit to find the delightful dwarf form (*A. g. var. pusillus*), but it does create the best effect. The nominate form is also suitable, while the almost

Dwarf Sedge, *Acorus gramineus*



Creeping Jenny (*Lysimachia nummularia*) is a terrarium plant that can be used almost anywhere.



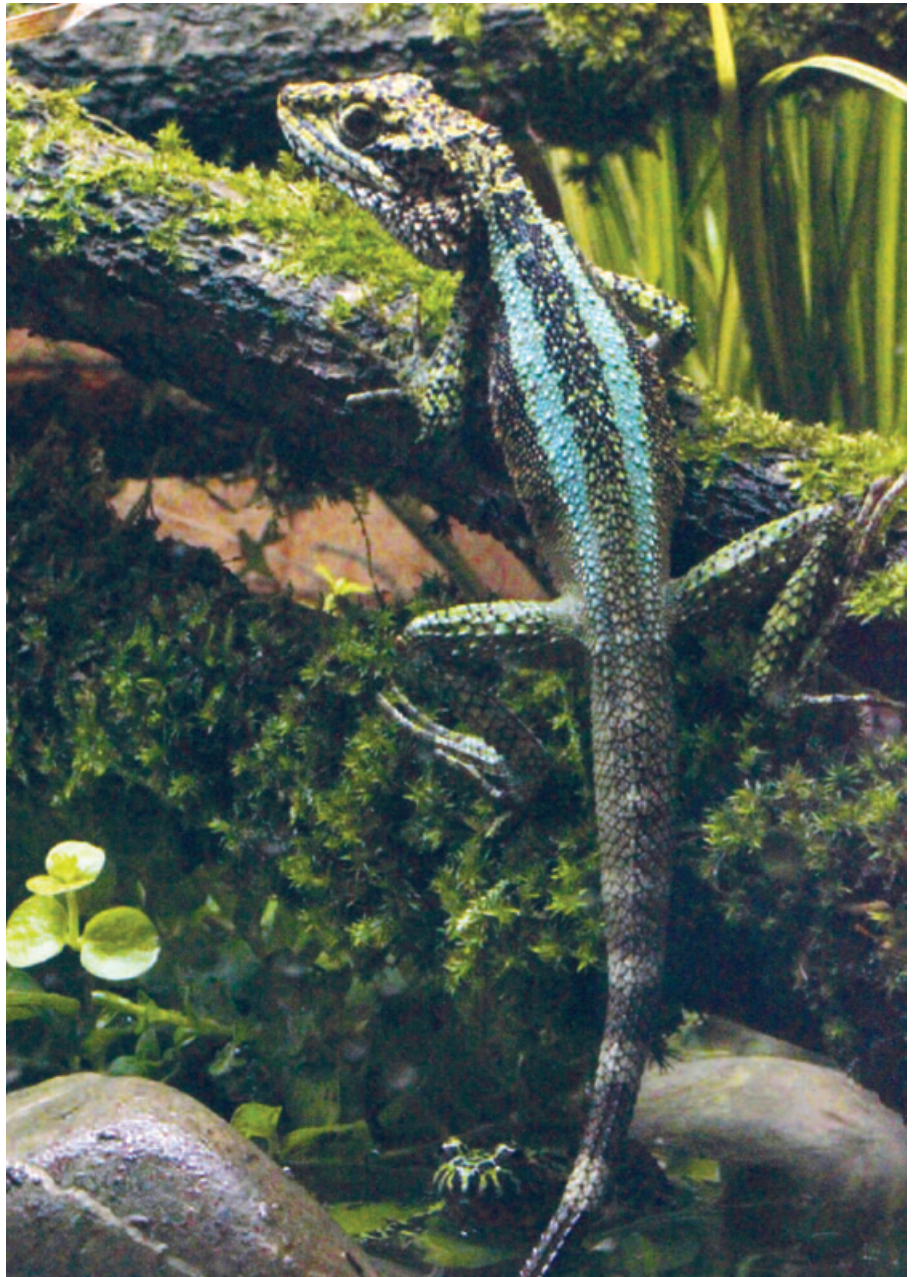
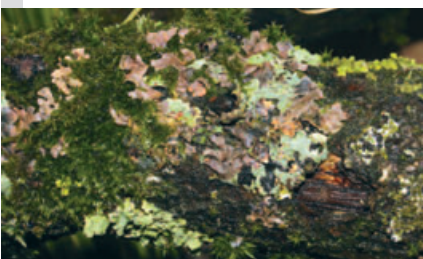


always available, white-striped form 'Variegatus' is more a matter of taste.

It should always be borne in mind that this plant species tolerates transplantation only very poorly. It is best to use well-rooted potted plants, which should be planted without pots but with roots and soil intact. The Dwarf Sedge should be surrounded with stones. Any large gaps through which the potting compost might escape should be blocked with coconut fiber (available as nesting material for cage birds; boil it before use in the aquarium or terrarium and throw the water away, and the material can then be used without concern). Some Java Moss (*Taxiphyllum barbieri*) can be placed on top of the coconut fiber, where it will grow well and soon cloak the little island in green.

If the Dwarf Sedge is available only as rhizomes with leaves, then you must expect losses, and at best there will be a check in growth for several weeks. Dwarf Sedge should be planted only a few centimeters deep in water, with the major part (at least 2/3) of the foliage protruding. The plants may survive for quite a long time

Unfortunately these attractive and interestingly colored lichens do only poorly in the terrarium.



The gorgeous blue-green markings of *Japalura splendida* act as camouflage on lichen-coated branches.

completely submerged, but they will grow only very slightly.

A few strands of Waterweed (*Elodea densa*) or Hornwort (*Ceratophyllum demersum*) can be placed in the water. After a while the Waterweed will battle the current with long threadlike roots, while the Hornwort is completely rootless and just floats around forever.

Moderate lighting of around 1,000 to 3,000 Lux will be perfectly adequate for the plants mentioned here. All these plants will happily tolerate a UVB lamp being used for reptiles for 8-12 hours per day. However, the horizontal distance from the cone of light of

any "hot spot" should be at least 20 cm, as otherwise the plants will be scorched.

#### Additional decoration and mosses

The final touch to the terrarium is slender branches (finger to at most 4-5 cm thick), if possible coated with lichens or mosses, such as can be found lying around on forest paths after a day of violent winds. These can be used to simulate the "thicket" that always accumulates on the shore of river bays following a period of high water. The mosses and lichens will usually die off after a while, but that doesn't really matter. Java Moss will grow very well on the coating of mosses or lichens and create a more than satisfactory replacement as long as you



*Amblystegium* (Stumpfdeckelmoos) sometimes also grow quite well in the terrarium.



*Bryum bicolor*, an Old World moss that often grows in flowerpots. It indicates a wealth of nutrients.

make sure that one end of the Java Moss remains dangling in the water. Capillary action will then provide the requisite moisture without any need to keep spraying. Sometimes you will be lucky and bring home a moss that grows well in the terrarium. But unfortunately that is the exception, and it is only rarely possible to satisfactorily determine to what species the moss belongs. Ground-living woodland mosses should never be collected for the terrarium, not so much out of conservation considerations but because they don't last for long, but the grassy mosses found growing on damp surfaces everywhere can and should always be tried. In particular the Springy Turfmoss (*Rhytidiadelphus squarrosus*), probably the commonest of all the turf mosses, is always worth a try.

#### The livestock

The top candidate for this biotope is the Chinese Firebellied Toad (*Bombina orientalis*). Five to ten individuals should always be present and form the tough core

population. The toads will also breed readily, though spawn and tadpoles must be hatched and reared separately. The call of these toads is a gentle rattle that doesn't cause any disturbance even in the living-room, and sounds like the gentle tapping of a fingernail on a wine glass. The favorite food of these toads is crickets of suitable size.

Another amphibian that should always be present in this terrarium is the Chinese Firebelly Newt (*Cynops orientalis*). Again five to ten specimens of this attractive and undemanding species can be introduced. They will get on exceptionally well with the toads but will eat their spawn. That apart, the newts can be fed on frozen foods for aquarium fishes (ideally with frozen adult *Artemia*). Because the newts will smell the food, any specimens currently on land will enter the water to feed. Alternatively you can choose the closely-related *Cynops pyrrhogaster* or *Cynops cyanurus*, but please, never more than one species per terrarium. *Cynops orientalis* is the most temperature-tolerant of all the newts, and at the same time a small species and peaceful to boot, and hence just the thing for a community terrarium.

Baby turtles can be kept only temporarily in the community terrarium, but they are so

much fun that a few young Chinese Stripe-Necked Turtles (*Ocadia* or *Mauremys sinensis*) should always be included. But obviously you must decide before purchasing them what you are going to do with them when they grow too large! It is nice if, for example, the adult turtles can be housed in outdoor accommodation and their young in the community terrarium. You will then see a completely different side to these turtles: the babies are exceptionally good at climbing and during the day can be found far more often among the branches than in the water area! Given this type of maintenance, the dreaded skin diseases often suffered by young *Ocadia sinensis* hardly ever occur. Baby Chinese Stripe-Necked Turtles feed almost exclusively on small organisms, and, like newts, are preferably fed on frozen foods, though they should always be given a special turtle-rearing food as well, in order to avoid dietary deficiencies. Newts and toads will ignore the turtles.

The land area can also accommodate a pair of lizards, for example the Brown Pricklenape (*Acanthosaura lepidogaster*) or the Chinese Tree Dragon (*Japalura splendida*). Neither species is a miracle of mobility and both remain manageably small, and both are very attractive to look at. Their often bemoaned susceptibility to

The attractive and easy-to-keep Chinese Firebellied Toad forms the core population of the terrarium.






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disease is rarely seen in the type of terrarium described, probably mainly because of the well-maintained water area. On the other hand they become very tame and enjoy taking titbits from forceps. Otherwise they will feed very readily on crickets. The females like to lay their eggs at the feet of the Weeping Figs.

#### Additional species and some little assistants

Naturally there a lot of other species that can be kept in this community terrarium, but unfortunately they are not often seen in the trade: for example, various small toad and frog species (*Bufo* spp. sensu lato, *Rana* spp. sensu lato), the Chinese Water Skink (*Tropidophorus sinicus*) or the dainty little skinks of the genus *Mabuya*. Other apparently suitable species such as the Chinese Tree Frog (*Hyla chinensis*) may require a rethink: males make an appalling racket at spawning time. They are better kept outside where they won't cause any further disturbance and only females housed in the living-room terrarium. But those terrarium enthusiasts who enjoy the thrill of the chase should always keep their eyes open.

A pair of house geckos (*Hemidactylus frenatus* or *Cosymbotus platyurus*) can be relied on to keep down the numbers of crickets missed by the toads and other lizards. A number of colorful millipedes, e.g. *Tonkinbolus dollfusi* (or *Aulacobolus rubropunctatus*; this is not the place to



*Misgurnus anguillicaudatus*, golden cultivated form. These fishes are excellent scavengers for the water area.

decide which name is valid, but millipedes found in the trade under these two names belong to the same species), are ideal "health police" for the land area and can be relied on to prevent mold. In addition they eat leaves and mildewed wood, and they should also regularly be given some ornamental fish flake and pieces of banana. All millipedes release poison when threatened, and hence are left in peace by reptiles and amphibians. There is no danger to the toads, newts, & co from the millipede poison.

Obviously you can also experiment with small native species found under stones in the garden. Woodlice are also good and harmless scavengers, although they are in turn much enjoyed by amphibians and

reptiles. Care is required with snails and slugs, as anyone not very familiar with them can rapidly bring a plant destroyer into the house. But there are undoubtedly also harmless species.

There should be a few (7-15) small fishes swimming in the water area. Ideal species include *Tanichthys* spp, the oriental minnows. If the little fishes shown signs of being unwell then this indicates there is something wrong with the water. They are thus perfect bio-indicators. It is also beneficial to have three to four mud loaches (*Misgurnus anguillicaudatus* or *Paramisgurnus dabryanus* (= *M. mizolepis*), both species are equally well suited) in the water area. These loaches, which grow to 8-15 cm long, are rather secretive but will eat any drowned insects and also process the droppings of lizards, toads, and newts, so that pollution of the water remains slight. If you feel that the fishes aren't getting enough nutrition in the way of uneaten or undigested newt and toad food, then they are best fed using food tablets for ornamental fishes. These are also a good way to entice the mud loaches out of their hiding-places and do a head count of your charges.

#### The terrarium throughout the year

The community terrarium described here is home to animals from temperate zones, where there are marked annual seasons. In

The Chinese Firebelly Newt is the ideal newt for the community terrarium.







*Tanichthys micagemmae*, dehe Vietnamese Minnow, is ideal for populating the water area, just like *T. albonubes*, the White Cloud Mountain Minnow.

the winter it can be bitterly cold, with frost and snow not uncommon. This raises the question of whether the animals need to hibernate. The answer is "No, they don't." Even so you should consider the bio-rhythms of the animals (and plants) by imposing shorter days during the winter (i.e. only 8-10 hours of lighting), and longer during the summer (14-16 hours of lighting). This lighting regime regulates important hormones, including sex



Millipedes such as *Tonkinbolus dollfusi* are excellent scavengers for the land area. The moss on which the animal is resting is the Springy Turfmoss, a very common turf moss.

hormones. Contrary to popular opinion it is almost always possible (there are exceptions) to breed animals from temperate zones, even if they haven't been

overwintered in the cold. But not, or in only a few years, if the animals are kept under the same lighting conditions year-in, year-out.

We meet in the community terrarium, ok?

All photos: Frank Schäfer

It must be made clear that a regular hibernation period, which is physiologically a type of coma, results in a relatively longer life span. We know of no scientific research to confirm this statement, but it is known that in practice an individual of a species of animal that undergoes a winter rest can live considerably longer than a conspecific that doesn't undergo hibernation. The actual periods of activity - i.e. the actual period of active life - of the two individuals are, however, identical, so it is ethically perfectly acceptable to dispense with hibernation. Hence this decision - hibernation or not - must be a matter of the personal choice of the owner of the animals

We will be portraying further attractive and interesting community terrariums in subsequent issues of the News. Your pet dealer can also provide you with advice on such matters, just as your pet dealer can himself obtain information from a wholesaler that he trusts, e.g. Tropenparadies in Oberhausen, Germany: Fax +49-208-665997.





## Evergreens

# Barbs, Rasboras, & Danios

by Frank Schäfer

Since 1st August 2014 new animal protection legislation has been in force in Germany, under which the vendor is obliged to provide every new customer with extensive written information on the newly purchased animal. In the case of fishes that is totally impracticable for every individual species. For this reason AQUALOG has developed "Profile" sheets to complement its "Labels" system, in order to comply with the legal requirements and cover each individual fish group. Labels and Profiles are an unbeatable "dream team". Here is the Profile for "Barbs, Rasboras and Danios".

**G**eneral Barbs, rasboras, and danios are popular names given to various genera of fishes belonging to the cypriniform (carp-like) family Cyprinidae. There is no precise scientific distinction between the three groups. Zoologically speaking the barbs, rasboras, and danios are classified in the subfamilies Barbinae and Danioninae of the

The species discussed here were formerly contained mainly in the genera *Barbus*, *Puntius*, *Danio*, *Brachydanio*, and *Rasbora*, but currently more than 20 new genus names have been added. Hence it is wise to look at the specific name when seeking more detailed information in the aquarium literature. For example, the Five-Banded Barb, a very popular aquarium fish, was formerly



The popular banded barbs, such as the Five-Banded Barb (above) and the Sumatra Barb (below) are now placed in the genus *Desmopuntius* (formerly *Barbus* or *Puntius*).

swallowing by the so-called pharyngeal teeth. The group contains a total of some 1,700 described species, all of which live in fresh water, with representatives in both Africa and Asia. Around 200 species are of importance in the aquarium hobby. All species breed by laying eggs, and there is no highly-developed brood care in the group. These fishes are very productive, and most of the stocks available in the trade are captive-bred. The maximum eventual length of the species regularly maintained in the aquarium is between 1.5 cm and 40 cm.

### Important requirements

Barbs, rasboras, and danios are popularly termed "shoaling fishes", which is, strictly speaking, only very marginally correct. They are in fact social fishes that sometimes join together to form larger groups, but often also occupy very small territories that are even defended against conspecifics on a short-term basis. In practice this means that barbs, rasboras, and danios should be kept in groups of six or more individuals, the upper limit being determined only by the size of the aquarium.

Some of the species of interest to the aquarium hobby, in particular some rasboras, have adapted to waters that are inhospitable to other, larger fishes, specifically small



The Harlequin Rasbora is one of the most popular of all aquarium fishes. It is currently called *Trigonostigma heteromorpha*, but was formerly known as *Rasbora heteromorpha*.

family Cyprinidae.

The scientific nomenclature of the barbs, rasboras, and danios has recently been undergoing major changes, as modern methods of research, in particular DNA analysis, are providing new insights into the phylogenetic relationships of these fishes.

known as *Barbus pentazona* or *Puntius pentazona*. Its current name is *Desmopuntius pentazona*. Thus the specific name *pentazona* remains the same as before.

Cyprinids have no teeth in their jaws, i.e. the mouth is always toothless. Any food taken in is reduced to smaller particles during

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The Malayan Lined Barb (*Striuntius lineatus*) is one of the larger species.

bodies of water with soft acid water. The chemical composition of the water is, however, of no physiological significance to barbs, rasboras, and danios; a Harlequin Rasbora (*Trigonostigma heteromorpha*) will live just as long in medium-hard, slightly alkaline water as a conspecific kept under near-natural water conditions. Very good water quality, in particular as demonstrated by the density of the bacterial population in the water, is of far more importance to species from such biotopes. These fishes require well-maintained water with a low germ count. This can be achieved via efficient biological filtration, the addition of humic substances using peat, Alder cones, or dead leaves (there are also suitable liquid preparations available), the best plant growth possible (many aquatic plants produce antibiotic substances that have a limiting effect on bacterial growth), and regular partial water changes, which should be as extensive as possible (see below).

On the other hand there are also many species of barbs that are regarded as ideal "beginner's fishes" on account of their enormous adaptability to the widest variety of water parameters, and because of their lack of sensitivity to serious organic pollution and a high bacteria count in the water. These fishes will survive, with no sign of illness, practically any beginner's mistake such as too high a fish population, overfeeding with

a monotonous diet, insufficient water changes, and being kept in so-called community aquaria that are usually just a collection of poorly compatible species. In the wild these hardy cyprinids are found in areas characterized by periods of severe drought and heavy rainfall, where all the stress factors mentioned above form part of the everyday life of the fishes.

The correct water temperature for long-term maintenance generally lies between 22 and 26 °C, but most barbs, rasboras, and danios can tolerate a short-term rise (for a few days

or weeks) to up to 30°C, and almost all species will also tolerate a short-term drop (again a few days or weeks) to 18°C. In the case of species from subtropical zones (northern India) the temperature can periodically be allowed to drop to anywhere down to 14 °C.

#### Appropriate feeding

The barbs, rasboras, and danios normally maintained in the aquarium can be characterized as omnivores with a preference for carnivore foods. They can be fed entirely without problem on all the usual types of food for ornamental fishes available in the trade (i.e. dry, frozen, and live foods). Only a few larger species feed predominantly on vegetable food. If the fishes are observed to consume aquatic plants then additional vegetable food (special flake foods, scalded lettuce or dandelion leaves, etc) should be provided. Decaying organic matter, the mud-like material known as mulm that accumulates in the aquarium, is indispensable to many barbs. It is very rich in bacteria and fungi that these barbs require to keep their intestinal flora healthy. An aquarium containing barbs should not be kept too clean as otherwise they will become unwell.

#### Correct maintenance

Regular large partial water changes are the

Two rival males of the Cherry Barb (*Puntius titteya*).





The Dadio, *Laubuca dadiburjori*.



*Rasboroides rohani*.

most important element of maintenance. Ideally 1/3 - 2/3 of the water should be changed every week, refilling with conditioned fresh water of the same chemistry; at the same time the difference in temperature between the new water and the aquarium water should be as small as possible and never more than 2-3 °C. In aquaria with a low fish density, minimal germ population, and good biological filtration, water changes can be reduced to 1/5 of the total volume every 14 days. Longer intervals should not be employed in the long term.

In line with the natural habitat, these fishes should always have access to secondary plant material. Dead leaves (of Sea Almond, Beech, Oak, or Walnut), Alder cones, or peat can be utilized, or special liquid preparations

Malabar Danio, *Devario malabaricus*.



Mosquito Rasbora, *Boraras brigittae*.

added at every water change. In the case of barbs it is important that there is always

some mulm present in the aquarium.

#### Aquarium and tankmates

Barbs, rasboras, and danios are active fishes that need a certain amount of swimming space for their well-being. Tank length should be around 10-15 times the length of the species in question, with a width to match (i.e. 5-7.5 times fish length), to permit the fishes enough room to exhibit their species-typical swimming behavior. Barbs tend to live near the bottom, rasboras and danios in the middle layers of the water or close to the surface. An aquarium for barbs, rasboras, and danios should provide plenty of cover and at the same time offer open swimming space. Floating plants will provide an increased sense of security and hence well-being. A dark substrate will encourage intensified coloration. In the case of barbs at



Red-Striped Torpedo Barb, *Sahyadria chalakkudiensis*.

least part of the substrate should consist of soft river sand (never builders' sand!), as these fishes like to grub about in the bottom, searching the sand for edible particles.

Barbs, rasboras, and danios are usually peaceful among themselves and towards other species. The only exception is the Sumatra or Tiger Barb (formerly *Barbus* or *Puntius tetrazona*, now assigned to the genus *Puntigrus*; the correct name in full is now *Puntigrus anchisporus*, but it will undoubtedly be decades before the correct

designation becomes established in the trade). Tiger Barbs have an extremely well-developed urge to play, which causes them to nip at the long fins of certain fishes such as Angelfishes, gouramis, veiltail Guppies, etc. This not only causes fin damage but the continuous negative stress to the victim fish can lead to increased susceptibility to disease and sometimes even death. So Tiger Barbs should never be kept with long-finned fishes.

#### Life expectancy

African Butterfly Barb, *Barbus hulstaerti*.



Zebra Danio, *Brachydanio rerio*.

In the wild the majority of the smaller species rarely enjoy a second year of life, but in captivity they can be astonishingly long-lived. Small species usually start to show the first signs of age at about three years old, medium-sized at 5-8 years, and large species can even live for decades.

#### Size

Barbs, rasboras, and danios with an eventual size of less than 5 cm are sexually mature at 12-15 weeks old, and at this point will be half to three quarters (depending on environmental conditions) of their eventual size. Larger species (up to 10 cm) grow



Redstripe Rasbora, *Trigonopoma pauciperforata*.

somewhat more slowly and are often full-grown at the age of 12 months. Species that grow larger than 10 cm usually don't reach breeding size until their second or third year of life. Because of the large variety of species, please check the label on the sales aquarium for the potential maximum size of any species that interests you.

#### Special details

Because of their bright coloration and lively behavior, barbs, rasboras, and danios are ideal fishes for community aquaria. They do not practice any brood care and hence do not hold territory - in other words they are peaceful.



## Marine fishes

# Butterfly- and Angelfishes - the royalty of the marine aquarium

by Levin Locke

In the 1970s and early 1980s the focus of the marine aquarium hobby was the maintenance of fishes. The crowning glory of every fish collection was the butterfly- and angelfishes. Then, in the middle of the 1980s, there was a total ban on the importation of these fishes to Germany, based on the protection of species. This import ban was in force for around 10 years, and then it was repealed as illegal. Meanwhile, however, the marine aquarium hobby had changed a lot, and now the maintenance of reef aquaria was the focus of interest. So what is the situation regarding butterfly- and angelfishes in the hobby nowadays?

Generally speaking it can be said that interest has decreased considerably. The reasons for this are manifold.

### Coral-eaters

Among the butterflyfishes in particular there are a whole set of species that have specialized in feeding on coral polyps in the wild. A number of species are so strongly specialized that they feed only on the polyps of very specific stony corals. These fishes do not, however, have any physiological requirement for coral polyps as food. If they can be weaned onto alternative foods then they can live for 15 years or more in the aquarium. But unfortunately this is achieved only very rarely. Nine out of ten butterflyfishes of this group will starve to death rather than accept other foods. So they are best left

on the reef if you aren't willing to satisfy their very special requirements. It is true that these fishes may find suitable food in a reef aquarium, but what aquarist wants to watch his lovingly cultivated stony corals end up as fish food? In brief, nowadays these butterflyfishes are as good as never maintained in the aquarium, even though it is legal. If they do turn up once again in the aquarium trade then it will be by accident, because they were sent in error.

### Continuous feeders

Another reason why butterfly- and angelfishes are less popular nowadays lies in their feeding behavior. The natural food that these fishes find on the reef is rather poor in nutrients and can be obtained only at the expense of a lot of time. The



Copperband Butterflyfish, *Chelmon rostratus*

stomachs of these fishes are not designed to take in large amounts once a day and then digest them, but instead they feed all day long, constantly consuming small portions. But we like to feed small amounts and only rarely in the reef aquarium, in order to keep pollution of the water at the low levels liked by the corals. And if butterfly- and angelfishes are kept on short rations then they will constantly pick around on the corals, which eventually stop opening any more. By contrast, this characteristic is less important in fish-only aquaria. Here they can be fed small portions 6-8 times a day by an automated feeder, even when you aren't at home. But who still keeps fish-only tanks nowadays? Their feeding behavior is also a reason why nowadays many butterfly- and angelfishes are maintained only by a few specialists.

### Gorgeous to look at and easy to keep

But despite all this many butterfly- and angelfishes are among the loveliest of all fishes! Many species are generally very suitable for maintenance in the reef aquarium, and some are even exceptionally easy to keep! These are the species that have specialized in feeding on plankton in the wild. They include the splendid wimplefishes (*Heniochus spp.*), the butterflyfishes of the genus *Hemitaurichthys*, the pygmy angelfishes (genus *Centropyge*), and the lyre-tail angelfishes of the genus *Genicanthus*. These fishes not only look gorgeous but they also leave corals totally in peace as they have no place in the natural food spectrum of the fishes. And finally, plankton feeders on the reef in the wild are

Majestic Angelfish, *Pomacanthus navarchus*





*Chaetodon kleinii*, Klein's Butterflyfish

specialized on fairly rare planktonic organisms; in other words they feed - just as in the aquarium - only when there is something to eat and don't go looking for food when there is none.

In addition the pygmy angelfishes remain very small. They often grow to only 8 cm long (males), with females remaining 1-2 cm smaller. Pygmy angels can and should be kept in pairs or groups of one male and several females, and they will also spawn regularly in the aquarium. One of the wimplefish species (*H. diphreustes*) is a shoaling fish, while the rest prefer to live in pairs or small groups. Hemitaenichthys likewise appreciate the company of conspecifics, while the lyre-tail angelfishes again live in shoals in the wild; because, like so many other coral fishes (including the pygmy angels), they undergo a sex change from female to male, it is mostly females that make it into the trade. The strongest individual in a group will sooner or later change into a male. However lyre-tail angelfishes attain a length of 12-20 cm (depending on the species), and hence require lots of swimming space.

#### Useful species

A number of species of butterflyfishes are kept by aquarists to eliminate nuisance "glass roses" (*Aiptasia spp.*). These are the

butterflyfishes of the genus *Chelmon* and the species *Chaetodon kleinii*. It should be understood that these fishes will also generally nibble at large-polyped corals if they are hungry. Hence they should be fed a generous and varied diet when Aiptasia are in short supply. The disadvantage of this biological method of combating Aiptasia is that both *Chelmon* and *Chaetodon kleinii* will consume hardly any glass roses once they have adapted to the easier pickings of substitute foods. Adding additional butterflyfishes that aren't yet "habituated" is difficult to impossible, as established individuals react very aggressively towards newcomers.

*Geniacanthus bellus*, Female Ornate Angelfish.



When Aiptasia are continuously attacked and eaten then the surviving specimens will contract into tiny, barely visible little clumps. Aquarists then assume prematurely that the plague has been overcome and start to feed the butterflyfishes heavily. The surviving Aiptasia then re-appear in all their former glory. Anyone who wants to buy one or more (it is always advisable to try and keep a group, as then there will be more behavior to observe) of these butterflyfishes to combat Aiptasia should keep them on short rations for a while after the apparent disappearance of the problem, even if this means risking attacks on corals and other sessile invertebrates.

#### "Brain-switchers"

Even though nowadays butterfly- and angelfishes generally play only a small secondary role in the overall action of the marine aquarium hobby, there are nevertheless a few of them that are so beautiful as to lead to people switching off their brains, getting out their wallets, and buying the gorgeous creatures. These species include a number of large angelfishes (*Pomacanthus spp.* and *Holacanthus spp.*). These species are in fact fairly easy to keep, but they grow rather large (between 15 and 40 cm) and there is always a risk of attacks on invertebrate tankmates. Another species belonging to the "brain-switcher" category is the Regal Angelfish (*Pygoplites diacanthus*). Many aquarists regard this as the loveliest fish of





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Regal Angelfish, *Pygoplites diacanthus*

them all. But you should really purchase it only from expert aquarium stores and also make sure that it is feeding, as the Regal Angelfish is notorious for starving to death rather than taking substitute foods. In the wild these fishes feed on sponges. Acclimatizing them with live sponges as food usually works well, and sooner or later the majority of individuals will eat other foods as well, taking their lead from the other fishes in the aquarium. But there are also many individuals that are reluctant to abandon their diet of sponges. In the long term (the species can easily live for 10-15 years in the aquarium) that costs an awful lot. You really do need to be quite clear about these special requirements of the Regal Angelfish before purchasing, and keep your brain switched on!

### A few basic rules in conclusion

In view of the large number of species of butterfly- and angelfishes it is essential to first of all seek information on the specific requirements of each and every species if you see it in the aquarium trade and are filled with the desire to keep it. Juveniles are ideally suited for acclimatizing. After the pelagic phase among the plankton that all species go through in the course of their larval development, at a length of 2-4 cm (depending on the species) they switch to life near the bottom. Many species do this in mangrove regions rather than on

the reef. During this phase of their development the young fishes are very adaptable and usually settle into the aquarium readily. Even species regarded as impossible to keep present few or no problems at this age. Unfortunately, however, it is usually fairly large specimens that arrive in the trade. Specimens 6-8 cm in length still settle in quite well, but with larger fishes it varies with the individual. A knowledgeable dealer will show you the fish feeding if you are serious about purchasing.

Good water quality - above all low germ levels - should be provided for all species.

In the past these fishes were usually kept singly, but it is preferable to keep them in pairs or as a group. This involves introducing all individuals at the same time. Pairs should if possible be of different sizes as this will reduce aggression. Two adult males cannot be kept together in the same aquarium. Because butterfly- and angelfishes are very often infested with parasitic worms, you should read up on this and treat them if necessary.

*Centropyge potteri*, Potter's Angelfish.

All photos: Frank Schäfer



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## Red List

# Not extinct: *Trigonostigma somphongsi*

by Frank Schäfer

Somphongs' Rasbora (*Trigonostigma somphongsi*, formerly *Rasbora somphongsi*) was described in 1958 by Hermann Meinken on the basis of specimens collected at the end of 1957 and imported from Thailand for the ornamental-fish trade. It appears to have been imported simultaneously by J. van Hengel (Aquarium Westhandel, Amsterdam) and A. Werner in Munich. Both importers sent specimens to Meinken with a request for identification. Even then the precise collecting location was unclear, and this is reflected in the very imprecise details given for the type locality (in the actual original description in DATZ there are no details given at all, in the somewhat later, more precise scientific description in *Opuscula Zoologica* it says "südliches Menam (Thailand)" (= southern Menam (Thailand))).

The technically valid original description is the first work (March 1958) published in DATZ, even though Meinken didn't intend it that way; in the past scientists fairly frequently published an "interim paper" (or similar) somewhere or other and the proper scientific description followed later. For this reason original descriptions that are technically valid from a nomenclatural viewpoint are often not very informative, and when researching you have to go to the trouble of studying the subsequent "proper" scientific work as well, in order to obtain all the information that the describer provided. In this case Meinken was more concerned with aquarium biology in the article in DATZ, while in *Opuscula Zoologica* he concentrates more on anatomical and phylogenetic characteristics of the new rasbora.

## Extinct!?

For around 20 years the species was considered as good as extinct in the wild. In the entry in the international Red List, the reviewer (C. Vidthayanon, 2013) gives the originally known distribution as the drainage of the Mae Khlong near Ratchaburi in central Thailand, where the species was supposedly no longer found as the result of extensive habitat destruction. The only reason this dwarf rasbora was

classified as critically endangered rather than extinct was the fact that single specimens kept on turning up in mixed collections of ornamental fishes. But it wasn't possible to track down where these fishes originated, and it was known only that they were still out there somewhere or other!

## Conservation breeding

A small group of enthusiastic private aquarists were successful in obtaining a world captive population consisting of only three specimens. These three fishes were rescued from a consignment of *Boraras urophthalmoides* (Least Rasbora) by Uta

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Hanel in 2006 and consisted of one male and two females. This strain still exists to the present day in Germany, England, and Thailand, but because of a sometimes unfavorable sex ratio among the offspring and the difficulty of co-ordinating breeding over the years, Somphongs' rasbora remains on the edge of extinction in the aquarium as well.

## Rediscovered!

But now it has finally proved possible to track down the species in the wild (Petsut et al., 2014). It turns out that this tiny fish occurs in relatively large bodies of water, namely the canals that water the rice paddies. But it can be found there for only a

A ripe female *Trigonostigma somphongsi*.





few months of the year, during the breeding season from July to November. Then the fishes disappear back into deeper water. The new location is in Nakhornnayok Province in central Thailand, in the inundation zone of the Bangpakong drainage.

### Re-imported

Aquarium Glaser has recently been able to import a number of specimens! Obviously collecting for the aquarium hobby will have no influence at all on the wild population. On the contrary, it is only thanks to the interest of aquarists that the species has been rediscovered, and hence it will now be possible to impose targeted conservation measures. It is to be hoped that these won't turn out to be the usual notoriously totally useless restrictions on collecting and maintenance, but that conservation areas will be designated where the fishes can - and indeed should - be collected for the trade, but where the habitat is completely protected from destruction.

### Maintenance in the aquarium

The maintenance of this dainty little (only 2-2.5 cm long) fish in the aquarium is totally without problem. The chemical composition of the water is unimportant for maintenance; soft, slightly acid water is required only for breeding and best avoided for "normal" maintenance and rearing, as like so many other small fishes *Trigonostigma somphongsi* is prone to infection with *Piscinoodinium* if kept permanently in such water.

Like its close relatives in the Harlequin Rasbora group (*Trigonostigma heteromorpha*, *T. hengeli*, and *T. espei*), Somphongs' rasbora spawns on the underside of the foliage of broad-leaved plants. These fishes prefer to live in a group, but individual pairs separate off to breed, with the male defending a spawning territory for a short time. A so-called V-tank is eminently suitable for breeding, where you can breed extensively and remove the fry fairly regularly. But a classic breeding set-up for pairs is also possible. However these little fishes apparently have spawning periods and don't breed year-round, including in the



During courtship males of *Trigonostigma somphongsi* develop a bright copper-red caudal peduncle.

aquarium. So in order to avoid the risk of *Piscinoodinium* the fishes should initially be kept in medium-hard, neutral water, which is changed for soft, slightly acid water (or the fishes moved to a breeding tank) only when you see courtship display and the female's genital papilla becomes visible. There is a particularly good breeding report by Meulengracht-Madsen (1966).

### A sigh of relief...

*Trigonostigma somphongsi* is a valuable addition to the list of species that often owe their discovery to the aquarium hobby and the ornamental-fish trade, and, once their existence is known, can eventually (hopefully) still be saved from extinction. Let us hope that as many aquarists as possible will now ask for this species so that it may perhaps even be worthwhile to breed this dainty little fish commercially. That would be a further, very important step for species conservation.

## Lexicon

### Trigonostigma somphongsi

**Trigonostigma:** means "triangle spot".  
**somphongsi:** named in honor of the collector and exporter Somphongs Lekaree.

**Rasbora:** derived from the Bengali name for one of the species.

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A small group of this rare dwarf.

### Literatur:

Meinken, H. (1958): *Rasbora somphongsi*, eine neue Zwergrasbora. XXIX. Mitteilungen der Fischbestimmungsstelle des VDA. Die Aquarien- und Terrarienzeitschrift 11 (3): 67-69  
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# A nursery in mother's mouth

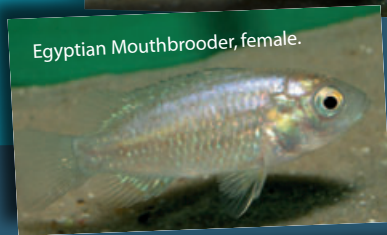
There are fishes that incubate their eggs in their mouths. Such fishes are called mouthbrooders. This technique has been invented several times independently in the wild, which means that the different species of mouthbrooder aren't necessarily related to one another. There are mouthbrooders among the catfishes, the cardinalfishes, the labyrinthfishes, and the cichlids.

In the days before the aquarium was invented people were unaware of the existence of mouthbrooding. It was only when we learned how to keep and breed fishes in the aquarium that this behavior was discovered.

Egyptian Mouthbrooder, male.



Egyptian Mouthbrooder, female.



The Egyptian Mouthbrooder's cousin, *Pseudocrenilabrus philander*, male



The majority of mouthbrooders are more colorful than the little fish from Egypt, but they also need a lot more space.

## A sensation

Around 110 years ago a Herr Schöller discovered a small fish in Egypt and kept it in an aquarium. To his great astonishment he found that the female picked up the eggs in her mouth after spawning and incubated them there for some 14 days. During this period the female fasted, she wouldn't eat any food, and couldn't be tempted, even by the tastiest delicacies, to spit out the eggs and feed. After 14 days the fry left their mother's mouth for the first time, but they dashed back there for a good week afterwards when danger threatened. Herr Schöller sent a few specimens to Germany, where they aquarist community accepted them with enthusiasm. It subsequently became known simply as "the mouthbrooder".

## Hundreds of species

Nowadays the original simple name would no longer be adequate, as many hundreds of mouthbrooding cichlids are now known to exist. And this group also includes the fish that Herr Schöller discovered. So today Herr Schöller's fish is known as the Egyptian Mouthbrooder (*Pseudocrenilabrus multicolor*). It can still be found in the aquarium (and in Egypt too). The aquarium fishes today are the descendants of those that Herr Schöller sent to Germany more than 100 years ago. The majority of mouthbrooding cichlids live in the Great Lakes of Africa: Lake Tanganyika, Lake Malawi, and Lake Victoria. Lake Victoria alone occupies an area of 68,800 km<sup>2</sup> and was once home to more than 400 species of mouthbrooders. But unfortunately the majority have become extinct due to environmental destruction by humans.

## Freshwater coral fishes

A Lake Malawi mouthbrooder, male.



Another lake in Africa, Lake Malawi, is also home to hundreds of mouthbrooding cichlids. When people were first able to see them alive 60 years ago they were fascinated by their gorgeous coloration. Such splendid colors were previously known only from the gaudy marine fishes of the coral reefs. And so soon they were christened "freshwater coral fishes". All these species can very readily be kept and bred in the aquarium, but they need a lot of space compared to Herr Schöller's Egyptian Mouthbrooder, which can be kept and bred in aquaria as small as 40 cm long. And many of them don't take their fry back into their mouths once they have been released. So if you want to see the wonderful behavior of the mouthbrooding mother then it is better to start with Herr Schöller's little species, even if it isn't as colorful.

## i

## Infobox for Parents

## Dear parents,

Please start by reading a good handbook on maintaining an aquarium with your child, before actually acquiring any fishes. The pet trade, book shops, and public libraries all have a wide range of books for beginners. It isn't possible to keep fishes successfully without first finding out the basic requirements of these finned creatures and the correct way to maintain an aquarium (setting up, water changes, etc).

## General hints

Egyptian Mouthbrooders are fundamentally very easy to keep. They have no special requirements regarding water chemistry. They will tolerate any mains water and water temperatures between 16 and 30 °C, with 20-26 °C being ideal. Because of the tough living conditions in their natural habitat, Egyptian Mouthbrooders are very resistant to beginner's mistakes and polluted water. But even so you should take the trouble to teach your child to look after the aquarium on a regular basis (the most important thing is a weekly partial water change, if possible).

## Holidays

Fishes are poikilothermic ("cold-blooded") and require much less energy than us humans. A fast of two to three weeks won't affect them much at all and won't do them any harm. If you are going to be away for two or three weeks then it is always best to let the fishes go hungry, as a neighbor or friend will usually be too generous towards them. Under normal circumstances no fish has ever died of starvation in the aquarium, but millions of them have died because they were given too much food and the water went bad.

## Hazards

Maintaining an aquarium is fundamentally not dangerous. But make sure your child is aware that the combination of water and electric current requires great care. Generally speaking there is only one disease that can be communicated from fishes to humans, a tuberculosis of the skin that manifests as difficult-to-heal wounds. But such infections are extremely rare and more often contracted via visits to swimming baths than from aquarium fishes.



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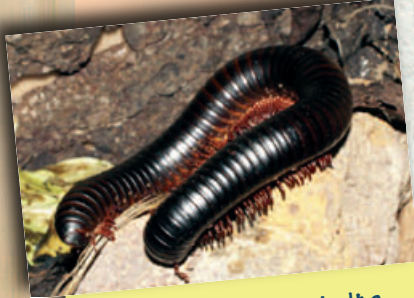
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## Climb aboard the Mombasa Train

Do you know Mombasa? No? Mombasa is a large seaport in Kenya. Kenya lies in Africa. Mombasa is the largest seaport in East Africa. But the Mombasa Train doesn't travel to Mombasa at all, but is a huge millipede (*Archispirostreptus gigas*), the largest species in the world! This giant millipede grows to more than 30 cm long, i.e. shoe size 47! It is no longer known who jokingly christened it the Mombasa Train, but if you ever go to Africa then everyone will know what it means.



The Mombasa Train isn't a railway train but the largest millipede in the world.

### A thousand feet?

Millipede means "thousand feet", but that is an exaggeration. The Mombasa Train has 60-70 body segments (ring-like sections of the body) and there are four legs on each segment, which means at most 280 legs. There are no millipedes with 1,000 legs, the highest number is 750 legs in a different species to the Mombasa Train.



Mombasa Trains mating.  
Breeding is easy.

### Poisonous and cool

Millipedes are found all over the world, including in Europe and America. The larger species look very cool and they are easy to keep and breed in the terrarium. They need a damp (not wet!) terrarium and eat fruit, vegetables, greens, flake food for ornamental fishes, and so forth.... They play an important role in the wild, as they eat dead leaves, bark, pine needles, etc, reducing them to humus. All millipedes are poisonous. The poison irritates the skin, so always wear rubber gloves when handling. You won't die, at least nobody has ever been reported as doing so. The poison acts as protection against being eaten. Hence hardly anything eats millipedes.



Other millipedes are a lot smaller, but colorful nonetheless. This one is called *Pelmatojulus ligulatus*, comes from Africa, and grows to 12 cm long.

### Millipedes in the terrarium

The Mombasa Train and a number of other large species can be purchased in the pet trade. It is best to buy several specimens (maybe four or five) at the same time. Then you will almost certainly have both males and females and can hope for young ones. The substrate should be humus, around 15 cm deep. Millipedes need to molt in order to grow and bury themselves to do so. No extra lighting or heating is needed for the millipede terrarium as long as it is sited in a warm room.







## i Infobox for Parents

Dear parents,

The maintenance of a terrarium is not for small children. Your child should be at least 12 years old so that he or she can look after the livestock properly. It is essential to read a good handbook on terrarium care with your child before acquiring a terrarium. Terrarium animals cannot be kept correctly by guesswork alone, you must learn how to treat them correctly as anything else would be cruelty to animals.

### Setting up the terrarium

For the Mombasa Train - the largest species - you will need a terrarium measuring 80 x 40 x 40 cm (for 3-5 individuals), while the terrarium can be correspondingly smaller for smaller species. The terrarium should be decorated with decaying branches and pieces of wood from

Millipedes are active both by day and at night, but won't tolerate strong sunlight. They require temperatures between 22 and 29 °C in order to thrive, and a humidity between 60 and 90%. If the terrarium is sited in a well-lit (but not sunny) place in a heated room and sprayed morning and evening with hand-warm water, then no equipment will be required: no lighting, no heating, not even a drinking-water container.

### Regular maintenance

A terrarium of this type doesn't require much maintenance. It should be sprayed every morning and evening with lukewarm water from a plant spray. Uneaten food should be removed regularly to avoid a plague of flies. There is no need to worry about the terrarium when you go on holiday, the animals can survive 2-3 weeks without additional food without problem. The substrate shouldn't be allowed to dry out completely but that won't happen that quickly.

### Special notes

Millipedes are venomous and release an irritant poison when they feel threatened. Hence they shouldn't be handled unnecessarily.



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## Freshwater fishes

# Peacock Gobies - gorgeous and full of character

by Birgit Bautz-Schäfer

New Guinea is one of the still relatively little explored regions of the Earth. Its freshwater fishes were late to find their way into the aquarium. They include the Peacock Goby, *Tateurndina ocellicauda*.



Male Peacock Gobies have a huge hump on the head.

This little species, which never grows longer than 5-6 cm, was first discovered in 1953. In the course of the fourth Archbold Expedition Hobart M. Van Deusen collected the first specimens in pool-like sections of Peria Creek, Kwagira River, around 10 miles from the coast. In 1955 John T. Nichols of the American Museum of Natural History described this goby in *Tateurndina*, a new genus specially erected for it, as *T. ocellicauda*. It remains the only species in the genus to the present day. The very unusual name *Tateurndina* is made up from the words "Tate" and "urndina". Nichols intended "Tate" to honor the brothers Geoffrey M. Tate and George H. H. Tate, who had made major contributions to our knowledge of the fauna of New Guinea. He doesn't

explain "urndina", but he does compare the new little fish with *Mogurnda*, the

spotted gobies, and says he had wondered if *Tateurndina* might not be simply a kind of larval stage of a spotted goby, but then rejected this idea again. It is thus highly probable that "urndina" is intended as a diminutive of *Mogurnda*. The name *Mogurnda* is, by the way, derived from the popular name for the species *Mogurnda mogurnda* in Port Essington in Australia.



### Kind of colorful

The Peacock Goby is quite extraordinarily colorful for a freshwater goby, and it has an extremely unusual way of life. Most gobies are bottom-dwelling fishes but the Peacock Goby swims in the open water. Nichols was totally unaware of its colorfulness when he described the new species. His specimens, preserved in alcohol, were merely brownish, and lighter on the belly. The only striking color character they exhibited was the large, sometimes light-ringed spot on the caudal peduncle, which also served as the inspiration for the specific name: *ocellicauda* means "with an ocellus on the tail". This eye-spot isn't anything like as

Peacock Gobies aren't bottom-dwellers but swim in the open water.





noticeable in live fishes, however. On the other hand the splendid red vertical stripes on a blue background on the flanks, and the red-spotted fins, bordered with bright yellow, are really eye-catching and make the Peacock Goby one of the most beautiful aquarium fishes from Papua.

#### The head has it !

The sexes can be distinguished in the Peacock Goby quite early on: males have a shallower belly than females. With increasing age the males develop an increasingly humped head, until eventually, when adult, they look almost grotesque. The head is ultimately reminiscent of the dolphinfishes (*Coryphaena*). No particular purpose is known for this head shape. There are, however, humped heads in all sorts of other fish species, above all in cichlids, but also in labyrinthfishes. It is probably purely ornamental like the splendid trailing tail of the male peacock, and serves primarily to attract females and scare other males away.

#### Easy to keep

The Peacock Goby was a latecomer to the aquarium hobby, not known until the 1980s. But it took the hearts of hobbyists by storm, as it combines numerous positive characteristics: it is always in view and very colorful; it is completely undemanding as regards water chemistry and feeding; it is peaceful (at least most of the time); and it is easy to breed. And the last of these again makes it an unusual goby. The vast majority of goby species arrive in the world in a very under-developed state. When the larvae hatch they are hardly developed at all, and have to go where the ocean currents take them and grow on among the plankton. This is the case even with the majority of freshwater species. They may spawn in fresh water, but the larvae are washed down to the sea by the current of rivers and streams. In *Tateurndina* things are quite different: the larvae hatch from the comparatively enormous eggs after 10 days, and although they swim free in the

water and look like nothing more than splinters of glass, they can already swim well enough to remain in the vicinity of their birth-place, where they grow on to adulthood.

#### Easy to breed

The Peacock Goby can be termed a genuine beginner's fish when it comes to breeding. Only a few species make things so easy for the aquarist. When the female is well-rounded, and ideally the genital papillae are protruding slightly in both male and female, then that is the right time to transfer the pair to a breeding tank. A 5-liter tank will be quite adequate. No decor is required apart from a few unrooted plants (Hornwort, Elodea, a handful of thread algae, etc) and a small cave resembling a dolmen (a stone-age grave) made from two walnut-sized pebbles with a capstone consisting of a flat stone. The pair will soon lay here. The water temperature should be 26-28 °C. The female should be netted out after spawning, as she doesn't bother caring for the eggs. That is the task of the male, who guards the eggs until the larvae hatch and fans fresh water over them. After the larvae hatch, however, the male ceases brood care and can then be returned to



Young male.



Young female.

the community tank. The young can be reared without problem on microworm (*Panagrellus redivivus*, formerly *Turbatrix silusiae* or *Anguillula silusiae*), *Artemia nauplii*, and even powdered dried food. Even novice fish breeders can manage it.

Ripe pair of Peacock Gobies, female in front.



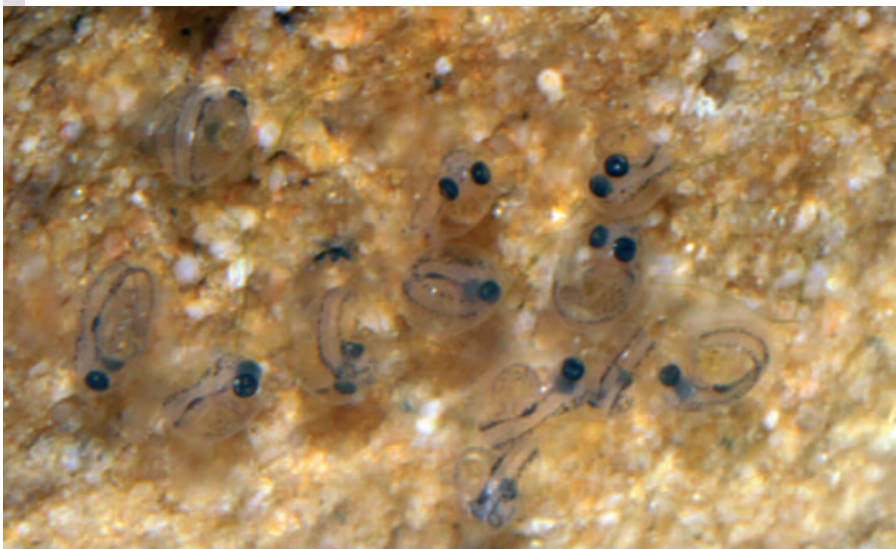


The male guards the spawn alone, the female plays no part in brood care. Hence the female should be removed after spawning. Above: Male with a newly-laid clutch.

Below: The clutch at the age of two days; the larvae with their large yolk sacs are clearly visible in the eggs.



Below: Three-day-old clutch. The larvae appear ready to hatch, but it will be another four days till hatching.



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### In the community tank

Essentially the Peacock Goby is exceptionally suitable for the community aquarium. It doesn't matter how many specimens or of which sex you have in the tank, they are always very peaceful among themselves, although they often can't resist nibbling the fins of some heterospecific species with long fin extensions. For this reason *Iriatherina wernerii* (Threadfin Rainbowfish), which is such a good fit geographically and in terms of size, shouldn't be kept with Peacock Gobies. On the other hand rainbowfishes of the genus *Melanotaenia*, barbs, tetras, lamp-eyes, catfishes, dwarf cichlids, and/or loaches are all good tankmates. *Tateurndina* can be fed on dried food, frozen food, and live food, and will eat anything apart from plants, which are of no interest as food. But in the final analysis no aquarist is going to object to that.....

Newly-hatched larva.





## New freshwater imports

# From all over the world: Recent imports

by Roman Neunkirchen

Given the huge number of fish species in existence - some 32,700 species are currently known to science, half of them from fresh water - the number kept in the aquarium at least now and then is very small. In fact only around 400 species of freshwater fishes are permanently available in the trade. So it isn't surprising that new species are constantly being discovered. Some recent new imports by Aquarium Glaser are briefly portrayed on the following pages.



Male of the newly-imported *Fluviphylax* species.

### Dwarf lamp-eyes from Venezuela

The miniature lamp-eyes of the genus *Fluviphylax* grow to only around 1.5 cm long and are also very slender. These

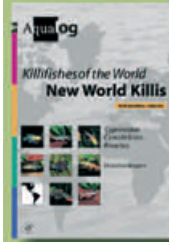
dainty little creatures are sensitive to transportation and hence only very rarely imported. For this reason Aquarium Glaser in Rodgau is very proud to have recently been able to import

Females also have the iridescent dots on the ventral ridge.



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The brilliance of the eyes is remarkable.

specimens of this genus from Venezuela. Moreover it appears that these little fishes belong to a species new to science, as all five of the *Fluviphylax* species known to date have significantly more rays in the anal fin. In addition the iridescent dots on the ventral ridge seen in the new imports have not been mentioned for any *Fluviphylax* species to date. The fishes are most similar to *F. obscurum*.

Apart from their sensitivity to capture and transportation (occasioned mainly by their small body size), miniature lamp-eyes aren't all that especially demanding. Obviously tiny fishes like this should by preference be fed on live *Artemia* nauplii and maintained in a species aquarium.

Let us hope that these tiny fishes will settle in well and perhaps then even breed. The sexes can be distinguished (if you have good eyesight) by the form of the ventral fins, which are prolonged in males, and rounded in females.



Mustang Shrimp, *Paracaridina zijinica*.



### Mustang Shrimps have arrived!

Aquarium Glaser is now able to offer picture-pretty, black-white Mustang Shrimps for the first time. According to the "Guru of dwarf shrimps", Werner Klotz, these dwarf shrimps belong to the species *Paracaridina zijinica*. Their maintenance and breeding is similar to that of the well-known Bee Shrimp and the Crystal Red.

Apropos of which, following intensive study these, probably the longest-serving of all dwarf shrimps in the aquarium, have also now received a scientific name: *Caridina logemanni* Klotz & van Rintelen, 2014, named in honor of the brothers Logemann, well-known shrimp breeders.

In the same work the authors also name the well-known Tiger Shrimp, which is now called *Caridina mariae* Klotz & van

Rintelen, 2014, in honor of Maria Klotz, the wife of Werner Klotz.

Aqualog animalbook is of course rather proud to have been the first to have published a book on the subject, in the form of Uwe Werner's classic "Shrimps, Crayfishes, & Crabs". Back then, in 1998, nobody had the least suspicion that dwarf shrimps would experience such a boom. And back then it was Uwe that first coined the name "dwarf shrimps". Initially scientific names were hardly every available. The Bee Shrimp, from which the Crystal Red was eventually bred, initially looked rather unspectacular. If you examine the three editions of Uwe's book then you can trace the development of dwarf-shrimp breeding very nicely, from the still rather modest beginnings (with photos that today have historic value) right through to the current high level of breeding.

The Crystal Red is, as Uwe Werner has previously presumed, a cultivated form of the Bee Shrimp, and hence is also called *Caridina logemanni*.



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The Tiger Shrimp is now called *Caridina mariae*. The photo shows the red cultivated form; the vertical striped are blue-black in the wild form.



Above: this is what Bee Shrimps looked like originally.....; below:.....and today. The species is now called *Caridina logemanni*.



### Literatur:

Klotz, W. & T. van Rintelen (2014): To "bee" or not to be - on some ornamental shrimp from Guangdong Province, Southern China and Hong Kong SAR, with descriptions of three new species. *Zootaxa* 3889 (2): 151-184



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*Garra cambodgiensis*

### *Pao baileyi* (= *Tetraodon baileyi*)

Aquarium Glaser has managed to import probably the most unusual of all freshwater pufferfishes: *Pao baileyi*. This species is found in the rapids of the Mekong in Thailand, Laos, and Cambodia, and was first discovered in 1985. These fishes attain a maximum length of around 12-15 cm. The strange "beard" exhibited by some individuals is probably only of limited value as a sexual characteristic. There are both beardless specimens that appear to be males by virtue of their other proportions, and slightly bearded individuals that may be females. It is only occasionally that the sexes can be told apart as easily as seen in our photos. The species is generally very variable as regards its coloration and the development of the beard.

This probably relates to the unique method of capturing prey used by *Pao baileyi*. This puffer uses suction to attach its belly to the substrate, thereby imitating a rock. And this explains the function of the beard - the fringe of skin simulates algal growth. If a fish or a shrimp comes by, and tries to investigate the rock for biocover or eat the algae from the "rock", it falls prey to the pufferfish, which thus obtains its food with minimal expenditure of effort. Otherwise a relatively poor swimmer such as a puffer would hardly be

able to survive in rapids.

*Pao baileyi* is very intolerant of conspecifics. These fishes are best kept singly and put together only to attempt breeding. The water chemistry is unimportant as regards hardness and pH, but *P. baileyi* does unconditionally require relatively clean, oxygen-rich water.

*Pao baileyi* isn't difficult when it comes to feeding, either. These fishes very quickly become accustomed to taking mussel flesh, shrimps, worms, etc from forceps.



An obvious male ...



... and an obvious female.



This variant looks similar to *P. suvattii*.



A rather gray specimen.



Dark-colored specimen of *P. baileyi*.

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