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The magazine for aquarists No 96

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TETRAS

A new star in the characin sky - *Moenkhausia cosmops*

by Wolfgang Löll

Characins are an immensely varied group of fishes. They include the tiny, prettily-colored fellows such as the neon tetras, much-dreaded predators such as the piranhas, and every imaginable form in between.

The genus *Moenkhausia* contains characins that have traditionally been among the most popular of aquarium fishes. There can be hardly a pet shop in the world that doesn't stock at the very least the Red-Eye Tetra (*M. sanctaefilomenae*) as a representative of its genus.

A first import!

Aquarium Glaser have now imported small numbers of a very unusual tetra, *Moenkhausia cosmops*, from Brazil for the first time. This species was first scientifically described in 2007. To date it is known only from the upper reaches of the Rio Paraguay and Rio Tapajos basins in the state of Mato Grosso: Rio Juba, Rio Juruena, Rio Papagaio, and their tributaries.

The closest relations of the new species

Its nearest relatives are thought to be the Glass Tetra, *Moenkhausia oligolepis*, and the Red-Eye Tetra, *M. sanctaefilomenae*, both

The "moustache" of the species is very striking.

Moenkhausia cosmops

All Photos: Frank Schäfer

well-known in the aquarium hobby. The other similar species - *M. cotinho*, *M. diktyota*, *M. forestii*, and *M. pyrophthalma* – have to date been unimportant in the hobby. All these species share the common features of a red iris and a caudal-peduncle spot. *M. cosmops* can be distinguished at first glance from the species named above by virtue of its blue-green eyes and the red stripe above the mouth.

No other species looks the same

The unique coloration of this species is slightly reminiscent on the one hand of the gorgeous emperor tetras (*Nematobrycon*), and on the other of the Lipstick Barb (*Barbus erythromycter*) from Asia. But there is no phylogenetic relationship with the species named.

Uncomplicated maintenance

A readily recognizable characteristic: the blue eyes.

The maximum length of *Moenkhausia cosmops* is around 6 cm. These fishes are somewhat timid initially. To date they have proved fairly hardy and peaceful. Like the majority of tetras they are unproblematical when it comes to feeding. Investigation of stomach contents in the wild revealed insects (mainly ants),

plus plant remains and algae. The water temperature should be between 24 and 26 °C; soft, slightly acid water will approximate to the conditions in the wild; the biotope is described as a whitewater biotope with a sandy bottom. The species forms shoals of more than 50 individuals that generally live among dead branches close to the bank vegetation in still-water zones of the rivers.

All in all, *Moenkhausia cosmops* is a very attractive, uncomplicated species, and it is to be hoped it will become widespread in the hobby.

Glossary for the article on *Moenkhausia cosmops*

Moenkhausia: name in honor of W. J. Moenkhaus, a friend of Eigenmann. *oligolepis*: ancient Greek meaning "with few scales". *sanctaefilomenae*: after the type locality of the species (a lagoon near Sa. Filomena on the Parnahyba). *cosmops*: ancient Greek meaning "with a decorated face". cotinho: name in honor of the collector, Major Cotinho, Brazilian attaché to the Thayer Expedition. *diktyota*: ancient Greek meaning "with a reticulated pattern "; *forestii*: name in honor of Fausto Foresti, a geneticist. *pyrophthalma*: ancient Greek, meaning "with fiery eyes". *Nematobrycon*: ancient Greek meaning "*Brycon* with threads", referring to the form of the caudal fin. *Brycon* is another tetra genus. *Barbus*: Latin, meaning "beard". *erythromycter*: ancient Greek meaning "with a red snout".

Suggested common name for *Moenkhausia cosmops*: Lipstick Moenkhausia

Moenkhausia cosmops, female

The founder of the firm, Norbert Zajac, welcomed around 500 guests to participate in the festivities.

35 years of Zoo Zajac – from 65 m2 to 10,065 m2 sales area

On 3.12.2010 Zoo Zajac celebrated 35 years of the company's existence. Founded by Norbert Zajac as a two-man concern with a sales area of 65 m2, in the course of 35 years the business has expanded to 10,065 m2 of sales area, as well as import/export and organization of exhibitions. Zoo Zajac has been so successful that it now employs around 200 staff, and there is no end to its success story in sight.

REPORT

Etroplus canarensis - maintenance and breeding

by Peter Langeland, Denmark

This cichlid differs from the majority of other cichlids of similar size in that it is a shoaling fish. This behavior is very typical for *Etroplus canarensis* and it only rarely that an individual is seen more than about 30 cm away from a conspecific. When I bred *E. canarensis* it became apparent that this behavior is present from the first day of free-swimming onward.

These fishes are very peaceful right from the start; while in the majority of other cichlids juvenile males will seek squabbles with conspecifics, and occupy and defend small territories, such behavior can be completely ruled out in *Etroplus canarensis*.

With the arrival of sexual maturity this changes to some degree. Minor battles and skirmishes are now to be seen more frequently. Because I keep one male and five females, I cannot say how two males would behave towards one another. Males grow to around 12 cm and are somewhat larger than females (10 cm) and more heavily built.

Group of adult *Etroplus canarensis*. Photo: Oliver Lucanus

A very typical feature of *Etroplus canarensis* is that it unconditionally requires vegetable food. Unfortunately that also means that it will eat the majority of aquarium plants. In my aquarium only *Microsorium* and *Echinodorus* are left unmolested. There used to be a good population of Giant Vallisneria, about a meter long, in my 1000-liter aquarium around but they were all eaten in the space of a week. Unlike other cichlids, *E. canarensis* do not dig up plants, but they will eat them down to stumps.

The history of my fishes

I purchased six *Etroplus canarensis* in autumn 2006. At the time they measured around 5 cm long and on that basis were probably hatched in the spring of that year. The first spawning in my aquarium took place in January 2008. On that basis wild-caught fishes must be around two years old before they spawn. However my youngsters spawned for the first time at

This around 2 cm long juvenile exhibits a "Tilapia spot" in the dorsal fin. Photo: Erwin Schraml

the age of only a year.

Aquarium maintenance

For rearing my wild-caught youngsters I used a 300-liter aquarium that forms part of my aquarium system of around 1200 liters. All the water circulates through this system and as a result I achieve very stable water conditions, even in smaller tanks. The 300-liter tank proved to be adequately large as the fishes also spawned for the first time there, but later on I transferred them into the aforementioned 1000-liter tank. I regard good water quality as very important. In my aquarium system the filter volume corresponds to around 10% of the volume of the aquaria. The filter turnover is set to 20 liters/min. A water change of around 25% is undertaken weekly. I use our mains water which has a pH of 7 and a conductivity of 350 µS (corresponding to around 12 °dGH). Thanks to the extensive water changes nitrite and nitrate levels are always very low. The temperature is set at 25-26 °C.

Feeding

I regard this aspect as very important!

INFO-BOX: Indian cichlids

Cichlids (Cichlidae) live mainly in Africa and South America. Only three species, all members of the genus *Etroplus*, are found in India. Their closest relatives live in Madagascar. In addition, it has recently been suggested that they are closely related to the damselfishes (Pomacentridae). *Etroplus maculatus* grows to 6 - 10 cm long and is a popular aquarium fish, while the up to 40 cm long *E. suratensis* is more for specialists.

The blue marks on the head and pectoral-fin base are striking. Photo: Frank Schäfer

Here is the menu:
- live glassworms; daily and year-round except in May;
- frozen bloodworms; twice per week;
- frozen (in summer live as well) Mysis; twice per week;
- live earthworms around 20 mm long; twice per week;
- deep-frozen peas (defrosted for 2 minutes in the microwave before feeding); three times per week;
- live mosquito larvae (in April); twice per week.

My young fishes are fed at least twice daily. In my opinion the key to successful breeding and rearing of this fish lies in the very varied diet. Anyone who feeds just cichlid pellets won't stand a chance. Unfortunately this diet is not only relatively expensive but it also requires regular – summer and winter – visits to ponds, no matter what the weather. The peas must, by the way, be chopped into mouth-sized pieces before feeding. I do this with a kitchen knife.

Breeding

When it comes to reproductive behavior, *Etroplus canarensis* is similar to other open-brooding cichlids, for example *Cleithracara maronii*. But there are also a number of important differences:

- the fishes are not monogamous; the male spawns with several females, as is also known from the checkerboard cichlids (*Dicrossus*).
- the eggs have little "stalks". When the parents fan fresh water across the rock, etc to which the spawn is attached, the eggs can be clearly seen to move.
- the growth of the young is strikingly uniform. While variable growth rates often lead to problems during the rearing of other cichlid youngsters (stronger juveniles out-compete weaker siblings), such difficulties do not occur in *Etroplus canarensis*.

Spawning, which typically follows a water change, is presaged by a striking change of color in both sexes. The vertical stripes are replaced by a dark horizontal zone. In addition vertical stripes appear on the forehead. This change of color is very significant. Immediately before spawning the fishes frequently indulge in quivering of the body, as is also known from discus (*Symphysodon*), for example. Like so many wild-caught fishes, *E. canarensis* spawn only during the rainy season, ie January, February, and March.

When a pair have decided to spawn and found a suitable spawning site (a sheltered spot with a rock), the spawning territory is defended after spawning, although the parents aren't particularly aggressive in this respect. Brood care is similar to that of other open-brooding cichlids, that is the free-swimming brood

The young of *Etroplus canarensis* grow on very uniformly.

are placed in small pits dug in the bottom. Unfortunately a repeated problem has occurred with my fishes at this stage: the parents start to eat the free-swimming fry. Unfortunately I have been unable to stop this and I don't know what is going wrong. Hence I can't say whether *Etroplus canarensis*, like other *Etroplus* species, feed their fry with skin mucus.

However, *E. canarensis* can easily be reared artificially and I have done so as well. Rearing is easy: initially the fry receive *Artemia* nauplii for a few days, then live *Cyclops*. As they increase in size they can be given increasingly larger foods. From a length of 10 mm I give the youngsters chopped peas as well.

One brood that I reared in this way numbered 108 individuals. I didn't suffer a single loss during the rearing process – very unusual!

All in all *Etroplus canarensis* is easy to maintain in the aquarium. The only thing is to bring them into breeding mood. In my opinion optimal water maintenance and a very varied diet are the key to success.

Not least the 2.2 million aquaria in German households have induced the TMS to organize the traditional congress in Friedrichshafen for the third year in succession. The AQUA-FISCH will be celebrating 20 years in existence in 2011. The event will be celebrated with numerous highlights and guests and by thousands of visitors from the three countries of Germany, Austria, and Switzerland.

Save money at www.aqua-fisch-messe.de!
Reduced-cost entry with the money-off coupon applies to the whole weekend.

More than just the aquarium hobby, for large and small

I wish everyone who cares to have a go the best of luck!

LIVEBEARERS

The goodeids – undervalued beauties from the land of the Aztecs

by Günther Schleussner

The Mexican goodeids (Goodeidae) have been well-known in the aquarium hobby for several decades. During the period between 1980 and 1995 in particular, many species reached Europe and the USA via traveling aquarists. But unfortunately they have never become properly established and achieved a wider distribution in the aquarium hobby. A real shame.....

One of the darkest chapters in the history of the discovery of the New World was the brutal destruction of the culture of the Aztecs by the Spanish conquistadores under the leadership of Hernando Cortez in the early 16th century. The members of a small fish family belonging to the toothcarp order, the goodeids (Goodeidae), were dumb witnesses to this blood tragedy in the highlands of what is now Mexico. In the course of their at least nine million years of evolutionary history they have always managed successfully to overcome the hostile living conditions in their native habitat. But now, at the beginning of the 21st century, it appears that they have suddenly and irrevocably lost their battle for survival.

Characodon audax `Guadalupe Aguilera'. Photo: Susanne Schleussner

The true livebearers

The goodeids, known in Mexico as

pintitos or *mexcalpiques*, are highly interesting fishes biologically speaking. With somewhat more than 40 species, the family is fairly insignificant in numerical terms, but its members are found in all possible ecotypes, from goby-like bottom-dwellers through laterally compressed, high-bodied forms adapted for life in vegetated standing waters, to elongate rheophiles.

Some species are Aufwuchs-feeders living primarily on algae, the majority are omnivores, and a very few are predatory. They all share a unique reproductive strategy. Goodeids bring well-developed living young into the world. The anal fin of the male is modified into an inseminatory organ (andropodium) that permits internal fertilization. Unlike the poeciliids, ie Guppy, Platy & Co., the embryos developing in the ovary of the female are nourished via a so-called trophotaenia (= feeding cord), which is discarded shortly after birth. The goodeids thus practice a "higher" form of livebearing than all other bony fishes.

Zoogoneticus tequila Photo: Frank Krönke

Adios pintitos?

As already hinted in the introduction to this article, they have another sad feature in common: almost all goodeids are threatened with extinction in the wild! Climatic changes, the constantly increasing demand for water for agriculture and industry, the discharge of insufficiently treated (if at all) waste

water into streams, rivers, and lakes, the increasing annexation of the few still intact waters for spare-time activities, and the uncontrolled introduction of alien (allochthonous) fish species are just some of the reasons why practically the entire family with its unique biological adaptations stands on the threshhold of extinction. For this reason in May 1998 the `Fish Ark Mexico´ project was brought into being at the University of Michoacán in Morelia on the initiative of the Englishman Ivan Dibble, unfortunately recently deceased. The objective is to build up and retain stable aquarium populations of as many goodeid species as possible. In spring 2009 the first open-air pond was created

Skiffia francesae Photo: Susanne Schleussner

goodeids are generally marked down as drab-colored, wicked rough-housers, and notorious fin-nippers. For this reputation they have to "thank" the species that at least now and then finds its way into dealers' tanks, the Red-Tailed Goodeid, Xenotoca eiseni.

Xenotoca eiseni `San Marcos' Photo: Susanne Schleussner

in order to in future be able to maintain and breed these fishes under the most natural conditions possible. There are also plans to establish conservation zones in the natural distribution regions. The `Fish Ark´ project is largely financed by donations from zoos and public aquaria, but also by enthusiast organizations from all over the world.

Goodeids – no thanks!

When the conversation among aquarists turns to goodeids, the majority immediately give a thumbs down. Even among dedicated livebearer fans the

It is true that mixing goodeids with other types of fishes requires careful consideration, a "feel" for the aquarium hobby, and regular observation. But Angelfishes may eat Cardinal Tetras if you aren't careful, yet nobody ever decided on that basis that they were generally unsuitable for community tanks!

Fresh air outside in summer

The equally frequently bemoaned lack of color in the goodeids is attributable to serious errors in maintenance. These fishes impose no special demands as regards water chemistry: moderately

hard, neutral to slightly alkaline water, such as comes out of the tap in many places, is quite OK. But they are greedy feeders that need significantly more food for healthy development than do fishes of similar size from other families. And then, of course, there is the most important point: goodeids are not tropical fishes that can be kept year-round at the same high temperature! Their habitats lie in subtropical zones at an altitude of up to 2000 meters above sea level and are characterized by marked daily and seasonal temperature fluctuations as well as intense UV radiation. They thus unequivocally

Moribund residual water at Los Pinos on the upper Rio Canatlán, until a few years ago the habitat of a *Characodon* population
Photo: Gunter Teichmann

Outdoor facility of the Fish Ark project at the University of Michoacán in Morelia.
Photo: Gunter Teichmann

belong in an unheated tank sited in a room that isn't heated too strongly. In the warm part of the year, say from around the beginning of May to the end of September, the method of choice is outdoor maintenance in planted containers or even the garden pond. After a four to five month stay in the open air, even during an average central European summer, the fishes will of their own accord exhibit a brilliance and intensity of color such as can never be achieved in the aquarium. The photos of various goodeid males accompanying this article are proof that under such conditions these purportedly drab fishes can hold their own with the most colorful species in the standard aquarium-hobby repertoire.

Aquarium facility in the Fish Ark.
Photo: Gunter Teichmann

At irregular intervals Aquarium Glaser is able to offer small quantities of various species of goodeids captive-bred by the few people keeping and breeding them in Germany – a rare opportunity to leave the well-trodden paths of the aquarium hobby and get to know this fascinating, often undervalued group of livebearers more closely.

Girardinichthys viviparus

Ameca splendens Photos: Susanne Schleussner

CRITTERS

Erythrinus erythrinus - the Red Wolf Fish

by John Dawes

It looks nothing like a cardinal tetra or any of its numerous colourful, small, shoaling relatives, but *Erythrinus erythrinus* is, nonetheless, a characiform, i.e. member of the order characiformes, just like them.

Besides not looking like a typical aquarium characin, this species is also unusual – along with the other 15 members of its family, the Erythrinidae, known widely as the trahiras – in lacking the characteristic adipose fin borne by the vast majority of its cousins.

But, to me, perhaps the most striking feature is not morphological. Rather, it's the extreme slipperiness of these medium-sized predators. I remember vividly collecting a close relative of *E. erythrinus* – the aimara or jejú (*Hoplerythrinus unitaeniatus*) – in a backwater or the Rio Negro, and not being able to hold on to it for any length of time. This was not only because of the impressive power packed into the muscles of the creature, but because of the extremely slippery nature of its thick covering of body mucus. Indeed, I immediately nicknamed the specimen, the 'soap fish'!

This small family of trahiras is divided, at least, at the moment, into just three genera: *Erythrinus* (two species), *Hoplerythrinus* (three species) and *Hoplias* (11 species). Of these, perhaps the

Erythrinus sp. "Peru" is very attractively colored. Photos: Frank Schäfer

best-known within the aquarium hobby is *Hoplias malabaricus*, the tiger characin, trahira or tigerfish, despite the fact that *E. erythrinus* has been around since 1910.

A little confusingly, *E. erythrinus* is, like *Hoplerythrinus*, often referred in Portuguese as jejú, an indication of their biological proximity. However, within the aquarium hobby, *Erythrinus* is generally known as the red or rainbow wolf fish…and with good reason.

Like its canine counterpart, *E. erythrinus* has a large mouth and the fearsome dentition typical of a predator that feeds on other animals. In the wild, the diet consists largely of insects, crustaceans and other fish, which it hunts in the tributaries, swamps, backwaters, pools, forest lakes and other, generally slow-flowing habitats of its native waters in Central and South America (Amazon and Orinoco River basins and coastal regions of the Guianas). The red wolf fish is often found (as was the case with the *H. unitaeniatus* I referred to above) in very shallow water, either lying on the bottom or hiding among surface vegetation, from where it can launch lightning-fast attacks on unsuspecting prey.

The maximum length for the species given by FishBase is 20cm SL (i.e. Standard Length, which extends from the snout to the base of the tail…not the tip). Most specimens imported are, however, smaller than this and are, presumably, juveniles or recently-matured adults.

The sexes can be easily told apart, since males have considerably larger pelvic (ventral) fins than females. They also tend to have a larger dorsal fin, but this may vary, making this feature a more unreliable one.

As the common names imply, the red or rainbow wolf fish can be quite colourful. In *Erythrinus* sp. 'Peru', the dorsal and caudal fins bear quite a bit of orange-red coloration. The body may also carry bold similarly-coloured splashes arranged in two roughly parallel bands running lengthwise above and below (and overlapping) the characteristic dark brownish band that extends from behind the eye to the caudal peduncle.

This fish is currently thought to be *Erythrinus erythrinus*. Photo: Migge /Aqualog-Archiv

It is this colourful appearance that has made this fish so attractive to aquarists who can provide for its needs. Now, such aquarists have a new wolf fish to consider. Little is known about this newcomer, which carries a broad orange stripe covering the whole of the posterior part of the belly. Some of this coloration extends into the pelvics and the anal fin, as well as the posterior base of the pectorals. However, there are none of the 'roughly parallel splashes' mentioned above. Neither does it bear the bright caudal and dorsal fin edges characteristic of *E.* sp. 'Peru'.

It is possible (but not certain) that the new wolf fish is the adult form of the previously imported, but unspectacular, *Erythrinus* sp. 'Madre de Diós' (Madre de Diós is a region of south eastern Peru bordering Brazil and Bolivia). It is also possible, of course, that we are dealing with a new species of wolf fish. Could it be that the new wolf fish is the real *E. erythrinus*, with the one we've traditionally regarded as such, being another species? After all, we know that wolf fish are widely distributed (see above) and, as often happens with such species, there are gaps in our knowledge regarding the variation that exists in the wild. This lack is not helped by the fact that imports of *Erythrinus erythrinus* are almost exclusively from Peru, so it could be that we currently have an inaccurate overall picture of the species.

In fact, studies carried out by Bertollo et al in 2004 (see reference below), demonstrated that there are chromosomal differences between *E. erythrinus* specimens from different localities. They found, for example, that females from some localities had 54 chromosomes and males 53, while, in fish from other localities, females had 52 chromosomes and males 51. There were also differences in the types of chromosomes possessed by fish from different populations, leading the researchers to conclude that "this species may represent a species complex."

In terms of aquarium care, wolf fish require spacious accommodation, preferably containing at least 100 litres. There should be abundant floating vegetation and some clumps of robust submerged plants, plus a number of shelters and open spaces. The tank should have a well-fitting cover. With regard to water chemistry, wolf fish are quite hardy and can easily cope with a pH range between 5.5 and 7.5 (the range reported from the wild is 5.6-7.8). Water hardness can go up to 30 dH and the temperature between 22-26oC. The diet must consist of meat-based items such as earthworms, shrimps, etc., or one or other of the excellent animal-based commercial formulations (as long as the individual components are not too small).

Erythrinus sp. "Orange Belly"

Owing to the predatory instincts of all erythrinids, they should only be kept with robust equally-sized tankmates, including catfish…but not other wolf fish. This is likely to result in battles for dominance…usually with serious consequences for one party or the other, or both. As yet, there are no reports of successful aquarium spawnings…so this challenge is still open.

Reference

L.A.C. Bertollo, C. Oliveira, W.F. Molina, V.P. Margarido, M.S. Fontes, M.C. Pastori, J. das N. Falcão and A.S. Fenocchio, Chromosome evolution in the erythrinid fish, *Erythrinus erythrinus* (Teleostei: Characifomres). Heredity (2004) 93, 228-233.

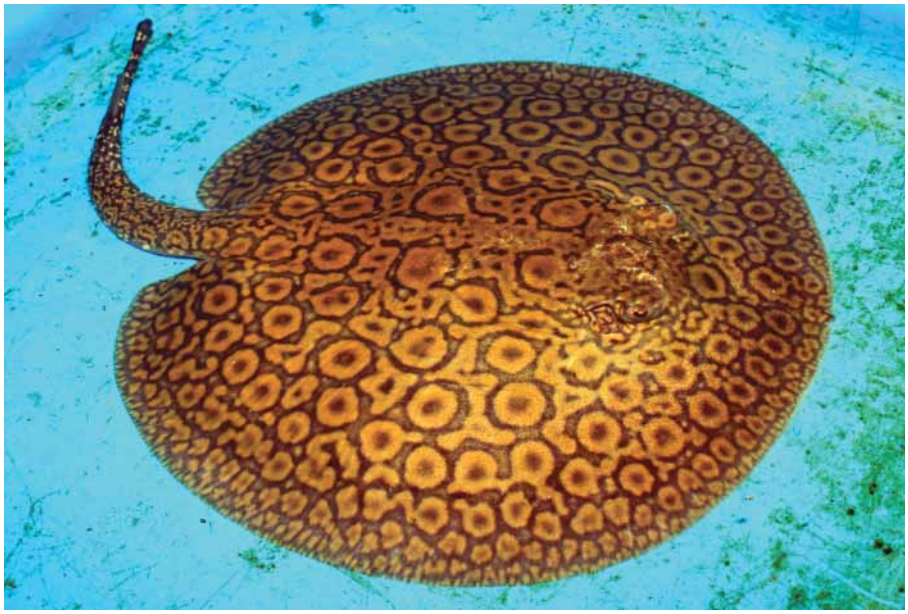
Erythrinus sp. "Madre de Dios"

STINGRAYS

A new freshwater ray from Peru
Potamotrygon sp. Mozaico

by Frank Schäfer

Aquarium Glaser received a wonderful surprise from Peru in the first week of the new year: two rays such as had never been seen there before! The two males exhibit a unique coloration that clearly distinguishes them from all other freshwater stingray species known to date.



Potamotrygon sp."Mozaico" All Photos: Frank Schäfer

The two rays imported by Aquarium Glaser were caught in the Rio Ucayali. The Ucayali is a large southern tributary of the Amazon (known there are the Marañón) around 2700 km long (including parts in its upper course that sometimes go under different names); the Ucayali is thus not only the largest Peruvian Amazon tributary, but is today regarded as the most important headwater of the Amazon itself, comparable to the Marañón. The Ucayali is correspondingly significant and well explored. Over the course of the centuries it has borne various names - San Miguel, Cocama, and Rio de Cuzco are the best known.

But despite the fact that numerous expeditions have explored the Ucayali, it is not only possible, but even relatively probable, that many species as yet unknown to science live in the Ucayali. Moreover the freshwater rays are among the fish species that have been exceptionally poorly studied by science. And they also present scientists with particularly difficult problems.

Pacific origins

The consensus is that the freshwater stingrays in all probability originate from the Pacific. At any rate their closest relatives, the stingrays of the family Urolophidae, live there today, as demonstrated by DNA studies and morphological comparisons. Unfortunately there are hardly any usable fossils as rays are well-known to be cartilaginous fishes, and thus possess no bones. The only structures that survive as fossils are the teeth. These are in fact species-specific in form, but vary

depending on age and sex, in some species at least.

The course of the Amazon reversed only 10-15 million years ago. This happened as a result of the uplifting of the Andes, the chain of mountains along the west coast of South America, which originated because after the fragmentation of the primeval continent of Gondwana (consisting of South America, Africa, India, Australia, and Antarctica) the South American continental plate was subducted by the Pacific plate. The result of this uplifting was that for a long time the Amazon was dammed up in the central part of South America, creating a huge freshwater inland sea that was home to the ancestors of the *Potamotrygon* species that exist today. It is only since around five million years ago that the Amazon has drained into the Atlantic as it does today.

Hybridization as a driving force for speciation

parent species and introduce new genetic material into their gene pool. This method is also well known from animal breeding in captivity. A very large number of our cultivated forms of platies and swordtails, for example, came into being in this way, with characteristics seen in only one of the parent species being introduced into the other via hybridization and subsequent back-crossing.

There have not been very many genetic studies of freshwater stingrays (as there have been only very few scientific studies of them at all), but the genetic information that we do have on these fishes indicates very clearly that natural hybridization between them occurs very frequently.

When the ancestors of the current species found themselves trapped in the vast "Amazon Sea", this undoubtedly resulted in an enormous amount of such hybridization.

Potamotrygon sp. "Mozaico", the second specimen imported to date.

Evolutionary biologists are becoming increasingly of the view that new species of animals evolve less frequently than previously thought through spontaneous random alterations in the genome (the technical term is mutation), and instead arise through the crossing of different species. It is true that the results of such crosses, so-called hybrids, are usually limited in their fertility, but it appears that some specimens are sufficiently fertile to back-cross with the

Difficult to tell apart

Unfortunately the majority of freshwater stingray species differ only slightly from one another, except in their coloration. If only morphological characters were to be taken into account then the number of species would be fairly small. But that very obviously doesn't accord with the situation in the wild, as the stingray species differ considerably in their coloration. However, here too the *Potamotrygon* species again present problems, as their coloration is not only species-specific, but also varies enormously from individual to individual. You thus need to have seen a whole lot of wild-caught individuals in order to be able to judge fairly accurately the difference between species-

specific coloration and individual variation.

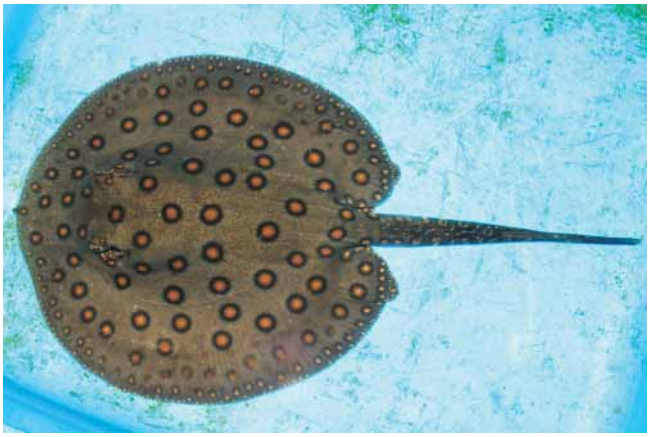
Rays grow large!

Almost all *Potamotrygon* species grow large, attaining a body diameter of 40 cm or more, and our two *P.* sp. "Mozaico" males are still "children" at 15-20 cm in diameter, as confirmed by their still very small copulatory organs.

Their size results in numerous problems when it comes to research. The facilities are not usually available to preserve a statistically significant number of adult specimens in the field. As a result the descriptions of many species are based on just one specimen! In addition these are often more than 150 years old and time has left its mark on them. In many cases it is not only difficult, but at present even impossible, to determine the species correctly, as important specific characters are no longer recognizable in the type specimens.

Unfortunately the size of these fishes also means that only a few aquarists have sufficiently spacious facilities to maintain and breed them and thus answer many of the open questions they pose as aquarists have done with numerous other fish groups that are difficult for scientists to study.

In the case of rays these questions are:
- To what extent are the sometimes clear differences in coloration seen in widespread species (such as *P. motoro*) genetically fixed such that they can be used for the description of new species?
- What do juveniles look like and how does the patterning alter in the course of the individual's life?
- Which of the observed differences in dentition are species-specific, which depend on diet, and which are sex-specific?
-Unfortunately the scientific study of freshwater rays cannot advance further in the absence of satisfactory answers to these questions. It is thus to be hoped that as many aquarists as possible will devote themselves to these splendid fishes, assuming they have the necessary facilities. At the same time it is important to work with wild-caught individuals of the same provenance, as large numbers of rays are being bred in South-East Asia (primarily for the Asian market). Such fishes may make nice pets, but are useless for answering the questions posed above.



Potamotrygon motoro, "Variante" from Peru.

MARINES

The Koran Angelfish -

Pomacanthus semicirculatus Cuvier, 1831

by Joachim Frische

This species owes its name to the pattern on the caudal fin during the transition from juvenile to adult. At this time the pattern of blue lines resembles Arabic script from the Koran.

Half-grown specimen with the typical caudal-fin pattern. Photos: Frank Schäfer

This robust species, which is widespread and common in the western Indo-Pacific, has become a mainstay of the marine hobby and is regularly imported as juveniles.

As in all *Pomacanthus* species from the Indo-Pacific, the juvenile coloration consists of a blue body color with white stripes. While the juvenile coloration of *P. imperator* is unique, young specimens of *P. semicirculatus* are easily confused with other species of the genus. Hence it is advisable to take along a suitable identification guide when making a purchase.

At a size of around 12 cm the attractive juvenile coloration changes to a rather plain adult coloration. With an ultimate length of more than 30 cm the species requires a large aquarium.

This large angelfish feeds exceptionally readily in the aquarium and will take any artificial food. It will also often regard the resident corals as snacks, so maintenance with corals should be the subject of careful consideration. The species is regarded as not very susceptible to disease and hence is listed in the hobby literature as one of the angelfishes that are recommended for beginners.

The Koran Angelfish should be kept with robust fishes, as the peaceful temperament of the juvenile stage can

change to rather "assertive" behavior with age. On the basis of numerous underwater observations, the species lives solitary by preference. Pairs are occasionally seen. It is unclear whether this has led to the suggestion that the social behavior of this species involves a sort of harem where the male harbors several females in his territory, with each occupying her own sub-territory that is defended vehemently against other females.

There is no sexual dichromatism, and only the length of the opercular spine offers an indication of sex. Although this has not yet been specifically documented for *Pomacanthus semicirculatus*, it is known from other members of the genus that the opercular spines in males are noticeably

longer than those of females – a character that can also be seen in juveniles. This criterion should be utilized by anyone who has the pick of several juveniles of this species at the dealer's and wishes to select a pair.

Another method of obtaining a pair is to maintain a juvenile and an adult together. Nature has given the two life stages such different body coloration so that juveniles can live without problem in the territory of adults. A feature that can usefully be exploited in the aquarium.

Maintenance in pairs is possible, but the fishes don't much like one another.

It isn't, however, possible to predict what will happen to the harmony between the two color stages when the transition to adult coloration begins. It has been speculated that sex is determined permanently only at the beginning of the change to adult coloration and that juveniles can in fact undergo a change of sex. An interesting hypothesis that it may be possible to validate via observations by aquarists.

Adult *Pomacanthus semicircularis.*

Info box

According to Klausewitz a specimen of the Koran Angel was once seen in a fish market in Zanzibar, on one side of whose caudal fin the words "Laillaha Illatah" (there is no God but Allah) appeared to be visible, and on the other "Skani Allah" (a warning from Allah). The value of the fish immediately rocketed from the equivalent of a few cents to 5000 Rupees... and ever since the species has been known as the Koran Angelfish!

Juvenile Koran Angelfish

DECORATION

Dead wood brings life into the aquarium!

by Henrik Weitkamp

The addition of wood adds a very special charm to an aquarium. But in addition to its purely decorative aspect, wood also supplies numerous fishes with a dietary supplement, creates natural hiding-places, provides a large surface area for water-purifying micro-organisms to colonize, and sometimes releases the humic substances valuable to many freshwater fish species into the water. Moreover it gives structure to the habitat, offers retreats for subordinate individuals, creates territorial boundaries, and provides spawning sites. In short, it makes an important contribution to the stabilization of the entire biological system in the aquarium.

Mopani, a very durable, bicolored wood

In this respect Nature is our template, as dead wood is of considerable practical importance for fishes in the wild. Thus aggregations of wood are often actively introduced into rivers as part of the process of restoring these waters to their natural state. These areas of dead wood act rather like an artificial reef on an area of open sand in the sea and are extensively frequented by fishes. The twigs and branches form a retreat for numerous species, and above all protection from predators such as birds and piscivorous fishes. This demonstrably leads to more rapid re-colonization of formerly barren rivers as well as an increased number of species.

Aquarium decorated with mangrove roots. Photo: Frank Schäfer

What wood is suitable?

The only suitable wood for the aquarium is that which is well-weathered, as well as being very hard and/or preserved through years of immersion in water or lying buried in acid bogs. But the provenance and type of wood also play a role in its suitability for the aquarium, and it is essential not to experiment when creating a habitat for fishes and invertebrates. Depending on the type and condition of wood collected in the wild, there may be problems with undesirable and oxygen-consuming processes of decay. Even if these processes are detected at an early stage, it is annoying if the recently created aquarium landscape has to be disturbed by the removal of pieces of wood or the entire aquarium has to be set up again from scratch.

Preparation of the wood

For this reason it is best to resort to safe, problem-free wood suitable for the aquarium hobby and available in the trade. Prior to use it should be scrubbed and soaked in warm water in order to remove any dirt accumulated during transportation and storage. But the use of boiling water should be avoided, as in the case of softer woods this may lead to the disintegration of the outer layers when it is first placed in the aquarium and can also encourage fungal attack. One reason for soaking wood is so that it becomes waterlogged and doesn't float in the aquarium. In the case of very heavy woods such as savanna or mopani wood it is sufficient to soak in a bucket for a day, while so-called mangrove roots, for example, require a week or longer before they will sink. But the process can be cut short after around a week if the decor

combines wood and rocks in the aquarium and the latter are used to weigh down the wood.

Why soak?

Another reason for soaking is to reduce the leaching of natural pigments into the water, as the tannins they contain can lower the pH. On the other hand, the leaching of these substances is precisely the reason why wood is so valuable for many softwater fishes, as the humic substances it contains represent an element in their natural environment. When the wood is removed from soaking the various sorts can be graded by virtue of the degree of staining. While mangrove roots are one of the types that color the water, savanna wood not only sinks immediately but stains the water very little and doesn't acidify it at all. On the other hand, the latter is no use as a food supplement – a welcome side-benefit of many other types of wood. The L-number catfishes, for example, include numerous wood-eaters, and they should be provided with softer wood such as mangrove or jati.

Wood as a decor item

All wood has the common feature of being a natural decor element. Thus, for example, you can create a particularly attractive effect by allowing slender roots to descent into the aquarium from above instead of siting them on the bottom. This can create a natural effect simulating bank vegetation characterized by tree roots, such as forms the habitat of Angels and Discus in Amazonia, for example. The addition of epiphytic plants such as Java Fern or *Anubias* is also attractive, plus these plant species don't require much light and are regarded as easy to grow. Small specimens can be attached using transparent nylon thread, larger ones with thin black cable ties. After the plants have rooted it is very quick and easy to remove the latter using forceps, but note that cable ties need to be applied carefully to avoid squashing the roots of the plants.

Reddish mangrove wood – a classic.

The same applies to wood as to the number of plants in the aquarium: less is often more. Using just one type will create a particularly harmonious and natural scene.

(to be continued)

PLANTS

In search of new aquarium plants (3)

by Claus Christensen – www.AquaDiscover.com - Denmark

In the first part of this series (AQUALOG News 94, like all issues of the News downloadable free of charge as a PDF file at www.aqualog.de) we described the habitat of *Cyperus helferi*, and additional biotopes in the second part (TERRALOG News 95). And now the journey draws to a close.

The author collecting *Cryptocoryne albida*. Photo: Claus Christensen

The search for new plants for the aquarium often leads us to remote corners of the world. Getting to know a country and its people are among the side benefits of such expeditions.

Near to the coast, in shallow gravelly stretches of the river, we again found flowering *Cryptocoryne albida*, plus *Cryptocoryne crispatula* and a large-leaved variant of *Hygrophila polysperma*.

Plants are survival specialists!

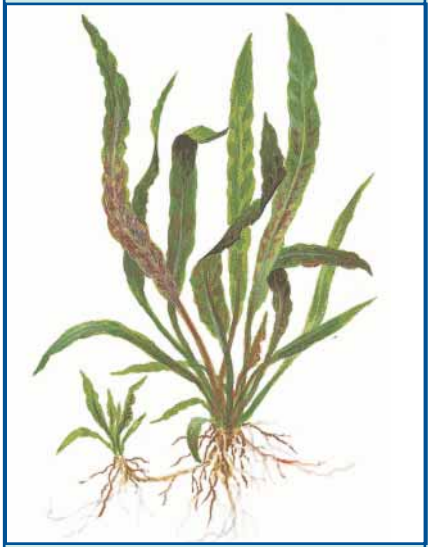
Thousands of *Cryptocoryne albida* were growing in a small river a little further south, both in the water and among the rocks of small islands. And once again we learnt something unexpected about our aquarium plants. On the bank of a small, shallow lake near to the river we found *Cryptocoryne albida* growing in the blazing hot sun. The water in which the plants were rooted was so hot that I couldn't stand in it in order to take photos. I measured the temperature of the water and the indicator went off the top of the scale – which was 50 °C!

A short rest

We stopped again further south, in a small dusty village. There was a so-called restaurant in a garage, as well as a shop – both businesses were run by the wife of the local rubber dealer. The rubber lay

Cryptocoryne albida

Cryptocoryne albida occurs in two color variants: light green and red brown with dark speckling on its leaves. It requires somewhat more light than other *Cryptocoryne* species and a very long acclimatization phase before it begins to grow. Thereafter it is unproblematical, however, although it requires a nutrient-rich substrate for growth.
Known as *Cryptocoryne costata* for many years.



Family	Araceae
Origin	Thailand
Height	10–30 cm
Breadth	12–20 cm
Lighting	moderate – very high
Temperature	20–28 °C
Water hardness	soft – hard
pH value	5.5–8
Growth rate	slow
Degree of difficulty	difficult

round about in large bales resembling heaps of bath mats. The local cuisine in this remote village was a wonderful experience. Tom gar kai is a chicken soup with coconut milk, coriander, lemon grass, small chillies, and lots of additional ingredients that I can no longer remember. Thai cuisine involves the rare and difficult art of combining a large number of herbs and spices without losing the individual flavors of the ingredients. Every flavor plays its own role, like the instruments of an orchestra. Coconut milk, for example, makes a rather sharp soup very tasty and acceptable to western palates.

Further south we found *Cryptocoryne cordata* (Blasii variant) and large-leaved *Barclaya longifolia*.

Relaxing while diving

We ended our trip in great style with a short diving holiday aboard the vessel Similan II. We sailed for six hours from Ban Lam Ru to the Similan Archipelago, one of the 10 finest diving areas in the world, which lies away from the mainland in the Andaman Sea between Thailand, Burma, and India. The water there is crystal clear. Corals that grow to only 50 cm high near the coast achieve a height of several meters there. The fauna is spectacular, ranging from the fascinating life of the coral reef to large fishes and whales disporting themselves in the open sea.

Surfing tip:

In TERRALOG News 93 Claus Christensen described a new foreground plant with a multitude of uses: *Staurogyne repens*.
Surf your way to www.aqualog.de and read all about it! All issues of the AQUALOG/TERRALOG News are available there free of charge as PDF files.

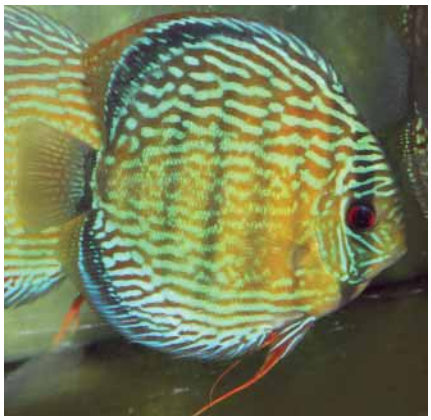
DISCUS

The fabulous Nhamunda Discus

by Harald Jahn

The Rio Nhamunda is a comparatively small river – at least in Amazonian terms. Nevertheless it is around 300 km long and forms the boundary between the Brazilian federal states of Amazonas and Pará in north-western Brazil for that entire distance.

Heckel Nhamunda Maracanha



Nhamunda Maracanha Royal Blue, male

Nhamunda Maracanha Blue, female

Legend has it that in 1541 Orellana, one of Pizarro's generals who is regarded as the (European) discoverer of the Amazon, encountered the Amazons, legendary female warriors, at Nhamunda, and hence the Amazon bears their name today. Nowadays, of course, we aquarists have little interest in the dazzling history of the blood-stained conquistador general, who disappeared without trace in 1545 during the attempt to conquer what is now Manaus. We are interested in the fishes of the Rio Nhamunda, which continue to go about their business with no regard for the fate of humans, just as they did back then. And this applies first and foremost to Discus!

Discus species in the Rio Nhamunda

The Rio Nhamunda is a left-bank Amazon tributary, where Brown/ Blue Discus are to be expected, while Green Discus are found in right-bank Amazon tributaries. There are also Heckel Discus in the Rio Nhamunda. The correct scientific names for Discus remain a matter for much debate; the three described species are nevertheless readily distinguishable and undoubtedly valid. On this basis the Brown/ Blue Discus is called *Symphysodon haraldi*, the Green *S. aequifasciatus*, and the Heckel *S. discus*.

What is special about Nhamunda Discus?

The Brown/ Blue Discus of the Rio Nhamunda first rose to fame because specimens with a high component of red in their body coloration are particularly frequent there. These fishes have been (and still are) marketed as "Nhamunda Rose". But these Discus also exhibit other unusual features. Normally Brown/ Blue Discus are not sexually dichromatic, ie male and female do not differ from one another in coloration. It is different with the Nhamunda Rose: it appears that all the males are Royal Blue and semi Royal Blue, while the females correspond to Brown Discus in their external appearance.

Brand new - the "Nhamunda Maracanha"

It should be made clear right from the start that we don't know precisely what is meant

by "Maracanha". Maybe a small settlement? Or given that Brazil is football-mad, does the name refer to the legendary circular football stadium of the same name in Rio de Janeiro? When it comes to the aquarium hobby the precise provenance of Discus variants has been in doubt ever since the time that they first appeared in the hobby (around 1930) and especially since the Discus boom in the 1980s. Who wants to let his competitors know where there is a collecting locality with attractive variants, especially when he has searched for years to find such a site?

The Brown/ Blue Nhamunda Marancanha are in any case very similar to the Nhamunda Rose, only brighter and larger; here too the Royals and semi Royals appear invariably to be males.

Heckel Discus from the Nhamunda

The Heckel Discus that originate from the Rio Nhamunda are again marketed under the name "Heckel Nhamunda Maracanha". Compared to other Heckel variants they have a very typical solid blue "scarf" extending from the nape to the fifth or sixth spine of the dorsal fin and downwards to the pectoral-fin insertion. They are splendid fishes!

Let us hope that these lovely wild-caught Discus will produce lots of young so that even aquarists with a small budget can enjoy Nhamunda Discus.

Nhamunda Maracanha Semiroyal Blue, male

Nhamunda Maracanha Rosé, female

aQuaDRAEN

At last – aquaria with no leakage problems

by aQuaDRAEN

aQuaDRAEN has developed an aquarium that avoids water leaks or aquarium breakage from turning into a domestic catastrophe. Worries during holidays away, damage in the home, tedious insurance claims ... not longer a problem with aQuaDRAEN!

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HERMIT CRABS

Terrestrial hermit crabs

Part 2

by Wolfgang Löll

Coenobita pseudorugosus, , red morp. All Photos: Frank Schäfer

There are two species of hermit crab in Australia: *Coenobita variabilis* and *C. perlatus*. Of these two species, however, only *C. variabilis* (the specific name means "variable") is endemic to Australia. But this species is not available in the international pet trade, as since the 1980s no commercial exports of living wild animals or plants have been permitted from Australia. That is a pity, as to date *C. variabilis* is the only *Coenobita* species that has been shown to have an abbreviated larval development, making the breeding of the species under vivarium conditions at least a possibility. According to Harvey (1992), following two non-feeding zoeal stages, the feeding megalopa larvae develop in only six days at 30 °C; these metamorphose only on land, similar to what was described for *C. compressus* in News 95.

The second species mentioned above, *C. perlatus*, occurs in Australia only on coral islands and is regarded as rare there. It is unclear what the species name signifies. It probably represents a Latinized form of the word "pearl" and hence means "pearly", referring to the striking white granulae (ie the little "pimples") on the surface of the armor in this species. The Latin for pearl is margarita, but the Italian is *perla*.

The rare occurrence of the species in Australia has been blamed on excessive collecting for the pet trade, but it is difficult to determine whether that is in fact the case or merely propaganda from those who oppose the keeping of pet animals, who have a powerful lobby in Australia. There are confirmed locations for *C. perlatus* in Polynesia (the Gambier Archipelago, the

1. Aquarium-hobby days a complete success

The organizers have expressed satisfaction with the results of the first Ulmer Aquaristik-Tage (Ulmer aquarium-hobby days). "The interest shown by visitors has exceeded our expectations and those of the exhibitors", say the organizers.

The Ulmer Aquaristik-Tage offered passionate aquarium enthusiasts lots of information and a comprehensive range of products spread over around 2,800 m2. The dates for the next Ulmer Aquaristik-Tage have already been set: from 29th October to 1st November 2011.

The huge smooth claw is typical for *Coenobita brevimanus*.

Marquesas, the Society Islands and Tuamotu) and other South-Sea islands. The species supposedly also occurs from the Seychelles to Madagascar, on isolated islands, and on the East African coast opposite. Its easternmost occurrence is given as Japan. The species has purportedly been introduced elsewhere by Man, who uses it for culinary purposes, and hence there are nowadays even self-sustaining colonies reported from the U.S.A. (eg Cape Cod, Massachusetts). In many cases, however, it appears that the species may have been incorrectly identified.

C. perlatus is a very attractive species, known in English-speaking countries as the Strawberry Hermit, which describes its coloration

Coenobita perlatus is very attractively colored.

very aptly. Full-grown specimens are bright red and the numerous granulae on the claws and legs are whitish. Juveniles are white initially and later become beige with brown stripes. At all stages the antennae are red, and this is regarded as a diagnostic characteristic for distinguishing this crab from other, similar species.

The other species are likewise distributed in the western Indo-Pacific. *Coenobita*

Coenobita cavipes is only rarely imported.

brevimanus (the species name means "with a short hand") and *C. rugosus* (the species name means "wrinkly") are imported quite frequently, and occasionally *C. cavipes* (the species name means "hollow foot"), *C. pseudorugosus* (the species name means "false rugosus"), *C. purpureus* (the species name means "purple"), and *C. violascens* (the species name means "with a violet sheen") are seen for sale. The last two species listed originate from Japan. In view of the considerable variability in coloration in all these species, however, it is highly debatable whether they are always actually correctly identified in the pet trade.

(to be continued)

HANSE TIER

Lizards and fishes...

by hanseTier

Hamburg – 11. January 2011

...will be the focus of the new special terrarium- and aquarium-hobby exhibition at the HanseTier 2011. The Hamburger Heimtier Messe (Hamburg pet convention) will be held from 25th-27th March in the MesseHalle Hamburg-Schnelsen, a day longer than previously (Friday 16.00-21.00 hours and Sat/Sun 10.00-18.00 hours).

Everything to do with animals will be presented by around 70 exhibitors in an area of 4,000 m2. The visitors and their animal companions will find everything their hearts desire, from food, equipment, and decor to livestock.

The lecture program reflects the special terrarium- and aquarium-hobby exhibition and offers interesting presentations on topics such as "Shrimp maintenance made easy" by the Garnelenfreunden Hamburg (Hamburg shrimp enthusiasts), "Invertebrates in the terrarium" by Dr. Oliver Zompro, and "The beginner's terrarium" by Norbert Grammel. Michael Schäfer will lecture on the subject of "Livestock for novices in the terrarium hobby" and Matthias Hajnal will provide valuable tips on "Snakes for beginners".

The lecture program also features "Bearded agamas" and "Native amphibians and reptiles in the terrarium" by Michael Millert. And anyone interested in "Monitor lizards" will receive appropriate information from Michael Lohse.

The HanseTier will be open on 25th March from 16.00 to 21.00 hours, and on 26th – 27th March from 10.00 to 18.00 hours. The entrance fee on the day will be 7 Euro (children up to 12 years accompanied by an adult free). The lecture program and 1,600 parking places are available free of charge. Further information on the event can be found at www. hansetier.de or by phoning +49 040/550 60 61.

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Aqualog animalbook GmbH, Liebigstraße 1,
D-63110 Rodgau
Tel. +49 (0) 6106 697977
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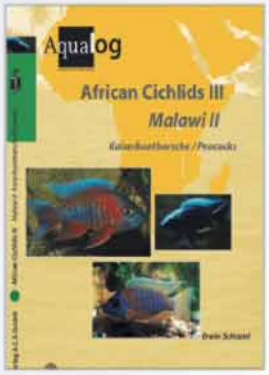

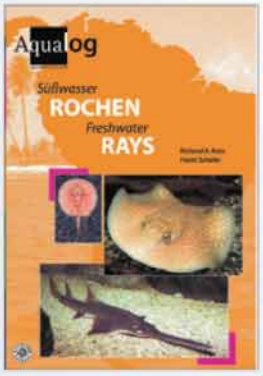

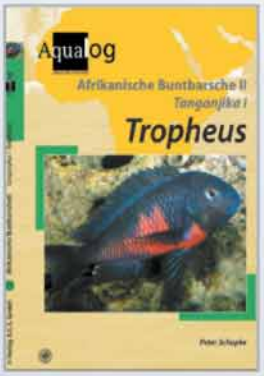

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