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Green Phantom Plecos, *Hemiancistrus subviridis*.
Images by Simon Meier.



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Dear Reader,

A conference in the north of England in March 2011 gave rise not only to this photo of me with Dr. Ralf Britz of the Natural History Museum in London, but also to the idea of a feature article on the Southeast Asian country of Myanmar (still called Burma or Birma by some people) and its importance to the aquarium hobby. Britz, an experienced aquarist with a particular interest in unusual fish species, is working on a number of fish groups from that country. Because he has traveled in Myanmar frequently and extensively in recent years, he immediately declared himself willing to tackle this cover feature.

South American and catfish fans will be relieved to learn that in this issue we are dedicating a number of articles to breeding several uncommon and rather attractive armored catfishes. Numerous fans of this fish group continue to achieve new or rare breeding successes. Given the continuing strained situation regarding importation of species from Brazil and Venezuela, and the catastrophic plans of the Brazilian government to dam practically the entire Amazon region, we aquarists cannot “breed hard enough” to at least document the behavior and reproductive biology of these fishes before they disappear forever. If not aquarists, who else will study the behaviors of new fish species?

A handful of scientists, including Ralf Britz, Stan and Marilyn Weitzman, Joachim Knaack, F. Herder, A. Nolte, U. Schliewen, and A. Lamboj, are aquarists who are interested in collaborating with hobbyists. Unfortunately, that possibility has not yet fully registered with some of their colleagues, who know their research subjects only from shriveled-up preserved specimens or, in some cases, only fin clippings and DNA structure, and often blame a lack of resources for their aquarium abstinence. But if we all pull together we can at least get to know and study a small

part of the aquatic world of the tropics before it all goes down the tubes.

Has Evers now become a prophet of doom and gloom? No, definitely not! I am simply too fond of life for that, and I rejoice in the beauty of nature. But increasingly frequently the smile disappears from my face when I see a once-fabulous habitat that is now no more than the water supply for oil palms or soy beans, and devoid of all specialized aquatic life forms. I am a



realist and I know that we may not prevail against the lust for power and the wealth of the few. These people (they, too, have children and grandchildren, who now live in the modern “concrete jungle” and never encounter a robin unless they google it) have woven their inextricable web worldwide. But we at AMAZONAS will carry on as before, and we welcome all, aquarists and scientists alike, who care to join us.

In Myanmar there are already plans afoot for a comprehensive reformation of the country’s government. We hope, dear Reader, that you will enjoy what this land of loveliness has to offer. The fishes, plants, and invertebrates of this largely unexplored country have more than earned your attention!





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• by Hans-Georg Evers

New Fishes from Brazil



Hudson Crizanto with fishermen at the Rio Itacaiúnas.

Some time ago we featured Hudson Crizanto's discus project on the lower Rio Purus in Brazil (Evers 2010). Since then, Crizanto and his company, H & K Ornamental Fish, based in the Brazilian coastal town of Fortaleza, have been working ever harder on this project, and his activities with local fishermen have now expanded to five different collecting localities in Amazonia. The underlying idea is that the fishermen in the field send him only selected discus and are paid a higher rate in return. The money thus goes directly to the collectors on the spot and the fish populations are spared by virtue of the targeted removal of a small number of specimens.

H & K has now expanded its operations to include other fish species. Crizanto and his fishermen have found a number of particularly colorful armored catfish species, illustrated here, in the previously little-collected Rio Itacaiúnas in the lower Rio Araguaia. They include a previously unknown, apparently new *Baryancistrus* species with golden yellow spots, which up





Above:
Gorgeous
variant of
Pseudacanthicus
sp. L 24 from the
Rio Itacaiúnas.



Right:
Hand-selected
and sustainably
collected discus
from Brazil.



Bottom:
Panaque cf.
armbrusteri
L 27.



THIS PAGE: ANONYMOUS; THE REST: H. CRIZANTO

**Planted Aquarium Set-up
Phase 1: Prepare the water.**
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to now has been known only from the Rio Xingu. It remains unclear whether this species is *Baryancistrus niveatus*, described from the Rio Araguaia, or a variant of L 26, likewise known from the Araguaia drainage. The other fishes collected, for example the bright yellow specimens of *Parancistrus aurantiacus*, intensely colored *Panaque* cf. *armbrusteri* L 27, and a particularly beautiful variant of *Pseudacanthicus* sp. L 24, demonstrate that the Rio Itacaiúnas harbors particularly splendid armored catfishes.

Hudson Crizanto is currently working with the relevant authorities to organize a certificate of sustainability and introduce a green label. Let us hope that this ambitious project is successful and we will be able to present lots of these beauties in these pages! 🐟

Top:
New, or
*Baryancistrus
niveatus* with
yellow spots?



Middle:
Bright orange
specimen of
*Parancistrus
aurantiacus*.



Bottom:
In this fish
the normal
coloration
at the fin
edges comes
through,
which makes
it even more
attractive.



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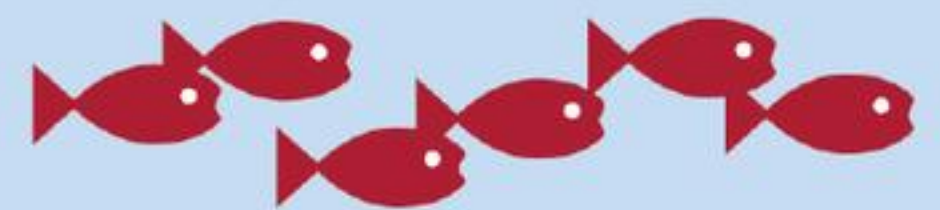
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Puntius denisonii "Gold"

• by AMAZONAS editors

Golden Torpedoes

For a number of years the Denison's or Torpedo Barb, *Puntius denisonii*, has been bred very successfully and in large numbers in Malaysia and Indonesia. These captive-bred fishes have long since come to outnumber wild exports, so it was only a matter of time before a mutation turned up among the countless thousands of offspring.

Xanthic specimens (lutinos) are no rarity among fishes and are usually very attractive by virtue of their coloration. This particularly applies to the *Puntius denisonii* "Gold" now being bred in Indonesia at the Maju Aquarium fish hatchery (Cibinong, West Java). The usual gray base color is a golden yellow in this form, and the red components of the coloration are retained. Anyone with an interest in such cultivated forms will certainly greet the "Golden Torpedo" with enthusiasm. But it will probably be some time before these fish are available here in large numbers. 🐟

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• article by Rachel O'Leary with images by Ian Fuller

Encounters with the Gold Laser Cory, *Corydoras* sp. CW010

Wild adult female (top) and male (bottom) Gold Laser Corys.

One of the most dazzling of the “new” armored catfish species finding its way into North American aquariums in recent years is best known as the Gold Laser Cory, categorized as *Corydoras* sp. CW010.

They are often imported from Peru into the trade under the name *Corydoras aeneus* “Gold.” I was fortunate to get a group of about 30 mixed adult and sub-adult fish from a member of my

local cichlid club. He travels annually to South America for collecting trips, and was able to purchase the original fish from a local fisherman in a canoe, whom he met near the mouth of the Rio Apayacu, downriver from Iquitos. The fisherman refused to disclose where the fish were collected, so the exact location has remained a mystery.

I was very excited about getting these fish,



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Young Gold Laser Corys at 5 months

as they have a striking vivid gold/green color and, at the time, were relatively rare in the hobby. I have had them about two years, and initially set them up in a 55-gallon (200-L) breeding tank, though a smaller group could be housed easily in a 20-gallon (75-L) tank. The tank has a sand substrate, numerous pieces of manzanita driftwood and bogwood, and a large amount of Java Moss, Java Fern, and *Anubias*.

The fish seem to prefer the darker areas of the tank, often hiding out in the stacked bogwood or among the plants. Despite their relatively reserved nature, they are easy to feed and greedily accept pellets, gelatinized foods, frozen meaty foods, and live foods. They appear to be very hardy, doing well in temperatures in the mid- to high 70s F (24–26°C). I have had success keeping them in neutral to moderately hard water.

The adult males grow to about 1.5 inches (3.8 cm) and the females slightly larger and broader at 1.75 inches (4.5 cm). I do weekly 40-percent water changes and have not used any other specific spawning triggers. I have not witnessed the laying of the eggs, but I saw behavior typical for *Corydoras* courtship, with the males pursuing the females vigorously around the entire tank.

The first successful spawn yielded approximately 40 eggs, which seemed to have been laid one at a time or in small groupings. Since predation of the eggs is a common occurrence with corys, it is best to remove the eggs to a hatching/rearing container. I do occasionally find young fish in the breeding tank, but without human intervention the survival rate is quite low. The eggs take about four days to hatch, and it is an additional two days before they become free-swimming fry.

I often add *Pomacea diffusa* (Mystery Apple Snail) to the container because they will eat any eggs that develop fungus, and their slime traps their feces, which, due to an inefficient digestive tract, produce *Paramecium* spp. protozoans that serve as an excellent live first food. I feed the young fish micro worms in addition to the paramecia, and then quickly progress to feeding baby brine shrimp. The tank-raised fish seem to be more outgoing than their wild-caught parents, but are still sensitive to bright light and like ample amounts of cover.

With their vivid coloration and ease of care, these corys, despite being a bit uncommon, are great additions to a community tank and would do well with other peaceful tetras, rasboras, and plecos. They are very social fish and are happiest when kept in groups of at least six; this also allows observers to see their best behaviors. 🐟

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Ready... Aim... Fire!



Above: The Archerfish *Toxotes jaculatrix*. Note the upward-pointing mouth. Left: By spitting a jet of water, this fish is able to shoot down insects from a height of up to about 5 feet (150 cm).

Sharpshooters in the aquarium

by Ralf Theuer • Archerfishes owe their common name to a unique and specialized hunting behavior: shooting insects down from leaves, stems, and branches with one or more jets of water. If you have ever kept archerfishes, you know what to expect from them. Sometimes you may be hit by a jet (or jets) of water, as these sharpshooters quickly get carried away. Every shot hits its mark—the middle of your face!

Archerfishes of the genus *Toxotes*, with seven species currently recognized, live mainly in the tangled mangrove swamps and brackish water areas of tropical and subtropical regions, where they occur in groups of varying size. From here they also penetrate upstream into fresh water or into the sea.

Before firing, the archerfish must plan the optimal trajectory. Then it shoots until the prey drops. But archerfishes know more than just the principles of cause and effect: they can calculate in advance where the prey will be after it has been successfully shot down onto the water's surface! The archerfish can do this because it is endowed with a small but highly efficient neural network. Archerfishes are masters of the laws of ballistics and require only three pieces of information: the location, the direction, and the speed of their prey. Using visual stimuli, with eyes and brain extracting

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relevant information, they recognize the individual elements and interpret them through comparison with memories.

Once these calculations have been made, the fish sets

off at the required speed and in a straight line toward its target, without needing to make any corrections. It must secure its prey before conspecifics or other surface-dwelling fishes get to it, as there is considerable competition at the water's surface.

After decades of research, German scientists headed by Stefan Schuster (chair of Animal Physiology at the University of Bayreuth) have managed to establish how these fishes achieve these astonishing results and what part of the brain is used to do so.

Archerfishes are capable of mastering these complex processes with only a few hundred neurons. The supposition is that six cells in the network of the two Mauthner cells play an important role in the process. The scientists demonstrated in their experimental setup that straight-line swimming behavior is based on a multitude of different options for action and associated complex decisions, which the fish has only around 40 milliseconds to make. The numerous experiments and observations in the experimental setup were conducted using *Toxotes jaculatrix* and *T. chatareus* and aided by the use of electrophysiology and twin-photon microscopy.

Unfortunately, this is a case of "use it or lose it;" over time, if fishes don't regularly employ this behavior, they tend to gradually stop exhibiting it. Hence you should encourage them by providing live food insects. If your archerfishes have become accustomed to it, you can stick slightly dampened food sticks high up on the aquarium glass. In a public aquarium, feeding time can be used to give a splendid demonstration of what these little sharpshooters are capable of, and it always astonishes visitors. At home, one could build a special platform that includes a holder where live food could be placed above the open water. 🐟



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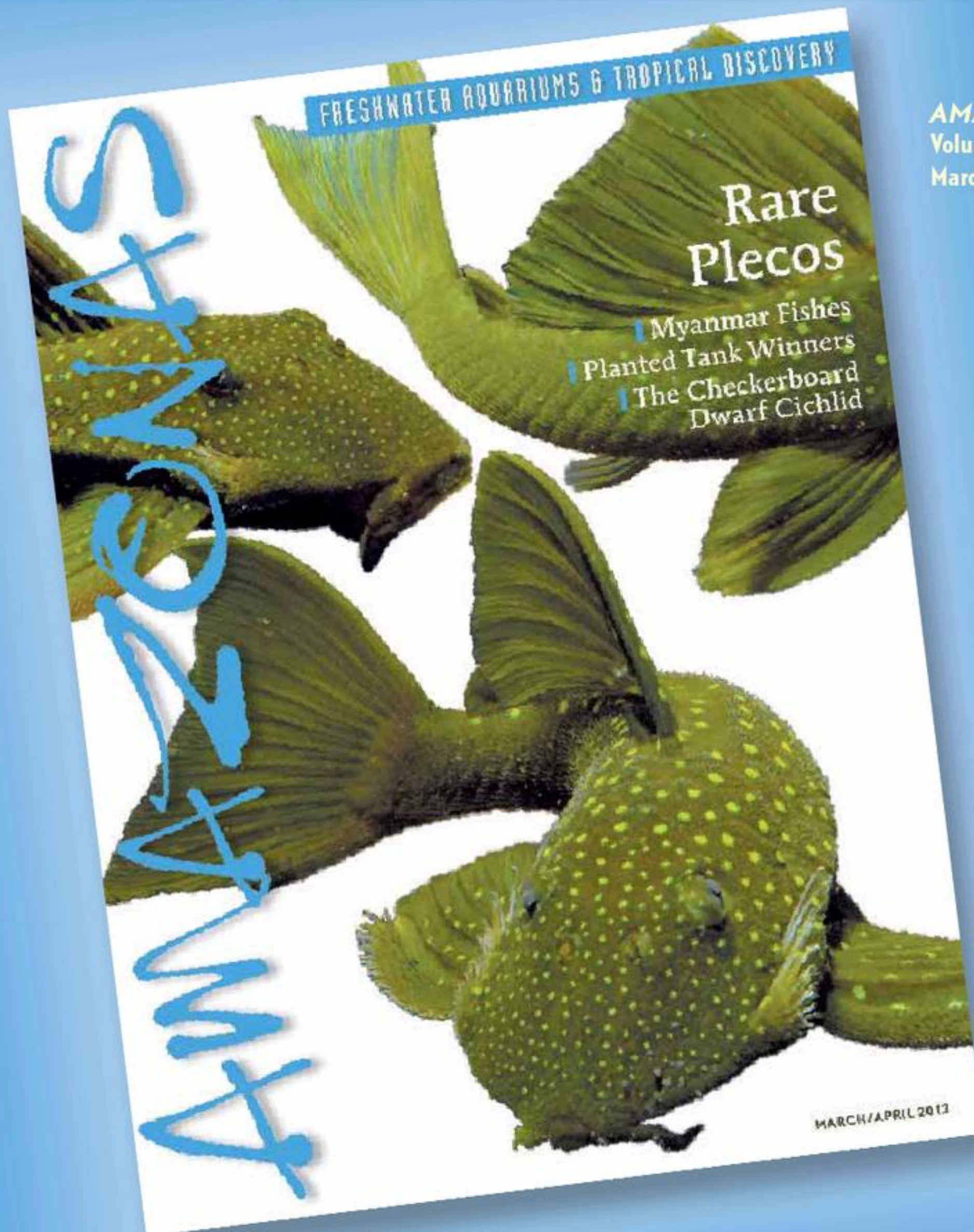
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Albino angels from Altum stock in a rearing tank.

• by Steffen Postin, Plauen, Germany

Feedback: Albino Altums

I read with great interest *A Life with Angels* by Bernd Schmitt in *AMAZONAS* [2 (1): 32–40]. As a pet dealer I am aware of problems with good quality in tank-bred angels and buy my fishes from breeders in the neighborhood.

I recently obtained juveniles of an apparently stable albino cultivated form from Peter Winterling (Plauen, Germany). The first albinos occurred in his strain of the so-called Honey Peruvian Altum. They were selected out and put together in pairs. After a number of generations, albinos that breed true have been obtained. Note that rearing takes longer than with normal-colored individuals and is relatively difficult because the fry and juveniles are delicate. But when adult, these fishes are completely healthy and stable, which is unusual with albino angelfishes. I hope that this “new” strain is of interest to *AMAZONAS* readers! 🐟

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“Burma is a land of surprises for ichthyologists.” With these words, the Indian ichthyologist Dev Dev Mukerji began his 1934 report on the fishes of the Mali Hka in northern Myanmar. I, too, became curious about Myanmar early on, and I have been fortunate enough to make a number of trips there. Here I will describe what I have learned about the country, its habitats, and, above all, its fishes. • *by Ralf Britz, Ph.D.*

Information on the fish fauna of Myanmar was still sparse only a few decades ago—it seems hardly anything was known about it. A photo of an Eyespot Gourami, *Parasphaerichthys ocellatus*, taken by Walter Foersch awakened in me an unquenchable desire to see this fish in life and be able to keep it. Another fish that kept my thoughts turning to Myanmar was the Armored Stickleback, *Indostomus paradoxus*, which I knew only from its description by Prashad & Mukerji.

Traveling to Myanmar

I came closer to realizing my dream of collecting fishes in Myanmar when, in the fall of 1995, I went to work at the American Museum of Natural History in New York for a year. At that time you could obtain only a two-week visa for travel to Myanmar, and I spent my first week in the capital, Yangon, waiting for permits. During the second week, I was able to travel around a little. But the wait in Yangon did have a positive side. One evening, over a beer in one of the street cafés, I was told by a group of students that a chemistry professor at the university was very interested in native fishes and it would undoubtedly be a good idea for me to meet him.



Myanmar

A fascinating country and its fishes

Accordingly, a get-together was planned for the next evening with U Tin Win, who was to play an important role in my subsequent study of Burmese fish fauna. We got along very well right from the start, and spent the entire evening chatting enthusiastically about the freshwater fishes of Myanmar. I told him about the increasing interest among aquarists and mentioned that exporting aquarium fishes from Myanmar would be a worthwhile business undertaking. Soon afterward I left for a barely week-long collecting trip to Mandalay and Lake Inlé. I returned with a small but interesting haul that later served as the basis for the revalidation of the Burmese Snakehead, *Channa harcourtbutleri*, and the description of *Dario hysginon*, sometimes appearing as the Red Flame Dario.

My Myanmar fire had been kindled, and in 1998 I had the opportunity to collect with Sven Kullander for the Swedish Museum of Natural History in Myanmar. Our travels took us to Lake Indawgyi, where we caught dozens of specimens of *Parasphaerichthys ocellatus* (Eyespot Gourami) and *Indostomus paradoxus* (Armored Stickleback) in the marginal vegetation. I also managed to bring around 20 individuals of each species back to Germany alive and to breed the Armored Stickleback. During this trip we discovered more new species of *Badis* in the area around Myitkina and Putao, and these were described in 2002 as *Badis corycaeus* (Cory Badis), *B. kyar* (Chameleon Fish), and *B. pyema* (Pyema Badis). I also brought specimens of *Dario hysginon* (Red Melon Dario) and the three new *Badis* species back alive to Germany and managed to breed *Dario hysginon*, *Badis corycaeus*, and *B. pyema*.

Unfortunately, I lost contact with Tin Win after my visit in 1996—e-mail wasn't available in Myanmar back then. So my surprise and delight were great when, in 2002, I found a message from Tin Win in my inbox. He told me that he had followed my advice and founded an aquarium-fish export company after taking early retirement. I was surprised and delighted to be back in touch with him.

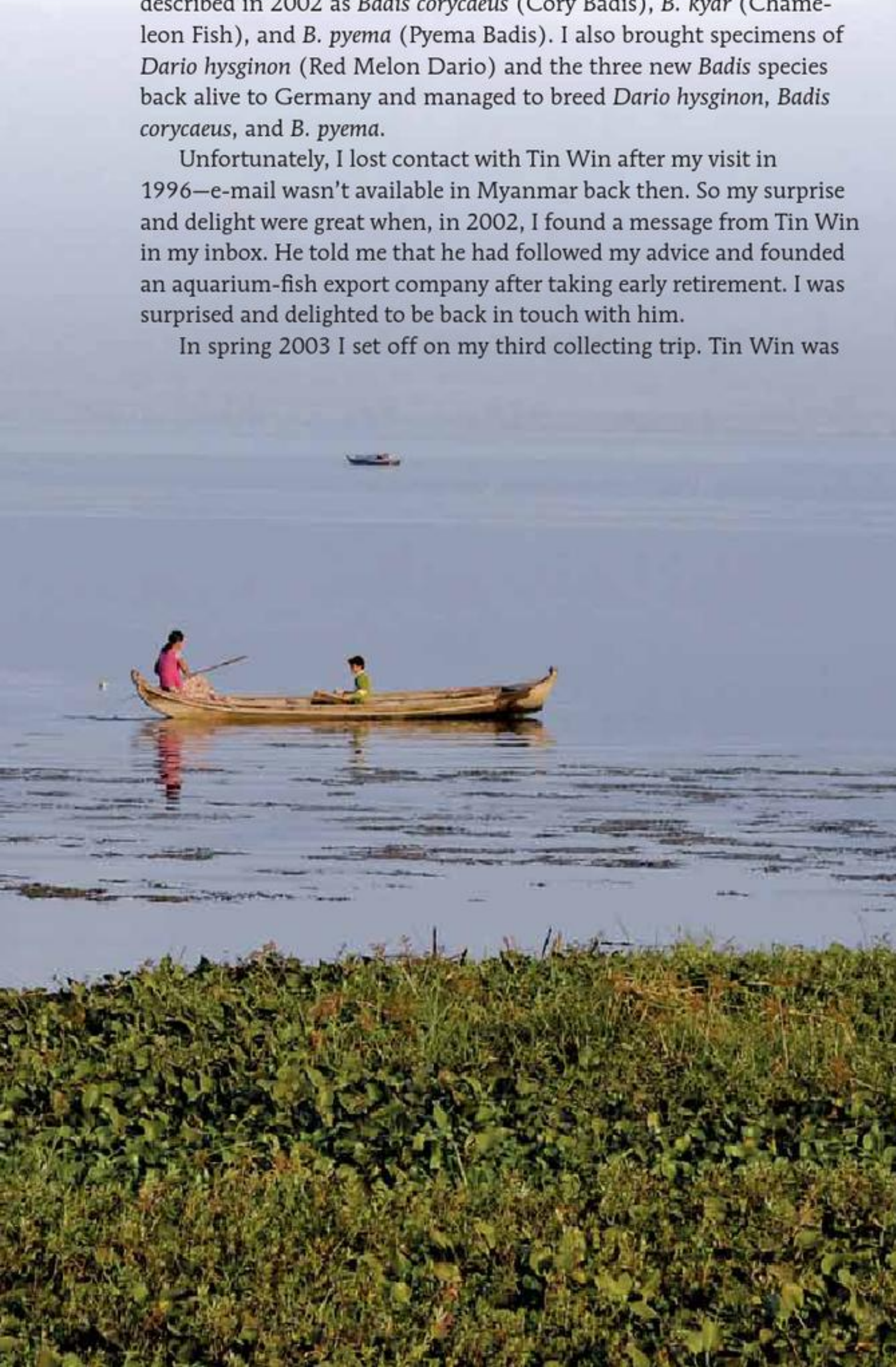
In spring 2003 I set off on my third collecting trip. Tin Win was

Morning on Lake Indawgyi.

Below, top to bottom:
Daw Tin Pyone, U Tin Win,
and the author.

One of the first fish species
to reach us from Myanmar
was the attractive Asian
Rummynose, *Sawba
resplendens* (male).

During my first trip to
Myanmar, I collected type
material of *Dario hysginon*.





Above: At the type locality of *Danionella translucida*, Micro Glassfish. These fish live only in the margins of the river and in deep, cool layers of water.

Left: The water in the rivers of Myanmar is usually slightly basic, as here at the waterfall of Keng Tung in the Golden Triangle.

Rather basic water

Several large rivers flow through Myanmar. Along with their tributaries, especially those of the mountain regions, they are responsible for the enormous diversity of the country's freshwater fish fauna. The largest river is the Irrawaddy, which runs from north to south through Myanmar. Into it empties the Chindwin, which has its source in the north of Myanmar.

It runs south along the border with India and is probably one of the least known large rivers of Myanmar. The Sittang rises to the southeast of Mandalay at the edge of the Shan Plateau, a highland plain that extends as far as China. The Salween has its source in Tibet, and in Myanmar forms part of the border with Thailand before flowing through the completely unstudied southern Shan states to the state of Kayah and emptying into the Andaman Sea to the east of Yangon.

Another interesting and little-explored river is the Tenasserim, which meanders along the narrow coastal strip of Myanmar that extends to the south in the direction of the Isthmus of Kra. A few weeks ago, the strikingly

of inestimable help in its planning and execution. I was now able to see his fish farm and meet his wife, Daw Tin Pyone, and his son, Ye Hein Htet, after whom his export company, Hein Aquarium, was named. The trip was a complete success, and in the years that followed I traveled to Myanmar again whenever the opportunity arose, in order to study the freshwater fish fauna with Tin Win's support and infectious enthusiasm. Over the years, Tin Win, with the aid of Hein Aquarium, has managed to export a series of very interesting fishes. Every time I visited Tin Win he proudly showed me his newly discovered fishy treasures, which almost always included as-yet-undescribed species.



Right, top to bottom:
Danionella translucida, Micro Glassfish, is a tiny cyprinid.
The little labyrinthfish *Parasphaerichthys ocellatus*, Eyespot Gourami, got me interested in fishes from Myanmar.
Danio tinwini was named in honor of U Tin Win.



patterned Incribed Arowana, *Scleropages inscriptus*, was described from this river. Somewhat better studied are the relatively short rivers that drain from the Rakhine Mountains in southwest Myanmar straight into the Bay of Bengal. Here an



interesting endemic fish fauna has evolved, including *Channa pulchra*, *Garra flavatra*, and *Danio aesculapii*.

During my seven collecting trips to Myanmar I have visited a wide variety of waters and gotten to know a considerable part of the country. What has astonished me the most and fascinated me time and again is that every accumulation of water, no matter how small, harbors fishes. For example, I was able to catch a new snakehead species in a residual pool around 16 inches (40 cm) in diameter and 8 inches (20 cm) deep that remained beneath a large piece of rock in an otherwise completely dried-up stream bed. A total of a dozen specimens had taken refuge there!



I was equally astonished about the type locality of *Dani-*



Garra flavatra is a popular export from Myanmar.



A number of snakeheads from Myanmar remain undescribed, including these: *Channa* sp. 1 (top), *Channa* sp. 2 (middle), and *Channa* sp. 3 (bottom).

onella translucida: a broad, fast-flowing, clear river with a sandy bottom and no aquatic vegetation. The tiny fish were found along the river margins beneath the grasses trailing from the bank, and also at greater water depths where the temperature was rather cool.

The waters around Yangon, the former capital (including the rivers in which we found *Danionella translucida*) contain more or less cloudy water with a pH of around 7.5; the conductivity varies between 10 and 100 $\mu\text{S}/\text{cm}$. The temperature ranges from 73°F (23°C) in shaded, cool areas to more than 86°F (30°C) in strongly sunlit surface waters. Here one can find *Badis ruber*, *Trichogaster labiosa*, *Rasbora daniconius*, *Xenentodon can-cila*, *Dermogenys burmanicus*, *Macrogathus dorsio-cellatus*, *Chaca burmensis*, *Channa gachua*, *Microde-vario nana*, and *Danionella translucida*.

Somewhat further west,

I found 12 specimens of an undescribed *Channa* species in this residual pool in the Rakhine Mountains.

in the Irrawaddy Delta at the type locality of *Parasphaerichthys lineatus*, the sister species of *P. ocellatus* from northern Myanmar, I measured a pH of 7.1 at a temperature of 84°F (29°C) and a conductivity of 290 $\mu\text{S}/\text{cm}$. Astonishingly, I also found *Dario hysginon* and *Indostomus paradoxus* there, species that I had previously caught only in the area around Lake Indawgyi in the north of Myanmar.

On the eastern side of the Bago Yoma, the chain of hills to the north of Yangon, the water parameters in the drainage of the Sittang River were further into the basic range. I measured a pH of 8.2–8.5, a temperature of 75°F (24°C), and a conductivity of 70 $\mu\text{S}/\text{cm}$. The waters around the Anisakan waterfalls on the Shan Plateau near Mandalay, where *Puntius padamya*, the Odessa Barb, also occurs, had rather unusual water parameters, initially causing me to suspect a faulty display on my pH meter. Here the pH was an astounding 11, the temperature of the water just 68°F (20°C), and the conductivity 320 $\mu\text{S}/\text{cm}$.

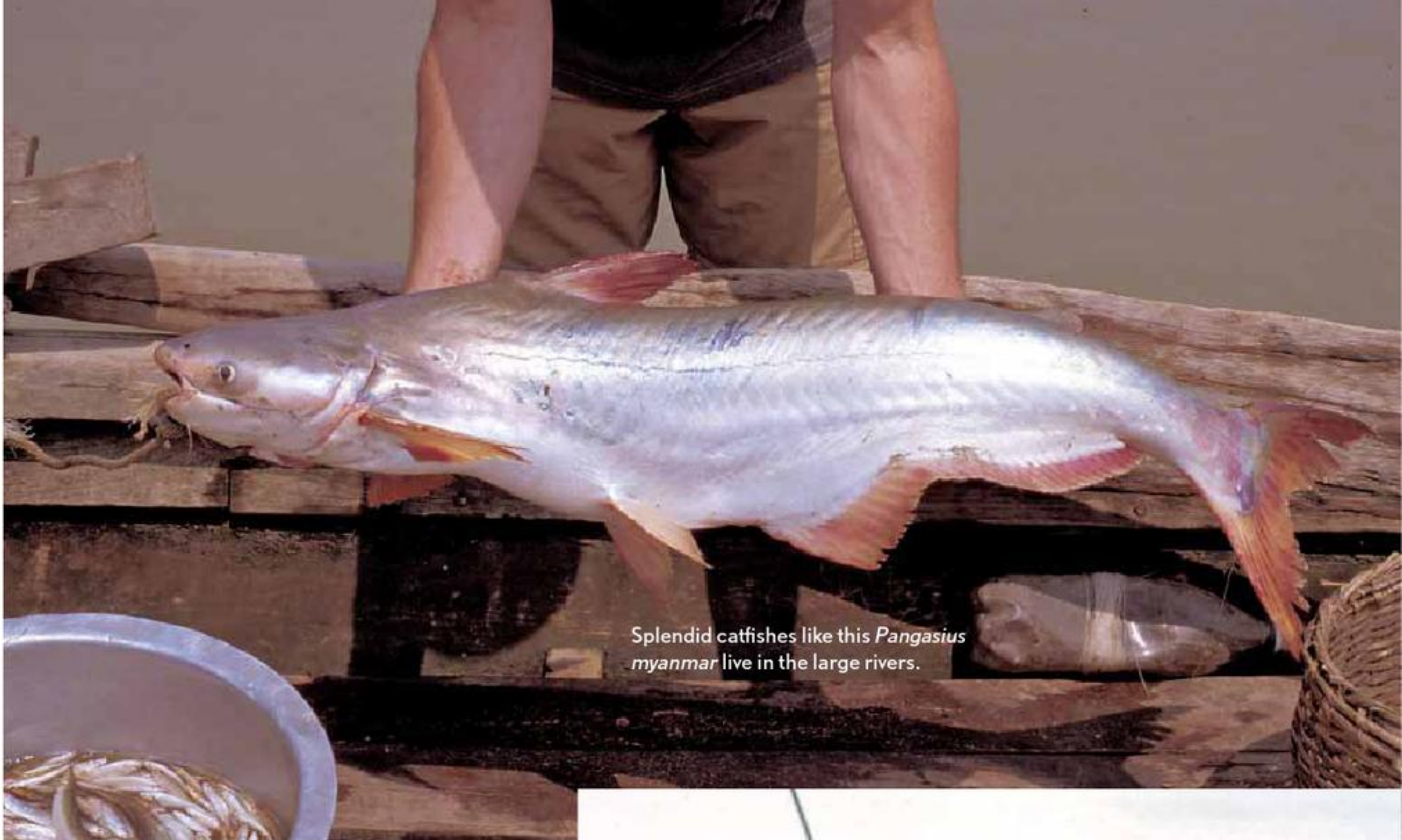
I found high pH values of 8–9 in almost all waters situated further east on the Shan Plateau. And in the Nan-Kwe River in the vicinity of Myitkina, from which *Badis corycaeus*, *B. kyar*, and *Dario hysginon* originate, the pH of 8.6–8.9 was again in the alkaline range; I measured similar water parameters in and around Lake Indawgyi.

I encountered unusually low temperatures well to the north around Putao, a region from which *Channa burmanica* was described, and I caught it there myself. During my trip in February the water in several streams there was just 57–63°F (14–17°C)! From this it is clear that species such as *Badis pyema*, *Channa burmanica*, *Puntius tiantian*, the local *Danio* cf. *choprae*, and the attractive *Devario* species found around Putao should be kept at low temperatures that should drop even lower at times, particularly in the winter.

A multitude of species

Given the huge variety of fishes (well over 300 species) that occur in Myanmar, it is extremely hard to choose a selection to present here. The real giants are found at the lo-





Splendid catfishes like this *Pangasius myanmar* live in the large rivers.



Left: This *Devario* species from the vicinity of Putao prefers cool conditions.

The catfish *Sperata acicularis* is prized as a food fish.



cal markets in Myanmar's villages and towns. Particularly worthy of mention are the huge *Pangasius myanmar*, *Sperata acicularis*, and *Bagarius yarelli*, plus the *Tor* and *Neolissochilus* species. And adult *Monopterus albus* and *M. cuchia* are, at more than half a meter long, impressive fishes. Naturally, the smaller fish species are interesting for aquarists, and there is no lack of them in Myanmar.

The various *Danio* and *Devario* species have received a lot of attention, above all the Celestial Pearl Danio, *Danio margaritatus*, a paragon of color. But the Glowlight Danio, *Danio choprae*, which Tin Win exported for the first time, has also been a real sensation. Myanmar is a hotspot—that is, an area of particularly high diversity—for this group of fishes.

Species that have not yet been imported, but have potential, include *Devario xyrops* from the Rakhine Mountains, the prettily marked *Devario kakhienensis*, and a *Devario* species from the area around Putao.

A minor sensation for me was the discoverof

Right, top: I found the type locality of *Channa ornatipinnis* by accident.

Right, bottom: Salai Thein Maung, restaurant owner and co-discoverer of *Channa ornatipinnis*.

Danionella dracula, in which Tin Win played a significant part. Males of this species have long, dagger-like fangs—they aren't teeth, but processes on the jawbones, a development unique among the cypriniforms. The reproductive behavior of all *Danionella* species is still largely unstudied, and there is undoubtedly a lot to discover. Unfortunately, the various *Badis* species—*B. corycaeus*, the unusual *B. kyar*, *B. juergenschmitti*, and *B. pyema*—and *Dario hysginon* are imported only occasionally.

A real snakehead boom was triggered by the importation of the recently described *Channa pulchra*, which was discovered by Tin Win, and *C. ornatipinnis*, the most colorful of the snakeheads.

I discovered *Channa ornatipinnis* through a random event. We were on our way back from the collecting tour in the Rakhine Mountains and stopped in the evening at a little restaurant in a tiny village near the pass. I had a few live specimens of the recently caught new snakehead with me in a clay pot. The owner of the restaurant, Salai Thein Maung, peered into it inquisitively, and I explained to him that I was in Myanmar to collect fishes. He immediately said that the same fish occurred in the valley, but was much, much more colorful there.

I was very curious, and the next morning we climbed down the very steep path into the valley 656 feet (200 m) below. After half an hour we saw the first specimen flapping in the net of a native fisherman. When I put it in a plastic bag and looked at it more closely, I couldn't



believe my eyes. It was immediately clear that this incredibly colorful snakehead was a new species. The description of *Channa ornatipinnis* appeared in January of the following year, and just a few weeks later I saw the first specimens of this species offered for sale for £150 (\$240) in a well-stocked store in north London.

With regard to the genus *Puntius*, we are again far



The Ornate Snakehead,
Channa ornatipinnis



Left, top: A river in the Chin Hills.

Left, bottom: *Devario affinis* is just one of the numerous danionin species from Myanmar.



species, also attractively colored; examples include *Mastacembelus alboguttatus*, the exquisitely striped *M. tinwini* and *M. caudicellatus*, and the golden *Macroglyphus aureus*. I think that *Macroglyphus pavo* from the Rakhine Mountains, where it occurs together with *Channa pulchra*, is probably the most unusual and most beautiful spiny eel in Myanmar.

The first importation of the Clouded Archerfish, *Toxotes blythii*, was a great surprise, as nobody had seen specimens of the species since its original description. During my last visit to Tin Win there were dozens of this extremely impressive and gorgeously colored freshwater archerfish swimming in his tanks.

There are also numerous pretty loach species, but the identification of the species isn't always clear.

Small and unusual fishes always make my heart beat faster, and Myanmar is home to not only *Indostomus paradoxus*, the Armored Stickleback, but also remarkable fishes such as *Chaudhuria caudata* and *Pillaiia kachinica*.

The gobies also include species whose keeping would undoubtedly be rewarding, for example *Sicyopterus fasciatus* and *Brachygobius nunus*, which differs from the Indian form in its smaller size.

The catfish fauna of Myanmar is likewise fascinating by virtue of its unusual forms, with the various *Hara*, *Amblyceps*, and *Olyra* species worthy of mention.

Introduced species

Unfortunately, many of the fish species from Myanmar pictured here have not yet appeared in the aquarium hobby. This could change in the near future, as the country is in the process of opening up further and the export of aquarium fishes could become a growth industry. In the meantime we should try to establish those species that are available by breeding them. The economic develop-

from grasping the extent of species diversity in Myanmar. The colorful species that I caught at the foot of the Chin Hills made this clear. But a large number of the species already described are not imported, or are only occasionally imported—for example, the Burmese Bumblebee Barb, *Puntius tiantian*, and the larger, more colorful species *Puntius binduchitra*, aka *P. sarana*, the Olive Barb.

Myanmar is also home to interesting species from groups of fishes less popular among aquarists, and their maintenance would certainly be rewarding for the specialist. The spiny eel species, for instance, are not only highly interesting and intelligent, but, depending on the

The discovery of the popular Celestial Pearl Danio, *Danio margaritatus*, created quite a stir.





Top, left: The pretty little catfish *Akysis vespa*, the Orange-Banded Hillstream Catfish.

Top, right: *Botia kubotai* is a popular loach from Myanmar.

Left: Unusual catfish species like *Exostoma vinciguerrae* would surely be of interest to some aquarists.

ment of Myanmar will lead to increased pressure on its unspoiled ecosystem; this has already happened in some other countries with a high biodiversity, which are now numbered among the so-called threshold countries.

And the production by fish farms of exotic fish species for food and the aquarium trade alike is certain to have a significant influence on the native fish fauna. Almost everywhere, even in remote areas of Myanmar, there is hardly a watershed that doesn't contain *Tilapia*. During my last two trips I saw large numbers of South American *Pacus* and *Prochilodus*, which are now reared on farms, in the fish markets. A fish caught in the north of Myanmar and thought by the fishermen to be a new species turned out to be a South American loricariid of the genus *Hypostomus*. This demonstrates that in Myanmar, too many exotic aquarium fishes are being released

uncontrolled into the wild.

Nevertheless, there is still much to be discovered in the waters of Myanmar, and I am already looking forward to my next collecting trip. 🐟

REFERENCES

Annandale, N. 1918. Fish and fisheries of the Inlé Lake. *Records of the Indian Museum (Calcutta)* 14: 33-64, pls 1-7.

Blyth, E. 1858. Report of Curator, Zoological Department, May 1858. *J Asiatic Soc Bengal* 27 (3): 267-90.

———. 1860. Report on some fishes received chiefly from the Sitang River and its tributary streams, Tenasserim Provinces. *J Asiatic Soc Bengal* 29 (2): 138-74.

Britz, R. 2008. *Channa ornatipinnis* and *C. pulchra*, two new species of dwarf snakeheads from Myanmar (Teleostei: Channidae). *Ichthyol Explor Freshwaters* 18 (4) (2007): 335-44.

Badis, like the recently described *Badis juergenschmidtii*, are found in many watersheds in Myanmar.



Ichthyological Research

The scientific study of Myanmar's freshwater fish fauna can be divided into three phases. The first phase began with the influence of the British Empire in India and what was then Burma, from around the middle of the nineteenth century on. The first freshwater fishes studied from Myanmar were the Zebra Spiny Eel, *Macrognathus zebrinus*, and the catfish *Amblyceps caecutiens*, both described by Edward Blyth. In a further monograph Blyth described additional freshwater species from the district of Tenasserim, which in those days included the whole of southeastern Myanmar. Some of the best-known species are probably the danionin *Danio albolineatus* and the loaches *Botia histrionica* and *Syncrossus berdmorei*.

Francis Day's works followed those of Blyth, and his results were summarized in *Fishes of India* (1875–1878) and *Fishes of British India, Burma, and Ceylon* (1889). Probably the last Briton to publish was Annandale (1919), who wrote a monographic study of the fishes of Lake Inlé and the description of several species popular today as aquarium fishes, for example *Danio erythromicron*, *Devario* (formerly *Inlecypris*) *aureopurpureus*, *Sawbwa resplendens*, and the little loach *Yunnanilus brevis*. The Italian Vinciguerra (1889) also produced a rather extensive work on Myanmar's freshwater fishes, in which he described some new species.

Following the British-dominated exploration, Indian ichthyologists continued the investigation in a second phase. Particularly worthy of mention are Chaudhuri's (1919) report on the fishes of Putao in the far north of Myanmar and Prasad & Mukerji's monograph on the fishes of Lake Indawgyi (1929), in which *Indostomus paradoxus* and *Parasphaerichthys ocellatus* were described. And finally, the numerous works by Sunder Lal Hora are important for the systematic study of the fishes of Myanmar.

With the death of Hora in the mid 1950s, talk of the fish fauna of Myanmar went quiet. With very few exceptions (such as Thant 1967, Roberts 1986, Ferraris & Brown 1988), this period lasted for 40 years, until around the mid-1990s. Then the slow opening up of the country for tourism began, and it became more feasible for ichthyologists to travel to Myanmar. And thus began the third phase. Since then, more than 90 new freshwater fishes have been described from Myanmar, including numerous very popular species. This number will only continue to increase.

Brown, B.A. and C.J. Ferraris, Jr. 1988. Comparative osteology of the Asian catfish family Chacidae, with the description of a new species from Burma. *Am Mus Novitates* 2907: 1–16.

Chaudhuri, B.L. 1919. Report on a small collection of fish from Putao (Hkamti Long) on the northern frontier of Burma. *Records of the Indian Museum (Calcutta)* 16 (4): 271–87, pl. 22.

Day, F. 1870. On the freshwater fishes of Burma, part I. *Proc Zool Soc London* 1869 (3): 614–23.

———. 1870. On the freshwater fishes of Burma. Part II. *Proc Zool Soc London* 1870 (1): 99–101.

———. 1872. On the freshwater siluroids of India and Burma. *Proc Zool Soc London* 1871 (3): 703–21 (1–19).

———. 1875–78. *The fishes of India; being a natural history of the fishes known to inhabit the seas and fresh waters of India, Burma, and Ceylon*. Quaritch, London.

———. (1889): Fishes. In: W.T. Blanford (ed.), *The Fauna of British India,*

including Ceylon and Burma. London. *The Fauna of British India*, v. 1: i–xviii, 1–548; v. 2: i–xiv, 1–509.

Fang, F. and S.O. Kullander. 2009. *Devario xyrops*, a new species of danionine fish from southwestern Myanmar (Teleostei: Cyprinidae). *Zootaxa* 2164: 33–40.

Kullander, S.O. 2008. Five new species of *Puntius* from Myanmar (Teleostei: Cyprinidae). *Ichthyol Explor Freshwaters* 19 (1): 59–84.

Kullander, S.O. and R. Britz. 2002. Revision of the family Badidae (Teleostei: Perciformes), with description of a new genus and ten new species. *Ichthyol Explor Freshwaters* 13 (4): 295–372.

———. 2008. *Puntius padamyia*, a new species of cyprinid fish from Myanmar (Teleostei: Cyprinidae). *Elect J Ichthyol, Bull Europ Ichthyol Soc* 2: 56–66.

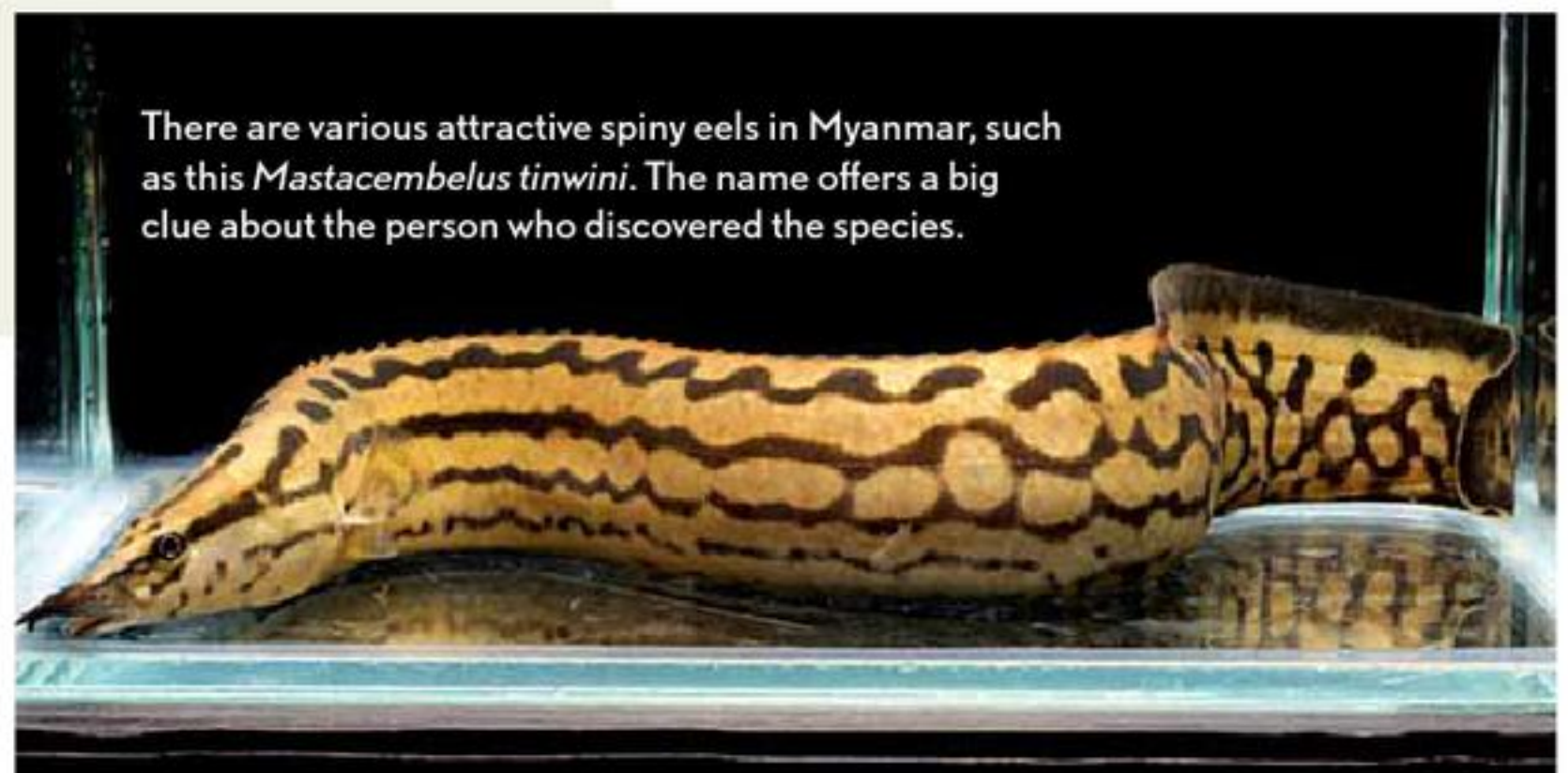
Kullander, S.O., R. Britz, and F. Fang. 2000. *Pillaia kachinia*, a new chaudhuriid fish from Myanmar, with observations on the genus *Garo* (Teleostei: Chaudhuriidae). *Ichthyol Explor Freshwaters* 11 (4): 327–34.

Kullander, S.O. and F. Fang. 2004. Seven new species of *Garra* (Cyprinidae: Cyprininae) from the Rakhine Yoma, southern Myanmar. *Ichthyol Explor Freshwaters* 15 (3): 257–78.

———. 2005. Two new species of *Puntius* from northern Myanmar (Teleostei: Cyprinidae). *Copeia* 2: 290–302.

———. 2009. *Danio aesculapii*, a new species of danio from southwestern Myanmar (Teleostei: Cyprinidae). *Zootaxa* 2164: 41–48.

Ng, H.H., P.K.L. Ng, and R. Britz. 2009. *Channa harcourtbutleri* (Annandale 1918): a valid species of snakehead (Perciformes: Channidae) from Myanmar. *J South Asian Nat History* 4 (1): 57–63.



There are various attractive spiny eels in Myanmar, such as this *Mastacembelus tinwini*. The name offers a big clue about the person who discovered the species.

Prasad, B. and D.D. Mukerji. 1929. The fish of the Indawgyi Lake and the streams of the Myitkyina District (Upper Burma). *Records of the Indian Museum (Calcutta)* 31 (3): 161–223, pls 7–10.

Roberts, T.R. 1986. *Danionella translucida*, a new genus and species of cyprinid fish from Burma, one of the smallest living vertebrates. *Environ Biol Fishes* 16 (4): 231–41.

Thant, M.K. 1966. *Silurus burmanensis*, a new species of fish from the Inlé Lake, Southern Shan State, Burma. *J Burma Res Soc* 49: 219–21, pls 1–3.

Vinciguerra, D. 1890. Viaggio di Leonardo Fea in Birmania e regioni vicine. XXIV, Pesci. *Ann Mus Civ Stor Nat Genova (Serie 2)* 9: 129–362, pls 7–11.

Barbs, danios, loaches



Puntius tiantian, Titan Barb



Mystacoleucus argenteus, Lemon-Finned Barb



Puntius binduchitra, Panther Danio



Esomus altus, Lofty Esomus



Puntius erythromycter, Lipstick Barb



Esomus caudocellatus, Tail-Spot Caudiocellatus



Puntius sp. 1, Cherry Puntius



Hampala salweenensis, Salween's Hampala



Puntius sp. 2, Golden Puntius



Danio choprae, Glowlight Danio

SECOND ROW AND TWO ON BOTTOM LEFT: R. BRITZ; THE REST: K. UDOMRITTHIRUJ



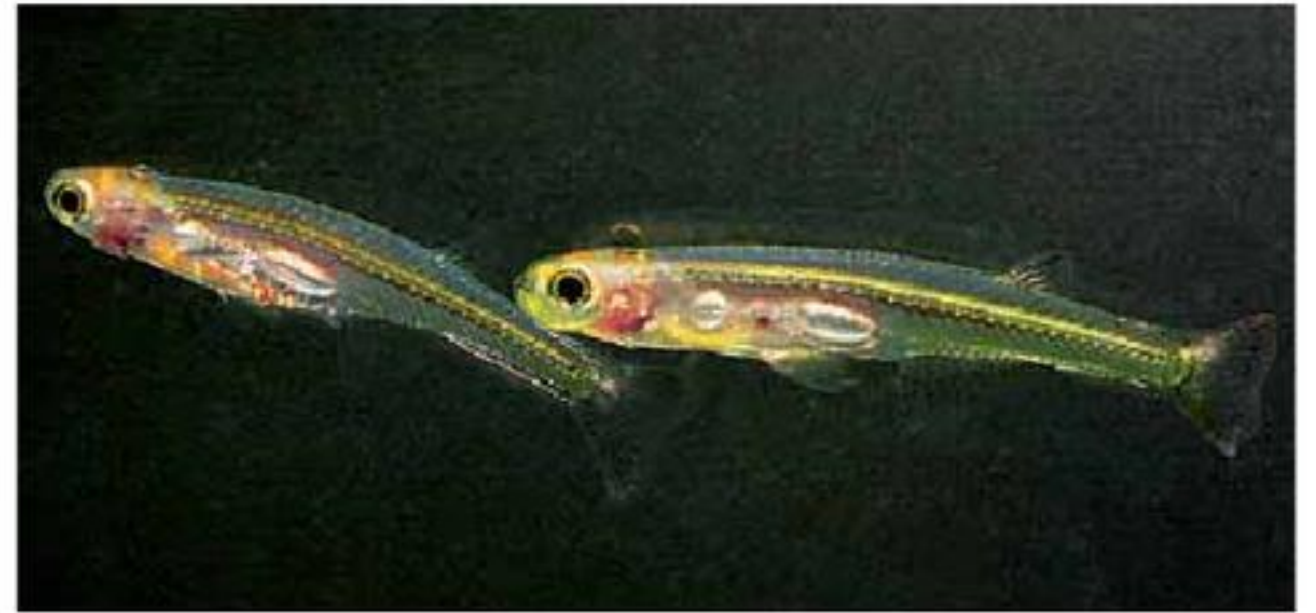
Danio dangila, Moustached Danio



Devario auropurpureus, Tiger Rasbora



Danio kyathit, Orange-Finned Danio



Danionella dracula, Dracula Fish



Devario shanensis, Hora Danio



Garra sp., Garra



Microdevario gatesi, Burmese Golden Rasbora



Homaloptera bilineata, Lizard Loach



Microdevario nana, Rasbora Nana



Aborichthys kempfi, Kempova Loach

AGA Aquascape



Underwater Gardens: The Aquatic Gardeners Association Aquascaping Contest is the world's oldest contest of its kind. This was our 13th year, and I have been privileged to judge both this contest and the Aqua Design Amano IAPLC from the inception. Over the last 13 years we have seen a tremendous growth of interest in aquatic gardening both in the U.S. and worldwide. One of the nice things about our AGA contest is that anyone can go onto our website, www.aquatic-gardeners.org, and see every tank ever entered, including all the details on the tanks and the judges' comments.

In the United States we come from a long, organized hobby tradition of fish keepers/breeders. It is often easier to teach a new hobbyist how to set up and manage a planted aquarium than it is to "unteach" much of what experienced fishkeepers take as gospel. (Fishrooms run on powerful air compressors just don't work for planted aquaria!) In North America, most of us live in areas with ready access to the outdoors—yards and gardens to feed our "natural souls." In many Asian cities, however, most people live in small apartments with no outdoor space. I suspect it is very tempting to have a little slice of nature in the apartment.

Winners



A flooded forest in just a 5-gallon (20-L) tank. Hong Te Syu's amazing aquascape "Spring" won in the Under 28-L category. See page 38.

As to why we don't see more North American winners in the major aquascaping contests, I think fewer Americans and Canadians are willing to constantly 'scape, tear down, and re-scape a tank just for the sake of entering contests. Personally, I value long-term aquascapes that are beautiful for a number of years. But these tanks with longevity are *not* the ones that typically garner the highest honors in aquascaping contests. Remember, also, how many tanks are entered in these contests. A tank can be very, very good and still not win a prize. Many of these tanks would be astoundingly beautiful if seen by themselves in the owners' homes. I regularly remind people: Aquascape for yourself. *You* are the person who needs to live with the tank!

I am very excited about the growth of interest and knowledge I see in the world of aquatic gardening. It is easier than ever to get the equipment and plants you need and the information to do it right. There is help in stores, books, on the Internet, and from members of local aquarium clubs. There are also small, local aquatic gardening clubs springing up everywhere. So if you don't belong to one yet, find one and join it—and enter an aquascaping contest!

—Karen Randall

“Rainforest”



Larry Lampert Most Innovative Award / Aquatic Garden, 200–320-L category

Zhang Jian Feng
Macau, China

Aquascape Details

Tank Size: 120 x 50 x 50 cm (47 x 20 x 20 in)

Volume: 210 L (56 gallons)

Lighting: 4 40-W

Plants: *Riccardia chamaedryfolia*, *Marsilea quadrifolia* Linn., *Myriophyllum mattogrossense*



©2012 ZHANG JIAN FENG

Judges' Comments:

Karen Randall: I absolutely love this tank...There's nothing else to say!

Kris Weinhold: Incredible scene—a perfect picture out of the rainforest. You've taken the treescape, upped the ante, and produced a forestscape. Well done!

Ballin Shaw: Very well-made trees incorporated into an aquascape that has depth and balance. The river running through the aquascape is very nicely defined and the hatchetfish are an excellent choice for this aquascape—they appear to fly in the tank! Good job!

“Spring”



©2012 HONG TE SYU

Aquatic Garden, Under 28-L category

Hong Te Syu

Ji'an Township, Hualien County
Taiwan, R.O.C.

Aquascape Details

Tank Size: 36 x 22 x 26 cm (14 x 8.7 x 10 in)

Volume: 20 L (5 gallons)

Plants: *Eleocharis* sp., *Hemianthus callitrichoides*, Java Moss, *Taxiphyllum barbieri*. Treetops: unidentified, but possibly Christmas Moss, *Vesicularia montagnei* or the very similar Triangle Moss.

Judges' Comments:

Karen Randall: I can't quite decide whether I like this tank or not. I am thinking it must be a maintenance nightmare with all those vertically placed sticks!

Kris Weinholt: Very serene forestscape, particularly given that this is just a 5-gallon aquarium. The mossy treetops might be slightly too thick, but overall it's very nicely executed.

Luis Navarro: Congratulations, your layout is great.

Bailln Shaw: Stunning tank with excellent use of rocks, roots, and plants to create depth. The stick that lies across the middle of the tank is not needed and detracts from the overall effect. Very well done!

“On the Edge of the World”



©2012 PROCIUK MIKOLA

Aquatic Garden, 60–120-L category

Procluk Mikola

Kalush Iwano-Frankiivsk, Ukraine
Website: Aquafanat, www.aquafanat.com.ua/forum/index.php

Aquascape Details

Tank Size: 60 x 40 x 30 cm (24 x 16 x 12 in)

Volume: 72 L (19 gallons)

Background: White film

Lighting: SunSun HDD600

Filtration: SunSun HBL-701 II

Plants: *Aegagropila linnaei*, *Eleocharis* “parvula”

Fishes/animals: *Hemigrammus rhodostomus*, *Neocaridina* sp. “Red Cherry”

Decorative materials: Substrate Hagen 1–2 mm and mountain stone

Judges' Comments:

Karen Randall: The rockwork is very nice. While the *Aegagropila* is interesting, there is SO much of it that it makes things look rather flat. I'd like to see a LITTLE more variety in the plants.

Kris Weinhold: Very creative use of algal *Aegagropila* in an aquascape.

Ballin Shaw: The arrangement of your hardscape is expertly done and the use of the *Aegagrophila* is a great choice to soften the lines. Very nice!

“Crimson Tide”

Aquatic Garden, 120–200-L category



“The Virgin Stream”

Aquatic Garden, Over 320-L category





©2012 SIM KIAN HONG

Sim Kian Hong

Senai Johor, Malaysia
 Website: Little Green Corner,
www.littlegreencorner.com

Aquascape Details

Tank Size: 90 x 45 x 45 cm (35 x 18 x 18 in)
Volume: 182 L (48 gallons)
Background: Black cardboard, paper
Lighting: 6 T5HO 36-W, 10 hours per day
Filtration: Eheim 2217
Supplementation: EI with KNO₃, Iron and Trace elements, twice a week with every water change.
Plants: *Eleocharis acicularis*, *Eleocharis* sp., *Glossostigma elatinoides*, *Hemianthus callitrichoides*, *Ludwigia arcuata*, *Rotala* sp. Goais, *Taxiphyllum* sp.
Fishes/animals: 50 *Hyphessobrycon amandae*, *Caridina japonica*, *Otocinclus affinis*
Decorative materials: ADA Amazonia 1 Aqua Soil, Seiryu stone

Judges' Comments:

Karen Randall: I love the contrast of color and texture in this tank. Even the fishes are perfectly chosen. Nice job!

Kris Weinhold: While the *Ludwigia arcuata* is striking, it may overpower the rockwork surrounding it. The rock is nicely placed and the plants are perfectly manicured.

Ballin Shaw: Absolutely LOVE this tank and its use of the *Ludwigia* and *Rotala* to provide color and contrast to the rest of the aquascape. Your use of the Seiryu stones is expertly done! Great tank!



©2012 PIOTR DYMOWSKI

Piotr Dymowski

Warsaw
 Mazowieckie, Poland
 Website: Design EliteAquarium,
<http://eliteaquarium.pl>

Aquascape Details

Tank Size: 120 x 60 x 50 cm (47 x 24 x 20 in)
Volume: 360 L (95 gallons)
Background: White wall
Lighting: 6 54-W T5s
Filtration: Eheim Filters
Fertilizers/supplements: Ferka Balance K, Ferka Balance N, Ferka Aquatizer, Ferka Aquashade, Ferka Rosetta, Ferka Stemma, Ferka Aquabase
Plants: *Anubias*, *Hydrocotyle* sp. "Japan," *Rotala rotundifolia*, *Microsorium pteropus* narrow, Taiwan Moss

Judges' Comments:

Karen Randall: There is a lot to like about this tank...the roots, the rockwork, and most of the planting. I just can't get past the bunches of moss on the tops of those heavy branches, though.

Kris Weinhold: The peaks in this aquascape are quite intriguing and immediately draw the eye. You've done a masterful job of trimming the *Rotala* and keeping the *Hydrocotyle* from taking over. Well done!

Luis Navarro: The way you blend the driftwood in with the rocks in this layout is really good; the use of moss is also remarkable. I really enjoy how balanced the whole layout is, from the plants to the fish. I get what you tried to accomplish here. Keep up the good work. Congratulations.

“Butterfly Life”

Paludarium category



“After reading about the aquatic fauna found around the Petén basins, I learned that both *Elodea* sp. and *Ceratophyllum* sp. are found extensively around some Lake Petén banks and shorelines. This inspired me to represent a shallow riverbank area, with Hornwort growing and left to trail along the surface to create a shady area.”—Lee Nuttall



“Lake Petén Shallows”

Biotope Aquascape category





Luidi Rafael de Souza Doim
 Ponta Grossa
 Paraná, Brasil

Aquascape Details

Tank Size: 120 x 60 x 60 cm (47 x 24 x 24 in)
Volume: 432 L (114 gallons)
Lighting: 6 T5 39-W, 12 hours per day
Filtration: SARLO Better Mini C pump, Marineland canister C260 filter
Plants: *Salvinia auriculata*, *Vesicularia montagnei* "Christmas Moss," *Taxiphyllum alternans*, *Vesicularia dubyana*, *Lomariopsis lineata*, *Hydrocotyle leucocephala*, *Hygrophila rosanervis*, *Hemianthus micranthemoides*, *Cryptocoryne willisi*, *C. wendtii*, *Glossostigma elatinoides*, *Spathiphyllum wallisii*, *Lomariopsis vestita*, *Maxillaria ubatubana*, *Chamaedorea elegans*, *Neoregelia* "Fireball," *Orthophytum foliosum*, *Cryptanthus microglazioui*, *Cryphaea tenella*
Fishes/animals: 11 *Puntius tetrazona*, 5 *Corydoras paleatus*
Decorative materials: Substrate Amazonia MBREDA, *Aroeira* driftwood, river rocks

Judges' Comments:

Karen Randall: Beautiful tank with good use of both hardscape and plants. I love that you've chosen the Tiger Barbs; these "common" fish are often overlooked by experienced aquarists, but they are just beautiful animals!
Kris Weinhold: Excellent wood work, and the moss growing on it looks fantastic!

©2012 LUIDI RAFAEL DE SOUZA DOIM



Lee Nuttall

Wolverhampton
 West Midlands,
 United Kingdom
 Website: The Central
 Scene, <http://centralscenemagazine.blogspot.co.uk>

Aquascape Details

Tank Size: 244 x 120 x 60 cm (96 x 47 x 24 in)
Volume: 1,474 L (390 gallons)
Background: Modified Back-to-Nature
Lighting: 2 T8 freshwater lamps
Filtration: Biological filtration behind the background, powered by 2 maxijet pumps rated 1,700 LPH and 2,300 LPH
Plants: *Ceratophyllum* sp. Hornwort
Fishes: 5 *Vieja melanura*
Decorative materials: Large river stones and cobbles, sand with fine gravel mix, beech tree branches

Judges' Comments:

Karen Randall: Not only is your tank faithful to the biotope, but it is a beautiful home for your spectacular fish as well. Great job!
Phil Edwards: You've created a lovely home for your large cichlids that makes me think of the rocky littoral zones of many lakes I've visited. The judicious use of Hornwort is well done. In this case less is definitely more. It adds a realistic touch of vegetation without overpowering the rocky theme.



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“Unknown Way”



Best of Show / Aquatic Garden, 28–60-L category

Leandro Artioli

São Paulo, Brasil

Website: Aquabase,

www.aquabase.com.br/2008

Aquascape Details

Tank Size: 60 x 30 x 30 cm (24 x 12 x 12 in)

Volume: 54 L (14 gallons)

Background: None

Lighting: 6 T5 14-W fluorescent bulbs (84 W total)

Filtration: 2 Eheim canister 2213

Supplements: Full set ADA liquid fertilizer and substrate system



©2012 LEANDRO ARTIOLI

Plants: *Fissiden fontanus*, Nambai Moss, *Hydrocotyle sibthorpioides* (*maritima*), *Rotala indica*, *R. sp* "Nanjenshan," *R. rotundifolia*, *Hemianthus callitrichoides*, *Micranthemum glomeratus*, *Riccia fluitans*, *Anubia barteri* "nana petite," *Limnophila* "Vietnam," *Echinodorus tenellus* "blood"

Fishes/animals: 20 *Paracheirodon simulans*

Decorative materials: Driftwood and rocks

Judges' Comments:

Karen Randall: The rich tapestry you have created in this small tank is stunning. Fabulous job!

Kris Weinhold: Very nice 'scape! The *Rotala rotundifolia* is beautiful and adds just the right amount of color to the green mosses and delicate stems. The hardscape isn't overpowering, but sticks out of the plants just enough to add intrigue. Very nicely done!

Ballin Shaw: Gorgeous tank and beautiful use of different species of *Rotala*. The hardscaping adds to this impressive tank. Well done!



This male *Hemiancistrus subviridis* demonstrates very nicely the long interopercular odontodes and the dense bristling of the first pectoral fin rays.



Hemiancistrus subviridis prefers protein-rich food, which can be used to lure the fish out of hiding.

Keeping & breeding *Hemiancistrus subviridis*



by Simon Meier • *Hemiancistrus subviridis* has fascinated me ever since I became interested in L-number catfishes at the beginning of 2008 and started to search the Internet for reports and pictures. My wish was to keep such fishes and, hopefully, breed them. But first I wanted to collect information on their husbandry and buy and set up suitable tanks. As a beginner in the hobby, I had no idea of how involved it would become within a short time.

In March 2009 I bought my first three specimens of *Hemiancistrus subviridis*. The fish measured a good 4.7 inches (12 cm), and at that point I had no idea of their sexes. A short time afterward I acquired four more of these lovely loricariids. All seven fish lived together in a tank measuring 55 x 24 x 12 inches (140 x 60 x 30 cm) and containing about 70 gallons (260-L). My intention was to raise them and then put together a nice breeding group. For a good year I made regular water changes and also tried several times to simulate rainy and dry seasons. I fed the fish a very protein-rich diet so they would grow well and the females would fill with eggs.

Just males?

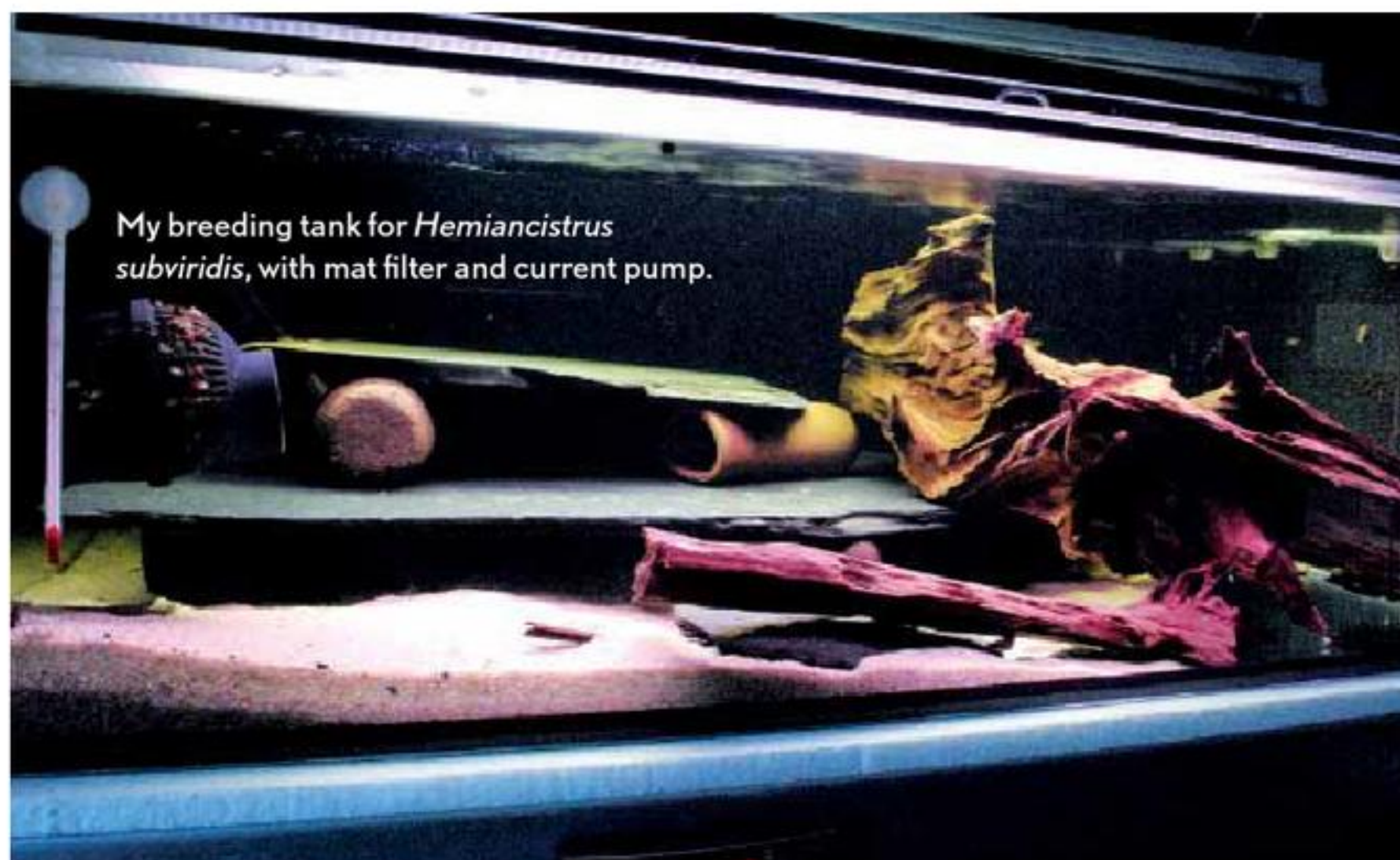
By observing the fish and comparing the individual specimens, I arrived at the suspicion that I had only males. So in February 2010 I bought another four specimens. To avoid having 11 catfish in the tank, which had now become somewhat cramped, I sold four that I had determined were males. Naturally the new wild-caughts had to be fed well, so I had to start again from the beginning! One of the new fish died after around a month; it had never accepted the food properly and was severely emaciated.

After moving in July 2010, I expanded my setup and put the six remaining specimens in a new tank of about 50 gallons (185 L). I arranged the tank with suitable caves and bogwood and filtered it with CZ airlifts and a Poret Foam mat filter. I also installed a current pump with an output of 1,321 gallons (5,000 L) per hour to provide current. The aquarium was illuminated for five hours every evening in the hope

that some green biocover would develop on the bogwood. On transferring the six catfish I could see that they included at least two females filled with spawn.

In September 2010 a Swiss colleague was ordering loricariids from a German importer, so I jumped on the bandwagon and ordered another three *Hemiancistrus subviridis*, which I added to my existing population.

In preparation for the breeding season (during winter) I resumed heavy feeding, often with discus pellets due to lack of time, but also regularly with mosquito larvae and assorted vegetables; the latter were mostly ignored by my specimens. From December on, when time permitted, I made large water changes every day using warm water at around 84°F (29°C)—pure reverse-osmosis water for two weeks and then tap water, which had a conductivity of 650 µS/cm, for two more weeks. When absolutely nothing had happened in the tank after two months, my motivation flagged and I gave up.

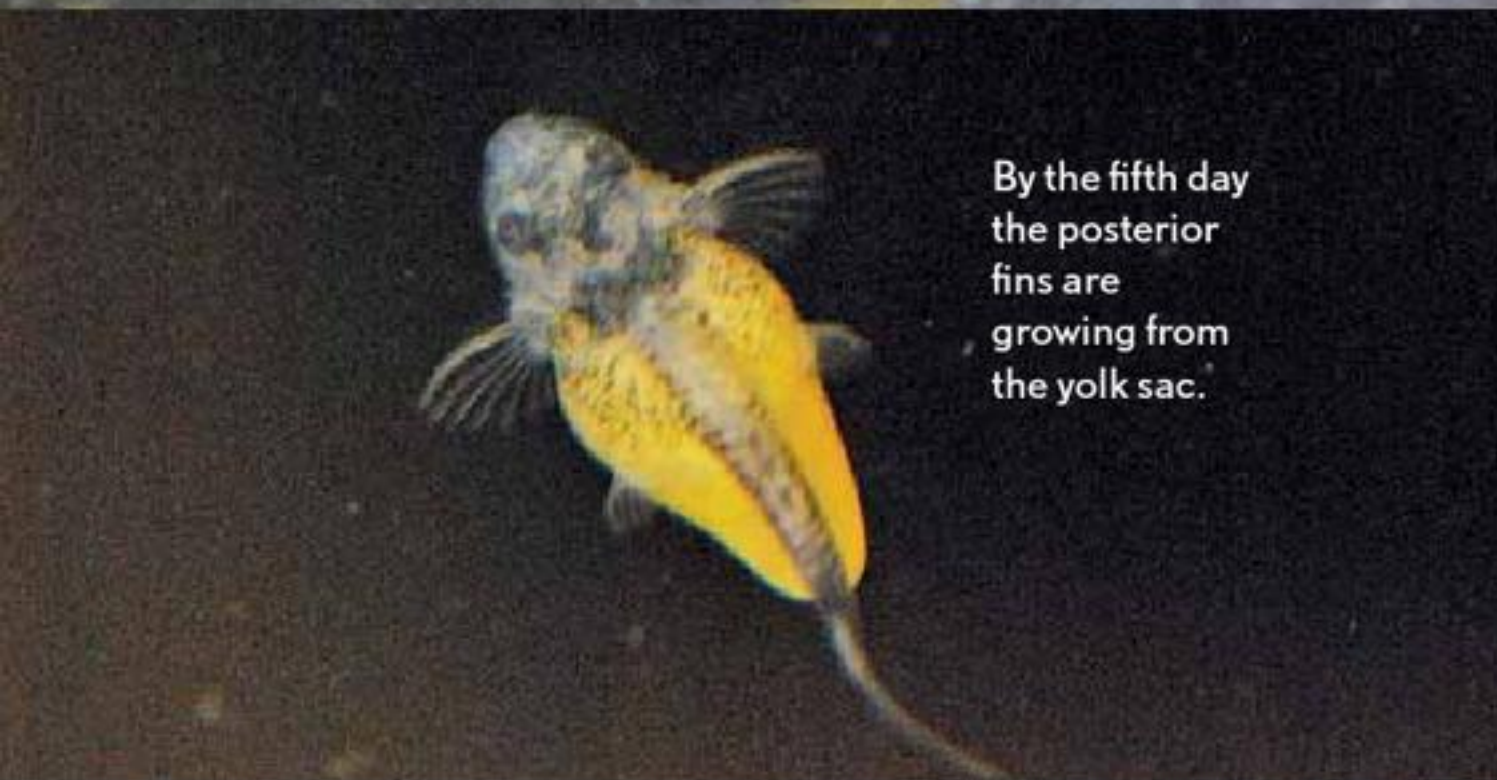




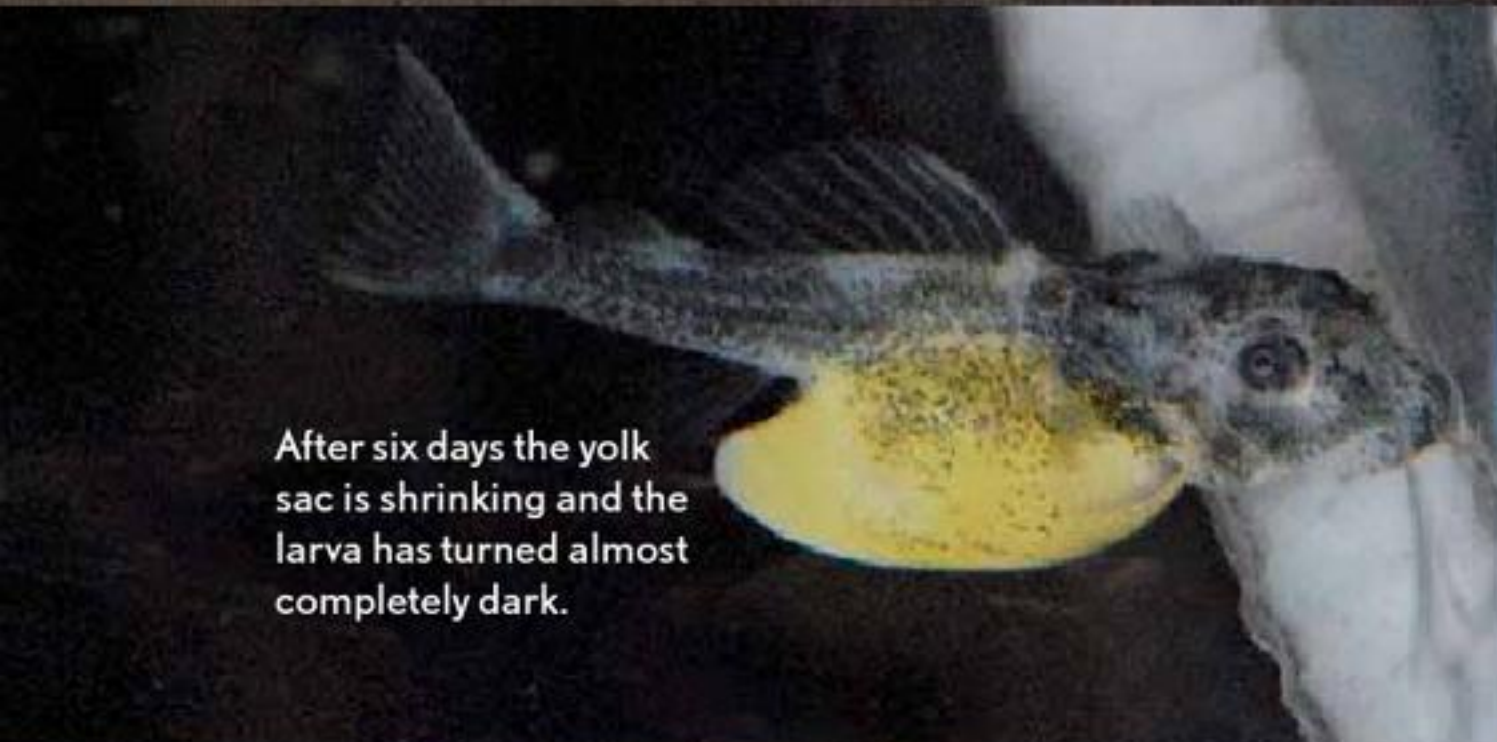
Egg balls in the egg tumbler.



Larva on the second day after hatching. Pigmentation is already beginning.



By the fifth day the posterior fins are growing from the yolk sac.



After six days the yolk sac is shrinking and the larva has turned almost completely dark.



For the first four weeks the young are grayish, but they change color rapidly and become typically colored *Hemiancistrus subviridis* after six weeks.

First spawning

My next idea was to play around with the temperature and the water parameters at the same time. Because I am fundamentally lazy and it is impracticable to keep altering the temperature setting on the heater itself, I ordered five electronic temperature-control units with external controls and immediately installed them on a number of tanks. I set the temperature on the heaters to 88°F (31°C) and regulated it down to 82°F (28°C) with the external thermostat.

A short time afterward I began a further attempt to stimulate the fishes to spawn. Again I performed water changes with pure osmosis water and simultaneously lowered the temperature in the tank from 82°F (28°C) to 75°F (24°C) over the space of a week. I immediately noticed increased activity in the aquarium, and the large males displayed the odontodes or dermal teeth on their pectorals as never before. This gave me hope!

I maintained the lower temperature for two weeks and made daily water changes as often as possible. After this period I let the temperature rise to 84°F (29°C), and just a week later I did a water change with tap water.

A day later I had to go abroad for a week on business. When I returned home, I checked my aquariums right away. I was delighted to see that there were a few odd eggs, albeit fungused, attached to the current pump in the *Hemiancistrus subviridis* tank. This was a bad sign for the clutch, but at least they had spawned!

I immediately looked for the breeding pipe being used and removed it from under cover. In the clay pipe I found the male with an estimated 60 eggs. Among them I could make out a few more fungused eggs. Because I had discovered the clutch shortly before hatching, I decided to take it away from the brooding male. I realized my mistake when I shook out the egg balls: most of the eggs were still two to three days short of hatching.

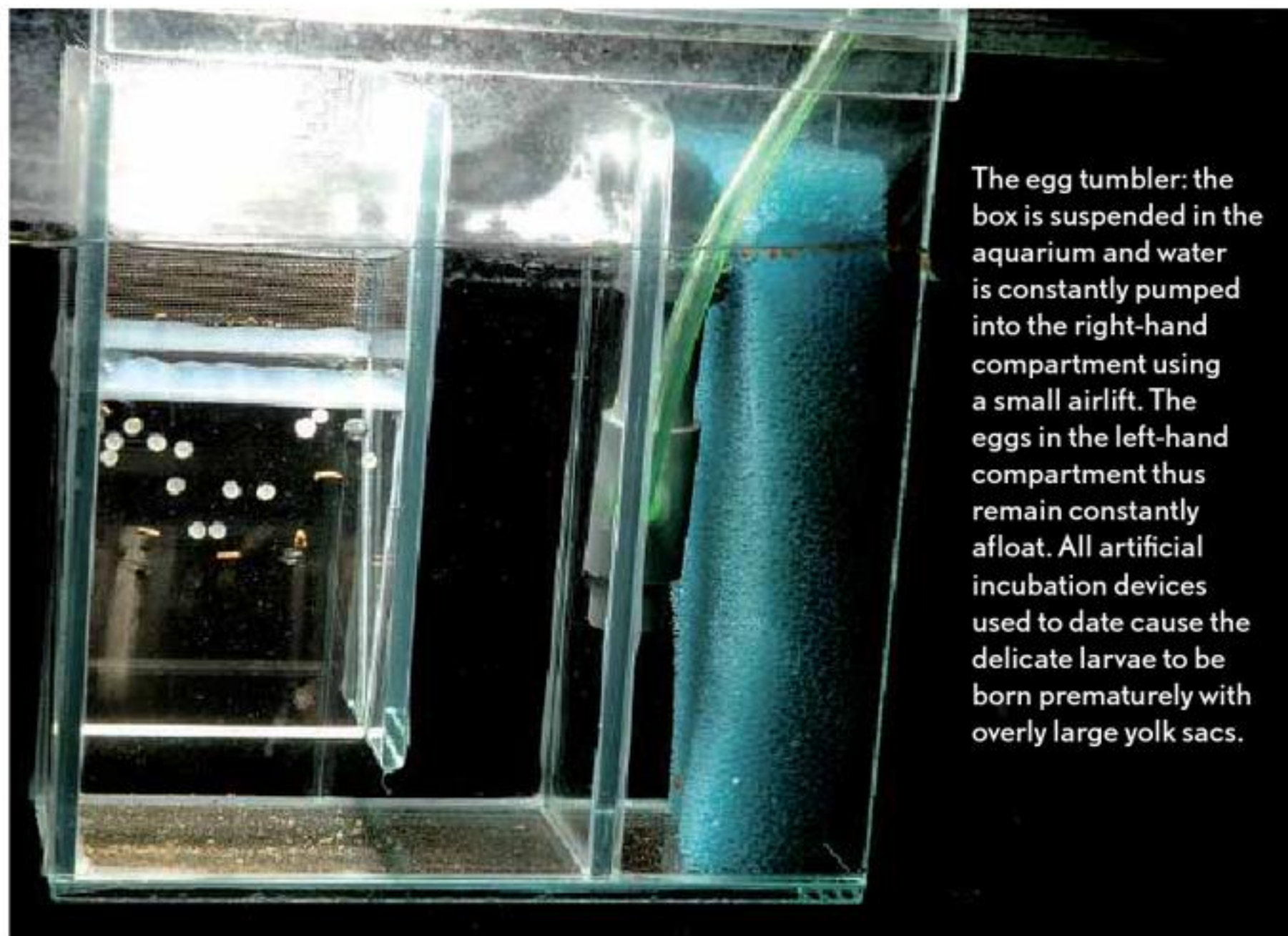
But as a result of my briefly taking the spawn out of the water, around 10 larvae hatched immediately. I put them in a suspended container and the put the

remaining egg balls in the egg tumbler. The hatched larvae died, probably as a result of their premature birth, and the clutch developed poorly. I had to remove fungused eggs several times daily. Nevertheless, larvae kept on hatching, and after a bare two days I had 20 larvae. I discovered white dots on the yolk sacs of the majority, so as I had feared, all the larvae perished!

A survivor

Barely a month later I was able to celebrate a further clutch. I found 17 ready-hatched larvae in the tank. Because of the ridiculously small number I assumed that the same female had expelled the remainder of her eggs. This time the larvae developed relatively well and I thought that I would probably be able to rear around 10 fry. In the end, only a single tough character survived the larval stage.

Initially the larvae were grayish in color, completely without spots. After a good month their ancestry became



The egg tumbler: the box is suspended in the aquarium and water is constantly pumped into the right-hand compartment using a small airlift. The eggs in the left-hand compartment thus remain constantly afloat. All artificial incubation devices used to date cause the delicate larvae to be born prematurely with overly large yolk sacs.

evident and the one surviving individual was a miniature edition of the parents. To my mind, tiny *Hemiancistrus subviridis* are the most attractive juveniles of all. Grass-green in color, with lots of tiny yellowish-white dots and big blue eyes, they look quite unique.

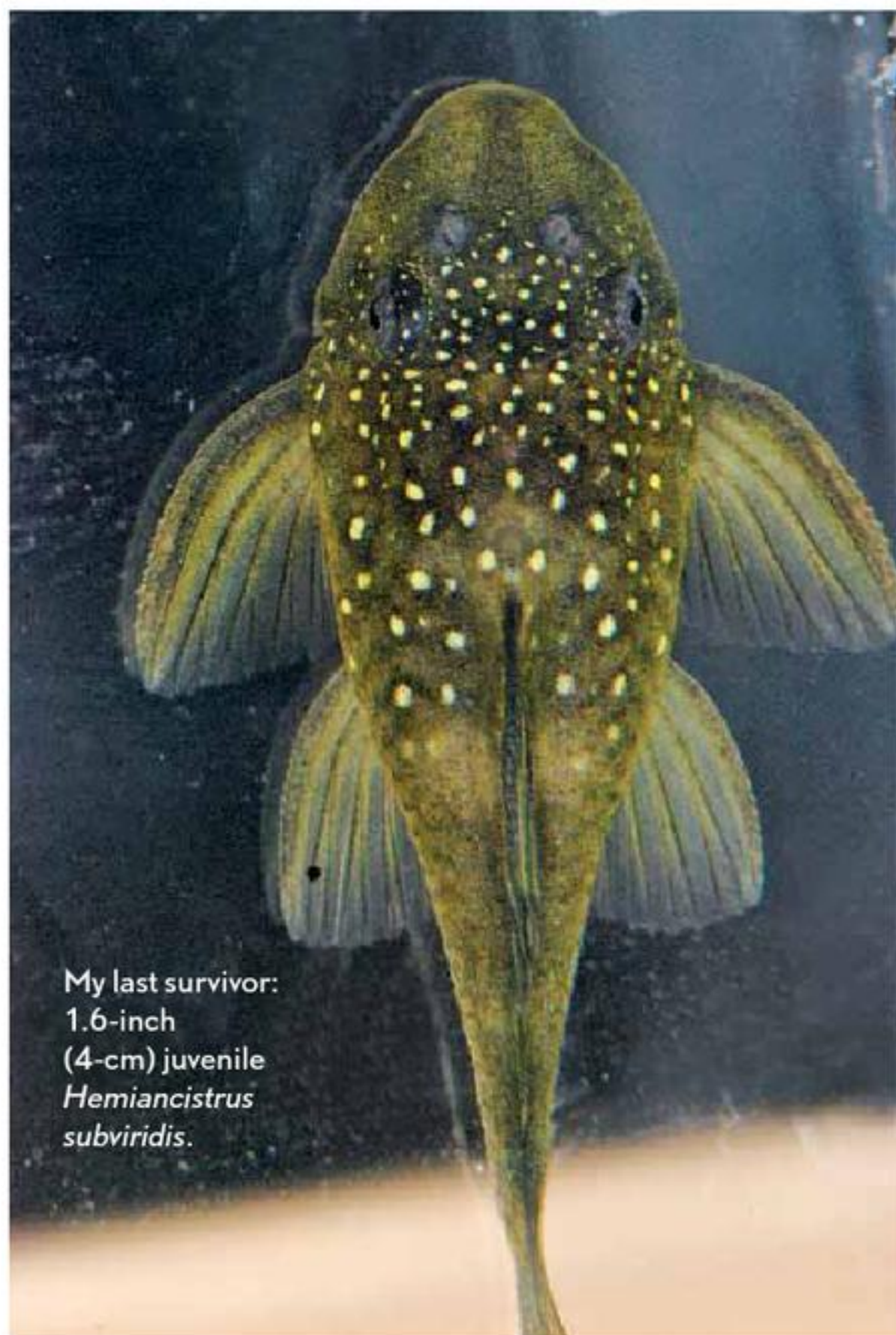
I am still keeping the survivor today, in a suspended container together with a number of my *Hypancistrus* sp. L 400 youngsters. It happily chases appreciably larger youngsters away from the food and has established its position at the top of the heap. The young appear to be unproblematical when it comes to food and further rearing, at least as far as I can judge on the basis of one individual; they just don't survive the larval stage in my tanks.

In the meantime, I have already had two more spawns, each with a good 60 eggs. I transferred the first of these clutches, together with the male and the cave, to a suspended container. In the course of three days the male repeatedly fanned hatched larvae out, albeit mainly fungused "remains."

Eventually I had 25 healthy larvae in the container, or so I thought. But every day I had to remove two or three dead larvae from the suspended container, so after around 10 days I had no larvae left. During these 10 days I had already discovered the next clutch—the fourth. As a result I now know that at least two pairs were spawning at the same time. The breeders measured between 5 and 6 inches (12 and 15 cm) total length. I will continue to be patient with *Hemiancistrus subviridis* in the future. I hope that the males are learning and after the 10th clutch will have gotten it right. The sole consolation is that I still have one juvenile. The little one is now four months old and measures 1.5 inches (4 cm). 🐟

REFERENCES

Seidel, I. 2008. *Back to Nature—Guide to L-Catfishes (Loricariidae)*. Fohrman Aquaristik AB, Jonsered, Sweden.



My last survivor:
1.6-inch
(4-cm) juvenile
Hemiancistrus
subviridis.



Adult specimen of *Pseudacanthicus* sp. "Alenquer"

For comparison, at page bottom: almost full-grown specimen of *Pseudacanthicus* sp. L 97 with round spots.

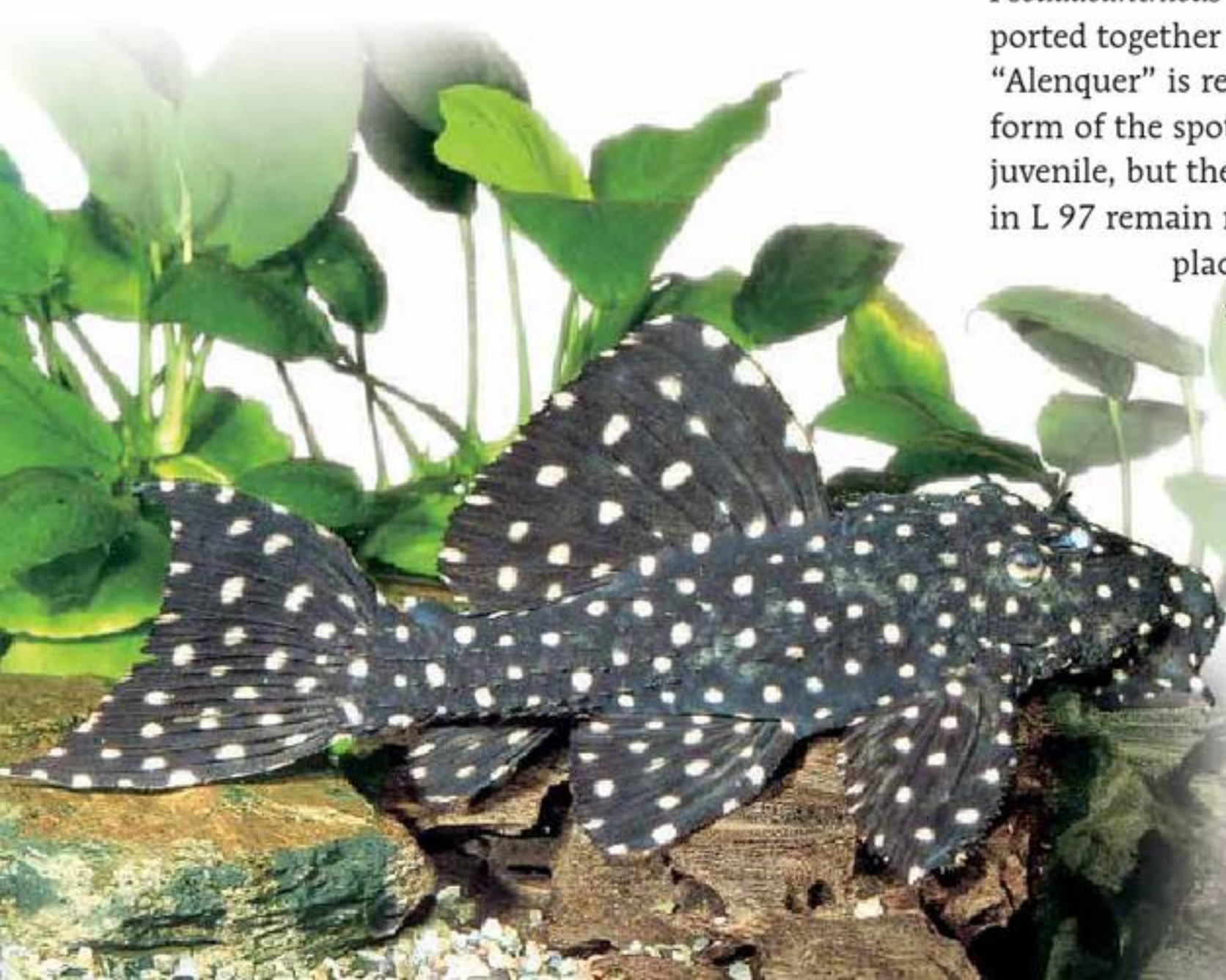
Breeding *Pseudacanthicus* sp. "Alenquer"

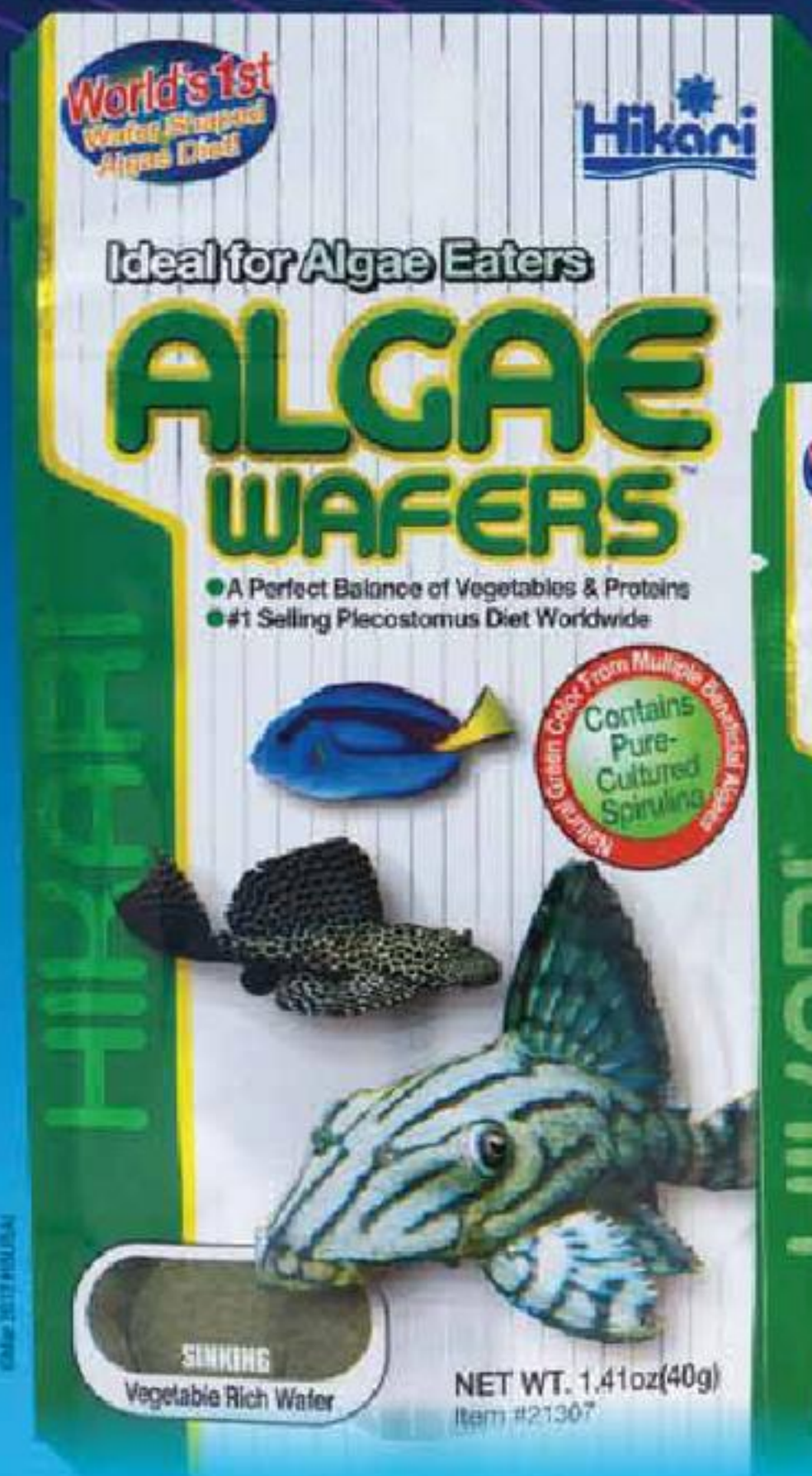


by Volker Degutsch • *Pseudacanthicus* sp. "Alenquer" is exported—on rare occasion—via Alenquer, the legendary tropical fish collection area in northern Brazil. It can be assumed that these fish are found in the general vicinity of the village of Alenquer, for example in the Rio Curuá, which empties into the Amazon not far from Alenquer. I have now managed to breed this species.

Pseudacanthicus sp. "Alenquer" and *Pseudacanthicus* L 97 are imported together and look very similar. When compared directly, "Alenquer" is readily distinguished from L 97 by the color and form of the spots. Both forms exhibit round white spots when juvenile, but these change as the fishes grow. While the spots in L 97 remain round and white for a long time, a change takes place earlier in *Pseudacanthicus* sp. "Alenquer". The spots become elongate, almost streak-like, and cream-colored.

Pseudacanthicus sp. "Alenquer" is rare, so I was delighted to be able to obtain two males and a female from Udo Wanninger in Switzerland in 2009. Because I had given up my breeding group of *Pseudacanthicus leopardus*, there was once again space in my 65-gallon (250-L) tank, which is run using a Poret Foam filter, an airlift, and a 264 gallon (1,000 L)/h current pump.





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My male *Pseudacanthicus* sp. "Alenquer" in front of his breeding cave.



The juveniles at 2 inches (5 cm) still have large spots.

The males measured 6.215–7 inches (16–18 cm) and the female 6–7 inches (15–16 cm). The sexes are readily distinguished by the form of the head and body. Males have a broad, blunt head and become increasingly slimmer toward the caudal fin. Females have a pointed head and are "fuller in the hips." I fed them everything that my freezer had to offer: whole shrimps, krill, *Mysis*, chopped mussel meat, and bloodworm and mosquito larvae.

A game of patience

In about two months, I noticed the first signs that the female was trying to get to the male into the triangular clay pipe that had produced breeding success in my *Pseudacanthicus leopardus*. Every three days the female lay with her head pointing toward the male in the cave, and I hoped they would spawn. I watched this fascinating spectacle for three weeks and it proved a real test of my patience—every time the female left the cave I hoped for a clutch.

Unfortunately, I was disappointed for a long time, so much so that I contemplated sending the fishes back to "prison" in Switzerland. The threat worked, and after three weeks I spotted a ball of eggs, which yielded me fry. The water parameters at the time of spawning were pH

6–6.5, 3°KH, conductivity 300 μ S/cm, and temperature 82°F (28°C). I didn't observe the usual biting on the part of the male during mating.

I didn't remove the fry until after they had used up their yolk sacs, when I transferred them into a suspended container. I let them grow on there to around .75 inch (2 cm) in length and then placed them in a 16-gallon (60-L) rearing tank. They exhibited very beautiful large, white spots on a black body, and still had a boldly contrasting pattern at a size of 2 inches (5 cm).

For several weeks after spawning I rarely saw the female, but three months after the first spawning I had a second clutch containing roughly the same number of eggs. By February 2011 the males had grown to around 8.5 inches (22 cm) and the female to around 7 inches (18 cm), and there was a further clutch of more than 200 eggs. Unfortunately, the male ate this clutch after three days and looked as plump as the female had previously.

I have already given the first juveniles to interested aquarists in order to secure the population, as it is questionable whether there will be any more imports. The species isn't on the Brazilian approved list, so at best there may be further imports under the label L 97. But will the fishes then be recognized for what they actually are? 🐟



Juveniles around .75 inch (2 cm) long are gorgeously patterned.

MIDDLE: I. SEIDEL; OTHERS: V. DEGUTSCH

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First breeding of *Peckoltia* sp. L 49



by Jonas Keller • I was looking for occupants for my new catfish tank at the end of 2009 when I came across an advertisement for a group of L 49 for sale. I telephoned immediately and was able to reserve the rare catfish. A month later my tank was ready, and I picked them up. Right from the start I was enchanted with the group, and my enthusiasm hasn't waned to this day.

My 11 *Peckoltia* sp. L 49 are 4.75–6 inches (12–15 cm) long and originally came from Rarefish GmbH in Bassersdorf, Germany, now out of business. I keep the group, along with six semi-adult *Panaqolus* L 397, in a 66-gallon (250-L) aquarium measuring 47 x 23.5 x 15.75 inches (120 x 60 x 40 cm). The tank has a large bottom area especially suited to the the catfish, and they obviously appreciate this.

The water is preconditioned, but not particularly soft. I keep the L 49 group at a conductivity of 150–300 $\mu\text{S}/\text{cm}$, a temperature of 79–86°F (26–30°C), and a pH of 7–7.5. The tank is set up with a sandy bottom plus loads of clay pipes, slates, and soft wood. In addition to caves, hiding places in the wood are important, especially for the females. The lighting isn't all that bright, but strong enough to enable a number of *Anubias* to grow.

From the beginning, the catfish felt very much at home and had no problem settling in. They were very active, and I was often awoken during the night by the sounds of their energetic swimming at the water's surface. At this time the males could be readily distinguished from the females by their odontodes. I did notice with surprise that they didn't occupy the pipes.



The group became quieter in the summer and the males' odontodes disappeared completely. In the autumn the catfish become more active again, and the males developed odontodes and lay in the pipes more frequently.

These catfish were always very peaceful in their behavior. I never saw any serious squabbles, either intraspecific or with the L 397 or other tankmates. The catfish frequently came out of their hiding places by day and never exhibited any real shyness. They always became quite active in the evening at feeding time.

Above: The breeding tank, set up with lots of wood, pieces of slate, clay pipes, and a number of plants, is sparingly illuminated with two 7-W energy-saving lamps.

Atmospheric pressure and water changes

When their sexual characters became more apparent in the autumn, I decided to try to breed these catfish. However, I hadn't found any helpful information about them. In the *Baensch Catfish Atlas* in German, it states only that they are rarely imported as juveniles and that there

Adult specimen of *Peckoltia* sp. L 49.





Larvae hatching.



My first young a day after hatching.

is no information on adult specimens; there is nothing at all about captive breeding. So I relied on various reports on *Peckoltia compta* L 134 and hoped to achieve success in that way.

I started by altering the feeding a little. I fed not only various tablets, but also increased amounts of shrimps and mosquito larvae. This resulted in the females visibly filling with eggs. In addition, I paid more attention to weather conditions and often performed large water changes with significant fluctuations in the water parameters. In particular, I altered temperature and conductivity.

In mid-December 2010, severe wintry weather set in. I did a cold water change and lowered the temperature to 79°F (26°C) and the conductivity to 200 µS/cm. The group immediately became active and I noted several pairs swimming excitedly in and around the caves. To my great disappointment, everything was quiet again the next morning and there was not a clutch to be found anywhere. After a few days I raised the temperature and conductivity back to the initial values of 86°F (30°C) and 250–300 µS/cm.

The next low-pressure system arrived at Christmas, and I altered the water parameters again. But this time I saw no marked signs of pairing behavior. Following Christmas there were almost three weeks of continuous high pressure. I returned the water parameters to their initial values and abandoned the cold water changes.

The next low-pressure system was forecast for the second week in January. Even before I could get around to a water change, I found a number of well-developed eggs in front of a pipe, fanned out of the cave by a male. The pipe was about 7.9 inches (20 cm) long and had an internal diameter of about 1.6 inches (4 cm).

I initially transferred the male, complete with pipe,

into a suspended container, planning to put the larvae that had spilled out of the pipe back inside. But because the eggs were already well developed and the male had fanned more than half of them behind him, I flushed out the pipe and put just the eggs in the suspended container. I counted around 25 yellow eggs, barely .2 inch (5 mm) in diameter. Unfortunately, a number of them had burst and I had to remove them. That same evening the first larvae hatched, and by the next morning all 21 remaining larvae had freed themselves from their shells (with a little assistance from me). I thoroughly cleaned the suspended container so that the larvae would stay healthy.

Rearing problems

For rearing I used a suspended container with a small airlift that permanently supplied the chamber with fresh water from the main tank. After a few days I placed a small piece of wood in the tank so that the larvae could hide. They slowly took on a degree of color.

As soon as the yolk sacs were exhausted, I fed the larvae several times a day with decapsulated *Artemia* cysts and powdered food consisting of crushed Sera Viformo tablets. They grew on quickly.

During the phase when the fry began to feed there were numerous losses, which I am unable to explain. The fry looked well and had more than enough food, and I siphoned off the old food twice daily. When the young were around .6–.8 inch (15–20 mm) long, no more died and the remaining 10 catfish continued to grow.

By the end of February there were four more clutches. However, one was abandoned by the male and largely fungused, and another was poorly tended and eventually eaten. Luckily, another male had looked after his clutch



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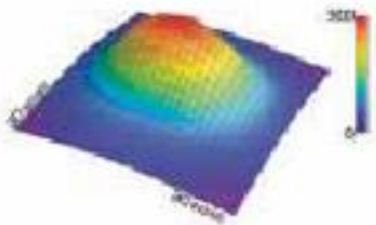


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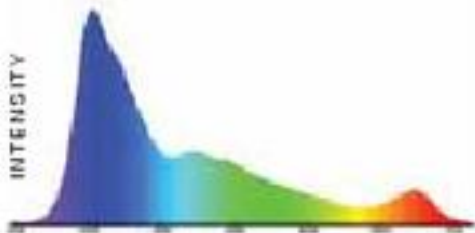
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Pair from above. The male (the lower individual) has a broader head and his body is a little longer; the female looks beefier and has a somewhat more pointed head.

well. I didn't discover it until the larvae were already slightly pigmented, almost a week after hatching. I flushed the cave out and counted 43 healthy larvae. I didn't really change my rearing methods, except that I began feeding the Sera Viformo at an earlier point.

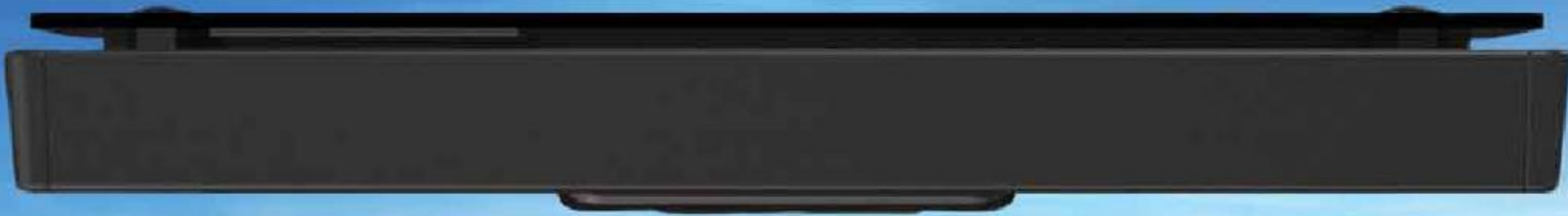
This time I had practically no losses and was able to rear the fish without problems of any kind. I attribute the numerous deaths during the first rearing to the poor care of the clutch. If the male tends the clutch reliably and for a long time, the young are more robust and survive rearing better.

I currently have almost 100 young catfish ranging from .6 to 1.75 inches (15–45 mm). At a body length of around .10 inch (25 mm) I transfer them into a 16-gallon (60-L) rearing tank equipped with an airlift and a small mat filter. Hiding places are provided by five slates stacked one above another at intervals of .8 to 1.2 inches (2–3 cm), a number of oak leaves, and a respectable piece of soft wood. The little ones are fed with assorted food tablets.

Even though *Peckoltia* sp. L 49 isn't spectacularly patterned, it is an interesting catfish that is well suited for South American tanks 47 inches (120 cm) long and up. The fish's lack of markings is more than compensated for by its behavior. I recommend these extremely peaceful catfish and hope that other people who keep them will get as much pleasure from them as I have. 🐟

REFERENCES

Seidel, I. and H.-G. Evers. 2005. *Wels Atlas*, vol. 2. Mergus Verlag GmbH, Melle, Germany.



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The ferocious female stands watch over her little "herd" of free-swimming fry. The male, pictured at right, appears to have little or no interaction with the fry after fertilizing the eggs.

Dicrossus maculatus:

Breeding the Checkerboard Cichlid



article by David Magid; images by Noah Magid • “Checkerboard Cichlid” is one of those fuzzy common names that may end up attached to related but different species, usually *Dicrossus filamentosa* or *Dicrossus maculatus*. If you see a tank labeled “Checkerboard Cichlids” and the fish are juveniles, you’ll know whether they are *filamentosa* or *maculatus* by the price. The *maculatus* are significantly more expensive.

Apparently, *D. filamentosa* can be found in the wild in the company of the Cardinal Tetra (*Paracheirodon axelrodi*). I speculate that, because Cardinal Tetras are in constant demand, *D. filamentosa* are caught along with the tetras and so can usually be found at a modest price. This species is often called the Lyretail Checkerboard Cichlid. Conversely, I assume that *D. maculatus*, not being caught alongside a similarly popular species, is less available. The fact that *maculatus* is not widely bred in captivity apparently adds to the price. This is the Checkerboard Cichlid and a species that caught my eye; when it appeared on my local fish store’s website as “recently arrived,” I didn’t hesitate. This time I was ready for a new dwarf cichlid and wanted to expand my collection, having moved fishes around to free up a breeding tank.

When purchasing juveniles, I prefer to buy six to eight fish to minimize the likelihood of getting all males or all females. More than once I have ended up with all of one sex. Most recently that happened when eight *Pseudotropheus saulosi* turned out to be all males. Of the five *maculatus* juveniles available, based on size alone it seemed that one was likely a male. Considering that *maculatus* are not readily available and that I was confident I had at least one male in the group, I decided to purchase all five.

Plants and furnishings

My new fish were destined for a 30-gallon (114-L), 36-inch-long (91-cm) tank heavily planted with a combination of *Vallisneria americana*, *Taxiphyllum barbieri* (Java Moss), and a few bits of *Microsorium pteropus* (Java Fern). With a 36-inch (91-cm) compact fluorescent fixture lighting the tank, *Lemna minor* (duckweed) completely covers the surface, growing rapidly and creating filtered lighting below. Every week or two I thin out the duckweed by removing what is easily netted.

In addition to the plants, the tank floor is crowded with small terra cotta flowerpots and coconut shells on a sand substrate. To create “caves,” I enlarge the drainage hole at the bottom of each pot and drill an entrance hole into the side of the pot near the top rim. I place





There's no mistaking a pair of *maculatus* in breeding colors, but it takes patience to see them. Give this reclusive species plenty of cover in the form of plants and caves, and they will be very happy.

these pots in the tank upside down, with the drainage hole on the top and the drilled entrance on the bottom. Coconut shells cut in half form another type of cave. I drill a single entrance hole in the side of each half-shell and place it in the tank with the cut side down.

To make tunnel-like structures, I use two flowerpots of the same size. I chisel or chip out the bottoms of the pots, apply a bead of silicone all along their top rims, and glue the two pots together, top rim to top rim. After the silicone dries, I place the glued pots on the tank floor on their sides, creating a tunnel with an opening at each end. A few pieces of driftwood complete the tank furnishings.

Filtration

Everyday life can interfere with the best intentions and schedules for tank maintenance. Acknowledging that, I tend to over-filter my tanks. A few years ago I read about Poret foam—essentially a huge sponge filter—and decided to try it out. It's great for the amount of filtration it provides. On my 30-gallon (114-L) and larger tanks, I typically use both canister filters and the Poret foam as a sponge filter. The 30-gallon tank housing the *Dicrossus maculatus* is filtered with such a sponge filter run by a power head (and a canister filter).

Water

Until recently, I never had to pay much attention to water chemistry. My water was very soft out of the tap (my city reports hardness at 24 ppm) with a pH of 6.5–7.0 that quickly dropped to 6.0. It was well suited to many South American cichlids. For years my water changes consisted of simply matching the temperature of the new tap water to the tank being cleaned and adding a water conditioner for dechlorination.



About 18 months ago, the city relined the interior of our water lines with a cement coating. Now my tap water has a pH of 8.0 or higher. I have been told that eventually a slime coating will form over the new lining, effectively keeping the water away from the cement, so the pH of the tap water will again be lower. Until that happens, I check the tank pH and treat the replacement water to bring the pH down to between 6.0 and 6.5. I try to change one-third to one-half of the water every two to three weeks. Occasionally the time between water changes stretches to four or even five weeks, so I'm glad I use a large sponge filter and that the tank is overgrown with plants.

Grow and wait

Into my heavily planted, heavily filtered tank went my newly acquired Checkerboard Cichlids. I quickly learned that *Dicrossus maculatus* seemed happiest when I could not see them. The overgrown tank, with plenty of hiding places and filtered lighting, was an excellent fit for this species. These are not out-and-about fish; even at feeding time they hang back and may remain out of sight. To view them I would sit and watch patiently for some motion, which usually occurred in the rear lower half of the tank.

The fish have not been aggressive eaters and with the heavy plantings, I am happy to have many snails eating what the fish don't find or don't seem to want. With relatively small mouths, my *maculatus* demand smaller-sized foods, so they have settled on taking small cichlid pellets, frozen *Daphnia*, frozen mosquito larvae, frozen whole brine shrimp, and, grudgingly, on occasion a few flakes. In summer, they get an occasional feeding of live mosquito larvae. Given their general lack of enthusiasm for foods, I feed them a small amount of food twice a day.

Other than feeding, changing the water, and thinning the duckweed when the food no longer found its way down into the water, I left the *maculatus* alone. Given their reclusive nature, I often wasn't certain they were all still alive. Once in a while I could catch a glimpse of all five; most of the time I could see only two or three. As they grew I found, based on size and coloration, that I had two males and three females. One female was nearly the size of the larger male; the rest were perhaps two-thirds the size of the males.

With such resplendent colors, it is a wise fish that stays out of the limelight. Watch quietly, and soon there will be a little movement, and then a bit of pecking at the tastiest morsels offered.





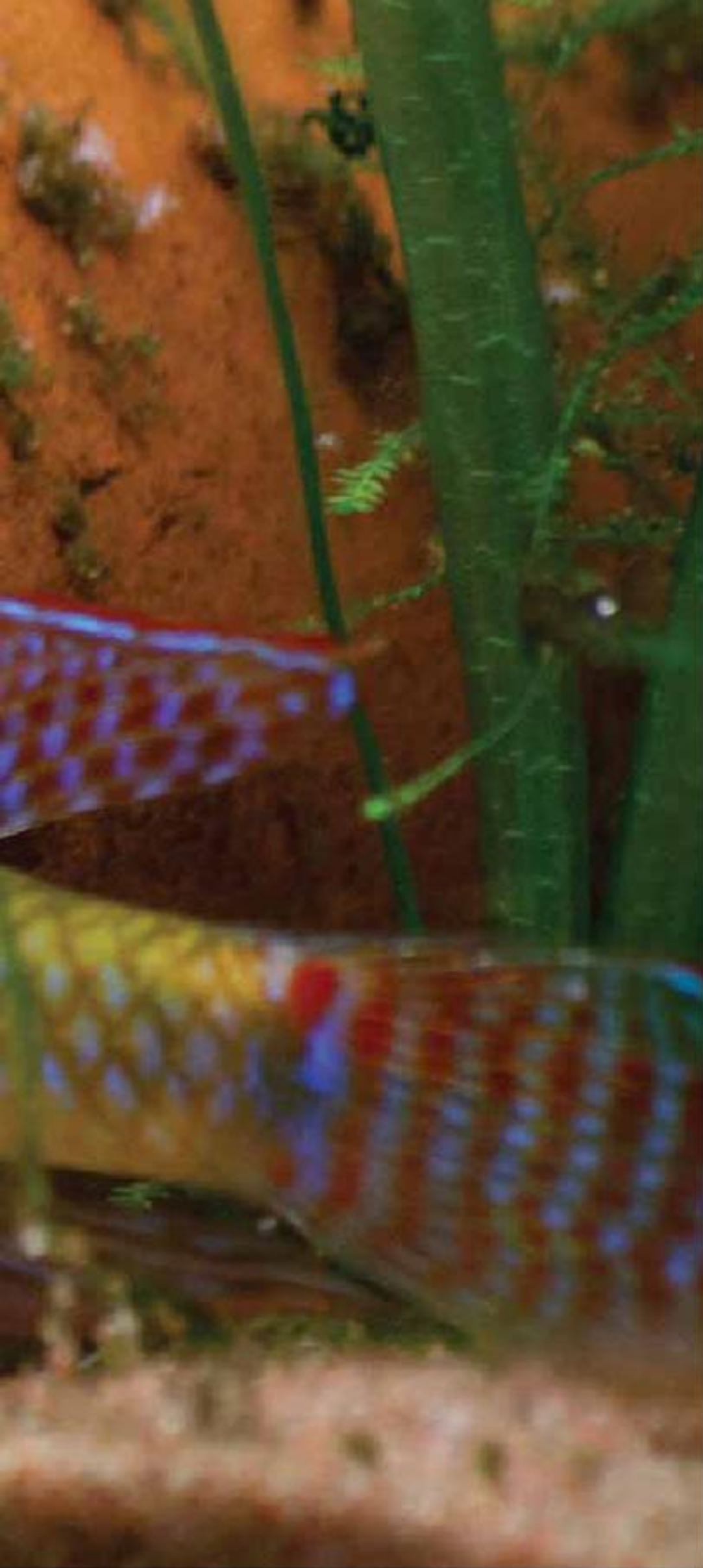
The caves and tunnels in the tank provide desirable spawning sites.

The males staked out opposite rear corners of the tank. The dominant male freely roamed the tank, harassing the other male whenever they met. The females roamed the tank too, but shied away from the males' territories. Both males attempted to impress whatever female they met. A few times I had a clear view of the dominant male displaying. The most notable aspect of this display is the way the male moves his long pelvic fins in a wavelike motion, similar to the way gouramis twitch their feelers when greeting another of their species. The times I saw this behavior, the target female never seemed particularly impressed and left the area in short order.

As the months passed, the dominant male grew noticeably larger than the other male and one of the females grew noticeably larger than the other two females. Ultimately, the largest female is no more than two-thirds the size of the larger male. My largest male is approximately 3.5 inches (8.9 cm) long.

Colors

The *Dicrossus maculatus* male is colorful, with fins of iridescent reds and blues. The caudal fin (tail) has near-solid vertical bands of red, separated by iridescent blue. The same reds and blues are found on all other fins except the pectorals. Tapering to a point, the pelvic fins extend nearly to the base of the tail. The mouth and gills are covered in striations of iridescent blue with red highlights. The black checkerboard spots appear in two faded rows, one just below the dorsal fin and the other along the lateral line. All of this is against a pale cream-gold



background of scales edged in orange-red.

In non-breeding colors the female is a pale cream with the same two rows of checkerboard spots as the male. In the female, the checkerboard is distinct. In addition there is a black band that extends from just behind the eye to across the snout. In breeding colors the female has bright, yellow-orange pelvic fins, an orange anal fin, and more pronounced contrast of the dark patches that create the checkerboard pattern along the body as well as the black band across the snout. The leading edges of the pelvic fins are black, providing a striking contrast with the yellow-orange.

As a demonstration of individual variations, another breeding female displayed very dark checkerboard spots with much darkening of the space between the spots, and specks of red on her dorsal fin.

First fry

I first saw a female in breeding colors four months after their arrival. Swimming as a small cloud around her were perhaps 18 to 24 fry mottled by specks of grey-black. By my guess, they were free-swimming for a day or two. I could see the fry grazing on the plants, flowerpots, coconut shells, and sand. Obviously, there were enough microorganisms to keep them going. Nonetheless, I started hatching baby brine shrimp (BBS) and in the meantime made available frozen baby brine shrimp, using a medicine dropper to squirt the thawed nauplii in the vicinity of the babies.

Although the mother aggressively chased off any other fishes, male or female, I debated whether to separate the fry to another tank or leave them with mom. On one hand, they were free-swim-

ming, had available food, and clearly had a formidable mother. On the other hand, these were reputedly difficult fish to breed, I was a new breeder, and the tank had four other adult fishes who presumably shared none of the female's protective instincts.

With all the plants and furnishings, removing the fry was going to be a challenge. They would have to be near the front of the tank and I would have a very short time to catch them all before they scattered or the female, sensing danger, drew them toward the rear of the tank, where I wouldn't even see them. Knowing I would never catch them all and that the female was thus far doing a fine job of rearing them, I decided I would siphon out those I could catch, but no more than half of them.

I was able to siphon out what turned out to be 12 fry. I put them into a 5-gallon (19-L) tank filled completely with water from their 30-gallon (114-L) tank. The 5-gallon tank had a sand substrate, an established air-powered sponge filter, and Java Moss. It was a close replica of their former home.

Unfortunately, over the next few days all but a few of the fry in the 5-gallon tank died. Fortunately, those that stayed behind in the 30-gallon tank were fine.

Growing out

With approximately 12 fry under the care of their mother and 3 under mine, I would be able to see if one group fared better than the other. For a few weeks I fed the fry in both tanks freshly hatched baby brine shrimp. The fry didn't seem to grow particularly fast in either tank.

After the fresh BBS, I switched to a mix of frozen BBS, frozen rotifers, and a bit of pulverized flakes. As they grew I added frozen *Daphnia*, frozen whole brine shrimp, and very small pellets to their diet.

It is hard to say how long the mother actively protected her offspring. With plants everywhere, especially an overabundance of Java Moss, the young seemed to feel secure as they wandered around. Certainly they stayed near the female for weeks, but when they reached perhaps ½ inch (13 mm) in length, they could be seen throughout the tank.

By the time the young were about ¾ inch (19 mm) long, I saw one of the females with a cloud of fry around her. I decided it was time to remove the first batch of

babies, but I did nothing for a few days while I debated exactly how I was going to catch them.

Removing all the plants, flowerpots, coconut shells, and driftwood would, in theory, make the task relatively easy. But I knew there would be enough suspended debris left that I would surely miss finding a ¾-inch fish whose color blended with the sand and would have, as excellent camouflage, bits of stirred-up detritus. I felt nearly certain the new batch of fry would be killed or eaten in the ensuing chaos. Finally, given how reclusive my adult *maculatus* had been in a well-furnished tank, I worried about disrupting their lives so dramatically.

In the end I decided on a slow, stealthy approach. I knew the fish all ventured toward the front of the tank

for feeding and grazing. Over the next few days I inserted a 2-inch (5-cm) and a 4-inch (10-cm) net into the tank and waited. I was able to net and remove the ¾-inch fish one or two at a time. Patience won out, and after a few days I had moved a dozen ¾-inch fish. They went into a 90-gallon (341-L) tank along with some juvenile angelfishes. Coming from a heavily planted tank, they were skittish in their lightly planted new home. They stayed in a close group, hovering near the bottom and darting to a new location when they felt threatened. Adding Java Moss and many Java Ferns provided enough cover that they became more secure and, consequently, calmer. By this time, only one of the fry I had moved to the 5-gallon tank survived, and I reunited it with its siblings in the 90-gallon tank.

While I continued to feed them frozen foods, these first-generation, tank-raised offspring (F1) also began to take flakes more readily than their wild-caught parents. Overall, they were more aggressive eaters than their parents.

At 10 months they were approximately 1.5 inches (3.8 cm) long and I could see that the largest was a male. While pleased at their success in breeding under my care, seeing only one male raised my concern about the sex ratio. The store where I purchased the parents was interested in obtaining the offspring and not concerned about the apparently limited number of males. I traded them for store credit, but continued thinking about sex ratios.

More fry

Since the first female did a vastly superior job of rearing her young than I did

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with the first batch of *maculatus* fry, I decided to play a reduced role with the second. Other than feeding, water changes, and an occasional thinning of the duckweed and Java Moss, I left the parents and fry alone. During this period most, if not all, of the *Vallisneria* died off from what I assume was a lack of light (due to the heavy growth of Java Moss and duckweed).

A few months before, the tank had become completely overgrown and there were many 1-inch (2.5-cm) juveniles visible, but no fry. I took the drastic step of removing most of the plants and furnishings to catch the juveniles and clean things up a bit.

The adult census was three females and one male. Apparently the subdominant male had died or been killed. I never saw the body—again, it was good to have many snails in the tank and excessive filtration. I removed 35 juveniles to the 90-gallon tank for growing out.

Despite multiple broods, I have not yet witnessed an actual spawning, nor have I seen a female tending to fry as wrigglers. Based on the tank setup and what I have observed, this is what I think happens: When I see a female in spawning colors, but without fry in tow, she tends toward the rear, bottom area of the tank, where I placed many of the tunnel-like flowerpot arrangements (two pots without bottoms connected at their rims). Since I have rarely seen them enter the upside-down pots or the coconut shells—in spawning colors or otherwise—

and there are no broad-leaved plants of consequence, my suspicion is that spawning takes place in one of the tunnel-like pots. Given that the female chases away all others that come near her, I assume she takes sole possession of the eggs early on. I have seen nothing to indicate whether she moves the eggs or wrigglers before they are free-swimming.

Sex ratios

Having previously raised multiple broods of *Apistogramma borelli*, always with significantly more males than females, the problem of sex ratios concerned me. To increase the potential number of *borelli* females, my local fish store suggested lowering the pH using Sphagnum Moss. It made no difference; the broods continued to have relatively few females. At this writing, the second brood of 35 *maculatus* has 11 visible males (approximately 30 percent).

When my local fish store took the first brood, there was only one clearly visible male. Although they might simply have been too young to sex, I sensed a potential problem and, given my past experience with *A. borelli*, I decided it was time to get a better handle on factors affecting sex ratios. A bit of web searching yielded two research papers showing that while pH influences sex ratios among dwarf cichlids, temperature also plays a role. Those studies (mostly involving species of *Pelvicachromis*

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and *Apistogramma*) are:

- Rubin's research with *Pelvicachromis* and *Apistogramma* reinforced previous findings that pH influences sex ratios. Acidic water tends to produce more males, while basic water tends to produce more females. Keeping the temperature constant at 79°F (26°C) +/- 1°C, he recorded, for example, that:

- at a pH of 5.8, 91 percent of *A. borelli* became males

- at a pH of 7.1, 9 percent of *A. borelli* became males

- Römer and Beisenherz examined the combined influence of pH and temperature on sex ratios. They found that in general, higher water temperature tends to produce more males, while lower water temperature tends to produce more females. For example, for *A. borelli* breeding at a pH of 5.5,

- at 73.4°F (23°C), 37 percent of the brood became males

- at 78.8°F (26°C), 54 percent of the brood became males

- at 84.2°F (29°C), 74 percent of the brood became males

Römer and Beisenherz's experimental data probably explains my many male *A. borelli*, which I was keeping at a temperature of 80–82°F (27–28°C) in water filtered by a canister filter that included a good bit of Sphagnum Moss. Between the low pH and high temperature, I was pushing the fry to become males!

It seems worth noting that for a target temperature of 78.8°F (26°C), the above data for *A. borelli* shows that:

- at a pH of 5.8, Rubin observed 91 percent males
- at a pH of 5.5, Römer and Beisenherz observed 54 percent males

That difference in male percentage reinforces the idea that there are factors determining sex ratios besides pH and temperature. For instance, Francis and Barlow showed in 1993 that for the Midas Cichlid, *Amphilophus citrinellus*, sex determination is also affected by a fish's

size relative to the sizes of those around it.

Given the above experimental data on pH and temperature affecting sex ratios, I looked at what those parameters were for both of my *D. maculatus* broods. In general, I take a fairly relaxed approach to tank-water parameters, but in this case it might have helped to be more meticulous. That said, I know that without intervention my tanks tend to a pH of 6 and I have very soft water. Lastly, I know my target temperature for each tank, and routinely confirm it is in the target range using a digital thermometer. As the tank is located on a three-season porch, it is cooler in winter than in summer. The tank's winter temperature generally ranges from 72 to 76°F (22–24°C). During the summer heat the water temperature routinely ranges from the high 70s to the mid-80s Fahrenheit.

While I do not maintain detailed water data for my tanks, I do record when eggs are laid or fry detected and, given the date, I can estimate the tank's temperature:

Brood	Date First Seen	Estimated Temp. (°F)	Brood Size	No. Males	Percent Male
1	9/2/2010	High 70s	11	1	9
2	12/15/2010	Low-mid 70s	35	11	31

Given the stability of my tank's pH, it appears that the sex ratios I have seen in the two broods are contrary to the general observations of Römer and Beisenherz. That is to say, I've seen that higher water temperature tends to produce fewer (rather than more) males.

There are a number of possible explanations for this discrepancy:

1. My temperature estimates are incorrect.
2. Temperature affects sex ratios in *Dicrossus maculatus* differently than temperature affects the *Apistogramma* species used by Römer and Beisenherz.

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3. Brood 1 matured more slowly than Brood 2 and ultimately consisted of more than one male. I traded in Brood 1 at 10 months of age. I traded in Brood 2 at 11 and 12 months of age. In Brood 2, males were readily identifiable at 11 months, although, given the tank they were in, it was difficult to do an accurate count. The count of 11 came after I traded in 11 from that group and was better able to count the remaining males.

All in all, it will take additional broods and more precise recordkeeping before I can conclude how pH and temperature affect sex ratios in my *Dicrossus maculatus*.

Summary

The wild-caught *Dicrossus maculatus* in my care successfully breed and raise their young in very soft, moderately acidic (6.0 pH) water, in a relatively wide range of temperatures (low to high 70s F). They appear most at ease in a heavily planted tank with many caves and tunnel-like structures. They prefer smaller-sized frozen foods and are not aggressive eaters.

Pair bonds are weak to non-existent. I have not seen *D. maculatus* spawning, the resulting eggs, or their care, so I don't know what role, if any, the male plays after fertilization. I do know that by the time the fry are free-swimming, the female alone has taken charge. She is a formidable parent, guarding the young and shepherding them around the tank for multiple months. Over the months, a single male has spawned with multiple females.

Although I've largely kept *Dicrossus maculatus* in their own tank, I have no reason to believe they would not be well suited to a community tank, so long as they are the only bottom-dwelling cichlids. I've observed them in a dealer's tank with large *Inpaichthys kerri* (Purple Emperor Tetra), and I've grown the young to adult size in a tank with angelfishes of assorted sizes. I have never seen the *maculatus* going after other fish, nor have I seen the *maculatus* themselves beaten up or with torn fins.

Whether you keep them for breeding or for enjoying the show put on by the vividly colored males, *Dicrossus maculatus* is worth the price. 🐟

REFERENCES

Kullander, S.O. 2010. A review of *Dicrossus foirni* and *Dicrossus warzeli*, two species of cichlid fishes from the Amazon River basin in Brazil (Teleostei: Cichlidae). *Aqua, Int J Ichthyol*. Received 11/6/2010, accepted 012/9/2010.

Rubin, D.A. 1985. Effect of pH on sex ratio in cichlids and a poeciliid (Teleostei). *Copeia* (1985) 1: 233-35.

Romer, U. and W. Beisenherz. 1996. Environmental determination of sex in *Apistogramma* (Cichlidae) and two other freshwater fishes (Teleostei). *J Fish Biol* 48: 714-25.

Francis, R.C. and G.W. Barlow. 1993. Social Control of Primary Sex Differentiation in the Midas Cichlid. *Proc Nat Acad Sci USA* 90 (22):10673-75.

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Monotrete cutcutia
shortly after capture in
Lake Indawgyi, Myanmar.

Monotrete cutcutia— an Indo-Burmese freshwater pufferfish



article and images by Ralf Britz, Ph.D. • The Ocellated Pufferfish, *Monotrete cutcutia*, appears to be imported very irregularly as an aquarium fish, and to the best of my knowledge the imports come exclusively from India. Often the imported specimens are in poor health, but with a bit of pampering, they can usually be persuaded to breed. However, rearing the young still poses problems.

Like so many other Indian fishes, the freshwater puffer *Monotrete cutcutia*, a resident of the Ganges-Brahmaputra system in India and Bangladesh, was described by Hamilton in 1822 in his monograph *An account of the fishes of the River Ganges and its branches*. He presented the two rather different-looking sexes of this puffer as two different species, *Tetrodon cutcutia* and *Tetrodon gularis*. The common name for *Monotrete cutcutia* is Ocellated Puffer.

But *Monotrete cutcutia* occurs not only in the Ganges-Brahmaputra system, but is also known from Myanmar, where the species is widespread in the Irrawaddy Delta and occurs into northern Myanmar. I have caught many in the area around Myitkina and in Lake Indawgyi.

Monotrete cutcutia is a real chameleon of the fish world—it can alter its coloration very rapidly. Especially when they are unwell or want to hide, these puffers exhibit a number of large, dark spots on the head and dorsum, creating a very effective camouflage in a well-planted aquarium.

The most striking color character of this species, and one that is almost always visible, is the brilliant carmine-red edge to the caudal fin. Equally striking are the bright red eyes that have led to the English name of the species. This red coloration is often covered by a blue or green iridescent layer on the cornea. This layer is also seen in other puffers, as well as in many other members

of the Tetraodontiformes.

With a bit of practice, one can tell adult males from females of *Monotrete cutcutia*. Male individuals have a very filigreed honeycomb or reticulated pattern of dark gray to black lines on a light background on the body behind the pectoral fins. The pattern is most clearly expressed on the flanks, but it is completely absent from the throat and belly. Instead of the honeycomb pattern, female individuals have a pattern of small, light spots on a darker background in the same place.

Emaciated imports

I first encountered this puffer at the end of the 1990s during one of my regular visits to Aquarium Glaser in Frankfurt. The *Monotrete cutcutia* had arrived there a few days earlier directly from India, and were not in good condition. Judging from the emaciated state of the specimens, they had probably endured a long period of hunger in their native land; they were a long way from the usual rounded form.

I nevertheless took six specimens, which I housed in a 31 x 20 x 21-inch (80 x 50 x 50-cm) tank back in Tübingen, where I was working at the time. By the next day, only four specimens were still alive, and their bodies were covered with numerous little swellings. The surviving individuals fed only hesitantly, and in the following days



A newly introduced pair of Ocellated Puffers, male with honeycomb patterned flanks at rear. Courtship began as soon as they were put together.



Male *Monotreta cutcutia* in courtship coloration. Note characteristic blood-red edge of the tail fin.



The female pictured on the opening page, much lighter in color just a few minutes later.

I watched as the numerous swellings burst and worm-like parasites emerged from the openings. In addition, an extraordinary degree of aggression developed among the four fish and after a week the dream was over—all the remaining puffers were dead.

It was to be almost 10 years before I had another opportunity to keep *Monotreta cutcutia*. By then I had moved to London and established contact with Andrew Rao, an Indian aquarium-fish exporter. One of the consignments he sent me in May 2008 included 10 specimens of *Monotreta cutcutia* that he had caught near Calcutta. Only six individuals survived transportation and the first days in my setup. Again, they arrived in very poor condition and were emaciated, but at least they showed no signs of worm infestation.

Striking courtship coloration

In anticipation of aggression, I housed the six fish separately. In the following weeks I was able to fatten them up with live earthworms, and it soon became evident that

Female *Monotreta cutcutia* in normal coloration.




there were at least two pairs among the six individuals.

At the beginning of August 2008, when the fish had recovered well, I ventured to put each of the two pairs into a 42-gallon (160-L) tank. The fish began courtship almost instantaneously. The male changed color dramatically and was almost unrecognizable. The head region and the throat, as well as the anterior part of the belly region, the dorsal and anal fins, and the caudal fin right to its distal margin, were sooty gray in color. The caudal fin was edged with blood red; the back and the sides were yellowish green, and the belly and lower part of the tail almost whitish. A reticulated pattern of dark gray lines created a honeycomb pattern, a fragmenting into individual spots at its edges on the back, lower head, and lower ventral region.

The female altered her coloration only slightly, becoming lighter in color overall, with irregular dark gray-green and lighter yellowish-green spots on the back and sides. The sides and belly region were covered in numerous small, light dots, similar to the normal coloration.

Spreading his fins very wide and displaying his bright red caudal-fin edging, the male tried to entice the female to the spawning site. He swam excitedly toward her and used seesaw-like movements to encourage her to follow him to the previously chosen spot. The courtship can extend over a few days until the female finally follows and deposits her eggs on the substrate, where they are then fertilized by the male.



This male has assumed dark coloration. He is guarding a clutch of eggs deposited on the leaf.

I was unable to observe the actual spawning act, but it appears to happen rather quickly, as it does with other freshwater puffers. The clutch was laid in the space of just a few minutes during one of my inspections of the aquarium room; I saw both the fish above an *Anubias* leaf, and when I came back a few minutes later, there was already a clutch on the leaf.

Anubias preferred


It was just four days after the pairs were put together that I found the first clutch, which had been laid on a large *Anubias* leaf and was now being fanned and defended by the male. Unlike in the *Monotreta* species from Indochina that I had bred previously, the male didn't hound the female mercilessly, but only shooed her away when she came into the immediate vicinity of the clutch. It was thus possible to keep a pair of *Monotreta cutcutia* in the tank described above, even during the brood-care period. The second pair also laid eggs within the first two weeks

after being put together.

In the subsequent weeks and months the pairs spawned at regular intervals, almost exclusively on the broad leaves of *Anubias*. Once I found a clutch on the end glass of the aquarium, and once in a flowerpot that I had put in the aquarium as a hiding place.

There appears to be a sort of breeding season, as no further clutches were produced during the late autumn and winter of 2008/2009, but then spawning resumed in mid-February 2009 and continued until mid-September of the same year. During this period a pair produced 10 clutches of 100–200 eggs apiece. The male guarded the clutch assiduously and fanned the eggs incessantly. Sometimes, however, clutches disappeared after one or two days; they were probably eaten by the male and/or the female.

In the course of normal brood care, the larvae hatch after six or seven days and, at 2.5 mm long, are significantly smaller than newly hatched larvae of Southeast Asian puffer species like *Monotreta suvattii*, *M. abei*, *M.*



Male during brood care. The clutch is close to hatching.



Fry just a few days after hatching.

The juveniles turn dark two weeks after hatching.



Juvenile *Monotreta cutcutia* at the age of two and a half months.



baileyi, and *M. cochinchinensis*. During the first one or two days after hatching, the larvae exhibit a remarkable behavior. They swim upward in the water column and let themselves drift down, then swim upward again.

Do the larvae migrate to the sea?

The larvae of *Monotreta cutcutia* feed from their yolk sacs for three days and thereafter require small live food. I

offered microworms and freshly hatched *Artemia*, but they didn't eat any. After a few days all the larvae were dead, apparently of starvation. This also happened with the following two broods—I didn't get a single larva to take food.

Before the fourth clutch was laid, I had an idea. I knew from breeding *Carinotetraodon imitator* that the parent fishes would spawn and the larvae would grow on only if I added some marine salt to the water to make it slightly brackish. So after the fourth clutch had been tended by the male until hatching and the larvae had almost consumed their yolk sacs, I gradually transferred them into slightly brackish water.

And it worked! The larvae accepted microworms without problems and, after a few days, were capable of managing *Artemia* nauplii as well. They grew on rapidly, but when they were around .39-.47 inch (10-12 mm) long the appetites of the youngsters slowly diminished and the first deaths occurred. Following my intuition, I now transferred the remaining little ones back into completely fresh water and they regained their appetites.

Using this method of transfer to brackish water and back into fresh water, I was able to rear several broods to around 1.18 inches (3 cm) in length. It thus appears that in the wild, the larvae of these fish are washed downstream after hatching and end up in brackish water after a few days. The drifting of the larvae downstream may well be encouraged by the remarkable upward swimming and downward sinking of the larvae immediately after hatching.

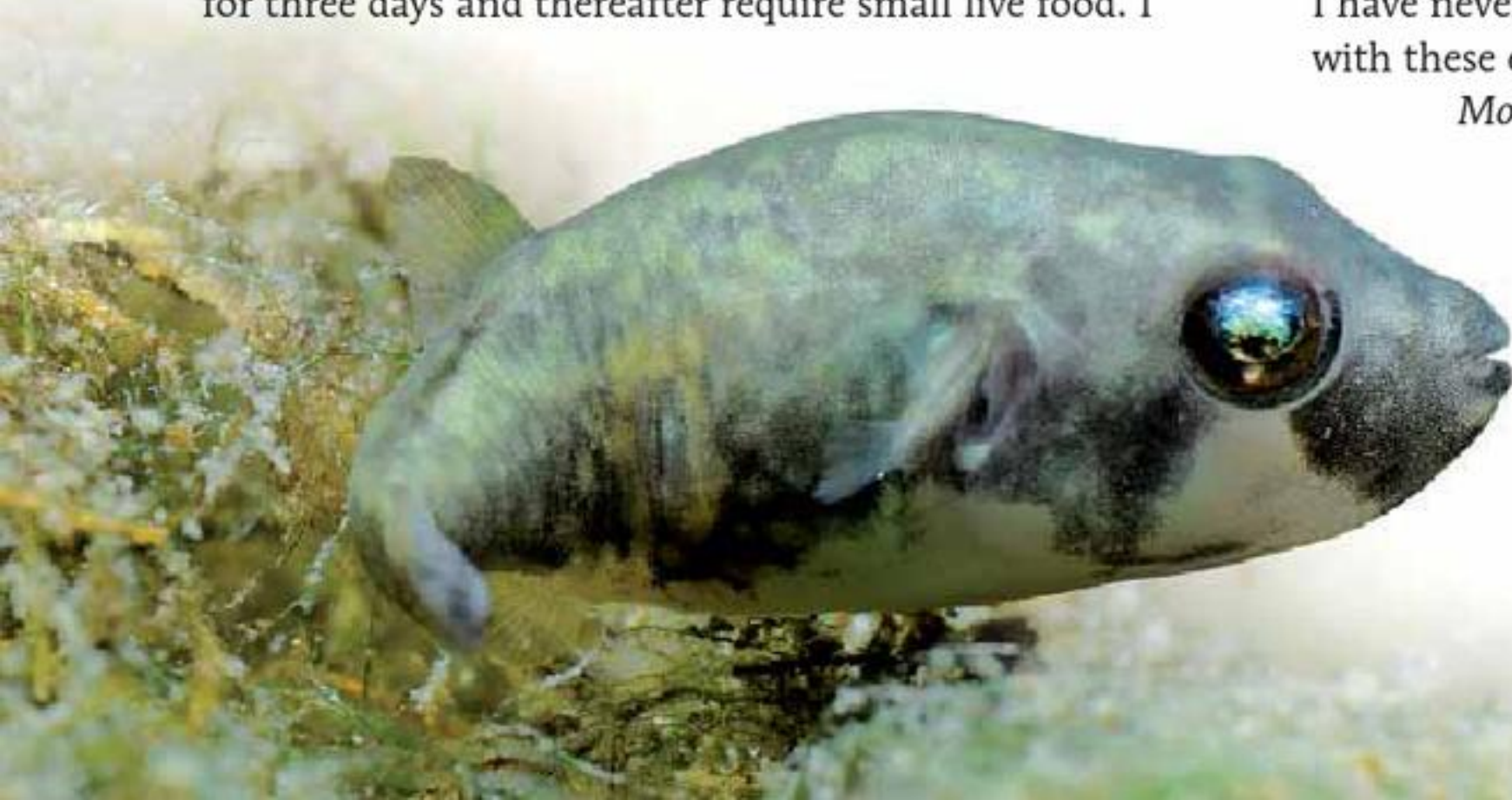
It remains to be seen whether this brackish-water phase is obligatory in all *Monotreta cutcutia*. However, I think it is rather unlikely that the populations of this species that live thousands of kilometers from the sea, for example in Assam in India or in Lake Indawgyi in northern Myanmar, pass through a brackish-water phase of this kind.

The Indo-Burmese freshwater puffer *Monotreta cutcutia* is an extremely interesting fish to keep. Maintaining it in pairs in medium-sized tanks allows one to see their fascinating behavior and coloration repertoire. They differ considerably in behavior from other Asian freshwater puffer species available in the trade, for example *M. leiurus* or *M. suvattii*. The rearing of the larvae and fry of *M. cutcutia* represents a challenge, but is worthwhile. I have never regretted a second of the time I have spent with these engaging creatures. I can only recommend

Monotreta cutcutia to freshwater puffer fans who will bear in mind the main points detailed above. 🐟

My thanks to **Timo Moritz** and **Peter Konstantinidis**, who helped me during the rearing of these fishes.

Left: This juvenile is about four months old.



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by Mary Sweeney with images by Felicia McCaulley • While the vibrant tattoo of an Apple Snail on her right forearm is testament to a slightly more than serious interest in *Ampularia* in the recent past, the two-tone, fluorescent mohawk sported by Rachel O'Leary evokes her current passion for the micro-fishes and invertebrates of the aquarium hobby. Picture the dorsal fin rays of *Apistogramma cacatuoides*, the Cockatoo Dwarf Cichlid, and you'll see that Rachel has fish-head written all over her. But as with the beloved cichlid, don't be fooled by the display; there's more here than meets the eye. Rachel can talk mean fish, too.

Msjinkzd?

Microfishes and invertebrates to go

Rachel O'Leary has had a lifelong passion for the aquarium hobby, including, especially, the invertebrates, which are sometimes overlooked—possibly due to the myths and misunderstandings that surround their maintenance. They are, she says, easy to keep and desirable when maintained in the proper conditions. Undemanding: it's what every hobbyist likes in a crustacean.

Within the past 10 years, the hobby has blossomed into a full-time business for this mother of three from York, Pennsylvania. She calls her enterprise Invertebrates by Msjinkzd, a name that seems perfectly suited to a consummate aquarist with a nonconformist streak. While tending to her growing family, Rachel has developed her

fishroom with courage and built a solid reputation for integrity in breeding, importing, and selling nano invertebrates and uncommon fishes, most of them suited to small aquariums.

As anyone who has a keen interest in freshwater fishes can readily attest, developing the ability to acquire, feed, breed, grow out, and then ship out a large variety of very, very small animals is no mean feat. To do it with over 70 aquaria, ranging in size from 10 gallons (38 L) to 220 (832 L) gallons, sounds like an awful lot of real work. Factor in the responsibilities of order fulfillment (down to the weather forecast for all time zones en route), and you will have a small idea of the scope of Rachel's work day.



Because of her own hobby interest—aquascaping is a relaxing pastime for Rachel—she maintains collections of dwarf freshwater invertebrates, including snails of the genera *Pomacea*, *Clea*, *Clithon*, and *Neritina*, for example; Amano Shrimp, *Cardina* spp., and *Neocaridina* spp.; and tiny crayfish, aquatic crabs, and even the African Dwarf Frog (*Hymenochirus boettgeri*). She keeps and shares an astounding variety of fishes and invertebrates under 2 inches (5 cm), but in the 220-gallon tank there are some true tankbusters—the ancient Saddled Bichirs (*Polypterus endlicheri endlicheri*) and Tropical Gars (*Atractosteus tropicus*). She also has a Cuban Gar (*Atractosteus tristoechus*) growing out to go in with them, but he is still only 12 inches (30 cm) long at this point, well short of his potential length of 5 feet (150 cm).

That passion for fishes both very small and very large is what has Rachel spending an average of 14 hours a day working in her basement fishroom. She estimates that 70 percent of what she sells is imported from overseas, either wild-caught or farmed; 10 to 15 percent is supplied by domestic U.S. breeders/hobbyists; and 15 to 20 percent is bred in her own tanks. She



cannot keep up with the demand for her home-bred stocks, so sometimes she has multiple tanks of the same species, some she's bred and some wild-caught. Rachel is always interested in hearing from sources of quality home-bred fishes and invertebrates, but she is the first to acknowledge that many of the animals she is interested in are either hard to breed or difficult to raise because of the tiny size of the fry.

Currently, Rachel is breeding an assortment of Central and South American cichlids, *Corydoras* spp., shrimps, snails, *Pseudomugil* sp. rainbows, dwarf crayfishes, plecos, and a range of livebearers and egg scatterers. She is known for having a fine way with the "eyestrain rasboras," *Boraras* spp., and she is especially fond of

Rachel O'Leary, 34, opposite, is unmistakable at aquarium conventions and fish shows, where she is much in demand as a speaker. Above, her 70-tank basement fishroom in York, PA. Left (inset), a horned nerite snail, *Clithon corona*.



Top: Vintage (1920s) 2-gallon (7.5-L) metal-frame tank, used to photograph nano fishes. Above left, Coral Red Pencil Fish, *Nannostomus mortenthaleri*, a South American nano beauty. Above right, mid-grade Crystal Red Shrimp, *Caridina cantonensis*.

the Pagoda Snails (*Brotia pagodula*).

In the warm-weather months, Rachel sets up many of the inverts and fishes outdoors for summer breeding. She is looking forward to an interesting impending import that will contain some wild bettas, small gouramis, and shrimps that are new to her fishroom. She is still working with the amazing freshwater pipefish, *Microphis deocata*. Rachel always has 10 to 20 different breeding projects going on, and she's excited about every one of them.

And still, the responsibilities of the growing fishroom and online entrepreneurship are not such a burden that she doesn't have time to visit aquarium societies, pick up some Ricefish (*Oryzias* sp.) and killifish eggs, and drop off orders along the way, and if she's asked, she's not too shy to take the mike and share her aquarium know-how with interested aquarists far and wide. Her speaking debut at the Potomac Valley Aquarium Society in 2010 set Rachel off on a

roll, starting with the very serious title "Freshwater Invertebrates: Myths and Mythconceptions." Rachel is an active member and on the board of the Capital Cichlid Association, as well as a global moderator on Aquaria Central and a moderator at MonsterFishKeepers.com.

She's a rare gem in the organized aquarium hobby: a good talker. She has something to say, and she's not shy about saying it. At her core an educator, Rachel is all seriousness when talking about the husbandry of the animals she's working with. Many classrooms that didn't have an aquarium now do, thanks to the pay-it-forward O'Leary.

One of her favorite speaking experiences was part of her visit to Bermuda, where she enjoyed the legendary hospitality of the Bermuda Fry-Angle Aquarium Society and presented on "Small Tanks and Their Occupants." There's a lot to be learned from our neighbors off the Cape Hatteras, North Carolina, coast, accord-



Thai Micro Crab or Micro Spider Crab, *Limnopilos naiyanetri*, a tiny but entertaining species that uses its bristled appendages for filter feeding. Below, Rachel keeping up with feeding chores.

ing to Rachel. She was most impressed by the scope of the entries in the traveling Home Show that she helped to judge during her visit. Bermuda has very strict rules about water use, as rainfall provides the only fresh water on the island and personal hygiene is a distinct priority over hobbies in a society with tenuous water supplies. Additionally, the importation of plants and fishes is severely curtailed. In spite of these obstacles, the club members showed exceptional attention to layout, grouping, and placement of the plants. Nano tanks are hot there, as they are everywhere we turn these days. More, Rachel was thrilled to see how many young members participate in the club, how pointed and intelligent the questions they asked were, and how they all “walked the walk and talked the talk.” And the cherry on top for Rachel? Club member Scott Dunstan showed his *Pomacea* cf. *insularum*, an Apple Snail species that Rachel had not met.

So what about that business name? Is Msjinkzd an inside joke?

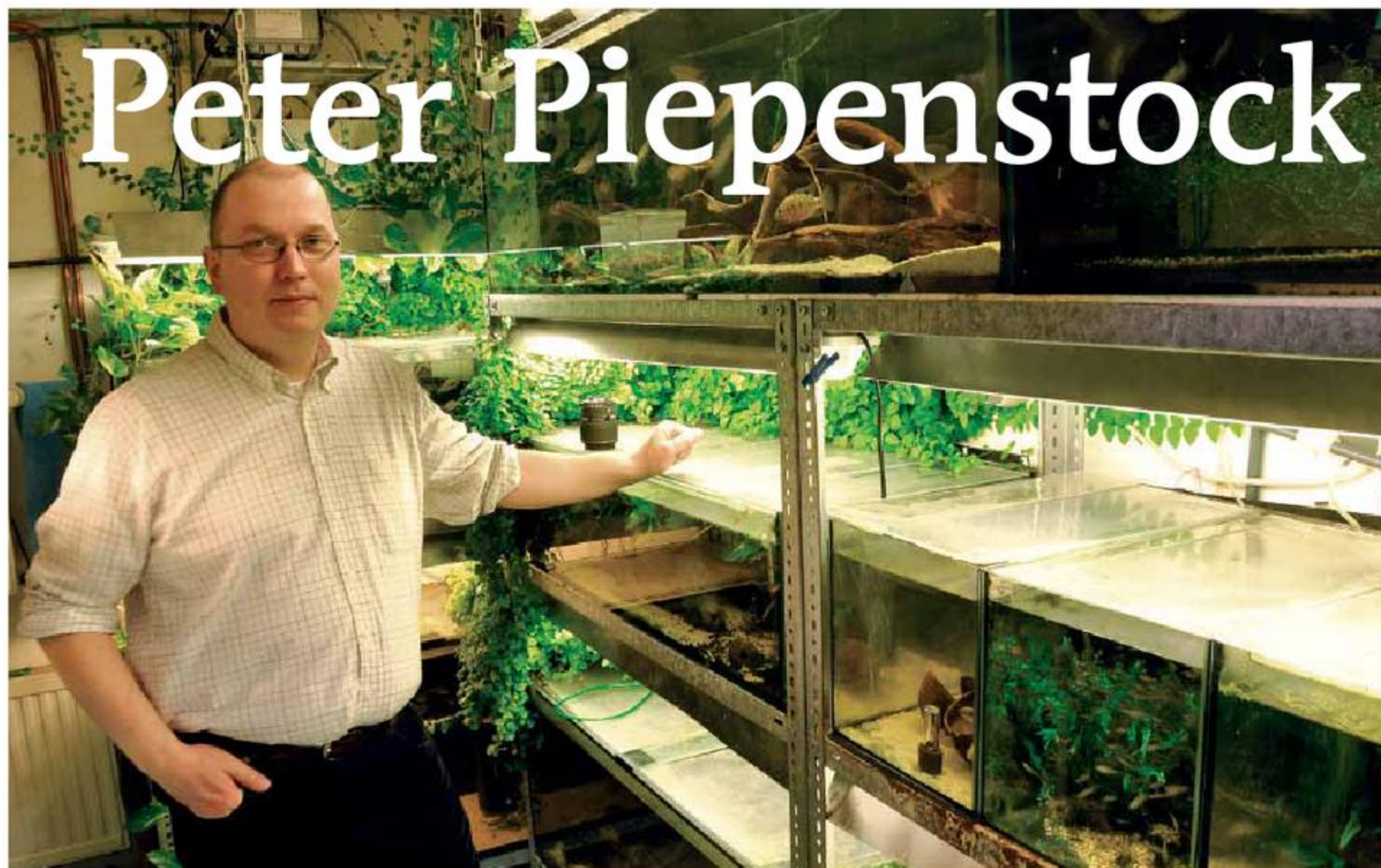
“No,” she says, “it was more of a convenience. My husband is a car and motorcycle junkie. He is into old gassers and British café racer bikes. He would sell used parts on eBay and I would often do the shipping and answer questions. His username was *jinkzd* (also the license plate on our '63 Chevy II), so when I signed up, I became *msjinkzd* to reduce confusion. Ironically, he now sometimes refers to himself as *mrjinkzd*, since I have gained some exposure.” 🐟

Contact: View Rachel's speaking schedule datebook and livestock selections here: <http://msjinkzd.com>.



conducted by Sascha Thamm • When we think of the Sauerland region of Germany, our first thoughts are of winter sports and walking holidays. But at the edge of Schalksmühle, a small rural community in the region, Peter Piepenstock lives with his family. The 41-year-old mechanical engineer, his wife Lidia, and their two children, Philipp and Pia, have something in their neat little house that would be the envy of any aquarist: plenty of space in the cellar, which Peter has filled with fish tanks—all now dedicated to African species.

An interview with



Peter Piepenstock

A *Papyrocranus afer* knifefish, easily 16 inches (40 cm) long, swims sedately on its way.

AMAZONAS: How did you come to currently have three rooms full of aquariums?

Peter Piepenstock: It all started when I got an 8-gallon (30-L) aquarium at the age of seven. In it I kept tadpoles and newts that I caught myself. Unfortunately, I have never been able to find any sticklebacks here. Shortly after that I took over my older brother's 29-gallon (110-L) aquarium,

which contained an ancient angelfish, a few swordtails, and a mailed catfish. And then I really caught fire. For my birthday I received a second 29-gallon tank; soon I had set up a South American tank and an Asian tank. I then acquired a third tank and bred my first fishes—initially fightingfishes, paradise fishes, and zebra cichlids. All three tanks were soon full of young zebra cichlids. Probably every aquarist has been there!



AMAZONAS: So cichlids conquered your heart as well as your tanks?

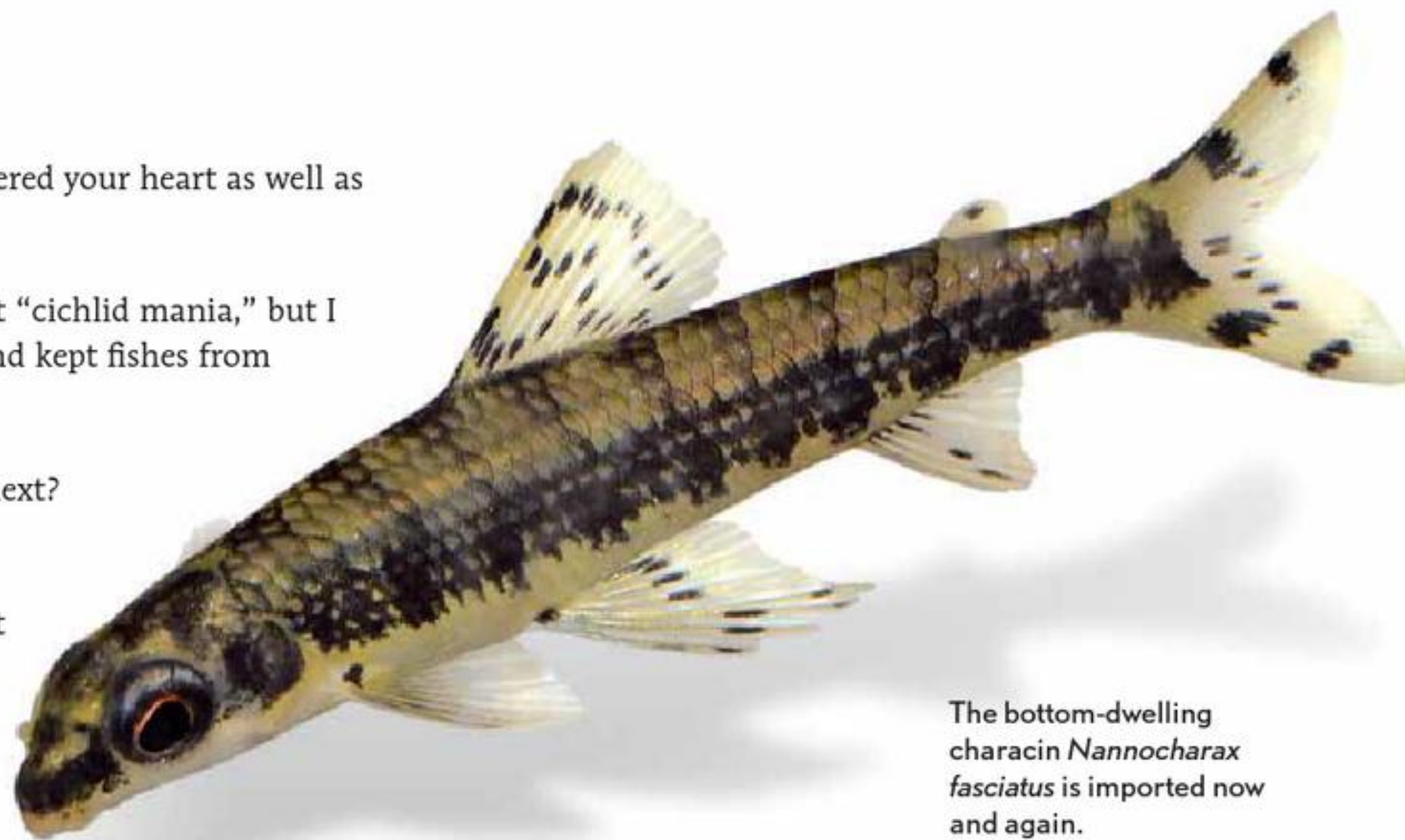
Peter Piepenstock: Yes—we call it “cichlid mania,” but I have always had an open mind and kept fishes from other families.

AMAZONAS: What happened next?

Peter Piepenstock: When I was around 18 years old I took a short break from fishkeeping, but after I met my wife I rediscovered my old hobby. Of course, that meant I needed a few more tanks!

AMAZONAS: How many tanks do you have now?

Peter Piepenstock: There are now about 40, with a total volume of more than 1,585 gallons (6,000 L). Water-changing is automatic for the majority of the aquariums, which keeps the effort involved in maintenance within bounds.



The bottom-dwelling characin *Nannocharax fasciatus* is imported now and again.

Below: There are some 40 aquariums to admire at Peter Piepenstock's.





Part of the setup is occupied by West and Central African species.

Right: These robust Nurse Tetras, *Brycinus nurse*, are only for enthusiasts willing to deal with their aggressive nature.

AMAZONAS: Nowadays you keep just African fishes. Why?

Peter Piepenstock: In 1993 I set up an Africa

tank with Congo Tetras, Kribensis, and an upside-down catfish, *Synodontis euptera*. These fishes fascinated me so much that I wanted to learn more about the fish fauna of Africa. I have now had the *Synodontis* for 18 years and it still enjoys the best of health.

AMAZONAS: Most people think of African fishes as primarily cichlids from Lake Malawi and Lake Tanganyika. I don't see any such fishes here.

Peter Piepenstock: I kept those fishes back then, but we have very soft water here—it comes out of the tap at 1.5°dGH—which is completely unsuitable for fishes from the East African Rift Valley. Because my water parameters are much better suited to West African fishes, it quickly became clear that I should concentrate on those species. So for around 10 years I have been keeping all sorts of fish species from West and Central Africa.

AMAZONAS: I have spotted some interesting characin species that I have never seen before. A particular interest?

Peter Piepenstock: Yes, there are a lot still to discover. Many species are imported only rarely, and in some cases nothing is known yet about breeding them. So far I have succeeded in breeding five species from the Congo Tetra assemblage. It can be tricky, but it's a nice challenge. Generally speaking, I try to breed all of the fish species I keep.

AMAZONAS: Including the large ones?

Peter Piepenstock: Yes, now that I have the opportunity. Even as a child I dreamed of having a 264-gallon (1,000-L) tank one day. Now I have two with a volume of more than





that, and am enjoying species like the Kafue Pike, *Hepsetus odoe*, and Nurse Tetras, *Brycinus nurse*. They are real bundles of energy, but in tanks that size they get along fine with large cichlids, adult bichirs (*Polypterus ornatipinnis*), and a knifefish (*Papyrocranus afer*) that's a good 15.75 inches (40 cm) long. The only time there's any stress is when the big *Tilapia buttikoferi* are guarding young.

AMAZONAS: I see you have lots of species from the *Tilapia* assemblage. But aren't they rather unpopular fishes?

Peter Piepenstock: These fishes are despised in the aquarium hobby without any justification. Most aquarists only know about *Oreochromis mossambicus* or *O. niloticus*. But the true *Tilapia* include fabulous species that should get a lot more attention! There are some relatively small, colorful species that

exhibit interesting behavior. Unfortunately, most aquarists, and especially dealers, throw up their hands in horror when you offer them juvenile *Tilapia*. What a shame! They will probably remain fishes for the enthusiast.

AMAZONAS: And for these enthusiasts you run the West and Central Africa Work Group in the German Cichlid Association?

Peter Piepenstock: Yes. The great thing about the aquarium hobby is the interaction among like-minded people.

AMAZONAS: I see you've got some *Heterochromis multidens*! I am totally amazed!

Peter Piepenstock: Yes, I had been keen to have some for a while, and then I had the chance. Interesting fish! We have joked about how these fish, which seem related to New

Above: *Heterochromis multidens* is an ultra-rare Congo cichlid and an exceptionally attractive fish.

Below: *Tilapia brevipinna* is not well known.



Tilapia buttikoferi, Zebra Tiliapia, are gorgeous fish, known for their intelligence and aggressiveness.

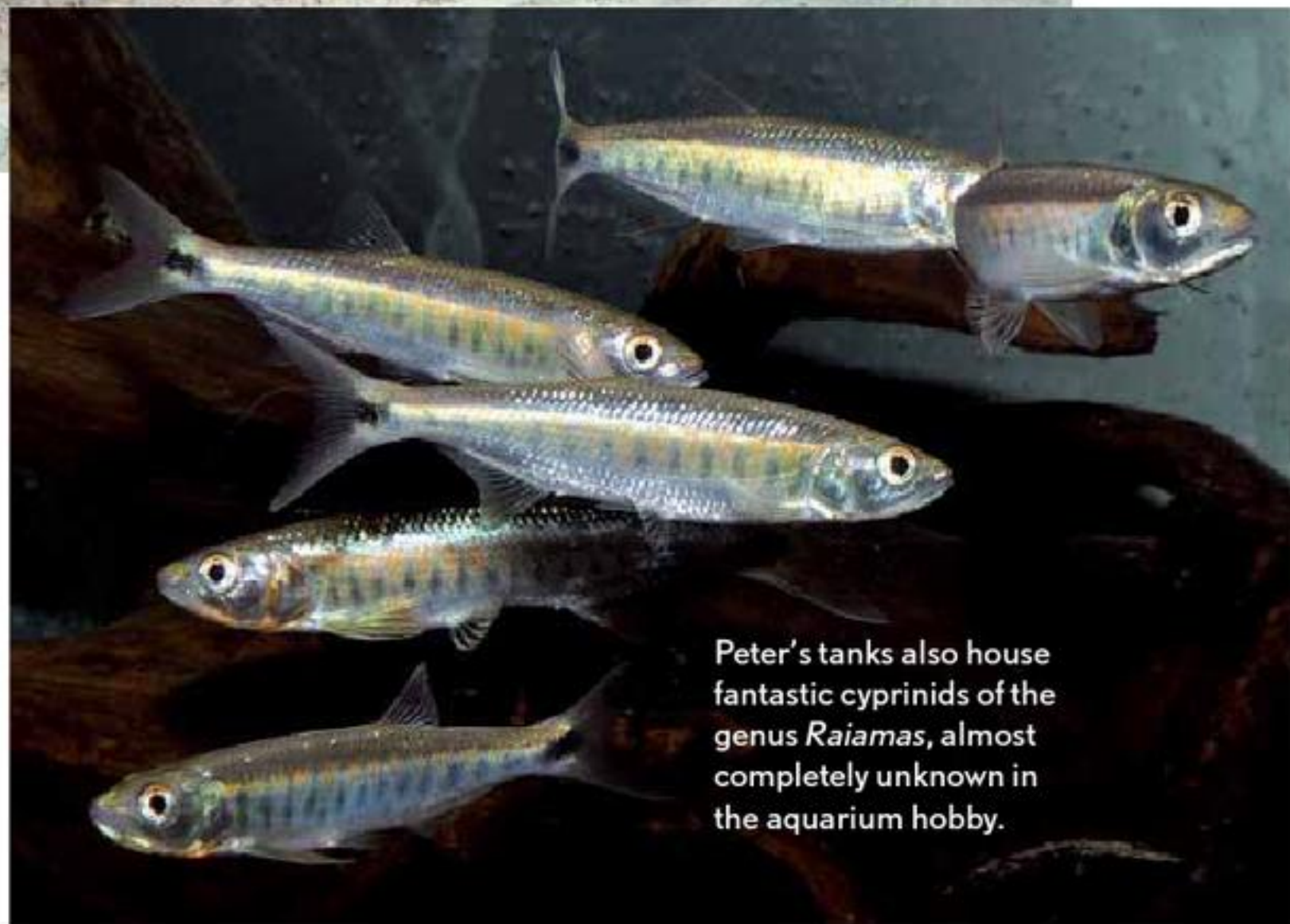


World cichlids, must have flown across the Atlantic on the back of a pterosaur in prehistoric times in order to confuse the taxonomists.

AMAZONAS: Quite! And Tomato Frogs were served during the flight. You have fulfilled one personal wish by acquiring the *Heterochromis*, but do you have other aquarium-hobby dreams?

Peter Piepenstock: Yes, I would like to visit the native lands of my fishes!

AMAZONAS: Many thanks for the chat, and may you continue to enjoy our wonderful hobby! 🐟



Peter's tanks also house fantastic cyprinids of the genus *Raiamas*, almost completely unknown in the aquarium hobby.

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compiled by Mary E. Sweeney

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8-10 **Convention**
Capital Cichlid Association
Silver Spring, MD
www.capitalcichlids.org

10 **Auction**
Jersey Shore Aquarium Society
Freehold, NJ
www.jerseyshoreas.org

15-17 **Convention**
Catfish Study Group
Standish, Lancashire, UK
www.catfishstudygroup.org

16 **Auction**
Greater Detroit Aquarium Society
Detroit, MI
greaterdetroitaquariumsociety.org

23 **Auction**
Greater Cincinnati Aquarium
Society
Cincinnati, OH
www.gcas.org

APRIL

6 **Auction**
Michiana Aquarium Society
Elkhart, IN
www.michianaaquariumsociety.org

5-7 **Convention**
Northeast Council of Aquarium
Societies
Cromwell, CT
www.northeastcouncil.org

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8-13 **Annual Show**
Allegheny River Valley Aquarium Society
Olean, NY
www.orgsites.com/ny/arvas

12-14 **Show & Auction**
Missouri Aquarium Society
Bridgeton, MO
pattoise@yahoo.com

26-28 **ALA Convention**
Grand Valley Aquarium Club
Wyoming, MI
www.livebearers.org

27-28 **Swap Meet & Auction**
North Jersey Aquarium Society
Nutley, NJ
www.njas.net

27-28 **Show & Auction**
IFGA Gateway Guppy Association
Chicago, IL
www.ifga.org

MAY

2-5 **Convention**
North American Native Fishes Association
Cumberland Falls, KY
www.nanfa.org/convention/2013.shtml

5 **Auction**
Greater Pittsburgh Aquarium Society
Pittsburgh, PA
gpasi.org

18-19 **Show & Auction**
IFGA Michigan Guppy Breeders
Orchard Lake, MI
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407-331-4882

The Planted Aquarium Store

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Sea Life Aquarium & Service

174 Semoran Commerce Pl
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706-546-1337

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Premier Aquatics

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678-453-3991

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Aquascape

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Aiea, HI
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Kalihi Pet Center

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Ste C-101
Honolulu, HI
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Fish, Aquariums & Stuff

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208-377-1119

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847-945-4700

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217-352-1121

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Inland Aquatics

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Aquatic Environments

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Gorham, ME
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508-678-8306

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Ocean Plaza
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Ocean, NJ
732-922-2300

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1254 New Loudon Rd Rt 9
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Oddball Pets & Aquarium

262 Joseph St
Pittsburgh, PA
412-884-2333

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1604 Fortview Rd
Austin, TX
512-442-1400

Birddog & Catfish Petshop

115D Old Boerne Rd
Bulverde, TX
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Fish Gallery Houston

2909 Fountain View Dr
Houston, TX
713-523-3474

Pet World

2700 Carson St
Fort Worth, TX
817-577-1955

Royal Aquatics

2601 Flower Mound Rd.,
Ste 101
Flower Mound, TX
214-453-9133

Vermont

Pet Advantage

350 Dorset St
South Burlington, VT
802-860-1714

Virginia

Pet & Aquatic Warehouse

2408 Wards Rd
Lynchburg, VA
434-239-6787

West Virginia

Scales & Tails Reptile/ Fish Store

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Westover, WV
304-296-9218

Wisconsin

Sunset Tropical Guppies

4864 County Rd C
Auburndale, WI
715-254-4929

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Big Al's Aquarium Supercentres

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- ❶ SYNODONTIS GRANULOSA ❷ SCHISTURA SP. "FIREFLY" ❸ RASBORA PATRICKYAPI
 ❹ ERNSTICHTHYS MEGISTUS ❺ "CICHLASOMA" ATROMACULATUM ❻ MUGILOGOBIUS TIGRINUS



Granny or White Seam Synodontis,
Synodontis granulosa

Synodontis granulosa, White Seam Synodontis

1 Here is a Lake Tanganyika catfish known variously as the White Seam or Granny Synodontis, distinguished by bright white trim on many fin edges. *Synodontis granulosa* was described in 1900 by Boulenger and is endemic to Lake Tanganyika, where these catfishes lead a rather solitary existence and are less frequently encountered than the usual suspects, *Synodontis grandiope*, *S. polli*, and *S. petricola*.

The eventual size of *Synodontis granulosa* is given as 10.6 inches (27 cm), but a staff member at a large German import company has reported specimens around 15.75 inches (40 cm) long. This means, of course, that we must provide these fish with spacious tanks—at least 112 gallons (500 L). In order to control the intraspecific aggression typical for *Synodontis*, it is advisable to purchase at least four individuals, which

might give an aquarist pause in light of the price—currently around \$325 (€250) per fish.

—Norbert Knaak

Schistura sp. "Firefly Loach"

2 Every little river in India probably has one or more species of so-called stone loaches that can be roughly assigned to the genus *Schistura* without actually knowing whether they have been scientifically described. This little loach, recently turning up in Europe, is a real dwarf at around 1.18 inches (3 cm) total length. The exporter in Calcutta, Deepak Nopany, reports that this pretty species supposedly originates from northern India.

What is special about this little fish is the metallic blue spots on the sides of the head and the gill covers. When the light plays on the gill cover these fish



Undescribed stone loach,
Schistura sp. "Firefly Loach"

appear to glitter. This led Deepak to introduce them into the trade under the name "Firefly Loach." These agile little chaps aren't at all timid in my aquarium and spend the entire day searching for food. In fact, they will eat anything that fits into their little mouths. This is a genuinely problem-free fish, but just try catching the little devils!

—Hans-G. Ever

Rasbora patrickyapi, "Yap's Rasbora"

3 | One of the most beautiful rasbora species to be discovered and described in the last few years is *Rasbora patrickyapi*, which grows to around 2.36 inches (6 cm) long and comes from central Borneo. In early 2012, Pier Aquatics in Wigan, UK, managed to import a large number of this attractive species.



Pair of *Rasbora patrickyapi*, female at rear.

Like their relative the Clown Rasbora, *Rasbora kalochroma*, these fishes originate from blackwater pools and should be kept in soft, acid water, where they will rapidly color up to violet and the sides of the body will literally gleam. The lacquer-black longitudinal band on the body is interrupted by metallic scales, creating a striking effect in a sparingly illuminated aquarium. In addition, the fins turn deep red.

Yap's Rasbora is a super new species for the fan of Asian blackwater fishes. And now all that is left to do is to breed them!

—Hans-Georg Evers

.....
REFERENCES

Tan, H.H. 2009. *Rasbora patrickyapi*, a new species of cyprinid fish from Central Kalimantan, Borneo. *Raffl Bull Zool* 57 (2): 505-9.

1961, a small species from the upper Amazon drainage in Ecuador and Peru.

During the day these little catfishes, with their broad mouths and long lip barbels, spend their lives in the leaf litter on the bottom and bury themselves in fine sand. They are crepuscular and are fairly active in shallow marginal water, searching for insect larvae and similar morsels of food. I see my single specimen exhibiting this same behavior when I peer into my tank in the dim light of early morning.

Ernstichthys megistus has previously been imported now and then, but has largely disappeared into oblivion. That may be because for most people, it is easy to overlook small buried catfishes. You need to know what to look for, which is precisely why I mention them here.

—Hans-Georg Evers

Ernstichthys megistus, an easily overlooked and seldom seen banjo catfish.



Ernstichthys megistus

4 | Considering what has come in from Peru over the last few years, that country is turning out to be a real cornucopia of virtually unknown fish species. Our correspondent Martin Mortenthaler (Aquarium Rio Momon) is indefatigable in the hunt for new species of interest to the aquarium hobby, and he has come up with yet another tasty tidbit.

The firm OF Aquaristik recently imported a consignment from Martin that also contained a few bags for me, including a small (around 1.6 inches [4 cm] long) but apparently almost full-grown catfish of the banjo catfish family (Aspredinidae). I was able to identify the fish fairly certainly as *Ernstichthys megistus* Orcés,

"Cichlasoma" atromaculatum

5 | You have to admire the courage of some importers and exporters—for instance, those who import "*Cichlasoma" atromaculatum* from the drainage of the Río San Juan. These are relatively large fish that are destined to be expensive, simply because so few fit in a box. So it is good news that some have taken the risk, and in the past year wild-caughts of this big cichlid have at last become available once again.

The fish originate from Colombia and are between 4 and 6 inches (10 and 15 cm) long. Normally, the females among freshly imported stocks can be recognized by a red-colored belly region at a size of 6 inches (15 cm) and up. Males are not quite as colorful, but have a note-



"Cichlasoma" atromaculatum, male

their pretty patterning and the very long fin-ray on the first dorsal fin. Locations for this species are known from Thailand, Malaysia, Singapore, and Sri Lanka. With a full-grown size of barely .9 inch (22 mm) total length, they are very suitable for maintenance in small aquariums.

Mugilogobius tigrinus is a very salt-tolerant

worthy yellow coloration on the flanks. In the aquarium the reddish coloration on the flanks disappears initially and the yellow also becomes duller at first. Only when the fish are kept in soft, slightly acid water and get ready to spawn do their original colors return.

These big cichlids are fundamentally easy to keep and will take every food imaginable. Astonishingly, despite their size and the bad reputation of the "Cichlasoma" festae assemblage to which they belong, my "C." atromaculatum have turned out to be fairly harmless aquarium occupants. Compared to others of this group, they even find it difficult to assert themselves, as they are happiest in the company of peaceful eartheaters. They are less enthusiastic about *Caquetaia*, *Andinoacara*, *Crenicichla*, and *Heros* of the same size. Even so, "C." atromaculatum is definitely not a fish for the planted community aquarium. The species is best reserved for the inveterate keeper of big cichlids.

—Thomas Weidner

species that typically inhabits small, shallow streams and pools among mangroves (Larson 2001). For optimal maintenance they should always be kept with a small addition of sea salt (1–2 g/l), even though they have been known to survive unharmed for long periods in completely fresh water.

Up until now, *Mugilogobius tigrinus* has seldom been seen in the aquarium hobby. Ott (2002) came across this species in Sri Lanka and brought back a few live specimens. *Mugilogobius tigrinus* is best kept in a small group. Territorial squabbles between males are common, but no harm ever results. Because this species, like so many other gobies, will take only live and frozen foods, its maintenance isn't recommended for beginners. These fish enjoy small food organisms such as *Artemia* nauplii, *Cyclops*, smaller water fleas, and micro- or Grindal worms.

—Michael Taxacher & Jens Kühne

Mugilogobius tigrinus, Dwarf Tiger Goby

6 | *Mugilogobius tigrinus* Larson, 2001, a pygmy goby rare in the aquarium hobby, has recently been imported. These fish are very attractive due to

REFERENCES

- Larson, H. 2001. A revision of the gobiid fish genus *Mugilogobius* (Teleostei: Gobioidae) and its systematic placement. *Rec West Aust Mus Suppl* no. 62.
- Ott, G. 2002. Fish Spots—*Mugilogobius tigrinus* Larson, 2001—Palmen-Grundel. *Aquaristik Fachmagazin* 34 (4), no. 166: 28–29.



Male *Mugilogobius tigrinus*

U.S. AQUARIUM SOCIETIES

NATIONAL AQUARIUM CLUBS

American Cichlid Association

www.cichlid.org

American Killifish Association

www.aka.org

American Livebearer Association

www.livebearers.org

The Angelfish Society

www.theangelfishsociety.org

Aquatic Gardeners Association

www.aquatic-gardeners.org

International Betta Congress

www.ibcbettas.org

International Fancy Guppy Association

www.ifga.org

Mid-Atlantic Koi Club

www.makc.com

North American Discus Association

www.discusnada.org

The North American Native Fishes Association

www.nanfa.org

Northeast Council of Aquarium Societies

www.northeastcouncil.org/nec/

ARIZONA

Dry Wash Aquarium Society, Phoenix

www.DryWashAquarium.org

Arizona Aquatic Plant Enthusiasts (AAPE)

Tuscon & Phoenix

www.azaquaticplants.com/index.php

CALIFORNIA

Sacramento Aquarium Society

Sacramento

www.SacramentoAquariumSociety.org

San Francisco Aquarium Society

San Francisco

www.SFAquarium.org

Silicon Valley Aquarium Society

San Jose

www.SiliconValleyAquariumSociety.com

COLORADO

Colorado Aquarium Society, Arvada

www.ColoradoAquarium.org

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www.GHASCT.org

Northeast Livebearer Association

Bristol

www.nela.northeastcouncil.org

Norwalk Aquarium Society

South Norwalk

www.NorwalkAS.org

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Greater Washington Aquatic Plant Association

www.GWAPA.org

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Gold Coast Aquarium Society of South Florida, Cooper City

www.GCAquarium.org

Tampa Bay Aquarium Society, Tampa

www.TBAS1.com

GEORGIA

Atlanta Area Aquarium Association

Atlanta

www.AtlantaAquarium.com

HAWAII

Honolulu Aquarium Society, Honolulu

www.HonoluluAquariumSociety.org

ILLINOIS

Central Illinois Tropical Aquarium Club (CITAC)

Bloomington

www.citac-il.org

Federation of American Aquarium Societies

Champaign

www.FAAS.info

Greater Chicago Cichlid Association

Brookfield

www.GCCA.net

Green Water Aquarist Society, Alsip

www.GWASOC.org

INDIANA

Circle City Aquarium Club

Indianapolis

www.CircleCityAqClub.org

Michiana Aquarium Society, South Bend

www.MichianaAquariumSociety.org

IOWA

Eastern Iowa Aquarium Association

Cedar Rapids

www.FinFlap.com

LOUISIANA

Southeast Louisiana Aquarium Society

Baton Rouge & New Orleans

www.selas.us

MARYLAND

Capital Cichlid Association, Silver Spring

www.CapitalCichlids.org

MASSACHUSETTS

Boston Aquarium Society, Boston

www.BostonAquariumSociety.org

Pioneer Valley Aquarium Society

Chicopee

www.PVAS.net

Worcester Aquarium Society, Worcester

www.WorcesterAquarium.org

MICHIGAN

Greater Detroit Aquarium Society

Royal Oak

www.GreaterDetroitAquariumSociety.com

Grand Valley Aquarium Society

Grand Rapids

www.GrandValleyAquariumClub.org

Southwest Michigan Aquarium Society

Portage

www.SWMAS.org

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Minnesota Aquarium Society

Roseville

www.aquarium.mn

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Missouri Aquarium Society, St. Louis

www.MissouriAquariumSociety.org

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New Hampshire Aquarium Society

Rollinsford

www.NHAquariumSociety.com

NEW JERSEY

Jersey Shore Aquarium Society

Freehold

www.JerseyShoreAS.org

North Jersey Aquarium Society, Nutley

www.NJAS.net

NEW YORK

Allegheny River Valley Aquarium Society

Olean

www.orgsites.com/ny/ARVAS

Brooklyn Aquarium Society, Brooklyn

www.BASNY.org

Danbury Area Aquarium Society (DAAS)

Carmel

www.northeastcouncil.org/daas

Central New York Aquarium Society

Syracuse

www.CNYAS.org

Genesee Valley Koi & Pond Club

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www.ggw.org/GVPAKE

Greater City Aquarium Society, Flushing

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Tropical Fish Club of Erie County

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Greater Akron Aquarium Society, Akron
www.GAAS-FISH.net

Great Lakes Cichlid Society, Euclid
www.GreatLakesCichlidSociety.net

Medina County Aquarium Society
Medina
www.geocities.com/MCASfish/index

Ohio Cichlid Association, Brunswick
www.OhioCichlid.com

Stark County Aqua Life Enthusiasts Society, Canton
www.ClubScales.com

Youngstown Area Tropical Fish Society
Youngstown
www.YATFS.com

OREGON

Greater Portland Aquarium Society
Clackamas
www.GPAS.org

PENNSYLVANIA

Aquarium Club of Lancaster County
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www.ACLCPA.com

Bucks County Aquarium Society
Chalfont
www.BCASOnline.com

Greater Pittsburgh Aquarium Society
Pittsburgh
www.GPASI.org

TEXAS

Houston Aquarium Society, Houston
www.HoustonAquariumSociety.org

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Tropical Fish Club of Burlington
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www.tfcb.org/

VIRGINIA

Central Virginia Aquarium Society
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Potomac Valley Aquarium Society, Fairfax
www.PVAS.com

WASHINGTON

Greater Seattle Aquarium Society
Seattle
www.GSAS.org

Puget Sound Aquarium Society
Federal Way
www.thePSAS.org

WISCONSIN

Milwaukee Aquarium Society, Milwaukee
www.MilwaukeeAquariumSociety.com

Central Wisconsin Aquarium Society
Wausau
www.cwas.org

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New South Wales Cichlid Society
Moorebank, NSW
www.NSWCS.org.au

Victorian Cichlid Society Inc.
Mitcham, VIC
home.vicnet.net.au/~cichlid

Queensland Cichlid Group Inc.
Clayfield, QLD
www.qcichlid.org

BELGIUM

Belgian Cichlid Association
www.cichlidae.be

BERMUDA

Bermuda Fry-Angle Aquarium Society
www.fryangle.com

CANADA

The Canadian Association of Aquarium Clubs
Canada & New York State
www.caoac.ca

London Aquaria Society
London, ON
www.londonaquariasociety.com

Saskatoon Aquarium Society
Saskatoon, SK
www.SaskatoonAquarium.com

Montreal Aquarium Society, Montreal, QC
www.theMontrealAquariumSociety.com

Hamilton & District Aquarium Society
Hamilton, ON
www.HDAS.ca

Durham Region Aquarium Society
Oshawa, ON
www.DRAS.ca

Regina Aquarium Society
www.reginaaquariumsociety.ca

Association Regionale des Aquariophiles de Quebec, Ste-Foy, QC
www.ARAQ.org

Aquarium Society of Winnipeg
Winnipeg, MB
www.ASW.ca

FINLAND

Ciklidistit r.y. (Finnish Cichlid Association), Vantaa
www.aquahoito.info/cichlids/index.html

FRANCE

Association France Cichlid, Hoenheim
www.FranceCichlid.com

GERMANY

Deutsche Cichliden-Gesellschaft
(German Cichlid Society)
Frankfurt am Main
www.DCGonline.de

MALAYSIA

Malaysia Guppy Club
www.myguppy.net

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Discus Club Singapore
www.DiscusClubSG.com

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Anabantoid Association of Great Britain
Doncaster
www.AAGB.org

BIDKA: The British and International Discus Keepers Association
www.BIDKA.org

Bristol Aquarists' Society, Bristol
www.bristol-aquarists.org.uk

The Federation of British Aquatic Societies, Sussex
www.FBAS.co.uk

Greater Manchester Cichlid Society
www.nekrosoft.co.uk/GMCS

Middlesex & Surrey Border Section, British Koi Keepers Society
www.MSBsection.co.uk

The Calypso Fish and Aquaria Club
London
www.calypso.org.uk

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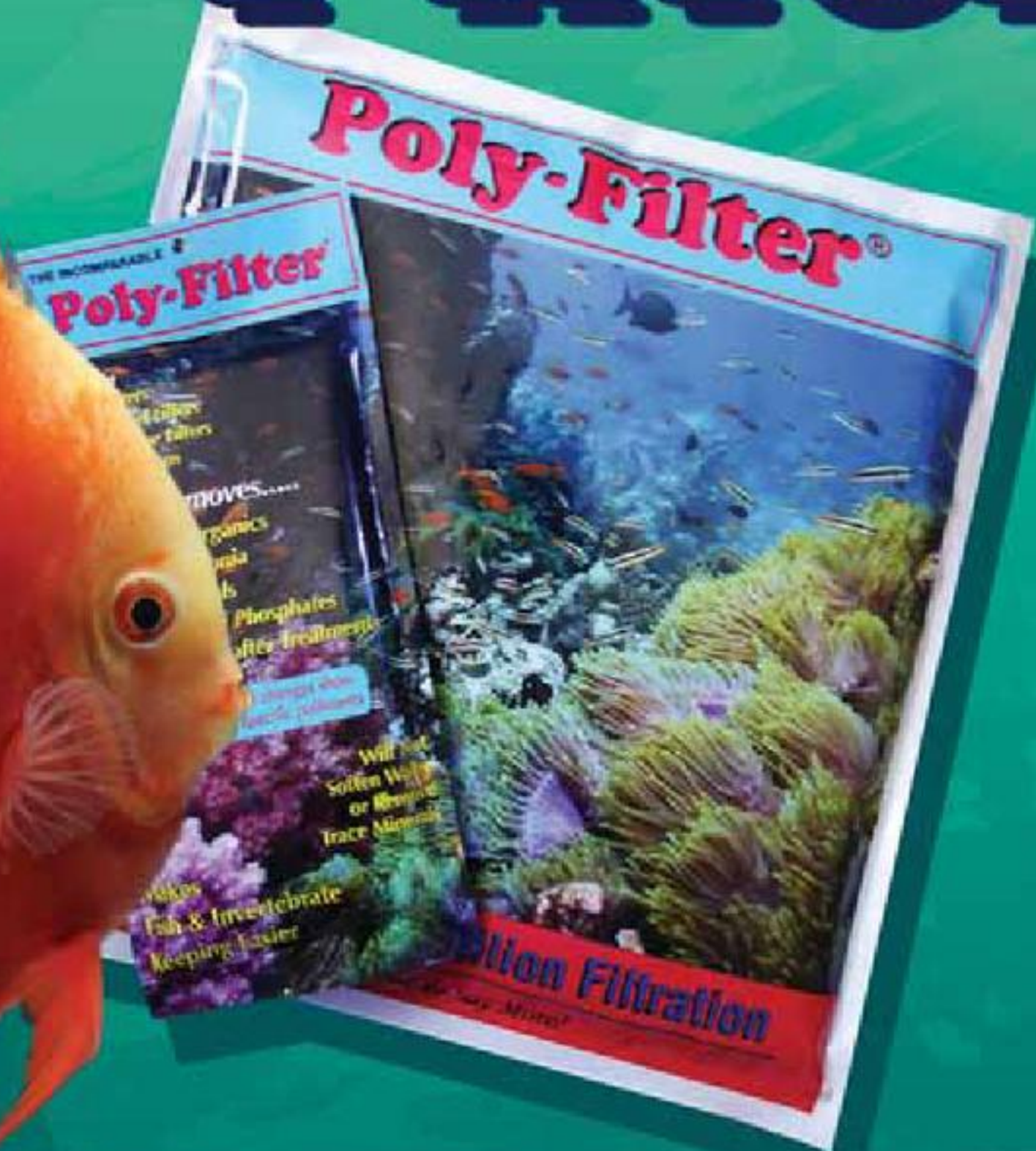
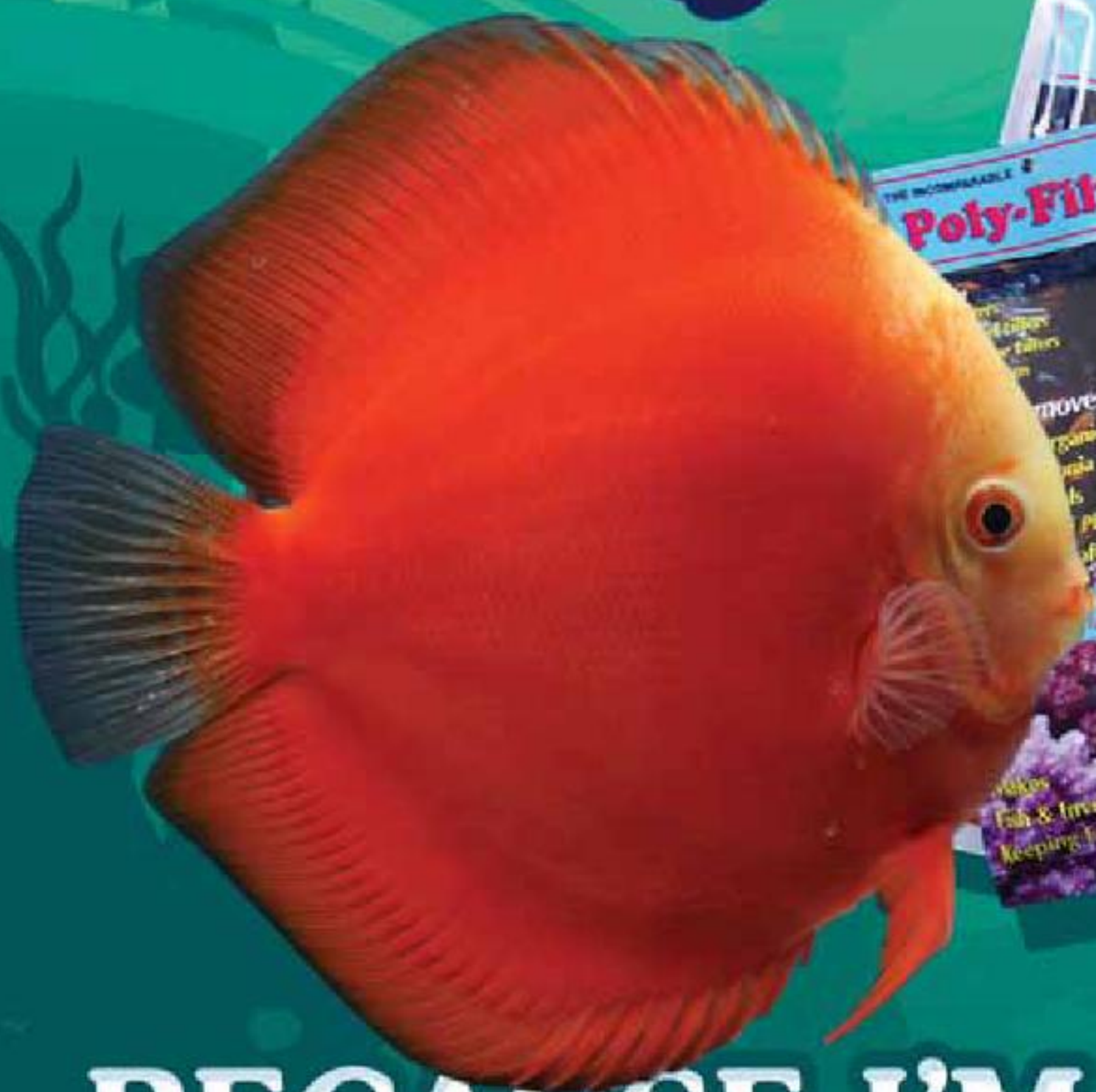
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Male *Paratheraps breidorhi*, the so-called Angostura Cichlid, previously known as *Vieja breidorhi*, a large, aggressive Central American species. Photographed by Morrill Devlin.

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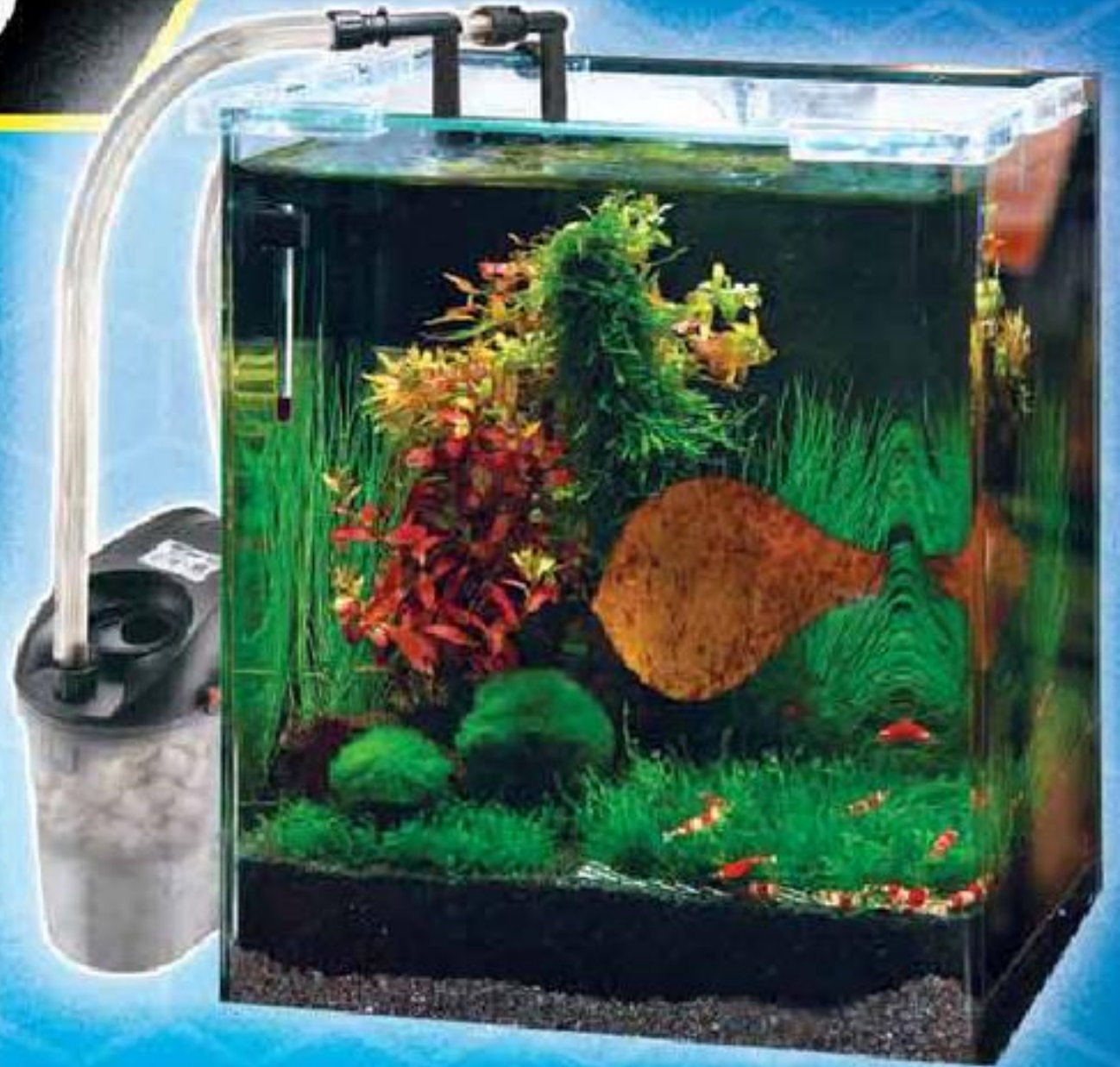
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