A new world of tetra breeding: Cardinals & Co.



AQUATIC TRAVEL

article & images by Hans-Georg Evers • Cardinal and Rummy Nose Tetras are the quintessential Brazilian aquarium fishes. For generations, millions of these fishes have been captured for export from the waters of the Rio Negro, but tank-raised animals from Southeast Asia are now appearing in some tropical fish shops. Leading the new wave are high-intensity tetra breeders on the big island of Java, Indonesia.

Above: Tetra broker Mr. Abas in his holding facility. For some time now, experts have been hard pressed to say exactly how many Cardinal Tetras (*Paracheirodon axelrodi*) are exported from Barcelos, on the middle Rio Negro, via Manaus. There are no verifiable estimates. But the number of Brazilian exporters has diminished severely; increasingly strict regulations are making it more and more difficult to export fishes, and a number of the old firms have already thrown in the towel. Even Turkys Aquarium, once the largest company in Manaus, has ceased operations, and no one really knows what will happen to the Brazilian fish export business in the coming years.

Colombia has always exported Cardinals, but recently the number shipped has been steadily increasing. Many importers tell *AMAZONAS* that they would rather buy from Colombia than from Brazil due to lower freight rates and better prices for this and other species. The prices of many once-expensive L-plecos have dropped, and it is hard to justify placing large orders with the remaining Brazilian exporters.

In addition, more and more tank-raised offspring from professional hatcheries have entered the market. Traditionally, Czech breeders have supplied the Central European market with Cardinals, Neon Tetras (*Paracheirodon innesi*), and Rummy Nose Tetras (*Hemigrammus bleheri*). However, even in the Czech Republic, the prices have more than doubled, so buyers are no longer as interested as they once were.

In Germany, the retail prices of aquarium fishes has barely increased in the past few decades. Especially the Cardinal Tetra is often discounted as a "loss leader" to bring customers into stores. The increased overhead and inflation



result in lower profits, which must be offset with greater production. This is impossible for small breeders like those in the Czech Republic.

Along with Thailand, Malaysia, and, increasingly, Vietnam, the "breeder nation" of Indonesia is one of the largest producers of aquarium fishes in the world. In the hatcheries on Java and Sumatra, large quantities of South American fishes are now being propagated. Wanting to see for myself, some months ago I visited a hatchery on Java and was very impressed by their methods. Any aquarist can imitate these techniques on a small scale, and I have been itching to give it a try ever since.

a try ever

Sawanga

As he has done so often, my friend Jeffrey Christian of Maju Aquarium in Cibinong helped me to establish a good local contact: Mr. Abas, the broker from whom he purchases his tetras.



Left: Hundreds of 0.7-gallon (3-L) tanks are used for the pairwise breeding of Neon Tetras.

Above: Mr. Roddy's

breeding

facility.



Above: Each day the eggs are collected, placed in a single tank, and hatched in shallow water.

Mr. Abas is one of several brokers who operate their own holding facilities. Small farms that typically focus on breeding one or a few species regularly bring their fishes to these brokers. Mr. Abas buys his Cardinals and Rummy Noses from breeders in a small village called Sawanga, where many families make their living by breeding these fishes because the local water is very soft and of good quality, making it possible to produce these demanding tetras in large numbers. Every month, Mr. Abas receives an average of 30,000 Cardinals, 10,000 Neon Tetras, and





50,000 Rummy Noses from his suppliers in Sawanga. He then resells and delivers the fishes to the exporters. He offered to take me to Sawanga so that I could see for myself. We visited the operation of Mr. Roddy, who greeted me warmly and invited me to take as many pictures as I pleased and ask any questions that came to mind. In contrast to other Asian countries, I found that information here was willingly shared and there were no secrets.

Neon Tetras

On the terrace near the entrance to the breeding station, the first thing I saw was a set of shelves holding 0.7-gallon (3-L) tanks for the breeding of *Paracheirodon innesi*, the Neon Tetra. As they are anywhere else, Neon Tetras are propagated pairwise. Males and females are separated for six to eight days and then matched randomly. The breeding strains have been domesticated for many generations, and more than 90 percent of the pairs spawn as soon as the next morning after being moved together.

The eggs are pooled and placed in large area tanks to hatch; they are raised there as well. With this method, Neons are propagated in great numbers here and elsewhere internationally, and few of them are exported from their native country of Peru anymore.

I reported on the professional production of



Above: As they grow larger, juveniles are moved to a separate fish house, where they are reared to selling size.

Right:

Cardinals are set up in a group over spawning grids. Mops and plastic fibers serve as substrate.



Paracheirodon innesi in detail in *AMAZONAS* No. 10 (Evers 2007), so I won't go into detail here. Since the water temperatures are 77–81°F (25–27°C) due to the high air temperature, Neons are not especially prolific here, but they are still propagated in order to offer buyers a variety of species. Breeding Neons is much more productive at 72–75°F (22–24°C), which is why Neon breeders on Java are more often found in the mountains of Bandung. The temperatures there are more moderate, but the water quality is not as good because of its higher total hardness. Therefore, hatching Cardinals and Rummy Noses is far more productive in Sawanga.

Cardinals en masse

Unlike their cousins, Cardinals are bred with a group approach. The sexes are separated from each other for about two weeks; then approximately 100 animals are set up in aquariums mea-









Above: Still somewhat small, but they will grow: offspring of the Rummy Nose Tetra (*Hemigrammus bleheri*) reared in Indonesia.



suring 48 x 16 inches (120 x 40 cm). Spawning grids measuring 16 x 16 inches (40 x 40 cm) are placed on both ends, with small spawning mops on top. The center area is kept open. The group clusters here most of the time, and every now and then individual pairs separate from the group and lay several eggs over the mops; the eggs then trickle through the grid.

The Cardinals spawn in the early morning hours until about noon. Every afternoon the employees remove the eggs with a thin hose. Before doing this, they fold the spawning grid up toward the center so that no adults get under the grid. The fish are obviously used to this procedure and bravely swim over to the other side of the tank to be out of the way.

Each day the eggs from all the tanks are pooled into a single aquarium of the same size, with the same water parameters and a water level of only about 4 inches (10 cm). A handful of leaves from the Singapore/Bengal or Sea Almond, *Terminalia catappa*, provides coverage and reduces the formation of bacteria and fungi. The hatching larvae of all three species are fed with newly hatched *Artemia* nauplii. In addition, the Cardinals receive cultured *Paramecium* because their hatchlings are a bit smaller than those of the other two species.

During rearing, the water level is raised with fresh water every day so that after about two weeks the fry tanks are completely filled. The abundant rainfall on Java is collected in large tanks and serves as breeding water. The water for rearing, extracted from a well, is also relatively soft. In the breeding tanks for all three species, I measured an electrical conductivity of less than 100 μ S/cm. In the rearing tanks in which a third of the water is changed daily, I measured about 200 μ S/cm and a pH of 6.

Although these values are several times higher than those in the native waters of the farmed tetras, one must remember that these are almost domesticated, decadeold strains that are breeding much more willingly and successfully in these water parameters. This also applies to the third species, on which I had cut my teeth as a student, and I was very pleased when I raised just 30 juveniles. If I had known the method described below, I would have been spared much frustration.

Rummy Nose Tetras

The breeding setup for the up to 2-inch (5-cm) Rummy Noses is similar. Approximately 50–60 adult animals are in a group. As described above, there are spawning grids on the left and right sides of the tank, but without mops. Instead, the spawning substrate used here is made up of *Terminalia* leaves, which are attached to thin sticks just



below the water's surface over the spawning grids.

Hemigrammus bleheri spawns at night. The pairs swim close together over the leaves so that their backs stick out of the water, then lay their eggs. Given the low water hardness, the strongly adhesive eggs stick to the leaves. The leaves with the spawn are moved every morning to prepared tanks of the same size. Fresh leaves are clamped to the sticks for the next night.

Mr. Roddy's operation produces about 2,000 to 3,000 Rummy Noses each month. Incidentally, the adult animals are fed with black mosquito larvae, which is why working here is a job reserved for people with steady nerves—the mosquitoes are constantly buzzing around you. But for conditioning these animals, they are by far

the best food.

In addition to *Artemia*, the larger juveniles are also offered live and frozen *Daphnia*. Thus, the tetras grow relatively quickly and are ready to be delivered when they are eight to twelve weeks old.

Too small?

A problem for many buyers is the relatively small size of these species when they reach the market. The Cardinals, in particular, are shipped out at a size of about 0.8 inch (2 cm) because there is such strong demand. Overseas customers often complain about that, which is why Maju Aquarium holds Cardinals and Rummy Noses for at least four weeks and raises them to a larger size before they ship them out.

It is a good thing that these popular tetras are being tank-raised in such large numbers. However, one can't help but think about the *piabeiros* (fishermen) in Brazil who probably won't have jobs much longer, because their government would rather invest in environmentally destructive dams and then blame them for the loss of species. Yet millions of flashing beauties still swim in the igarapés of the Rio Negro. With careful management, they could represent a good source of income for the local people, who would then protect the rivers from which their livelihood comes. Now, there are people on the other side of the world who owe their livelihood to the swimming jewels of the Amazon region. 🔎

REFERENCE

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