

TROPICAL FISH

HOBBYIST

SEPTEMBER, 1964

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Platies and Moons, by Wilfred L. Whiteman. 50¢ from your dealer or direct from TFH.

PLATIES AND MOONS is a new book devoted to a complete coverage of two of the most popular livebearers, *Xiphophorus maculatus* and *Xiphophorus variatus*. Information is given on all phases of the successful keeping of Platies of all varieties, with special emphasis on the differences between varieties.

Intended as a practical guide to raising these colorful and prolific hobby favorites, author Wilfred L. Whiteman's book gives concise, easy to understand treatment to such topics of vital importance as foods and feeding, plants and planting, hybridizing, and selective breeding. Under this last category the author discusses a point which has so far presented many problems for the livebearer enthusiast: how to detect and separate the sexes before they are old enough to breed indiscriminately.

The separate section on diseases and medicants lists the major fish ailments encountered and describes the most effective and simple treatments. Moreover, this section is of special benefit in showing not only how to diagnose and treat, but also how to avoid, these diseases. Diseases covered are white spot, fin and tail rot, mouth fungus, velvet, and others.

For hobbyists who have long wanted to develop and raise their own distinctive Platy variety, but who have no desire to wade through the complicated mechanics of the principles of genetics, PLATIES AND

TROPICAL FISH HOBBYIST

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COVER	
By far the most popular of all marine fishes, probably no need for their interesting habits as for their odd form. See Horses continue on the reverse of the July cover hobby. Peter Chiuschi tells of some of his interesting experiences with Sea Horses and their breeding habits, in the article beginning on page 20. The Sea Horses pictured on the cover is <i>Hippocampus</i> <i>ludlowi</i> , from the Indian Ocean, photographed by Elton Rappaport.	
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EDITORIALLY . . .

I wonder how many fish hobbyists realize how lucky they are. An aquarium setup doesn't cost very much, nor does it occupy much space. Fishes run a wide gamut of prices, but when you consider the price of a purebred puppy or kitten, they are relatively cheap. Most apartment landlords who would unhesitatingly veto their tenants' owning cats or dogs have no objections to an aquarium. The upkeep on an aquarium is very low; its cost of lighting, heating, and aerating does not make a great difference on the electric bill. Think how much it would cost in comparison to keep, for instance, a poodle! Imagine having to contend with clipping, worming, anti-rabies inoculations and a multiplicity of minor annoyances such as dog-walking and wondering what to do with little Frou-Frou when you are going to be away all day. Fishes get all the exercise they need in an aquarium with adequate space and do not have to be taken out on a leash when Mother Nature requires. And if Junior throws something into the aquarium that causes a few deaths, the fishes are usually easier to replace than a purebred dog or cat! Of course, you can't use any of these arguments on a real cat or dog lover. To most of them we fish hobbyists are a race apart, and a tankful of mere fishes is a poor substitute for the unquestioning affection of a dog or cat. Personally I find that fish-keeping throws the hobbyist into contact with a much wider scope of allied sciences than keeping a dog or cat normally does. I have learned a lot more about a wide range of subjects from keeping fishes than many dog or cat lovers have from keeping their pets; maybe I don't have the personal affection for my fish collection that they have for their pets, but my fishes have certainly taught me plenty. And do you know what? I'm still learning!

William Vorderwinkler

With Harold Schultz in Brazil.



The Purus River at Tapauá. At the shoreline are floating warehouses that supply the local fishermen with the necessities of life and take their cash in exchange.

Fishing in the Rio Purus

BY HAROLD SCHULTZ
São Paulo, Brazil
Photos by the author

We were seated comfortably with the map of the Brazilian State of Amazonas between us. Dr. Axelrod tapped his finger on a spot where the Tapauá, a minor stream, met the great Rio Purus. "What do you think of this spot, Harold?" he asked.

"The entire Purus, in my opinion, is an almost unexplored territory for ichthyology. Wherever we fly there is virgin territory. In those huge stretches a collector would have trouble identifying even the most numerous species!" I said.



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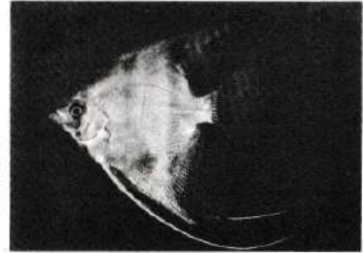
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"Tapauá" is also the name of a small settlement at the mouth of the stream which bears the same name. The only thing I could find out about the place was that there was no hotel or any other accommodations for strangers.

The Purus flows on through the ages, constantly shifting its beds but always the same with its yellow, muddy waters. And in the rainy season when its bed has filled, there passes a procession of thousands of limbs, tree-trunks with their roots reaching out of the water, and palm-fronds. They gather in the eddies where the stream turns and present a terrible hazard for boats which travel upstream to load up with the products of this region: rubber, furs, hardwood, turtles, etc. In the dry season the debris settles in shallow water and points warning fingers at the boats.

The motor of our Norseman plane roared. George Insley, our pilot, followed the course of the Purus. All went well until suddenly we lost all visibility when we found ourselves in a pea-soup of dense rain-clouds. Having neither radio nor radar, the pilot had to feel his way with pure instinct and a very inaccurate map.



This is a wild caught young Angelfish; the caudal filaments are considerably longer than on most wild Angels.

Below us finally lay the mouth of a smaller tributary stream and somewhat below, neatly placed on a high bank, a row of white and red houses. Tapauá! When we had landed, the waves stirred up by the rainstorm caused our six-seater to rock considerably. Eager hands pulled it up to its mooring and carried out our baggage to a sheltered place.

Whenever one travels in new places, it is first necessary to look for the best spots to fish—waterholes, brooks, lakes, and pools in the streams—this is a tedious task. Consider how difficult such an undertaking is in the jungle. Even getting to the locations is much more difficult, as there are no roads or paths. Frequently getting to a stream bank is an impossibility in the jungle, because

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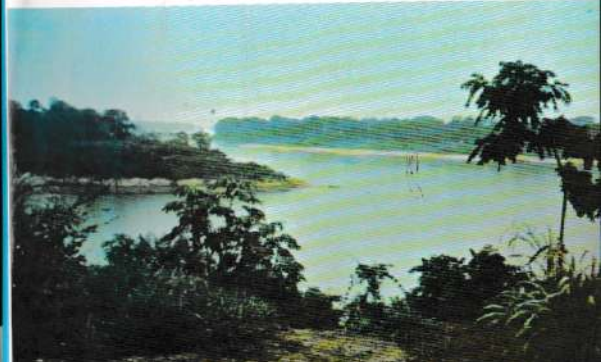
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This is the main street in Tapauá. Too small to have facilities for housing visiting strangers, the village is little more than a clearing in the jungle.

The Purus at Tapauá has banks of soft mud, and the vegetation is thick right down to the shoreline.

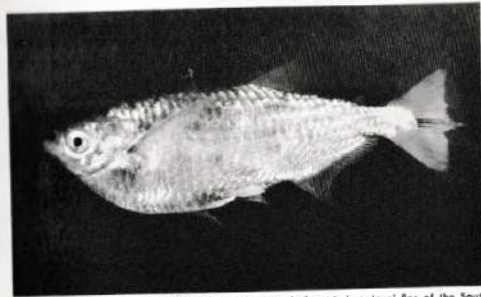
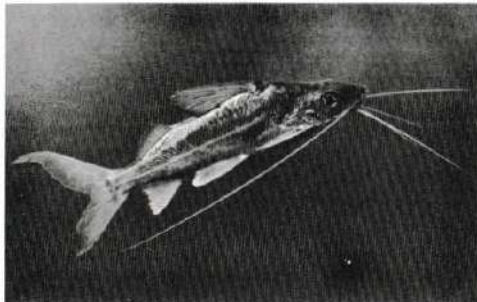


the banks may be so overgrown with thorny bamboo thickets or so muddy that there would be danger of sinking. In other places there are layers of fallen branches and twigs which offer easy escape for the fishes without a single one being caught. Attempts at fishing the banks of the larger streams, which can be attained without difficulty, are usually unsuccessful or result in catching only the well-known species. Naturally there can also be surprises.

So it goes in Tapauá too. Using tiny hooks to fish from a floating dock, we caught some very dark-colored *Leporinus* which were probably new to science, some silvery high-backed Characins that looked like *Moenkhausia* species, a round-breasted *Tripottheus* species of which several occur in the open waters of most streams here, as well as naked Catfishes with long barbels and unattractive gray and white bodies. One man brought a brownish blue *Discus* which looked like something between the already identified color varieties of this fish. "There is a little stream in the jungle which you can reach in an hour's walk!" we were told.

That afternoon Dr. Axelrod and Dr. Terofal went, taking along a few boys as guides. The stream wound its way through the half-light of the jungle. Only very rarely did its surface get sunlight. The water was crystal clear. Logs and tree limbs lay across it in the water and the bottom was sandy, covered with fallen leaves in quiet spots and pools. Our catch included *Boulengerella*, *Potamorhaphis*, *Pimelodus*, *Bunocephalus*, young *Erythrinus*, *Hyphessobrycon agulhas*, and *Hyphessobrycon peruvianus*, real beauties with a deep black horizontal stripe and gleaming red fins. Then came the surprise:

This *Pimelodus* species has very sharp pectoral spines that can inflict a painful wound if the fish is handled carelessly.



This *Tripottheus* species combines the deep body and elongated pectoral fins of the South American Hatchet fishes with an extension of the caudal fin, a feature of some of the African Characins, notably *Phenacogomus*.

real *Parachanna imnei*, the well-known Neon Tetra, many hundreds of miles away from its usual haunts in the upper Solimões. They gleamed metallic green and deep red in the collecting net, and it seemed that here in their natural water Neons were even lovelier.

In aquarium literature reference has been made to a new Neon Tetra, *Hyphessobrycon simulans*, which has become popularly known as the "Blue Neon." The place where they were found was given as the mouth of the Purus. I saw the so-called "Purus Neons" in Manaus at the establishment of their collector. I must confess that I could detect no difference between them and the old, established Neons.

Today it has been established that the Neons which occurred in the Purus region is not *H. simulans* but our old-time *Parachanna imnei*. The "Blue Neon" probably comes from a small stream which empties into the Rio Negro, where it swims with *Cherodon axelrodi*, the well-known Cardinal Tetra. This is a guess, however, which has not yet been confirmed.

Next morning we traveled up the Purus to a lake which was supposed to be hidden by the jungle. Here we found a large motorboat anchored at a bend. This was the supply boat for a quantity of fishermen who pursued the mighty Pirarucus (*Arapaima gigas*) and the manatees, or sea-cows, which still occur here. Manatees have become very rare in the Amazon region, and in some places have disappeared entirely. In the lake region of Manacapuru in the lower Solimões in the past summer, because of the very low water level, there were about one thousand of them harpooned and slaughtered. The fishermen



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These large Amazon turtles, *Pseudemys* species, are caught by the fishermen of Tapauá and shipped to Manaus; the turtles, still plentiful in the area, are offered for sale at between \$10 and \$15 each, depending upon size.

claimed that this cleaned them all out. Here in the Purus the manatee, in spite of being hunted heavily, can still hold its own because of the sparse human population.

If the water depth in the streams and lakes is normal one finds them below the huge floating mats of vegetation which are frequently several miles long and more than a mile wide, where they find shelter and an abundance of food. They are strict vegetarians, subsisting only on aquatic plants. They are extremely shy and clever and are equipped with sensitive organs. It is possible for them to come up unnoticed in the grass, letting just the nostrils show, breathe, and then disappear again into the depths. In spite of this an occasional one falls prey.

However, this year the water depth was so low that the floating meadows either lay on the bottom or had disappeared totally. Manatees and the huge Pirarucus were therefore deprived of their protective cover and fell easy prey to the unerring aim of the fishermen with their steel harpoons.

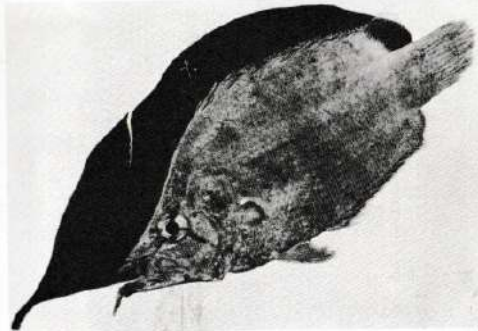
Manatees are encased in a thick padding of fat, which helps them to withstand long periods of hunger. Their hide is tough, thick, and waterproof and brings a good price. The flesh is white and stays fresh for a considerable length of time if stored in its own fat after being cooked. *Mischira* is what the natives call this cooked meat when it is stored. On this motorboat there was a large wooden barrel of it. The flavor is reminiscent of chicken or pork.

We followed a narrow path through the jungle, which led around the lake. The banks were so muddy that no one could possibly dare to approach the water. In one place there was an opening where there lay some small leaky dugouts. But to reach them one had to jump from one log to another in the mud and then into the dugout. This was no small feat!

Dr. Axelrod preferred to fish near the muddy bank. And, as is his custom, he was not afraid to stand in mud up to his hips in order to fish. I rode in the bow of one of the tiny boats which was rowed out into the lake by two young fellows in our party.

These lakes serve as water storage reservoirs for the large streams; they give up their water slowly if the stream depth drops and finally are cut off entirely from the stream and hold their water through the hot, dry summer, during which time they dry out slowly. The water becomes discolored and scarcely transparent. On one bank there is an accumulation of floating plants, a mixture of *Eichhornia*, *Nymphaea*, *Pistia*, *Salvinia*, and others. The long roots reach deep into the water and form a matted tangle which sometimes resembles felt. I allowed the frame net of plastic netting on a metal frame to sink deeply below the aquatic vegetation and then lifted it. The weight of the plants made it so heavy that I could scarcely lift it from the water. I shook the contents vigorously in order to allow the fishes in the plants to fall into the net. Then the plants had to be removed carefully and a colorful struggle remained: half-grown black and silver *Pterophyllum*, ten or more; tiny *Leporinus fasciatus*, with their convict stripes of alternating yellow and black; young silvery *Motynnis* and of course the ubiquitous *Cichlasoma festucosum* with the vertical bars and the diagonal one running through. I have caught these fish in the most remote regions. There do not seem to be any varieties, and the same species is spread almost throughout northern Brazil. There were also some *Pimelodus* swimming in the net, almost transparent and with long barbels: "Look out, Senhor Haroldo," one of my rowers warned, "these fish can hurt painfully if you're not careful!"

"Thanks, but I know it." Yes, the first dorsal spine and the pectoral spines have very sharp points which are covered with an irritating slime. These are erected at once when the fish becomes frightened, especially if it finds itself in the meshes of a net. Tiny barbs make withdrawal painful. Great care must be taken when grasping any of the South American Catfishes, even the well-known *Corydoras* species.



The resemblance of the body outline of the South American Leaf Fish, *Menocirhus polyacanthus*, to the leaf of a plant native to the fish's home area is almost startling. The labial protrusion completes the near-perfect mimicry.

A light purring sound came from tiny brown clumps which were rolled up and hanging among the aquatic plants: small armored Catfishes, possibly young *Acanthodoras* species. This was all, with the exception of silvery, unattractive *Hemigrammus* and *Epiplatys* species, and Pencilfishes of the *Poeciliobrycon* species. These can be caught almost anywhere in the Amazon Basin!

Dr. Axelrod caught some beautiful *Rivulus* species, dark brown with rows of red dots. The females all had the typical nectated spot. Otherwise his catch was very similar to mine. Dr. Terofal, the newcomer, cleverly decided to fish one of the half-dry tributary streams. During the rainy season these streams maintain a connection between the lake and the Purus. The pools which still remained were simply swarming with fish. In his collecting containers there were many very pretty *Corydoras* of the same species we had discovered shortly before in the mouth of the Purus. These had been given the popular name of "Schwartz's *Corydoras*" in honor of their discoverer. There were also a number of the attractive *Rivulus* species among them, as well as *Aequidens*, *Geophagus*, *Motynnis*, and immense *Hoplosternon* with pectoral spines so long that they looked like leg bones.

Our last trip was a failure. We rode up the Tapauá for two hours and arrived in a shallow, open, and very large lake with swampy banks that were overgrown with low grass. It had no aquatic plants, no protective mat of float-

ing plants to cool the water, no quiet bays, no proper places where fish could hide. Clear, transparent water which flowed quite strongly where it came in. There we saw small schools of silvery fishes which were more of a size for eating; it was impossible to catch them in our seines, as they managed to stay ahead of the net in the open water. Right from the beginning I dared to predict that we would find no great surprises here. There just wasn't enough fish life! However, we could see the possibility of catching *Rivulus* or other Cyprinodonts in the numerous little waterholes in the shallow swampy shore regions, which were fed by tiny springs. This was also a bad guess. There were a very few tiny Cichlids there, possibly the young of some *Geophagus* species, and very rarely *Apistogramma agassizi*.

We poured some fish poison into a secluded deep waterhole. Soon there were some silvery fishes at the surface: *Lentodus*, *Hemigrammus* and other Characins, also some of the well-known predatory *Erythrinus*.

This was a disappointment for the hobbyist seeking after beauty as well as for the serious ichthyologist, to whom such negative results could also have a meaning.

The natives of Tapauá brought us their own contributions. Time and again they brought us *Cichla acularis*, a beautiful fish which is greatly desired by the Brazilians for eating purposes; we also got some pretty *Prochilodus*, which they call *Cascadura*, "hard armor plate."

Then came a surprise. A little girl put out her hands, in which she held an 8-inch torpedo-shaped silvery fish. It was covered with large scales and had a large round black spot and blood-red tail. The ventral fins were a gleaming chrome yellow, a wonderful species. A color variety of the well-known *Chalcis macrolepidotus*? Or possibly a new subspecies? None of us had seen this fish before, but it was already half-dead and not even fit for photographing.

Our plane was coming next morning, and we had to hurry to get some fish. "The fisherman Candinho will help you," the mayor told us. Toward evening he came with his fishing-pole and tiny hooks. We laughed and offered him our large collecting net. He just told us very calmly, "The Arari' would jump over the edge of your net. I wouldn't be able to get any for you!"

Next morning we had a number of these wonderful fish—most of them dead but a few still alive. We were especially interested in taking pictures of all the fishes and then preserving them in formalin for scientific purposes, rather than take them back alive. One of them was wide-awake and swam actively in its transport container. It arrived safely in Manaus, but because the plane developed trouble and was delayed on the voyage to São Paulo, it and all the other fishes shipped with it died and were not saved for scientific purposes.

Not even in virgin territory can one always find new fishes, but sometimes a beautiful unknown species is found in the nearest stream!

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Sea Horses

BY PETER CHLUPATY
Photo by the Author

One would be hard put indeed to find any drollier or more interesting fishes than the Sea Horses, recognized since ancient times, of which about 25 species are known. The elder Pliny gives an account of this charming little creature which he called *hippus*, the horse. The popular name refers to the fish's equine head.

Sea Horses belong to the family Syngnathidae, which also contains the Pipefishes. Characteristic of all members of this family are the bony rings which cover the body. The dorsal fin is either simple or missing altogether. Ventral fins are totally missing. The members of this family are small fishes of elongated structure that inhabit most marine coastal waters where there is any amount of vegetation; some species are adapted to a pelagic existence. A number of species have adapted to fresh water. Pipefishes also are interesting, mostly inhabiting tropical and subtropical waters, with only a few, such as the Australian Pipefishes *Doryichthys* and *Corythoichthys*, which are found in the cloaca of the Holothurians, pushing into colder zones.

The family Syngnathidae is further characterized by the pipe-shaped snout of its members. The mouth is usually surrounded by the maxillary and intermaxillary bones. There are no ribs at all. The swim bladder is closed.

An interesting feature of the Sea Horse is its brood pouch, with which every mature male Sea Horse is provided. The brood pouch lies under the tail and is closed for almost its entire length. Its structure exists because the body plates on the sides, all but one little one, are permanently grown together. The brood pouch therefore remains constant, but the inner cell structures show many differences, depending upon whether or not there are eggs. Spawning takes place in the spring and summer months. The large eggs are laid by the female in the brood pouch of the male. During their development in this brood pouch the eggs get oxygen from the bloodstream, which flows through the vessels in the mucous membrane there. After the eggs hatch this membrane disappears again. The young remain for a time in the pouch after hatching.

The courtship which precedes spawning is truly worth watching. The male swims in circles around the female, bowing elegantly. When the female recognizes him as a partner, they intertwine their tails and hold each other while making comical pecking motions. Then they search through the tank for a spot where they can anchor themselves. They let go at times and swim around each other in graceful motions, then their tails entwine once more, and the process is repeated frequently until the actual spawning begins at

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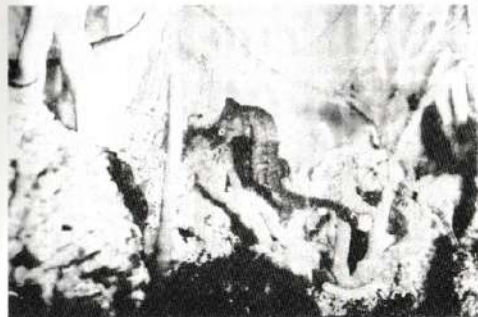
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last. During spawning the male's brood pouch opening becomes wider; the female squirts her eggs into it by means of a spawning tube. Here fertilization takes place. The male then pushes down the eggs in the brood pouch to make room for more. Egg-laying is repeated again and again. The eggs hatch in about 6 weeks, depending on temperature. One could really refer to what follows as a birth, because the male suffers birth pangs. The process extends over 2 to 3 days. The body and brood pouch are shaken with violent motions, with the male often spinning on his head and banging the brood pouch against coral branches and rocks until the last youngster has seen the light of day. Sometimes gas bubbles form in the brood pouch. The result is that the male can scarcely swim and is driven to the surface by the gas which has formed. If he is not helped at this time he will die. The brood pouch must be opened carefully and its contents squeezed out. For this reason it is advisable with Sea Horses to use an airstone which delivers large air bubbles.

Sea Horse spawning is seldom accomplished in captivity, and usually only pregnant males which have spawned in their native waters give birth in the aquarium. In nature, Sea Horses feed mostly on marine crustacea and, if they are large enough, on young fishes. The Dwarf Sea Horse, *Hippocampus zosterae*, from the Caribbean Sea, is supposed to have been spawned quite frequently in the United States. I kept some of these years ago and they spawned repeatedly. I fed the young according to the American instructions with newly-hatched brine shrimp without luck, and after three weeks all of them had starved to death.

I have already stated that Sea Horses occur in warm waters and generally in patches of seaweed. One must take their natural surroundings into consideration when setting up their aquarium. A 5-gallon aquarium is sufficient for three or four of these charming creatures. A sandy bottom is not necessary, but larger plants and thin-branched corals are advisable, to give them places where they can fasten themselves with their prehensile tails. They are weak swimmers and are incapable of pursuing their prey by swimming rapidly. Nature has helped them, though, and they are capable of catching their prey by a quick, strong, sucking motion. This takes place at lightning speed, almost too fast for the eye to follow. In captivity they can be fed with *Mysis* (a small, slow-swimming type of crustacean) and young fishes. It is necessary to have the proper amount of food, however, for the appetite of a healthy Sea Horse is almost unbelievable. For instance, a *Hippocampus kuda* from the Indian Ocean can easily eat 8 to 12 half-grown male Guppies in a single day. How many hobbyists can keep such a large amount of Guppies? If one can get a large portion of *Mysis* every week, the keeping of Sea Horses is no problem, because otherwise they are very easily kept and very hardy. They take other foods such as glass larvae, *Daphnia*, and the larger brine shrimp, but if fed with these our little armored friends are very likely to starve. Before buying Sea Horses, one must provide for their food needs.



This Mediterranean Sea Horse is right at home in a tank containing various living invertebrates. Like its relatives the world over, it makes good use of its prehensile tail to grasp a stationary object to maintain its position.

Another and no less important factor is that Sea Horses should be kept in their own tank if possible, because most of their other tankmates are much faster and would beat them to their food. These things must be watched if Sea Horses are to be kept successfully.

An observer would be likely to be less impressed by the unusual manner of swimming by Sea Horses than by the way they use their eyes. In a manner similar to the Puffers, one eye can look in one direction and the other in the opposite one.

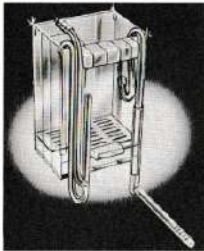
Some years ago I kept a number of *Hippocampus kuda* from Indian Ocean waters, an excellent species in captivity. One could not see enough of these droll creatures. When they found a place to anchor themselves they examined their surroundings very carefully. When something edible swam by they usually all swam after it. If it stood still they would all turn their heads to the left and the right until finally one of them sucked it in. As with humans, Sea Horses also show different temperaments. Naturally I do not want to be guilty of humanizing, but some were very adept at catching their prey, while others hardly ever seemed to get the knack. Sometimes I would get the impression that they needed to be helped by force-feeding. Unfortunately this is not possible and one must be patient.

It frequently happens that when two Sea Horses meet they grasp each other with their tails. If they are both swimming in the same direction, all is well.

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The problems begin when each wants to swim in opposite directions. They begin by pulling, with the result that the weaker one must follow, but this does not usually suit him and he tries to disengage his tail. This usually succeeds, or the other Sea Horse lets go of his own accord. Sometimes one Sea Horse wraps his tail around the most unlikely places, such as another's head or snout. The victim, as can be easily imagined, is not at all pleased and tries to free himself as quickly as possible. Their behavior is really worth watching, and it is hard to take one's eyes from such a tank.

One day I put my Sea Horses in a larger tank which was occupied by 3 Lionfish 9 to 11 inches long. At first I was worried lest the Sea Horses would make a little snack for the big Lionfish, but after some interest at first the Lionfish gave them no further heed. Probably those armored little fish were not considered proper food. After a short period of getting used to things I could watch an unusual game being played by the Sea Horses. One or two swam up to a Lionfish and attached himself to one of the large fins, the head, or even the poisonous dorsal spines, until the Lionfish got annoyed. Either he swam away, which bothered the Sea Horse not one bit, or he shook himself to get rid of the nuisance. If this was also unsuccessful, there was a last resort, to swim suddenly forward. This always succeeded, but it was not long before the Lionfish had another Sea Horse riding him.



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- TROPICAL FISH HATCHERY, Dr. Harberl R. Axelrad, P. O. Box 102, Palmatto, Fla.

Spawning *Corydoras elegans*

BY DR. HANNS-JOACHIM KNAACK
 Photos by the Author

Among the numerous imports of Armored Catfishes which have found their way into Europe in recent years there have been many specimens of *Corydoras elegans*. Nigg and Stettler have called this species *Corydoras reticulatus*, and Pinter has referred to it as *C. virens*. Fortunately the published photographs were clear enough to make a diagnosis of the species. In both cases it proved to be *C. elegans*. Both of the other species are in my possession as imports and could be used for comparison to identify *C. elegans*. There is no difficulty in telling these species apart; while *C. virens* belongs to the long-snouted group and has many similarities to *C. corvinus* and *C. foatleri*, *C. reticulatus* belongs with *C. haraldschultzei*, *C. sterbai*, and *C. latus* in another group which is differentiated from the *elegans* group by the high body form of its members.

My *C. elegans* were shipped as *C. myersi*. Because the latter species was so well described and we had living specimens besides, the error was obvious, but it took almost three years of investigation before I could find out what species I actually had. The result of all these investigations was that the fish which will be henceforth described is *Corydoras elegans*. Steindachner's original description gives the range as Cudajas and Teffe. Scherer also found



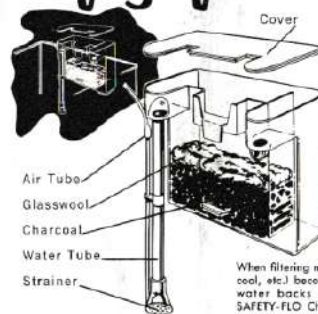
A female *Corydoras elegans*, at the right in the picture, is pursued by 3 males.



A male bands his body in front of a female, showing his side and trying to lure her into the plants.

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this Catfish in the Ampyacu River and surely the habitat of *C. elegans* is much more widespread than the few places where they were reported to be found. This Catfish has also found its way into the U.S.A.; in an article which appeared in *TROPICAL FISH HOBBYIST* magazine about *C. axelrodi*, *C. elegans* and *C. horradischultzei* were also mentioned as the most beautiful members of the genus.

Many successes in the past few years in the breeding of Catfishes strengthened us in the hope that we would also be successful in breeding *C. elegans*. A successful breeding of "wild" Catfish indicates that they are absolutely well pleased with their surroundings. As it is known that the *Corydoras* species appear in schools in their natural waters, I kept 3 females and 10 males in each of two large (50-gallon) tanks. There was no bottom gravel in these tanks, and in its place several flower pots densely planted with *Cryptocoryne* plants, a few rocks, and some well-washed beech roots. A half-gallon filter with activated charcoal kept the water clean and clear.

Because of the failure of a thermostat I lost one half of my *C. elegans*, and all my hopes had to be placed on the other half. After they were put in the fish soon became accustomed to their surroundings. They were not shy; only when there was a disturbance in the water or sudden motion in the room did they disappear among the roots. In March 1961 the peaceful atmosphere which had prevailed came in for a change. The males, one or two each, took possession of the flowerpots with the *Cryptocoryne* plants and became constantly belligerent.

As soon as a male swam into a "wrong" pot, the "owner" immediately drove him out. At this time the females remained hidden among the roots. For food they got *Daphnia*, white worms, Grindal worms, and *Tubifex* worms, and the females soon clearly showed signs of egg development. They were constantly pursued by the males, who tried to lure them into one of the "occupied" pots. The rivalry battles became increasingly vigorous, and after considerable hesitation I decided to take out two females and seven males. On the next morning I noticed that the males swam about among the plants and pressed their bellies against the undersides of the plant leaves. The phase of "symbolic cleaning" had begun. At times the female also took part. Whenever she did, the three males gathered about her, each trying to crowd the other two out. Two days later the first spawning took place—it was the beginning of a spawning period which extended over seven weeks, the fish spawning every fourth day. The eggs were not only fastened under leaves, but also to the roots and on the glass sides. After spawning was completed the eggs could be removed from the spawning sites and placed in a hatching tank.

At a temperature of 75 to 77° F. the fry hatched after 3 to 4 days. Worthy of notice was the relatively small size of the eggs (average diameter of 50 eggs 1.23 mm). At every mating 8 to 25 eggs resulted. These were yellow at first



While the female still remains in about the same spot the male swims on, always showing his side and trembling.



The willing female follows slowly and while she remains among the plants the male begins to clean the underside of a leaf.



Again the male touches him, the bends his trembling male grabs her body before the female with his pelvic. She is so coral fins. Both stimulated that she tremble and she swims to the male's sperm is ejaculated side. As soon as she by the male.

After a longer time of maneuvers and "cleaning" on the male's part and after "will chases through the aquarium the female also begins to clean.



Usually the embrace and the eggs are released into this. Frequent distance from the bottom and both partners sink to the bottom in this position. The female site for a few seconds her ventral ends in this rest position.



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After this the female, with the eggs in her pocket and usually followed by the male, searches for a place to paste the eggs.



A proper leaf is found and, beginning with the underside of the leaf tip, the ventral region is pressed against this.

and as the embryos developed they became darker. One spawning (consisting of the eggs laid in a 5 to 8-hour period) resulted in 350 eggs. Because of their great stickiness the eggs in the pocket between the ventral fins of the female usually remained together. This caused a good deal to be attacked by fungus—in spite of this a good number were successfully raised. Today the third generation is ready for spawning and a selected breeding stock should guarantee the further distribution of *C. elegans*.

Also notable is that with newly hatched spawn the maxillary barbels are impressive. In their coloration (first juvenile stage) and appearance the youngsters bear a great resemblance to young *C. hastatus*. They also require a similar food in their first weeks of life (for instance, small unshelled rotifers and swarms of vorticellae) to that given to *C. hastatus*. When about half an inch of length is attained this stage disappears and a dark horizontal stripe (second juvenile stage) appears on the sides. Youngsters of this size are very similar to half-grown *C. hastatus australis*, except that the spot in the caudal fin is missing and in its place there is one in the dorsal fin. This disappears later and gives way to a series of bands.

The really beautiful colors of *C. elegans* are found with adult specimens. Sexual maturity is attained with good feeding after 9 to 11 months, and especially during spawning do the most beautiful colors of this fish become apparent.

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New scavenger?

Q. About a year ago some friends of mine got me some minnows out of a stream. All of them died until only one was left. I put it into my 5-gallon tank thinking it would probably die. It is still there and is doing very nicely. I feed it tropical fish food along with my other fish. The water is about 70-75° F. It is in with Guppies and one Catfish. The Guppies still have babies and I don't think it eats very many of them. It is a very good scavenger and keeps my small population down by eating their eggs. What do you think of this?

Tim Freeman, St. John, Wash.
A. You take me back to the first issue of this magazine (September, 1952) which carried an article by Dr. Leonard P. Schultz on the Washington Mud-Minnow, Novum-

brus hubbsi. Since you are from Washington, this might be the same species. The trouble with keeping native fishes along with tropical fishes is that either the tropicals have to get used to colder water or the natives have to get used to warmer water. If you try a temper-

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nature about half-way in between, both are uncomfortable. Many hobbyists keep native species with their tropicals (I've done it myself!) but those generally are species which come from the southern states. If you keep a fish native to your state with tropical fishes and it adapts you will generally find that its life span is considerably shortened and it is more susceptible to disease than it should be. Native species should be treated as such and kept in their own aquariums without a heater.

Chocolate Gouramis.

Q. I have a few questions to ask concerning the Chocolate Gourami, *Sphaerichthys osphromenoides*:

1. What would be the right pH and temperature for them?
2. I have a pair of them in a 3 1/2-gallon tank. They are approximately 1 1/2 inches long. Could I breed them in this tank?
3. If I could breed them in this tank what would be the easiest way?

Leon Milberg, North Hollywood, Calif.
A. I. Dr. Eduard Schmidt, who collected them in Sumatra and subsequently bred them in Germany, tells



Chocolate Gourami, *Sphaerichthys osphromenoides*.

us the water temperature should be 80° F, and the water should be highly acid, pH 5.0 to 5.6.

2. A tank of at least 10 gallons should be used.
3. Supposing you have a tank of the proper size and other conditions as stated, they swim around a den-



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pression in the gravel. The males are lighter in color than the females. The male suddenly comes to a stop and they go into an embrace, releasing 30 to 40 eggs. The male picks them up and carries them in his mouth. The female should then be taken out. After 12 to 14 days the male spits out the fry, which are large and grow quickly with newly-hatched brine shrimp as the main item in their diet.

Answer to Mrs. D. J. Pharr.
Q. In reference to Mrs. D. J. Pharr's letter in the July, 1964 issue, I believe what she said could happen. There is a small pond near where I live stocked with Goldfish and Carp. Every year about July there are dead Carp on the mud and hundreds or even thousands of others, mostly smaller, in puddles gasping for air. By the end of August the pond is completely dry. Yet every

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year there are more and more Carp and Goldfish dying on the mud. I never could figure out where they came from. Maybe now I know. The only thing that puzzles me is where do they spawn? The only plants I have ever seen in the pond are Arrow Head and Water Plantain.

Robert Steiner, Cambria Heights, N.Y.

A. Everyone who works with living things is frequently inspired to wonder at the marvels of nature. We have learned so much and are so frequently reminded of how much we have yet to learn. Goldfish, we are told, take about a week to ten days to hatch. Now it seems that this incubation period could be increased by partial drying, if what you say is so. Of course there are other possibilities: it could be that when the pond has water in it after the dry period it is replenished again by someone introducing fish once more. As for your question, a Goldfish or Carp that has no plants to spawn on simply scatters the eggs willy-nilly and they sink to the bottom. The eggs settle into the mud there and eventually hatch. If your theory holds good, the eggs which are laid last become partially

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dried and incubation is delayed until water covers the mud once more. This of course is what happens with the South American and African annual fishes, and if it is possible there, it is within the realm of possibility here. There is much room for experiment and research along these lines.

Four-Eyed Fish

Q. I purchased some *Anableps* and would like to know if they are livebearers or egglayers. Also please tell me how to sex them. (They are also known as the Four-Eyed Fish).

Rita Weiserman, Vineland, N.J.
A. *Anableps* are livebearers in an unusual livebearing fish from northern South America. It attains a length of about 12 inches; when mature, the males develop a gonopodium. The females have a genital opening which may be on the right or the

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feeding any distance below the surface, they are difficult to feed. Overheating.

Q. I have a question that has been bothering me for some time. I have a 5½-gallon aquarium that overheats very quickly when I put the light on for over an hour. If I leave the light off, the plants don't do very well. If I leave it on for four hours, the fish don't do very well. I am using a 25-watt incandescent bulb. How can I keep it from overheating without using fluorescent lighting?

Robert Lee, Rochester, N.Y.
A. The only thing you can do is to put your tank in a place where it will get a few hours of natural sunlight every day. This will take care of your fish and plants without the heat that a bulb right over the water would give it.

Q. How did they get there?
Q. Recently I acquired black gravel for a 20-gallon tank, and before the addition of any more plants I noticed small plants growing in the gravel. They are either Amazon Swordplants or *Vallisneria*. I am letting them grow to satisfy my curiosity. My question is — how did this happen?

Glen Heller, Englewood, N.J.

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A. This one had me scratching my head for a while; finally I came to this conclusion: if you bought your gravel dry, there couldn't have been aquatic plants in it. What probably happened is that your dealer got some grass seed or bird seeds into the gravel and they sprouted.

Q. 1. Does this set-up sound good to you? A 20-gallon tank containing 9 small Neons, 4 Glow-Light Tetras, 5 small Angelfish, 2 larger Angelfish, 3 Marble Hatchets, 2 *Corydoras julii*, an Algae Eater, a Whip-tail Cat, 2 Rosconas, and 7 Zebra Danios. It has a filter which handles 100 gallons per day and aeration besides. It is moderately planted with a few rocks for timid fish to hide behind. Temperature ranges from 76 to 78°. I feed brine shrimp and dried foods daily.



Whip-tail, Loricaria species.

2. Compared to other books, you recommend a much smaller number (inches) of fish per gallon than any of them. Why?
3. How long can I leave Zebra fry in their 5-gallon spawning tank? How old do they have to be before they can be safely moved?
4. Are infusoria tablets good food for fry?

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43

5. Could you please recommend some fish which are harder to breed than Zebras, but not too hard?
 6. Is there any way to tell the sex of *Corydoras julii*? I have two of these that stay together much of the time, but do not know if I have a pair.

Hank Zucker, Great Neck, NY.
 A. 1. You do not have any fishes which will not get along together, but if you have no other tank where you can put them, you're going to overstep your limit when your Angelfish begin to grow. Your temperature and feeding are OK.
 2. It is a tough, almost impossible task to generalize on the question of how many fish a tank will hold. The original "fish-per-gallon" rule was made for Goldfish. These were kept at room temperatures and without aeration. I feel that 1 1/2

inches of tropicals per gallon is about right for most species. With good aeration and filtration this figure could be overstepped somewhat, but I feel that it is better to be on the safe side.

3. You do not say how many fry. Hank, up to about 100, I would say about two weeks. If you are careful to match your water as to pH and temperature they can be moved safely as soon as they are free-swimming.

4. Infusoria tablets are designed to feed infusoria, not fry. The fry then eat the infusoria.

5. In my opinion, the top-spawning members of the so-called "Panchax" group. Try *Pachypanchax playfairii*, *Aphyosemion australe*, or *Epiplatys chapera*.

6. Females of any of the *Corydoras* species, when looked at from above.

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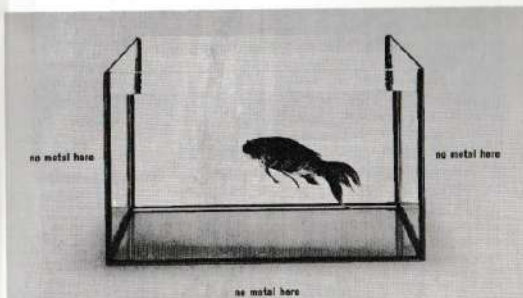
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are wider and a little longer than the males. This of course applies only to mature fish.

One-eyed Zebra.

Q. 1. One of my Zebras got his eye bitten out by another Zebra. He is still living and very healthy, but is not growing half as much as the others are. Is there a reason for this?

Steven Nirk, New Orleans, LA.
 A. 1. Let our readers think that Zebras are vicious, your fish must have had something wrong with that eye. It seems that with active fish that travel in schools one that becomes injured or sick is a target for the others and if not separated will be killed. After the eye was removed by the others the pocket healed and the fish was left alone once more; however, a one-eyed fish sees only half as much food as the others and is at a great disadvantage. This naturally is the reason he is growing more slowly than the rest.



New, Tribuna species.

after they began to decompose by the snails in the tank, or by the fish.

2. Because much of my mail is addressed to me by name, I thought everyone knew who conducted this column; William Vorderwinkler.

Q. 1. In the past year I have had three newts, all of which have disappeared from the aquarium after a maximum of six months. I offered them few hiding places and there was no way to get out. Where could they have gone?

2. I enjoy your column very much and I was wondering about something: it is not stated who writes the column! Could you please tell me who does? I think other readers would be interested, also.

Mike Kessler, Columbus, Ohio
 A. Newts have a way of making themselves quite scarce when they are not feeling well. These probably dug in under the "few hiding places" and died, to be cleared up

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By Paul Hahnel

Foods, etc.

Q. I realize that the best diet for young Guppies is brine shrimp. For the first week of their lives there is a continual supply of it in their tank, but the shrimp sink to the bottom and the young do not want to go away from the top to get it. There are plants both on the surface and on the bottom. Please tell me how to keep the shrimp on top and why the Guppies won't move down.

2. In all the books I read, they say that *Tubifex* worms should be fed to Guppies in their second month. But my Guppies are ready for the worms after three weeks. Should I start them on it at this time?

3. At the two-month stage, are live vestigial-winged fruit flies a good supplement to brine shrimp? While I'm on the subject of food, is the following diet diversified enough: live and frozen brine shrimp, frozen fish roe, *Tubifex* worms, microworms, white worms, fruit

flies, and a variety of dried food including beef meal, shrimp meal, and salmon egg meal?

4. One month ago I went a long way to purchase a superb trio of red strain Guppies. When the females were in their twentieth day of pregnancy I removed them to a 20-gallon long tank. The male remained alone. He was understandably lazy without the females. The pH was 6.8, the temperature was 78°, and the tank was planted with Water Sprite. He got the usual diet of brine shrimp and *Tubifex* worms. But after a week without the females the male was dead. It was a real heartbreak for me, and now my main interest is why he died. Somebody told me I may have overfed him. Is this possible? If it isn't what could have been the reason for his death?

5. In my baby tanks, I keep no gravel. Every week I go over the tank with an excellent power dip tube, getting out all the brine shrimp eggs which have found their way into the tank with the live shrimp. But this clods the tank for about half a day. Is this all right or should I have gravel in the tank? The only reason I didn't use gravel was to save myself the trouble of taking down the tank every so often to clean it.

6. Somehow my tank acquired snails. Now I'm going crazy trying to get them out. Taking down the tank to sterilize it is the most dreaded thing in

my mind now. Is it all right to let the snails stay in the tank as long as I keep them down to a small amount?

7. Are 20-gallon tanks the only things that can be used to raise perfect Guppies? My supply is running out and I'm not rich enough to buy many more setups.

Robert Sireta, Massapequa, N.Y.

A. 1. I fail to see where you have a problem there. Young Guppies are always on top, mostly under the light. Baby brine shrimp, being phototropic, also tend to congregate under the light, right where the fish are. Be careful with your continual brine shrimp supply; the shrimp will live for only a few hours in the fresh water of your tank and then die and pollute the water if they are not eaten.

2. There is no certain time to begin feeding *Tubifex* worms. If chopped finely enough they can be fed from the first day. But keeping them on top is another problem!

3. Vestigial fruit flies are very nourishing and satisfactory as food for fishes, but I doubt whether a two-month-old Guppy will be able to get them into its mouth. All the other foods you mentioned are just what a Guppy needs.

4. There are many possible reasons why your male died. A Guppy cannot be over-

fed, but a tank can. The result is fouled water, caused by excess food.

5. Empty shrimp shells generally float on top. I do not know why your tank should cloud up. I prefer to use gravel in all of my tanks.

6. Snails can be a nuisance if there are too many. I crush all I can find with my fingers and let my Guppies eat them. This not only cuts down the snail population but also gives my fish an added source of fresh food.

7. Tanks of 20 gallons capacity are perfect for raising Guppies, but that does not mean that Guppies raised in them will be perfect. There are many other fundamental requirements for raising good Guppies, such as knowledge and patience.

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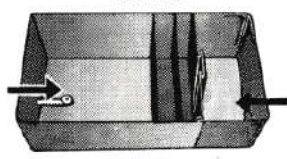
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By Alfred A. Schalts



Moorish Idol

Q. Ever since I have kept fish, one species has always attracted me as the most bizarre and still the most beautiful fish alive. I refer to the fish known as the "Moorish Idol." What are my chances of getting some, and what is more important, keeping them?

Maureen McCarthy, Indianapolis, Ind.

A. The Moorish Idol, *Zanclus cornutus*, is a real eye-catcher. It comes from the East Indies and does not take very kindly to crowding. It must be carefully acclimated

to life in the aquarium after being taken from its home waters, and the mortality rate is high. Add to this the fact that it is not one of the easy fishes to find and catch and you get the inevitable answer:

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Hemiodus uncinatus.

a very expensive fish which is difficult to keep. I recommend that you get *Hemiodus uncinatus*, which, while not quite as beautiful, is almost as showy, more durable, and much easier to keep.

Q. At what size can I put Dwarf Seahorses in my community aquarium? It is well planted and contains Guppies, Black Mollies, and a pair of Rosy Barb.

A. Evidently you have not been introduced to the fundamentals of marine fish-keeping, and I am publishing your letter in case there might be others as poorly informed

as you are. Marine fishes, and the Dwarf Seahorse is one, must be kept in water which closely approaches that from which they come. On the other hand, freshwater fishes and plants species are just that. Give a freshwater fish marine water or a saltwater fish fresh water and the usual result is a miserable death. Each group requires its own aquarium and conditions. Better get a good book on the subject, such as *Salt-Water Aquarium Fish* by Axelrod and Vanderwolf.

Q. I would like to keep some plants in my salt-water aquarium. Which would you recommend?

A. The few marine plants which have been kept with a medium of seawater in aquaria have given so much trouble that they were scarcely worth the bother. It seems that in the comparatively close confines of a marine aquarium, a plant that dies quickly fouls the water with disastrous results not only to plants around it but to the fish life as well. Even plastic plants are not entirely safe. They are made for use in the freshwater aquarium and are not always usable in a marine aquarium.

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Dealing in Danios

BY CAROL HONNOLD

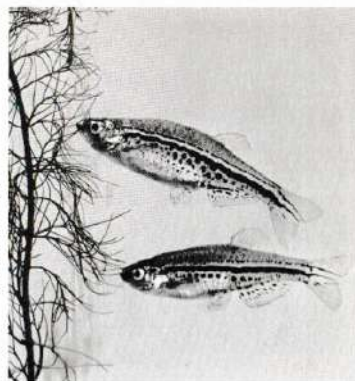
An account having to do with the spawning of the Zebra Danio and its cousins, the Pearl and Spotted Danios, is not particularly sensational. However, the Danios are easy to spawn and are especially desirable for the new hobbyist who, having passed the stage of being thrilled by the birth of Guppies, wants to try his hand at spawning some of the egg layers.

Zebras were the first egg layers I was successful in spawning, a fact which may coincide with the experiences of many other hobbyists. I set up a ten-gallon tank, covered the bottom with marbles, filled the water level to six inches, and I was on my way. I put in a pair of Zebras, and even though the spawning was a small one, it was a spawning nevertheless, and my first effort along this line thrilled me greatly. I spawned Zebras several times in this tank, but the results did not justify what I had read about their being a prolific fish! A careful study of a spawning pair in this tank revealed that many of the eggs were being eaten, in spite of the marbles. There wasn't a thing to keep them from picking up the eggs from in between the marbles.

In due time, I had a tank especially built for the spawning of these fish. The tank is six inches wide, six inches deep, and thirty-six inches long. To set the tank up, I cover the bottom with a double layer of marbles, fill it, and put a vigorously bubbling airstone in one end. After twenty-four hours, I'm ready to go into business with the fish. (To save you from having to make repeated trips to the store to get enough marbles, here's a tip: it takes an even



These healthy, colorful Pearl Danios (male above) are ripe for spawning, as evidenced by the abdominal distention of the female. Photo by G. J. M. Timmerman.



The Spotted Danio, the smallest of the three most common Brachydanio species, is also less prolific and slightly less active than either the Zebra or Pearl Danio. Photo by G. J. M. Timmerman.

1,000 marbles. I've had little boys tell me this is a horrible waste of perfectly good marbles!) The double layer of marbles is important, for there is no way the fish can get between them and pick up the eggs. And I have never had a problem with the fish getting caught between them.

Dimensions of the tank are important. Its length provides the "racing" space these fish need to spawn successfully, and the shallowness keeps them from eating their eggs on their return trip. Temperature is best kept at 74°; pH seems to be unimportant. As long as the females are full of eggs, these fish will spawn in almost any kind of water.

I do not separate the sexes. I feed a great deal of frozen brine shrimp, blood worms, tubifex and frozen beef heart, as well as live white worms and chopped earthworms, and when I feel the females are sufficiently full of eggs to warrant spawning them, I net them out of their community tank (and usually make a shambles of it in the process) and put them in the spawning tank one evening and remove them the following evening. If you ever try to watch the fish in this tank, you will find that you are pooped long before the fish are. They race continually from one end of the tank to the other. Finally the female will periodically let a male "catch" her, at which time they tremble side by side, the female releasing a few eggs which are fertilized, and the chase is on again. I don't feed the fish while they are in this tank—they are too busy to notice the food, and it only fouls the tank.



A robust pair of Zebras, *Brachydanio rerio*. Photo by G. J. M. Timmerman.

One objection to this setup is that you can't see between the marbles to get an idea of what kind of spawning has taken place. However, just be patient for a while and you will find that the tank is literally covered with animated exclamation points. The fish cling helplessly to the sides of the tank for another day or two and then become free-swimming. They require copious amounts of infusoria, which I supply by dropping infusoria tablets into the tank. The fry are very tiny, but they grow at an amazing rate. By the time they are ten days old, they are large enough for newly hatched brine shrimp, which they consume in unbelievable quantities. At this time, they are netted out of their hatching tank and placed in a 20-gallon tank.

Growth continues to be rapid, and providing these fish are fed plenty of food—both brine shrimp and dry food. By the time they are a month old, they can handle frozen adult brine shrimp, which they seem to delight in tearing to shreds in order to make it bite-size for them. At the end of two months, they will be of salable size.

Many hobbyists can't be bothered spawning Zebras. Personally, I am fascinated by them. There is always a market for them, and even though I have raised them by the thousands, I have never had any trouble disposing of them. This is an inexpensive fish and one which remains at the top of the popularity poll so far as the hobbyist is concerned.



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"Whenever I need a 'winners' food, I find Rut-King Guppy Food best of all." Benjamin Kleiss, Ridgewood, N.J., Nitro breeder, exhibitor

"For size, long life and natural color, nothing beats Rut-King." Louis Buxford, No. Branch, N.J., World renowned breeder

"I use—and always recommend Rut-King foods to my customers." Sol Kessler, owner FISHERY, Bridgewater, N.J., Nationally known showplace of some of the world's finest and most exotic tropicals.

Rosario La Corte, Elizabeth, N.J., Author breeder of Cyprinids, Chichlids, Characins. Recommends and uses Rut-King foods for fry and adults of these species.



Since I have been so successful with Zebras spawning in my "racing course", I have also successfully spawned the other popular *Brachydanio* in this same tank, the only difference being in the number of parent fish used.

The Pearl Danio (*Brachydanio albolineatus*) and the Spotted Danio (*Brachydanio nigrofasciatus*) spawn in the same manner as the Zebra, but I use different combinations of spawning partners to assure maximum success. For spawning the Pearl Danio I use one male to two females, with a resultant average spawning of 500. With the Spotted Danio, a fish smaller than either the Zebra or Pearl Danio, I use two pairs; this usually results in a spawning of about 200.

One BIG problem I have had in the raising of the Danios is that they are extremely susceptible to Velvet Disease. I was almost ready to toss the whole thing into the back yard, for youngsters from every spawning would develop Velvet when they were about half grown, no matter what precautions I took. This problem has been licked by adding enough acriflavine to the water to make it a dark green, just as soon as the parents are removed. The fry remain in this water until they are transferred to their larger growing quarters, and then the acriflavine is used once a week, at which time about half the water in their tank is siphoned off and replaced with fresh water. These fish all require so much food that it is pretty easy to overfeed, and I have come to the conclusion that there might be a relationship between the heavy feeding and the incidence of Velvet. In fact, when I decide to be lazy and skip the siphoning and the use of acriflavine, Velvet disease will develop every time.

Whether you are a beginner or an advanced hobbyist, if you have never tried spawning any of the *Brachydanios*—try it some time. They won't disappoint you. They all hatch within 48 hours, so you don't even have to wait very long for the results if you are the impatient type.

Please Mention T. F. H. When Writing to Advertisers

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