

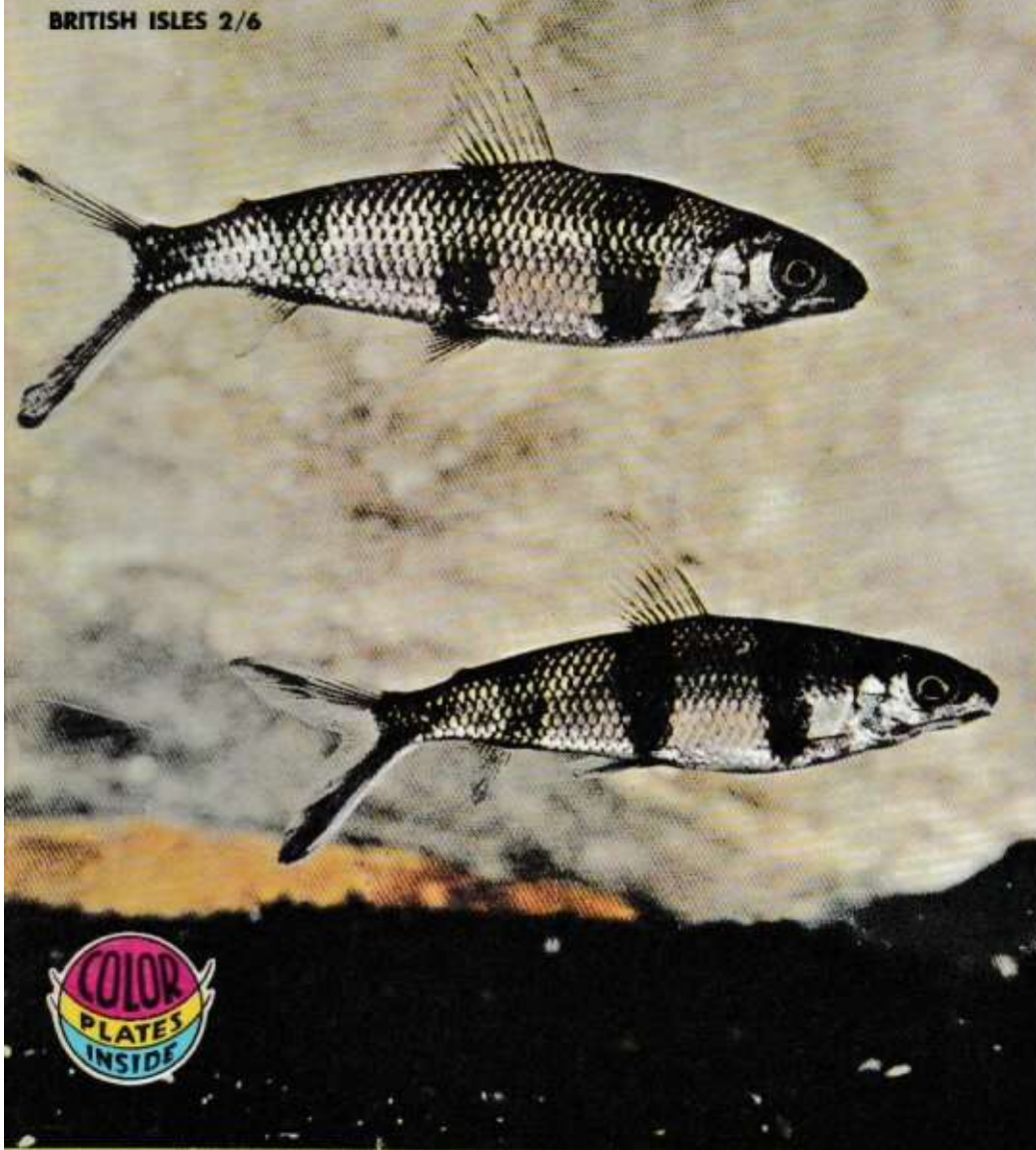
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HOBBYIST

NOVEMBER, 1964

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TROPICAL FISH HOBBYIST

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FEATURES
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COVER
On the cover this month are two beautiful specimens of *Hemiptera* (invertebrates), a South American insect that has lately been named in honor of T.F.H. Publisher William Vorderwinkler. Dr. Gary, who named the fish, introduces it and some of its most relatives in the article beginning on page 11. Cover photo by Dr. Herbert E. Axelrod.
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November, 1964

EDITORIALLY . . .

I have released quite a bit of news of one kind or another in my day, but something was shown to me which staggers me a bit: the General Electric Company has announced that Dr. Walter L. Robb of Scotia, N. Y., manager of their chemical process station, has invented a membrane which serves as a "gill" and would permit a human to live under water indefinitely. This sounds like the answer to a fish-nut's prayer, especially if he is of the salt-water variety. Not only can he study fish in their natural environments, but imagine what a time the bill-collectors will have finding him!

Don't go ordering one yet, though; Dr. Robb has one working perfectly on a hamster which he keeps in a tank of water, a strange place for a desert animal, but you can't get one for a person yet. The silicone rubber membrane seems a bit delicate, too (only a thousandth of an inch thick). A start has been made, however, and perhaps we will live to see the day when we can climb into a suit with a Robb Gill and walk into the ocean for a pleasant weekend among the sharks, barracuda, octopuses, morays, stingrays, and the many other pleasant things to be encountered on the ocean's floor. They're an improvement over some people, don't you think?

William Vorderwinkler

3



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November, 1964



These *Plotosus* catfish are, by reason of the painful sting they can give and the buzzing noise they make, more rightly entitled to the common name "bumblebee" than the gobies of the genus *Brachygnathus*. Photo by Klaus Payson.

Bumblebee Catfishes (*Plotosus*)

BY DR. GEORGE S. MYERS

Big black-and-yellow bumblebees (*Bombus*) are known around the world for their often bumbling fight and fearful sting. Tropical fish hobbyists are familiar with the little bumblebee gobies (*Brachygnathus*) of the East Indies, so called because they resemble bumblebees in size and in their black and yellow color. However, there is an aquarium fish which deserves the name "bumblebee" a great deal more than the bumblebee gobies. It happens to be a catfish.

Most catfishes are strictly confined to fresh water and never enter salt sea water. That is, most of them belong to an ecological group which I once called "primary fresh-water fishes," a division since accepted pretty generally by zoogeographers—those zoologists who study the geographical and geological distribution of animals.

However, two well-known catfish families have no such sharp restriction to fresh water and have a number of marine representatives in the shallow salt water of coastal areas. One of these families is the one called *Ariidae*,

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nearly all of them larger, plain-colored species of little interest to aquarists. The other family is the one called Plotosidae, which includes the fish I want to talk about.

The plotosid catfishes are found principally in Indonesia and Australia and mostly in fresh water, but a couple of species of the genus *Plotosus* are widely distributed in coastal salt waters along the shores on the Indian Ocean and western Pacific, from East Africa and the Red Sea to Japan.

Plotosids differ from other catfishes in having the anal fin united with the caudal fin, or tail fin, and this eel-like united "fin-fringe" also runs forward on the back of the fish for a distance which varies with the genus and species. The short dorsal fin is set close behind the head and begins with a sharp spine. There is no adipose fin such as most other catfishes have. The pectoral, or breast fins, also have sharp spines.

There is one species of this family (and perhaps two or three other, lesser known ones) which deserves the name "bumblebee" more than any other fish. It is a black-and-yellow species found on coral reefs and on shallow shores in the sea, in river mouths, and in the lower parts of rivers, from the coast of East Africa to southern Japan and northern Australia. Its name is *Plotosus*

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My Jewel Cichlids

by K. DEPPE

I wonder if anyone has ever seen Jewel Cichlids (*Hemichromis bimaculatus*) in an aquarium or some illustration without having the desire to keep them himself. This desire is usually dispelled very quickly when one hears about cloudy tanks, uprooted plants, and other troubles caused by these Cichlids. Yes, so it was with me, but things did not stay that way.

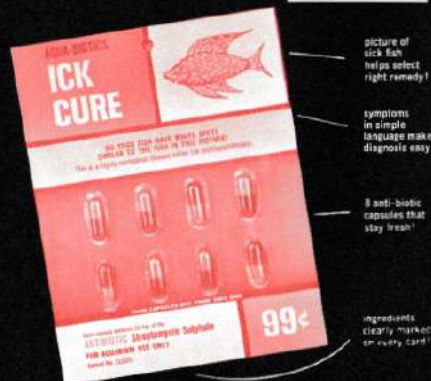
One day my wife and I visited the aquarium section of the Natural History Museum in Hanover. In the beautiful aquaria there were kept some Jewel Cichlids of outstanding beauty. My wife was entranced. What more could a hobbyist ask for than that?

While searching for young ones I discovered in the Cichlid tank of a dealer three fully grown specimens about 4 inches long. I had hoped to buy a pair, but the dealer insisted that I take all three, because there were no

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New Species of Hemiodin characoid Fishes Forming the *Hemiodopsis quadrimaculatus*-group

by J. Géry

Until now, only one Hemiodin species was known to have a transverse pattern. It had been described by Pellegrin (1908) as *Hemiodus quadrimaculatus*, and it was characterized by four vertical bands on the sides. All other Hemiodins had an essentially longitudinal pattern of a band or spots along the sides.

Bohlke (1955) suggested that, whereas Hemiodins' color patterns appear as though they might all be derivable from a single fundamental type . . . (i.e., a longitudinal one) *Hemiodus quadrimaculatus* might be considered as being permanently in a sort of "threatening phase." I may add that it could be, just the same, in a permanent "nocturnal pattern," if one is allowed to compare the Hemiodin pattern with that of the Nannostomus, where a similar exception is to be found. *Nannostomus espei*, for example, bears the transverse pattern during the day which, in the other members of the tribe, is only to be observed at night, as every aquarist knows.

Hemiodus quadrimaculatus, whose types are redescribed below, is perhaps endemic. It has only been found once, in a rather remote basin (the Camopi River in French Guiana), where only Dr. Ternetz collected. The scarce literature (see below) concerns only citations after Pellegrin.

Even Puyo's reference to *Hemiodus quadrimaculatus* from the coast of French Guiana (Kaw & Tonate) concerns, in my opinion, another (new) species which is described below, whereas Eigenmann's description of British Guiana material refers to a third (new) form which is also to be found in the upper Amazon. Finally, a fourth one has been discovered by Harald Schultz, on a TFF Expedition, in the Upper Arinos-Juruaena basin. All four forms have almost exactly the same bands and they are distinguishable only by their meristics.

Thus, the *quadrimaculatus* pattern, which was previously considered as an exception, seems presently to be widely presented by four species (at least) around the Amazon basin, forming what apparently could be called the *quadrimaculatus*-group, i.e., an *Arietenaria* in the sense of Renssch.

The subject of the present paper is restricted to the systematics of this small group, as I am unable at present to give consistent explanation of the origin, or function (if any), of their common pattern. The fact that several members of the tribe are now known to bear the same "frightening" (or nocturnal?) pattern, may facilitate the solution of the problem.

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Fig. 1. *Hemiodopsis vorderwinkleri* sp. nov.; paratype 53.5 mm in standard length. Photo by Dr. Herbert R. Axelrod.

The use of the generic name *Hemiodopsis* instead of *Hemiodus* in the present paper has to be explained: I have recently found (in press) that *Anisistia* (species with much larger scales on ventral than on dorsal part of the flanks) is an exact synonym of *Hemiodus*. The types of *Hemiodus unimaculatus* in Humboldt's University, Berlin, are indeed of the same species as the specimens which were lately called *Anisistia notata*. Thus the name *Hemiodus* must be reserved to the relatively few species with unequal scales (*Anisistia auct.*), whereas the other rather numerous forms with relatively equal scales (at least transversally) have to be given a new name: *Hemiodopsis* Fowler (based on *microlepis*, a small-scaled species) is the first available one.

(1) *Hemiodopsis quadrimaculatus* (Pellegrin, 1908)

French Guiana (Camopi River).

Hemiodus quadrimaculatus Pellegrin, *Bull. Mus. Hist. Nat.* 7: 343-344, 1908
 —Eigenmann, *Mon. Carnegie Mus.* 5: 67, 1912 (cit.)—Puyo, *Poiss. Guy. Freq.* 121-122; fig. 62, 1949 (cit.)—Bohlke, *Notul. Nat. Acad. Sci. Philadelphia* No. 278: 3, fig. 4, 1955 (cit.).

MATERIAL STUDIED: Pellegrin's syntypes, 3, respectively 39.0, 60.6 and 100.5 in standard length; coll. Geay, 1901, Camopi River (into Oyapok), French Guiana (cf. Bertin, *Catal. Types Mus. nat. Hist. nat.* (3): 37, 1947). The fourth syntype (48 mm in standard length) has apparently disappeared.

LECTOTYPE: The male specimen, 100.5 mm. in standard length, in the Galerie d'Ichthyologie du Mus. nat. Hist. nat., Paris, No. 01.394, is here designated as the type of the species.

REDESCRIPTION (Table I): Depth 3.63-4.33 and head 3.68-4.17 in the standard length; eye 2.30-3.22, interorbital 2.80-4.42 and snout (oblique) 2.74-3.31 in the length of head; snout-to-ventrals 0.985-1.03 in ventrals-to-caudal; snout-to-dorsal 1.10-1.24 in dorsal-to-caudal; depth of peduncle 1.28-1.37 in length of same. D(1) ii 9; A iii 9(1); P i 17i-1 19i; V i 10; scales 6i or 7i/42-44/4 or 4i; predors. 12, preentr. 18 or 19, peduncular 12; teeth (total number) 20-22, with generally 13 cusps; inferior gill-rakers 27, very denticulate.

The depth, interorbital space and length of snout have probably an increasing allometry, and the length of head and the eye seem to have a decreasing allometry, whereas the dorsal fin, as well as the ventral fins, become slightly anterior during the growth. The regression lines cannot be calculated, with so few specimens.

The black, vertical bands correspond respectively to the 6th-9th, 16th-22nd and 30th-33rd lateral line scales; the horizontal, peduncular band begins at about the 37th scale.

Characteristic of this species is the relatively low number of scales, which would place it in the group with 42 to 52 or 53 perforated scales (*H. gracilis*, *goldsi thayeria* and *fowleri*) and nearest to *gracilis*, which is much more elongate.

(2) *Hemiodopsis vorderwinkleri* sp. nov.¹ (fig. 1)

Hemiodopsis quadrimaculatus (non Pellegrin), Eigenmann, *Mem. Carnegie Mus.* 5 (1): 275-276, pl. 36 fig. 2, 1912 (lower Potaro)—? Fowler, *Proc. Acad. Nat. Sci. Philadelphia*, 66: 233, 1914 (Rupununi River)—? Boeseman, *Zool. Mededel.* 31 (17): 184, 1952 (Corantyne River).

Hemiodopsis quadrimaculatus vorderwinkleri Axelrod, *Vorderwinkler & Pronek, Exotic Trop. Fishes*: F. 328.00, 1962 (name and fig. only).

Hemiodopsis pellegrini Eigenmann, *Mem. Carnegie Mus.* 5 (1): 91, 1912 (Amaruk Cataract, name only).

HOLOTYPE:² 63.6 mm. in standard length, pers. No. 0123.1; Upper Amazon, on the Brazilian-Colombian boundaries surrounding Leticia, coll. Mr. Tszikis, dec. 1960.

PARATYPES: 1, 53.5 mm. in standard length, collected with the type.

1, 54 mm. in standard length, British Guiana, creek near Amaruk, coll. Mr. C. Liley of The Oxford Univ. Exp. to British Guiana 1959, dec. 1 (No. Oxford Univ. C. 198a).

¹ Honoring William Vorderwinkler, well-known scientific writer and aquarist, publisher of *Tropical Fish Hobbyist*.

² "If a zoologist, in basing a new nominal species on specimens before him, subjectively associates with it specimens that he believes to have been misidentified by another author, he should designate his holotype from the former." (Recommendation 75B: 77 of the International Code of Zoological Nomenclature, 1961).

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Tropical Fish Hobbyist

My Jewel Cichlids

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visible sex differences. According to literature on the subject the males have more green gleaming spots on the gill-plates than the females. Besides, these spots are bunched to form a semicircle on the caudal fin of the males, while on the females they are only hinted at. As the final difference the red color of the female was given as deeper than in the male. Yes, this is what the books tell us.

For these inhabitants of Central and North Africa a 24-inch long tank was set up. My wife washed quartz gravel until it was very clean. Then were added some stones for hiding places and driftwood for decorations. In addition there was a flowerpot with the bottom knocked out, as a spawning site. I did not at first dare to put in rooted plants. The tank was filled with light brown water that had been filtered through peat moss and measured 1.5 DH. The pH value approximated 6.5. There were floating plants. After the three fish had been put in the temperature was raised to 82°.

The three fish, which, as far as I could ascertain, had been together since their youth, took very well to their new surroundings. They behaved themselves and by human standards were model citizens.

Feeding them gave me a little trouble, because it seemed that *Daphnia*, gnat larvae, *Tubifex* worms, and white worms were insufficient. I made an extended tour of the ponds and had the luck to find salamander larvae 1 to 2 inches long. My Jewel Cichlids ate about 50 to 60 of them in a single week. Besides, some of my aquarium society friends who were also gardeners passed on to me a sufficient number of earthworms. The remaining food was kept only for emergencies, especially when I noticed that one of the fish was guarding the *Daphnia* in the same manner as young fry.

With this care the fish took on a gorgeous gleaming red color that shone like lacquer. Unfortunately this marked the end of their good manners. One fish was constantly chased and bitten by the other two. There did not seem to be enough places to hide. I made up my mind to clear out my 50-gallon tank and put in enough hiding-places for my three Cichlids. The setting up of this tank and the water characteristics were the same as in the smaller one. In addition I put in a plant dish with a large plant and fastened several small plants to the driftwood.

To get ahead of myself, the plants have lasted well until the present time. Only one plant on the driftwood was dislodged again and again. The fish did not approve of it in that particular spot. Finally I gave up and stopped putting it there. I will not give the name of the plants, because they are not African. How could I do such a thing!

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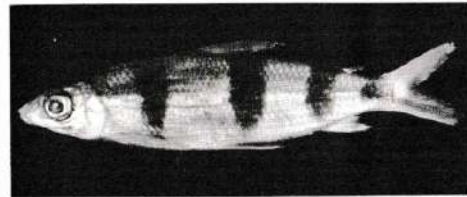


Fig. 2. *Hemiodopsis heraulti* sp. nov., paratype 56.6 mm in standard length. Photo by J. Gery (preserved specimen).

Note: 2 specimens from Turnatunari, British Guiana, collected by Eigenmann, 1908 (labelled "ectypes of *Hemiodopsis pellegrini*"), as well as Eigenmann's text (loc. cit.), were also used for the following description.

DIAGNOSIS (Table I): Depth 4.05-4.95 and head 3.65-4.02 in the standard length; eye 3.08-3.40, interorbital 3.14-3.52 and snout 2.93-3.49 in the length of head; snout-to-ventrals 0.93-1.08 in ventrals-to-caudal; snout-to-dorsal 1.15-1.29 in dorsal-to-caudal; depth of peduncle 1.38-1.75 in length of same. D (1) ii 9(1); A iii 8(1); P i 19i-1 20i; V i 9i-1 10i; scales 7 or 7i/44-45/5, predors. 13-13i (no regular series), preentr. about 19, peduncular 12; teeth (total number) 16-20, with 10-12 cusps; inferior gill-rakers 16-21, feebly denticulate.

Same pattern as *H. quadrimaculatus*, the black transverse band corresponding approximately to the same perforated scales; a small red spot on the adipose fin.

DISCUSSION: Eigenmann (loc. cit.), very probably, was well aware that the British Guiana specimens did not correspond exactly with the *quadrimaculatus* of Pellegrin. He intended to name his specimen *H. pellegrini* but, for some unknown reason, abandoned the idea in the course of his work. Thus he created a *nomen nudum* which is now 50 years old. There is no advantage to revalidate it.

When Dr. Herbert R. Axelrod and Mr. Vorderwinkler sent me the upper Amazonian material, whose occurrence in that region was quite unexpected (*quadrimaculatus* was thought to be "typical" Guianean), I checked it against Pellegrin's types as well as with British Guiana material. I found that, despite their geographic remoteness, the form from surrounding Leticia and from the Basequibo were strikingly close to each other, whereas the Camopi River form was clearly, if only slightly, different.

H. vorderwinkleri has the body and the peduncle more elongate, a smaller eye and the dorsal fin slightly more forward (accounting for the allometries); it has probably one more scale in longitudinal, as well as in transversal and

continued on page 69

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Tropical Fish Hobbyist

It was the work of two days to set up the larger aquarium. These were not good times for the harassed fish. It took on a grayish brown color and the fins were partly damaged. I put it alone in the big tank to give it a chance to recover. Peace was restored in the smaller tank as well, so well that two days later I got the news that I indeed had a pair.

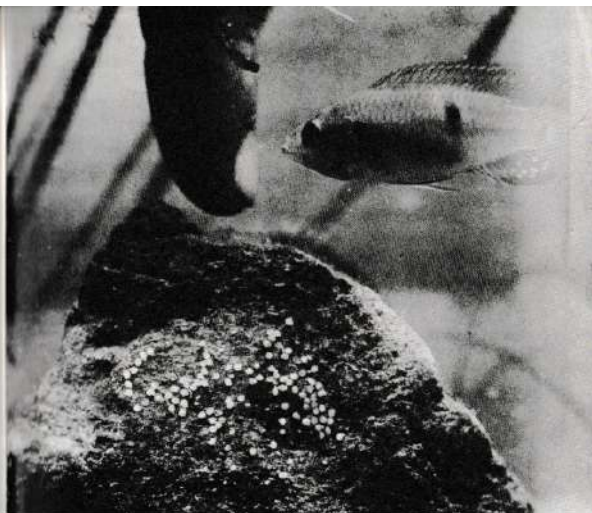
This pair spawned at about 3 o'clock in the afternoon, on the outer side of the flowerpot. The eggs were laid in a circular pattern, constantly enlarged on the outside edges as the pair swam around in a circle, one following the other. Sometimes both swam over the edge of the eggs simultaneously, and in spite of close observation I could not distinguish which fish was laying the eggs and which fertilizing them.

Now there began a touching parental care: the patch of eggs was constantly fanned by one or the other parent, and it was clearly visible how much strength they put into their effort with their pectoral fins. The partner who was not so occupied was kept busy digging pits. The thoroughly washed gravel came to good value here, because the tank water remained clear. After two days the parents transported their fry into one of the pits and every day thereafter they transferred the fry from one pit to another, carrying the eggs (which had already grown a tail) in their mouths. The holes were constantly enlarged. One fish put special effort into the operations, and I surmised that this was the female. Later this turned out to be the case.

After about 5 days the youngsters began to swim freely for the first time. Immediately I fed them with sifted *Cyclops*. The female and later also the male kept the school together with a rhythmic twitching of the fins. This twitching was a signal for the youngsters to remain close to the side of the parent. If any of them swam away, they were picked up in the parents' mouths and spat back. With every day the swarm of 60 to 70 youngsters spread out a little more. In the evening the parents brought the youngsters back into one of the pits and guarded them.

As I had the impression that the parents were eating some of their young, I put the male in the large tank. The Cichlid who had been in there had meantime regained its health and immediately became interested in the male. So I had another pair together; they spawned two days later on a piece of driftwood. In this tank the youngsters were not placed in different pits, but merely in different parts of a large depression. Probably there were too many, 700 to 800 youngsters.

When this large swarm first began to swim, it represented a catastrophe for the parents. The youngsters did not respond to the signals and swam about in the entire aquarium. After hours of work by both exasperated parents, they were able to assemble the swarm in a clump of plants just below the water's surface. Now they inspected the bottom and brought up the weaklings (about 20 to 30) in their mouths and spat them into the swarm. Probably these



This female Jewel Cichlid is doing to attack the finger menacing her eggs, shows on the rock. Photo by New York Zoological Society.

youngsters had not yet filled their swimming bladders with air, because on no other day were they brought so close to the surface. From the following day on the swarm reacted to the fin signal, but also here the group became looser every day. I have tried in various ways to move the water at the same intervals as the parents' with their fins; no success, however. Nature is not so easily fooled.

At an age of four weeks the youngsters already measured about $\frac{1}{4}$ of an inch. Their growth was rapid and also the need for food. I was astonished to find how much food such a swarm required.

Every hobbyist who has seen my Jewel Cichlids wants them, but seldom does anyone want to take care of them, for one reason or another. So I am back where I was at the beginning of the article. However, it pays! Not entirely clear water is compensated for by the observation of the touching parental care and the lovely colors, such as are seen in scarcely any other Cichlid.

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Dr. Fujii Yasuo

Dr. Fujii Yasuo, Japanese surgeon-hobbyist, inspecting some of his tanks in his home in Yokohama. Photo by the author.



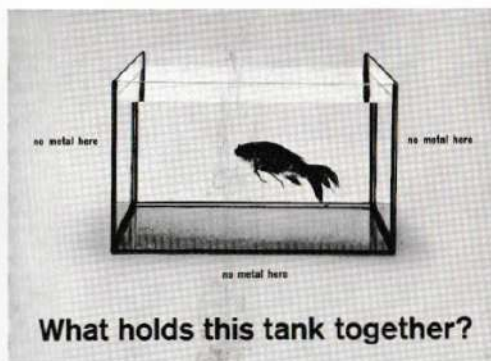
Meet the Hobbyist... Dr. Fujii Yasuo

By Hussein Rofe
The President of the Japanese Amateur Aquarists' Club is a frail-looking 67-year-old surgeon, Dr. Fujii Yasuo, who lives in Yokohama. His residence, surgery, and fish-houses are all located on the same premises, the premises, incidentally, to which the police send Dr. Fujii murder victims for autopsy. Although Dr. Fujii has been responsible for saving many lives through his surgical knowledge, he never practices on sick fishes, since his interference has only been known to hasten their death.

This elderly doctor, who traveled around the world more than 40 years ago while practicing at sea, has also been a tropical fish enthusiast for over 30 years. Yokohama had its own Amateur Club before World War II, (it was inaugurated in 1936) while the present Tokyo all-Japan Club has been in existence since 1950. Twenty members sponsored its foundation, and the membership has since grown to about 150.

Contests are held annually in Ueno Park, close to the Tokyo Zoo, and the Crown Prince is always an interested visitor. Among its other activities, the Club studies the conditions of the public aquariums throughout Japan (the principal one being in a suburb of Kobe). Members also devote some attention to the collection and study of

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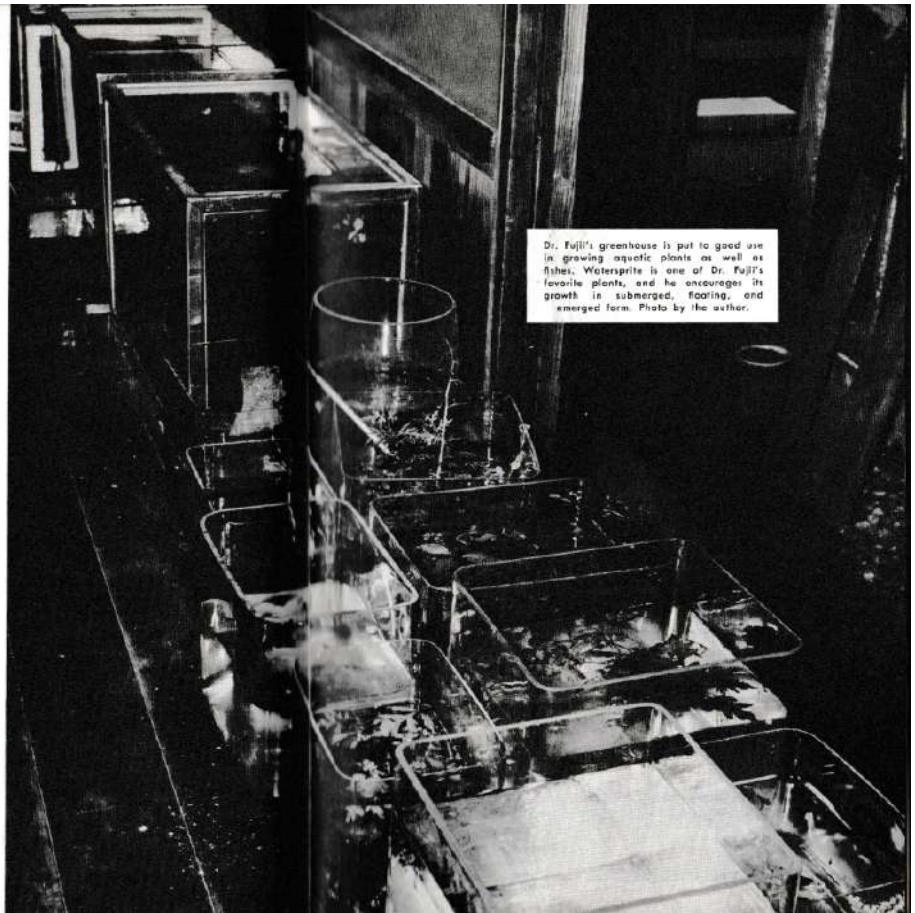
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marine fishes and publish a Japanese language magazine.

During the war, tropical fishes practically disappeared from Japan, and Dr. Fujii could only keep Japanese Carp in his tanks, which were then installed in the upper level of his home. The Carp were also a reserve for the dining-table during this time of acute food shortage. In May of 1945, when American bombers were frequently dropping incendiary bombs over the main Japanese cities, Dr. Fujii's wife was one night sheltering in the basement with a friend, the doctor himself being away at the time.

Seven incendiary bombs scored direct hits on the Fujii home, and one of them went straight through the biggest fish-tank, thereby causing all the water to gush out onto the floor. Because Japanese houses of the time were built almost entirely of inflammable materials, it was because of the presence of that particular tankful of water that the house and occupants were not promptly incinerated. The doctor now attributes his wife's lucky escape to her tolerance of his hobby. She formerly was accustomed to grumble about the purchases of costly fishes, but she now accepts their arrival with equanimity.

Dr. Fujii divides hobbyists into two categories: those who like to breed their fishes, and those who favor display and decoration. Adding that he himself belongs to the former category, he went on: "I



Dr. Fujii's greenhouse is put to good use in growing aquatic plants as well as fishes. Watersprite is one of Dr. Fujii's favorite plants, and he encourages its growth in submerged, floating, and emerged form. Photo by the author.

Tropical Fish Hobbyist

observe that people principally interested in the idea of having an ornament in the home need a great outlay of capital and soon tire of their hobby. The breeder, however, is a real hobbyist, and does not need to spend so much, and his interest is likely to be sustained."

Among species which the doctor likes to breed are the Halfbeaks (*Dermogenys*) and also *Copeina arnoldi* and *Copeina guttata*. In 1956, H.M. the Emperor consulted Dr. Fujii about a gift of Cardinal Tetras which he had just received from Mr. Takase, a world-famous tropical fish expert. At that time, the species was not mentioned in current handbooks, though Dr. Fujii came across a description of

it in an issue of an aquarium magazine. He has always been on friendly terms with the Japanese imperial family, thanks to his recently received a gift of Bluegill Sunfish from Prince Akihito, who brought them back with him from a visit to the United States. Dr. Fujii was able to raise these successfully in Japan.

At present he keeps some 35 to 40 different species, and I was astonished to hear that this busy man employed no assistants at all. "Who cleans the tanks?" I asked. "They are not cleaned often; when you see, you will understand," he replied. Even the carpentry and painting are done by the doctor himself, and this is what he des-

Here Dr. Fujii discusses with Ichiro Sukamoto and Taiji Iwako his ideas concerning the use of aquaria as items of decoration as opposed to their use as the basis of a true workable hobby. Photo by the author.



November, 1964

cribes as the spirit of a true amateur hobbyist. He finds odd moments in the daily routine during which he can attend to his pets, especially as they are only a few yards from his surgery.

The fishes receive a diet of prepared foods, with a weekly treat of Bloodworms and *Tabifex*. Live worms are especially difficult to obtain during the hot months of the rainy season. Ordinary tap water is used, that of Yokohama being less heavily chlorinated than the municipal supply for Tokyo, and it is therefore safe to use after standing for twelve hours. The two fish-houses are heated in winter by a British oil stove, and the normal tank temperature is about 81°, although the tanks on the top shelves may be about 86°. The 1962 summer was cool and there were several cases of sickness; last year's weather was hotter, and the fishes remained in a better condition during the rainy season (which also lasted longer than usual).

I was surprised to hear that Dr. Fujii was particularly fond of Guppies and Swordtails. As he puts it: "Fish-keeping starts with Guppies and ends with Guppies. Everything else comes in between." I felt like a very junior hobbyist when I heard this, since I have so far evinced not the slightest desire to return to keeping Guppies, being much more partial to larger species. Again I was reminded that the true hobbyist has little interest in the commercial rarity of his pets



Taiji Iwako, one of Japan's foremost fish breeders, specializing in the spawning of *Melanimis*, examines one of Dr. Fujii's large tanks. Photo by the author.

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and does not exhibit for ostentation. Furthermore, the Guppy provides a particularly interesting object for study, since it matures rapidly, is easily bred, and new varieties can be evolved in a comparatively short space of time.

Dr. Fujii has not been successful in his attempts to breed Japanese albino Loaches. In any case, Loaches in general seem to present a problem to hobbyists. His future plans are to collect and study Japanese freshwater fishes, since he is not sufficiently familiar with them "like all Japanese who rarely know the names of their native fishes unless they are edible species."

I enjoyed visiting the two rather cramped fish-houses in the garden, where I noticed a very few Discus and Oscars, but countless Guppies, and some of the Bluegill Sunfish which I had never seen before. Every pane of glass in the greenhouse had been put in and painted by the doctor himself. I thought he had every right to feel proud of his achievements, and in parting he told me that he heartily recommended that all other hobbyists try and learn to do the same.

ACKNOWLEDGEMENT

I should like here to record again my considerable indebtedness to Ichiro Sakamoto, manager of the Tokyo Aquarium Co., who accompanied me to Yokohama on a visit to Dr. Fujii (on the recommendation of the Ueno Zoo curator), and acted as interpreter.



Dr. Fujii and Ichiro Sakamoto inspect some of Dr. Fujii's plants. Photo by the author.

Everything a hobbyist would want!

Spawning *Rasbora borapetensis*

BY REINHOLD UEBRING

In a local petshop my wife and I saw in an aquarium a school of active and attractively colored fish. The dealer could tell us no more than that they were a species of *Rasbora*, but further inquiries established that they were *Rasbora borapetensis*. Naturally five of them found their way into my community aquarium, where they were combined with *R. heteromorpha*, *R. maculata*, *R. urophthalma*, *Nannostomus aripirangensis*, *N. marginatus*, and a few other fishes. They felt very much at home right from the start.

In April of this year I put out a pair of *Nannostomus aripirangensis* to spawn. As the male seemed to be unwilling, I took them out after two days and put in a pair of *Rasbora borapetensis*. The water temperature was brought up to 82°, the pH was about 5.5, and the hardness 4 dH. The bottom of the tank was covered with peat moss and in the middle there was a bunch of Watersprite. In the evening there began a vigorous driving. The female sometimes defended herself from the attacks of the male, and sometimes she would turn on the male and chase him without warning. This all took place during the evening; during the day there was very little activity.

After three days they surprised us early one morning with their spawning activity. They spawned—and I wish to emphasize this—on a cloudy day! This was the first surprise. The second was that *R. borapetensis* are open-water spawners. Each time they laid eggs, the fish were in an open space in the upper sections of the tank. After having felt each other out the evening before, the egg-laying itself took place quietly. The male followed the female, swam to her side, and pressed his body against hers in such a manner that his caudal peduncle lay over hers (as with *R. heteromorpha*, but in a normal swimming position). Usually the females dropped two or three eggs each time this happened, and the male fertilized them at once. I would like to emphasize here that the male especially is a greedy egg-eater.

The eggs of *R. borapetensis* are glassy clear and about the same size as those of *Nannostomus aripirangensis*. After an hour the female defended herself from the attempted approaches of the male. Both fish were removed from the tank, as their spawning activities seemed to be over. The first youngsters hatched after about 36 hours. They hung on the plants and glass sides and looked like the fry of Cherry Barbs. About 12 hours later pigments began to show in the eyes, making the embryos easier to see. The fry began to swim after about three days. I fed them commercial fry foods until, six days after becoming free-swimming, the little fellows were able to take newly-hatched

continued on page 77

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A Brazilian Indian legend

The Origin of Fishes

BY HARALD SCHULTZ,
Museu Paulista, Sao Paulo, Brazil.

Photos by the author

With the following Indian legend from Brazil we begin a series of articles which you will find only in TROPICAL FISH HOBBYIST. All legends concern fishes and Indians, and were gathered in the jungle from the lips of the Indians themselves. They are presented just as I heard them.

The world of other people and races is not always completely understandable to us. For this reason the author will attempt, by explanations in the text, to bring the reader closer to the thoughts and surroundings in which the Indian finds himself.

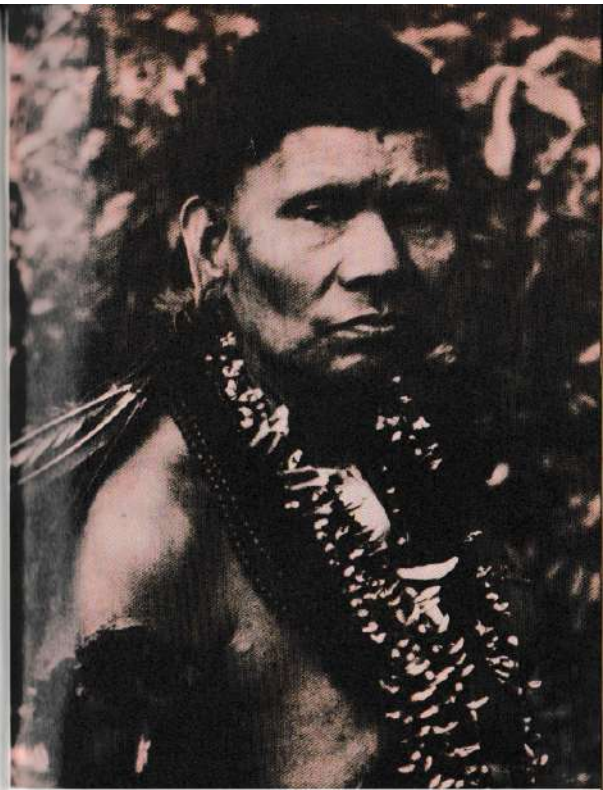
People the world over are always trying to explain how all things began. And all give themselves an answer which seems most logical to them. The Indians of Brazil also occupy themselves with thoughts such as: Who created the first men? Who created the animals of the forest? And the trees? Where did the good, useful plants of the field come from?

The Umutina, a race of fishermen from the Upper Paraguay River in the State of Mato Grosso, Brazil, naturally also think about where the fish in the rivers and lakes of their native land come from!

Many Indian races believe that all the fruits of the forest and fields came from a single original tree. Another time they say that a legendary forefather left us the good products of the field and the waters as an offering to atone for his sins. Such forefathers assume a god-like stature in the folklore. In many legends there is also an earthy, sometimes rude humor in which there is also a fine, poetic character to be seen.

The Umutina were a very warlike race who successfully defended their fields and wide forests of the Upper Paraguay from invasion by the white men, using only bows and arrows and a famous double-edged club which somewhat resembled a sword. Their strength as a race was finally broken by a series of deadly epidemics. The Umutina who are left live by agriculture, hunting and fishing. They are skilled in the shooting of small fish with bow and arrow. Even fish which are bigger and swim a yard or so under the surface are killed in this manner. If a fish is very large it can happen that it will swim away with an arrow imbedded in its flesh. The Indians follow it in order to get the arrow out, but this is not often successful. The big fish dives and pushes its way through the tangles below, breaking the arrow shaft and escaping. The loss of an arrow is a painful one to an Indian. It takes more than a day's work to make a really accurate arrow such as is needed for hunting and fish-shooting.

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Matárepá is the most skilled story-teller in the village of the Umutina Indians which lies at the Upper Paraguay River in Central Brazil, where the author spent eight months. The Umutina women wear short hair. In their drilled earlobes they wear rings of hard palm-nuts, from which they hang pretty feathers. Necklaces of black seeds and animal teeth are worn daily.

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Tropical Fish Hobbyist

The Umutina also poison the waters of their many lakes with vine poison. This is supposed to paralyze the respiratory muscles of the fish. Humans eating the flesh of a fish poisoned in this manner are not at all affected. Once one of these lakes is depleted the Indians leave it, because in the rainy season these lakes are once more connected with the main stream and are again populated. For this reason the numbers of fish never diminish, and every year other fishing spots can be put to use. Earlier, when the race was more numerous, as many as a hundred Indians would take part in such an undertaking; they remained for days in little huts by the lakes.

In the legend which we bring to our readers today, the origin of the fishes is described. The Umutina even tell how the really small fishes came to exist, those which have no practical use for them. But Indians take pleasure in beauty, whether it is in the beauty of their artistic handicraft or the beauties of Nature, and they have a name for each creature, no matter how small, in their surroundings, even the small and often pretty fishes which find their way into our aquaria. Here is the story of the origin of fishes, as the Indians tell it:

Opakariana complained that there were no fishes in the whole world. He went to the magician Bakododó and asked him to do something about it, so that there would be fish for everyone to eat. But Bakododó did not care to, and refused. Opakariana persisted and pestered Bakododó so long that he finally agreed to do something about it, something which would provide everyone with fish.

Bakododó sat in the shade of his hut and was busy making arrows. He had been there all morning, and his two sons sat with him and watched. As the sun was already high in the sky and it was growing hot, the children pleaded with him:

"Come, father, let's go bathing!" Looking up at the sky, the father said:

"Wait a bit, boys, until I'm finished. Then I'll go with you. Mind your father!"

It became very hot and the children became more and more restless; their father kept telling them, however, that they had to wait a little longer.

Bakododó's wife had roasted some corn, of which he was very fond. She ground brown kernels with a wooden pestle and made a coarse, tasty meal which the Indians call *subá*.

Her husband was still working on his arrows. Now and then he picked up a handful of *subá* and threw it into his mouth. More and more arrows were finished. The children were becoming very impatient, and pleaded again:

"Mother, you come with us and we'll go bathing!"

The father answered instead and said:

"Let me finish with my arrows and then we'll go!"

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The men, in contrast to the women, have long hair. This is worn in a knot atop the head, wrapped in a narrow cotton band. All Umutina men are excellent marksmen with bow and arrow. They prefer to fish with bow and arrow, walking stealthily along the banks of the Paraguay River until they spot a fish swimming up to a yard below the surface, at which range they can pierce the fish.

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Tropical Fish Hobbyist

Early in the afternoon the job was completed. Bakododó strapped them together in a bundle and put them away in the hut. Everything he had used for his arrow-making was put into a little basket: a chisel made from a tapir-tooth, cotton thread which his wife had twisted for him, resin from the jungle and flexible bark.

"There! Now run ahead of me to the Bugres River!" he shouted to his sons. The boys dashed off to the river. They stayed in the water a long time. So long, in fact, that they began to feel cold. They pleaded again with their father:

"Come on, father, let's go home now!" And the father said:

"Wait a little longer!" Then he sat them on his shoulders and remained a very long time in the water. His wife, his mother-in-law and his father-in-law were waiting at home, but the father and sons did not return. When the sun became very low, the sister-in-law went to the river to fetch water. She saw her brother-in-law standing in the middle of the stream. He had become changed into a big, wild fig-tree. Both legs, spread wide apart, had become mighty roots. The two children sat on his shoulders, one a little higher and the other a little lower. The woman rushed back to the hut and told her sister what an awful calamity had happened to her husband. She asked her to hurry quickly and take the children away from her husband. When the wife arrived and saw what had taken place she became very angry and berated her husband:

"Why did you do that? You could have gone and shot some fish with the arrows you finished!" But the husband stood stock still and uttered not one word. The wife began to weep and went away cursing. She wished that she had seen the last of her husband, who had changed into a big fig-tree and taken away her children.

Next day the entire village visited the spot, brothers, sisters and in-laws. Everybody! The husband, who was still transformed into the tree, was swept slowly downstream by the current. His loud groans were heard everywhere. Soon he was in the Paraguay River. When he arrived at the big current he asked his friend:

"Can I hold on here?" Opakariana answered:

"Not yet; it is not far enough away!" He was dragged farther and farther downstream, groaning loudly. Then he asked once more:

"Can I remain here?"

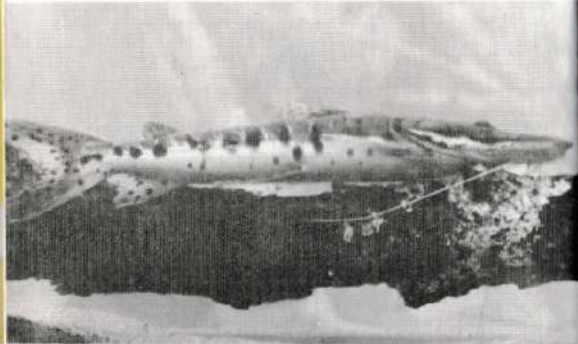
"Not yet!" said his friend. Finally he came to a stop far downstream. Here he remained, where the Paraguay River comes to an end. Bakododó was still transformed into a wild fig-tree. One of his sons had become a limb, and the other an iguana which sat on it.

Previous to this there had been no fish in the streams. Since this man changed himself into a fig-tree there are plenty of fish for everyone to eat, to this very day.



Akataré was the best friend the author had among these people. Here he is sitting on a straw mat and putting the finishing touches to symbols which represent the different fish species. Before him lies a "Slingshot" (*Pisomotrygon*) which he has woven out of straw. During the rituals for the dead these symbols of straw are carried by the dancers on long poles. The Urutina Indians then pray to the patron god of the fishes *Jurima* to bless them with rich catches. The men carry a soft plug of wood in the drilled lower lip, the symbol of their masculinity.

Tropical Fish Hobbyist



The Pintado Catfish, *Sorubim lima*, is believed by the Urutina Indians to be leaves from the fig-tree into which Bakododó the magician had been transformed.

The Urutina Indians group many of the small Characins all together under the name "Lambaris," according to their account of the origin of fishes, the Lambaris were formed from the blossoms of the fish-making fig-tree. Pictured here are Red Tetras, *Hyphessobrycon flammeus*.



Leporinus species, known to the Urutinas as "Piaba," also originated from the blossoms of the fig-tree.

The leaves which fell into the water from the fig-tree became large Pintado Catfish¹, Dourados² and Piraputangas³. The blossoms changed to Lambaris⁴ in the water, and the fruit to Pacú-Péva⁵, Piaba⁶ and Curimatás⁷.

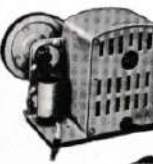
The man always remained there. He was far downstream, where the river ends. The water flowed on under the roots. Formerly the Indians often went there to visit him. Further below there was neither a river nor anything else, just nothing at all!

1. Pintado Catfish—*Sorubim lima*.
2. Dourados—*Salminus maxillosus*.
3. Piraputangas—*Chaetostoma*.
4. Lambaris—All of the small, sometimes highly colored Characins, *Hyphessobrycon*, *Hemigrammus*, *Gymnocorymbus*, *Maculaniplodus*, etc.
5. Pacú-Péva—All the small species of *Metynnis*.
6. Piaba—*Leporinus* species.
7. Curimatá—*Curimata* species.

This is the first of a series of fascinating articles detailing the folklore of the South American Indian tribes with whom Harald Schultz, world-renowned ethnologist and T.F.H. Expedition Chief, has lived. Authentic to the last detail and all illustrated by photographs taken by Harald Schultz right among the peoples of whom he writes, these articles will serve to give an insight into the minds and beliefs of the primitives for whom the discovery of rare tropical fishes is an everyday occurrence.

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Popeyes.
Q. We have had an experience which we would like to relate to you and your readers. It concerns a cure for popeyes:

Recently, my friend and I discovered that my Keyhole Cichlid, *Aequidens nasroni*, had popeyes, a disease which has been described as incurable. We read up on it and discovered that it was caused by either a tumor or gas building up behind the eye. We netted the fish and placed it on a clean piece of glass, the fish still in the net. Then we inserted a sterile needle behind both eyes at the spot where the swelling had begun. We then applied mercurochrome on both eyes, thus minimizing the danger of infection. We put the fish into a container of water from the original tank, allowing the excess mercurochrome to be rinsed off. We then put him into his tank. The next day

we examined the fish and saw he didn't eat. We thought we had merely hastened his death, but on the following day we saw he was more active and ate normally. Four days later his left eye had gone down and looked normal, but his right eye did not. Then his strength began to fade; he stopped eating

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Tropical Fish Hobbyist

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and became very inactive. We later repeated the same operation on the right eye, again applying mercurochrome. Next day we noticed that when food was dropped on the fish's left side he ate it, but not when it fell on his right side. From this we derived that he was blind in his right eye. Within five days, however, the right eye became normal once more, and his sight was restored. We do not know if this treatment will work 100% for others, but we know it did for us.

Manuel Armesa, Teaneck, N. J.



Aequidens nasroni

A. What you and your friend did, Manuel, was to provide an opening through which the fluid or gas that was causing the condition could drain. This operation would be fairly easy for a large fish like a Keyhole Cichlid, but a mighty delicate proposition in the case of smaller fishes. It calls for a delicate touch as well to avoid piercing the eye or skull. Thank you for your account; perhaps others will try it successfully as well.

Why not the Catfish?

Q. About a week ago ich attacked the fishes in my aquarium. My Black Molly was first to get it, then the Guppies and last the *Corydoras* Catfish. It didn't even touch the Catfish. Why didn't he get it?

Richard Vonark, New Orleans, La.
A. I've had a good many people ask me why their fish died, but all too seldom I get a letter like yours asking me why the Grim Reaper spared his fish. An Armored Catfish is fairly well protected by nature against Ichthyophthirius attacks. Instead of small scales which provide many spaces where the parasites can get at its skin, a Catfish has a series of tough plates which keep them from getting where they can do harm; an attack of ich has to be fairly heavy to do any real harm to a Catfish.



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Fourteen years in a bowl.

Q. Fourteen years ago my wife purchased two Goldfish on a special sale, both fish and the bowl for 19 cents. Yesterday one of the fish died, but the other is still living. I think perhaps this should be of some interest to you because of the fish's age.

Mr. & Mrs. Bud Henke, Blue Earth, Minn.

A. After fourteen years in the close confines of a bowl, it's high time that you give your fish some "retirement benefits." Give him a gold-sized aquarium, about ten gallons and no less than five gallons, nicely planted and kept clean. I feel he has earned such a home for himself after all these years in the "torture chamber" and may surprise you by living another fourteen years or more.

"Congos"

Q.1. I bought from a dealer six of what he called "Congos." They are more white than silver and have vertical black stripes. Lately I observed that a pair was digging a very deep tunnel into the gravel between the rocks, and one morning I found about 100 babies in front of this tunnel, guarded by their parents. This all happened in a community tank and in order to relieve the already tired pair and prevent scattering the fry I siphoned them into another tank. I also transferred the parents into this new tank. Are they called Congos; what is their scientific name? **2.** Is it common for them to breed in a community tank? **3.** Are they easy to breed? (The price I paid for them suggests it.) **4.** Are they egglayers or livebear-

ers, and do you think there are more in the tunnel? It seems to me that for egglayers the fry emerged too soon after the tunnel was started. The whole process took only 3 days.

5. Should I return the parents to take care of the remainder, if any?
6. What is their best water condition and temperature?
7. How and how soon can I sex them?
8. At what age do they mature?
9. I also have two Blue Gouramis. How do you sex these?
10. Besides the above two species, I have the following in my community tank: Swordtails, Guppies, Platies, Neons, Bloodfins, Angel-

fish, Zebras, Kissing Gouramis, and Catfish. Something is uprooting my plants. Could you tell me which fish it may be?

Hans-Joachim Szpironat, Chicago, Ill.

A. 1. What you bought were first imported in the late 1950's. The dealer who introduced them called them "Cichlasoma congo" and they became as well known that they are still frequently called "Congos" although they come from Guatemala, not from Africa. Their proper scientific name is *Cichlasoma nigrofasciatum*.

2. It happens quite frequently, but the practice is not recommended if you want to save any number of young.
3. Yes, they are among the easiest of all Cichlids to breed.
4. They are egglayers, of course. The eggs may have been hidden elsewhere and may have already hatched when the tunnel was dug.
5. No, I do not suggest it. Most Cichlid species are able to fend for themselves as far as food is concerned as soon as they can swim freely. As for being suckled by your other fishes, the parents can give them but little protection.



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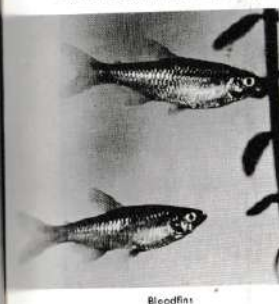
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Bloodfin

fish, Zebras, Kissing Gouramis, and Catfish. Something is uprooting my plants. Could you tell me which fish it may be?

Hans-Joachim Szpironat, Chicago, Ill.


A. 1. What you bought were first imported in the late 1950's. The dealer who introduced them called them "Cichlasoma congo" and they

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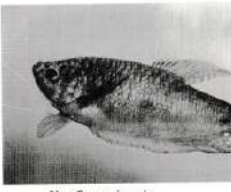
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6. About neutral to slightly alkaline, temperature 76° to 78°.
 7. At about three inches the males begin to show longer fin lips and slightly brighter colors. Sexing is difficult, however, at this size.
 8. They begin to breed at about three inches but grow to about six inches.
 9. The best way to sex Blue Gouramis is to pick out the males by their longer and better developed dorsal fins.
 10. Doubtless your "Congo" Cichlids. They uproot all the plants around their nest so that they may see any approaching enemies.
- Angelfish growth.**
- Q. 1.** I have 3 Giant Kuhl Loaches in one of my 10-gallon tanks. What is the proper temperature, pH, and DH for these?
2. Are they nocturnal?
 3. How does this combination sound? Two small Black Laco An-



Blue Gourami, male

gels, one medium silver Angel, four Zebras, one small female Betta, three Kuhl Loaches, in a 10-gallon tank.

4. When my uncle's silver Angels spawned, he gave me four of them. About four months later his fish were about four inches long and very silver, but mine were about two and a half inches long and were blackish, resembling Black

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Lace Angels. My uncle keeps his tank at 80°, while mine is kept at 74°. The pH and DH of both tanks are about the same. I have inconstant lighting, while my uncle has fluorescent. Why the difference in growth?

(Letter received unsigned, from Chicago, Ill.)



Kuhl Loaches

A. I. I have never heard of a Giant Kuhl Loach, but the entire *Acanthopthalmus genus* has very similar requirements. Temperature 76 to 78°, pH about neutral, and the DH not important as long as the water is clean.

2. Yes, they are so inclined.
3. Your combination is all right until the Angelfish get bigger, at which time I would suggest about twenty gallons.
4. Your uncle has at least one thing going for him. Your 74° temperature is too low, while your uncle's 80° is just what the doctor ordered for baby Angelfish. Incandescent lighting, used sensibly, is about the same as fluorescent. You do not say it, but I'll wager that your uncle uses a bigger tank too.

Reflector causing fungus?

Q. I have a reflector on my aquarium. It seems to be causing fungus.

Will this hurt the fish? Is there any way to stop it?

2. What size tank is best for breeding Bettas? What should the temperature be?
3. Can a male Slender Tetra be bred to a Neon Tetra? If so, what will the young look like?
4. How long should you wait to put a Betta into a community aquarium?

Scott Thompson, El Paso, Texas.

A. 1. Fungus is not caused by the use of a reflector, unless it would by its bright light cause the fish to become frightened and damage himself. Fungus is a type of mold which attacks dead tissue. As long as your fish are healthy they are immune to attacks of fungus, so your job is simply to keep them healthy and not to leave dirty or rough objects lying in the tank where the fish can injure themselves. As for fungus hurting the fish, of course. A fish which is attacked by fungus is frequently killed as a result.

2. When breeding Bettas, it must be remembered that the water level must be kept low until the young begin to grow. A 10-gallon or, better yet, a 15-gallon aquarium with the water about four inches deep is best.

3. By "Slender Tetra" I presume you mean *Hemigrammus gracilis*. When hybridizing, you will very seldom get specimens of two different genera to cross. The Neon Tetra is *Parachanna innesi*, so you can see that you are probably wasting your time.

4. A Betta can be put into a community tank with fish approximately his size at any time. Do not put him into a tank that contains fairly young fry or you will get losses in short order.

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Guppy Corner



By Paul Hahnel

Three-pronged tail.

Q. I am a newcomer to the fish world and have decided to stick to raising fancy Guppies. At the present time I have a pair of Flamenco Guppies and a male of which I am not sure. He has a tail which, besides coming to a point at the top and bottom, has another point which comes out between, giving him a three-pronged tail. Do these Guppies have a special name?

Bill Mielke, Lincolnwood, Ill.
A. The Guppy you describe has become very popular among German Guppy fans and is known to them as the "Nephele Guppy." Sick Guppies.

Q. In recent weeks I have lost upwards of three dozen male and female Guppies (predominately fe-

males) and am at a loss to understand why this happened and is still happening at time of writing. These fish were all in a 20-gallon tank together with several pairs of Platies, Swords, Tetras, and Barbs numbering about a dozen or more, but these were not affected in any way and had been in that same tank for many months. The tank was perfectly clean and well serviced with aeration, etc. I netted out all the Guppies and placed them in two other 12-gallon tanks with fresh matured water and plenty of filtration and aeration and the same temperature (around 76° to 78°), but the losses continued. The females all developed protrusions from the anal region, their bellies wasted away, and their backs arched just prior to death. I tried placing the worst afflicted in a smaller "hospital" tank with a weak salt solution, but after a few days these also died. Feeding was continued with both proteins and live foods such as micro and white worms and freshly hatched brine shrimp, but most of the time the food was left uneaten and had to be removed.

C. P. Meyer, Salisbury, So. Rhodesia, Africa.

A. Your strain of Guppies seems to be in a weak condition. This can be brought on by poor environment, which includes one-sided feeding, acid condition of the water, foul gravel which produces poisonous gases, and possible inbreeding. It is also quite possible that your Guppies were exposed to the parasite *Octomitus intestinalis truttae*. This parasite is found mostly in the gall bladder and intestines of Guppies and other fish species, which are also vulnerable to this parasite. This disease is found in commercial hatcheries and in game fish as well. If found in a hatchery or a pond the following steps are taken:

For two days add 0.2% of mercuric chloride to the food, or for four consecutive days add 0.2% of carbonyl (para-carboxylate-phenyl ammonium acid, H₂O, A.C.H.NH-CONH₂) to the food. Probably it would be better to experiment with neorflavine.

All in all it is better to prevent this disease than to cure it. Make sure that the gravel in your tank is clean and that the pH of the water is slightly alkaline. This is the best prevention against this parasite.

Look-alike males.

Q. I am 13 years old and know a lot about tropical fish, but I have two male Guppies that look alike. I've heard that no two male Guppies ever look alike. Can you tell me why mine do?

Linda Grimes, San Antonio, Texas
A. They may look alike to you, but I suggest that you take a close look. You will probably discover some small dissimilarities. It is possible to breed Guppies which look exactly alike by inbreeding for many generations, however.

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NOTICE

Paul Hahnel is in the hospital recuperating from surgery. Surely there are many who would like to add their good wishes for a speedy and complete recovery to ours. Mr. Hahnel's home address is 57 Clifford Place, New York 53, N. Y., and "get-well" cards would be greatly appreciated.

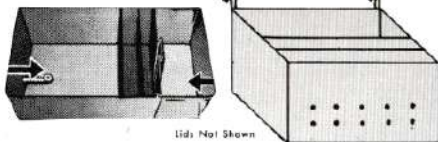
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By Alfred A. Schultz

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A small crowd had gathered in front of three 3-gallon tanks set up in the showroom, and upon investigation we saw that all three of the tanks were stacked with salt water fishes. I heard a deep breath beside me and turned to see my friend standing open-mouthed, his expres-

sion one of disbelief. "Al," he said, "they're beautiful." He kept repeating these words as he went from tank to tank and back again.

All the way home he kept saying that the marine tropicals made his fishes look sick and that he would soon set up a marine tank of his own. Now this man is no newcomer to the aquarium hobby; he is a noted fish breeder, the owner of at least 250 tanks, and he has over the years kept and bred most of the good-looking freshwater tropicals around. He has in the past expressed a few half-hearted intentions of going into the marine hobby on a small scale, and, upon my urging, has even made tentative plans for his first tank. But until he saw the beautiful marine tropicals for himself, before he had more to

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go on than my descriptions and the pictures he had seen, he had no real stimulus. Now, of course, he can hardly wait to begin his own experiments with the wonders of the sea.

Moral? Only this: seeing is believing. Why don't you, as a marine hobbyist, drop down to your local marine tropicals dealer and bring along a freshwater hobbyist, one who has never before seen living marine fishes at their best?

Q. I have kept a marine aquarium successfully for almost a year, but whenever I put in some shrimp from our local bays and inlets they seem to do wonderfully well for a while and then I find their remains on the bottom. Why does this happen?

William Bradley, Bayshore, N.Y.
A. You must remember that many fishes feed largely on crustaceans. Normally a crustacean's shell and claws give it sufficient protection to keep it from being eaten and they get along very well in a sort of "mutual respect" with the fish life, but a shrimp or crab must periodically shed its shell and grow a slightly larger one as time goes on. Just after they do this they are

helpless and vulnerable to the attacks of hungry fishes unless they find a safe hiding place. If you want to keep shrimp with your fish, give them places where they can hide until their shell hardens.

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New Species

continued from page 15



Fig. 3. *Hemiodopsis steni* sp. nov.; paratype 71.8 mm in standard length. Photo by Harald Schultz.

predorsal series, and almost certainly fewer teeth with fewer cusps, less gill-rakers and less anal rays. These last characters seem to be fairly constant in the group, and they do not overlap.

Other characters, rather inconstant nevertheless, show that a drift between Guianan and Amazonian populations is scarcely appearing. The upper Amazonian specimens may have a slightly larger eye, one more ray on pectorals and one less on ventrals, and perhaps less teeth, but this is not worth a sub-specific separation.

(3) *Hemiodopsis huraulti* sp. nov. (fig. 2)

Hemiodopsis quadrimaculatus (non Pellegrin), Payo, Poiss. Guyane Fr.: 121-122, fig. 62, 1949 (Kaw?, Tonate?).

¹ For Mr. J. Hurault, an expert ethnologist of the forest tribes in French Guiana, who collected the holotype.

HOLOTYPE: 115.7 mm. in standard length, pers. No. 5792.3; French Guiana, upper part of the Maroni River, at about the Litani falls; coll. Mr. J. Hurault, Nov. 1962.

PARATYPES: 1, 56.6 mm. in standard length, middle Maroni River near the Abatis Cotica falls up-stream, coll. J. Gery Nov. 25th, 1957 (Str. 27, coll. with explosives).

1, 47.8 mm. in standard length, middle Mana River in French Guiana at the Arouani-Sougnou falls, coll. J. Gery, Oct. 13th, 1957 (net).

DIAGNOSIS: (Table I) depth 3.86-4.27 and head 3.77-4.06 in the standard length; eye 3.05-3.57, interorbital 3.06-3.33 and snout 2.64-3.06 in the length of head; snout-to-ventrals 0.91-0.97 in ventrals-to-caudal; snout-to-dorsal 1.05-1.23 in dorsal-to-caudal; depth of peduncle 1.41-1.43 in length of same. D (j)ii 9(i); A iii 9(i); P i 19 or 19i; V i 10; scales 9 $\frac{1}{2}$ or 10/50-52/5 or 6, predors. 13-15, preentr. about 22, peduncular 14 or 16; teeth 18-22, with 8 to 11 cusps in the broadest; lower gill-rakers 20-26.

Same pattern as the preceding forms, with the middle band more distant from the anterior one (or, evidently, nearer the posterior one), and the peduncular streak shorter. The bands correspond respectively to the 7th-11th, 22nd-27th, 34th-37th and 43rd-50th perforated scales.

DISCUSSION: *H. huraulti* sp. nov., has about the same body form as *H. vorderstankleri*, i.e. somewhat more elongate than *H. quadrimaculatus*; all have the same head structure, similar form and place of the fins, etc.

It is best distinguished by its scales-formulae, as compared with *quadrimaculatus*, *huraulti* sp. nov. has about 8 more lateral line scales, 3 or 4 more scales in transversal series, 1-3 in predorsal, 2-3 in preentral and 2-4 around peduncle. The number of lower gill-rakers, 20-26, is intermediate between that of the two former forms.

(4) *Hemiodopsis sternali* sp. nov. (fig. 3)

HOLOTYPE: 80.8 mm. in standard length, USNM 194377; Mato Grosso, Brazil, Amazon System, shore of Alto Rio-Juruena not far from the road Cuiaba-Porto Velho; coll. Mr. Harald Schultz, June-October, 1962.

PARATYPES: 1, 71.8 mm. in standard length, USNM 194368, same locality as the holotype.

1, 60.0 mm. in standard length, USNM 194330, also upper Juruena, collected with a seine, 2-3 feet depth, by Mr. Harald Schultz, July 8, 1962.

DIAGNOSIS (Table I): Depth 4.23-4.82 and head 3.87-4.18 in the standard length; eye 3.50-3.82, interorbital 3.19-3.60 and snout 3.12-3.21 in the length of head; snout-to-ventrals 0.98-1.05 in ventrals-to-caudal; snout-to-dorsal 1.22-1.25 in dorsal-to-caudal; depth of peduncle 1.62-1.81 in length of same. D (j)ii 9; A (j)ii 9(i); P i 17 to 19; V (j) 19i; scales 12/64-67/7 or 8, predors. 19 or 20, preentr. about 26-28, peduncular 18; teeth 22, with 12 (rarely 14) cusps in the broadest; lower gill-rakers 26 or 27.

Same habit and pattern as the preceding forms; the black vertical bands correspond respectively to the 7th-11th or 13th, 25th or 28th-35th of 37th, 45th or 49th-52nd-57th perforated scales, the peduncular band beginning at the 57th to 60th one.

⁴ For Mr. Max Stern who founded Hartz Mountain Bird Company and has done so much for the aquarium industry.

TABLE 1
Hemiodopsis quadrimaculatus sp. nov. (Group *gracilis*)
Hemiodopsis sternali sp. nov. (Group *sternalis*)
Hemiodopsis huraulti sp. nov. (Group *huraulti*)

No.	<i>Hemiodopsis quadrimaculatus</i> sp. nov. (Group <i>gracilis</i>)		<i>Hemiodopsis sternali</i> sp. nov. (Group <i>sternalis</i>)		<i>Hemiodopsis huraulti</i> sp. nov. (Group <i>huraulti</i>)	
	USNM	Other	USNM	Other	USNM	Other
Standard length	80.8	71.8	80.8	71.8	115.7	56.6
Depth of peduncle	1.62-1.81	1.62-1.81	1.62-1.81	1.62-1.81	1.41-1.43	1.41-1.43
Head	3.87-4.18	3.87-4.18	3.87-4.18	3.87-4.18	3.77-4.06	3.77-4.06
Eye	3.50-3.82	3.50-3.82	3.50-3.82	3.50-3.82	3.05-3.57	3.05-3.57
Interorbital	3.19-3.60	3.19-3.60	3.19-3.60	3.19-3.60	3.06-3.33	3.06-3.33
Snout	3.12-3.21	3.12-3.21	3.12-3.21	3.12-3.21	2.64-3.06	2.64-3.06
Snout-to-ventrals	0.98-1.05	0.98-1.05	0.98-1.05	0.98-1.05	0.91-0.97	0.91-0.97
Snout-to-dorsal	1.22-1.25	1.22-1.25	1.22-1.25	1.22-1.25	1.05-1.23	1.05-1.23
Depth of peduncle	1.41-1.43	1.41-1.43	1.41-1.43	1.41-1.43	1.41-1.43	1.41-1.43
Length of head	3.77-4.06	3.77-4.06	3.77-4.06	3.77-4.06	3.77-4.06	3.77-4.06
D (j)ii	9	9	9	9	9(i)	9(i)
A (j)ii	9(i)	9(i)	9(i)	9(i)	9(i)	9(i)
P i	17-19	17-19	17-19	17-19	19 or 19i	19 or 19i
V (j)	19i	19i	19i	19i	10	10
Scales	12/64-67/7 or 8	12/64-67/7 or 8	12/64-67/7 or 8	12/64-67/7 or 8	9 $\frac{1}{2}$ or 10/50-52/5 or 6	9 $\frac{1}{2}$ or 10/50-52/5 or 6
Predorsals	19 or 20	19 or 20	19 or 20	19 or 20	13-15	13-15
Preentrals	26-28	26-28	26-28	26-28	about 22	about 22
Peduncular	18	18	18	18	14 or 16	14 or 16
Teeth	22	22	22	22	18-22	18-22
Cusps (broadest)	12	12	12	12	8 to 11	8 to 11
Gill-rakers (lower)	26 or 27	26 or 27	26 or 27	26 or 27	20-26	20-26

Measurements are given in mm. Proportions between parentheses in the standard length and head in the length of head for the eye, interorbital and snout; snout-to-ventrals, snout-to-dorsal, snout-to-caudal, and depth of peduncle in its length.

DISCUSSION: Again, *H. sternali* sp. nov. is best distinguished from its supposed relatives by the number of its scales, which is the largest of the group, as far as known. In the number of teeth, tooth-cusps, gill-rakers, etc. . . . it is closest to *quadrimaculatus*, whereas in the proportions it is nearer to *vorderstankleri*.

CONCLUSION: The following tentative Key of the genus *Hemiodopsis* (as here intended) may serve to show the differences between the three new species just described with the other forms, as well as to give some idea of their affinities.

It can be seen that *Hemiodopsis* nominal, i.e. species with very small scales on the middle of the sides (the few first and last scales of the lateral line are clearly larger than the other ones) constitutes a small group distinctly different from the other forms. Incidentally, this group needs a revision. Whereas the majority has no real gap between the three mentioned groups (*gracilis*, *semitaeniatus* and *quadrimaculatus*): *H. sternali* for example, with its relatively numerous scales, clearly bridges the gap between the *gracilis*- and *semitaeniatus*-groups.

KEY TO THE GENUS HEMIODOPSIS (HEMIODUS AUCT.)

- a. Less than 90 perforated scales
 - b. No definite transversal bands on sides; generally a longitudinal band and (or) some spots
 - c. Less than 55 perforated scales (*gracilis*-group); transversal scales about 7 or 7 $\frac{1}{4}$ or 5; a longitudinal band
 - d. Body elongate, slender; lateral line 42
 - ... *gracilis* (Amazon, R. São Francisco)
 - dd. Body less elongate; lateral line 44 or more
 - c. Longitudinal band beginning below dorsal fin level
 - f. Lateral line 44
 - ... *goeldii* (Guianas, Xingu, often confused with *semitaeniatus*)
 - ff. Lateral line 50-53
 - ... *fowleri* (Amazon)
 - cc. Longitudinal band continuous from opercle to end of lower caudal lobe; lateral line 46
 - ... *thayeria* (Rio Negro)
 - cc. 55-85 perforated scales (*semitaeniatus*-group)
 - g. A longitudinal band; lateral line not more than 63
 - h. Longitudinal band beginning below dorsal fin-level; sc. 9/56-58/5
 - ... *semitaeniatus* (Rio Guaporé)
 - hh. Longitudinal band continuous from eye to end of lower caudal lobe; sc. 11/63/6
 - ... *ternetzi* (Tocantins)
 - eg. No longitudinal band
 - i. No spot at all on flanks; sc. 10-11/69-72/6 of 7
 - ... *immaculatus* (Rio Negro)
 - ii. A round spot on the middle of the body
 - j. Sc. 17 or 18? /65-70/11
 - ... *rodolphi* (Rio Parahyba)



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jj. Sc. 20/80-83/12

... *parnaguae* (Rio Parnagua)

bb. Three transversal bands on sides, plus one on peduncle (*quadrimaculatus*-group)

k. Perforated scales 42-45

l. Branched rays of anal 9; about 27 lower gill-rakers

... *quadrimaculatus* (Camopi Riv. French Guiana)

ll. Branched rays of anal 8; about 16-21 lower gill-rakers

... *vorderwinkleri* sp. nov. (Upper Amazon, British Guiana, Surinam?)

kk. Perforated scales 50 or more

m. Scales 9 $\frac{1}{2}$ or 10/50-52/5 or 6

... *huraulti* sp. nov. (Surinam and French Guiana)

mm. Scales 12/64-67/7 $\frac{1}{2}$ or 8

... *sterni* sp. nov. (Alto Rio Juruena)

aa. More than 90 perforated scales (*Hemiodopsis* s. str.)

n. Scales 24 or 25/110-112/14 or 15

... *microlepis*-group (probably more than one species, Rio Negro and Guianas to Guaporé)

nn. Scales 30-32/120-125/18 or 19

... *argenteus* (Orinoco)

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Bumblebee Catfish

continued from page 7



lineatus (Thunberg), although in most books it will be found listed as *Plotosus anguillaris* (Bloch). It grows to an extreme size of about a foot in length, but smaller examples, one to four inches in length, are much more frequently seen. The smaller examples are of a blackish brown color, with two bright yellow stripes along each side.

However, the color alone is not what makes these catfishes so much like a bumblebee. For a second similarity, they buzz, like an angry bee, when a fish is taken out of the water in a dip net. Other catfishes are likely to make croaking noises under such circumstances, but *plotosids* buzz. Third, unlike bumblebee gobies, bumblebee catfishes can sting like a bee! Touch the sharp dorsal spine, or the pectoral spine, and you'll wish you hadn't! Not only is there a stinging venom in most catfish spines, but the venom also includes an anti-coagulant which keeps your blood flowing out of the puncture for a long time! Fourth, bumblebee catfishes swarm like bees!

I shall always remember a story told to me by the late Dr. Albert W. Herre, who was for many years one of the principal authorities on the fishes of the Philippines and East Indies. He was collecting fishes on a coral reef somewhere in this vast tropical area. He knew that large blocks of coral, thrown up on top of the reef by the waves during heavy storms, are usually porous and that the holes are often the hiding places of rare fishes. He had found such a block, three or four feet in diameter. He surrounded it with a fine mesh seine net and then squirted a little formaldehyde into some of the holes. Then, he said, occurred a most remarkable event!

Out of one hole in the coral block came a stream of little bright yellow and black *Plotosus* catfishes about an inch in length. They came out fast, in a column three or four abreast! And they kept coming—and coming—and coming—and coming—for minute after minute—until he thought there couldn't be that many *Plotosus* in the whole world! There were thousands of them! The whole block must have been hollow, he said, with little *plotosids* packed into it like bees in a hive!

I have seen small *Plotosus* in marine aquariums, and they are brilliantly colored and active little fishes—more active after dusk than during the day. Also, they enter rivers, and it is said that even those collected in salt water can be acclimatized to brackish and fresh water. *Plotosus lineatus* has occasionally been brought to this country as a marine aquarium fish. But I have heard of no one in this country who has tried to keep them in brackish or fresh water. Somebody should try!

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Rasbora borapetensis

continued from page 32



A pair of *Rasbora borapetensis* (male below), less colorful than many other *Rasbora* species but just as active and pleasing in a community of other inoffensive fishes. Photo by Dr. Herbert R. Axelrod.

brine shrimp. Growth is quite rapid if the young get enough food. After nine or ten days the black horizontal stripe began to show and the iris took on its silvery color. Six or seven days later the silvery color of the belly began to show, and four days after that the red in the base of the tail became visible.

Three weeks later, the little *R. borapetensis*, which grew quite evenly, had grown to a size of almost half an inch.

From my experience *R. borapetensis* is not particularly productive (only 25 youngsters from the spawning described), because the female rarely shows the presence of eggs unless she is exceptionally full. The breeding pair repeated for me after only two weeks!

Because of their attractive colors and their peaceful but alert appearance as well as their size, which seldom exceeds 1 $\frac{1}{2}$ inches, this *Rasbora* is highly recommended for all hobbyists.