

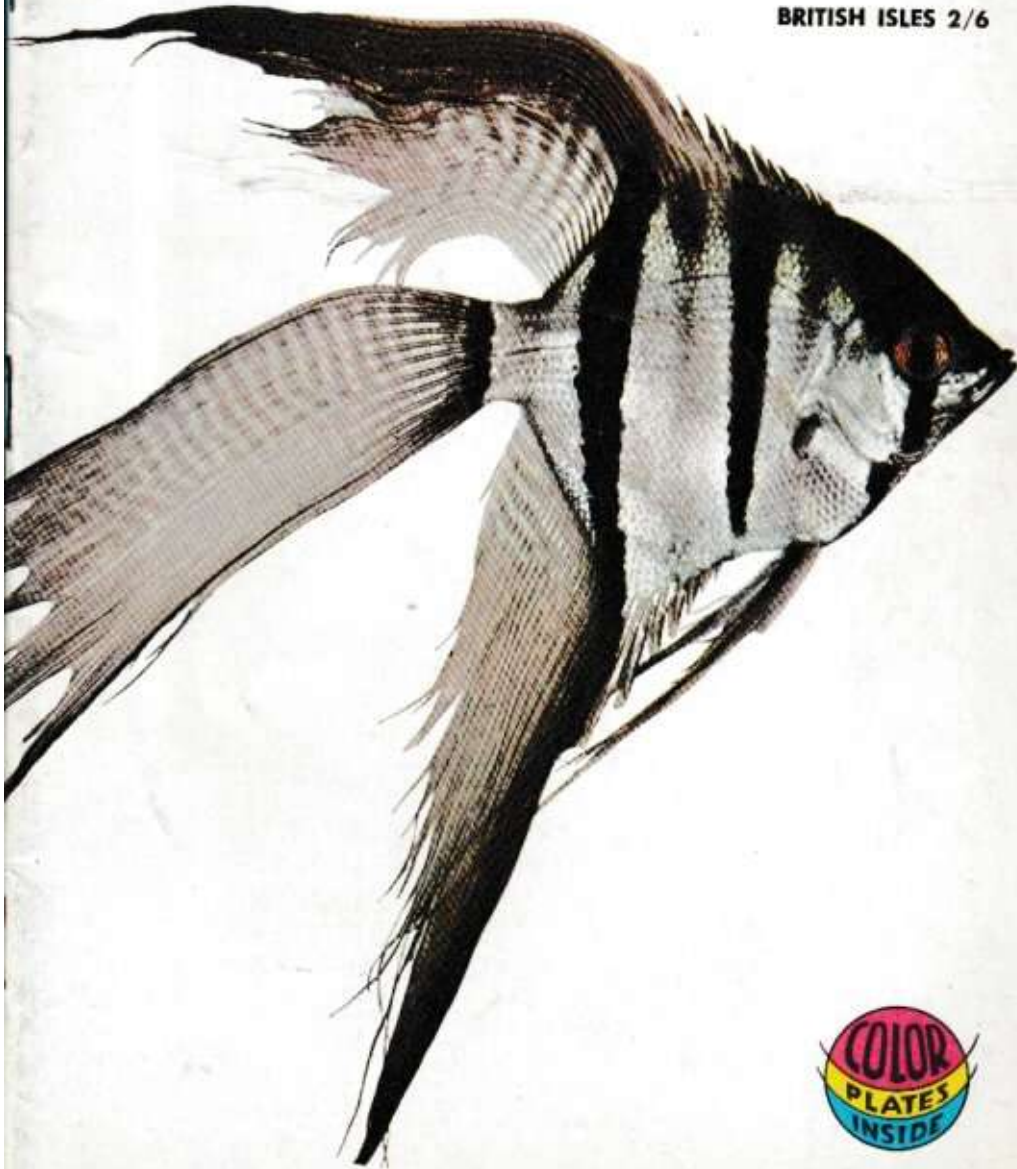
TROPICAL FISH

HOBBYIST

NOVEMBER, 1963

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AQUARIUM WATER CHEMISTRY.
by Dr. Rolf Geisler.
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Another in a series of tropical fish books designed to help both the novice and the advanced hobbyist is Dr. Rolf Geisler's *Aquarium Water Chemistry*. This thirty-two page book has eight information-packed chapters, and is profusely illustrated throughout.

All hobbyists will find it of extreme interest because of the vital information the book contains. Leading topics include Physical and Chemical Properties of Water and the Methods of Measurement; The Native Waters of Fishes; What Water do Aquarium Fishes Need?; How to Create Special Water Characteristics; Filtration of Aquarium Water; and Water Care and Fish Feeding.

Aquarium Water Chemistry reveals how to soften hard water, how to harden soft water, how to neutralize or acidify alkaline water, how to make acid water neutral or alkaline, and how to make black water.

Of special interest to the novice fish keeper is the section on how to properly test for water characteristics. Products are also discussed, detailing the functions of each.

Of definite interest to the salt-water hobbyist is a recently developed scientific formula for making a singularly successful synthetic ocean water. Salt-water effects on aquariums are also discussed. Equipment needed to successfully keep a salt-water aquarium is described.

A total of twenty-one illustrations picture either fishes, accompanied by a description of their water requirements, or aquarium chemistry products, with an explanation of their use. There are also photographs showing the natural habitat of tropical fishes.

TROPICAL FISH HOBBYIST

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(Actual date of distribution: Oct. 21, 1963)

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COVER
The magnificent finnage of the beautiful Lyretails on this month's cover is a tribute to the skill of the man who bred the fish, Danny Ericsson, who has gained renown throughout the hobby for his great successes in consistently spawning especially fishy. On page 18 begins the account of another of Danny's rearing efforts: the successful raising of baby fish with the body stripes of a non-spawning adult on the fry's first band. Cover photo by Dr. Herbert R. Axelrod.

EXOTIC TROPICAL FISHES SUPPLEMENT
Pages 33 and 39, 39 and 40. These pages are perforated for easy removal and punched to fit into the Looseleaf Edition of EXOTIC TROPICAL FISHES.

RATES: 35¢ per copy in the U.S.; 35¢ per copy in Canada or foreign; \$2.50 for 12 issue subscription. All back issues available at 35¢ per copy. Index available in every 12th issue.

In Canada Tropical Fish Hobbyist magazine and books are sold exclusively through Canadian Aquarium Supply Co., 1125 Labot Street, St. Thomas, Ontario. All subscriptions and inquiries from Canadians should be directed to them.

In England and the western Sterling area Tropical Fish Hobbyist magazine and T.F.H. Books are distributed exclusively through T.F.H. Publications (London) Ltd., 39 Station Road, Redhill, Surrey, England. All subscriptions and inquiries should be sent directly to them.

© 1963 T.F.H. Publications, Inc.
Second Class Postage Paid at Jersey City, New Jersey. Published monthly by T.F.H. Publications, Inc. at 245 Cordeiro Avenue, Jersey City 2, N.J. Printed in U.S.A.

EDITORIALLY . . .

Every time a community announces that it is about to fluoridate its water supply I get frantic letters from aquarium hobbyists asking if this is a thing which will hurt their fish and plant life, and what to do to get rid of this substance in their tanks. My answer is always the same: Don't worry about it! The amount of sodium fluoride, which by itself is a violent poison, is so tiny that your most delicate fishes and plants will not feel any ill effects. The reason for adding it to your drinking water has been publicized so often that it is almost foolishness to repeat it: it has been proven effective in cutting down tooth caries, and if used in all drinking water will in time make your dentist almost a thing of the past. All right, we know it's good for our teeth, but what will it do to our fish? I called up a Water Company chemist recently in an effort to get an authoritative answer. He told me that fluoridation is something that even the sickliest person need never fear, and that it would have no effect at all on all our aquarium fishes. Is there any method of filtration or something which will clear it out of the water? I asked him. No, he told me. Removing it from the water is a very complicated chemical process which the amateur would be hard put to duplicate. So there you are, readers. If you are losing fish, don't be too hasty to blame the Water Company! Ask yourself if you aren't giving them a little too much to eat, and if that wasn't a sick fish you put in last week without quarantining first, or when you gave the tank its last good cleaning. Is your tank just a wee bit crowded? These things will lead to BIG trouble a lot more quickly than an infinitesimal amount of sodium fluoride!

William Vorderwinkler

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What a 10-gallon tank led to.



There is a wide variation in the markings of the Lyretails. The male shown here has a highly developed lyre-shaped tail, but the markings on the body are less pronounced. Note the fringed pelvic. Photo by Dr. Herbert R. Axelrod.

Our Marble Lyretail Mollies

BY MARGUERITE AND NORMAN KNEPPER

It all began about a year and a half ago, when we decided that an aquarium of tropical fish was just what our basement room, decorated in a South Sea Islands style, needed. We bought a 10-gallon aquarium, put in some pretty plants and carefully chose each and every fish. We had no notion of becoming hobbyists, but these things come upon one so gradually that before you know it, the bug has bitten and the damage is done! Each female livebearer kept having babies, and as the population went up we had to keep on buying tanks. But why am I telling you this? It happened to you

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Marguerite Knepper feeding the Marble Lyretail breeders. The tank at lower left contains a few of the Kneppers' adult Marble Lyretails.

Norman Knepper checks on the progress of some of the baby Marble Lyretail Mollies. On the wall behind Norman is a shelf holding jars for hatching brine shrimp. Brine shrimp were an important first food for the young Lyretails.



A beautiful female Marble Lyretail Molly. Photo by Dr. Herbert R. Axelrod.



Hemigrammus vorderwinkleri sp. nov. These two fish are aquarium specimens and were not taken as types. Photo by Dr. Herbert R. Axelrod.

too, didn't it? As our interest grew we decided to join the Greater Dayton Aquarium Club and learn how to breed more difficult species.

With each visit to an aquarium shop or a club member's home we became the proud owners of more and more species. Every flat surface which was capable of holding a tank held one. Then Norm began building racks to hold our ever-increasing supply of tanks and equipment. To give you an idea of how far we went, we raised all kinds of livebearers, Angels, Bettas, White Clouds, and eight types of Killifishes. At present we have a 40-tank miniature fish hatchery and very little room for further expansion.

All this time we shared a wish: what we wanted was a fish that nobody else, or at least almost nobody else in our area, had. One day it looked as if we had it. In a spawn of baby Bettas we had fifteen black females and two black males. We had high hopes of breeding a strain of Black Bettas, but so far have been unsuccessful.

Then in August, 1962, we came across a beautiful big pair of Black Lyretail Mollies which won our hearts immediately. Although they cost a great deal, we had to have them, and they quickly became part of our collection.

The female quickly began to supply us with youngsters. Much to our pleased surprise, they all turned out to be Lyretails. These were carefully

Continued on Page 60

Three new Tetras from the upper Rio Negro near Tapurucuara

by J. GERY¹

The species described below were discovered by Dr. Herbert R. Axelrod during the 1962 TFH Brazilian Expedition. They range in the habitat of the famous *Cheirodon axelrodi*. Three are new to science, and the two *Hemigrammus* are named in honor of Messrs. William Vorderwinkler and Neal Pronck, respectively Publisher and Editor of Tropical Fish Hobbyist Magazine. The third new species, though not very attractive to the aquarium hobbyist, is a very valuable addition to our knowledge of those "border-forms" close to *Hyphessobrycon*, and provisionally classified within that genus. Finally, a fourth species, although not new to science, is also redescribed because it is the first recorded for the Rio Negro.

¹Nr. 30 of the author's series: Contributions to the Study of the characid fishes.



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(1) *Hemigrammus vorderwinkleri* sp. nov. (fig. 1)
Holotype: USNM (orig. Nr. 333.1) female, 33.0 mm in standard length, collected near Tapurucuara, upper Rio Negro, Nov., 1962.
Paratypes: 3, 22.0-29.9 mm sd. lgh., collected with the type.
Diagnosis: Depth 2.75-3.02; scales 5(6-8)29-30/3 or 3½; anal fin iii, 14, i or III, 15; 2 or 3 maxillary teeth; silvery with bluish iridescence, a vertically narrow lateral band, terminating in a large con-

spicuous caudal spot, not quite reaching the end of middle caudal rays. Habitat of a typical *Hemigrammus*; best distinguished by its short anal. *Description*: (see Table 1 for proportions and counts). Medium depth, dorsal and ventral profiles evenly arched, dorsal fin very slightly behind the middle of the body; pectoral fin short, not reaching ventral fin; the latter just reaching the anal fin, which has a rather long lobe in either sex; male

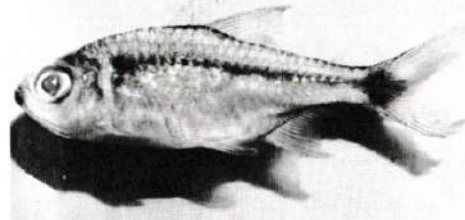


Fig. 1. Type of *Hemigrammus vorderwinkleri* sp. nov., a female, 33 mm. in the USNM.

with hooks from the last unbranched to the sixth branched ray; caudal lobes scaled to near their middle. Head moderate; maxillary reaching level of the anterior border of the pupil; fontanelles rather broad and short, the anterior one reaching the level of the middle of eye; great suborbital (SO3) leaving only a very narrow area behind, covering about three-fourths of the cheek below; teeth of the Tetragonoptera type, 2-4 tricuspid ones on outer row of

premaxillary, 5 quincuspid ones on inner row; 2 or 3 tricuspid teeth at premaxillary angle; dentary with 4 or 5 large, frontal, quincuspid teeth, followed on the sides by about 6 tricuspid, much smaller ones; gill-rakers 7-8 above, 11-12 below. *Pattern and coloration*: When freshly unpacked, the fishes were rather brilliantly colored, with a bluish-silvery iridescence on the body, the dorsal fin orange, and the upper part

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Fig. 2. Type of *Hemigrammus pronoki* sp. nov., a male, 30.5 mm. in the USNM. Photo by Dr. Herbert R. Axelrod.

of the eye, as well as the base of the caudal lobes, cherry red. The black pigment, certainly emphasized by the preservation in formalin, consists of a vertical humeral spot, which may be scarcely visible in life, not surrounded by a light area, — a black lateral band (perhaps silvery in life)—and a large, rhomboid caudal spot, astride on end of peduncle and base of caudal rays, up to the middle of the latter ones; all the fins gray (in formalin) with some black at the tip of the dorsal fin; a black line along the base of anal fin; no bright area on peduncle.

Discussion: (a) Following Mrs. Durbin-Ellis's (in Eigenmann, 1918) key the new species traces down, on the heading

"ddd" (humeral and caudal spots both present) to *H. jota*: this species, from the Essequibo River, which has few anal rays and similar position of the dorsal fin, is very differently shaped, with elongate body, and it has rather different markings. Other species of the group differ in the number of anal rays, as well as in the coloration.

(b) Neglecting the humeral spot, which is altogether relatively slightly visible, the new species falls under "dd" (no humeral spot) "ff" (maxillary with teeth) and "hh" (caudal spot continuous with the lateral stripe): none of the species has as few as iii, 14, i anal rays, except *H. humary* (A iii, 12-13), which is very different in

shape and coloration', and *H. tridans*, from Paraguay (Anal about iii or iv, 14-17); this species has at least a different caudal pattern and a different position of the dorsal fin.

(c) The species included in the Supplement (Eigenmann & Myers, 1929) to "The American Characidae", namely *H. caudocinctatus* Ahl and *H. rhodostomus* Ahl, are well-known forms without any resemblance to *H. vorderwinkleri* sp. nov.

(d) Finally a number of forms since described: *H. pulcher* Ladiges, 1938 (and subspecies *H. pulcher haraldi* Géry, 1961); *H. erythrostigma* Fowler, 1943; *H. mogaopi* and *melanion* Fowler, 1945; *H. armstrongi* Schultz and Axelrod, 1955; *H. minus* Böhlke, 1955; *H. ocellifer falsus* Meinken, 1958; *H. aereus guyanensis*, *micropterus boesemani* and *unilunatus cayennensis*, Géry, 1959, are also quite different, either in shape, in counts or in color pattern. *Hemigrammus vorderwinkleri* approaches *H. armstrongi* (A. iv, 19-21), *H. ocellifer falsus*, the well-known Head-and-Tail light (A. about iv, 20-21), and *H. guyanensis* (A. iv, 20-24), but obviously differs from them, at least in the anal-ray-count.

As far as known, no *Hemigramma* has been described from the same locality, with the exception of *H. minus*, an interesting mimic of the Cheirodontine genus *Microschemobrycon*.

- (2) *Hemigrammus proneki* sp. nov. (fig. 2)
 Holotype: USNM (orig. Nr. M.334,1), male, 30.5 mm in

standard length, collected near Tapuruçara, upper Rio Negro, Nov., 1962.

Paratype: female, 36.8 mm sd. lgh., collected with the type.

Diagnosis: Depth 2.52-2.65; scales 5(7-9) 30-31/3 or 31; anal fin iii, 17; one or two maxillary teeth; a very faint humeral spot, an inconspicuous longitudinal line and a broad, deep black, broadly rounded caudal spot; same habitat as the preceding, best distinguished by its somewhat longer anal fin and several associated characters.

Description: (see Table I for proportions and counts). Rather deep, dorsal and ventral profiles evenly arched, dorsal fin very slightly in advance of the middle of the body; pectoral fin almost reaching ventral fin in the male, not reaching ventral fin in the female; ventral fin overlapping first rays of anal fin, the latter with a well marked anterior lobe; male with hooks from the last unbranched ray to the 8th branched one.

Head moderate; maxillary reaching to slightly behind front of eye; fontanel and great suborbital as in *H. vorderwinkleri*, the latter bone somewhat more expanded, covering about 4/5 of the cheek below; teeth of the same type, 3-4 tricuspid ones in outer premaxillary row, 5 quincuspid ones in inner row; 1 or 2 tricuspid maxillary teeth; four large, quincuspid, frontal mandibular teeth, followed on sides by 4 or 5 much smaller tricuspid ones; gill-rakers 7 above, 12 below.

*See Géry, D.A.T.Z., 15. Jahrg. 4. Heft, pp. 110-112, Apr., 1962.

Pattern and coloration: as said above, *Hemigrammus proneki* sp. nov. is very similar to *H. vorderwinkleri*; it is nevertheless less iridescent, with the dorsal fin more yellow than orange, and the red spot at the base of the caudal lobes probably present in the males only (as it is likely the case in *H. rotuayi*). The humeral spot is very faint; the band is reduced to a thin black line, continuing with the black caudal spot, which in turn is very large, roundish, not expanded on the middle caudal rays.

Discussion: *H. proneki* sp. nov. differs from the just described *H. vorderwinkleri* in several minor points: deeper body, correlated with deeper peduncle; shorter head, correlated with larger eye and interorbital; more forward position of the dorsal fin; and, chiefly, 17 branched anal rays instead of 14 or 15. Both forms being sympatric, they are a priori isolated, hence good species.

Concerning the differential diagnosis with the numerous other *Hemigrammus* species, the above mentioned arguments apply as well to *H. proneki* sp. nov. as to the preceding *H. vorderwinkleri*. By the number of anal rays, its habitat and color pattern, it most closely approaches *H. rotuayi*, being probably an inland form of the latter. Nevertheless I have seen a lot of specimens of *H. rotuayi* from the three Guianas: they seldom have fewer than 20 branched anal rays. The same is true for *micropterus guyanensis*, *armstrongi* and several other similar Tetras.

- (3) *Hypessobrycon bellottii* (Steindachner, 1883) (figs. 3 and 4).

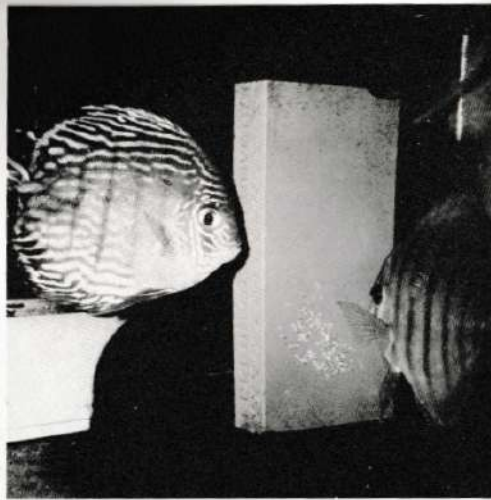
The typical specimens came from Tabatinga, Upper Amazon River. Later on Ulrey signaled this variable species from Santarem, and Eigenmann from Vila Bela (— Parintins). *H. bellottii* was never figured and only very shortly described. Its redescription by Mrs. Marion Durbin-Ellis (in Eigenmann, 1918) gives the impression that the middle-lower Amazon material may constitute a distinct form.

Likewise, the two small examples collected and photographed alive (fig. 3) by Dr. Herbert R. Axelrod are quite elongate, and they have slightly fewer anal rays, maxillary teeth and gill-rakers than the typical material of Steindachner, which I know only from description. On the other hand, they agree rather closely with numerous specimens collected some time ago by Harald Schultz in Lago Tefe (fig. 4) and Igarapé Preto, that is, in a certain sense, topotypes, at least the last ones.

For the present, it is best to consider the various populations along the Amazon basin, inclusive of the upper Rio Negro, new specimens whose proportions and counts are given below, as a part of a clade, without separable subspecies.

Continued on Page 57

*If they had been allopatric, i.e., coming from different localities, it would have been difficult to attribute to them a higher taxonomic level than the subspecific one.



Danny's Blue Discus have spawned on a slab of tile, which they seem to prefer.

Danny Di Cocco Does It Again!

BY WILLIAM VORDERWINKLER

Photos by Dr. Herbert R. Axelrod

Most of the aquarium hobbyists in the northern New Jersey area have at some time or other had the pleasure of meeting Danny Di Cocco. Danny's smiling face and pleasant personality can be encountered at most of the aquarium society meetings hereabouts, and at the fish shows you'll not only meet him but also see some of his fishes among the entries, and it is rare that his name does not appear when the winners are announced.

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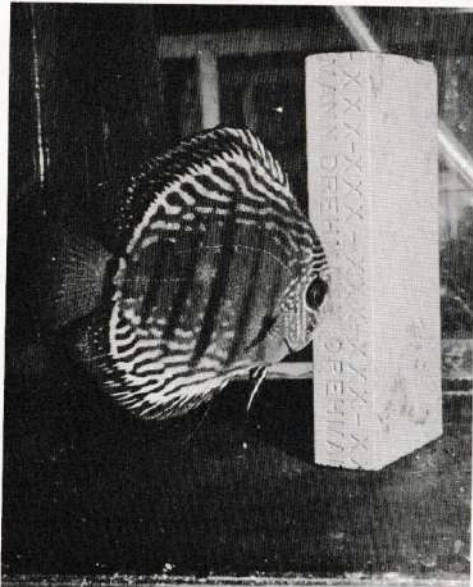
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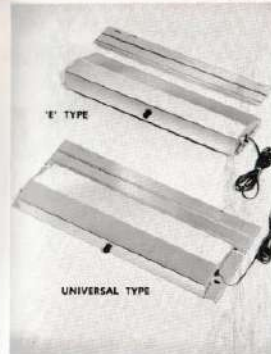
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21E	24 1/2"	17-U	17 1/2"	6 1/2"
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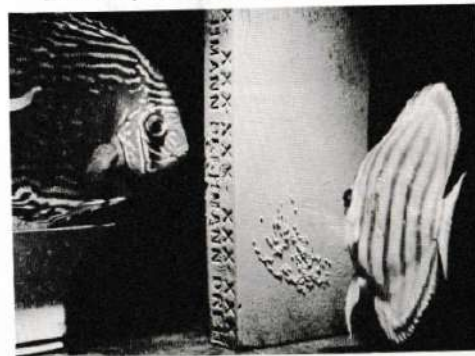
"I use—and always recommend Rut-King food to my customers." Ed Resler, owner FISHWORLD, Bridgewater, N.J., Nationally known showplace of some of the world's finest and most exotic tropicals.

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



Sometimes the Red Discus become a bit inquisitive as to what was going on on the other side. She was very gently pushed back.

Both are minding their own business here, fanning and cleaning the eggs.



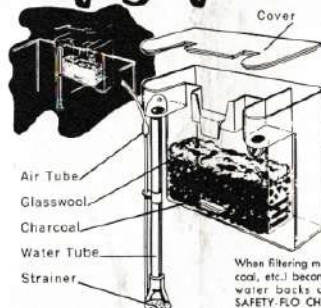


These are the young with their foster-mother, busily picking at her sides.

spawn and everything would progress happily, the parents giving the eggs all the necessary attention. But when the youngsters became free-swimming the female would cat them after a few days, for no evident reason. Danny decided to try something which the experts would have told him couldn't be done. He decided to provide the youngsters with a "foster mother." The little ones gathered around her and immediately began to nibble at her sides, which she did not seem to mind at all. Growth went on uninterrupted and the "foster mother" was none the worse.

So now we have one additional fact which we can add to the heap of information already available: the parent fish do not grow a special nutrient slime when they are spawning. A non-spawning fish carries a slime which has

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the same characteristics. It is to be hoped that some day in the not so far distant future scientists will analyze this slime and tell the waiting world what the ingredient is that has not so far been duplicated. Once we have this information and a usable *substitute* becomes available, we can take a batch of Discus eggs and hatch them in the time-honored manner that has produced so many Angelfish, and the danger of eggs or fry being eaten by the parents will be eliminated. This nutrient will probably also prove valuable in the raising of other Cichlids, or even other non-related species.

Another of Danny's many accomplishments is the fact that he has hybridized two species of Discus. He took a male *Symphysodon aequifasciata haraldi* (Blue Discus) and mated it to a female *Symphysodon discus* (Red Discus). Results were successful, and he has the young fish to prove it.

Danny is also having good results spawning the Honey Dwarf Gourami, *Colisa chana*. They did not look like any great shakes when we first got them in, but Danny tells me that his are *gorgeous*. Probably this is a fish which has a great deal of hidden beauty that comes out when it is spawning but is only hinted at under normal conditions.

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A Suggested Standard for the Judging of Male Bettas

BY FREDERICK J. KERR

Although Bettas are the most popular egg-layers displayed at aquarium competitions, no widely recognized standard exists for their judging. It is hoped that the standard I propose here will at least be a step toward the establishment of an accepted standard for this important fish.

The purpose of a judging standard, in addition to judging competitions, is to improve the breed and to present fanciers with a common breeding goal. Just what is to constitute improvement depends entirely on what breeders and judges feel they would like the breed to look like. Whatever they decide, judging schedules and breeding programs must be adjusted to fit the selected goal if it is to be reached.

A standard can take two forms, open or closed. The closed standard is very rigid and tolerates little departure from the stated ideal. An example of this is the British Guppy Standard, which requires the body length of the male fish to equal the diameter of an English penny, with variation in either direction being a fault. This type of standard tends to eliminate variation in the breed.

The open standard, on the other hand, allows a range of characters. An example of this is the color range allowed by the American Guppy Standard. This type of standard allows the breeder to proceed in several directions and to be rewarded in all of them. Naturally, this type of standard encourages variation in the breed.

Most standards are a combination of the open and closed types. This allows certain characters to be severely limited to a certain desired shape or color, while other characters are allowed to vary considerably. This is the type of standard I have tried to present here.

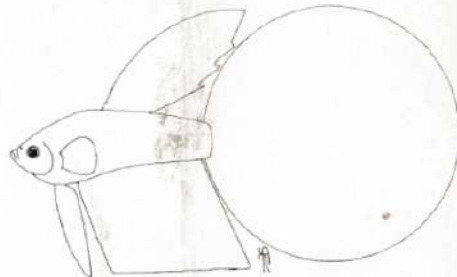
I feel that two aspects of the standard may need defending. First is the body form. Currently, most judges prefer the slender body form. It is my feeling, and I am sure the feeling of many others, that this form is undesirable for several reasons. It requires a feeding program that borders on starvation, and it is well known that a male of this form in "show condition" is practically worthless as a breeder until it has been fattened up. In no other animal standard is the ideal considered to be less than top (breeding) condition!

This slim body form is also inconsistent mechanically and esthetically with the large expanse of fins that we require of male Bettas. It is against common sense to expect a fish with a slender body to adequately support large fins. It is also esthetically incorrect to expect such a body to seem visually in harmony with extensive finnage.

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The other aspect of the standard that is in need of defending is caudal form. Here I am advocating that the caudal fin take the form of a circle, which I feel presents a desirable and not impossible challenge to the breeder. This is not to indicate that other forms do not have value, but only that this standard is for circle-tailed Bettas.

I fully realize that this standard is not perfect and that some aspects of it will be subject to controversy. I also realize that this standard, developed by one person, may contain personal preferences and may not represent what a majority of breeders are working for. I welcome comment from judges, breeders, and aquarists.



Ideal fin and body form as proposed by the standard.

STANDARD

FIN COLOR (15 points)

Self: Color is to be opaque and evenly distributed to the margins of the fins.

Pectorals may be pigmented in the fin color. Pelvics may be any color.

Secondary fin color is to be considered a fault, and points are to be deducted in direct proportion to the amount present.

Self with secondary fin color: Color is to be opaque and evenly distributed to the margins of the fins. Pectorals may be pigmented in the primary fin color. Pelvics may be any color. Secondary fin color must contrast with primary color and repeat the shape of the fin. It must extend from the base of the fin to a point not more than 75%, nor less than 25% of the fin length. Secondary color must be equally distributed on dorsal, caudal, and anal fins.

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Bicolor: Color is to be opaque and evenly distributed to the margins of the fins and in complete contrast to body color. Pectorals may be pigmented in the fin color. Secondary fin color is to be considered a fault, and points are to be deducted in direct proportion to the amount present.

Bicolors with secondary fin color: Color is to be opaque and evenly distributed to the margins of the fins and in complete contrast to body color. Pectorals may be pigmented in the primary fin color. Secondary fin color must contrast with primary color and repeat the shape of the fin. Secondary fin color should extend from the base of the fin to a point not more than 75%, nor less than 25% of the fin length and should be equally distributed on dorsal, caudal, and anal fins.

FIN SIZE (20 points)

Caudal fin (8 points). To be at least 50% of body length, with 100% of body length being equal to 6 points.

Anal fin (4 points). To be wide enough to meet but not pass an imaginary line extending forward from the ventral edge of the caudal fin when all fins are fully spread.

Dorsal fin (4 points). To stand in a position so that the tip meets but does not pass an imaginary line extending forward from the dorsal edge of the caudal fin when all fins are fully spread.

Pelvic fins (4 points). To be long enough to meet but not pass an imaginary line extending forward from the ventral edge of the caudal fin when all fins are fully spread.

FIN FORM (30 points)

Caudal fin (12 points). To be equally distributed on both sides of the center of the caudal peduncle and to approximate a circle. Misaligned rays constitute a serious fault, and at least 6 points are to be deducted for such a fault. Fin margin is to be even.

Anal fin (5 points). To present the shape of a parallelogram. Misaligned rays are a serious fault, and at least 2.5 points are to be deducted. Fin margin is to be even.

Dorsal fin (5 points). To present an elongate tear shape with projections allowed. Misaligned rays are a serious fault, and at least 2.5 points are to be deducted.

Pelvic fins (5 points). To present a knife shape with the anterior edge gently curved. Misaligned rays are a serious fault, and at least 2.5 points are to be deducted. Fin margin is to be even.

Pectoral Fins (3 points). Misaligned rays are a serious fault, and all points are to be deducted.

BODY COLOR (15 points)

Self: Body color should be identical to primary fin color. Failure in this is a serious fault, and at least 5 points are to be deducted. Higher points are

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Tropical Fish Hobbyist

to be given when primary color is extended onto back or head. Secondary body color is allowed if it is present as flecking on the body or red striping on the head. Wash-like secondary color is to be considered a fault, and at least 5 points are to be deducted.

Bicolors: Body and fins must be in complete contrast. Secondary color may be present as a wash, but flecking, especially black, is to be considered a serious fault, with at least 5 points being deducted. Red striping is allowed on the head.

BODY FORM AND SIZE (15 points)

Body form (10 points). The body is to be $\frac{3}{4}$ (preferred) to $\frac{1}{2}$ as wide as the body is long.

Body size (5 points). Not less than 1 $\frac{1}{2}$ inches. Larger fish are to be given higher points.

DEPORTMENT (5 points)

The fish is to be vigorous and ready to display upon proper stimulation. Fins are to be widely spread and adequately supported.

DISQUALIFICATIONS

Any fish is to be disqualified for any of the following:

1. Inability to rise from the bottom without great effort.
2. Resting on its side on the bottom.
3. A caudal fin less than 50% of body length.
4. Any gross deformity of fins or body, particularly of the muscle area.

NOVELTIES

Occasionally fish are displayed which obviously were not bred or shown on the basis of this standard. If such a fish can not or should not be disqualified in the opinion of the judge, three alternatives are open:

1. Give no recognition.
2. Award a special ribbon.
3. Judge according to standard as far as possible and score on the basis of percentage of applicable points.

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T-13 African Butterfly	1.50	C-13 How to Care for Your Ferrets	1.50	D-13 Springer Spaniel as Pet	1.50
T-14 African Butterfly	1.50	C-14 How to Care for Your Chinchillas	1.50	D-14 Springer Spaniel as Pet	1.50
T-15 African Butterfly	1.50	C-15 How to Care for Your Guinea Pigs	1.50	D-15 Springer Spaniel as Pet	1.50
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MAIL CALL

If you have an aquarium question and cannot find the answer in any of the standard reference texts, send it to MAIL CALL. Each month this column will publish the most interesting questions received and their answers. Letters containing questions cannot be acknowledged or answered personally. Address all questions to: MAIL CALL, T.F.H. Publications, Inc., 245-247 Cornelison Ave., Jersey City 2, N. J.

He wants letters—from you!
Q. By chance I recently got the 1959 and 1960 volumes of your magazine, borrowed from a friend. Unfortunately I could only skim through them, because my friend wanted them back after a few days. From these circumstances I have my first question: Wouldn't it be possible that one of your friends would be interested in the German magazine *Aquarien und Terrarien*? I would be glad to exchange a subscription to this magazine for one to TFH. There is only one drawback: your magazine appears monthly, while our appears only once every two months, alternating with a journal on ornithology. I would also like to exchange letters with American aquarists. Do you find that *Corydoras acutus* stick to a certain spawning time, as do *C. schultzei* and *C. aeneus* (September, March and April)? I tried almost everything in spawning the *acutus*, but nothing has happened. I kept them at a tempera-

ture of 59 to 61° for about four weeks, then raised the temperature to 79°, adding some salt to the water. I also tried putting them into water in which *C. schultzei* had spawned before, in a tank the sides of which were overgrown with algae, but so far everything has been in vain. Also, can you give me some hints as to the spawning of *Hoplosternum* and *Gambusia*?

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Besides these species I have a lot of Barbs, Rasboras, Zebras, Halfbreaks, and *Apistogramma reitzigi*.



Apistogramma reitzigi

Keeping fish is strictly a hobby with me. By profession I am a teacher of English and Russian at the Leipzig College of Civil Engineering.

Hans H. Zenner, Leipzig, SS, August Bebelstr. 79, Germany.

A. Your full address is being published with your letter, and I'm sure you will get some replies. There are a great many aquarium societies who might be willing to exchange letters with you, and they might want the excellent Aquarien und Terrarien in

Corydoras arcuatus



exchange for their society journals, many of which make good reading. Of course there may be many individuals who might want to correspond with you. As for *Corydoras arcuatus*, it seems to be one of the "difficult" ones, and it is possible that they "come into ripeness" at certain seasons. We do not have any information about their spawning, and would be glad to get some. The *Hoplosternum* spawn on the underside of a floating object, and the *Callichthys* require a lot of space for the huge bubbles the male builds.

Angelish failure.

Q. I have had a pair of Angelfish for about three months. About one month ago the pair bred in their 20-gallon tank on a ceramic pillar covered with algae. The pH in the tank is very slightly acid; the water is quite hard and the temperature about 80°. Deciding to leave the eggs with the pair



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was apparently wrong, for the male started eating them one after another, so I moved the remaining eggs to a clean 10-gallon tank I had recently prepared for Dwarf Gouramis, and aerated them as per instructions. During the first two days about five eggs went bad and got a fuzzy growth of fungus. I picked them off with sterile tweezers. After the second day the fungus spread to the entire batch of eggs. Recently, my pair of Angelfish bred again in the same water. This time, however, the pillar was thoroughly cleaned by me about a day before the spawning actions began. This time the Angels cared for the eggs diligently but within three days the eggs again turned white. I don't think the water was wrong for the eggs because before I purchased the Angels, a pair of *Cichlasoma nigrofasciatum* raised brood upon brood in the very same water. Although I saw the male apparently fertilizing the

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eggs as the female deposited them, could it be that somehow the entire batch was infertile? Is there anything I can do to save the eggs the next time?

Roger Davis, Palestine, Ill.

A. My guess would be that even though they might be of the same age, your male is still too young to deliver ripe sperm and fertilize the eggs. If this persists you may have to use another male.

Some tips.
Q. For the past two years I have been curing Neem disease in such a simple way I thought surely someone would write, but I find it still listed as an incurable disease. By the use of one drop of formaldehyde per gallon of water at a temperature of 75° this disease will be completely cured if detected in time. As this disease attacks several other fish species

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Besides Neons, it could very well be a good idea to make a note of this in case you ever have occasion to use it. By using this remedy I have found that the loss of Neons and other fish is very small.

Mrs. Jane Romshe, Marion, Ohio.

A. Many thanks, Mrs. Romshe, for the information you have given us on the cure of Neos disease. Since it has been successful for you, perhaps other hobbyists will also find it useful.

Snails.
Q. What do you think about snails in a heated aquarium?

Linda Holland, Dover, Delaware.

A. A few snails in the aquarium add interest and do no great deal of harm if they are not permitted to do so. But sooner or later you do not have

just a few snails, but more and more. Then you begin to wish for the good old days when you had none. Personally I consider them an abomination; a *Corydoras Catfish* does a better scavenging job, and any of the algae-eating fish species will do a better task of getting rid of your algae. Snails will chew holes in your plants, and if you ever have your fish spawn for you they will feast on the eggs. Probably the good Lord had a reason when He saw fit to create snails, but I see no reason why the aquarium hobbyist should put up with them.

Glariidichthys falcatius.

Q. Could you please tell me the meaning of the scientific name *Glariidichthys*? It appears in the Sept.-Oct. 1952 issue of *Tropical Fish Hobbyist*. I did not know what species this fish was that I have in my aquarium. I

found out it was *Glariidichthys* when I received the book copy tonight. Hope you can help me.

Mary Allen, Jacksonville, Fla.

A. The full scientific name of your fish is *Glariidichthys falcatius*. The



Glariidichthys falcatius

generic name means "chisel fish." The specific name of the fish means "scythe-shaped." This describes the long, curved shape of the gonopodium on the male.

Pop-eye.
Q. 1. One of my fish recently got pop-eye, but doesn't show any other

sign of illness. Is this disease contagious?

2. I have two books on tropical fish and neither of them has any classification on the Siamese Algae-Eater. Why is this?

Mark Brodie, Levittown, Pa.

A. 1. The disease itself is not very easily transmissible, but if the conditions exist which give one fish pop-eye, others can get it as well.

2. Although it has been known to science since before the turn of the century, the Siamese Algae-Eater, frequently known as the Chinese Algae-Eater, was not known to aquarists until its importation in 1955. If your book dates back further than that, it would not be shown. Its correct

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Siamese Algae-Eater, *Gyrinocheilus aymonieri*

scientific name is *Gyrinocheilus aymonieri*.

White Clouds—velvet?

Q. 1. Why are White Clouds more prone to velvet disease than other fishes?

2. I am breeding Tiger Barbs. After the eggs hatch out all the young seem to die in about a month's time. What causes this?

3. What are the best kind of fish and plants to have for a project in the schoolroom?

4. I have about ten bunches of *Elodea* in a 20-gallon tank. The plants get 7 hours of light, yet they start to die in a very short time. How can this happen?

I am a frequent reader of your magazine. I hope you can answer these questions for me; your answers would be greatly appreciated.

Marcia Wilson,
Baltimore, Md.

A. J. Probably because about 95% of all White Clouds are kept at temperatures which are entirely too warm. They are more of a temperate water species rather than tropical, because they come from rather cool mountain streams in China.

2. Tiger Barbs are very hungry propositions when they are a month old, and your fish are probably being starved. At this stage they should be given generous amounts of newly-hatched brine shrimp.

3. It all depends on what the project might be. Some school classrooms are allowed to become quite cold during the cold months at night, so your delicate species are out of the question.

4. The fact that you mention "bunches" leads me to think that you did not separate them properly when you got them. All "bunch plants" should be separated and planted separately if any kind of success is desired.

Another native fish enthusiast.

Hooray for Mr. Howard Baumgartner for writing his letter "The neglected native fishes" to Mail Call in the July 1963 issue of TFH! I want to let Mr. Baumgartner and all other TFH readers know that I agree with him.

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Robert C. Steiner,
Cambria Heights, N.Y.

A. It takes me back to my youth, Mr. Steiner, to read your letter. I, too, enjoyed (and still enjoy) sloshing around in the New Jersey waters and filling my tanks with all sorts of fascinating things. But our local fishes and plants are only a very small part of those in the whole world and although a school of Black-Nosed Dace may be a fascinating thing to watch, they cannot compare to some of the beauties from other lands in color, and getting them to spawn would be a rather difficult task when compared with the ease with which some of our exotics can be propagated. This, to my mind, is the biggest advantage our imported fishes have. You can take most of them and get them to breed for you. Raising the

young is not difficult in most cases, and gives you a thrill you won't get with most of your native fishes. Fantastic prices for imported fishes? You wouldn't think so if you ever went to the expense and trouble it takes to get them in the tropics!

Silvertip Tetras.

Q. I would like a few breeding facts on the Silvertip Tetra. I read in a

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book that more males are needed than females to breed the Head and Tail Light. It is also true of the Silver Tips? I have read your magazine for years and enjoy it very much.

Gleason Gilbert,
Southgate, Mich.

A. Silvertips breed like most of the small Tetras. Their tank should be at least 10 gallons and the water soft and slightly acid. Feed your pair with a preponderance of live foods for a

time before trying to spawn them. The young are quite small at first and require infusoria for a week or so. About using two males for one female: when you do this, there is likely to be so much rivalry between the males that they may forget the female is there. Besides, if the spawners are not removed at once after the eggs are laid there will be one more fish to eat them. Eggs hatch in 24 hours at a temperature of 78°.

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Breeding tube?

Q. Several months ago I purchased what was reported to be a Green Swordtail female which was about 1 1/2 inches long at the time, with good markings and shape. After exposure to a male of the same species she developed a protrusion of forthcoming motherhood. At this time she was separated from her mate and placed in another tank. After another four weeks she gave birth to 33 young within a 16-hour period. During the time of delivery a blood-red tube protruded from the anal region. I searched all the available books published by TFH and could find no mention of a breeding tube for the Swordtail. Included in the research was the Axelrod-Vorderwinkler Encyclopedia of Tropical Fishes. After another 4 to 6 hours a fungus

developed on the aforementioned tube. Using available medication, including Methylene Blue, the mother fish survived another 24 hours, at the end of which she died. I am now still wondering what could cause the breeding tube to appear, and then why the fungus. The fry are doing well with few losses, excepting the unwanted ones which were culled. There are still about 28 remaining.

G. D. Turner,
Ft. Collins, Colo.

A. Your female seems to have dropped part of her intestines through her oviduct. No wonder it took her 16 hours to deliver 33 youngsters! Normally she should have completed the job in an hour or two. No, livebearers do not have a breeding tube, and this is the only tube I could think of.

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Guppy Corner



By Paul Hahnel

Moving babies.

Q. "Guppy Corner" is a wonderful help to me. I've bred a number of fish in the past two and a half years, including Bettas, Swordtails, and Guppies. For the past two months I've been trying to decide if I want to breed tropicals in general or try to keep a good strain of Guppies going. I've decided in favor of the most fascinating fish I know—the Guppy. I now have a few questions to which I would appreciate the answers in your column:

1. If a female throws 30 fry in one litter, can I put ten of the babies in each of my 5-gallon tanks?
2. If so, how long will it take them to grow to maturity?
3. What is the best temperature for breeding Guppies?
4. I have no pH test kit. Is it necessary to get one?

5. I have ten tanks. Is this enough for what I'm trying to do?

6. The tanks are as follows: three 5½-gallon, four 2½-gallon (for mating), one 10-gallon, a 40-gallon and a 20-gallon, plus some large jars.

7. My 40-gallon and 20-gallon tanks are not completely set up yet. Do you suggest I wait to set them up or proceed with the three 5-gallon tanks?

Ed Eberle, Lyabrook, N.V.

A. 1. If the water is of about the same composition the babies will not receive too much of a shock in being moved from one tank to another. You could help yourself by taking water from the tank where the babies were born.

2. A Guppy can be fertilized when she

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is six weeks old, if that is what you mean by maturity.

3. Do not try to keep it over 78 degrees, but do not go below 70 degrees. The best temperature range is between 74 and 78 degrees.

4. Try to get one. It is a very useful and inexpensive bit of equipment.

5 & 6. A 10-gallon tank would be sufficient. The smallest tank I use is a 10-gallon. Small amounts of water pollute too quickly.

7. As I said in the previous answer, do not waste your time with small tanks. Two letters, one answer.

Q. I have fancy Guppies and several of them have black pectoral fins. I've been curious as to whether this is special and if a strain of fancy Guppies can be developed having these black pectoral fins.

Jeffrey Goldberg, New York City, N.Y.

Q. About three months ago I noticed in a tank of my young male Guppies one male with black coloring in one of his pectoral fins. I separated him for a time and then mated him to several of our large female Guppies. What I'd like to know is, what are my chances of getting male Guppies with black color in both pectoral fins? What do you think my chances are of getting males with other than black coloring, such as red, green, or blue in the pectorals?

Robert Evans, Jersey City, N.J.

A. (to both readers): Yes, fish like these turn up in my tanks once in a while. I pay them no attention and do not try to breed especially for this. If you have the time and patience you could try and see what you could develop. I saw among my Guppies some black-reds, but no other colors.

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Salts From The Seven Seas



By Alfred A. Schultz

Q. 1. I want to start a 10-gallon marine tank. Would I be overcrowding it if I put a Clownfish, Dascyllus, Neon Goby, and a hermit crab in it?

2. At what temperature and specific gravity should it be maintained?

3. What type of food is best for the hermit crab?

Paul Foster, Minneapolis, Minn.

A. 1. No.
2. 73° temperature and a hydrometer reading of 1.025.
3. They like small chunks of raw shrimp.

Q. 1. I am raising Sea Horses for a project. I would like to know: what good do Sea Horses do in the sea?

2. What is a good experiment to do with them in a very short time?

Linda Kling, Intercourse, Pa.

A. 1. They do their share in upholding the natural balance by eating small life and in turn being eaten by some of the larger life. A few of them have no other mission than to look pretty for you.

2. You might try to see if you can fool them into thinking that frozen shrimp are alive by squirting a few at a time at them. If you can get them to eat frozen food you will save yourself a lot of trouble.

Q. I have several marine squaria in which brown algae have always presented a problem by covering the walls and stained glass ornaments and spoiling the appearance of the tanks. I have so far been unsuccessful in finding information about anti-algal agents in

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the many biological journals and pharmacology textbooks that I have consulted. Since I have ready access to any chemical or pharmaceutical, I would appreciate any information or references you might have regarding the chemical nature of anti-sigal substances.

Stephen D. Nelson,
Menlo Park, Calif.

A. There is no chemical that I know of that will accomplish this. However, I have overcome this problem by the use of a power filter going all day long and a frequent change of glass tool.

Q. I have a pair of Giant Sea Horses (six to eight inches tall) in a filtered and aerated 2 1/2-gallon drum bowl. Is this all right? If not, how large a tank is needed?

2. Is a reflector or a small light bulb necessary for three hours a day?
3. How many brine shrimp will the Sea Horses eat, and can I feed them any frozen foods?
4. Could a pair of dwarf starfish be added without any danger to the Sea Horses?

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5. If the answer to No. 4 is negative, what size tank would be necessary for the starfish, and what do they eat?

6. What is the correct hydrometer reading for a starfish? If conditions are right, could I cut a limb off a starfish and count on regeneration?

7. Is there enough room in my 2 1/2-gallon tank for a pair of Neon Gobies?

James S. Odle,
Muncie, Ind.

- You will need at least a 5-gallon tank.
- Only during feeding.
- They will eat hundreds of live brine shrimp. You can train them to eat frozen brine shrimp as well.
- I don't recommend it; both feed differently.
- Keep them by themselves in a tank of at least 10 gallons. They eat chunks of raw shrimp.
- 1.025. Yes, regeneration will take place if your starfish is healthy.
- Yes, there is enough room.

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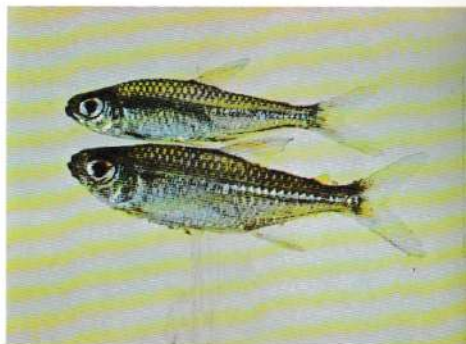


Fig. 3. *Hyphessobrycon bellottii* from the Rio Negro, often appears with collections of *Cheiracanth axelrodi* from Tapajucara, Upper Rio Negro, Brazil. Photo by Dr. Herbert R. Axelrod.

Three new Tetras

Continued from Page 15

Standard length 26.3 mm (24.2); depth 3.37 (3.90) and head 3.60 (4.10) in sd. lgth.; snout-to-caudal 1.06 (1.06) in dorsal-to-caudal; depth of peduncle 1.52 (1.82) in its lgth.; eye 2.61 (2.36), interorbital 3.18 (3.47), maxillary 3.04 (3.10) and snout (oblique) 4.30 (4.21) in lgth. of head (with membrane).

Dorsal ii, 9, anal iv, 17, i (18, i); pectoral i, 11; scales 5/(6-7) 31/3; 10 predorsal, 12 circumpeduncular; teeth 1-3 external pmx., tricuspid, 5 internal pmx., quincuspoid to

tricuspid; 0-1 mx., teeth, conical; 4 large, frontal, quincuspoid mandibular teeth, followed on the side by about 4 or 5 much smaller ones. Gillrakers about 7/10; frontal fontanel extending forward up to the level of the front of the pupil; great suborbital leaving a triangular naked area in front and above, but rather close behind, to the angle of the preopercular canal.

This species is new for the locality (Upper Rio Negro). It is also the first time that *H. bellottii* has been imported alive, as far as I know.

(4) *Hyphessobrycon tropis** sp. nov. (fig. 5)

Holotype: USNM (orig. "Nr. *From the greek tropis, a keel.

M.336,1), male, 21.3 mm in standard length, collected near Tapurucaçu, upper Rio Negro, Oct., 1962.

Paratype: 1, female, 20 mm, collected with the type.

Diagnosis: A very aberrant member of the genus, characterized by its numerous, rather narrow maxillary and internal premaxillary teeth, by the outer premaxillary row of teeth, which is quite weak, and

anal; anal fin with a moderate, roundish anterior lobe, that of the male with some hooks from the last, longer, unbranched ray to the 5th branched one; peduncle compressed, longer than high; body strongly compressed, almost keeled, in its posterior, lower part, i.e., above the anal fin; scales on base of caudal lobes of the ordinary type, no enlarged scales as in "typical"

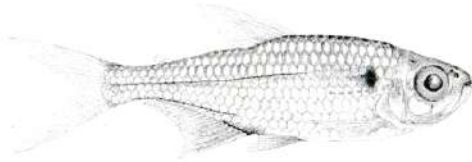


Fig. 4. *Hyphessobrycon bellatii* from Lago Tefe, Brazil (preserved).

by the base of anal which is rather strongly keeled; no pseudo-tympanum; no prominent interhaemals; depth about 3.4-3.5 in ad. lgh.; scales 5/6/31 or 32/3; anal rays iv, 19, (1); humeral spot a rather large, dark zone, not well delimited; a narrow black longitudinal line, ending in a rhomboidal, medium-sized black caudal spot.

Description: (see table I for proportions and counts). Body compressed, of moderate depth, the dorsal profile slightly more arched than the ventral one; dorsal fin exactly on the middle of the body, just behind the insertion of the ventral fins, which are largely overlapping the first rays of

Hyphessobrycon, but, also, no additional scales on the lobes (as in "typical" *Hemigrammus*); lateral line rather short, only 6 perforated scales; structure of the scales of the ordinary small-Tetraodon-type; adipose fin present.

Head short, with a very large eye; snout obtuse, maxillary rather long and slender, reaching the level of the front of the pupil; anterior fontanel elongated, extending anteriorly up to the level of the nares; great suborbital almost entire; leaving nevertheless a very narrow margin below; post-orbitals weak, but not rudimentary.

Jaws (fig. 6) of the *Hemigrammus-Hyphessobrycon* type, that is, the premaxillary with

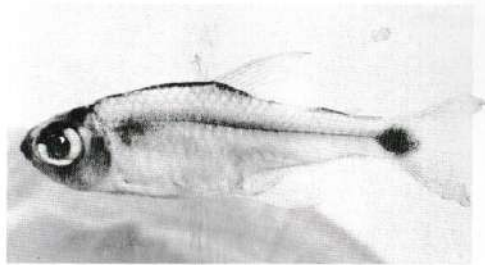


Fig. 5. Type of *Hyphessobrycon tropis*, sp. nov., a male, 21.3 mm, in the USNM.

an ascending process and the teeth in two rows, at least apparently. But certain features are peculiar: the upper outer "row" consists of only one or two (depending on the side) very small, conical teeth, coming off easily; the second, inner row has more than the usual five teeth, and consists of at least seven narrow, tricuspid to conical teeth (in the accompanying sketch, there are probably 8 teeth, but the second one has fallen off and its replacement tooth, still visible in its alveolus, has not as yet taken its place; the third tooth has likewise not quite appeared). The maxillary teeth, very minute and almost impossible to count without dissecting and clearing the bone, are more numerous (probably 6-8) than any other species of the genus (unless some forms were not dissected and only "apparent" teeth were mentioned), yet not as numerous as in rather close

genera like *Pristella* or *Megalomphodus*.

Pattern (in formalin): The usual humeral spot, probably emphasized by the preservation, is rather large but light and not well delimited. On the other hand, the rhomboidal caudal spot, exactly astride on the end of the peduncle and the middle caudal rays (not to their end), is very conspicuous. Nape and scales of the back dark; a black longitudinal line, continued with the caudal spot; another thin dark line underlines the base of the "keel," still another one marks the base of the first anal rays; this anal pattern is rather like that of *H. bellatii* (above), but the latter has not the very flattened part of body, above the anal lobe, which is characteristic for *Hyphessobrycon tropis* sp. nov.

Continued on Page 62

OUR MARBLE LYRETAIL MOLLIES *Continued from Page 8*

raised until they were about three months old, when we selected the ones we wanted for breeding stock and traded or sold the rest. We kept waiting for signs of young in our breeding stock, but nothing happened. The embarrassing thing was that people who had gotten them from us had the same experience and told us that the fish were sterile.

At about the same time, we read about the Black Lyretail-Black Spheonops cross and decided that this might be what was needed with our stock. If successful we would prove that our females were not sterile. What was more, there might be the chance we had been waiting for to breed a new strain.

Looking around for a possible cross that would give us something different, we chose a beautiful large male Marble Sailfin Molly and put him in a separate tank with one of our prettiest Black Lyretail females.

Continued on Page 64

A beautiful male Marble Sailfin Molly like the one pictured here was chosen to be mated with one of the Kneppers' best Black Lyretail females. Thirty-two beautiful Marble Lyretail Mollies combining the best qualities of each parent resulted from the mating.

Photo by Dr. Herbert R. Axelrod.

(This photo is available in the TFH postcard series.)



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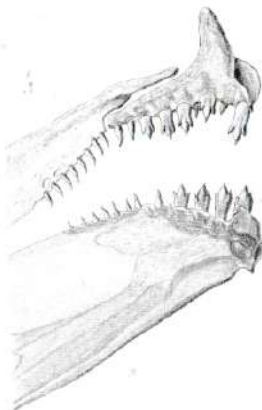


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Three new Tetras

Continued from Page 59
 Discussion: (a) *Hyphessobrycon tropis* sp. nov. has about the same color pattern as *Hyphessobrycon minimus* Durbin, but with the caudal spot larger. This latter species, from British Guiana, has only iii, 14-15 anal rays and a different dentition.
 (b) The species with narrow, rather numerous teeth on the inner row of the premaxillary, namely *H. riddlei* Meek, in Eigenmann and Ogle, *H. stramineus* Durbin in Eigenmann, and *H. ecuadorensis*

Fig. 6. The jaws of *Hyphessobrycon tropis*, sp. nov.



Eigenmann and Henn (the latter species probably not a *Hyphessobrycon*, the former ones also rather aberrant), are much deeper, with different meristic characters and different pattern. Nevertheless, if one wants to have an idea of the possible phylogeny of *H. tropis* sp. nov. it is probably in the *riddlei*-line, from the Orinoco, that one would have to look. It is well known that the Orinoco basin is directly connected with the Rio Negro.
 (c) Other species, apparently "true" *Hyphessobrycon*, which have been collected some miles north of the Canal de Casiquiare, are *H. abelinoatum* and *hildeae*, succinctly described by Fernandez-Yepes in 1950: the second one, whose dentition is not mentioned except that it is "typical of the genus," seems also rather close to *H. tropis* sp. nov., as far as the meristic counts and the usual proportions go. But it has not the characteristic anal "keel," nor the pattern.
 (d) Finally the new form was also compared with several species of the genera *Megalomphodus*, *Pristella*, *Pseudopristella* and *Paracheirodon* which, as mentioned above, have similar teeth structures. Among those with a caudal spot, *Pristella aubrynei* probably is closest in meristic counts but is quite different in shape. In fact it is just a *Hemigrammus* with serrated maxillary teeth, different from *Pristella riddlei* and belonging very probably to another *Tetragonopterygion*-like genus (whereas *Pristella* is much more, in my opinion, on the *Cheirodontina* side).

TABLE I
 Proportions and counts of *Hemigrammus vorderwinkleri* sp. nov., *H. proncki* sp. nov. and *Hyphessobrycon tropis* sp. nov., from Tapuruicua, Upper Rio Negro.

	<i>Hemigrammus vorderwinkleri</i> sp. nov.				<i>Hemigrammus proncki</i> sp. nov.		<i>Hyphessobrycon tropis</i> sp. nov.	
	TYPE ♀	♀	♂	♂	TYPE ♀	♀	♂	♂
Standard length	13.0	20.0	27.2	22.0	30.5	36.8	21.3	20.0
Depth in st. lgh.	2.75	2.90	3.02	2.93	2.67	2.52	3.36	3.51
Head (with membrane) in st. lgh.	3.55	3.52	3.49	3.79	3.59	3.68	3.67	3.85
Eye (vertical) in head	3.6	2.83	2.88	2.85	2.43	2.78	2.32	2.47
Interorbital in head	3.32	3.46	3.55	3.42	3.15	3.03	3.23	3.47
Maxillary in head	3.32	3.54	3.72	3.42	3.54	3.45	3.05	2.86
Snout (in oblique) in head	4.23	4.26	4.59	4.34	4.05	4.45	4.35	4.23
Snout-to-dorsal in dorsal-to-caudal	6.86	6.97	6.96	6.95	1.01	1.04	1.02	1.0
Depth of peduncle in st. lgh.	1.25	1.56	1.52	1.85	1.12	1.25	1.21	1.59
Dorsal	ii, 9	ii, 9	ii, 9	ii, 9	ii, 9	ii, 8, 1	ii, 9	ii, 9
Anal	iii, 15	iii, 14, 1	iii, 14, 1	iii, 14, 1	iii, 17	iv, 16, (1)	iv, 18, (1)	iv, 18, (1)
Pecoral	i, 11	i, 11	i, 12	i, 11	i, 12	i, 12	i, 11	i, 11
Scales st. long./st. w.	5/(7.39/3)	5/(6.25/3)	5/(6.29/3)	5/(7.28/3)	5/(7.39/3)	5/(5.31/3)	5/(5.31/3)	5/(6.31/3)
Scales pred./post./ped.	9/16/12	9/17/10/12	10/10/7	10/10/7	9/10/12	6/9/12	10-/12	10-/12
Max. ext. teeth	3-4	3	3-4	2-3	3	4	2-3	3
Max. int. teeth	5	5	5	5	5	5	7-8	7
Mx. teeth	3	2	2	2	2	1-2 ^{op}	7/7	8
Resp.	7/11	7/11	7/12	8/12	7/12	7/12	—	—

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OUR MARBLE LYRETAIL MOLLIES

Continued from Page 50
 You can imagine our anxiety as we waited and waited, each morning checking the female's girth to see if it had increased any since the night before. She grew larger and larger, but no babies. Everyone laughed and told us she just ate well. Finally there could be no more doubt, and we put her by herself. On Valentine's Day we were presented with 32 little Marble Molly Valentines. Our worries were not over yet; we still had to wait and see what they would look like.
 Of course we pampered them, giving them every bit of tender loving care plus lots of brine shrimp, microworms, frozen baby-food spinach, and a large variety of finely-ground dry foods. They ate anything and everything with a great flourish. When they were a month old we could detect a difference: their tails, instead of having a rounded edge like that of a regular Molly, had a straight edge. By a month and a half all of them had formed very distinguished lyretails and still retained their marble bodies. This was the answer to our dreams or getting something different.

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Right now at five and a half months the variations of patterns in their tails and dorsals are quite beautiful. Some have transparent fins with black stripes, others have transparent fins with black spots, others have all clear fins, and still others have all black fins. When a light shines on their marble bodies in certain ways they look gold and black, but usually the silver predominates.

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