

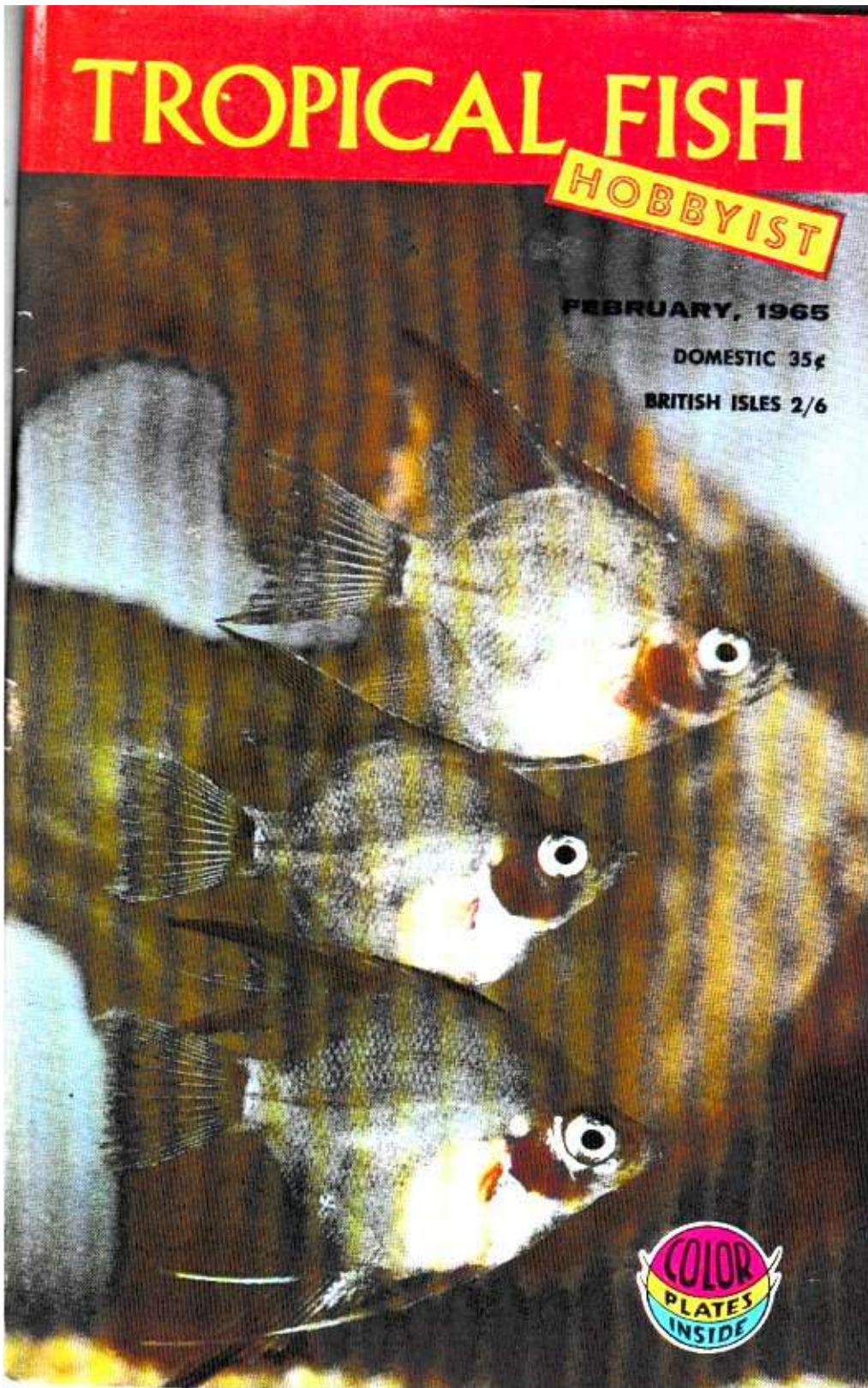
TROPICAL FISH

HOBBYIST

FEBRUARY, 1965

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TROPICAL FISH HOBBYIST

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COVER	
Another new color strain of Angelfish has turned up and flows of the new fish are featured on our cover this month. They're called Conles Blushing Angelfish and are the second color strain of Angelfish that has been discovered since the first Angelfish was introduced to our Oct. '64 issue on page 77. In response to our short time after the release of our new color strain of Angelfish, we should have known the hobby would soon have their day. For this story on the Conles Blushing Angelfish, turn to page 5. Photo by Dr. Herbert R. Axelrod.	
EXOTIC TROPICAL FISH SUPPLEMENTS	
Pages 33 and 34, 31 and 32. These pages are reprinted for easy removal and purchased to fit into the Illustrated Edition of EXOTIC TROPICAL FISHES.	

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EDITORIALLY . . .

There still seems to be a lack of satisfactory names which apply to an enthusiast in this hobby of ours. "Fish hobbyist" seems to be the most used and, while it is accurate, it is not entirely satisfactory. Most of us refer to each other jokingly as "fish-nuts," but would object very strongly to someone else calling us that, and insinuating that we are insane on the subject. The word "aquarist" has come to mean a person who is an advanced hobbyist, a cut above the usual. "Fish-keeper" would denote one who keeps fish, but not necessarily one who has any love for them. There is a group who refer to themselves as "fish culturists." This could be interpreted to mean those who are interested in raising fish, only one facet of this great hobby. We of course could not call ourselves "ichthyologists." These are scientists who specialize in the study of fish life. Many of our great ichthyologists are not fish hobbyists, and on the other hand, some fish hobbyists have become ichthyologists. The other night while watching a very mediocre television program (see where I get some of my ideas for editorials?) I heard a man call a skin-diver an "ichthyophile." This struck me as a very apt thing to call a fish hobbyist: ichthyo-, a prefix meaning "pertaining to fish," -phile, a suffix meaning "one with a fondness for." In other words, "one with a fondness for anything pertaining to fish." This is not a good thing to call many skin-divers. Lots of them have no particular love for fish, considering them merely as prey to be hunted with their spear-guns, or as possible menaces like sharks, barracudas or stingrays. I would not refer to such a person as an "ichthyophile." So, refer to me as an "ichthyophile" if you like. If you want me to beam, call me an "aquarist." But if you call me a "fish-nut," be prepared to dodge or beat a hasty retreat!

William Vorderwinkler



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Another new Angelfish. **The Conles Blushing Angelfish**

BY WILLIAM VORDERWINKLER
Photos by Dr. Herbert R. Axelrod



In the past few years we fish hobbyists have been bombarded with a great many different strains of Angelfish. We have seen and heard of a great many color mutations, some of which bred true and some of which didn't. The black vertical bars have come in for some changes: as we all know, an all-black Angelfish is now commonplace, and now an all-white strain will shortly be on the market. Now we have new transparent Angels which have shown up in batches of the White Ghost strain. They are not white but glassy in appearance. The breeder is Lester Boisvert, of Fin and Feather, 1123 Albany Avenue, Hartford, Connecticut. Lester and his wife Constance combined their names to call this fish the Conles Blushing Angelfish. They have not

A young Conles Blushing Angel. Note how the blood in the gills shows through the operculum, giving the strain its "blushing" appearance.



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Lester Boisvert, originator of the new Angelfish strain known as the Conles Blushing Angel.



These young Angels show typical normal coloring.

begun inbreeding them to establish the strain as yet, but expect to have some available this coming spring. The body is glassily transparent and the peritoneum is white, and the one touch of color is given by the transparency of the gill-covers. The bright red gills are easily visible, and the fish looks as if it is actually *blushing*!

We hope the Boisverts have luck breeding this strain and predict that it could easily become one of our future standbys if we ever get enough of them. From the few specimens we got for photographing, they are healthy and vigorous enough to produce many offspring.

Lest our readers become confused, this is not a new species or anything but a sport of *Pterophyllum eimekei*. There is a Malayan fish (*Gymnochanda filamentosa*) sometimes called the Glass Angelfish; a few specimens come in now and then. This fish does not resemble the Conles Blushing Angelfish, but probably people will also call the pink-cheeked newcomer a "Glass Angelfish" as well and the usual confusion that goes with common names will exist here.

The trouble with common or popular names is that they carry simplification to a point where it defeats its own purpose. Take the name Mosquito Fish, for instance: this could mean just about any hardy livebearer that has been used at some time or other for mosquito eradication. How can you pinpoint which one you are talking about unless you give them a *scientific* name, which each species has?



Contrast the coloring of this trio of Conles Blushing Angels with that of the normally colored Angels pictured on the opposite page.



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THE BEST OF THE KNIFEFISHES . . .

THE BLACK GHOST

Sternarchus albifrons

by MICHAEL REED

Up until a friend of mine acquainted me with the black ghost fish I wouldn't have accepted any knife-fish as a gift, much less pay the comparatively high purchase price most knife-fishes command. I like oddities as much as the next guy, but other than their strange shape and mode of swimming (by undulating their long anal fins), most knife-fishes have little to offer. The African knife-fish (*Xenomystus nigri*), banded knife-fish (*Gymnotus carapo*), and speckled knife-

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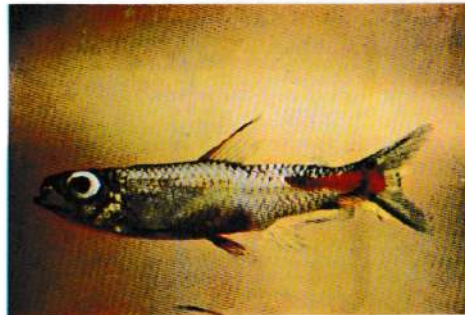
Sternarchus albifrons is one of the few really unusual looking fishes with all the many characteristics qualifying them as good community tank citizens. Photo by Dr. Herbert R. Axelrod.

fish (*Hypopomus artedii*) are all drably colored. Worse yet, they are completely nocturnal and stay pretty well hidden while their aquaria are lighted. For the finishing touch, none of them is trustworthy in a community tank. *Sternarchella schotii*, a knife-fish more closely related to the black ghost than any of the foregoing species, is little better, because it too is dully colored and very shy.

It is a fortunate coincidence indeed that the black ghost is not only the best looking of the knife-fishes but is also the best for the aquarium by any standard. It is colored jet black, occasionally with a bluish cast. A milk-white band runs along the fish's back from the tip of the snout to about the middle of the body. There are also attractive white markings on the tail base. The fish's tail fin is so small that it is hardly noticeable, and its dorsal fin is reduced to a slender filament.

S. albifrons is usually sold at between 4 inches and 8 inches in length. In its native waters it reaches a maximum length of 18 to 24 inches but will not grow to anywhere near this size in an aquarium. Despite their fierce looks, even large specimens are not aggressive toward either their own kind or other fishes. In addition, they are not fussy eaters and require no special water conditions. All this makes

Continued on Page 77



A color photograph of *Brittanichthys axelrodi* taken by the collector, Dr. Martin Brittan, in Brazil.

A New Genus from Brazil—*Brittanichthys*

A New, Sexually-dimorphic Characid Genus with Peculiar Caudal Ornament, from the Rio Negro, Brazil, with a Discussion of Certain Cheirodontin Genera and a Description of Two New Species, *B. axelrodi* and *B. myersi*

by Dr. Jacques R. Géry*

During his 1964 Rio Negro Expedition, sponsored by the T.F.H. Foundation, Dr. Martin R. Brittan, Professor of Life Science at Sacramento State College, California, found the two remarkable new species described below. My collaboration was requested when it was evident that the forms were members of a new genus; description of these new forms follows. I am also attempting the taxonomic placement of the new genus, in the frame of a short "numerical taxonomic" study, which must be considered as a mere trial.

BRITTANICHTHYS *gen. nov.*

Type-species: Brittanichthys axelrodi *sp. nov.*

Tetragonopterinae-Cheirodontidi (Cheirodontinae *sens. Eigenmann*, 1915, *partim*).—Body rather elongate, not very compressed; adipose fin present;

*Contribution No. 43 of the author's series on characid fishes.

caudal lobes with large scales along their proximal third; lateral line incomplete; anal of moderate length; an inconstant pseudotympanum; no prominent interhemals.

Mouth very slightly inclined upwards; teeth in jaws minute, conical, uniserial, about 7-12 on reduced premaxillary, and 14-20 on dentary; none on maxillary, which is broad, curved, blade-like, with a thickened upper border; a patch of minute teeth on palate; no tongue; antorbital developed, suborbitals leaving a naked area on cheek, postorbitals very feeble or absent; posterior fontanel very broad, anterior one variable, reaching to at least level of anterior border of pupil; gill-rakers long and numerous (about 8-10/16-18).

Important sexual dimorphism: males with minute hooklets on first 4 rays of anal fin, with a deep peduncle, and chiefly with a unique (among characoid fishes so far known), probably sexual, differentiation of the caudal fin; the uppermost inferior caudal ray is thickened, elongated, twice-curved (in an "S") with ornamentation of either the second primary ramification (type-species) or the first one (second species); there is also, in the second species, a corrugated keel on the second simple inferior ray (counting from above), somewhat reminiscent of that of *Gephyrocharax*; finally it is possible that the males of *Brittanichthys* gen. nov. also possess, at the base of their caudal fin, a "gland" which may be analogous, or homologous, to that of the Stevardiidi (*Glandulocaudinae* auct.): the absence of specialized middle caudal base scales on examined specimens (no doubt caused by the deciduous character of the scales) does not permit conclusions.

Differential diagnosis and phylogeny:

(1) There are, among the characoids, three small groups with sexual dimorphism resting on caudal modification. It consists on a so-called caudal gland, generally formed by cutaneous (?) sacks or thickenings of the middle rays (in *Mionomonistius*, for example; see Géry, 1964c), or both, frequently associated with ornamented scales covering it. Members of these groups, namely the Stevardiidi, the "true" Cheirodontins *Compura* and *Sacoderna*, and the Xenurobryconidi, may have tiny hooks on caudal rays (as well as on anal, as usual) but never a strongly differentiated middle caudal ray as in *Brittanichthys* gen. nov. A few, like *Gephyrocharax* and *Stewardia*, have a peculiar lower caudal lobe, but it does not approach in complexity that of *Brittanichthys*, being not even of the same type.

Moreover the Stevardiidi, certainly a polyphyletic group, have two rows of teeth on the premaxillary: they are independently derived from some ancestors of the Tetragonopterinae (s. str.) (at least some *Bryconamericus*-like on one side, and some *Astyanax* or other generalized characid on the other side), *Compura* and *Sacoderna* (see Schultz, 1944) have *Cheirodon*-like teeth, broad, flat, with several cusps, contrarily to *Brittanichthys*. Finally the Xenurobryconidi (see Myers and Böhlke, 1956, and Géry, 1963) have numerous external teeth and very different mouth structures. Their rather common habitus with *Brittanichthys* makes one nevertheless believe that they could have derived from some common, but remote, ancestor.

The peculiar caudal differentiation of the new genus, and perhaps the caudal "gland" (which cannot yet, with the material at hand, be ascertained), is thus believed to be only convergent with the above cited structures. They very probably have a similar (sexual ?) function, but the already mentioned groups are probably not very close, phylogenetically, to *Brittanichthys*.

(2) It appears that, disregarding this striking caudal ornament (a rather

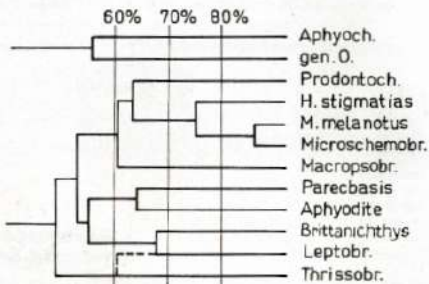
recent adaptation, anyhow), the closest affinities are to be looked for in the small group of cheirodontins formed by Eigenmann, 1915 (section "g" of the key to the Cheirodontinae). The genus *Megalomphodus* (except one species, *melanotus*), has to be excluded, owing to the different habitus of the genus; later on a number of taxa were added (more or less formally), namely *Prodontocharax*, *Thriassobrycon*, and *Aphyocharacidium* (for *Odontostilbe melanota*); and finally two new genera have to be included, which have here to be given only an initial, their formal description being still in press: genus O., from Ucayali (Géry, 1964a), and P., for *Hyphessobrycon stigmatias* Fowler (Géry, 1964b).

The dentition of *Brittanichthys*, as well as several other characters, are typical of the members of the group. It has the long gill-rakers of *Thriassobrycon*; the incomplete lateral line of the majority in the sub-tribe (only *Parecbasis*, *Prodontocharax* and *Aphyocharacidium* have complete lateral line); the scaled caudal lobe of *Aphyodite*; the rather numerous, conical and uniserial teeth of *Leptobrycon*, genus O. and *Hyphessobrycon stigmatias*; the blade-like, toothless maxillary of *Parecbasis* and *Leptobrycon* (which is also quite similar to that of *Aphyodite* and *Thriassobrycon*); and finally the armature of the cheek of a few forms like *Leptobrycon*, genus O. and *Aphyocharacidium*.

(Some characters, like palate-teeth, absence of the tongue, and naturally the caudal differentiation, cannot be taken into consideration: they are not known in most of the genera.)

This can be resumed in the following matrix, which is taken from Géry's 1964b paper (where these genera were briefly reviewed), with adjunction of *Brittanichthys*. It must be pointed out that several of these almost monotypic genera are rather poorly known: some of the coded characters are somewhat dubious.

Fig. O. Diagram of phenetic resemblances between members of Aphyoditeini (compare with diagram Fig. 2 in Eigenmann, 1915).



*The name Aphyoditeini, new sub-tribe, may be applied for this group.

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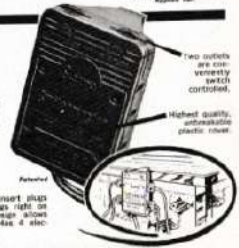
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The simplified code is self-explanatory. Intermediate characters are coded between parenthesis.

Character	Leptobrycon	Aphyodite	Thrissobrycon	Macropsobrycon	Genus "O"	Microchemobrycon	Prodontocharax	Aphyocharacidium	M. melanotus	H. stigmatias	Brittanichthys
Lateral line complete	0	0	0	0	0	0	0	0	0	0	0
Scaled caudal fin	0	0	0	0	0	0	0	0	0	0	0
Long anal fin	0	0	0	0	0	0	0	0	0	0	0
Pseudotympanum	0	0	0	0	0	0	0	0	0	0	0
Superior mouth	0	0	0	0	0	0	0	0	0	0	0
Numerous teeth	0	0	0	0	0	0	0	0	0	0	0
Tricuspid teeth	0	0	0	0	0	0	0	0	0	0	0
Toothed maxillary	0	0	0	0	0	0	0	0	0	0	0
Thickened border on maxillary	0	0	0	0	0	0	0	0	0	0	0
2 rows of teeth on dentary	0	0	0	0	0	0	0	0	0	0	0
Sides of dentary raised	0	0	0	0	0	0	0	0	0	0	0
Broad anterior font.	0	0	0	0	0	0	0	0	0	0	0
Complete SO*	0	0	0	0	0	0	0	0	0	0	0
Postorbitals present	0	0	0	0	0	0	0	0	0	0	0

Another matrix of simplest coefficient of association¹ was then computed:

	Leptobrycon	Aphyodite	Thrissobrycon	Macropsobrycon	Genus "O"	Microchemobrycon	Prodontocharax	Aphyocharacidium	M. melanotus	H. stigmatias	Brittanichthys
Parecbasis	57	64	29	57	25	68	57	29	57	32	39
Leptobrycon	57	61	61	50	46	43	30	46	57	68	68
Aphyodite	50	57	32	61	46	21	61	43	54	54	50
Thrissobrycon	50	21	39	25	21	39	50	50	50	50	50
Macropsobrycon	53	61	57	50	68	57	39	50	50	50	50
Genus "O"	39	46	57	50	64	32	39	50	50	50	50
Microchemobrycon	61	54	86	64	36	36	36	36	36	36	36
Prodontocharax	54	64	64	39	36	36	36	36	36	36	36
Aphyocharacidium	57	61	36	36	36	36	36	36	36	36	36
M. melanotus	57	61	36	36	36	36	36	36	36	36	36
H. stigmatias	75	46	46	46	46	46	46	46	46	46	46
Brittanichthys	54	54	54	54	54	54	54	54	54	54	54

The taxa may be ranged with respect to their "fitness" with the group as a whole (average of association of one taxon with the other ones).

M. melanotus	59.0	Aphyodite	49.6
H. stigmatias	56.5	Parecbasis	46.7
Macropsobrycon	56.3	Brittanichthys	44.8
Microchemobrycon	55.9	Aphyocharacidium	44.4
Leptobrycon	53.2	Genus "O"	42.5
Prodontocharax	50.5	Thrissobrycon	39.5

The "best fit" with the group is seen in *M. melanotus*, an interesting species which needs to be re-examined. Other "central" (or generalized ?) species are *H. stigmatias*, *Macropsobrycon* and *Microchemobrycon*. "Aberrant" taxa are chiefly genus "O" and *Thrissobrycon*.

With a "groups method" (devised by Sokal and Michener, 1958) the second matrix gives a diagram of phenetic resemblances (Fig. 0), which again is to be taken with caution, owing to the small number of characters and the primitive computation, not to mention several objections to the principles of Numerical Taxonomy.

It may be seen in the matrix, as well as in the diagram, that *Microchemobrycon* and *M. melanotus* (86, highest number), may be closely related, if not of the same genus. *H. stigmatias* (genus "P.") is also close to the group thus formed, whereas *Aphyocharacidium*, on one side, and *Thrissobrycon*, on the other, would be well apart from each other as well as from the central group (no doubt owing to their divergent specializations). The former may even not belong to the group (mean of coefficient of association with all other taxa is 44.4).

*Matching characters are counted as 1, non-matching as 0; cases such as (+) versus + or ++ versus + are counted as 1/2. Then the sums are divided by 14 (number of characters) to transform them into percentages.

In the central, major group, two smaller, sub-groups appear. One is formed by *Prodontocharax*, *H. stigmatias* and *Microchemobrycon*, together with *M. melanotus* and *Macropsobrycon*. The second, more interesting for the present, would comprise *Parecbasis* with *Aphyodite*, and *Leptobrycon* with *Brittanichthys*. It seems necessary, for "subjective" reasons, to add *Thrissobrycon* to this sub-group. *Macropsobrycon* could well be the junction between both sub-groups.

Brittanichthys gen. nov., judging from its coefficient of association with the other species or genera of the "central" group (last column in matrix II) would be well apart from *Prodontocharax* among others (which, in turn, is rather close to the *Microchemobrycon* group). This is rather well in accordance with impressions given by traditional taxonomy, except that the resemblance with *H. stigmatias* may be coincidental. Moreover this small numerical study does not reflect the rather striking convergence with *Thrissobrycon* (also from the Rio Negro). The latter is altogether linked to *Brittanichthys* by its phenetic resemblance with *Leptobrycon* (interrupted line on diagram, Fig. 0).

In the whole, the present arrangement does not differ very much from the preceding one (Géry, 1964b), arrived to by subjective weighting of the characters. Both still need considerable improvement.

Brittanichthys axelrodi sp. nov. (Fig. 1 and color photo)

HOLOTYPE: A male, 28.1 mm. in standard length (measured with micrometric ocular), about 35 mm. in total length; loc. typ. Rio Negro basin (Brazil), Praia (= beach) Bulufu on the Rio Itu; the collecting place is about 80 km. upstream from the meeting with the Rio Negro, Lat. about 0°-30' S., Long. about 65°-30' W.; colls. Dr. Martin R. Brittan and Mr. H. W. Schwartz, Apr. 26, 1964; orig. No. 1964-61.1; U.S.N.M. will have Holotypes.

PARATYPES: 19, 12 males and 7 females, 25-28 mm. in standard length; collected with the type; deposited as follows: U.S.N.M., 7; Stanford University, California, 4; Sacramento State College, California, 4; Collection of J. Gery, 4.

DIAGNOSIS: Depth 3.75-4.43 and head 3.36-3.69 in the standard length; snout-to-dorsal 1.05-1.18 in dorsal-to-caudal; depth of peduncle 1.24-1.44 in its length in males, 1.71-2.20 in females; eye 2.82-3.16, bony interorbital 3.91-4.26, maxillary 3.0-3.50 and snout (measured in projection between tip of snout and anterior border of orbit, not eyeball) 4.94-6.15 in the length of head (with opercular membrane); dorsal iii; anal iii7(i)-18(i) or 19; scales (6 or 7) 32-34?, 8 or 8 1/2 between dorsal and ventral; gill-rakers long, 8-10/16-18; teeth minute, conical, about 10-12 on reduced premaxillary and 14-16 on dentary, none on maxillary, which is long, curved, blade-like; pterygoid (?) dentition present, in a patch of 25-35 very minute, conical teeth; strong sexual dimorphism, the males having, among other features, a specialized, ornamented, hooked middle caudal ray; sex-ratio of type series: about 2 males: 1 female.

DESCRIPTION (see Table I for proportions and anal counts of 12 largest specimens, 9 ♂♂ and 3 ♀♀): Clupeoid; body rather elongate, not very compressed; dorsal profile rather straight, ventral profile only slightly arched; dorsal fin nearer snout than end of hypural, not very high, formula iii; adipose fin quite large; peduncle high in males, relative to females; pectorals low, long, over-

¹For Dr. Herbert R. Axelrod, who sponsored the T.F.H. 1964 Expedition to Rio Negro.

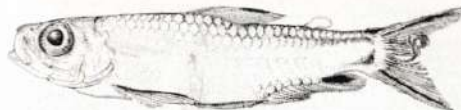


Fig. 1. *Brittanichthys axelrodi* n. sp.; holotype, a male 28.1 mm. in standard length. (x2)

lapping base of ventrals, formula iii1 (last rays rudimentary); ventrals low, long, originating under first rays of dorsal, and overlapping first rays of anal; its first (simple) ray bordered externally by a long flap continuing the rudimentary pelvic ray of most characids; a similar "flap" or additional ray is also to be seen on pectoral, but much less developed; formula (i)17 (last ray rudimentary); anal moderate, bilobed, the first and the last rays being rather elongate; no scales visible on base of anal (probably lost); in males, last, longer simple ray and first 3 branched rays armed with a series of 30 or so very tiny hooklets, scarcely visible with a magnification of about 50 x; base of same rays with a rounded flap; there are apparently no hooks on other fins, save for the specialized structure on caudal; caudal fin (Fig. 2) rather developed, with unusual formula which seems to be 9 or 10/7, that is that the superior branched rays are clearly more numerous than the inferior ones (instead of, as usual, 8/7 or 7/8 in most characids); simple rays about vi above and lvi below; in males, the uppermost inferior branched ray shows the structure figured on the left of Fig. 2; it is much elongate and strongly curved twice, forming a sort of "S" with the second primary ramification (counting from above) thickened at its base; much ramified at its tip and armed with 3 to 7-8 rather strong hooklets or each secondary ramification; the modified ray is bordered and covered by a thick membrane; the base of the fin has another, fleshy, thickened structure, which may or may not be analogous to a "caudal" gland; this is difficult to ascertain, owing to the fact that the base of the middle rays is not modified (as is the case in "typical" Stevardiini like *Mimagonistius*); moreover, the middle scales are mostly lost and there is no possibility to say if they are ornamented or not; the base of the lobes is altogether clearly scaly on its proximal third, as can be seen in two or three of the best preserved specimens. The females have no hooks on caudal fin, no modified caudal rays; a slight thickening of the fleshy part of the caudal base, and a much narrower peduncle than the males; no prominent interhaemals in either sex; a small pseudotympanum is visible by transparency in some specimens.

Scales deciduous, these remaining regular, of the cheirodontine type; lateral line interrupted after the 6th or 7th scale; a count attempted in the best specimens, mostly from scale-pockets, gives the following: longis. series probably 32-34; transv. series 8 or 8 1/2, less likely 9 (about 4 1/2 above virtual lat. line and 2 1/2 or 3 below to ventral); predorsal scales most probably 9, very regular, predorsal not keeled; preventral not keeled, not much flattened, regularly scaled; peduncular scales about 12 (?).

Head (Fig. 3) moderate; eyes large, without adipose lid; posterior fontanel very broad, anterior fontanel much narrower, reaching to in front of pupil; antorbital (SO*) very developed; second suborbital narrow; great suborbital

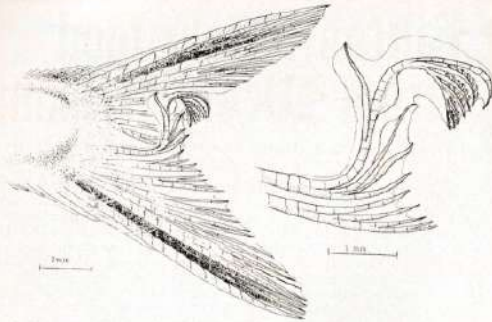


Fig. 2. Caudal fin of a male *Brittanichthys azeladi* n. sp., showing the peculiar modification of the central rays. (x10)

(SO¹) of irregular surface, leaving a rather broad naked area all around the cheek; SO¹ present, but very weak, on a few specimens only; other post-orbitals absent; their canal scarcely visible; opercular series not modified, similar to that found in most Tetragonopterinae sens. lat.

Mouth very slightly upturned; no tongue; jaws (Fig. 4) of the type found in some cheirodontins (see generic discussion), for example *Macropodus* (the only one figured in Eigenmann, 1915, Fig. 13); premaxillary rather weak, with a broad, short ascending process; 10 or 12 minute conical teeth in one row, and a few replacement teeth; maxillary curved, broad and long, reaching to beyond level of eye when the mouth is closed, its upper border distinctly more thick than in most small tetragonopterins; no teeth visible; only one (dorsal) projection (or anterior apophysis) contrary to *Thrisobrycon* which has a similar maxillary; dentary with the sides not much raised, armed with one rather regular series of about 14-16 minute, conical teeth; behind a second series of curved, conical teeth which apparently are replacement teeth; a patch of about 25-35 extremely tiny conical teeth on each side of palate (probably on pterygoids); gill-rakers on inferior first arch minutely denticulated, very long, almost as long as the gill-filaments, and numerous: about 8-10/16-18.

This last character, associated with dupoid form of the mouth and even the body, the structure of the jaws, and the biotope (the specimens were collected along a beach of sand), makes one believe that *Brittanichthys*, like *Thrisobrycon* and perhaps others, may be adapted for plankton feeding.

PATTERN AND COLORATION (from field notes of Dr. M. R. Brittan):

"I was unable to examine closely living or freshly-dead specimens, since they were seized at night, though I did notice the major details of coloration by

Continued on Page 61

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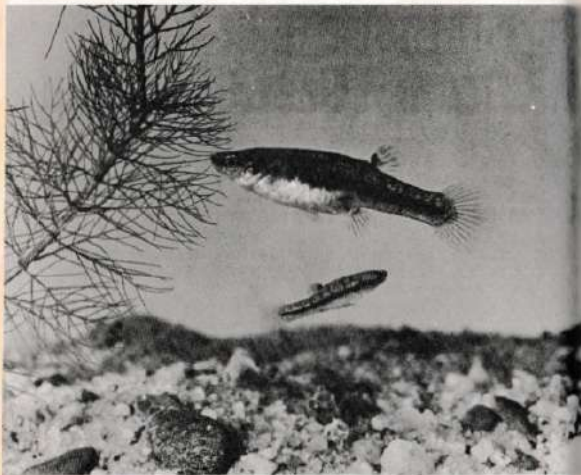


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At maturity, the female Mosquito Fish outsize the male considerably. Photo by Milan Chvojka.

Heterandria formosa, the Mosquito Fish.

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BY KLAUS MOLCH, Halle/Saale, Germany

Heterandria formosa is not only the smallest representative of the family Poeciliidae but a very attractive fish as well. Unfortunately this fish, which is also one of the smallest vertebrates, is met with in Germany in very small numbers, while the larger aquarium fishes enjoy a not always deserved popularity.

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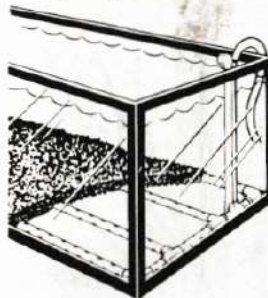
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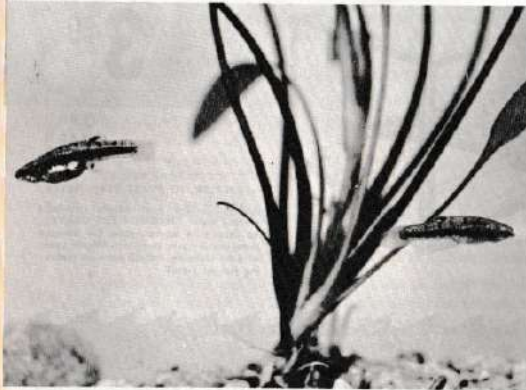
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would be the female, which is considerably larger than the male. Average size of females kept by me was about 1 inch, while the males were only $\frac{3}{4}$ of an inch in length. Both sexes have a brown horizontal stripe which stands out against a background color of lighter brown. The dorsal fin of both sexes, which leans back at an angle of about 60° from the back, frequently carries a black spot with an attractive red edging. The anal fin of the female is milky white, with a black spot inside. The female, like all livebearers, has a rounded anal fin, whereas that of the male is modified into a copulative organ, the gonopodium.

Heterandria is undemanding; it is omnivorous but because of its size prefers food which is small. For this reason they have a great liking for *Cyclops* and algae. I have kept them in 1-gallon aquaria at a temperature of 68° F., and my fish felt very well and had young. To have this fish multiply for him is after all the aim of every hobbyist. One of the advantages of breeding this fish is that the females are not cannibals, as are female Guppies, Platies, and Swordtails. At least, this has been my experience.

The newly born young, which appear over a period of time at the rate of one or two a day, are barely $\frac{1}{4}$ of an inch in length. If one observes closely the

A pair of Mosquito Fish. Note the long gonopodium of the male (right). Photo by G. J. M. Timmerman.



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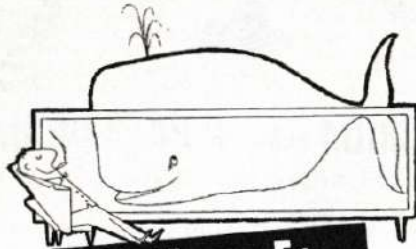
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changes that take place while they grow up, the sexes can be distinguished at six to eight weeks of age. These observations can be made by watching the following: even at birth the youngsters, which already show the horizontal stripe, show a tiny black spot which later gets the red edge. Once the youngsters are six to eight weeks old, the anal fin of the females takes on color as well, while that of the male remains colorless and a short time later changes shape and becomes a gonopodium. The anal fin of the female also has a black spot, but the reddish color around it becomes intense and then fades.

The males are very active and constantly engaged in driving the females out of their hiding-places. In doing this he frequently turns his gonopodium, which can be moved in either direction, so that the tip lies exactly below his mouth. When two males meet it often happens that for several seconds they quiver excitedly or turn in various directions without increasing or reducing the distance between them. Sometimes there are battles, but they never lead to any injuries. Taken all in all, this fish can be the means of providing some interesting observations which can lead to more surprises than one would think possible.

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The Umutina wear a thick covering of animal furs on their backs. They prefer the skins of the jaguar, otter, and spotted wildcat. Formerly when they went to war, these furs were also worn on the chest. They were as heavily armored as a Catfish and thereby protected from being shot by arrows.

"Come quickly, father! There is a big fish in the stream again! It is swimming very slowly, just below the surface!"

Katama ran quickly to the stream, taking with him a brand-new bundle of beautiful arrows he had just finished. He took one shot which hit and killed the Catfish, which of course was really Hári, the Moon. They cooked and ate their huge prize.

Mini waited a long time for his friend, the Moon. When he did not show up for many hours, he decided to go in search of him. Mini went to the home of Katama, the Kingfisher. There he found the children, their bellies full of fish. On the floor the bones of the Catfish were strewn. In the fireplace, hanging from a stick which was tied across, was the tail which was being smoked.

Mini, the Sun, asked the children where their father was. "He is looking for a big fish," they told him, "which swam away with a lot of his arrows sticking in him!"

Mini carefully gathered all of his friend's bones and tossed them into a straw mat. Then he ordered the children to lie down on the floor and pressed down on their bodies, causing them to disgorge all the fish they had eaten. This he also placed in the mat, folded it up and took it along to his house. There he laid it in a corner and went about his other tasks. Soon he heard groans coming from the straw mat. He investigated and found that his friend the Moon had again changed into human form. "I feel so cold!" he complained. He asked Mini to build a fire, but Mini simply answered:

"Wait a bit!"

Soon afterwards Mini, the Sun, thought of something new:

The otters were also humans at this time. They fished in the streams and at the same time held parties on the banks. Here they had clay pots standing, filled with boiling water so that they could cook the fish as soon as they caught them.

Mini crept among the clay pots and wondered how he could possibly get possession of one. He thought it over for a long time, then decided to change himself into a bamboo rat. In this form he dug a long tunnel which took him exactly under one of these pots. He then took some cool earth into his hands and quickly carried away one of the pots. But this proved to be very heavy and hot, and Mini found that he could not finish the task by himself. He carried it a good way and then called to Hári, the Moon, to assist him. The pot was so awfully heavy and hot that the Moon could scarcely carry it. Hári also did not have the foresight to take some cool earth into his hands before tackling the job.

The pot fell down and broke. Because it was red hot, the Earth began to burn. Mini saw that all the forests and savannahs might be destroyed. For this reason he turned himself into a falcon. He circled high above the fire, in order that he might catch the insects which were rising in the hot air.

Hári, the Moon, had changed himself into a savannah owl, the type which nests in a hole in the ground.

The fire spread farther and farther. The Moon had sought shelter under a clump of grass. A tongue of flame licked over it and

burned up the grass, along with the little owl which was the Moon.

Mini went home and waited. But Hári did not come back! The fire had long ago burned itself out. He went out to look around. Finally he found the bones of his friend the Moon and took them back with him. At home he placed them in a straw mat, folded it up and put it aside. Soon the Moon came back to life.

This is the reason the Umutina are always singing about "When the Moon Dies."

The heavens with their stars have become strangers to us who live in the city. When we want to look at the sky—if only to see if the moon is shining—we must almost dislocate our necks. The bright glare of the illuminated advertisements blind us so that we can see only a pale picture of the glory of the heavens with all the stars.

The sun, moon, and all the stars of the heavens are all-important to the people who live close to Nature. They play a large part in their lives. By the appearance and disappearance of the constellations they are guided as to when to plant or harvest, when the rainy season is approaching, or when the dry season is not far away.

The Indians of the Brazilian jungle have also given a great deal of thought about what the relationship might be between their heavenly friends, the Sun, Moon, and Stars. The Stars are the dead in heaven, sitting before their fireplaces. Sun and Moon are men, friends or twin brothers, who formerly lived here on Earth. The Sun, whom the Umutina named Mini, is clever; Hári, the Moon, is stupid. Mini thinks up and

performs tricky and jolly schemes and adventures and has a great deal of fun with them, but Hári, the Moon, comes to grief every time he wants to duplicate them. Mini, the Sun, then finds the victim, gathers his bones and by the power of magic brings him back to life again.

It is not difficult to imagine that the Umutina Indians explain the phases of the Moon in this poetic manner.

The Umutina believe that animals were formerly people. Katama, the Kingfisher, ate fish as he still does today, but in the old days he shot them with his beautiful arrows. We have all at some time watched how a kingfisher in his colorful feather costume sits on a waving branch above the water's surface. Suddenly he pitches himself down, half disappears in the water, flutters, seizes his prey and hurries away in an erratic, wavering flight to find another similar branch. In Brazil there are many kinds of kingfishers. Some are as large as doves, and others are quite tiny. All have brilliant, beautiful feathers. They nest in little caves which they dig in the steep banks.

In order to steal the wonderful arrows owned by Katama, the Kingfisher, Mini turned himself into a large Armored Catfish, of which there are many hundreds of species in the Brazilian rivers, but it is not difficult to guess which kind of Catfish he chose—of course it was one of the heavily armored ones,

Plecotomas or a similar genus, whose entire body is encased in a hard bony armor. The beautiful arrows of Katama naturally stuck in the other protection without piercing his real armor. Hári, the Moon, was not as clever and changed himself into a Catfish with an unarmored leathery skin. He covered his body with just the palm leaves, with the result that the arrows pierced his covering easily and killed him.

In all the Indian legends it is always the stupid one, the one who does not understand the gist of things, who meets his downfall.

The straw mat is the holiest possession of the Umutina Indians. They connect this with a belief in resurrection. A dead body wrapped in a straw mat is given the power to come to another life once more. The Umutina sit on these and sleep on them. When they die they are rolled up in one and buried.

Only once in a year, when the ghosts of their predecessors take shape in the masked dances of the Death Cult ceremonies, the women weave straw mats from the straw of the masked costumes. This straw has come into direct contact with the souls of the forefathers.

Mini, the Sun, is constantly making use of the powers contained in his straw mat. The bones and flesh of the Catfish into which the Moon had changed itself were again awakened to life by these powers.

The eternal phases of the Moon, which dies and comes to life again.

When the corn becomes ripe, the Umutina celebrate a large Death Cult feast. The souls of the dead are invited. They become embodied in the masked dancers, who carry fish symbols. The small discs of straw on the long poles signify the Pacú (*Metynnis*). New mats are woven from the straw of the masked costumes.



Ever try it?

Peat Moss in the Aquarium

BY WILLIAM VORDERWINKLER

Many readers write and tell me that for some reason or other their plants do not grow and their fish do not do as well as they should. Frequently the people with plant troubles are being just a bit too thorough when they filter their tanks, with the result that there is not enough nitrogenous matter for the plants to grow. There are also some other ingredients which would normally exist in the silt of a stream or pond, and in order to get the plants to grow as they would in the open we must give them at least somewhat similar conditions. What are these conditions? Next time you get a chance to look into a pond or stream where plants are growing, take a look at what sort of bottom there is where the vegetation is densest. Is it a sandy bottom? Not on your life! You will always find the most plants rooted in a muddy bottom. Our problem, then, is this: how are we going to give the same qualities to our aquarium that are in existence in a muddy stream bottom? Obviously we cannot put a layer of mud on the bottom of our aquarium. After all, we want to see our fish. Using a layer of peat moss underneath the gravel is what a great many of our German friends do, but if there are bottom-grubbing fishes in the tank the peat moss will wind up on top and the gravel underneath. The plant roots do not have to be in direct contact with the peat moss. Many hobbyists have the mistaken notion that plants get their nourishment solely through the roots, where the truth in many cases is that the roots are little more than anchors which hold the stems in place, and most of the nourishment is taken in through the leaves. It is enough, then, to add the plant-growing ingredients of peat moss to the water where they can be absorbed by the plants. The simplest way to do this is to use it in the filter, with a layer of glass wool or filter floss above and below to keep it where it belongs. The water flows through the peat moss and gradually leaches out the substances from it, giving the water a slightly amber tint and lowering the pH value a little because of the humic acid released.

What most hobbyists are unaware of is that peat moss is a highly variable substance. There are peat deposits in many parts of the world, and they differ greatly depending upon the nature of the soil surrounding them and the water which flows through. Most peat mosses are strongly acid because of a high content of humic acid. This is a very desirable thing in regions where the water is alkaline in nature and one wants to bring about a change from alkalinity to acidity. But here is the rub: there are many kinds of peat moss which are almost devoid of humic acid, the very thing we are trying to introduce into the aquarium. This is true of much of our domestic peat moss, and before we use it we must give it a simple test. Take a drinking glass and

fill it with water. Test the pH of the water. Then take a couple of pinches of peat moss and put it into the water. The next day, test the pH of the water again. If the water has turned strongly acid, the peat moss is the kind you are looking for. Most German peat moss is very good, but you will find that a great deal of domestic peat moss is useless for our purposes. This may not impair its usefulness for gardeners, but in the aquarium it leaves much to be desired.

Why all this fuss about humic acid in the aquarium, besides helping the plants along a bit? After all, most of us are more concerned with the welfare of our fishes than that of our plants. In order to give our fishes a natural environment, we have to give them just about the same water as that from which they came. Many of our most beautiful and popular aquarium fishes come from regions which are far inland, where the water has no salinity and the heavy rains and high content of decaying vegetation make for a fair amount of acidity. This is the condition we want to duplicate in the aquarium, one which will keep our fishes looking and feeling their best as well as inhibiting the growth of algae and giving a boost to the other plants. This kind of water is also very low in bacterial content, as a microscopic examination will confirm.

You have already been told how peat moss can be used as a filter medium by putting it in a filter with a layer of glass wool or filter floss above to hold it in place. There is a peat moss pressed into discs about the size of a hockey puck. If this does not fit your filter as it is (it breaks up into loose flakes when water-soaked in any case), it can be easily broken up into whatever size is desired to fit the filter. Do not try to jam too much peat moss into the filter; remember that the water has to flow through. When the filter becomes jammed with impurities, replace with fresh glass wool and peat moss once more. Once your water has reached the desired acidity, stop adding peat moss and use glass wool or filter floss as you normally would. Your fishes will get brighter colors, and the plants which you have been despairing of growing will in many cases become easy to keep.

Having Trouble Identifying Corydoras?

BY DR. HERBERT R. AXELROD
Drawings by Ingeborg Weirich
Identifications by Dr. W. Klausewitz

Next month — A valuable pictorial guide to identifying these popular catfishes.

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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.

Ants

Q. Some time back I had a few tanks in my basement, including a 2½-gallon one with a single fish in it, a Betta. One day I went to check on my fish and I saw a red ant crawling down the side of my tank, with the Betta trying to get at it. I picked it up and dropped it into the tank; he immediately gobbled it up. I was wondering if it would be all right to keep feeding my fish ants. Would the ants hurt my fish?

Gene Cramer, Wauwatosa, Wisc.
A. Adult ants like the one you fed have little food value, besides having a rather thick shell which would be hard to digest. If you find a nest and get some of the eggs, these would be a very good food, but you would have a problem keeping the eggs before they hatched. You would also have a problem, come to think of it, keep-

ing the ants of you while you were digging into the nest and getting out the eggs. Why not forget the whole thing and start a white worm culture, or try to find a pond that has a Daphnia population?



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Want a Piranha Club?

Q. I read in your magazine months ago that Piranhas have been spawned in a 300-gallon tank. Could you please tell me how I can find out which are the males and the females? I keep four species in a 55-gallon tank, and would like to give it a try, breeding them, that is. My "boys" get along very well; once in a while they tear at each other, but I always manage to get them through the mess alive! This week my Electric Catfish gave one of them a shock and now my poor "darling" is swimming upside down. Is there a cure? I removed the Catfish, of course. I would be glad if you could print my address in your magazine so that I could get in touch with other Piranha fans, and possibly start a Piranha Club. These fish really fascinate me.

F. H. Bellmer,
3099 Crescent St.,
Astoria, L.I., N.Y.

A. The only way you can tell the boys from the girls is to wait until they are ready to breed and then separate the females by their increased girth. Your Electric Catfish probably damaged your Piranha's swim bladder or his brain



A Piranha, *Serassalmus rhombeus*.

center, which controls his balance. Either way it sounds incurable. I published your address in the hopes that if you do not find enough fellow Piranha fans to form a club, you will at least get a few to write to. Lots of luck!

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Not-so-wingless fruit flies.

Q. Recently I purchased a culture of wingless fruit flies. I have several cultures in pint jars. Is there a better container in which I could raise cultures of flies? I've had trouble in getting the flies from their cultures. What is the best method to do this? I have noticed that the flies in my culture have wings and can fly. Does this occur in all wingless fruit fly cultures after several generations, or should I write the company I bought the flies from about this?

Larry Streck, Esid, Oklahoma

A. You should have no trouble shaking out what you need of your flies if they are the real wingless variety. Pint jars are as good as any containers for raising them. There are two ways that your culture could have become contaminated. Either you exposed the culture medium to winged flies or the culture was already contaminated when you received it. Try using a clean culture medium and carefully separating a small amount of wingless flies. When you get wingless flies once more, throw out the old cultures and stick to the new culture.

Bumblebees.

Q. I enjoy your column very much, and find it extremely informative. I have, however, come up with a few questions that nobody seems to be able to answer.

1. Are Bumblebees (the Gobies) apt to cause trouble in a community tank containing: one Dwarf Gourami, one Albino Catfish, two Albino Barbs, two Tiger Barbs, a Golden Lined Pencil Fish, and a Sucker Catfish.
2. What is *Astronotus lisa*? None of the available reference books

contain any pictures or descriptions of it.

3. Is it possible to feed fish exclusively on frozen brine shrimp and still maintain their good health?

4. The Desert Aquarium Society, of which I am a member, is planning soon to begin printing a club magazine. I plan to conduct a question and answer column similar to yours. Can you make any suggestions?

Robert Mirabal, Lancaster, Calif.

A. 1. Bumblebees are not the perfect community fish that some repute them to be. They do best in a small tank by themselves, and may even spawn for you.

2. Nor do mine. I show several species of *Astronotus*, but no fish named *Astronotus lisa*.

3. It is not possible to maintain perfect health in any fish by giving it any one food, even if that food is alive. No food is perfect, and a variety is required to give the fish the required nutritive elements.

4. Lots of Luck! The best I can wish you is that you get a copious flow of good material and that your fellow members do not murder you in cold blood if you change one

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word of their deathless prose. All spawning aside, many of our top fish writers started by writing for society publications. What better way to get experience?

Paradise Fish

Q. I have been trying to get a pair of Paradise Fish to spawn. I'm pretty sure they're a pair. The man I bought them from said they were and I compared them to a picture in the November, 1962 issue. I've tried to get them to spawn by feeding them earthworms, dried foods, and even Guppies. I've separated them with a pane of glass, put them in different aquaria, and even put them together. At times both would get fat, or else just one would. The biggest always seems to have built the bubble nest, but then it disappears. They only have little spots and can be kept together



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safely. At the moment they're separated by glass and want to get together. Would you please help me cope with this problem?

Bob Reynolds, Warren, Ohio
A. One thing makes me suspicious you mention both fish getting fat at times. The male does not take on much girth at breeding time, but the female does. Does the fish you believe to be the male have long, drawn-out fins? Are his colors considerably brighter? I suggest you get another fish, a definite male this time, and then try when one fish gets fat. I am inclined to believe that the two fish you have now are both females.

Kuhli Loaches and Pencilfish
Q. 1. How long do Kuhli Loaches usually live? How big do they get?
2. Do Pencilfish become hump-backed when old, like Zebras?
Don Horacek, Burbank, Calif.

A. 1. When properly and intelligently kept, about three years and more. They attain a length of about 3 1/2 inches. Trouble with most Kuhli Loaches is that they are kept like the farmer who kept a pig and fed it nothing but table scraps when it needed more than twice the amount it got. Kuhlis have healthy

appetites, but all too frequently they are left to just dig out what the others leave.

2. There is no reason for a healthy Pencilfish or a Zebra for that matter to get humpbacked when old. Proper feeding and a clean uncrowded tank are the most important requisites for health.

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Anybody got a crystal ball?
Q. I am inquiring about a fish. I do not know what kind she is. Where her backbone is, it is a bluish-green color. On top of her gills, or just above them, it is green. Underneath her gills it is pink. Her belly is silver, and near her mouth it is pale yellow. At the base of her tail, it is yellow. Could you please tell me what kind she is?
Judy Cowing, Santa Barbara, Cal.

A. Judy, there are a total of about 40,000 species of fishes. If you could take your not-too-void description and conjure up a mental picture of the fish you describe without your ever having seen it, and then be able to tell which one of the 40,000 species it is, I would like to teach you to see if you are real.

"Meteor Minnows"
Q. In my copy of EXOTIC TROPICAL FISHES there is a picture of a truly beautiful fish, the Meteor Minnow variety of White Cloud. I would like a few pairs for breeding purposes. However, "the strain is no longer available." I don't believe that this beautiful fish has been allowed to die out. I feel sure that some hobbyist, dealer, or breeder has kept the strain going. If you would print this letter along with my complete name and address, perhaps someone who has some or knows where I can get some will get in touch with me.

M. S. Mackay-Smith
9 Winsor Lane, Topsfield, Mass.

A. The strain was not very strong to begin with. It never bred 100% true, and it seemed that every batch of youngsters had fewer large-finned ones in it. I wish you luck, but don't worry much whether you will locate some.

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Brittanichthys

Continued from Page 24

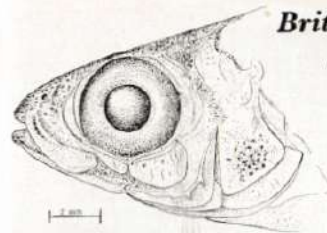


Fig. 3. Head of holotype of *Brittanichthys azeiroi* n. sp. (x6)

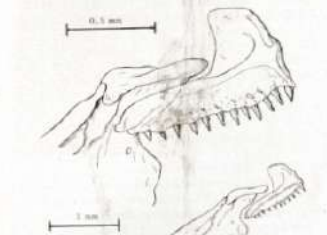


Fig. 4. Premaxillary bone (above, x40); premaxillary, maxillary and dentary bones (upper and lower jaws; center, x16); and dentary bone (lower jaw; below, x40) of *Brittanichthys azeiroi*, n. sp.

flashlight. Most examples preserved at once, but it was attempted to keep some alive. However, all were dead by morning; these, too, were preserved in 10% formalin. The following detailed color description is based on specimens which had been in formalin about 18 hours: Background coloration whitish, probably silvery in life. A definite, regular, blackish network pattern, corresponding to the scale pattern, most pronounced on the back posterior to the dorsal fin, and weakest on the anterior part of the sides. All the fin rays speckled blackish, as is the adipose fin. Anterior pectoral rays (leading edge) heavily blackish to tip. Basal third of pelvic rays heavily blackish, fading on middle third. A prominent oval blackish blotch on the proximal half of the last 2-3 anal rays, smaller than the pupil of the eye. An elongate blackish fleck at the anterior tip of the dorsal fin. Principal simple caudal rays deep blackish from base to tip. Belly bright carmine from halfway between pectoral and pelvic origins backward to vent, extending about halfway out on anal fin. A brilliant, carmine, elongate keyhole-shaped blotch on caudal peduncle, starting above midpoint of anal base and ending midway on central caudal rays. A blackish crescent on lower half of hypural portion of caudal peduncle. Coloration similar to that of the other new species, but with important differences. By flashlight I did not notice in this species the emerald belly color of the other."

"In formalin all the reddish coloration eventually fades. The background color becomes, overall, yellowish white. A blackish reticulate pattern on the dorsum, rather prominent behind the dorsal fin. A black streak subdistally on the first ray of the dorsal. First pectoral ray black. Two black streaks, one along each principal simple caudal ray. An oval black spot about the size of the pupil at the posterior margin of the anal. Some blackish pigmentation on most of the fin rays. A blackish longitudinal streak along the upper third of the caudal peduncle; a shorter, more lunate, one on the lower third."

ASSOCIATED SPECIES AND BIOTOP (field data from Dr. Brittan):

"Seining was done at night with a fine meshed 10 x 60 foot bag seine on a muddy beach in water up to 10 feet deep. The river was in low phase (dry season). The water was brownish-stained and only slightly turbid. Temperature about 80° F; pH not taken, but certainly less than 5.0, as it was less than this at all stations tested. Current nil. Taken in the same haul were many small characins (*Creatochanes*, *Hemigrammus*, *Curimatus*, *Cryogobius*, *Hemiodus*, *Characidium*, etc.), a few small catfishes and cichlids (*Loricaria*, *Apistogramma*), three large cichlids ("tucunaré," *Cichla* sp.), and three stingrays (*Paratrygon* sp.)."

DIFFERENTIAL DIAGNOSIS: see following species.

*Brittanichthys myersi*¹ sp. nov. (Fig. 5)

HOLOTYPE: ♂, 31.7 mm. in standard length (measured with micrometric ocular), about 39.0 mm. in total length (caudal slightly damaged); loc. type, Rio Negro, Brazil, unnamed inlet on shore, at about 13 km. west of junction with the Amazon, 10 km. west of Manaus; Lat. about 3°-10' S., Long. about 59°-55' W.; coll. Dr. Martin R. Brittan, April 7, 1964; orig. No. 1964-53.1; *U.S.N.M.* will have Holotype.

PARATYPES: no additional specimens secured.

¹For Dr. George S. Myers, Professor of Zoology at Stanford University, and a long-time student of South American fishes.

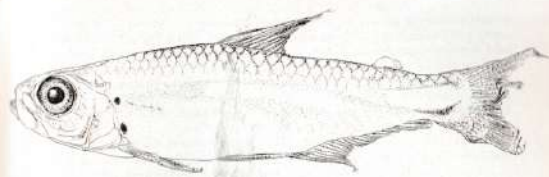


Fig. 5. *Brittanichthys myersi*, n. sp.; holotype, a male 31.7 mm. in standard length. (x2)

DIAGNOSIS: Depth 3.83 and head 3.68 in the standard length; snout-to-dorsal 1.14 in dorsal-to-caudal; depth of peduncle 1.47 in its length; eye 3.31, bony interorbital 3.53, maxillary 3.12 and snout 5.3 in the length of head; dorsal ii9; anal iii18; scales probably, judging from scale-pockets, (6)33, 9 or 9] between dorsal and ventral; gill-rakers long, 9/18; teeth minute, conical, uniserial, about 7 (or more?) on reduced premaxillary and about 20 on dentary; probably none on maxillary which is long, curved, blade-like with thickened upper border; pterygoid teeth not seen (the single specimen cannot be cleared or dissected); a specialized middle caudal ray, curved and thickened, but not hooked, and another ornamented structure on second (from above) inferior simple ray.

DESCRIPTION: (see Table I for proportions and anal count) Somewhat less elongate than the preceding species, but with the same clypeoid habitus, especially in the anterior part; body not very compressed; dorsal and ventral profiles slightly, almost evenly, arched; dorsal fin nearer snout than end of hypural, formula ii9; adipose moderate; peduncle rather high; pectorals rather low and long, reaching to base of ventral, formula ii0; ventrals low, long, originating under first rays of dorsal, and overlapping first rays of anal; a long, "fleshy" accessory ray as in the preceding species, formula (0)7; anal moderate, somewhat bilobed, with no visible scales on base (probably lost); last simple ray and first 3 branched ones with about 20-30 tiny hooklets, similar to those of the preceding species, as are the flaps above them; apparently no hooks on other fins; caudal (Fig. 6) fin formula v1 10/7 Ivi, the uppermost inferior branched ray strongly modified, in an "S," and thickened, but with apparently no hooks; in this species (Fig. 6 above), contrarily to the preceding one, the first primary ramification is ornamented, whereas the second one (from above) is only secondarily ramified, without any hooklets; a thick membrane covers all the structure (which is on the right side of the fin, the figure having been inverted to facilitate the comparison with the other species, whose specialized ray is about 7 out of 10 times to the left side of the caudal).

Another differentiation, which does not exist in the examined specimens of *B. usatohi*, is to be seen on the second simple ray of the lower caudal lobe (or the last accessory one) (Fig. 6, below); it consists of a small, keeled, rounded, mammillate crest on its lower border, bordered by a thick membrane and partially covered by an oblique flap; there are some scales still adherent above it, and it is very probable that the caudal lobes are scaly (in Eigenmann's sense), but, as

in the preceding species, the deciduous scales are lost on the middle caudal base, and the fleshy "thickening" which covers the region cannot be surely said to be a "gland," even if a posterior opening may be suspected. There are apparently no interhemals nor a pseudotympanum.

Scales deciduous; lateral line almost surely incomplete, probably of 6 scales; about 33 scales in longitudinal series, 9 or 9] in transverse series and 10 in predorsal series; predorsal and preventral regions not keeled, but not flattened, with a regular, median series of scales.

Head (Fig. 7) rather short; eye rather large; posterior fontanel very broad, anterior ("frontal") one quite as broad, reaching to almost the anterior border of the eye; antorbital and suborbitals similar as in the preceding species; post-orbitals somewhat less rudimentary, SO¹ being present, but reduced, and the SO² canal conspicuous; opercular series normal.

The jaws were not dissected, but at the 80x magnification, they appear to be almost exactly the same as the preceding, with the maxillary very slightly shorter though stouter, reaching to below anterior border of the eye; teeth about 7 on premaxillary and 20 on dentary; gill-rakers as long as gill-filaments, 9/18.

PATTERN AND COLORATION (from field notes of Dr. Brittan):

"Body light olive grey above and on lower half of caudal peduncle, belly and sides of head silvery. A silver line half of the diameter of eye running from middle of body to base of tail, at about midline. Occiput and interorbital area blackish. Anterior portion of lower jaw citron. Occiput and interorbital area blackish. Two longitudinal blackish lunate streaks on the caudal peduncle, one on level with middle of pupil, lower on level with lower eye-rim. Pectoral rays dusky, first few with bright lengthwise salmon-orange streaks. Scales (or scale pockets) of anterior dorsum finely margined with citron. Bright carmine on belly in front of vent, extending onto base of ventrals and fading out toward pectorals. Above, and behind this the belly is a bright iridescent blue green (in part peritoneum shining through?). Ventral rays dusky, especially the central portions of the middle rays. Dorsal with a bright salmon-orange wash extending out halfway on membranes around 4th-5th fin rays, abruptly changing to a bright carmine splash near tip of fin. Tip of longest simple ray dusky, others less so. An elongate, "keyhole" shaped, bright carmine streak on caudal peduncle, about equal to head length, extending slightly onto the bases of the caudal rays above the center line; below this a dusky, longitudinal crescentic spot, another fainter one bordering the streak above. A blackish diffuse longitudinal streak is beginning to appear bordering the silver streak as the colors fade in death, as is a faint blackish network matching the scale pattern."

"After being in formalin for a time all the reddish and greenish-blue color fades, leaving only background color of yellowish white and some blackish pigmentation. Two longitudinal blackish lunate streaks on the caudal peduncle, one on the upper third, one on the lower third, the lower the more lunate. Dorsum with a faint blackish reticulate pattern. Two black dots behind the operculum, the upper on a level with the pupil, the other about on a level with the lower rim of the eye, the upper spot slightly in advance. Occiput darkish."

ASSOCIATED SPECIES AND BIOTOP (field data of Dr. Brittan):

"River rising. Seined with a 10 x 60 foot bag seine on a beach of clay-mud with much flooded grass and other terrestrial plants. Water depth to 4 feet, 82° F, brown-stained and slightly turbid. No current. A few characids, mostly *Creatochanes*, and a few cichlids, mostly *Cichlasoma feticum*, were also taken."

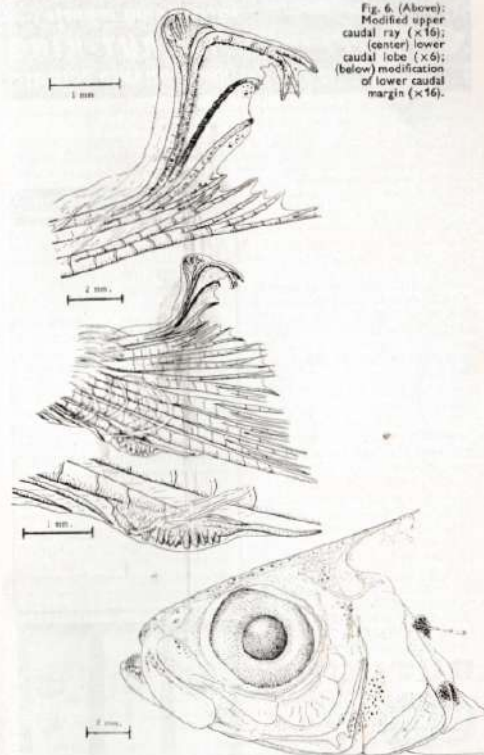


Fig. 7. Head of holotype of *Brittanichthys myersi*, n. sp. (x5)



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DIFFERENTIAL DIAGNOSIS: I did hesitate to describe as new, and different from *B. axelrodi*, the present form, because its specific variation is not as yet known and because only a single specimen was at hand. Nevertheless, even if the observable meristics are almost the same, there is little probability that *B. myersi* is only a somewhat bigger specimen of *B. axelrodi*. The males of the latter, judging from the presence of anal hooks, are sexually mature at least 26 mm. (standard length). The pattern, although of the same type, is clearly different (see below): it could not have so drastically changed from about 28 mm. to 32 mm. (standard length). Moreover the caudal differentiation(s), as may be seen from the accompanying descriptions and figures, fundamentally of the same, unique type, are strikingly different in details.

Other differences are as follows: (those dubious, because we do not have a sufficient series of *myersi* for comparison, with a question mark): *C. myersi* is somewhat deeper (?), with a shorter head (?), smaller eye (by allometry ?), broader interorbital, shorter (?) and stouter maxillary, and larger anterior fontanel as well as more developed postorbitals; it would also have one more scale between dorsal and ventral (?).

Dr. Brittan has contributed these comments on coloration: "Compared to *B. axelrodi*, this species has a smaller red streak on the caudal peduncle, more prominent blackish crescentic area bordering it, possesses the two black postopercular dots which *axelrodi* lacks, has the red coloration on the dorsal fin further back rather than on the leading edge, lacks the heavy black pigmentation of the principal simple rays of the caudal fin, lacks the intense black leading edge of the pectoral fin (although the top of the first ray is somewhat dusky) lacks the heavy black spot at the posterior edge of the anal fin, has a bright red streak near the center tip of the dorsal rather than a prominent black streak at the front tip, and has a more weakly developed blackish reticulate pattern. In addition, *myersi* may have the blue-green iridescence of the belly and *axelrodi* not, although the former was examined alive by sunlight, the latter silv by flashlight and later on by sunlight after 18 hours of preservation. It is felt, however, that the major points of difference are valid and would hold true in living specimens of both species."

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TABLE I. PROPORTIONAL MEASUREMENTS AND ANAL RAY COUNTS OF SPECIMENS OF TWO NEW SPECIES OF *BRITTANICHTHYS* GEN. NOV.

	Paratypes										Ranges		Holo-type		
	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂	High	Low			
Total length in mm.	35.0	34.2	33.3	33.3	33.7	33.7	33.7	33.7	33.7	33.7	31.4	31.5	31.4	35	39.0
Standard length in mm.	28.1	27.8	27.4	27.4	27.2	26.6	26.5	26.5	26.5	26.5	25.2	25.2	25.2	28.1	31.7
St. length	4.07	3.98	3.95	4.10	4.25	3.98	3.91	3.98	4.29	3.75	4.05	4.43	3.75	4.93	3.83
Greatest depth	3.43	3.36	3.43	3.46	3.50	3.41	3.42	3.55	3.63	3.40	3.52	3.69	3.36	3.69	3.68
Head length	3.16	3.09	2.88	3.05	3.0	3.09	2.91	3.06	3.0	2.82	2.84	3.11	2.82	3.16	3.31
Head L. → diam. of bony orbit	4.21	4.25	4.26	4.04	4.78	4.26	4.17	4.0	3.91	4.0	4.13	4.20	3.91	4.26	3.53
Head L. → maxillary I.	3.48	3.29	3.38	3.23	3.20	3.38	3.20	3.28	3.33	3.0	3.03	3.50	3.0	3.50	3.12
Head L. → snout I.	5.61	6.0	6.12	6.05	5.33	6.12	6.0	6.13	5.0	5.33	5.36	4.94	4.94	6.13	5.3
Dorsal-caudal distance → snout-dorsal distance	1.10	1.14	1.05	1.15	1.07	1.14	1.11	1.05	1.05	1.18	1.12	1.05	1.05	1.18	1.14
Length caudal peduncle → depth caud. ped.	1.43	1.35	1.35	1.44	2.18	1.14	1.29	1.31	1.72	1.32	1.24	2.20	1.24	1.44	1.47
Anal fin rays	11(70)	11(19)	11(18)	11(70)	11(70)	11(70)	11(70)	11(70)	11(70)	11(70)	11(70)	11(70)	11(70)	11(100)	11(18)



Fig. 8. *Brittanichthys myersi*, n. sp., water color sketch showing natural colors. Drawn by Dr. Martin R. Brittan from a specimen about 2 1/2 inches long.

REFERENCES

EIGENMANN, C. H. 1915: The Cheirodontinae, a subfamily of minute characid fishes of South America. *Mem. Carnegie Mus.* VII (1): 1-99, XVII pl.

GERY, J. 1963: *Tytocharax madeirae* and other Xenurobryconine Characids. *Trop. Fish Hobb.* XII (2): 11-15, 58-59, 62.

1964 a: Poissons characoides de l'Amazonie péruvienne (Résultats scientifiques de l'Expédition Amazone-Ucayali du Dr. K. H. Lüling 1959/60). *Beilage Neotrop. Fauna*, in press.

1964 b: Poissons characoides Sud-Américains du Senckenberg Museum-II: Characidae et Crenuchidae de l'Igarapé Prêto (Haute-Amazonic). *Abhandl. Senck. Mus.*, in press.

1964 c: *Glandulocauda torofaji*, un nouveau Poisson characoïde de la République Argentine, avec une note sur la "glande" caudale des Stevardiidi. *Opusc. Zool. München*, in press.

MYERS, G. S. and BOHLKE, J. 1956: The Xenurobryconidi, a group of minute South American characid fishes with teeth outside the mouth. *Stanford Ichth. Bull.* 7 (2): 6-12.

SCHULTZ, L. P. 1944: The Fishes of the Family Characidae from Venezuela, with description of seventeen new forms. *Proc. U.S. Nat. Mus.* 95 (3181): 235-367.

SOKAL, R. R. and MICHENER, Ch. D. 1958: A statistical method for evaluating systematic relationships. *Univ. Kansas Sci. Bull.* XXXVIII (22): 1409-1438.

Guppy Corner



By Paul Hahnel

Sex change.

Q. I would like to take this opportunity to ask you a question which has been troubling me for many months: I bought a most beautiful pair of fancy guppies which were imported from Holland; the female was — as usual — rather colorless but very beautifully shaped. The male died (I think of fin-rot), but the female continued life very happily. The strange thing is, she started becoming more and more colorful! She is now more colorful than the original male ever was. It had changed sex! My dealer had to see my tank for something and said that she (or rather he) was one of the most beautiful guppies he had seen for a long time. Due to this change of

sex, is my guppy's resistance to disease lowered? Also, could you give me some possible reasons for this strange occurrence?

B. David Lapin, Johannesburg, South Africa.

A. I can imagine that for a beginner like you having this happen is like a miracle, but I have seen it happen once in a great while in my own tanks. Until now I never made it my business to look for the scientific explanation. Sex change will not give the fish poor resistance, but bad water conditions or a one-sided feeding will!

Continued on Page 75

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Salts From The Seven Seas



By Alfred A. Schultz

Q. Recently I left for a 10-day vacation. So that my new tank-full of marine tropicals would not starve while I was gone, I fed them a double serving of frozen brine shrimp. When I returned, there was a rotten odor coming from the tank. On the gravel were a great many decayed brine shrimp. Several of my fish were dead too. I siphoned out the dead shrimp and speeded up the action of my filter. The next day the water was clear and odorless, but on that day and several following days my fish continued to die. I tested the water and found the pH was very low. Before I invest in more fish, I would like to know what went wrong.

John T. Riley, Chicago, Ill.

A. I think your troubles are a perfect example of why overfeeding tropical fishes in perhaps the single most disastrous mistake commonly made by hobbyists. Your fishes would have been far better off without your generous "double serving." Even if one had died of starvation (not likely in an short a period as 10 days), the rest would have been able to eat its remains.

It was the poisons released by putrefaction of the decaying food that started the deaths in your tank. The decay was also responsible for the increased acidity in the aquarium, and merely removing the decaying material could not change the pH. The remainder of your fishes died, no doubt, as a result of both the acidifying effects of the decay and the low pH. My advice to you is to tear down your tank, wash all the gravel, and start all over again. Most important, watch that overfeeding!

Q. This year I was in the northern Marshall Islands. While there, I did a lot of snorkeling and skin diving. Of the thousands of fishes I saw, there were a great many I could not identify. One species in particular, however, caught my fancy. I saw only two of them in

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Acanthurus lineatus. Photo by Klaus Pajason.

the three months I spent on the Islands, but I think I can give you an adequate description. The largest of the two was 7 or 8 inches long. Body coloring was a lustrous blue. Black-bordered yellow lines ran horizontally along the entire length of the back and upper sides. An irregular pattern of similar yellow covered the entire face. The eyes also were bright yellow. At the base of the tail was a single vertical yellow stripe exactly like those running horizontally along the rest of the fish. The belly was light blue and unmarked. The dorsal and anal fins were both long and low. Fine lines of light blue formed 3 or 4

crests in the otherwise translucent tail fin.

1. Can you identify the fish for me?
2. Can you tell me if it is sold for use in home aquaria?

Donald Devenie, Boston, Mass.
A. 1. Your description seems to fit almost exactly that of *Acanthurus lineatus*. Actually seeing the fish in the northern Marshalls even once is unusual. So far as I know, there has been only one confirmed incidence of its occurrence there.

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Guppy Corner

Continued from Page 70

Enteritis.

Q. I'm writing to you in regard to my guppies. I have six tanks of beautiful fish (guppies), but I'm starting to lose them. They have a protrusion of the anus. It looks as if their insides are coming out. There isn't anybody around here that seems to know what is wrong. I've written to two people and they don't seem to know. My sister-in-law has nine tanks and the same thing is happening to her guppies. I just don't know what to do for them. I've tried salt but it doesn't seem to help. I don't want to lose all of them. They are so pretty.

Mrs. Harold L. Pravance,
Hopwood, Pa.



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to those who were kind enough to send me cards expressing their concern over my health during my recent illness. I cannot possibly answer each of the many cards individually, so please forgive this rather impersonal "thank you".

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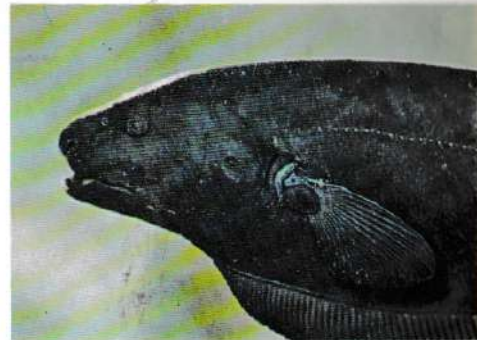
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Black Ghost

Continued from Page 12



The face of *Sternarchus albifrons* could be a model of what a vicious fish should look like. Its calm, unaggressive nature is a strange contrast to its looks. Photo by Harold Schultz.

them fine community tank fish, although it is best to be choosy in the choice of community tank partners of *Sternarchus*, if only because of the knife-fish's cost.

Although the black ghost is not extremely active, neither is it shy, and it usually stays within view. I think that one of the best features of the fish is that, like some of the large cichlids, it takes readily to hand feeding. Also amusing, it sometimes doesn't seem to care much whether it is right side up or not. On such occasions, I find either one of the two I own swimming or hovering either upside down or in some even more ridiculous partially turned position. In addition, these fish swim backward as easily as they swim forward. As with all other knife-fishes, swimming is accomplished primarily by an undulating motion of the extremely long anal fin.

So far as I know, *S. albifrons* cannot be sexed while alive and has never been bred in captivity. As a matter of fact, little is known of its breeding habits even in the wild.