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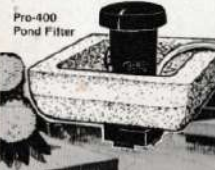


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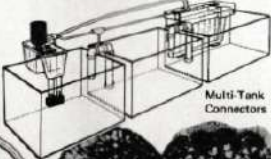
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VOL. XXV, October, 1976 (#248, No. 2)

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❖ exotic tropical fishes supplements

Pages 17 & 18, 83 & 84. These pages are perforated and punched for easy removal and insertion into the loose-leaf edition of Exotic Tropical Fishes.

Cover:

A sturdy pair of blue platies, *Xiphophorus maculatus*. The blue strain was developed when the tropical fish hobby was in its infancy and is still one of the most popular strains. Photo courtesy Wardley Products Co.

1976

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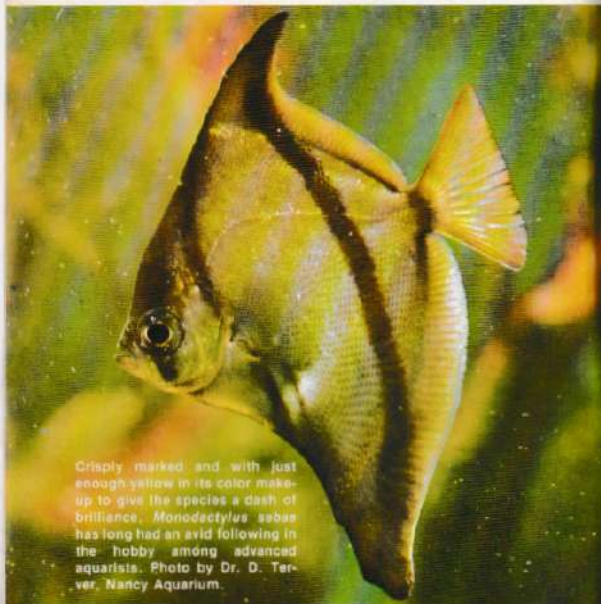
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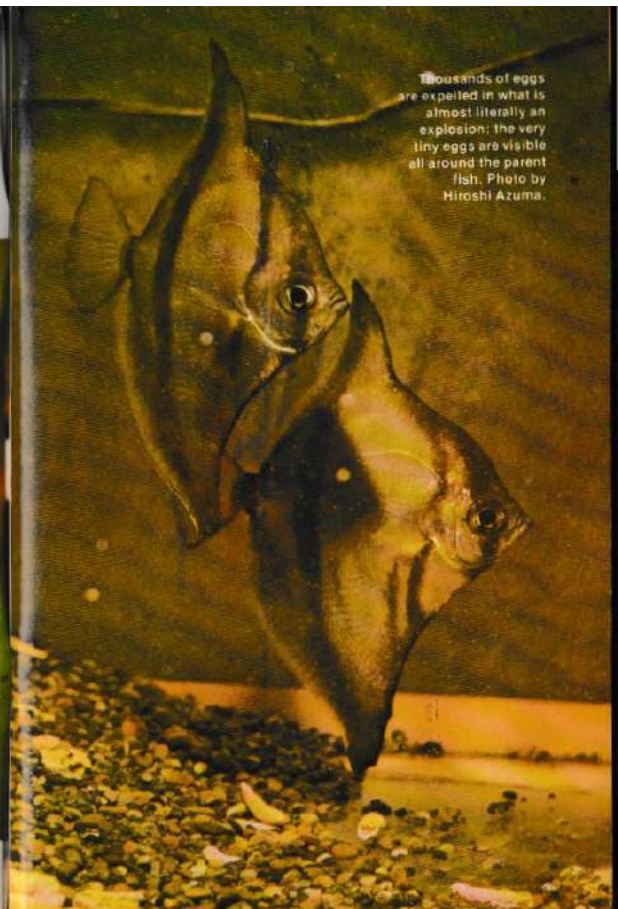
Never before, to our knowledge, has a photographic account of the spawning of *Monodactylus sebae* been published. This first-time photographic spectacular may result in the creation of an entirely new meaning for the good old word MONOMANIA!

SPAWNING *MONODACTYLUS SEBAE*

by Hiroshi Azuma



Crisply marked and with just enough yellow in its color make-up to give the species a dash of brilliance, *Monodactylus sebae* has long had an avid following in the hobby among advanced aquarists. Photo by Dr. D. Terver, Nancy Aquarium.



Thousands of eggs are expelled in what is almost literally an explosion; the very tiny eggs are visible all around the parent fish. Photo by Hiroshi Azuma.

For all intents and purposes *Monodactylus sebae* can be considered to be a pelagic fish; that is, one which is continually on the move in relatively open water. Accordingly, it spawns in the typical manner of a pelagic fish: a large number of eggs are rapidly broadcast into open water accompanied by an equally rapid shedding of sperm into the same area of open water. This spawning technique is an efficient ecological adaptation to the fish's environment, since no parental care of the eggs or fry is offered. The fry begin their precarious existence right out in the open as an integral part of the free-swimming plankton. Right from the start, the eggs and fry are subject to heavy predation by the thousands of plankton-feeding organisms that also inhabit the same waters. Very few of the eggs and even a smaller percentage of the fry survive long enough to become mature breeding fish. Therefore, producing thousands, and in the case of some pelagic fishes even millions, of eggs in a brief period of time insures survival of the species.

Monodactylus sebae occurs in the coastal waters of tropical West Africa, where it is found in both fresh and brackish water. Accordingly, it is best maintained in captivity by the addition of a small amount of salt to the aquarium water. For many years the attractive *Monodactylus* species were considered impossible to spawn and successfully resisted all efforts to coax them to do so. There were many tries and failures, but finally some progress was reported; as more information gradually began to accumulate here and there breeders began to tell of their *Monodactylus sebae* spawning. Now I am happy to be able to offer a first-hand account of the spawning of this species.

The spawning pair was about two years old. Since there is little sexual dimorphism among *Monodactylus* species I was not even sure that I had a sexed pair until the female was quite gravid. Since these six-inch long fish were nearly eight inches high, they were kept in a 125-gallon aquarium so that they would have plenty of room in both the horizontal and vertical directions. In addition, all this space would easily, at least for a while, accommodate their exceedingly large number of offspring. The water temperature was kept between 75 and 80° F. Tap water was used, as apparently the pH and DH are not too important as long as the water is not soft and acidic. A teaspoon of non-iodized salt was added to each gallon of water.

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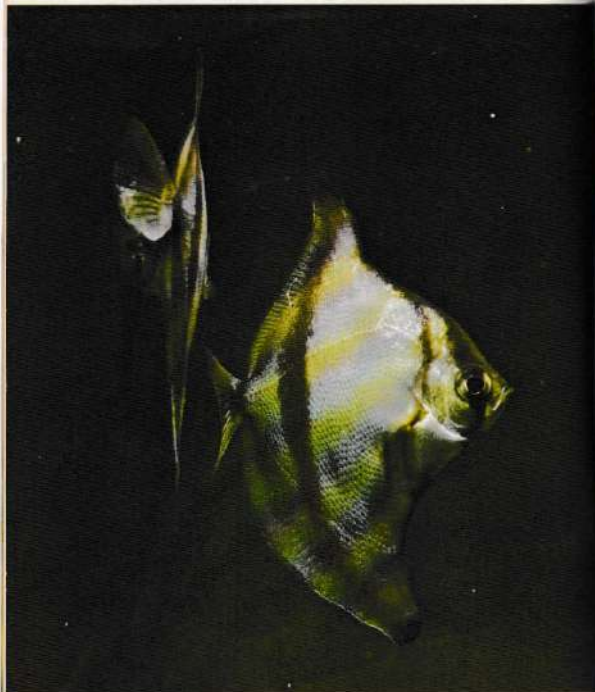
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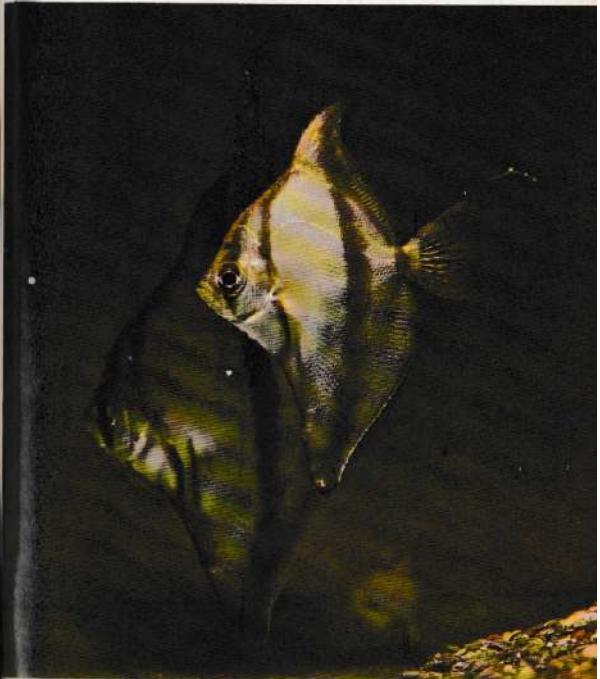
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The male (upper fish) begins to approach the female; he will eventually be successful in nudging the female in the side, thus triggering the final spawning motions. Photo by Hiroshi Azuma.



There is very little difference in the appearance of the fish as far as sexual distinctions are concerned, and even in completely adult fish like the author's spawning stock (six inches long and eight inches high at the time of spawning), the only difference that could be noted was the increased girth of the female. Photo by Hiroshi Azuma.

Tropical Fish Hobbyist

This small amount of salt did not harm the sparse planting in the tank.

The actual spawning began with little advanced warning. For just a few seconds (fortunately I had my camera handy) the male nudged the female. Then, in a side by side position, the pair suddenly began to whirl around in tight circles as the female expelled thousands of eggs in a very brief but spectacular explosion! The female swam off and the male swam through the swarm of eggs broadcasting his mlit in every direction. The complete spawning was over in a matter of seconds! The sequence occurred too rapidly for me to photograph the actual expulsion of the eggs.

Many of the eggs now began to float to the surface. (Editor's note—it has been reported to us by other sources that in fresh water the eggs sink to the bottom and in slightly saline or marine water the eggs float to the surface.) The transparent non-adhesive eggs were quite small, having a diameter of 0.6



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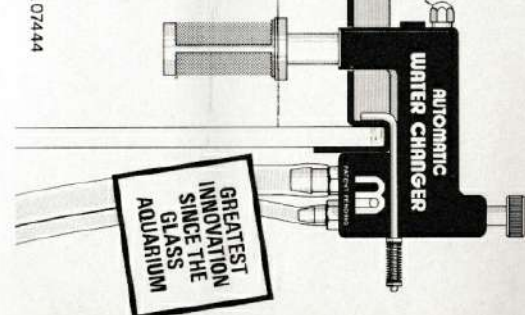


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In slightly saline water the non-adhesive eggs gradually float to the surface; in this photo the eggs are magnified. Photo by Hiroshi Azuma.

A magnified view shows the single droplet of fat that gives each egg its buoyancy. Photo by Hiroshi Azuma. **Continued on page 66**



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YOUR FISHES' HEALTH



by Dr. Mark P. Dulin

Perhaps one of the most confusing and misunderstood topics for aquarists is fish health. Keeping exotic fishes in captivity requires at least some degree of skill and knowledge of the fishes' needs. It is not like raising plants—some people can be totally uninformed on the care of potted plants yet maintain a healthy looking plant for years. Few people can "luck-out" in the same uninformed fashion with the art of keeping exotic fishes in captivity.

Through this column, I intend to provide you with useful information on maintaining health in your aquarium. We can get down to specifics next month, but for my introductory column I want to be a little philosophical and tell you where I see fish health—past, present and future.

As a veterinarian I have spent a good deal of time trying to figure out why some people go to so much expense and inconvenience to own certain types of pets. I will spare you my psychoanalysis of the various categories of pet owners, but let me give you my thoughts on why people keep tropical fishes in captivity. As I see it, there appear to be two distinct types of aquarists.

In the first group, the "aquarists" use the fish tank and accompanying fishes mainly for decoration. They derive no particular thrill from keeping exotic fishes and are reluctant to invest any time in learning about the hobby. They are more concerned with the appearance of the tank and whether the color of the gravel (and even the fish) fits into the decor of their room or office. If they do treat diseased fishes, the treatments generally are haphazard. They like convenience treatments—the no-muss, no-fuss, throw-the-pill-in-the-tank therapy. When it comes to nutrition, they go for the no-muss, no fuss, sprinkle-flake-food-when-the-mood-arises approach. Generally these types are upset when a fish dies, not so much because of the loss of life, but because they have to spend more money to put their showpiece back in order for their visitors. Don't misunderstand; I am not saying there is anything wrong with wanting to display your fishes in an attractive fashion. I recently had a custom-made aquarium

cabinet built myself, but if pure decoration is your thing—stick to potted plants.

Aquarists of the second type are genuinely interested in their hobby; they enjoy keeping fishes and realize that to assume ownership of an animal means that they should also assume responsibility for its health and well-being. I am making the assumption that the readers of *Tropical Fish Hobbyist* fall into this second category of aquarists. You are obviously concerned with maintaining health in the aquarium or you would not be reading this column.

Most of the articles that appear in this column will naturally be about fish diseases, but I don't want you to think of disease in the limited sense of the word. Disease is the antithesis of health. Any adverse stimulus, whether it is environmentally induced (such as high ammonia-nitrogen levels, low dissolved oxygen levels, or poor nutrition) or induced by living organisms (such as worms, crustaceans, protozoans, fungi, bacteria, and viruses) will be considered as a disease-causing agent. So in your own mind, start thinking of diseases as being either non-infectious (environmentally induced) or infectious (induced by living organisms). This approach may seem uncomfortable to you at first because you have probably been conditioned to associate disease only with "germs." But let's not get hung up on semantics; just start thinking of your

fishes as being diseased whenever they are no longer in a state of health.

The infectious diseases have naturally been given the most consideration by the early fish disease experts. Some of these experts have been working on isolating and classifying fish pathogens for fifty years; during that time much less was published on the diagnosis and treatment of infectious diseases . . . and even less research was conducted on the diagnosis and

Continued on page 86

Dr. Stanislas F. Snieszko, a true pioneer of fish health in America. Photo by the author.



This fish is suffering from an acute case of fin rot. Note the white edging around the remains of the caudal fin. This is the advancing front of the disease organisms which can be either bacterial or fungal. Photo by R. Zukal.

PRUDENT PISCAN PURCHASING

by Edward Vielmas

In order to make sensible fish purchases, all hobbyists should be familiar with signs associated with healthy fishes. The condition of a shop and its aquariums as well as the fishes' general health and deportment are clues that should assist the hobbyist in deciding whether or not the fishes in question should be purchased.

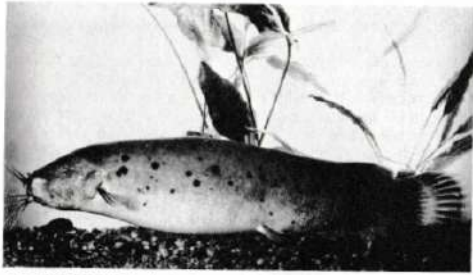
The general appearance of the pet shop is a good indication of what condition its fish will be in. Generally speaking (there are exceptions), unkept stores have dirty, unkept tanks. Healthy fishes often deteriorate rapidly in such conditions. Pet shops with clean floors usually have clean tanks. To put it rather simply: patronize shops that reflect an "I care about my livestock" attitude.

Suppose you have found an acceptable pet shop and are walking down an aisle when you are stopped by the sight of an intriguing specimen. What do you do? First examine the tank. Is it overcrowded? Does it contain any dead or dying fish? If so, do you know why? Do the fish have ich, fungus or velvet? A hobbyist must ask himself—and more importantly, answer—all of these questions before seriously considering the purchase of these fish. If the aquarium passes your inspection, examine not only the particular fish that you want but also all of the other fish in the tank.

If you find an acceptable tank containing healthy looking fish, don't purchase them without having some prior knowledge of their physical and chemical requirements. If you are unfamiliar with a fish's particular needs in this regard you may be buying problems. For example, if you only have a small aquarium, don't buy juvenile fishes that will outgrow the tank unless you are certain that you can make compensatory adjustments later on. On the other hand, if you already have large fishes in the tank, avoid purchasing small ones, for that will only serve to provide your large fishes with a very expensive meal! Do you know whether the fishes whose pur-

An advancing case of *Ichthyophthirius* (ich), a protozoan parasite that attaches to the fish's skin and feeds on its body fluids. Photo by R. Zukal.





The electric catfish, *Malapterurus electricus*, requires caves in which to hide. It can produce an electric discharge that is strong enough to give a human a sizable jolt, and safety precautions should be followed when keeping or handling it. Photo by H. Pinter.

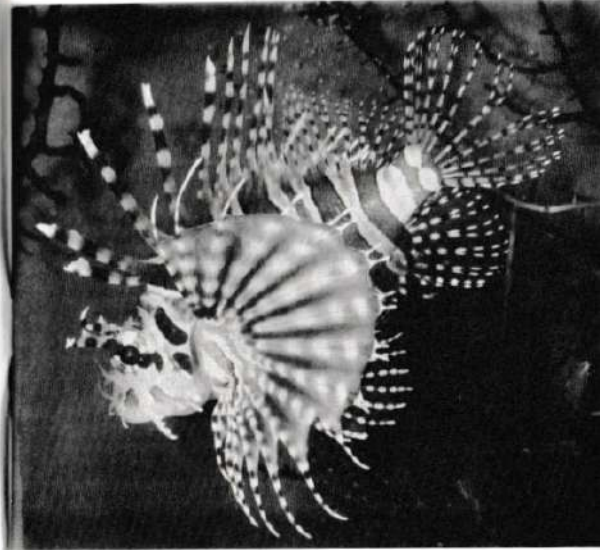
chase you are contemplating will only eat live foods? If so, you must have an adequate *clean* source for such foods. Is the fish a bottom dweller? Without a satisfactory bottom substrate this fish is in trouble. If the fish is a nocturnal species you must be able to provide it with suitable hiding places in which it can comfortably reside during the day.

If you find a fish about which you know enough to keep it alive and healthy, closely examine its appearance. Only with some knowledge of the fish's normal behavior, for instance, will you know whether it is normal for the fish to swim upside-down. Study the fish. Its opercula and eyes should be examined. Are the opercula red and are the eyes cloudy? If so, it is in trouble. Carefully examine the fish's mouth. Is it free of fungus or potentially fungusing injuries? The fins should be carefully scrutinized. Minor fin damage often results when a fish is transported. However, make sure that it is such minor damage, and not fin rot! Massive fin damage often hinders a fish in swimming and eating; such damaged fishes should be allowed to regenerate most of their finnage before they are purchased.

If there are many fishes in the same tank, examine them all and select the healthiest ones. You should oversee the

salesman netting out the fish to assure yourself that you are getting the healthiest specimens. If you want a sexed pair, make sure that you are sold a *pair*! If pairs of fishes such as cichlids are available, select the pair in which the sexes are nearly of equal size, and not necessarily the largest ones. If you wish to raise more than one or two spawnings, make certain that the fish are not past their prime. They should not

The marine lionfish *Pterois volitans* has venomous glands in the tips of its dorsal fin spines. Punctures from this fish are not usually fatal, although they are exceedingly painful. These fish should be kept in covered tanks well out of the reach of small children and other pets. Photo by G. Marcuse.



have roughened scales or a depression in the nuchal area (the area in a fish that corresponds to the neck of a terrestrial vertebrate). If mated pairs are not available or you would rather raise them to maturity yourself, select 6 or 8 fish. Keep in mind that it is best to purchase at least trios (preferably two females and a male) with certain fishes (some killies, for example) because of the extreme aggressiveness of the males during courtship. It is best to purchase fishes like barbs and tetras in schools of six or more for the sake of appearance because of their schooling habits, and in the case of some of the barbs such schools will deter their habit of fin nipping on other tankmates.

If you enjoy the more expensive exotic fishes, then naturally more care should be taken when purchasing them. All of the suggestions made up to this point are, of course, applicable, but a few more questions should be answered. What is it about these fishes that makes them more "exotic" (and accordingly, more expensive)? If the fish is electric (such as an electric eel or catfish) or venomous (such as a freshwater stingray or a marine lionfish), can you safely house it? (The safety of its tankmates as well as the other human inhabitants of your home must be considered here.) Are there any governmental restrictions on owning such a fish? Is the fish eating well? (After they have been transported many of the more exotic fishes will refuse to eat for a while.)


Recapitulating, the hobbyist should familiarize himself with the indicative signs of healthy fishes and what is required of him to keep them healthy, so that he will be relatively certain that the fishes will have a normal life expectancy. Only prior knowledge of the fishes' requirements will guarantee a sound and lasting purchase.

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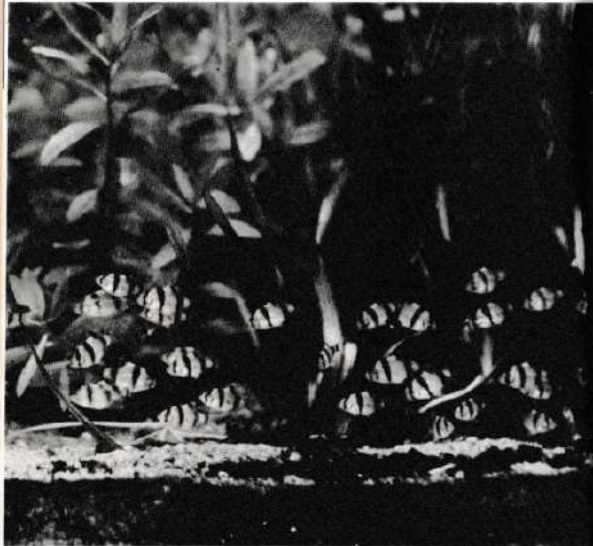
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THE TIGER THAT MEOWS A Beginners' Guide to Spawning *Capoeta tetrazona*

by Bill and Joan Kratt

A group of young tiger barbs playfully nip and nudge each other, but no damage results, as this nearly constant activity is an integral part of their normal schooling behavior. Photo by Dr. Herbert R. Axelrod.



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The female (rear) submits to the male's chasing as she swims into a plant thicket. Photo by R. Zukal.

Where in the world the tiger barb, *Capoeta tetrazona*, ever got the reputation of being an aggressive fish is beyond us. Perhaps if *one* specimen were kept in a tank full of guppies or some similar situation, we could label his antics as aggressive, but in all of our experience never has any fish sustained a single nip of a fin from a tiger barb. Perhaps it's his looks that cause people to regard him as pugnacious, for he certainly looks feisty—snappy black stripes run vertically over a shimmering body, the dorsal, ventral and caudal fins gleam bright red, and this red also repeats on his snout and around the rim of his eye. His actions may also be mistaken for aggressiveness, for he is showy, quick, and loves nothing better than a dozen or so of his own kind with which to school over a large tank. As with any active fish, he loves to romp and playfully butt at others, but when kept with a group of his own, this activity is always limited to his own kind. Nippy and aggressive? . . . certainly not. Just give him a few of his own species to travel with and you'll have a school of the most beautiful, peaceful, interesting fish that could be found anywhere.

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For ease of keeping, conditioning, and spawning, there is no better fish for the beginning breeder to attempt to spawn than the tiger barb. The fundamentals learned on this little fish can be applied to any small egg-scatterer. Almost every spawning will be successful, giving the new breeder much needed experience and confidence to try breeding other egg layers.

Tiger barbs are always in great demand, and good fish can be easily sold anywhere. Besides all of these virtues, there is something that one can't quite put into words that makes this little fish a permanent feature in every fish-keeper's heart. We went from spawning tiger barbs to other members of the barb family, through most of the characins, killies, and anabantids, but most of these fish have been transitory. We, like others, always come back to breeding, raising, and showing the tiger barb . . . he's just one of the most appealing fish around!



The male (rear) curves his body around the female as the pair begins to quiver while the eggs and sperm are discharged into the plant thicket. Photo by R. Zukal.



Spawning occurs at any level of the aquarium. Here the male (front) encircles the female in a plant cluster near the surface. Photo by R. Zukal.

To spawn any fish you must begin at the beginning, and our beginning is the purchase of young fish. Sometimes large, mature specimens may be found in dealers' tanks, but if planning to spawn a fish, it is not always wise to buy it at an adult stage. We have found that tiger barbs are extremely prone to becoming egg-bound if not spawned regularly, and any mature fish found in a store carries the chance that it will be likewise. The best method of assuring yourself of a few choice pairs of spawners is to purchase about a dozen small fish, give them a tank (15 or more gallons) to themselves, keep it clean, and feed them properly. Tiger barbs are greedy eaters and will accept anything, but the best conditioning foods are the live ones, with tubifex worms and brine shrimp high on the list. Frozen beef heart is also excellent. Fed in this manner, the fish will be quite ready for spawning within 4 or 5 months. They don't have to be adult size for breeding, but may be spawned whenever the females fill with roe. To hasten this process, separate the sexes as they become apparent. Males will be slender in the belly region, somewhat smaller than the

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The male (right) forces the female against the plants as more eggs are discharged and fertilized. Photo by R. Zukal.

females, and extremely colorful. A male in spawning colors takes on a pinkish glow over his entire body and his snout region becomes blood red. Females are easy to spot as they become heavy with roe. The fish will also come into condition faster if the male's and female's tanks are placed side-by-side so that they can see each other.

A five or ten gallon tank will do nicely for the spawning. It should be cleaned, filled with fresh tap water, an airstone and heater placed in it, and the temperature raised to 80° F. Several bunches of artificial spawning grass complete the set-up. The pair should be selected for fullness of the female and intensity of snout color in the male. After placing them in the breeding tank, all that is left to do is sit back and watch, for if you have conditioned them well, they will show their gratitude by obliging.

Colors on a tiger barb, although beautiful at any time, exceed all expectations while they are in the act of spawning. The male hops and dances, flirting with the female, all the while nudging her toward the spawning grass. They then assume a side-by-side position and, quivering, release eggs and sperm. This process is repeated time and time again until

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the female is void of eggs. When, finally the pair no longer shows an interest in one another, they may be removed. The grass may either be left in the tank or the eggs may be gently shaken off and the grass removed. As the fry are sensitive to light, the tank should be darkened; progress can be checked with a flashlight.

The fry hatch in about 24 hours and appear as tiny glass-like slivers hanging vertically on the sides of the tank. In two or three more days they should begin to swim and should then be fed several times daily with small amounts of newly hatched brine shrimp. At two weeks of age they should be large enough to transfer to larger quarters for rearing, and their diet of shrimp may be supplemented with fine powdered foods. It is wise to never altogether quit feeding the shrimp, for they will grow at an astonishing rate while on it. Although it seems a tiny food, even large mature tiger barbs relish it!

When the urge to try breeding an egg layer strikes you, remember: tiger barbs don't grow! . . . they're not mean or aggressive. . . they're not hard to take care of. . . and they're EASY TO SPAWN!!!

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7. *Cynotilapia axelrodi*, a New Species of Mbuna from Lake Malawi (Pisces: Cichlidae)

by Warren E. Burgess

The genus *Cynotilapia* is easily distinguishable from other genera of mbuna by the presence of short, conical teeth in the jaws. Only one species, *C. afra*, is currently included in the genus. It closely resembles in color pattern the black-top morph of *Pseudotropheus zebra* and has occasionally even been called the dwarf zebra in the aquarium trade because of its smaller size.

It was rather surprising then to find a slender-bodied species of conical-toothed cichlid in the material collected when I was at the Davies residence at Cape Maclear on Lake Malawi. *Cynotilapia afra*, like *P. zebra*, is deeper bodied than the new species, a character easily discerned by the naked eye. The slender-bodied form is therefore described here as a new species.

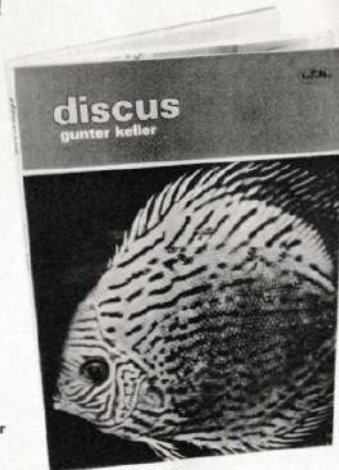
Cynotilapia axelrodi, new species

Holotype.—USNM 216429, male, 55.9 mm SL, collected in Lake Malawi, Malawi in February, 1976. Obtained through Peter Davles.

Paratypes.—USNM 216430, 2 specimens (1 male, 1 female) 43.8 and 49.4 mm SL respectively, same data as holotype. Three additional paratypes have been divided between the British Museum (Natural History) and the American Museum of Natural History, all with the same data as the holotype.

Diagnosis.—*Cynotilapia axelrodi* is a slender-bodied species of *Cynotilapia* with a body depth contained 3.4-3.5 times in the standard length as compared to 2.7-3.3 for *C. afra*, the only

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Cynotilapia axelrodi, male holotype, 55.9 mm SL. Photo by Warren E. Burgess.



Cynotilapia axelrodi, male paratype, 43.8 mm SL. Photo by Warren E. Burgess.



Cynotilapia axelrodi, female paratype, 49.4 mm SL. Photo by Warren E. Burgess.



Cynotilapia afra, male above and female below. The male is very similar to the black top *Pseudotropheus zebra*. Photo by Dr. Herbert R. Axelrod.

other species currently accepted in the genus. The color pattern is somewhat different, with a sooty, pale gray, or yellowish dorsal fin, compared with that of *C. afra*, which has a broad solid black basal band or wide black vertical bands separated by pale areas. The ventrolateral surface of the body in *C. axelrodi* is relatively light in color, but that of *C. afra* is dark, a continuation of the body color.

Description.—Proportional measurements (data for holotype in italic type): Depth 3.4, 3.4-3.5 (28.6-29.4%) in SL; head 3.4, 3.1-3.2 (20.4-32.3%) in SL; eye 3.4, 3.4-3.6 (27.8-29.4%) in head length; snout length 3.5, 3.1-3.6 (27.8-32.3%) in head length; interorbital width 3.6, 3.6-4.0 (25.0-27.8%) in head length; upper jaw length 3.2, 3.2-3.7 (27.0-31.3%) in head length; lower jaw length 4.1, 3.7-4.3 (23.3-27.0%) in head length; length of preorbital bone 5.8, 4.9-6.4 (15.6-20.4%) in head length; depth of caudal peduncle 8.0, 7.9-8.5 (11.8-12.7%) in SL; predorsal length 3.3, 3.0-3.3 (30.3-33.3%) in SL; pectoral fin length 3.7, 3.2-3.9 (25.8-31.3%) in SL; pelvic fin spine length 6.6, 6.0-7.3 (13.7-19.7%) in SL; and pelvic fin length 2.5, 2.9-4.4 (22.7-40.0%) in SL.

Fins: Dorsal fin XVII-XVIII, 8-10; anal fin III, 8 (one with 7); pectoral fin 13 (one with 14) (all elements counted except short splinter at upper edge); caudal fin truncate or slightly emarginate.

Scales: Lateral line scales 21-23 + 6-12 (plus 1-2 additional pored scales that may extend onto the caudal fin); scales in a longitudinal line from the upper edge of the opercle to the base of the caudal fin 29; 7-8 + 1 + 9-10 scales in a transverse series from base of first dorsal fin spine to base of first anal fin spine; caudal fin scaled only at base, dorsal and anal fins not scaled.

Gill rakers: 17 (3 + 1 + 13) on first gill arch.

Teeth: Teeth of the jaws in three rows, all unicuspid; outer row of each jaw enlarged, composed of short curved unicuspid teeth (about 32 in the upper jaw, 16 in the lower) typical of the genus *Cynotilapia*; inner rows of smaller unicuspid teeth. Teeth of lower pharyngeals not crowded, posterior row enlarged and composed of about 36 teeth.

Internal anatomy: The specimens were examined to determine sex and the lower pharyngeals from 2 specimens were removed for examination. Peritoneum black. Ten large eggs were found in the 45.2 mm SL female.

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Coloration: Body and head of males bluish, becoming yellowish or peach colored ventrally and crossed by dark bars, the number (about 7-9) depending largely on the mood of the fish. The dorsal fin is sooty grayish to whitish, the border and much of the outer portion of the soft rays yellowish. The anal fin is broadly bordered with black except posteriorly where there are one or two orange spots bordered by a clear or whitish area. The base of the fin is dusky. The upper and lower borders of the caudal fin are blackish, the central portion sooty yellowish and becoming more yellowish toward posterior edge, which is yellow. Pelvic fins with outer edge narrowly white, then with a dark streak, the inner portion grayish. Pectoral fins hyaline. Dark spot at corner of opercle, a dark streak from eye to posterior end of upper jaw, and possibly two light blue streaks across the interorbital. There is some measure of sexual dimorphism, with the female being less blue and more brownish on the body, the dorsal fin dusky yellowish with a yellow edge broadening to include much of the outer part of the soft dorsal rays, the anal fin mostly yellow but sooty anteriorly and with a narrow clear zone next to the body; the caudal fin, similar to that of the male, is more yellowish; the inner part of the pelvic fin is yellowish.

Comparisons.—Only one other species is currently accepted in the genus *Cynotilapia*, *Cynotilapia afra* Gunther 1893. *Cynotilapia axelrodi* differs from *C. afra* immediately by the more slender body and different coloration. The teeth, characteristic of the genus, are similar in both species. The generic diagnosis by Regan (1921) does not have to be modified to include this new species.

Distribution.—Known only from the southern end of Lake Malawi.

Etymology.—Named for Dr. Herbert R. Axelrod whose encouragement and help (including a trip to Lake Malawi to collect these fishes) has made the study of the mbuna possible for me.

Discussion.—A third form of *Cynotilapia*, referred to as *C. "eduardi"* in the aquarium trade, is similar to *C. afra* in all aspects but color. It differs only slightly in body depth (with considerable overlap)—2.7-3.1 in typical *afra* and 2.9-3.3 in the "eduardi" form. The color differs chiefly in the dorsal fin of the males: largely dark in *afra* and yellow to whitish in "eduardi" but with dark markings usually coinciding with and

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The "eduardi" morph of *Cynotilapia afra* with whitish interspaces in the dorsal fin. Photo by Warren E. Burgess.

Another "eduardi" morph of *Cynotilapia afra*, but with yellow interspaces. "Eduardi" has been called the flag-fin *afra*. Photo by Dr. Herbert R. Axelrod.



An adult male *Cynotilapia afra* (44.8 mm SL) with a pattern intermediate between the solid and flag-fin morphs. The black spots at the base of the tail are parasites. Photo by Warren E. Burgess.



An intermediate form from the Mozambique coast. Photo by Warren E. Burgess.

Tropical Fish Hobbyist

extensions of the cross bars of the body. If these dark markings fuse (in some specimens examined they are quite large, leaving only remnants of the lighter fin color between) the pattern would be very much like that of *afra* and the two would be very difficult to distinguish. The "eduardi" form is here considered a color morph of *afra* until additional evidence proves otherwise.

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Dr. Axelrod and Misha Fainzilber pose in front of a painting that hangs in the Fainzilbers' hotel. This painting, depicting native life in Tanzania, was produced by one of the talented native artists. Photo by Mrs. Evelyn Axelrod.

MISHA FAINZILBER... The Pride of Tanzania

by Dr. Herbert R. Axelrod

Of all the great lakes of Africa, only two have yielded substantially of their treasures of magnificent endemic (which means they are found nowhere else in the world) cichlids... Lakes Malawi and Tanganyika.

Because of the persistence and hard work of Mr. and Mrs. Peter Davies, the fishes of Lake Malawi have taken aquarists



Lamprologus compressiceps of Lake Tanganyika has many of the attributes of a successful predator. Its powerfully built body, compressed shape, long snout, and deep jaw gape all complement its long sharp teeth and make the fish well adapted to its piscivorous diet. Photo by Dr. Herbert R. Axelrod.

Spathodus erythron is a Tanganyikan cichlid with a color pattern that is different from most. The anterior markings are vermiform (worm-like) rather than spotted. Photo by Dr. Herbert R. Axelrod.



Lamprologus teleupi, often talked about but not often seen, is an expensive fish from Lake Tanganyika whose high price is partly related to the fact that it is a deep-dwelling species difficult to collect in good condition. Photo by Dr. Herbert R. Axelrod.

Chalinochromis brichardi, a fairly new arrival on the aquarium scene, is one of the Tanganyikan fishes that Misha Fainzilber stocks in quantity. Photo by Dr. Herbert R. Axelrod.



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by storm, and today there are probably more Malawian cichlids "home bred" than there are around the lakes' rocky islands. It was a great shock for us to learn that in July, 1976 the Davies had left Malawi after their personal belongings were taken into custody by the authorities. The authorities, unfortunately, didn't appreciate how successful the Davies were in putting the country on the map as far as aquarists are concerned...nor did they appreciate how much foreign exchange the Davies brought into the country. Perhaps when today is history the government will appreciate how much their loyal patriots are willing to serve.

Lake Malawi is about 15% smaller than Lake Tanganyika. It has a surface of 11,430 square miles, while Tanganyika has 13,124 square miles of surface. Lake Malawi is about 2,500 feet

At the Silversands Hotel desk are, right to left: Phillips, the hotel manager; Glen Axelrod; and a member of Phillippe's staff. Photo by Dr. Herbert R. Axelrod.



Right: a closeup of one of the glass-fronted cement tanks used to house Tanganyikan fish at the Fainziber compound. Below: the cement housing tanks, built against one wall of the fish house. Photos by Dr. Herbert R. Axelrod.



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deep, while Tanganyika reaches twice that depth. Both contain about the same number of endemic cichlids, though the final count is far from being completed.

Much has been written about Lake Malawi but little about Lake Tanganyika, because the promoters of Malawian fishes were more "successful" than the Tanganyikan exporters, but that is swiftly changing. With the Davies out of Malawi, that will probably be the end of new oddities from the Malawi side of the lake, but there is some hope, because a little-known "giant" of a man has popped up in Tanzania, and he is expected to make a very big splash.

Unlike Malawi, which has only one of the great lakes within its borders, Tanzania has THREE of the great lakes, namely Lake Tanganyika, Lake Malawi (which the Tanzanians call by the old name, Lake Nyasa), and Lake Victoria...and they are blessed with a man who, like the Davies, is dedicated to helping his country in every way possible. That man is Misha Fainziber.

Misha is a bachelor who left Bessarabia (Russia) in 1939 and went to France, trying to stay as far away from the Nazi Germans as he could. He was always interested in animals, so he spent his last few rubles for a tramp steamer ticket to Mombasa, Kenya, where he worked for an English firm collecting animals around Mount Kenya. He was so successful in both collecting the animals and in training them that he ended up as a "star" for Frank Buck (remember his "Bring 'em back alive" slogan?) and his name was splashed all over the World's Fair of 1939 in New York as 'The World's Greatest White Hunter and Animal Trainer from Africa!' After the World's Fair, life had its letdowns for Misha, and he headed back to Kenya. With the world now embroiled in a war, there was little chance of making a living selling wild animals, so Misha headed for Uganda and what is now called Tanzania (which was Tanganyika and Zanzibar during those British empire years), where he went into gold mining.

Misha fell in love with Tanganyika. He loved the people as much as the country and decided to dedicate his life to his adopted fatherland. He learned the local language and customs and lived with the people, building roads and risking his life daily as the chief "blasting engineer." He handled the dynamite and was in charge of all blasting in Tanzania. He even built a soap factory in Iringa, a city in Tanzania.

October, 1976

One of Misha's native friends loves to tell the story of how he met Misha and came to love him. Misha found a seriously wounded lioness. The animal was huge...pregnant...and dying. Misha nursed her back to health and assisted in delivering her cubs. So delicate was the health of the lioness that Misha actually slept with her, assisting her every few hours with medicine and pain-killing drugs. As the cubs grew, they all treated Misha as their "father" and followed him around like puppy dogs. Later, when Misha worked as a "white hunter," he would stun his clients by stopping them from shooting a particular lion. Instead, he would leave his gun over his shoulder and walk slowly towards the huge lion hiding in the grass. As he approached the lion, it would raise itself in the grass and hesitate for only a second before it would start bounding for Misha, seemingly in a wild attack. Of course Misha would

Abe Fainziber and his two children, Simon (center) and Victor. Photo by Dr. Herbert R. Axelrod.





Tropheus duboisi, a Tanganyikan mouth-brooder, produces unusually large eggs (7 mm long) and accordingly has a much smaller brood size (5 to 10) than most Malawian mbuna or other Tanganyikan cichlids. Photo by Dr. Herbert R. Axelrod.

Nothobranchius guentheri is one of the most well known annual killifish of the Tanzanian area. It is also one of the most colorful of the Old World rivulids. Photo by Dr. Herbert R. Axelrod.



Haplochromis barbaree is one of the more unusually colored Lake Victoria cichlids. This piebald color pattern is usually a female character. Photo by Dr. Herbert R. Axelrod.

Because Tanzania abuts portions of three of the Rift Lakes of Africa instead of just one, the Faingilbers are well situated to receive shipments of a great variety of fishes. . . and of course they have marine species from the Indian Ocean as well. This is a female *Haplochromis sauvagei* from Lake Victoria; the fish shows the partial piebald pattern. Photo by Dr. Herbert R. Axelrod.

Continued on page 90



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Salts from the Seven Seas

by Warren E. Burgess

There have been more and more reports of spawnings of marine fishes as the number of hobbyists setting up marine aquaria grows and the guidelines for keeping marine fishes become more exact. Most of the earlier reports were of the easily spawned fishes such as damselfishes and anemonefishes. Now stories of spawnings of more unusual species are surfacing, and it is with great interest when we hear of spawnings of such un-

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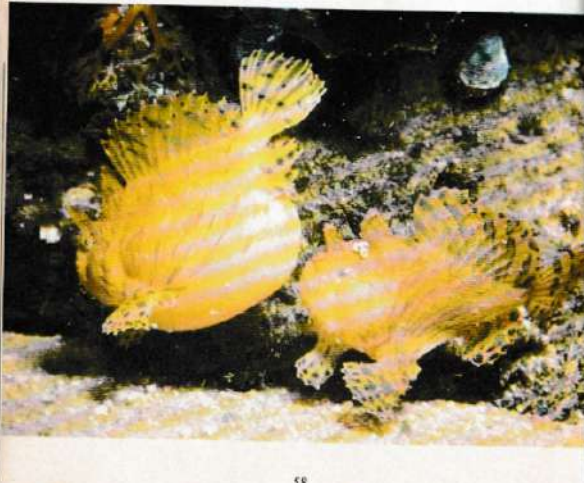
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With the female *Antennarius zebrinus* full of eggs, the male closely follows her around the tank in courtship and eventually nudges her in the ventral region to precipitate egg-laying, which usually occurs at the surface. Photos by U. Erich Friese.



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usual fishes as anglerfishes or frogfishes.

I first became aware of the egg rafts of anglerfishes when I was in Hawaii working on the rearing of marine fish larvae under laboratory conditions. A friend who was keeping a large female *Antennarius* in his tank excitedly called me over one day to observe the egg-laying of this fish. The genital aperture opened wider and wider as a gelatinous mass was extruded. Eventually the whole mass was free in the water and floated to the surface of the tank. We removed it to a larger tank to keep an eye on it, but since it was obviously not fertilized it eventually disintegrated, and that was the end of that.

Just recently I read of another spawning of *Antennarius* and am able to present the story along with suitable photos. The fish was *Antennarius zebrinus*, a rather interestingly patterned species. Sexual differences were not noticeable until the female started filling up with eggs. Most aquarists are familiar with fishes in which the female can be distinguished by the roundness of her belly, but the anglerfish female carries this to extremes. She gets so big it appears as if she will burst at any time. Without a male in the tank she eventually extrudes the unfertilized eggs as described above.

With a male of the same species in the tank it is a different

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Above: the egg mass, or veil, of *Antennarius zebrinus*; below, a female *A. zebrinus* expelling the veil as the genital opening expands. Photos by U. Erich Friese.



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story. As the female fills with eggs and spawning time approaches, the male follows the female about the tank slowly (with these fishes it would have to be slowly). Some anglerfishes are very aggressive toward each other when not courting, and in the sargassumfish, *Histrio histrio*, a larger fish will eat any smaller ones until only the largest is left in the tank. But at spawning time the male will approach the female from behind and below, nudging her in the ventral area. There is then some general vibrating by the male which is eventually picked up by the female. Soon there is a rapid movement toward the surface (the courtship appears to occur above the bottom), and in a very quick motion the egg raft is extruded. Fertilization apparently is external, since it was observed in a spawning female that not all the eggs were laid at once, a portion remaining within the female for a time. This portion when finally released contained unfertilized eggs. The egg raft, or veil as it is often called, remains or floats to the surface and is ignored by the parents.

The size and jelly-like consistency of the raft probably act as deterrents to predators. A small delicate individual egg is surely much easier to attack and eat than a huge mass of jelly. The egg masses are variable in size, and a veil of *A. hispidus* some 9½ feet long and 6¼ inches thick was reported in 1922. *Antennarius nummifer*, on the other hand, produces a balloon

float rather than a scroll-shaped egg mass. The veil of *A. hispidus* was rather transparent but slightly yellowish in color and about 3 to 4 inches thick; the length was variable and difficult to measure, as the corners and edges curled up.

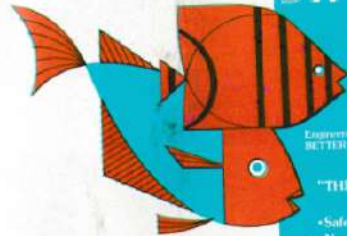
In a day or two the egg raft becomes less transparent as the embryos develop. After a week to ten days hatching occurs. The young develop quite far within the raft and upon hatching have all but absorbed the yolk. This is where the trouble begins! Although well advanced when compared to many marine larvae at hatching, these fishes have been very difficult to feed properly. Marine plankton may work if the right combination of organisms is present. More often than not, the larvae die off seemingly in the midst of plenty. But it is worth a try anyway.

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MAIL CALL

by Marshall E. Ostrow

If you have an aquarium question that you would like to have answered, send it to MAIL CALL. Letters containing questions of course cannot be acknowledged or answered personally, but each month a number of the most interesting questions and their answers will be published in this column. Address all questions to: MAIL CALL, T.F.H. Publications, Inc., P.O. Box 27, Neptune City, New Jersey 07753. Please do not combine MAIL CALL questions with correspondence about subscriptions or book orders.

All in the Family

Q. Six months ago I purchased a male highfin swordtail and a female lyretail swordtail. The male has an anal fin that is the same length as a common swordtail, not elongated. I was able to get one spawn from this pair before the female died. Five males and seven females resulted from this spawning. Two of the males had an elongated anal fin. Two of the females had neither the lyretail nor the highfin trait. The remaining fish displayed a combination of those traits.

If I am to establish these as viable breeding stock, is it better to breed father to daughter, or let the young males mate with their sisters? Will this inbreeding develop weak fish?

Neil Seufert
Wooster, Ohio

A. A detailed explanation of the genetics involved here would require that we write a short book in this column. Suffice it to say that inbreeding most assuredly has its deleterious effects on the offspring of the breeders. The closer the relationship between the selected breeders, the greater is the probability of the offspring's carrying deleterious mutations or gene combinations. Breeding brother to sister, each having the desired characteristics, will give you the greatest probability of winding up with those characteristics being faithfully reproduced, but will also give you the greatest probability of the fish having some deleterious combination of genes. Breeding offspring to parent will, of course, somewhat reduce the probability of getting the desired effect in the offspring, but this

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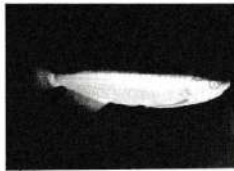


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Tropical Fish Hobbyist



Scleropages leichardti is one of two arowana species that are native to Asiatic waters. Photo by H. Hansen.

A. There are two known Asiatic species of Osteoglossidae, *Scleropages leichardti* (incorrectly referred to as *S. scheichardti*) and *S. formosus*. Both are found in the Malay Archipelago as well as in Australia, and are predatory fish. In the wild, *S. formosus* is known to reach nearly a meter in length. It is unlikely that it would attain such size in the aquarium. More information on these fish can be found in the T.F.H. publication, *Sterba's Freshwater Fishes of the World*, by Gunther Sterba.

Salty Syndrome

Q. I have three marble mollies in a 10 gallon tank along with some guppies, platies, swordtails, and Chinese fishes. Will it hurt these fish to put salt in the tank?

I am going to breed a pair of fancy guppies. What should the temperature be and is a 5-gallon tank with no other fish in it too small for them to breed in?

Shari Ashbahr
Gresham, Oregon

A. Guppies, mollies, platies, and swordtails are often found in slightly brackish (saline) waters in nature. Therefore, a small amount of salt will be most beneficial to all of them. We are not sure what you mean by "Chinese fishes." If you are referring to the common Chinese algae eater, as we suspect you are, then a small amount of salt will not hurt them, and may even benefit them, since, in nature, they are found in slightly alkaline waters.

You can use one level teaspoon of non-iodized salt to a gallon of water. (Salt purchased at your local pet shop is okay. If you use a grocery store brand, be certain that it says "Non-iodized" on the box.) Iodine, as found in salt preparations is, is lethal to fish.

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scheme will also reduce the probability among those offspring that do come out as desired of their having the deleterious gene combination mentioned above. If the desired result is obtained from the latter scheme, it is more likely that those fish will be of a more viable genetic constitution than would be the offspring of a sib x sib mating.

A Rare Beauty

Q. I recently purchased eight *Neolebias ansorgei*. I would like to know how long this fish lives and if it has a common name. I also wondered why it is so seldom seen.

Dean Taba
Honolulu, Hawaii



Neolebias ansorgei lacks the adipose fin typical of most tetras. Photo by G. Timmerman.

A. *Neolebias ansorgei*, commonly known only as *Ansorge's Neolebias*, is rarely seen in the aquarium probably because there is little demand for it. Although in nature it is one of the most colorful of the small tetras, its colors are usually faded out in the aquarium because of the very special soft acidic water it requires and because of its shyness in the presence of other fishes. In addition, it is a fussy eater and will usually only respond to small living food organisms. Since it is so difficult to keep in the aquarium, little is known about its longevity.

Asiatic Arowana

Q. About a year ago I purchased a 5-inch long fish called an Asian arowana. It has now grown to 15 inches. I have not been able to find out its scientific name or anything about its size, temperament, or place of origin. I have been managing it like a South American arowana (*Osteoglossum bicirrhosum*), keeping it in a 75-gallon tank with undergravel filters, and feeding it two large goldfish a day. The only difference that I can see between the Asiatic and the South American species is in the position of the dorsal, caudal, and pelvic fins. Can you give me its scientific name and tell me about its location and ultimate size?

William T. Romansky Jr.
Landisville, Pa.

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A 5-gallon tank is fine for breeding guppies. For the best results, the temperature should be in the high 70's with a slight increase of aeration.

He Talks to the Animals

Q. I have a *plecostomus* catfish that makes a funny beeping sound when I take him out of water. I have never heard a fish make such a sound. What causes this beeping noise?

Bernard Condon
Elmont, New York



Hypostomus plecostomus, like many of the catfishes, produces a grating sound when lifted out of water. Photo by Dr. Herbert R. Axelrod.

A. Many fishes, and particularly many catfishes, are capable of producing various sounds. These

sounds are produced by an assortment of mechanisms in different species. Catfishes produce their characteristic sounds in a manner similar to that of croakers and drums of the family *Sciaenidae*; that is, they use specialized muscles to vibrate the walls of their swim bladders. The swim bladder then amplifies those vibrations in a manner similar in principle to that of the cone of a loudspeaker.

There have been a number of investigations into sound reproduction in various catfish and other fish species and much has been learned of the mechanics involved. However, little is known of the function of these sounds and we can only postulate, as many others have done before us, that these sounds may subserve courting, territorial defense, or danger signaling to other fishes in those species in which there exists a social order.

What Price Warm Water?

Q. I have a 55 gallon tank in which I have one large oscar, one medium oscar, one medium severum, and two full sized tinfoil barbs. They have been living together peacefully for five months. I have kept my tank

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water at 73° F. With the recent change in the weather the water temperature stays near 80° F. Since the water has warmed up I have noticed a very foul odor in this tank as well as in my 29-gallon tank which contains one old world arowana. With this temperature change my large oscar has developed a very mean temper and he continually chases the other fish, trapping them in corners and biting their fins off. Could their be a connection between the foul odor in my tanks, the change in my oscar's temperament, and the increase in the water temperature?

Chuck Wojcik
Cleveland, Ohio

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A. The fish you have are tropical species that normally inhabit warmer waters. When aquarium temperatures are kept in the low 70's tropical fishes' metabolic rates slow down, hence they eat less, are less active, and produce fewer waste products. Temperatures in the high 70's and 80's more closely simulate these fishes' natural conditions and usually bring about greater activity (territorial aggression in the case of cichlids) as well as heavier feeding, hence producing more waste products. The increased amount of waste decomposes faster in warmer water and has probably rendered your filtering system inadequate for the increased load. This condition leads to the accumulation of odiferous waste products. That, combined with the lower oxygen holding capacity of warmer water promotes the growth of aerobic bacteria (bacteria that respire without oxygen) in the gravel bed. These bacteria produce a noxious gas, hydrogen sulfide (the rotten egg smell) as a respiratory by-product instead of carbon dioxide which is produced by oxygen consuming aerobic bacteria.

These problems can unsuspectingly crop up even during the winter months if the tanks are kept at warmer temperatures. The solution: use a filtering system with a greater cleaning capacity, increase the volume of aeration in the tanks, reduce the amount of food given, and provide the shelters such as rocks, clay flowerpots, etc. for your cichlids.

Support your local aquarium society.

AFRICAN CICHLIDS

From Lakes Malawi and Tanganyika for both Hobbyists and Dealers.

The photo below shows a mature male of an unidentified *Pseudotropheus* species, currently called dingahni. The December 1975 issue (page 71) of Tropical Fish Hobbyist magazine contains a close-up photo of a female dingahni brooding a mouthful of eggs.

Dingahni appears closely related to *Pseudotropheus elongatus*, having a similar slender shape but with green vertical bars replacing blue; thus, dingahni is often called the green elongatus. All the fins are black with yellow trim. Hardy and active like most of Lake Malawi's mbuna species, dingahni spawns readily, if kept well fed and crowded in a clean aquarium. Our list usually offers unsexable 1 1/2" juveniles for \$2.00 to \$4.00 each and occasionally offers young adult pairs.



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Odd Swimmer

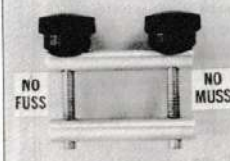
Q. Recently, four of my albino *paleatus* catfish died, but the fish showed no symptoms of illness other than swimming up and down the sides of the tank. I was told by a local pet dealer that it was a fungal disease that affected the brains of the fish, and probably accounted for their odd swimming behavior. Could you tell me (if possible) what it really was?

David Broudy
 South Laguna, California

A. Your dealer was probably referring to a fungal disease called leichthyophonosis (not to be confused with leichthyophthirius, the white spot disease). This fungus invades the skin as well as the internal organs. The disease progresses slowly and external symptoms are likely to

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show up before swimming behavior is affected. When the nervous system is finally affected the fish begins to swim erratically.

The behavior you describe does not seem to be the result of any disease producing organism. Although they are essentially bottom dwellers, Corydoras catfish occasionally engage in the more pelagic type locomotion that you describe. This behavior may be part of the courtship ritual or the fish could have been grazing on microscopic organisms residing on the glass. Often this behavior is merely random swimming motion.

The fact that your fish all died showing no symptoms of illness suggests that they may have been the victims of some sort of chemical irritant in the water.

ATTENTION GIVEN TO TROPICAL FISH DISEASES AT UNIVERSITY OF GEORGIA

At a recent meeting of the Florida Tropical Fish Farmers Association (FTFFA) Dr. John Gratzek, who heads the University of Georgia's research program on parasitism in tropical fishes, gave a photographic presentation on parasites that attack tropical fishes. Dr. Gratzek emphasized the need for concentrated research in this area. It is reassuring to tropical fish hobbyists to know that scientific institutions as well as fish farmers who produce many of our aquarium fishes are not only interested in providing us with healthy fishes, but are doing something about it!

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Likes Crowds

Q. Of all the fish I've ever kept, the excitement and pleasure I receive from observing my African cichlids is unmatched—even to the most beautiful of the bettas.

I have a pair of *Pseudotropheus auratus* that I am trying to breed in a 10-gallon tank. They both seem willing and able to spawn, but every time I remove the partition the male becomes overly aggressive toward the female. I know that they are both sexually mature and that it is the nature of the species to act in this manner. However, I fear that the female will be damaged by the male. Is it better to try spawning them in my African community tank, or shall I just wait it out?

In raising the young of this fish, how can I be certain the female will

not eat them after they become free swimming, since she may just accept them in her buccal pouch at this point?

Anthony P. DiNicola
 Milwaukee, Wisconsin

A male *Melanochromis auratus*. The dark ventral half of the body distinguishes males from females in mature specimens. Photo by G. Marcuse.



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ALBINO DISCUS... A Startling New Reality!!!

by Marshall E. Ostrow

Although genetic mutations in animals are generally considered to be rare events, albinism (lack of pigmentation) is one of the most well known of these rare events. Albinism has been reported and studied in frogs, salamanders, snakes, turtles, birds, mice, apes, and man, as well as in numerous species of fishes. I have even observed, while walking down a tree-lined street in a residential district of St. Paul, Minnesota, an albino squirrel!

This rare genetic event has been well exploited among the fanciers of ornamental tropical fishes, and albino strains have become well established in swordtails, mollies, guppies, barbs, killies, catfish, paradise fish, and a host of others. Now, as the result of careful observation by Len and Sylvia LoBue, the owners of Discus Haven, in San Jose, California, a brand new strain of albino discus is being developed.



The world's first tank-bred albino discus. All of the LoBues' discus fry are reared without their parents at an 80 to 90% survival rate. Photo by Bruce H. Stull.

Early last spring the LoBues spotted albino fry among a brood produced by a pair of their royal-blue discus. This pair has spawned more than 10 times since, and the LoBues have estimated that about 32% of each and every brood have been albinos. (As this issue is going to press the fry from the first brood have reached about 2 1/2 to 3 inches.) This 32% proportion is close to the 25% proportion that would be expected if the albino mutation was completely recessive, and accordingly, we anticipate that this first generation will be true-breeding when siblings are mated to each other.

We, as well as the LoBues and many of the world's discus fanciers, shall be optimistically waiting in the hope that this newest albino beauty does not carry any deleterious effects along with its pigment mutation as albinos so often do. The LoBues, who are discus experts, are anxiously anticipating that they will be able to establish these rare beauties as a viable reproducible strain.

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YOUR FISHES' HEALTH
Continued from page 15

treatment of non-infectious diseases. But now advances in fish health are beginning to accelerate at a surprising rate. I have been pleasantly surprised at the quantity and quality of work currently being done in aquatic animal medicine. It's an exciting new field with new and creative techniques and developments occurring in the areas of diagnostics, treatment and disease prevention.

Currently several universities and private firms are working specifically on methods of disease prevention in fishes. It should not be too many more years before new and more effective drugs will be on the market which have been designed specifically for use with fishes. Likewise, I predict that it won't be too long before you can obtain exotic fishes that have been previously vaccinated against many of the common fish pathogens. The newly developed immersion method whereby fish are submerged into a bacterial antigen suspension shows much promise in this regard.

It has become economically feasible for commercial food fish farmers to invest in preventive medicine. As a matter of fact, it has gotten to the point where fish farmers must look to preventive medicine to survive. Unlike the aquarist, the fish farmer is not allowed to use antibiotics indiscriminately. Only two antibacterial agents (sulfamerazine and oxytetracycline) have been approved by the Food and Drug Administration for use



Dr. George W. Klontz, a twenty-year veteran of aquatic animal medicine, is shown tabulating research data at an Idaho trout farm. Photo by the author.

in fishes intended for human consumption. Because so many strains of bacteria have developed resistance to these drugs, the fish farmer must reduce the incidence of mortalities from infectious diseases or face economic disaster. But what does the life of an Idaho trout farmer have to do with the health of your fishes? Actually nothing, except that the research being conducted for food fishes can and should be applied to the treatment and prevention of exotic fish diseases.

The exotic pet fish industry is also encountering drug-resis-

October, 1976

tant strains of pathogenic organisms. The time is coming when it will be economically feasible for fish dealers to invest in preventive medicine methods, such as immunization, prior to distribution of fishes. Aside from the economic aspect of controlling disease-related mortalities, I feel importers of exotic fishes have a moral obligation to try and reduce the number of fish deaths. Certainly the pet fish industry is coming up with many innovations of its own, but scientific advancements in fish medicine are advancing faster for the commercial food fish species (because of economics than for the exotic species. When efficacious drugs designed specifically for exotic fishes are made available to importers and aquarists, the success rate of keeping exotic fishes in captivity will undoubtedly improve.

Even with scientific advancements in fish health, however, there will always be disease problems in the aquarium. You are subjecting your fishes to an unnatural habitat; that habitat must be managed carefully and knowledgeably. Hopefully this column will supplement your readings on fish health and provide you with some new ideas and concepts about maintaining healthy fishes. After all, who is going to maintain health in your aquarium if you don't? There are very few fish disease specialists available on the local level. Mailing samples and specimens to a fish disease laboratory is

generally not the answer either. Mailing and laboratory confirmation takes time, and an aquarist with a sick fish can't afford to lose time prior to initiating proper therapy. Some day qualified fish disease specialists will probably offer diagnostic and treatment facilities on the local level throughout the United States, but until that time it will continue to be up to you to prevent, diagnose and treat fish diseases.

This column will not be presented in a "disease-a-month" fashion. If you want a concise guide to fish health, buy a book (for you saltwater aquarists may I suggest my recent book *Diseases of Marine Aquarium Fishes* which sells for only \$4.95 from T.F.H. Publications.) Although personal opinions and suggestions are invited, I cannot devote the column to answering letters of inquiry. If you have questions on particular fish diseases you can continue to send them to *Mail Call* (of course not all *Mail Call* inquiries can be printed nor can they be answered individually).

I am going to try and keep abreast of all the advances in fish health, attend fish disease conferences and conduct some investigations myself. Month-by-month you can look forward to something "diseasey" in *Tropical Fish Hobbyist*; because, through this column, I plan to bridge the gap between the scientific world and the actual world of the concerned (and often frustrated) aquarist.

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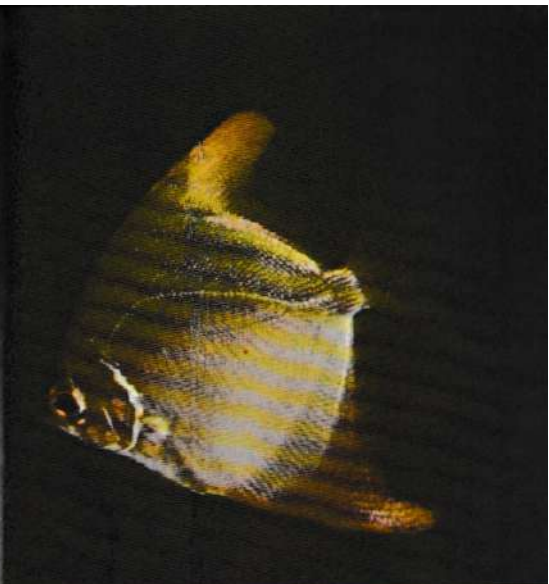
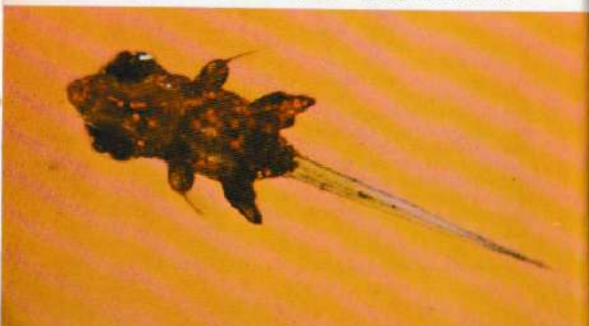
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MONODACTYLUS SEBAE
Continued from page 12

This magnified view shows *M. sebae* larvae shortly after hatching. They require the tiniest of infusorians to survive through the first critical days of their lives. Photo by Hiroshi Azuma.

A highly magnified view of *M. sebae* larva. The anterior pair of appendages are the developing pectoral fins. The posterior pair are the pelvic fin buds, which never develop into full fins in the adult but remain in a rudimentary state as one or two spines. Photo by Hiroshi Azuma.



Monodactylus argenteus is much more common on the aquarium market than *Monodactylus sebae* and is considerably less expensive. Photo by Dr. Gerald R. Allen.

to 0.9 mm. At 79° F. they hatched in 24 hours. The fry were very small; even when fed tiny infusorians, many of them apparently starved to death.

Much remains to be learned about *Monodactylus sebae*, particularly with respect to bringing the young through the initial critical period. With more effort and accurate observation on the part of interested aquarists, propagating *Monodactylus* species, which was once considered an impossibility, may become a commonplace achievement of tomorrow.

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PRIDE OF TANZANIA
Continued from page 55

throw his hands around the lion and they would wrestle in the dust, as they did when the lion was only a small cub. By this time the "clients" would be panicked...they felt sure their "white hunter" was being eaten alive. Then Misha would get up...shake the dirt from his clothes, and leave the lion lying on his back, recovering from having his belly scratched by an old friend.

From his interest in animals, Misha became interested in the waters of his beloved country. He went to Zanzibar and started a business in collecting lobsters and seashells. He was probably the first African to use scuba diving gear to collect these valuable exports...and he was amazed at the colorful tropical fishes he saw every place he dived. In short order Misha had a fish tank...and became Tanzania's first aquarist. Soon he was collecting freshwater fishes, too, in both lakes Tanganyika and Victoria, though Lake Victoria was so full of disease that he became ill with schistosomiasis.

Misha, with his intense Russian heritage and peasant upbringing, was quick to join the Afro-Shirazi Party and has been an avid supporter of Tanzania's African culture, their political aims, and their suppressed desire to make a great mark for themselves in the world.

Misha not only gives the local people lessons in scuba diving, but he started a Makombe carving business for the local people, and has begun to teach the people how to collect, care for and export aquarium fishes...a great renewable natural resource. Misha has, at the present time, a magnificent collection of Makombe carvings. After teaching the people how to carve, he also had to help them sell their work, so he ended up buying quite a few for himself, since he didn't want the carvers to be discouraged by being unable to sell the fruits of their labor.

Between water cobras and magic black stone which is used to cure all kinds of diseases (Misha swears it works!!), Misha is developing a magnificent business for his comrades. Imagine...magnificent coral fishes from the Indian Ocean...lake cichlids from Tanganyika, Victoria and Nyasa lakes...beautiful seashells and freshwater fishes, especially *Noto-branchius*...all from one country!!!

Misha has already built a fish house in Dar es Salaam at his hotel! In it he processes and stores the fishes from the sea and lakes for shipment to Europe. He also has a fine establish-



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Tropical Fish Hobbyist

ment in Kigoma on the lake; soon he will open the other lakes, but as he says, "The country is for the people...and not for me, alone. I must teach the local people how to fish and preserve their heritage. I must leave behind me a lesson in patriotism and devotion to one's duty."

Misha and his brother own a lovely hotel in Dar es Salaam. It is called SILVERSANDS and its address (Misha's address is the same) is P.O. Box 20318, Dar es Salaam, Tanzania. His telephone number is 47631. Misha is really as nice and wonderful as I am reporting. He has a great big heart and is a brilliant intellectual. He speaks so many languages I can't remember the exact number, but try Rumanian, Russian, Polish, German, French, Spanish, English, Hebrew and a few of the local dialects, including Swahili. I was so amused when one Sunday the local group of foreign ambassadors arrived to spend the day at his beach. He conversed with the Russians, Czechs, Poles and East Germans in their native tongues! When the gentlemen from Peking arrived, I expected him to speak Cantonese...but he didn't...and the few words I knew in Chinese worked wonders!

P.S. Just as this was going to press the following newspaper article appeared in a Dar es Salaam paper: I do not know at this time what changes, if any, this new policy will have on Misha and Abe Fainzilber, nor can I predict whether or not this policy of the Tanzanian government will have any effect on the availability of Tanganyikan cichlids.

INDIVIDUAL FISHING BANNED IN KIGOMA

From *Juma Posta*, Kigoma

INDIVIDUAL fishing in Kigoma Region has been prohibited for both and all the 5,567 licensed fishermen have been ordered to form a co-operative society.

The order was issued here yesterday by the First Vice-President when addressing Tama and Government leaders at the Kigoma Tama regional headquarters.

Mkapa Juma directed the Police and Government to ensure that no one in the Region is allowed to operate fishing activities individually.

He said that the step had been initiated after it was realized that most of the fishing villages in the Region had been causing their activities contrary to the Arusha Declaration.

"Fishermen must pool their resources and form a co-operative society if they intend to remain in the fishing industry. Those who do not agree to go communal will have to stop fishing," he said.

To this effect, the First Vice-President stressed that Tanzanians have resolved to build socialism.

Explaining why the steps had been taken, Mkapa Juma said there were three groups of fishermen operating in the area.

The first group of 811 people owned fishing gear including boats but employed other people.

This group exploit labourers and get money without any sweat.

The second group of 2,200 have no fishing gear of their own, and in order to fish they have to work for people who have the gear.

The third group of 960 people have their own fishing gear and do the job themselves.

October, 1976

Epiplatys obrehtsi

by E. Roloff
photos by the author

In November, 1971, in small streams near Salayea and Zorzor in Liberia, I caught a number of young *Epiplatys* that I had great difficulty in identifying as to species. From the dark cross bands on the body of these fish I concluded that they might be a variety of the *sexfasciatus* group. Since this *Epiplatys* species lives in the same habitat as *Roloffia maeseni* and *Roloffia viridis*, I thought the animals I had collected must be *Epiplatys obrehtsi*, as this fish had also been found beyond the border of Guinea near N'Zerekore, together with the two *Roloffia* species mentioned above. But then I dismissed this assumption because in the drawing of an *E. obrehtsi* male that illustrates the scientific description by Prof. Dr. Poll only three longitudinal rows of small dark speckles can be seen and no cross bands. The description did say, however, that *E. obrehtsi* had 7 to 8 oblique cross bands on the posterior part of the body. But my fish had more than 8 cross bands. On some of them I counted as many as 12. The description further said that *E. obrehtsi* was a relative of *E. fasciolatus*, and this could hardly apply to my animals.

Over the course of several years of breeding experiments I was able to observe that the number of dark cross bands decreased continuously as the fish grew. Half-grown specimens already had no more than 7 to 8 cross bands, thus fitting Poll's description (he had only had 4 specimens with a size of 18 to 60 mm on which to base his data). My own specimens attained a maximum length of nearly 10 cm. I must add, however, that these large specimens were males. The females grew to only about 8 to 9 cm. These adult specimens no longer showed any cross bands at all. They had a broad longitudinal band of irregular dark spots down the mid-line of the body, some of which could still be recognized as the vestiges of cross-bands. I also possessed a few older males, bred in captivity, with an especially intense red body color, and in these males even the dark longitudinal band was completely absent. Preserved in formalin solution, these fish merely showed a couple of longitudinal rows which consisted of small red dots on the scales. In this condition, they resembled the *E. obrehtsi* male drawn by Poll.

These observations eventually led me to send a number of preserved specimens to Dr. Thys van den Audenaerde (Museum for Central Africa in Tervuren, Belgium), with the request to compare them



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Epiplatys obrechtsi. In the lower photo, the male is at the beginning of an attempt to impress the female. Photos by E. Roloff.



Tropical Fish Hobbyist

with the type material of *E. obrechtsi*. Dr. Thys was kind enough to oblige me, and I was informed by him that my fish corresponded to the type material of *E. obrechtsi* and that they were indeed the same species. So now the problem was solved—and it would never have arisen if it had not been for the confusing fact that the number of dark cross bands seen in *E. obrechtsi* decreases continuously with growth and that adult specimens eventually have no cross bands at all. These observations also suggest that the number of dark cross bands is not a reliable characteristic when it comes to the differentiation of *Epiplatys* species.

In recent years, a number of other *Epiplatys* species have repeatedly been described as *E. obrechtsi* and were even exhibited by aquaristic clubs under this name. These fish bore no resemblance to the animals I had caught near Salaya and Zorzor, and there is now no doubt whatsoever that they had been incorrectly classified.

E. obrechtsi is predominantly a surface fish—waiting for its prey, which consists mainly of insects and mosquito larvae, in shaded places of its native waters. In the aquarium it will take *Cyclops*, *Daphnia*, red and white mosquito larvae, *Tubifex* and prepared food. But smaller fish are not rejected either. It should not, therefore, be kept in a community tank which accommodates smaller fish species.

The native waters of *E. obrechtsi* had a pH of 7.5 to 7.8 and a hardness of 1 to 2 German degrees. Since the fish lives in mountainous areas, the temperature of the water it inhabits lies within the range of no more than 70 to 72° F. During the drought, however, this is likely to rise by several degrees—because the small amount of water which then remains—and which, at that time, is of course not added to by cooler water flowing in—warms up more quickly. In the aquarium, I kept by *E. obrechtsi* at temperatures between 71 and 77° F., in water having a hardness of 5 to 8 German degrees and a pH of 7 to 7.5. I kept several pairs in one tank without there being any serious fighting as a result. The eggs were laid on fine-leaved water plants, on the roots of floating plants, and even on nylon mops, and could be collected from the spawning substrate without difficulty. The fry hatched after about 14 days. They immediately ate brine shrimp nauplii and were easy to rear.

When traveling in Sierra Leone I found *Epiplatys fasciolatus* in many places. I also came across this species in a number of places in Liberia. It hardly differed from the population I had seen in Sierra Leone. But in Liberia there are also some varieties which, while being related to *E. fasciolatus*, have to be regarded as separate, independent species. A male of one such species was given to me by an aquarist from Monrovia. He had caught it in the hinterland but was unable to say exactly where. Perhaps someone will come across this species again at some time and it will then be possible to supply a scientific description.

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