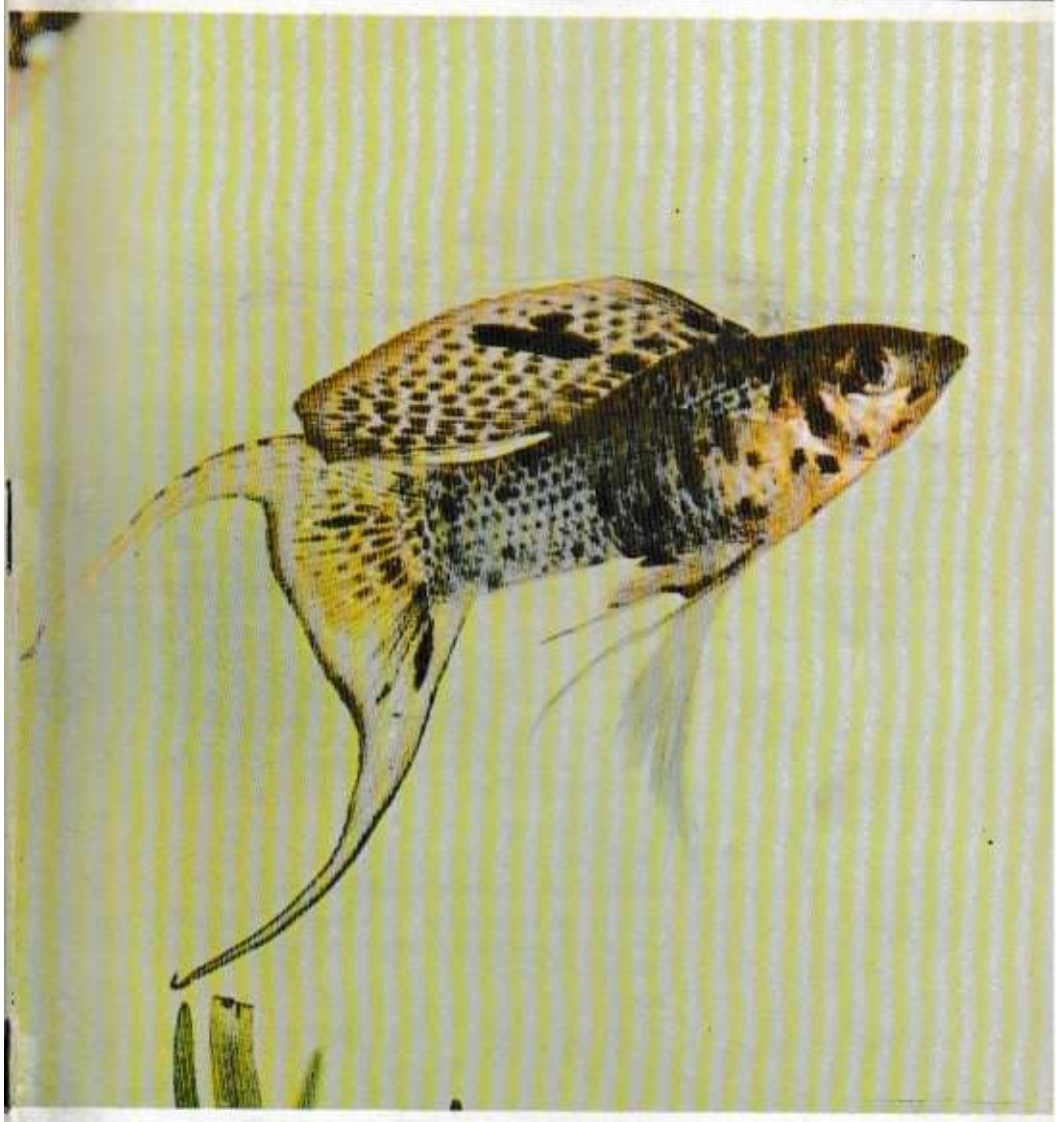
April, 1968

tropical fish hobbyist

DOMESTIC 35¢ / British Isles 2/6



mutations

tropical fish hobbyist

Vol. XVI, April, 1968 (#148) No. 8

contents

features

Bettaphile - 95, Mail Call - 37, Guppy Corner - 71, Salts From The Seven Seas - 75.

cover

From the many daily letters to T.F.H. we have noted that there is an ever increasing '**mollienania**'. It seems as if anyone and everyone who owns an aquarium and fish net wants urgently to know all there is to know about his newly purchased, beloved mollies. Let's face it! The molly is an eternal favorite with aquarists, and when a new variety comes along, the vibrations can be felt in Yucatan. So you can imagine how this Hi-Fin Lyre-Tail shook up the mollie set. We are of the opinion that the molly deserves a little more contemporary consideration, so we have scheduled a publishing event that you '**mollie men**' should be anxious to see: "Mollies In Color" by Dr. Herbert R. Axelrod is an informative, current review of what's happening in the **molly world,** including special material devoted to hybrids. If you decide that the molly on our cover is intriguingly weird looking, read our feature article 'Mutations' by Fred Kerr for further information and other fascinating examples of fish varieties that initially evolved through the 'process' of mutation. Cover photo by Hansen.

exotic tropical fishes supplements

Pages 33 and 34, 67 and 68. These pages are perforated for easy removal and punched to fit into the Looseleaf Edition of EXOTIC TROPICAL FISHES.

rates

35c per copy in the U. S. 35c per copy in Canada or foreign. $3.50 for 12 issue subscription in U.S. Add 60c per year for foreign subscriptions. Index available in every 12th issue.

In England and the western Sterling area Tropical Fish Hobbyist magazine and T.F.H. Books are distributed exclusively through T.F.H. Publications (London) Ltd., 13 Nutley Lane, Reigate, Surrey England. All subscriptions and inquiries should be sent directly to them.

Second Class Postage Paid at Jersey City, New Jersey. Published monthly by T.F.H. Publications, Inc. at 245 Comelison Avenue, Jersey City, N. J. 07302. Printed in U.S.A.

editorial

It was with a great deal of regret that we had to cease the publication of our companion magazine ICHTHYOLOGICA, THE AQUARIUM JOURNAL. This publication was beamed at the more scientific groups and contained articles of a very sophisticated nature. We just couldn't get the support from advertisers, and the increased postal rates forced us to make a drastic decision. Though the magazine never made a profit, TFH continued publishing it as a service to scientists. Whenever a magazine is "put to rest" it usually leaves a "morgue" full of articles. Many of the articles which were left over from ICHTHYOLOGICA concerned aquarium fishes and will slowly find their way into the pages of TFH. In several editorial meetings most of the staff disagreed with the inclusion of any highly scientific material in a hobbyist publication. I disagreed for I feel certain that some of our readers want scientific material all of the time, while all of our readers want scientific material some of the time. If I'm wrong, please let me know. I'd very much like to hear from our readers on both sides of the issue. I think it will pay you to read a scientific article through, just once. Even though you might think you haven't learned anything, you'll be surprised how much you did pick up. How many people know that some fish have teeth in their jaws, some in their throats and some have none at all! Did you also know that most characins are identified almost solely by their teeth? That the tooth structure changes as the fish gets older? And most fishes have replacement teeth, like alligators?

Herbert R. Axelrod

This spectacular male bleeding heart topsail platy embodies the ideal body-form proportions which the Takeshita experiments are striving to approximate. Photo by Dr. Joanne Norton.

The Bleeding Heart Wag

Although the female bleeding heart wag topsail platy is similar in appearance to the gold wag topsail, she does possess subtle color distinctions and the necessary genetic material for future experiments. Photo by Glenn Y. Takeshita.

This trio of good old fashioned bleeding hearts are still popular with aquarists the world over, and they are the basis for these new exciting Xiphophorus color varieties. Photo by Dr. Herbert R. Axelrod.

Topsail Platy

BY GLENN Y. TAKESHITA
HONOLULU, HAWAII

Although this male bleeding heart wag topsail platy does not represent the ultimate in finnage formation as envisioned in the goals of the Takeshita project, this male platy is still a beautiful prize worth owning! Photo by Glenn Y. Takeshita.

(over)

Several months after the article "The Bleeding Heart Wag Platy" appeared in TFH (May 1965 issue), a shipment of this new color variety arrived in Hawaii. Immediately, its subtle and unique body color created a stir in the ranks of Hawaii's talented livebearer hybridizers. Today, the hi-dorsal character has been successfully transmitted to this new color variety, and the fish that has resulted is very beautiful and well worth introducing to the hobby.

Dr. Joanne Norton introduced her beautiful bleeding heart topsail platy to the hobby (TFH, July 1967). I would now like to introduce to the hobby the bleeding heart *wag* topsail platy. This new topsail platy took almost 2 years from its ancestors' initial introduction to Hawaii to be created by careful selective hybridizing and inbreeding programs. The difficulties encountered in its creation were many. The biggest stumbling block was the way that the original stock arrived in Hawaii: this new strain arrived in Hawaii mixed with a batch of gold wag platies the males of which undoubtedly contaminated the bleeding heart wag strain by mating with the females. Therefore, before any serious selective breeding could be undertaken, the bleeding heart wag strain first had to be "cleaned out." This cleaning-out period took the author almost a year to accomplish and involved carefully weeding out all the gold wag individuals and keeping the individuals which had white basic body color with the bleeding heart and wagtail characters.

The author carefully selected the white bodied females with the wag pattern. These were inbred to the males which possessed the white body plus the bleeding heart and wag characters. It was when this type of mating resulted in a batch of fry that possessed the three desired characters that the step of breeding to a hi-fin male was taken.

Finally I decided to mate a true breeding low-fin bleeding heart wag female to a hi-fin male bleeding heart platy. This turned out to be the magic combination, for the first generation, as expected, had a few individuals that were bleeding heart wags with a hi-dorsal. These few individuals were placed aside carefully to be inbred to give me my second generation stock. But to my disappointment, the females refused to drop any young. After trying for 6 months with the hi-fin females which gave negative results in desperation I mated the male hi-fin bleeding heart wags to their low-finned sisters. This gave me the second generation stock that I needed to work with. Since the second generation stock, the hi-fin females now seemed to be fertile: they are now in the process of giving me my third generation hi-fin stock of this beautiful color variety.

It is true that the present hi-fin bleeding heart wags are far from being "show quality" fish, but I felt that they should be introduced to the hobby

early so that others may join me in improving them. Much work still has to be done to improve the hi-dorsal fin and also the bleeding heart pattern on the body.

Some of the female hi-fin bleeding heart wags possess the red body stripes that Dr. Norton mentioned in her article on the bleeding heart topsail platy. These are the females that are now being bred to the most colorful males. I am hoping that the red body stripes of the hi-fin females may be improved by careful selective breeding. If such highly colored females can be produced consistently, this strain will have a very bright future, for then the true beauty of this color variety would be accentuated and the beautiful contrasting body colors brought forth to give the full captivating effect.

As the strain stands today, the males are just breathtaking. The basic body color is porcelain white with a contrasting very black wagtail finnage. The red bleeding heart pattern is generally localized on the white body in the forward belly area. But this bleeding heart pattern may extend in many directions, sometimes almost completely covering the white basic body color. In other individuals the bleeding heart pattern may just be a few red lines running vertically on the belly area. But it has been observed that this bleeding heart pattern *intensifies and enlarges in all cases* as the fish ages.

The hi dorsal of this new color variety is far from being perfect, for most of the individuals have the long and narrow type instead of the more desired very high, wide, and flowing type. Much work has to be done on the hi dorsal before the true beauty of this color variety is realized.

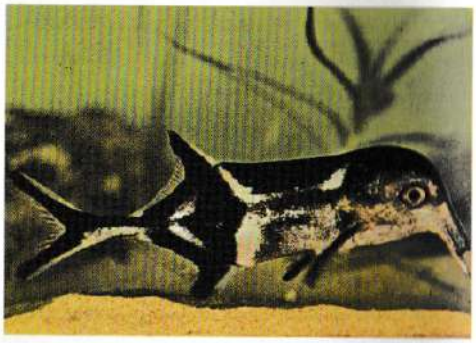
The females look very much like the gold wag topsails, the only difference being that bleeding heart wags have a white basic body color instead of the yellow basic body color found in the gold wag topsail. Also, as mentioned before, some females possess the bleeding heart pattern on the belly area. Other females may have a large red splotch in the belly area instead of the vertical red lines on the body. Also, many females as they age begin to develop small black spots in the dorsal fin much like the small liver spots that occur in humans as they age. The wag character is very strong, and all the fins are very dark and black.

Basically the bleeding heart wag topsail platy is a very strong and robust strain which has a very bright future, and, since the high-dorsal character has been successfully transferred to this strain, a much brighter future can be foreseen for this fish.

A platy with the low fin might look good, but place the topsail character on the same platy, and it begins to have "class." Thus, the bleeding heart wag topsail platy joins the many color varieties that will bring hours of enjoyment to many hobbyists the world over in the years to come.

Although most members of the **Mormyridae** family could be termed as "loners" who are best kept in species setups, they are actually very peaceful towards other fishes. The gaping companions of this **Gnathonemus petersi** have nothing to fear for "Cyrano" wouldn't harm even small aquarium fish.

Doesn't this young **Gnathonemus** look as if he's about to laugh? He may not really have a sense of humor, but he is rated, according to scientific brain studies, as possessing a superior intelligence amongst fishes.

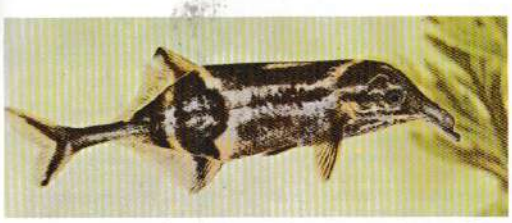


The Marvelous Mormyrid— *Gnathonemus tamandua*

BY DAVID BODYCOMBE

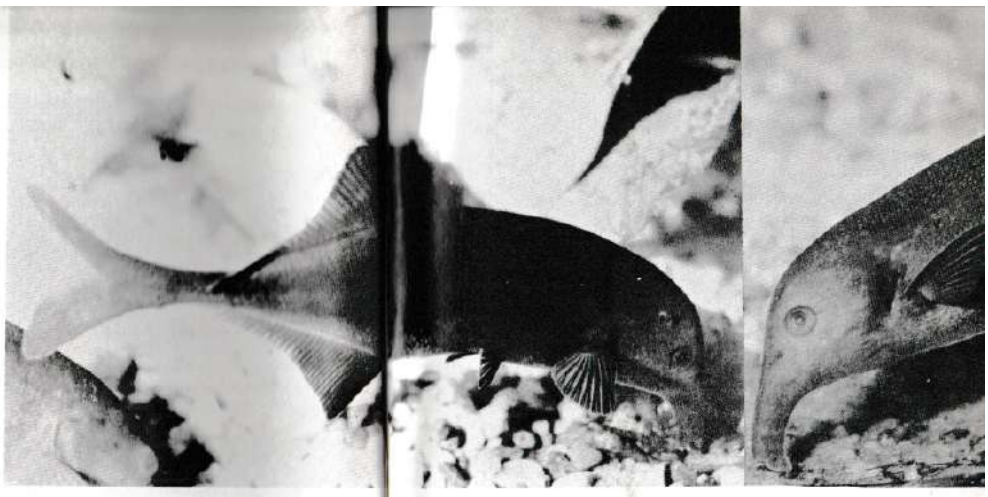
I have always taken to fighting for things that I think deserve recogniton. For years now I have been an avid aquarist with an eye for the more exotic fish. A little more than a year ago, I purchased my first *Gnathonemus*, commonly called the elephant nose. From that time, I have had a queer attachment to these peculiar fish, and I have learned much about their habits and remarkable physiology. Despite all their physical attributes and uniqueness, aquarists seem to shy away from them from fear of expense or lack of knowledge.

The fish known scientifically as *Gnathonemus tamandua* comes from the Stanley Pool region of the Congo. Its family, *Mormyridae*, ranges across the entire African continent. The water the fish inhabits is muddy and turbulent, so the elephant nose is not hindered by its small eyes that are only useful to see things at extremely short distances. To cope with power-



If you're about to purchase **Gnathonemus tamandua**, make sure your boss at work isn't about to place you on the night shift, because if he does, you'll miss the best opportunities to watch the strange antics of this crepuscular (twilight-active) aquarium fish.

ful currents, the elephant nose has a torpedo-shaped body that tapers radically to a slender tail stalk and split caudal fin. With swept back dorsal and anal fins, the mormyrid becomes a quite effective streamlined vehicle for contending with the tremendous force of the river. The poor eyesight is somewhat made up for by the long thin snout that is used, like the barbel of a catfish, as a sensory organ. Patches of brown and white on the fish's tiny scales give it a marbled effect.



In a 100 gallon tank, one can really observe the unique body-locomotion peculiar to the Mormyridae. These creatures dart about through the aquarium playing a jet-age version of hide and seek which is most amusing to watch. In fact, behavior-wise, these fishes offer the student of ethology many intriguing questions to answer; as yet no one has even been able to sex these fishes so as to attempt a spawning. Photo by Gerhard Marcuse.

All these physical attributes alone are enough to distinguish *Gnathonemus tamandua* from its fellows of the fishy world, but there is still more. Apart from all its other qualities, *Gnathonemus tamandua* is electric, as are all the other members of the family *Mormyridae*. There is no powerful shock to worry the hobbyist; the electrical organ is too weak to shock. The elephant nose surrounds itself with a very sensitive electrical field with which it can detect differing electric potentials, and therefore different objects. The electrical apparatus of *Gnathonemus tamandua* is located in the tail. The organ is composed of a series of about 200 longitudinally arranged electro-plates, somewhat like a car battery. The plates are connected to the spinal cord, which relays impulses to and from the brain. Still other electrical sensing devices are incorporated in the lateral sense organs.

With its specialized electric system, the elephant nose can find friend, food, or foe. The electricity is emitted in short irregular pulses that decrease in number during rest and increase during excitement.

I have had the opportunity to do some actual research on the elephant nose, and with an oscilloscope and tape recorder I have made a record of one night's discharges of four large *Gnathonemus tamandua*. Ichthyologists are just beginning to do important work on these fish, but the field is open to any enterprising aquarist.

Elephant noses will prove to be fine, healthy occupants of any aquarium if they are given sufficient shade. Since bright light annoys them, I recommend a heavy cover of floating plants such as duckweed. From my own experience, they get along well in a community aquarium. They are usually content in chasing each other for excitement. Though they are supposed to like tubifex worms, I suggest live or frozen brine shrimp as the best food for them. Neutral pH and a water temperature of about 80°F. will satisfy their living requirements. New specimens sometimes acquire a curious head fungus which can easily be treated effectively with malachite green.

Elephant noses don't want to be second-rate fish. They make first class friends and excellent companions. When I have to do some aquarium work with my hands, my elephant noses swim through my fingers and play tag around my wrist. If you want a fish that doesn't just sit in the water, get an elephant nose, and smile when he pokes his nose out at you in the morning.

A beautiful male *Apistogramma reitzigi* in courting colors. After they have spawned the yellow will disappear from their fins but remain on their throats. Photo by R. Zukal.

A seldom-seen dwarf cichlid

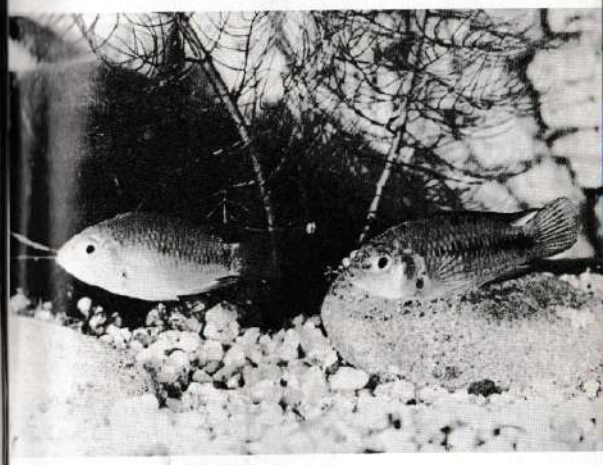
Apistogramma reitzigi

BY RUDOLF ZUKAL
BRNO, CZECHOSLOVAKIA

The yellow dwarf cichlid, *Apistogramma reitzigi*, is one of the smallest and most popular of the cichlid family. The male attains a size of only 2½ inches, and the female is only half this size. The species was brought into Europe in the year 1936 from the middle reaches of the Rio Paraguay in South America. They are inclined to be a bit quarrelsome among themselves. The males carry on their harmless battles by beating at each other with their tails and locking lips; in spite of all this bluster, they are often afraid of the much smaller female. (Would it be fair to compare their behavior to that of some human married couples?) Otherwise this species

Above: A male standing by the female while she is fanning the eggs. The female can be seen just below his ventral fins. The male seems to stay close to the nest at all times.

Below: the female as she lays her oval shaped eggs. She will release a few eggs at a time, perhaps as many as ten, and the male will then immediately follow her and fertilize them. Photos by R. Zukal.



A pair of *Apistogramma reitzigi*, the male to the right.

is peaceful, does not dig holes when not spawning, and spends most of the time near the bottom. They are well adapted to life in a community aquarium, but, being a bit shy, they should not be kept with overly active fishes. Providing a few places to take cover also gives one the possibility of watching their spawning activities in the community tank. The care of the young by the female is admirable.

These fish do very well in a medium-sized, well-planted, well-lighted aquarium in which a few stones have been placed. Their water should be soft, slightly acid, well aerated, and not too old. The fish are very quiet, do not move about very much, and spend much of their time in hiding. They are sensitive to many chemicals and to water changes. They prefer living foods.

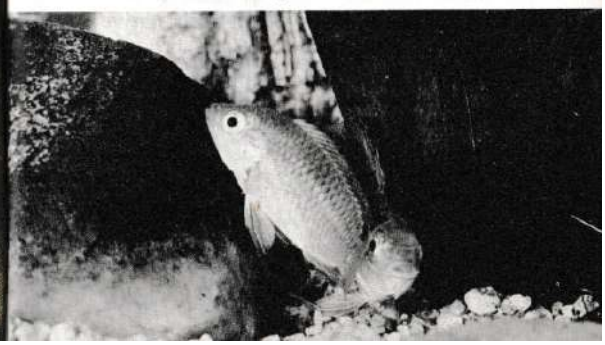
Spawning is in typical cichlid fashion. You can spawn them in a 5-gallon tank. The water is best taken out of the community aquarium in which

Above: An almost colorless female *Apistogramma reitzigi*. She is guarding her eggs which were laid in a coconut shell. Coconut shells are used by European aquarists for spawning all dwarf cichlids.
Below: A beautiful male *Apistogramma reitzigi*. Photo by Arend van den Nieuwenhuizen.

The female, now in her yellow breeding colors, is swimming toward the selected spawning spot. The male waits patiently.

they are living and should be kept at about 78° F. The females lay their eggs on a rock or sturdy plant leaf. Unfortunately it is not easy to tell when a female is ripe with eggs, because her belly does not swell greatly. The experienced breeder learns to recognize her readiness rather by her color and her behavior. During spawning the pair should be disturbed as little as

The place where spawning will take place is carefully cleaned by the female, while the male approaches hesitantly.



Suddenly a rival female shows up; note the differing color between the two females. The excited male takes his place between them.

possible. It is advisable to darken the spawning tank partially with sheets of paper.

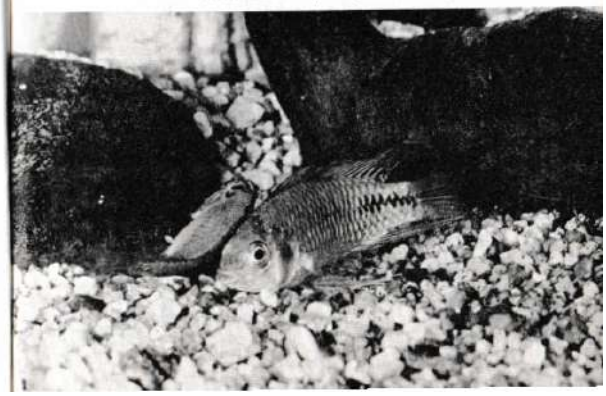
The third day after spawning, the youngsters wriggle on the rock or leaf. They are picked off by the female, guarded, and moved about frequently. The male must be removed shortly after spawning, or the female will often injure him fatally.

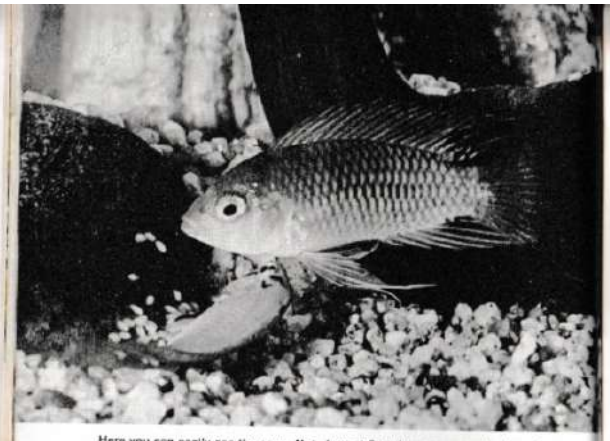
After the yolk-sac has been absorbed, the fry are fed with finely ground

The female on the right is wearing her warning colors. An inquisitive rival female is watching from behind the rock.

Finally both decide they have had enough of this nonsense and gang up to drive the extra female away.

The female's first spawning attempt.





Here you can easily see the eggs. Note how at first they are unevenly shaped.

prepared foods. When the female senses danger, she stiffens for several minutes in her rest position and then swims slowly backwards and gathers her young ones about her. As the brood is no longer dependent on the female after 14 days, it is advisable to remove her at the end of that amount of time so that fright will not induce her to eat her own young. The brood frequently consists of more males than females.

Food for Thought

BY LENOX R. LOHR
PRESIDENT, MUSEUM OF SCIENCE AND INDUSTRY
Chicago, Ill.

The ever present problem of primitive man and animals in the wild is food. The American Indians' idea of heaven was the "Happy Hunting Ground." It was not so much that they enjoyed hunting as that it ensured their next meal. As with other man-made heavens, it reflected needs on earth.

Animals and fish in the wild are seldom sure of their next meal, for the luck of the chase is at best uncertain. The number of animals which the supply of food in a given area will sustain is generally known as the "balance of nature."

While living at our ranch in the mountains of Arizona, we feed wild animals at our kitchen window. These animals include raccoons, foxes, ringtail cats, and a variety of skunks. When we have been in residence for a considerable period of time, some 30 or more animals will appear every night and will clean up as many as five loaves of bread. However, after we have been away for several months, and our food supply has not been available, only a few animals show up when we return. The others have scattered far and wide, for the natural food available will maintain only a limited number of them.

It was thinking about this which led me to wonder about the feeding habits of fishes in an aquarium. It is unquestionably a strong instinct in most wild animals to gorge themselves when food is available, for they never know when or where they can or will get their next meal, and thus they prepare themselves for the worst. If luck is against them, they may have to go for days. This is certainly true for many fishes in the wild, where for a few days there may be an abundant supply of insects and other foods, and then there may be long periods with little or nothing available to eat.

On the other hand, fishes native to tropical streams where there has always been an abundant supply of food all through the year might not have developed this instinct to gorge in times of plenty. It would be interesting to correlate eating habits to place of origin. This instinct has apparently been considerably curbed in domestic animals, for they have learned by generations of experience that owners who are solicitous for their welfare provide regular meals.

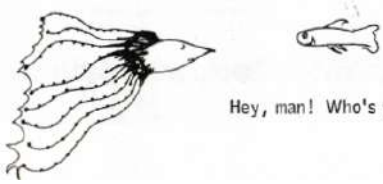
Fishes in an aquarium cannot be considered domesticated and, therefore, the instinct of the wild still prevails within them. Differing from fishes and other animals in the wild, fishes in an aquarium have no place to go if food is in short supply. I made the experiment of feeding a community tank of

swordtails, mollies, neons and kribensis five times with a lapse of about 15 minutes between feedings. While each helping was generous, the fishes continued to seem ravenous for the food, certainly eating far more than it was necessary to sustain them. Of course, when they have reached the absolute end to their capacity, they will leave the food to contaminate the tank. It would be interesting to know how long these same fish would remain healthy if they were not fed for a long period of time, say 2 weeks or more.

As I read articles on tropical fishes, much of the data seem empirical and based on observations like the above, with very little really basic scientific research. What is the actual amount of food needed for aquarium fishes? They are undoubtedly a highly efficient machine in relation to the amount of energy expended to the calories in the food consumed. Different from most animals who rest for long periods, fishes are in almost continuous motion and must expend many footpounds of energy for the number of energy units in the tiny bits of food which they consume. Despite the fact that they are efficient swimmers with a balanced buoyancy, we know that sustained swimming is considerably harder work for fishes than is remaining motionless. Perhaps one versed in naval design, chemistry, and engineering could figure out the conversion factor, taking into account that fishes need no food to supply bodily heat.

This is but one of the many questions on which real laboratory research would be interesting and possibly profitable. A simple experiment would be to arrange a large number of identical tanks, and in each tank put the same number, say ten, fishes of several species. With each feeding being the same exactly measured amount of food, those in the first tank would be fed three times a day; in the second tank, twice a day; the third, once; the fourth, every other day; the fifth, every second day; the sixth tank, every third day; and so on, for perhaps as long as once in four or more weeks. This experiment could be continued long enough to determine by the condition of the fishes what was the optimum amount of food and time interval.

Since the hobby of tropical fishes has become big business, perhaps the National Science Foundation would make a substantial grant for scientific research into their life habits.



Hey, man! Who's your tailor?

MAIL CALL

If you have an aquarium question that you would like answered, send it to MAIL CALL. Each month the most interesting questions received and their answers will be published in this column. Letters containing questions cannot be acknowledged or answered personally. Address all questions to: MAIL CALL, T.F.H. Publications, Inc., 245 Cornelison Avenue, Jersey City, N. J. 07302.

Metynnis spawning possibilities

Q. I have decided to write you because I wondered if I could send for some fish and equipment from you, mainly guppies.

I also have a question concerning fish. I own a pair of *Metynnis schreitmuelleri*, and was wondering if they are able to breed.

Mr. Arthur Davis,
London, England

A. No, you can't write to us for fish or equipment. See your pet dealer or write to firms that have fish and equipment for sale through the mails.

If your Metynnis schreitmuelleri *are truly a pair, in comparative good health and neither too old nor too young for spawning, they can breed . . . provided you give them the conditions they require. See the August, 1964 issue of* TROPICAL FISH HOBBYIST *for an excellent account of spawning various members of the genus* Metynnis.

Healthful rocks?

Q. Thank you for your very interesting and instructive section "Mail Call" in TFH. I always read it, and one can get a few tips about certain things in your answers.

I have an 80-gallon tank. Last year I

had a few rocks in it, but this year I removed them.

Prior to removing these rocks I never had any trouble with sick fishes, but after taking them out of the tank I have lost 10 fishes. I have no idea why my fish are dying. Is it possible that the rocks contained something that killed bacteria and the like?

Steffan Lindgren,
Pitea, Sweden

A. *Disregarding the notion of the possibility that the rocks discharged a beneficial substance into the water and that upon the rocks' removal the fishes died for lack of that beneficial substance, my guess is that the rocks had trapped under them some type of pollutant. As long as the rocks were in the tank, the pollutants could do no harm, but they were let loose into the water upon removal of the rocks.*

There probably is no real cause-and-effect relationship between the presence or absence of rocks in your tank and the death of your tropicals. The greater possibility is that you did something (or failed to do something) concurrent with or subsequent to the removal of the rocks and that that is what's causing the trouble.

No one would dare call him cute; Serrasalmus is as mean as he looks!

Breeding piranhas

Q. I've just purchased a baby piranha and am quite interested in my new charge.

1. Have piranhas, to date, been successfully bred in captivity?

2. If so, how was it achieved?

3. At what age do piranhas become dangerous to their own kind and to humans?

4. What do you suggest as the best foods for piranhas?

Ronald Antinarelli,
Rochester, N.Y.

A. 1. Yes, several times.

2. A complete description appeared in the January 1966 issue of this magazine. If you don't have a copy, your public library probably does.

3. Piranhas are not as dangerous as they are cut out to be. When they are hungry is when trouble can be expected. They are also more dangerous in large numbers than they are one or two at a time, but the most dangerous time of all is when they are frightened, such as when they are netted or when they fall out of an aquarium. Be very careful at these times.

4. Live goldfish, guppies, or other fishes of about the same sizes are very good. Chunks of meat or fish are also quite good. Freeze-dried liver has also been reported to be accepted quite enthusiastically by piranhas. This food should be available at your dealer's shop.

Peaceful paradise fish

Q. I have kept several specimens, male and female of the paradise fish (*Macropodus operculatis*) for almost 4 years. I would appreciate it if you would answer the following questions concerning them:

1. Are fruit flies (*Drosophila*) good for them?

2. Why are paradise fish reputed to be nasty when in truth they are not? I have found them to be quite peaceful.

3. I have spawned these fish. What is the best thing to do if the nest breaks up and the eggs float out?

Joseph Barry,
Ft. Myers Beach, Fla.

A. *1. Fruit flies are excellent food for any fish that will feed from the surface. Some species take a while to get used to them, however.*

10 to 12 hours per day. I have tried plant fertilizers to no avail. Several species of sagittaria thrive in this tank. How can I get Amazon swordplants to grow well?

David Murowski,
Bay City, Mich.

A. *Amazon swords can be pretty tricky. If I were having the trouble you are I would try two things: first, be sure the the plants you are buying were raised or kept in water that is about the same pH as your tank water for some time before you bought them. You can do this by being sure your dealer has held the plant you buy for some time without its dying. If the dealer is in your area, his water will be the same as yours. As a matter of fact, if your dealer has Amazon swords established in any of his display tanks, buy these. But be prepared to pay a bit more for such a plant, since it means extra work for the dealer and the disturbance of a display setup. The second thing I would do would be to provide more light, and more room if necessary. Change at least two of your bulbs to 25-watters. Your present lighting setup is too dim. In addition, trim off any dying leaves before they begin to rot.*

2. You are quite lucky. Usually, but not always, these fish are quite aggressive.

3. There is nothing you can do but let the male worry about it if he is in with the nest. Even if he doesn't do anything about it, however, most of the eggs will probably hatch.

Amazon trouble

Q. I have a 29-gallon tank in my basement. In it are about a dozen fishes—all in good health, I might add. I keep the water temperature at 76 to 78° F. constantly. I have a power filter which keeps the aquarium water crystal clear.

In this tank, which seems otherwise perfect, I cannot grow Amazon sword plants. When I plant them, they turn brown within a week or two. The pH of the water is 7.0 to 7.3, and I keep four 15-watt incandescent bulbs on for

Advantages of fluorescents

Q. 1. I have heard that a fluorescent overhead reflector is better for an aquarium because: (a) The light is left on at all times. (b) It doesn't encourage the growth of algae. Is this true?

2. A friend of mine has an aquarium, and his plants never seem to grow higher than 6 inches. The plants in my aquarium grow to the top of the tank very frequently. The water temperature in our tanks is the same (74 to 82° F.), and the pH value is the same (neutral to slightly alkaline). We both have good lighting and have the same water source. What could keep his plants from growing?

Felix Baguchinsky,
Kearny, N.J.

A. 1. Those people who prefer fluorescents prefer them for two major reasons: First, they do not throw off as much heat as do incandescents. Second, they provide more light for less money (lower wattages are required).

2. The color of the water itself and the color of the gravel and background could also affect the actual amount of light that the plants receive. If the water is less clear in one tank, less light will be available to the plants; the plants also will receive less utilizable light if the gravel or background of the tank is dark.

Even more important as a determinant is the depth of the tank. The deeper the tank, the greater the amount of light needed for the good growth of plants at the bottom.

Also—how about surface plants? If your friend has floating surface plants, they're cutting off some of the light for the bottom plants.

Water chemistry

Q. The water in my aquarium is always alkaline, and the pH never stays neutral for long after it is corrected.

I use the chemicals from the commercial pH kits that are on the market, but they don't help. Could this condition be caused by the coral and seashells that were formerly in the tank? Is there anything else I might try to correct it?

I enjoy reading TFH, especially "Mail Call", "Guppy Corner", and articles about other hobbyists.

Bill Scheffel, Stayeline, Calif.

A. *Yes, the condition could most certainly be caused by coral and seashells. Evidently enough of this material is still in your tank to affect its pH. Many aquarists use such material in their tanks or filters to correct the conditions of acidity that develop in some aquariums. The material is also useful in tanks where high pH and high water hardness is desired as a permanent condition (i.e., in tanks housing Nyasa cichlids). I suggest you set your tank up anew using both new water and new gravel.*

Mystery bubbles

Q. About a month ago, we set up a 10-gallon tank. In it we planted some anacharis. One shoot of the anacharis has been giving off small bubbles constantly for 5 days. We are quite curious; what is causing this?

Steve and Beverly Saulis, Wallingford, Conn.

A. *In some high-school biology courses, anacharis is used to show that plants produce oxygen when they are in strong enough light. A sprig of the plant is broken off and put in a test tube of water. Then the test tube is put in strong light. Soon bubbles begin to come from the broken end of the sprig. These bubbles are then proven to be oxygen bubbles by using a standard test for oxygen. To prove to yourself that this is what you are seeing in your tank, notice that the production of bubbles is slower in dimmer light.*

Cross-breeding platies

Q. I would like to know if there is a possibility of cross-breeding a crescent platy with another type of platy. If this is possible please give me some tips on how to do so.

Peter Mulleboom, Port Colborne, Ont., Canada

A. *If you mean whether there's a chance that you can cross a crescent variety of* Xiphophorus maculatus *with a non-crescent type of* X. maculatus, *the answer is that you can do it without any difficulty at all. Regardless of the type of markings or coloration, the fish are of the same species and will breed easily.*

If you are asking whether you can cross-breed a crescent Xiphophorus maculatus *with a "platy" of another species (such as the platy variatus,* Xiphophorus variatus, *in its many color and finnage variations), the answer is still yes; in this case, however, you have a little more work to do, as the species usually will not interbreed unless you create a completely artificial set of conditions for them. If you want to cross* X. maculatus *with* X. variatus, *I suggest that you take a virgin female of either species and confine it with a number of males of the other species, then await developments. Platies, both crescent and non-crescent varieties, have been cross-bred many, many times.*

Will the real **Xiphophorus maculatus** please stand up! This is **X. maculatus**—male on top, female below.

WHEN YOU CHANGE YOUR ADDRESS

You won't want to miss your TROPICAL FISH HOBBYIST when you move to your new home — so please tell us, well in advance, what your new address will be. (It isn't enough just to tell the Post Office, for they won't *forward* your copies unless you pay extra postage.) When you write us, be sure to give us your *old* address, too — even better, enclose a clipping of the address label from a recent wrapper. We'll see that you don't miss a single copy if you notify us at least six weeks in advance of your moving date. *Please don't forget to include your zip code number!* Write to: TROPICAL FISH HOBBYIST, 245 Cornelison Ave., Jersey City, N. J. 07302.

Index for Exotic Supplements

Q. My wife and I have been receiving your fine magazine for six years and enjoy it very much.

The pride of our tropical fish library is our copy of *Exotic Tropical Fish* (looseleaf), about which I have two questions.

1. Is there or will there be a new index to cover all the supplements that have been issued?

2. I have missed only one issue of supplements (due to moving) and would like to have this to keep my copy complete. Is there any way to get this without buying the entire set of supplements?

The issue I'm missing (Jan. '65) is not listed in the list of back issues available.

John Moon, Camden, Ohio

A. *1. Yes, there will be. Soon we'll publish in a regular monthly issue of* TROPICAL FISH HOBBYIST *a complete index of all supplements ever issued to the EXOTIC Looseleaf.*

2. Since the original issue carrying the supplement is unavailable as a back issue, you'll have to get one of the sets of supplements, unless you can come upon one by asking other hobbyists.

Let the Pterophyllum eimekei choose their own partners.

Breeding angels

Q. I have recently become interested in breeding angels. As I am a beginner, I have read every pamphlet you see in tropical fish stores on these fish. However, I am completely confused on one point. What should be done with a mated pair that has spawned for the first time. One author suggests separating them for about a month before allowing them to spawn again. A second states that a mated pair once broken will rarely remate. I have the feeling that someone is telling me a fish story. Would you please shed some light on this subject?

Frank Windfelder, Philadelphia, Pa.

A. *It is not unusual for the first few spawns of a newly mated pair to be unsuccessful for one reason or another, but let them keep trying four or five times. Once a successful spawn has been achieved, it is not a good idea to separate the pair if more spawnings are desired.*

Fraidy fish

Q. I have a 10-gallon tank. It is thickly planted in the back. With my other fishes I have a pair of swordtails, two rosy tetras, and three angelfish. These fishes are always hiding in the back where nobody can see them. Can you tell me why they do this and what I can do to get them out?

Timothy McCann, Park Ridge, N.J.

A. *The best way to assure that your fishes will stay up front is to be sure you always feed from the front. Never feed a fish in the back because the fish is shy. Sooner or later hunger will bring a shy fish out during feeding time, and once this begins to happen, it won't be long until your "shy" fish is quite at home in the open. I note, however, that the three species you have trouble with are species quite liable to be picked on by fin nippers. Look for a trouble-maker among your other fishes. Another thing, such problems arise far more frequently in a crowded tank than in one that is properly stocked. Is your tank overcrowded? If so, remove a few of the most aggressive fishes.*

Egyptian mouthbreeders

Q. 1. My dealer says that Egyptian mouthbreeders will fight with other fish as well as each other. Is this true?

2. How big should an aquarium be for breeding the Egyptian mouthbreeder?

3. How often do these fish breed?

Barry Harris, Monroeville, N.J.

A. *1. Your dealer is right. Egyptian mouthbreeders, males especially, are pretty scrappy individuals; if they're confined in a small tank with other species, you'll have some battles on your hands. In a large tank they're less aggressive.*

2. They can be successfully spawned in a 2½-gallon tank, and a tank this size will even be okay for housing the youngsters after they've left their mother to fend for themselves. But you'll have to give them more room after they've put on a little growth.

3. With a receptive female, the male is almost always ready to spawn; a female shouldn't be spawned until a week or so after she's given indication that she's completely recuperated from her last egg-incubation activities.

Colonel Joergen Scheel: A Logical Man

BY MARTIN R. BRITTAN
PROFESSOR OF BIOLOGICAL SCIENCES
SACRAMENTO STATE COLLEGE
EDITOR ICHTHYOLOGICA, THE AQUARIUM JOURNAL

Whoever sees the stunning photographs of killifishes by Col. Joergen Scheel is likely to disbelieve them: they are too good to be true! Before I met Col. Scheel, I was of the opinion that he used special lights, while some of my colleagues were sure that he retouched his photographs to heighten the colors. My reasons for wanting to meet Col. Scheel were not only because of his beautiful photographs, but also because of the painstaking hybridization experiments he has been carrying out with the genus *Aphyosemion*.

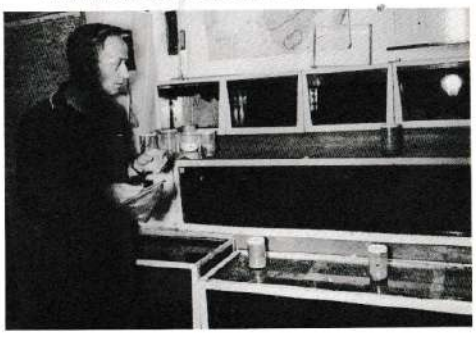
On a clear day this April, I caught a train from Copenhagen's Westerport station to Lyngby, where I took a cab to Col. Scheel's house in Virum. A tall, blue-eyed Dane came out to meet me in front of a two-story house in a comfortable residential area where people, the Scheels included, are obviously proud of their houses and gardens. The Colonel, after introducing his wife, took me out to his fish room. There, in dozens of tanks and jars, were all the wild-caught killifishes which Scheel and Dr. Stenholt Clausen had collected in West Africa. There were also domestic strains and the offspring from the many crosses made between various domestic and wild strains. On the walls were large-scale maps of West Africa, showing rainfall, weather, topography, vegetation, and other factors important in working out the problems of distribution and evolution of African killifishes. Here were the large tanks in which he raises daphnia and the bottles in which he hatches fruit flies (*Drosophila*) as live food for his fishes. Scheel's penchant for doing things logically shows itself in the fact that he gets double use out of the culture medium (basically agar and a fortified cereal) on which he raises his fruit flies. The first use is for raising the flies. After this he uses it, along with sugar, as food for his daphnia. He "cycles" as much of his operation as possible, so as to save as much time, effort, and expense as practicable, and to have a steady supply of superior food in large amounts always at hand, even to the point of using in his cultures three species of fruit flies which replace each other one after another, giving, by reinoculation, longterm continuity.

Scheel believes that many of the so-called species of killifishes are merely well marked color varieties of variable, widely distributed species, and that some supposedly variable species are really composed of several "cryptic" species closely resembling one another. He has attacked the problem with

hybridization experiments to see which nominal species will interbreed and produce normal fertile offspring, which will interbreed and produce physically normal but infertile offspring, and which will interbreed but produce no or only a few distorted offspring. The colonel is reinforcing this work by studying the chromosomes of the various forms. Since some of the chromosomes have characteristic shapes, they can be followed (by using tissue smears and sections on glass slides and examining under a microscope) through many generations in Scheel's hybridization experiments. Also, if various wild populations have the same characteristic chromosomes, one may presume genetic interchange, at least in the past, indicating that they are closely related.

After looking around the aquarium room, we went upstairs to the colonel's study. Mrs. Scheel brought us some cheese and sherry, and I asked Col. Scheel how he had become interested in killifishes. The story he told was a fascinating one: Born in 1916 into a noble family (the Skeel family dates back to 1366, some members still spelling it in the old Danish way of "Skeel," others in the Germanicized manner, "Scheel"), young Joergen eventually entered military training, becoming an officer in the Guards Division. Interested in nature, he raised plants, then rare birds. Scheel married in 1939. When the Germans invaded Denmark in 1940, his collec-

Col. J. J. Scheel, besides being a high ranking officer in the army, has royal blood. His home abounds with aquaria, as does his office in the army. He is totally dedicated to his work and has done outstanding research on killifishes.



tion of plants and birds was lost. Sending his wife to safety with her parents on the island of Jutland, Scheel disappeared into the Danish underground. Eventually he was captured by the Gestapo and imprisoned. Many members of the Danish underground were executed, but with less incriminating evidence against him, Scheel escaped death but languished in prison. Having developed rheumatoid arthritis, Scheel was released at the war's end, and he turned first to "aquarium dynamics" and then, as a natural step, to fishes to keep himself occupied. Largely recovered, he continued with his army career as a staff officer, and, with the death of his older brother, he has assumed the family title. He is thus Count Scheel as well as Col. Scheel.

Scheel took ordnance mathematics and applied it to aquarium "mechanics." Using the principle of the recoil of an artillery piece, he designed an aquarium pump-heater. Scheel remarks that his old colonel thought he was "putting him on" about it. Continuing his research, Scheel found out that all rainforest water is essentially the same, and his "standardized rainforest water" can be used for any rainforest fish species. Scheel concocts this water himself.

Col. Scheel has done some extensive research in the basic hereditary material found in all killifishes. He has made photographs of many of the chromosomes of many of the species and has crossed fishes with a different chromosome number. At one time this was thought to be impossible.

Promoted to full colonel, Scheel was placed in charge of transport for the Danish army. All his time not spent at his duties is devoted to fish research, with which Scheel says his wife is most patient. The colonel's wife, Anne-Sophie, known by the nickname of "Fifi," is tall, blonde and gracious. The Scheels have three daughters, the oldest 26. Their youngest child is their only boy, 6 years old.

The Colonel's study is dominated by a top-quality German phase microscope for his chromosome studies and by his photography setup. The latter is composed of a large photographing tank with a suspended internal glass "cage," electronic flash, and a 35mm single lens reflex camera mounted on an adjustable rail. Col. Scheel always uses a telephoto lens and puts the fishes against a black background for color shots and a white background for black and white photos. His favorite film is Kodachrome II; he often uses Ferraniacolor for duplicates. Use of a black background and electronic flash gives the marvelous color saturation which led so many of us to think that Col. Scheel used trick lighting or retouching.

The Colonel is quick to insist that he is not an ichthyologist. Perhaps he is not by academic training, but, by dint of intensive self-teaching and application of the scientific method, he achieves the same results. His rigorously scientific attitude shows itself in the following: During his collecting in West Africa, he contracted filariasis, a mosquito-borne disease. Since filariasis is nearly nonexistent in Denmark, the Danish medicos were delighted to be able to study a case at hand. Assured that the disease would not develop into elephantiasis (this happens in relatively few cases in proportion to the total number of people infected, and then nearly always in the tropics), Scheel decided to stall treatment—he experiences no symptoms—so that the medicos could study his malady for awhile. He smilingly says: "Maybe they can learn something they didn't know before, and if it gets worse they can start treatment." Col. Scheel has applied this kind of scientific curiosity to the aquarium; would that more would do likewise.

Watersprite problem

Q. We have been raising guppies for 7 months now, and they seem to be doing fine. Our greatest problem is keeping watersprite alive in our tanks. We would switch to other plants, but we know that watersprite is particularly good in guppy tanks. About 4 days after we put watersprite in our tanks, it starts to turn dark, and then, in a few days, it dies. We keep the pH in our tanks as close as possible to normal for guppies, and we have used aquarium-plant foods, but they do no good. We clean our tanks every week and change the filters twice a week. Can you help us?

Bill and Betty Doherty, Charleston, S.C.

A. *Given the proper environment, watersprite grows like mad. The water should never be harder than 10 DH; preferably it would be half this. Along with this, the plant prefers water on the acid side of neutral. Too-soft or too-alkaline water will turn watersprite to mush. Too-hard water will cause it to become brittle. Proper lighting is also important. I find that watersprite needs at least 8 hours of light. I use incandescent bulbs. The light must not be too strong, or the plant will grow fast but will have a faded green color. If you are keeping your tanks as clean as you claim to be keeping them, there is little chance that the plants' roots are rotting due to foul gravel conditions.*

Best female

Q. 1. I have a female guppy which has a large tail (¾ inch long and ¾ inch wide) with black and white margins. Is this an unusual female?

2. How big do albino guppies get?

3. What color female gives the best color to her male babies?

Earl Parker, Memphis, Tenn.

A. *1. In the past few years, many strains of guppies have been developed in which females have color, particularly in their tail.*

2. Albinos get as large as the common type of guppy.

3. There is no best color for transmission from generation to generation. A female from any color strain that is true-breeding will transmit color well.

Plant propagation

Q. I have elodea and sagittaria in a tank with fluorescent lighting, and I even use

plant food. The light is kept on for 13 hours per day, but my plants are still dying. My guppies, on the other hand, are doing fine. Could you tell me what causes this?

Marvin Yancy, N. Charleston, S.C.

A. *With so little information I cannot possibly tell you why your plants are dying. I would have to know the chemical nature of your aquarium water as well as its temperature and how much light you are using. If your plant leaves are turning fuzzy or dark-colored green, you are giving too much light. If the gravel is getting black underneath, plant roots are rotting from accumulation of uneaten food and other wastes.*

Salts From The Seven Seas

By Alfred A. Schultz

Q. About 4 months ago, I purchased a small hermit crab. When I bought it, it came in a small red shell. Now it has outgrown the shell, and the fishes in my tanks are picking on the unprotected crab. What can I do?

J. Hoffman, Jasper, Indiana

A. *A hermit crab in its natural home has a choice of many sizes of shells. The only solution is for you to supply assorted sizes of shells, preferably small shells. The hermit crab will change to larger sizes as it grows. There was a time when I had three hermit crabs in one tank, and as one became larger and had to abandon a shell which had become too small for it, he would start fighting with one of the other crabs for possession of the larger shell. The result was that one killed the other. By the way, these crabs are very good scavengers.*

Q. I have just purchased some seahorses from Florida. I also bought your book on seahorses. After reading the book, I have found the chemical ingredients that are mixed with fresh water to make it salt water to be terribly expensive. Do you know of any recipe or formula which is less expensive?

Mrs. V. Borchers, Le Mars, Iowa

A. *Prepared synthetic salts can be purchased from almost any pet dealer. The cost is minimal. If you cannot obtain the salts locally, check the advertisers in this magazine.*

Q. A member of my aquarium club recently became the proud possessor of a seahorse which is yellow. He tells me that they are very rare and very expensive. I have never seen a seahorse that was other than gray in color. Is this really rare?

K. Frey, Vacoville, Calif.

A. *It is not unusual to see seahorses which are colored red, blue, and yellow. Gray is the most common color, and, therefore, seahorses of this color are the least expensive. However, the difference in price is not that excessive.*

Q. In many books on saltwater systems, it is stated that various sizes of sand and gravel grains mixed with glasswool and charcoal layers are considered to be the best type of filtering agents to use in marine tanks. Is it efficient in filtering out the various particles of dirt and other harmful objects from the water?

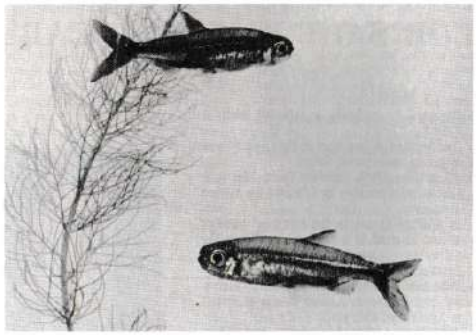
Don Wells, Riverside, Calif.

A. *The best filtering is done by a combination of filters. An undergravel filter under a bed of broken shells acts as a buffering agent. Its use with a good outside power filter with just glasswool makes an ideal combination. This method is used by the Cleveland Public Aquarium.*

Q. I soon plan to purchase a Moorish idol. Can you give me any information about this fish? Is it difficult to keep?

Frank Peters, Ontario, Canada

A. *The Moorish idol is one of the prize beauties of all saltwater fishes. It grows to about 6 inches in a home aquarium, much larger in its native waters. It is a very expensive fish, especially in the larger sizes. Feeding this fish is a problem, and it is not very hardy. However, once it becomes acclimated to your tank, it will live a long life.*



Ladigesia roloffi, a pair of adult wild specimens. Photo by E. Roloff.

LADIGESIA ROLOFFI, A NEW GENUS AND SPECIES OF AFRICAN CHARACOID FISHES

JACQUES GÉRY[1]

The colorful little Characid described below was discovered in Sierra Leone, West Africa, by Mr. E. Roloff, well known aquarist and writer from Karlsruhe. It is an important contribution to the knowledge of this small "Atlantico-guinean" territory, whose coastal rivers have been scarcely explored. It is also an interesting, rather unexpected, addition to the small African alestids, which are still rather poorly known.

Ladigesia gen. nov.[2], family Alestidae

Type-species *Ladigesia roloffi* sp. nov.

Small size; relatively elongated; dorsal behind the middle of the body; ventrals in the middle, inserted in front of the dorsal-level; adipose fin present; anal short, modified in males (fig. 1a); apparently no other sexual dimorphism; *lateral line incomplete*; *dorsal region entirely naked* up to front of adipose, the naked area corresponding, on both sides, to 3 or more normal scales-series. Posterior fontanel broadly open, anterior fontanel short,

[1] Contribution number 49 to the study of characoid fishes.
[2] Honoring Dr. Werner Ladiges, Hamburg, who kindly loaned the type-material.

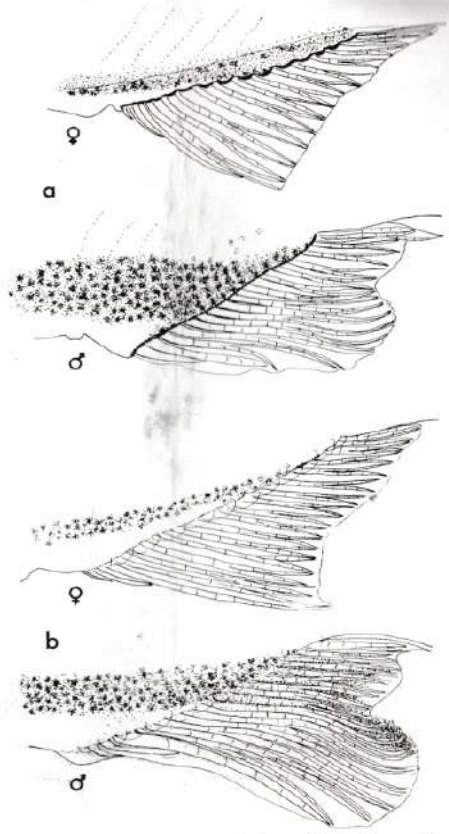


Fig. 1 (a): Anal fin of mature specimen of *Ladigesia roloffi*, showing sexual dimorphism.

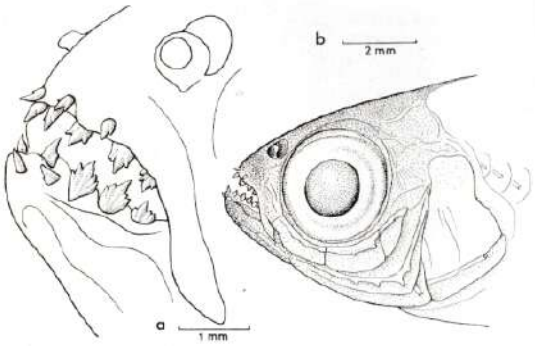


Fig. 2: Type of *Ladigesia roloffi*; (a): detail of the mouth; (b): profile of the head.

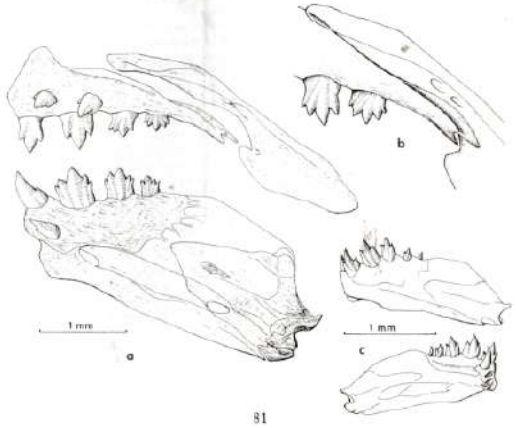
reaching to the level of middle of pupil; apparently *only 3 branchiostegal rays*; circumorbital series incomplete, the antorbital partly overlapping the maxillary, the 2nd and 3rd suborbitals not entirely covering the cheek, the 4th one very reduced, the 5th one and the dermosphenotic apparently completely missing (fig. 2b); mouth supero-terminal; premaxillary elongated, *its distal end* (fig. 3b) *bifid*, armed with 4 tri- to quincuspidate teeth, and 2 smaller tricuspidate ones in front, obliquely *inserted above the lip* (figs. 2a, 3a), at least in adults; maxillary without teeth, with a paddle-like free end, whose base is articulated with the above-mentioned premaxillary fork; mandible of adults armed with 4 bi- to quincuspidate teeth, the two mesial ones slightly pointing outwards, and with an external tooth (on both sides) clearly pointing forward, *inserted behind the lip* (figs. 2a, 3a); the inner pair of small conical teeth, characteristic of *Alestes*, *Micralestes*, etc., is missing in adults. In juvenile stage (about 20 mm), at least in aquarium-bred specimens, the teeth are narrower, tricuspidate at the most, with the outer premaxillary teeth less pointed forward, and no external tooth on the mandible (fig. 3c); instead, there is a regular outer series of 5 tricuspid teeth and a conical tooth behind. The peculiar dentary tooth-structure of the adult may

be due to the forward migration of the mesial outer tooth, whereas the conical inner one, also migrating forwards, would have taken its place(?).

Discussion and phylogenetic affinities: *Ladigesia* gen. nov. is quite apart from all other alestids by the following characters: (1) low number of branchiostegials (?); (2) presence, in adults, of some external teeth, which give evidence of some, still undefined, alimentary specialization; the teeth resemble, rather remotely, those of certain Neotropical Characidae like *Probolodus*, *Exodon*, *Roeboides*, etc., some of which are known to be "scales-eaters"; (3) lack of scales on the upper fourth, or fifth, part of the body; again, the same partial disappearance of the squamation is found in a Neotropical genus, *Hoplocharax*, which is phylogenetically very remote (Géry, 1966). The only known entirely naked African characid, *Lepidarchus adonis* Roberts, 1966, from Ghana, is probably nearer, although apparently of a different group (see discussion in Roberts, 1966).

Not considering the above briefly discussed characters, *Ladigesia* belongs apparently to the group of alestid species characterized by the small size,

Fig. 3: Jaws of *Ladigesia roloffi*; (a): adult (female paratype), left side dissected, external view, semi-schematic assemblage; (b): detail of the premaxillary-maxillary articulation; (c): mandible of a young specimen, left side, external (above) and internal (below) view.



and the flattened, not molariform, pluricuspid teeth, i.e. the genera *Micralestes*, and *Phenacogrammus*, *Petersius* and *Hemigrammopetersius*, etc.[3] *Ladigesia* may be considered as a very specialized offshoot of some elongate *Micralestes*-like species, for instance *Alestopetersius intermedius* Blache and Miton, on the one hand, or *Micralestes humilis*, on the other. It is rather close to the former (which is found in Sierra Leone, and could be nothing more than a local race of the common *septentrionalis*, with a rather irregular lateral line), in the body-form as well as in the sexual dimorphism of the anal fin (fig. 1b). It differs at once from the *humilis-argyrotaenia-sardina* group by the absence of the inner mandibulary teeth, at least in adults, but (as shown above), this could well be due to the transformation of the dentition during the growth (tooth-migration), and not due to the loss of a character, as in the *Petersius*-group in the broad sense.

[3] As shown by Myers (1929), *Petersius* is restricted to its type *conserialis*, a rather large form with closed fontanels; the dozen or so of smaller species which possess a fontanel, but differ from *Micralestes* in the rather constant (Poll, 1945) absence of the inner, conical pair of teeth on mandible, should be called *Hemigrammopetersius*. The type-species of the latter genus, which was not designated by Pellegrin (1926), is *Petersius pulcher*, designated by Burton in the Zoological Record for 1926, i.e. prior to the designation by Myers (1929) of *P. major*. *P. pulcher* having an incomplete lateral line, a question arises as to the proper generic name for the 6 or 7 species of the same group which generally have a complete lateral line, if such a generic name is really necessary.

Hoedeman (1951) proposed a number of new names, some of which could be relevant here. For nomenclatorial reasons, all of them (except *Bryconalestes* and *Alestobrycon*, which pertain to a different group) are *nomina nuda*: they do not satisfy article 13(b) of the International Code of zoological Nomenclature, which demands that "a genus-group name published after 1930 must . . . be accompanied by the definite fixation of a type-species" (and not, as stated by Matthes, 1964, concerning *Alestopetersius*, because they are based on insufficient criteria: this is a good taxonomic reason, but not a nomenclatorial one).

Nevertheless, it is generally less known that Hoedeman designated in 1956 (pp. 559–560) the type-species of most of his genus-names of 1951: *Alestogrammus* (*abali*), *Microlepidalestes* (*caudomaculata*), *Brachypetersius* (*altus*), *Nannopetersius* (*ansorgei*), *Rhabdopetersius* (*leopoldianus*), and *Petersialestes* (*xenurus*, a synonym of *caudalis*), which are all supposedly subgenera of *Phenacogrammus*; and finally *Alestopetersius* (type *hilgendorfi*, of which *modestus* is a synonym). I seriously doubt the usefulness of all except the last, although they appear to be valid, dating from 1956 (they are not described, but accompanied by a definite bibliographic reference). *Microlepidalestes* and *Brachypetersius* are apparently synonyms of *Bathyaethiops*, *Alestogrammus* of *Brycinus* and *Nannopetersius* of *Alestes*.

But *Alestopetersius* Hoedeman, 1956, with its type-species expressly designated, would be available, and would include *caudalis* (synonyms *xenurus* and *brumpti*), *compressus*, *septentrionalis* (synonyms *loennbergi* and ? *intermedius*), *leopoldianus*, *maunensis* and *tangensis*, besides the type *hilgendorfi* (synonym *modestus*). The types of *Rhabdopetersius* and *Petersialestes* belong to the list: they are thus subjective synonyms, although a rather futile question of priority may be discussed.

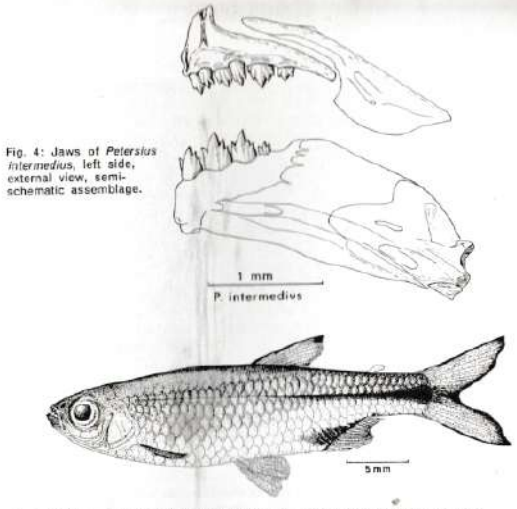


Fig. 4: Jaws of *Petersius intermedius*, left side, external view, semi-schematic assemblage.

Fig. 5: Habitus of the type of *Ladigesia roloffi* (deposited in the Zoological Museum, Hamburg, Germany).

Ladigesia roloffi sp. nov.[4] (figs. 5, 6, 7)

HOLOTYPE: male, 30.8 mm in standard length (total length 36.8 mm), collected April, 1965, by Mr. E. Roloff in the Kasewe Forest, Sierra Leone (West Africa); deposited in the Zoological Museum, Hamburg (Germany).

PARATYPES: 6, 3 males and 3 females, 23.5–27.2 mm in standard length, collected with the type.

— 2, immatures, 21 and 22 mm in standard length, first generation in aquarium; leg Mr. E. Roloff, May, 1966.

DIAGNOSIS OF THE HOLOTYPE: greatest depth 3.9 and length of head, without membrane, 4.05 in the standard length; snout-to-dorsal .9 in dorsal-to-caudal; depth of peduncle about 1.4 in its length; eye 2.75, bony interorbital 3.31, free part of maxillary about 5, and snout about 4 and

[4] Honoring the collector of the species, Mr. E. Roloff.

6 (respectively oblique and in projection), in the length of head; dorsal ii7i; anal ii14(i); squamation (5) 34–35, 7 in a transverse series above ventral, 14 around peduncle; gill-rakers 8/11.

DESCRIPTION (table 1): rather elongate like certain "*Petersius*" (*intermedius* for instance), the dorsal fin always behind the middle of the body, the ventral fins approximately in the middle; the caudal peduncle quite narrow, owing to the shortness of the anal fin, its depth 1.35–1.8 in its length; pectorals i9ii, short, not reaching ventrals; ventrals i6i, short, not reaching anal; anal with a straight base and a concave border in females, iii 13 or 14(i) rays; in males, the anal base is somewhat "wavy", following the lowering of the anterior part of the anal keel, with ii 14(i) (rarely 13) rays: the first, rudimentary, unbranched ray is apparently missing, like in certain other male alestids (cf. Daget & Iltis, 1965 p. 79, genus *Petersius* auct.) (fig. 1a); dorsal ii7i (once 8i); caudal viil 9/8 lvi; predorsal and preventral regions not angulated nor keeled, more or less rounded, the former one entirely naked from the post-occipital up to the dorsal, then almost up to the adipose behind, as well as, laterally, on almost a fourth of the surface of the sides; anal and caudal bases not covered with scales; no pseudotympanum (humeral hiatus), no prominent interhaemal spines. Squamation (5–7) 34–35, 7 to 9 in a transverse oblique series above ventral (towards dorsal), 14 or 15 around peduncle; gill-rakers 7–9/11–12. Detailed proportions and counts in table 1.

The characters of the head and of the dentition have been described in the generic diagnosis (figs. 2, 3), mostly from the external examination of the type (fig. 2a) and from the dissection of the female paratype N. 3 (fig. 3a). The characters of the dentition are scarcely discernible on the other, mature specimens. According to Mr. E. Roloff, who brought them back alive, the wild fishes were easily frightened and difficult to keep: they have broken their external teeth while throwing themselves against the aquarium glass. Nevertheless, the presence of two intact specimens, of both sexes, permitted the above mentioned hypothesis concerning this important generic character.

The coloration of *Ladigesia roloffi* sp. nov. is most gorgeous: when alive, the mature wild fish has its fins (including the middle part of the paired ones), the upper part of the eye and, in a somewhat less intense tone, the whole body, *bright vermilion* (fig. 6); the unbranched dorsal and caudal rays, as well as the tip of their branched ones, are black. After preservation, there exists a black longitudinal line on body, spreading outwards on peduncle, and continuing up to the tip of the median caudal rays: this line corresponds with a golden band visible *in vivo*. The anal base is marked, in females, by a band of chromatophores which, in males, attains the propor-

Fig. 6: Wild specimens of *Ladigesia roloffi*, male (largest) above. Photograph E. Roloff.

Fig. 7: Aquarium-bred specimens of *Ladigesia roloffi*, male (largest) above. Photograph E. Roloff.

TABLE 1—Principal proportions and counts of 9 ex. of *Ladigesia roloffi* sp. nov.

No., sex	Type	2	3	4	5	6	7	8	9	Ranges
		♂	♂	♀	♂	♂	♀	juv.	juv.	
Sd. length		30.8	28.5	27.2	25.9	25.7	23.6	23.5	22.0	21.0	21–30.8
Sd. L./depth		3.9	3.96	3.78	4.31	4.08	4.49	4.12	4.23	4.47	3.8–4.5
Sd. L./head		4.05	3.85	4.39	3.77	3.84	?	3.62	4.32	4.38	3.6–4.4
Head/eye		2.72	2.64	2.48	2.87	2.58	?	2.83	2.55	2.67	2.55–2.85
Head/interorb.		3.31	2.96	2.95	3.33?	3.05	?	3.61	3.19	3.43	2.95–3.6
Head/Maxill.		5	5.3	5.6	5.4	4.8	?	5.4	5.1	5.34	4.8–5.6
Head/snout (abd.)		4	4.9	3.9	?	?	?	3.92	4	3.9–4.9	
D.–caud./sn.–D.		.9	.92	.9	.96	.87	?	.91	.9	.91	.87–.96
Ped. L./depth		1.68	1.55	1.57	1.63	1.45	1.82	1.36	1.4	1.7	1.35–1.8
Dorsal (br.)		7i	7	7	8i	7i	7i	7i	7i	—	7i (8i)
Anal (br.)		14	13	14?	14	14	13	14	14	14	13–14
Lat. scales		34–35	35	35	34	34	35	34	34?	34?	34–35
Tr. scales		7	7	9	7	8	7	7	7	??	7–9
Ped. scales		14	14–15	?	?	—	—	—	14?	?	14 (15)
Gill-rakers		8/11	7/11	7/12	8/11	8/11	7/11	9/11	—	—	7–9/11–12

tion of a real, apparent spot; there is no humeral spot. The fishes of the first generation (aquarium bred, fig. 7) seem to be less brightly colored than the wild fishes.

ECOLOGICAL DATA: according to certain maps, the village of Kasewe is in the north of Moyamba, near the northern limit of the primeval forest which covers the southern part of Sierra Leone, Liberia-Guinea, Ivory and Gold Coast. The numerous little streams are apparently tributary to the River Gbangbaia system, a medium-sized coastal river running west of the larger Jong River.

Mr. E. Roloff provided the following data: *Ladigesia roloffi* was found at the end of the dry period, in a very slowly running forest brook, which was then almost empty; temperature 26° C.; hardness 5.1 (German scale), pH 6.7; no aquatic plants, save for many ferns (*Bolbitis* sp.) growing on emerged rocks, and doubtless submerged during the rainy season. Associated species were *Neolebias unifasciatus*, *Epiplatys annulatus* (cf. Roloff, 1966), *Epiplatys bifasciatus* and an unidentified alestid.

Ladigesia roloffi is said to be very scarce, and difficult to capture alive, being a fast swimmer. Only a few young fishes, not yet colored, could be secured and brought back alive to Karlsruhe. In the first months of acclimatation, they were very shy, trying to jump out of the aquarium at the slightest disturbance, Mr. E. Roloff, despite these difficulties, was fortunate enough to raise several males and one female to maturity, and to obtain 40 or so fry. The species is now well acclimated and would be an excellent fish for the hobbyist, being reasonably hardy and peaceful, as well as highly decorative.

REFERENCES

DAGET, J. and A. ILTIS, 1965. Poissons de Côte d'Ivoire (eaux douces et saumâtres). Mém. Inst. fr. Afrique noire N. 74, 385 pp., IV pls.

GÉRY, J., 1966. *Hoplocharax goethei*, a new genus and species of South American characoid fishes, with a review of the sub-tribe Heterocharacini. Ichth. The Aq. J. 38 (3): 281–296.

HOEDEMAN, J. J., 1951. Studies on African characid fishes—I. The tribe Alestidi. Beaufortia N. 3: 1–8.

— 1956. Aanvulling Aquariumvissen-encyclopaedie, Amsterdam: 529–714.

MATTHES, H., 1964. List of types of African freshwater fishes in the Amsterdam zoological Museum, with notes on their synonymy. Beaufortia 10 (122): 177–182.

MYERS, G. S., 1929. Cranial differences in the African characin fishes of the genera *Alestes* and *Brycinus*, with notes on the arrangement of related genera. Amer. Mus. Nov. N. 342: 1–7.

PELLEGRIN, J., 1926. Description de Characinidés nouveaux récoltés au Congo belge par le Dr. Schouteden. Rev. Zool. Afr. 13 (3–4): 157–164.

POLL, M., 1945. Descriptions de Mormyridae et de Characidae nouveaux du Congo belge avec une étude du genre *Stomatorhinus* et des genres de Characidae nains africains. Rev. Zool. Bot. Afr. 39 (1): 36–77.

ROBERTS, T. R., 1966. Description and osteology of *Lepidarchus adonis*, a remarkable new characid fish from West Africa. Stanford Ichth. Bull. 8 (3): 209–227.

ROLOFF, E., 1966. *Epiplatys annulatus*. Trop. Fish. Hobb 14 (7): 5–11.

The "freak" mutant above was one of many thousands of deformed angelfishes which appear in breeders' aquariums throughout the world. Though many have tried to fix a strain of such monsters, no one has succeeded. Photo by Rudo Zukal.

Mutations

BY FREDERICK J. KERR

I have often thought as a I languished beside my aquariums with the cold Wyoming wind rattling the windows and the storm doors . . . how pleasant it would be to be with Dr. Herbert R. Axelrod as he explored the jungles of South America in search of new fishes for our aquariums. What aquarist would turn down the chance to net a few dozen familiar fishes or, better still, a completely new species that would meet with favor among aquarists all over the world? It is the search for something new that gives the aquarium hobby much of its vitality. Whether it is the youngster searching a dealer's tanks for a species he has never had before, or Dr. Axelrod seeking a species new even to science, the search for something new is the heartbeat of the hobby.

Let's forget about searching for new species, however, for there is another source of "new" aquarium fishes that does not require the costly planning or the hazardous life of the jungle. This search is conducted in the aquariums of amateur and professional fish breeders all over the world. Generally

the "new" discovery comes as a complete surprise to the breeder who one day finds in his rearing tanks a fish or two which are different to a great extent from their parents or siblings. The breeders of yesterday called these variations "sports" or "freaks". Today, we usually call them "mutations".

In terms of the number available to aquarists, mutations are not rare. This is because they have been conserved and developed into fixed strains by skilled breeders. Many mutations are more popular than the normal varieties from which they arose. Consider the lordly betta and the multi-colored platy, which are only two species which show not one but a number of mutations. A new mutation can occur at any time in the tanks of any breeder, be he a first-time breeder or the owner of the largest hatchery in the world. Because these mutations might well provide the hobby with a popular new variety, it behooves every breeder to understand them.

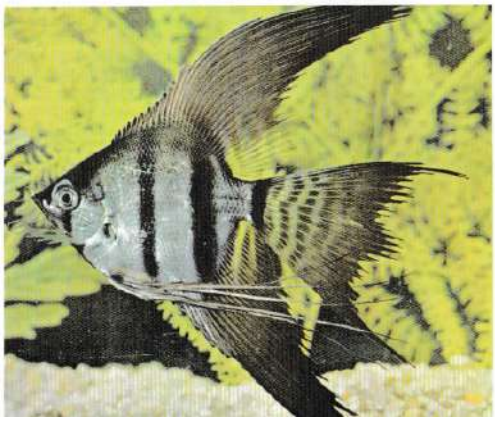
We have said that the breeder usually first notices a mutation because it is different in some way from what he had expected of a particular species. Perhaps the mutant individual's fins are longer than usual (i.e. veil angel) or maybe it was completely black (i.e. black molly, black angel). Perhaps one or more fins are unusually shaped (i.e. lyretail sword, lyretail molly) or one or more pigments are absent from the skin resulting in a white (i.e. albino molly) or golden (i.e. golden guppy) fish. It must, however, be recognized that not all odd fishes are mutations. Many such fishes are deformed as the result of improper development of the embryo. This may be the result of improper water conditions or mechanical injury to the egg. How can the breeder tell these congenital deformities from true mutations?

Generally color variations are not congenital. Variations in fin length and shape may be caused by either a mutation or a congenital disorder. If there are two or more fry with the same variation, the chances are greater that a mutation has occurred than that a congenital disorder is responsible. In the last analysis, the only way to be sure that a mutation is being dealt with is to try to produce a true-breeding strain; mutational variations can be passed from generation to generation, but congenital variations.

There are several ways to attempt to produce a true-breeding strain from a suspected mutation, and which one of these to use depends largely upon the individual situation. If there are a number of affected individuals and two are of opposite sexes, the best plan is to mate these two. If there is only one suspected mutant, or if there are a number of them, all of the same sex, the best attack is to mate one of the mutations back to its parent of the opposite sex. If this is impossible because the parent is unknown, too old, or dead, it is best to mate the mutation to one or more of its siblings. If the parents and siblings of the possible mutation are unknown, it becomes quite a problem to select a suitable mate.

Many times there are several color and fin varieties from which to choose. It is tempting in such cases to mate the mutation to the variety it most

Above: A normal wild angelfish from Guyana.
Below: A dark "lace" variety with long fins is now fixed as a permanent strain. Both dark color and longer fins resulted from bringing into one fish two mutations. Photos by Dr. Herbert R. Axelrod.



The Conles Blushing Angel is a stripeless variety which did result in a permanent strain. This Ghost Angel is now available on the market in the USA. Photo by Dr. Herbert R. Axelrod.

resembles. As a rule this should not be done, because the variety is itself a different mutation from the one being tested. The result is that the breeder finds himself working with two variables instead of one, making it much more difficult to establish the new mutation in a strain of its own. One breeder discovered an albino betta in his hatchery and crossed it to a Cambodia betta, because they resembled each other. The breeder was amazed and disappointed when he discovered all of the offspring were purple, and in his discouragement he gave up attempting to fix a strain of albinos. What is the proper procedure in such cases? The answer is almost axiomatic: *when a mutation cannot be crossed to its parent or sibling, it should be crossed to the wild variety to avoid the complications of dealing with two genetic mutations.*

After the cross has been selected and made, the breeder's work has just begun. If the affected fish is a true mutation and the mutation is dominant, the trait should appear in the first generation. This was the case with the hi-fin mutation in swordtails. If the affected fish is merely deformed, or if the mutation is recessive, the trait will not appear in the first generation. If the trait does not appear, the best plan is to mate the offspring back to the affected parent, or if the parent is no longer in breeding condition, to interbreed the offspring. If the variation is a mutation, some of the offspring of the second generation should show the trait. If the original variation was congenital, it will not appear in the second generation.

After a number of individuals are obtained which show the variation, it is usually a fairly simple matter to interbreed them to obtain a reasonably true-breeding strain. At this point, the new strain can usually be sold as it is if it is attractive. Also, the mutant characteristic can often be transferred to other varieties of the same species or to closely related species through interbreeding.

Before the breeder devotes time, space, and effort to such a project, he must ask himself if such a mutation, if that is what it is, is worth the effort needed to bring it to the marketplace. Certainly some mutations are downright ugly, while others are beautiful. One factor which should affect the breeder's thinking about a possible mutation is what the fish would look like if the variation were intensified. A slightly dusky variation might often be, by selective breeding, developed into a solid black. Rust colored mutations can often be developed into orange by the same procedure.

The marvelous thing about new mutations is that they are so completely democratic. A beginner is just as likely to have a mutation in his first hatching as an old pro is to have one in his thousandth.

And so, while the wind rattles my storm door like a feeble and unwanted visitor, I peer intently into my breeding tanks. Does that young betta have an odd-shaped tail fin? Does this platy look redder than the rest? Is it just my imagination, or are they mutations? I wonder.

Q. Recently my two beautiful bettas accidentally got together when I was not at home and the result was torn and shredded fins. Will the fins ever grow to their original size and beauty?

Jeff Honstain,
Miami, Florida.

A. The degree to which the original perfection will be attained very much depends on how you care for these males. There is a great tendency for scar tissue to form, resulting in clamped fins and crooked rays. To prevent this condition several steps should be taken: The fins which are damaged should be trimmed even with the body, keeping in mind, the closer this is done to the body, the less conspicuous the regrowth line will be; the fish should be kept in water to which a bactericide - fungicide has been added. It is also important that these males have the opportunity to display as much as possible so as to prevent the fins from growing back clossed. It will take from two to five months for the fins to approach their original length.

Q. Several weeks ago I set up three pairs of bettas in separate 5-gallon aquariums. Because the males did not seem especially pugnacious, the females were not placed behind a partition. After several weeks with no spawning results, I became discouraged and neglected my fish. After leaving these bettas without food for three days I noticed that the fins of the males were all torn up, but that the females were only slightly damaged. Why did these females do this and why did the males let them get away with it?

Steve Darling,
Peoria, Illinois.

A. *It is unfortunate that you neglected the fish in the first place, but you have an interesting question. It is difficult to know whether the fin damage was the result of fighting or whether it was the result of fin nipping as the result of hunger. We have long known that long finned males were no match for short finned males in a fight. No doubt females would have the same advantage if they had the fighting drive of the male, especially if the males were weakened by hunger.*

Q. I have kept a number of black bettas in a fairly dark location. They have plenty of light for feeding and displaying, but the location is too dark to grow plants. After being kept in this location for about six weeks, all of the black bettas have turned red. What happened?

Clyde Tester,
New York, New York.

A. *This observation has been made several times. Some blacks do fade in dark locations, but others do not. Dr. Gene Lucas of Drake University suspects that there are two genes for black, one of which changes red pigment to black and the other which results in the loss of red with an increase of the black pigment normally present. It would be the first group that would turn red. At any rate, it seems that the black pigment of some blacks is improved by being in the light. It might be the same principle that works in suntanning!*

Q. I have tried many times to spawn bettas but I have never succeeded. Many aquarists complain that they can't raise the fry. I can't even get eggs. The male builds a nest and the female is willing to be embraced but when she approaches the male he goes dashing around the aquarium like a nut. I have tried to follow breeding instructions to the letter, but no luck. This has happened with a number of males. Can you help me?

Mike Vande Veegaete
Thermopolis, Wyoming.

A. *Knowing your location, I can help you with one word: water. The water in your area is extremely hard and alkaline. If you hope to breed bettas, you must find a source of softer water. Ion exchange resins, while they are useful with some water, will not help you because the sodium build up needed to remove the calcium and magnesium from the water would be as bad a problem as that with which you started. Get a test kit and try to find a soft water spring in the area. If that fails, try snow water or distilled water. You can mix this with tap water at a ratio of one part tap water to three parts soft water.*