DELTA TALE

Official Publication of the
POTOMAC VALLEY AQUARIUM SOCIETY

Volume 31, Numbers 3 and 4

DELTA TALE

Volume 31, Numbers 3 - 4

Delta Tale is published bimonthly for the benefit of the membership of the POTOMAC VALLEY AQUARIUM SOCIETY, INC., a non-profit educational and social organization. The society was founded in 1960 for the purposes of furthering the aquarium hobby through the dissemination of information and advice, and the promotion of good fellowship among the membership by organized activities and competitions.

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Cover Photo: *Aphyosemion australe* "Orange" by PVAS Member Andrew Blumhagen

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Trading Post

For Sale: Plastic fish bags and back issues of aquarium magazines, many different titles. Send SASE for catalog to John Mangan, 12633 Oakwood Dr., Woodbridge, VA 22192.

Looking For: Wet Pets, Inc. is looking for full and part-time Aquarium Service Technicians. Experience in the hobby required, marine experience preferred. Vehicle and equipment provided. Great Pay! Call (301) 565-3474 for details.

From the Editors' Tank

Before I get started, It's late. It's really late. I'm sorry. Since we're behind, we are publishing two double issues to finish out the year. Fortunately we have great content for these two Delta Tales, as you'll see shortly. We're starting to get some articles from some different people and that's great! Not that we don't like the folks who submit lots of stuff, but it's good to get some variety. Keep it coming... Photographs are appreciated as well. New technology is allowing every copy to be first-generation so pictures should look clear and crisp.

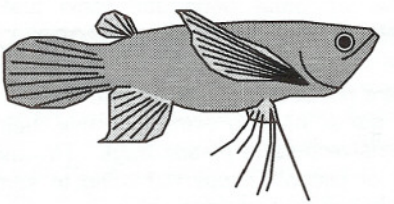
We have two items that we're especially excited about. Both are accounts of collecting. One's from Gene Aldridge, a longtime PVAS member, who gathered his notes from a 1987 trip to Peru with the American Cichlid Association and sent them to us for publication. After reading it, you'll exactly what to expect on a collecting trip on the Amazon, from the moment you step into the airport until you walk back in your front door. The other is from Shane Linder, a PVAS member who was recently transferred to Venezuela. Shane's been kind enough to send diary accounts of his collecting excursions. As you'll see in his collecting diaries, he's out every weekend. He hates living in Caracas, I can tell. Fortunately we have a front seat to all his adventures in fish collecting.

Thanks very much to Gene Moy for his line drawings of various fish. You'll see them scattered through this Delta Tale as well as many issues to come.

We have brought back the Trading Post. If you have anything you're looking for or selling, let us know and we'll print it.

So enjoy this double issue; see you at the auction.

delta@pvas.com



May 2000 Bowl Show

Dove Goldstein, our PVAS president took first place with a fine *Pseudotropheus* "tropheops red cheek". Second place went to Alysoun McLaughlin, part of our "Delta Tale" editor team, for her *Rasbora hetermorpha*. Third place went to yours truly, Don Kinyon, for an *Apistogramma mendezi* male. There were only four people entering fish in this month's show, with seven entries in all.

June 2000 Bowl Show: Rift Lake Cichlids

We had only one rift lake cichlid entered, an *Astatalapia bloyetti*, entered by Lorne Williams. Lorne also took second place in the "any other variety" class for his *Thorychthes ellioti*. First place went to Don Kinyon for a *Melanotaenia trifaciata* "Goyder River" rainbowfish, and third to Andrew Blumhagen for a very nice Cardinal Tetra, *Paracheriodon axelrodi*.

July 2000 Bowl Show: Killifish

There were seventeen entries by five hobbyists in this month's bowl show; a record as far as I know, at least as long as I've been taking care of them. Killifish were the featured family, of which we had four entries. Bill Pabst took first, second, and third place honors with his *Aphyosemion Gardneri*, *Epiplatys chaperi*, and *Aphyosemion sjostedti*, respectively. First place in the "any other variety" class went to Dov Goldstein with his *Haplochromis* sp. "porthole" and Lorne Williams placed second with an *Aulonocara malauna* "bicolor". Dov also took third with a *Haplochromis* sp. "44".

It was good to see so much interest in the bowl show. I hope this function of our monthly meetings continues its revival; it may spark an interest in a fish that may otherwise never have been realized.

Bowl Show results August 2000: Discus

There were no discus entered in the bowl show this month; I guess no one wanted to risk their prized and expensive pets in plastic bags. However, Joe and Duc of Global Discus did bring in some very nice specimens for us to see.

There were, however, eight entries by five members in the "any other variety" catagory. It was also encouraging to see two new participants in the bowl show competition. First place went to Don Kinyon for a male *Moema piriana*, second to Hank Darin for his male Bolivian ram, and third to Kelly Kinyon for a long-finned leopard danio. A mention must also be made of the huge Midas Cichlid that Lorne Williams entered. Though it didn't place this time, It's a beautiful fish and could not have been much fun to bring to the show.

September Bowl Show: Catfish

September's bowl show was another good one, with ten entries brought in by six individuals. The featured fish for the month was catfish (except Loricariidae). First place in the catfish category was taken by a *Corydoras Paleatus*, entered by Barbara McClorey, second; a Cory species "venezuela" by Don Kinyon, and third; a *Synodontis petricola*, by Lorne Williams. In the 'any other variety' category, first place went to Alysoun McLaughlin for her Congo tetra, *Phenacogrammus interruptus*, second to Don Kinyon for a "King tiger pleco" L-66, and third to Barbara McClorey for a female goodied.

Bowl Show Standings as of September, 2000

Don Kinyon, 43
Lorne Williams, 28
Dov Goldstein, 21
Andrew Blumhagen, 16
Francine Bethea, 11
Alysoun McLaughlin, 8
Bill Pabst, 7
Barbara McClorey, 7
Duc Lam, 4
Hank Darin, 4
Gene Moy, 3
Kelly Kinyon, 3
Dan Schueckler, 1

What's Happening?

December 11:

PVAS Holiday Dinner and Party. Bring a vegetable side dish or dessert. Party will be held at the John C. Wood facility (see back cover for directions).

Peruvian Amazonia

Part One of Two

Eugene T. Aldridge, Jr.

Saturday:

I started out at noon on June 27, 1987 on one of the greatest adventures of my life, going to the Amazon River Iquitos, Peru to collect tropical fish, by leaving for Dulles Airport. The first stop was Miami where I was to meet the other members of the group. My flight did not leave until 2:15 pm but I wanted to get to the airport with enough time to get something to eat, check in, pick up my seat assignment and get out to the mid-field terminal that United Airlines has at Dulles. I got something to eat at the snack bar as the sit-down restaurants would have taken too long. My carry-on luggage was a small bag containing a camera , a 28mm wide angle lens, two pair of underpants (to cover potential problems during 22 hours of flying or sitting in airports) and three pair of socks. All the rest was checked in a large cardboard box with two styros or in a medium size duffel bag. This included another camera, 20 rolls of film and other clothes and extras.

The flight left Dulles on time on time but it was six hours later that I landed in Miami. A normal flight takes about two and a half hours. We got to Miami on time only to get caught in the edges of a terrible thunderstorm. We were sent way out to sea in a holding pattern and were told that the airport had been closed because of the storm. After circling for about an hour the pilot told us that the airport had reopened for fifteen minutes but had closed again and he was going to have to land the plane somewhere to pick up fuel. From past experiences I knew the situation was not serious but the plane could not continue to circle for an extended period. We landed at West Palm Beach Airport for refueling and then sat for an hour. A little after 7:00 we left West Palm and arrived in Miami at 8:00 without further trouble.

A Sky Cap with a wheelchair picked me and my luggage up and took me to the Faucett Airlines ticket counter to check in get reissued tickets. Originally we were supposed to go directly to Iquitos from Miami and our tickets had been issued accordingly. However, two weeks before leaving we were advised that we would have to go though Lima. The Sky Cap took me to a closed counter and went behind to find a clerk. One arrived and asked me what I wanted. I told him and he took me away from all the hustle, told me to wait and he would be back in a few minutes with my tickets. There were people in droves waiting in line for tickets and seat assignments so the place was a madhouse. The Sky Cap needed the wheelchair so he found me a chair and left. In about 15 minutes the Faucett clerk returned with my new tickets and baggage checks and asked me to wait until 10:30 when someone would pick me up. It was now 9:00.

I did not see any members of my group, so I decided to I should get something to eat at a nearby snack bar. I ended up with an oversized hot dog and some lemonade. I took my time and watched all the traffic going to the Faucett counter. A few minutes after I finished eating I saw John O'Malley, one member of our group. I followed him to the ticket counter and, as there were no chairs, sat on the floor with many others. Shortly all of our group members had arrived except Paul Loiselle. There were ten of us going: Chuck Davis, Lee Finley, John and Jay Stankevitch, Gian Padovani, Wayne Liebel, John O'Malley, George Fear, Paul Loiselle and me. I watched all the carry-on luggage while they stood in line. At this point a young lady representing Holbrook Travel arrived to see if she could to see is she could do anything for us. During this time Paul arrived. With an hour before the airplane was to start boarding we went to a nearby bar for a drink. I had a Lite beer and took my time drinking it as I did not want to spend all night running to the john.

Close to boarding time we walked down to the gate. Luckily it wasn't far from the bar. I found a chair though most of them were full. At about 11:30 the started to board but since I had seat 2C, I was one of the last to get on the plane. The plane was a 727-200 with some 200 seats, all filled. The plane was so full that they asked whether someone would give up their seat. Not understanding Spanish, I asked Paul what happened later. I was after midnight when we finally got off the ground. After we had all settled we were given drinks and a light dinner. They had NO beer but the alcohol was free. For dinner we had a slice each of cotta-type salami, turkey and cheese with some coleslaw. After eating I tried in vain to get to sleep. Part was my fault for eating right before trying to sleep, part was that the seat size and foot room were smaller than I was

used to. Finally, behind me there were and man and wife with three teenage kids. The woman had been very loud telling the others where to put the luggage in the overhead racks with particular emphasis on where to put the one with the medicine. Then to make everything VERY NICE, every fifteen minutes or so one of them would get up to go to the bathroom or rummage around in the overhead compartments for something for the rest of the night. To keep from completely going nuts and doing something I should not do, I started to to write notes, in the dark, on what had happened so far.

Sunday:

A little after 3:00 am the plane landed in Panama City for 45 minutes to refuel. We were allowed to get off the plane if we wanted. A few did though I did not. Close to 5:00 we were given a breakfast of croissant with slices of ham and cheese, a small sweet roll, a fruit cup and coffee. At this point I switched my watch from Daylight Savings Time to Standard Time. We land in Lima at about 5:10. I was picked up in a wheelchair and waited for a long time for my luggage. I was then told that some of the luggage had been off-loaded in Miami as the plane was too heavy. Both of my checked pieces and one of John O'Malley's were in the off-loaded group. We were told that it would arrive in a few minutes as if had been loaded onto a cargo plane that left Miami at the same time we did. Well it didn't get there. We were met by a charming lady from a local travel agency acting for Holbrook. She took care of all the running around associated with my missing bags then filled out the required forms for me. John and I had to leave our passports and papers with her so our luggage could be collected and passed through customs. She took us to the other end of the airport and got us seat assignments for the flight to Iquitos.

This time the plane was a 737, and I had seat 1C. Luckily no one was in seats A and B so was able to get some pictures of the Andes mountains. The window was a little dirty and the sky slightly overcast so the pictures are not the best. The Andes are a range of mountains, most of them being well over 10,000 feet high. In some parts there are plateaus at 15,000 feet. During the two and a half hour flight from Lima to Iquitos, we played Bingo with a top prize of a ticket on any Faucett flight. I am sure there were limitations on the prize but didn't hear The numbers were called in both English and Spanish so you had to be careful and listen. The flight attendants on all the Faucett flights were both men and women and could speak English very well so getting any questions answered was easy. I was expecting Iquitos to be a small "back-water town" of maybe 5,000 people and was quite surprised to find out that this little "back-water town" was actually a city of 500,000. Oil had been discovered in the late 1960's on the east side of the Andes, near Ecuador's border, making Peru self-sufficient for petroleum products. The oil production and all that goes with it caused Iquitos to grow to this size in a little over ten years.

After landing there was no wheelchair so I slowly walked 200 or so feet to the terminal. My legs showed the effects of 22 hours in airplanes and airports. Those with luggage picked it up and we were then met by people from Amazon Camp, the group taking us on the river. We drove through Iquitos to the waterfront. The streets were in TERRIBLE with all kinds and sizes of potholes, some big enough to swallow a car. Luckily we didn't hit any. We saw a lot of cars, trucks, and taxis. Most of these were three-wheeled bicycles with double seats for passengers and little one or two cylinder lawnmower motors. They acted like they were driving big Mack trucks. The traffic was terrible with no one minding the lights or stop signs.

On arriving at the river, I looked down a 200-foot bank made up of rocks, logs and dripping water. I figured I would wait for everyone to get down as we had arrived at the same time as two other Amazon Camp buses. I was told to come on and that I'd be help down. I had a man on each arm and a third telling me where to put my feet. Under the circumstances I made it down without any trouble. The ten of us from the U.S. got on the M/V *Margarita* at about 10:00 am. At this point John and I asked about our missing luggage. He said he would do what he could but couldn't make any promises. He told us it would cost $200 for a speedboat to find us on the river and deliver the luggage. That was too expensive for me and others who hadn't lost their luggage offered us things to wear. If my luggage was really lost, everything but the passport could be replaced so what the heck!!! I found out later that we were talking to the company "worker bees" not the bosses and was sure that someone would hold on to the passport.

We had been advised before the trip that there was no real need to change dollars to Peruvian money since dollars were accepted everywhere. I took $70 in ones and another $75 in fives figuring it would give me plenty of small bills. At this point we discovered that we would have another passenger, Pat, a charming young lady from the company who would take pictures for advertising materials. Some of the group were a little unhappy but there was nothing that could be done at that point so we just went along.

Close to Noon we started down the Amazon River with our first stop just outside Iquitos at the Naval Base. It was necessary for the Navy to check our passports and approve some collecting papers. Luckily I remembered my passport number and it and my name were put on a sheet of paper along with the others. A company representative that got off the boat and went to a shack where a Naval Officer was stationed to have our papers approved. In a few minutes the officer in the shack came down and got on board so I was expecting trouble. However, in a couple of minutes I saw him leave with a piece of raw red meat. A little further down the river we dropped off the company man. No we really set off down the river where we were to spend the first night.

At this point Alfredo, the company trip leader, introduced himself, the "Tour Captain", Manuelo the "Boat Captain", Moises the Upper Deck Steward, Maria the Cook and the four guides. We were given a few rules for the road and told how were to get our drinks and be charged for them. Beer was one dollar for a 16-ounce bottle and soft drinks in the old-style 7-ounce bottles were fifty cents. It was a local Peruvian beer and tasted a little sweet to me. The M/V *Margarita* is a typical Amazon River tour boat, 76 feet long and 21 feet wide. The lower deck is used for embarking and disembarking, storage for the ship's gear and small boats. There was a sign on the lower deck indicating that no shoes were allowed on the upper deck, only flip-flops or shower thongs. An exception was made for me for which I was very grateful as my brace had become necessary for me. The upper deck has four cabins with an upper and lower bunk and two cabins with three bunks. The bathroom facilities are communal with three toilet shower combinations and three sinks. The rest of the main deck is open. We selected our cabin mates. Paul Loiselle and I shared a cabin as we had on a previous trip to Costa Rica. Gratefully Paul took the top bunk so I would not have to climb. There wasn't much room between bunks, maybe two feet, so I couldn't sit up straight.

We are now going down the river at a fairly good clip of eight to ten knots. We passed by the place where the Napo River comes into Amazon. The Napo is a large, black water river which shows very clearly coming well out into the Amazon. Until you see these rivers you have no concept of the size of them. The Amazon River at this point is roughly two miles wide and some of its tributaries are just as wide. We stopped for the night at a small village called Oran one the river and tied up close to the bank, no more than five or six feet. The villagers all came down to see us and the boat. The crew seemed to know all of them so there was a lot of give and take talking. For dinner we had Pacu in a very good, mild cajun-type sauce, a local short-grain rice, a salad and fruit for dessert. The fish had been cut into one to two-inch cubes was very good. I wish I had gotten the recipe for the sauce, it was that good. It would also have been fun to try at home. We had some variety of fish at least once a day for the whole trip. Though most of the group got off to visit or to go for a walk through the forest, I did not go ashore, as the bank was 15 to 18 feet up over rocks and mud. I later learned that the walk was pretty rough even if I had gotten up the bank. Some of the men stayed on shore for a long time playing a game up on a field that I couldn't see. Later on they had a celebration with the natives. The small children and most of the girls and women stayed on the shore by the boat until way after dark. They were quite good-looking, reminding me of the Western American Indians. Paul told me they were from the same stock coming out of South China ages ago and settled most of Polynesia. The young girls were quite nice looking and in my mind stand up to any of our girls until their late teens or early twenties but the hard life they lead takes its toll early. Most of the homes I saw were up off the ground on piles, with what looked like log floors and thatch walls and roofs. Most had a covered proch and maybe a window but with no glass or screen. Some of the houses were fancier than others but nothing like we're used to. From what I could see, most were neat and clean.

Everything was quite lush and green giving evidence of a great deal of rain and moisture. We are now in one of the largest rain forests in the world covering about 2.5 million square miles, equal to the United States west of the Mississippi River. Every minute the Amazon River system discharges enough water into the Atlantic Ocean to supply New York City for nine years. The Amazon River is 4,000 miles long and includes a system of 200 major tributaries. Seventeen of these are more than 1,000 miles long and ten discharge more water than the Mississippi. The mosquitoes come out about an hour before sunset and stay for a couple of hours so there was an urgent need for mosquito repellent. Luckily, someone shared with me. Certain types of mosquitoes carry two strains of malaria so you have to be prepared. Any doctor can give you a prescription for malaria pills and something for the ever present and Montezuma's Revenge. We were advised to eat only food on the boat, as it was carefully prepared, and to drink ONLY bottled water. The boat had water that came from the local Iquitos Coca-Cola bottling plant. Alfredo told us they did big business in bottled water. They would take the local water and do everything to it: filter, boil, chlorinate and purify it for use in soda. The bottled water tasted even better than the water we get in Arlington.

About a quarter of a mile upriver from where we stayed for the night there was a small, black water stream coming into the river. It looked like a nice place to go and collect fish, but we were told there was not enough time to go there. At about 10:00 pm I went to bed smelling terrible from sweat and mosquito repellent. I am very reluctant to go around much at night without my shoes so I just went to bed stinking.

Monday:

In the morning the air was HEAVY and wet even without rain. It burned off as the sun came up. Very early we left Oran and went to the stream we had seen the night before to fill up shower and toilet tanks on the roof of the upper deck. Then we went down to the Apayacu River and tied up at about 9:00 am. We broke up into groups and went into various small streams to collect fish. I went with John S., Jay S. and Paul. Were in a 14 to 15 foot aluminum boat with a 25 horsepower outboard motor. We ended up in a stream about 45 minutes away from main boat. The water was a little high so some of the tree roots were submerged, providing plenty of places for fish to hide. There were broken trees at the mouth of the stream and the water had a pH of 6.1 and a conductivity of 28 microsiemens (a factor relating to hardness). After going up the stream about 300 yards, the pH dropped to 5.8 and conductivity to between 8 and 9 microsiemens. We netted and kept pencilfish, several species of hatchetfish and several species of *Apistogramma* at each spot we collected. Our guide caught a beautiful Morpho butterfly that was as big as the palm of my hand. The top of the wings were dark sky blue with black edging and the bottom of the wings were paisley. We ended up back at the *Margarita* in time for lunch. After lunch the group went back to different streams but I stayed on the boat as I wasn't feeling well. Sufficient fish of edible size were caught by various group members during the morning and afternoon trips to provide food for several days. Included in the catch were Pacu, Red-Belly Piranha, *Cichla ocellaris* and a big rainbow colored bass, one of which weighed well over five pounds.

A night trip was planned to go and look for Cayman. Those going were divided up into three boats and they left with flashlights. They went off in different directions so as to have a better chance at seeing Cayman. I don't know whether they are endangered but special permits are required to get them out of Peru and into this country. In two hours the boats returned. All had seen Cayman but some only briefly. Chuck Davis came back with a baby, about ten inches long. After everyone looked at it, took pictures, and played with it he released it. While the others were away I took a shower and put on some loaned fresh clothes. It felt good to get rid of all the sweat and bug repellent. At about 10:30 I went to bed and slept very well.

Tuesday:

We woke up to a steady rain called a "female rain" by the natives. A "male rain" is short, perhaps lasting ten minutes. The plan for the day day called for us to go to the Madre Selva Forest Reserve and Lake Atun Cocha for lunch, returning in time for dinner. The trip in small boats would have taken more than five hours. The way it was raining none of us wanted to go. It would have been nice but the rain made it out of the question for me; I didn't want to get wet. It rained all morning and very hard at

times. During this time Lee Finley caught about fifteen Red-Belly Piranhas. After Noon it cleared up so we made plans to go to some local sites.

After Lunch I went with Paul, John S., Gian (John) P. and Alfredo to a new lake-type area off of the Apayacu River. Paul and John S. went ashore to observe and collect specimens for an hour. The rest of us went out into the middle of the lake and fished with rods and reels. Alfredo was the only one to catch anything: six *Cichla ocellaris* (10 to 12"), two Chocolate Cichlids (3" and 6") and two Red-belly Piranha (6"). At the agreed time we picked Paul and John. Another group stayed close to the M/V *Margarita* and using one of the small boats under paddle power went up a small black water stream. They caught a dozen twelve to fourteen inch plecos. After everyone saw and photographed them they were given to the local kids that were always around the boat. Some of the kids were no more than two or three years old and those as young as six or seven were fishing. At this point I took a shower. Alfredo had told John O. that Maria would wash some clothes for us if we wanted. We both did so I got some things ready for her.

In the late afternoon, after everyone had returned from the various trips, a great deal of trading went on. A dirty T-shirt with any sort of design on it was worth a used canoe paddle. New paddles took a little more. Since I didn't have any T-shirts, Chuck gave me one with a St. Patrick's Day party logo from a North Jersey beer joint so I could get a paddle. Mine was well used and is a super reminder of the trip. In the end we all got paddles and some even bought local woodcarvings. After dinner the trading went on. Another group also went out looking for Cayman. They were successful but brought none back. My paddle is now dried out and was been painted with poly wood sealer so it will not crack. They are made out of a type of rose wood and are okay when they are new or wet, but when they dry they crack and break up. The water around the boat is full of *Prochodilus insignus* (red-striped) and *P. taeniurus* (silver siders, no real color). There were also many Hachetfish. After spending a good part of the day in the sun, I went to bed at 11:00 and got a good night's sleep.

Wednesday:

In the morning, we left the Apayacu River to return to the Amazon River and then went up the Oraza River and stopped. We were to go in the small boats across the river to see birds and water lilies. There was a great deal of walking to be done so I stayed on the boat. It would have been fun to go but I had to be careful not to get my shoes wet. The left at about 9:00. The bank at which we were tied was 12 to 15 feet height and it was clear that the water had been 12 feet or more. The bank also had many catfish holes, many of them six inches in diameter or more. I was borrowing clothes from the half the group so I could at least put fresh clothes on daily. The half not helping wore a size too small for me. Lee Finley was good enough to loan me 5 rolls of film, so at least I could take some pictures. I spent most of the time getting my notes up to date. In the three days we were on the Amazon and Apayacu Rivers the water level hs dropped 18 inches and it showed on all banks. Alfredo brought back with him a big blooming lily. We kept it on the table for a couple days and watched beetles come out of the open flower. Everyone returned to the boat at about 10:30 so we continued up on the river toward Oran, the village where we spent the first night. It took three hours to get there.

There were two activities planned for the rest of the afternoon One was a four or five mile walk through the jungle with some fish collecting; the other was a small boat trip up the little black water stream we had seen on Sunday. Chuck, John O., Paul and I went in two boats with Teddy and Hernando as crew and Sandigo as a guide. We went several miles upstream and pushed and pulled our way through patches of river junk, cane and Morning Glory. We went by a lot of rain forest jungle so I got to see and be close to the jungle without actually walking in it. Along the shore we caught and kept Whiptail, Banjo and other catfish, Apistos in breeding color. We also returned Hatchetfish, Pikes, Piranhas, shrimp and freshwater crabs. No Corys were found. The consensus of the crew and guide was that we were about two weeks too early for Corys. While we were in a clearing beyond the river junk we saw a large bird that we found out later, after looking in a bird book, was a *Opisthovomos hoatzn*, a large scavenger. It was quite majestic with its black feathers and long neck. The noise it made was hard to believe, much like the honk of a car horn. On returning to the M/V *Margarita* we had to push and pull the boats through the same junk. On the return trip it started to rain and we all got soaked.

Continued on page 12

My First Reef Aquarium

Part One of Two

Andrew Blumhagen

Editor's Note: When this article was first printed in Volume 31, Number 2 of the Delta Tale a portion of the article was cut out of the middle. It appears here in its complete form.

What do you think of when you imagine a captive coral reef? Certainly the beautiful colors, variety of shapes and alien textures of living corals come to mind, as do flashes of the gaudy hues of small fish darting in and out of their hiding places. A closer look might reveal comical hermit crabs picking tiny delicacies from the rock and snails grazing on an invisible layer of algae. Perhaps a feather duster worm suddenly retracts its delicate tentacles as it senses your shadow, or a shrimp dances in the current as its antennae sweep the environs looking for its next meal. But as soon as you are entrenched in this underwater reverie, you realize that the equipment alone for this wonderful creation costs more than half a year's rent and that the invertebrates are more sensitive than wild-caught discus - ready to crash spectacularly the moment your visiting mother-in-law sneezes in the wrong direction. The plumbing looks like the inner workings of a steam engine, the fish never seem to last for more than two weeks and the water chemistry would baffle a Nobel laureate. Who needs the trouble when you can go to a public aquarium and see the same magic without the hassle? Heck, even a SCUBA tour of the Solomon Islands would be cheaper! Well, believe it or not, you're now going to learn how to re-create this delicate but beautiful environment for about two hundred dollars and one hour of maintenance each month.

Equipment:

The micro-reef aquarium described here is centered around the Eclipse System Six. The Eclipse incorporates the tank, hood, filter and light into a compact unit that sits on any flat surface capable of supporting 75 pounds. It measures 16" long by 8" deep by 14.5" tall and holds (you guessed it!) six gallons of water. The front curves outward to create a magnifying effect and the sides taper slightly towards the rear. The tank's construction of high-quality acrylic also enhances the appearance of the system. The hood contains an 8-watt fluorescent light completely covered by a plastic shield, a small pump that feeds the filter, a floss and carbon cartridge, and a Biowheel. The hood is completely sealed so that the reef critters stay in the tank and everything else stays out. The Eclipse System Six retails for approximately $60.

As small and simple as the Eclipse System Six is, it performs all of the functions necessary to sustain a simple coral reef aquarium. The fluorescent bulb is bright enough for hardy corals and other sessile invertebrates that will be described later. The bulb included with the Eclipse is a broad-spectrum daylight bulb that is perfect for the reef, however a bulb with a stronger blue spectrum, such as a Power-Glo bulb, which will set off the inflorescence of certain corals may be substituted. The purpose of the floss and carbon cartridge is fairly obvious, though it's important to maintain fresh carbon in a small system such as this to absorb accumulations of dissolved organic material. The Biowheel provides efficient wet/dry filtration for the system and keeps the water well aerated. Due to the inherently high amounts of dissolved solids in saltwater, it holds much less dissolved oxygen than freshwater does, therefore the Biowheel becomes an essential component of the system.

If the system is placed in a room where the ambient temperature drops below 70°, a small, submersible heater will be needed. A 25 watt VisiTherm heater, which retails for about $15, is ideal. The optimum temperature is 75°, but keep in mind that the light and pump will add about four degrees to the system. A timer for the light is essential, as a consistent photo period of 11 to 12 hours per day is necessary to maintain healthy corals. The timer can be purchased at any hardware stores for about $5. This is all the equipment required for the reef aquarium, except for certain maintenance items that will be discussed later. So far, we've only spent $80.

Furnishings:

What makes a reef tank a reef tank? Primarily, it's the presence of live rock. Live rock, as its name implies, is coral skeletons that have become inhabited by bacteria; micro and macroalgae; worms; sessile invertebrates, like corals, anemones, sponges, crustaceans and other marine organisms.

It serves as the building blocks for your reef, as well as fulfilling a number of other important functions. Most important is the biological function it performs. Live rock actually reduces organic wastes from the fish and other animals living in the aquarium. The coralline algae (pink, purple or red microalgae with calcareous or calcium-containing cell walls) absorb nitrogen and phosphorous just as live plants do in a freshwater aquarium. In addition, live rock is full of holes, tunnels and crevices. These provide perfect habitats for denitrifying bacteria. In the outside of the hole, aerobic bacteria perform the familiar nitrification process (which is the same in saltwater as it is in fresh, though with different bacteria species) of converting ammonia into nitrites, then nitrites into nitrates. Toward the back of the hole where oxygen has become scarce, denitrifying anaerobic bacteria complete the cycle, converting nitrates into nitrogen gas. In addition to providing habitats for your animals, plants and bacteria, live rock also introduces a wide variety of organisms into your tank. These provide a diversity of organisms that can serve as food to other reef inhabitants but mostly delight the aquarist as they are observed popping out of nowhere and growing into recognizable forms.

In this system, six to eight pounds of live rock will be needed. It's important to remember that the corals to be added to the system will come attached to live rock as well. Four or five pounds of live rock is a good starting point. To select live rock, use your eyes and your nose. Look first for rock encrusted with coralline alga. Coralline alga is an extremely important component of the reef system. It is distinctively pink, red or purple and feels like wet chalk. In addition to removing organic wastes, it prevents unwanted algae from taking charge of the tank as other algae are not able to grow on top of it. Next look for other organisms attached to the rock. Macroalgae (seaweed) is good for the tank and aesthetically pleasing. Live corals, sponges, tubeworms, snails and other animals are generally desirable as well. Basically, the best live rock is the live rock with as much "stuff" growing on it as possible. Look also for interesting shapes that will be used to construct the reef. After looking at the live rock, give it a good sniff. If it smells foul, don't buy it. It should smell like a clear ocean breeze, not a rotting pile of seaweed or a bait bucket that's been left in the sun. Premium live rock tends to cost between $5 and $7 per pound.

No furnishings other than live rock are needed for the system, however it may be more aesthetically pleasing to cover the bottom of the aquarium with gravel instead of keeping a bare tank floor. Use a small amount of crushed coral or aragonite gravel, at most 1/2" thick, preferably 1/4" or less. The size of the gravel does not particularly matter for the thin layer that will be used here. So far the total cost of the system is about $130.

Setting Up:

The obvious first step is to select a location for your micro-reef. It should be placed where it is easily viewed and readily accessible for feeding and maintenance. Direct sunlight should be avoided; it may cause undesirable algae growth on the acrylic and sudden spikes in water temperature. As mentioned above, any flat, sturdy surface that will support 75 pounds is perfect. This can be a dresser in the bedroom, a desk at work, the kitchen counter, or the top of a toilet tank. The easiest way to test whether the surface will hold the aquarium is to sit on it first. If it breaks, find another surface. If it doesn't, it's plenty strong.

The quality of the water used in the micro-reef is extremely important. The presence of organic chemicals, pesticides, chlorine, and fertilizers will assuredly ruin your hopes for a healthy reef in spectacular fashion. Similarly, traces of metals in the water like copper, iron, lead or mercury will destroy your invertebrates and likely your fish as well. While it might be assumed that the water is safe simply because it comes from the tap, a review of a printout from the local water company will probably be enough to warrant another source of water. It is probably wisest to use a de-ionization or reverse osmosis filter on the water to be used in the reef. If these are not available, distilled water can be purchased at the drug or grocery store. It's only a six- gallon tank, after all.

The salt mix must also be of the highest quality. Tropic Marin and Reef Crystals are premium salt mixes which contain all of the necessary trace elements and buffers for a healthy micro-reef. A bag of premium salt mix that makes fifty gallons of saltwater costs less than $20. A hydrometer will be needed for mixing the salt with the water to the appropriate salinity. This is a device that measures

the specific gravity (spg) of the water, thereby indicating how much salt is dissolved in the water. A SeaTest hydrometer made by Aquarium Systems is sufficient for our purposes and costs about $12. It must be mentioned that specific gravity and salinity are two completely different attributes of water. Salinity is the measurement of dissolved ions in the water. Specific gravity is the density of the water (weight/volume). For the purposes of keeping a relatively simple microreef the distinction is not particularly important.

Now, we're ready to fill the Eclipse. Start by mixing five gallons of saltwater in a five-gallon bucket. This may not be quite as easy as it seems. The first time you mix saltwater, use a set of measuring cups. For five gallons of water at least a cup of salt mix will be needed. Mix the salt into the water with clean hands (free of soap, hair products, nicotine, grease or anything else). A long-handled spoon or other mixing device could theoretically be used but it's not likely that the hands will stay dry anyway during setup or regular maintenance. The water will initially be white and cloudy. Let it sit until it clears, then measure the specific gravity with the hydrometer. The target spg will be 1.022 to 1.023. This is slightly higher than might be used in a fish-only aquarium but slightly lower than the average spg of the tropical oceans. If needed, add additional salt mix in small increments, each time allowing the salt to completely dissolve before measuring. Keep track of how much salt is put in each increment and when the target is reached, add up the increments so that the amount of salt mix needed for five gallons of water can be recorded or memorized.

Pour about half the water into the Eclipse and set aside the rest for the moment. If any gravel is to be used it should be added at this point. Make sure it is very well rinsed or it will cloud the water and leave nasty-looking deposits on the inside of the acrylic. Now the tank is ready for live rock. Remove any wrapping that the live rock may have come with and simply place it in the tank. The live rock should be stacked to about two thirds the height of the aquarium. Be creative in this process; all too often reef tanks look like they were assembled like brick walls, unnatural and regular like they were, well, man-made. Use a good amount of time turning the rocks all different directions, making caves, coves, spires, shelves and other features that the inhabitants will eventually weave in and out of, or perhaps claim as their exclusive territory. Pieces of live rock often have a "good side" with noticeably more organisms growing on it. Put that side facing out and up so that the organisms can be viewed, and will receive the light that feeds them. The reef should not actually touch any of the walls of the tank as this will likely create dead spots devoid of essential water circulation. Take care that the rocks are stable since a freak landslide may kill prized corals or shrimp. To check, give the stack a gentle push from several different directions to make sure they're securely in place. It will be very difficult to rearrange the rocks once the reef is established, so make sure that reef the looks good, even without animals. Once the reef is built, add the remainder of the water and place the hood on the tank. Turn on the filter and let it run for a few days before turning on the light.

Now comes the hard part, the waiting game. Live rock often needs a good amount of time to "cure" once it's in the aquarium. Some of the organisms on the rock die from the stress of transportation and changes in water. The rotting corpses cause nutrient spikes, creating an environment that will not support any of the animals that the reef will eventually maintain. One of the best ways to measure the curing process is by watching alga growth on the tank walls and on the rocks. Initially, algae will grow very quickly. As the live rock cures, it will slow down to a manageable level with regular maintenance. While the live rock is curing, water changes of about two gallons every week may be needed to reduce nutrient levels in the tank. Once alga growth slows down, it's time to start adding animals to the tank.

There are two problem algae to watch out for during this period and during regular maintenance. Cyanobacteria is readily recognizable. It coats the substrate and furnishings in an ugly layer in a variety of colors from blue-green to red to black, hence its more common name, slime algae. Fortunately it is easily removed. Simply start a siphon with a narrow, flexible tube and suck it right off the substrate. Replace the waste water with newly mixed saltwater. Slime algae are not only ugly, but they can smother other beneficial organisms blocking light and nutrients. The other problem algae are filamentous or hair algae.

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Venezuela Collecting Diary

R. Shane Linder

September 2, 2000

From Caracas we traveled south down the Cordillera de la Costa towards the Northern Llanos. Basically, this journey brings you down from the mountains to the large flat plains known as the Llanos. Several rivers drain south down these slopes into the mighty Orinoco. I drove as far south as El Sombrero in the Northern Llanos. Unfortunately, since it is still the wet season, I found collecting here impossible. These flooded plains are just saturated mud at this time of year and it is impossible to get near any water without sinking dangerously deep in the mud. I attempted collecting in one roadside creek and quickly found myself knee deep in the mud and stuck. The mud was so thick that it literally sucked one of my sandals off of my foot. This made me mad as these were my collecting sandals which I have always used collecting from the States to Ecuador. At this point I decided to leave the Llanos until the dry season and headed north back into the mountains.

The next collecting location was the Rio Pao just outside of San Sabastian. The Rio had a small amount of current and was muddy brown with sediment (as are most rivers in the wet season). The water temp was near 80F and the Rio was about 15-20 feet wide. The typical depth was 6-12 inches with deep areas near cutbanks. By running a four foot by four foot seine along the shallows I was able to collect wild guppies and a number of cichlids. I seined the outside cutbanks where there were many overhanging land plants and managed to collect a fair number of *Farlowella*. The water was about two feet deep on the outside banks. Also collected was a small (2 inch) *Hypostomus* sp. This fish was collected from the center of the creek in the strongest rapids by basically pure luck. It got caught in my net as I was crossing the river. I continued up the mountains towards Caracas and stopped to sample the Rio Zuata in the village of San Casimiro. The collecting site was beautiful. A crystal clear mountain stream with a bed of fist-sized rocks. By seining near the banks I turned up pike cichlids, Hoplias, and a small species of tetra. In the main rapids I was able to collect a *Chaetostoma* sp. by kick seining. Although this was the most beautiful place to collect, it was also difficult. In the clear water the fishes could see me from far away and scatter. I saw many loricariids (sp. unknown) scramble away from me. I plan to try this site again with a 12 seine which should work much better.

September 4, 2000

On Monday I headed east out of Caracas through the towns of Guatire and Caucaqua. There were beautiful rivers, but they were still too full of mountain run off to attempt to collect from. At this point I headed west towards Santa Teresa along the Rio Tuy. Just outside of Santa Teresa I collected at a spot where a creek enters the Tuy. The beautiful creek was unproductive so I kept moving towards the juncture of the creek and river. The silt from the creek was piled high at the juncture and I sunk 3-4 inches deep with every step. The mud flats also smelled to high heaven! Surpassingly, seining the mud flats was very productive. Every net (4 ft by 4 ft seine) brought up 2-3 *Corydoras aeneus*. All fish were adults of about two inches. I retained 5 for myself. Interestingly, Caracas is listed as the collection location of the holotype of *C. aeneus*. My guess is that the holotype was collected in the Rio Guaire that flows through Caracas. However, this river is no so polluted that no fish could live in it. The Guaire flows out of Caracas and joins the Tuy. Since I was collecting *C. aeneus* as close to the Guaire as it is possible, the *C. aeneus* I have should be as close as is possible to the actual holotype of *C. aeneus*. *C. aeneus* from the wild are beautiful! They are a true bright metallic bronze color. You have to have collected this fish from the wild to know what I mean about the color. The last highlight of this spot was that I collected a huge (7-8 inches SL) *Hypostomus*. This fish was collected against the mud bank at the confluence of the creek and the river. Several small cichlids were collected as well, but no tetras.

September 9, 2000

I headed south to Embalse Camatagua about 1.5 hours from Caracas. Camatagua is a huge resevoir famous for peacock bass (various *Cichla* spp. and not Bass at all) fishing. I scouted out the area where the Rio Guarico exits the lake and it was teeming with fish. The main problem with collecting there was that the river is choked with aquatic vegetation. The vegetation is mainly *Elodea*, but there are many

other species of plants growing here. I headed south along the lake to a small creek not on the map. The creek appears to be a small tributary of the Rio Camatagua and is referred to by the locals as Quebrada Camataguita (translation: little Camatagua stream). A bridge crosses the stream and provides a nice collecting location.

Two small boys were on the bridge fishing with a tiny hook and what looked like large bloodworms for bait. They had collected a cichlid lovers dream with their little hooks. Most of their catch were large tetras, Acara, pike cichlids, and what appeared to be *Biotodoma* and Festivums. There were also spp. of cichlid that I could not identify and Hoplias. Collecting the stream with a 4 foot seine turned up numerous species of cichlids and tetras. The catch of the day was a small *Rineloricaria*-type loricariid about three inches in length. There were also various *Leoprinus*-looking fishes that proved too fast to capture. I came across one large (six inch) *Hypostomus* species but could not catch it. The fish kept moving around a large rock in the middle of the stream and I kept chasing it around the rock, but the pleco always faster than I. Also, at this location I caught some large (2-3 inch) freshwater shrimps. The water in this location was crystal clear with a stream bed of gravel and small rocks. The stream was 4-6 feet wide in the riffles with a pool every 10-15 feet. The pools were 15-30 feet in diameter and from 2-4 feet deep. The pools were home to the various cichlids and many tetras. Other tetras, pike cichlids, loricariids, and Hoplias were found mainly in the riffle sections. The water was very warm (about 80F) except in a few shaded pools that were no longer connected to the main stream. These pools turned up guppies, a few small cichlid fry, and a young Hoplias about 2 inches long. The temperature in the shaded pools was about 76F.

I took video footage of the stream and the fishes collected before returning them to the creek. I hope to return to this location soon with a scuba mask and a large hand net in hopes of snorkeling the pools and collecting from them. They are too deep to be collected with a small seine. I also am convinced that I need to modify my nets with larger heavier weights on the bottom. Since so many loricariids stay so close to substrate, they often swim right under my net. Hopefully larger weights will better anchor the net to the substrate and prevent some of this.

September 17, 2000

I drove south out of Caracas to the Rio Zuata. Just south of the little village of San Casimiro the road crosses the Rio Zuata. I collected from the bridge to about 500 yards downstream. On my last trip to this spot I had wondered up the river. Last week's rains had greatly changed the river. Instead of being a lazy crystal-clear stream it had become a fairly fast moving small river and the water was heavy with sediment. Perhaps the greatest surprise was the change in temperature. On my last visit I estimated the temperature to be near 80F. The rains had greatly cooled the river and I estimated the temperature to be near 70F. Near the bridge I collected net after net of the ubiquitous guppies and some tetras. I have found only one species of tetra in this river and have yet to identify it to species. The tetra is an overall silver with a single black stripe running from the operculum to the caudal peduncle. At the caudal peduncle, both above and below the stripe, are two bright red circular markings. These tetras are always caught singly which leads me to believe that they are not a schooling species. The largest specimen captured was about 2 inches SL.

About 100 feet downstream there were a number of plants hanging down into the water from the riverbank. I collected this area with my seine and caught three small loricariids. All three are less than one inch and appear to be fry of a *Hypostomus*-like species. I kept all three and will raise them up to see what they turn out to be. This collecting location has to be the best in the world for pike cichlids and I caught many on this trip. There are at least two (or possibly more) distinct species. The cichlid catch of the day was a 10 inch (SL) pike. One species has an ocelli on the caudal fin and lots of orange color. The second has bright red on the dorsal and gill covers. The giant pike was the second, red, type. The greatest discovery of the day was a new *Chaetostoma* sp. that I had not caught previously. This fish is by far the most attractive *Chaetostoma* sp. I have ever seen. The body is an overall dark green with white spots. A thick yellow/white stripe runs down both the caudal and dorsal fins in a manner similar to that of the various *Baryancistrus* spp. The *Chaetostoma* were only captured in the strongest riffles by kick seining.

Luckily, my strange actions in the river brought a few local children to investigate. I took video footage of them and played it back for them to see on the camcorder's flip out screen. Needless to say I was a big hit. I ended up with three small boys and one girl that had a monkey on a leash as fishing companions. The boys quickly grasped how to use the seine and were a great help. I kept and photographed all of the loricariids and they kept all of the pike cichlids for dinner. The boys showed me how they collect loricariids by reaching under rocks and feeling for them. When a fish is felt it is quickly snatched up. Of course, to utilize this method you have to be brave enough to stick your hands into underwater holes in the jungle. They boys told me that the loricariids are turned loose in people's cisterns (rain water reservoirs) in order to eat the algae and keep the reservoirs clean. The last mentionable catch was a large (8 inch SL) pimelodid that appeared to belong to the genus *Rhamdia*. The fish was basically an overall dappled gray with no other markings. Since the large pim was caught under a rock, I realized that I would never try the boy's method for hand catching loricariids. I would bet that a pim that large could pack quite a sting. I became weary of pim stings in Ecuador when I noticed that the fishermen were doing anything not to touch any pims in their nets. I have always figured that they knew what they were doing since they likely learned from experience.

October 9, 2000

I traveled east of Caracas down along the Rio Tuy drainage system. We had driven along this route the weekend before on our way to the beach at Puerto La Cruz and the numerous potential collecting locations I had spotted had me very excited to return. I traveled east of Caracas for about 1.5 hours and crossed the Rio Tuy on Highway 9 near the village of El Clavo. A few kilometers beyond the Tuy is the Cano Canoa. A few notes on Venezuelan terms for rivers, streams, lakes, etc.: the term Quebrada (kay-broad-ah) is applied to streams with a fair amount of current. These are usually located in the highlands. The term Cano (can-yo) is applied to lowland streams with a slack current. the term rio (river) is used in the highlands and lowlands for rivers and streams that remain fairly constant year round and are not radically effected between the dry and wet seasons. The term Lago (lake) is used for natural lakes while the term Embalse (im-ball-say) is the equivalent of a reservoir. Cano Canoa (can-yo can-oh-ah or Canoe Creek) is a meandering stream that flows north into the Rio Tuy. The stream varies from 15 to 5 feet wide and gently flows through a series of pools up to 30 feet wide. The water is fairly clear with a slight tint. I would estimate water parameters to be: pH near neutral, very soft, and about 80F. The bed is composed of sand/ mud in the pools and small rocks in the stretches between pools. Since the stream flows through thick jungle, there is a fair amount of driftwood and sunken logs. In one large pool I collected numerous tetras of 4-5 different species. Among these was one species that grows rather large (possibly *Astanyx bimaculatus*) and I captured one that measured a good 5 inches SL. Also in the pool was a school of *Corydoras aeneus* fry less than one inch in length. Since the water was fairly clear, I could actually watch the little fellows swim right under my 4' by 4' seine. Despite my best attempts, I only managed to catch one *C. aeneus*. Julio Melgar suggested that I affix a motorcycle chain across the bottom of the seine for extra weight. This sounds like a great idea and I plan to try it soon.

The ubiquitous cichlids I normally come across were strangely absent from this location. The sole cichlid catch of the day was a 7 inch (SL) pike cichlid (more on this later). This fish was clearly a different species from the two species I normally encounter in the Rio Zuata drainage. The lack of cichlids, however, was well made up for by the abundance of catfishes. In the small riffle between two pools I captured a beautiful *Ancistrus* that looks like no other species I have ever seen. The fish is about 3.5 inches SL and the overall body is a slate gray (like *Panaque nigrolineatus*). The body is decorated with irregular black stripes that run horizontally. The overall coloration reminds me of *P. nigrolineatus*, but the stripes are irregular and broken. A very attractive fish and I plan to return to this location so I can collect a spawning colony.

I eventually met up with Jose and Jesus two local fisherman. Jesus went to his home and returned with a cast net and a hoop net. Neither of these was as successful as my seine, so Jesus decided to show me how to really do it right. Jesus waded into one of the pools up to his chest and then dove under the water. About 10 seconds later he surfaced with a 6 inch *Rhamdia* in his hand! In five or so dives he had collected 3 *Rhamdia* and the pike cichlid. I

asked him to explain to me how he was catching the fish and he demonstrated on the mud bank above the water. Jesus dives down and feels for holes in the bank with his hands. When he feels one of the proper size he sticks his hand in the hole and pulls out whatever is in there. Since most of what he was collecting were pimelodids that pack a nasty sting, I declined to try this method myself. However, with this method Jesus broughtup the catch of the day, a foot long Loricaria. This was also a great area for inverts and we collected many huge freshwater shrimps. These were the largest shrimps I have ever seen and measured up to 9 inches in total length. The shrimp are an overall dark brown and quite attractive. Also collected were huge apple snails the size of baseballs.

By 11:00am it was too hot to collect so we all sat down to take a well-deserved break. The jungle in this area is just stunning with wild orchids growing everywhere. I handed out American cigarettes and Jose climbed a tree and picked a cacao fruit. Among the subsistence people in this area cacao is very important. Nearly everyone collects cacao in the morning and dries the seeds through the day. The following day they walk out to the highway and sell the dried beans for hard currency. The cacao bean (from which chocolate is made) is too bitter to eat raw, but the fruit that surrounds the bean is sweet and delicious. After sucking the fruit from the beans we spit them in a pile. Jose then collected the beans and put them in his pocket. Undoubtedly to be dried and sold. I took home the smallest *Rhamdia*, the *Ancistrus*, the one Cory, and the giant Loricaria species. I also took a few of the various tetras. All fishes survived the trip well and the *Ancistrus* has already taken to cucumber. This is certainly a location I will return to for more *Ancistrus* and Loricaria. Thanks to friend, and fellow Potomac Valley Aquarium Society member, Francine Bethea I know have both 8 and 12 foot seines as well as two wire minnow traps. I believe that the baited minnow traps, left out over night, will be fantastic catfish catching machines. The longer nets will also allow me to return and sample places for which a 4 foot net is just not adequate.

Below is a list of the catfishes I have collected so far:

Rineloricaria "Camataguita"
Loricaria "Canoa"
Hypostomus "Zuata" light color small dots (fast water dweller)
Hypostomus "Pao" Dark brown w/ large dots
Hypostomus "Tuy" Very light with minute blacks dots, red on pectorals

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Peruvian Amazonia continued from page 5

I should mention that my cane came in very handy in loading and unloading the small boats when we close to the big boat. I made for a nice extra arm (about three feet longer) with a hook to grab with. It was much appreciated by all. I was also given ALL kinds of help getting in and out of the small boats. About 5:30 I took a shower. With my shoes as wet as they were it took about 30 minutes to get them back on.

After dinner a small group, Wayne, John S. and John O. went out to find Angelfish. Wayne was trying to get as many different Angels as he could from different areas and was trying to figure out what way to cut or nip the fins so they could be separated when all in one tank. The rest of us stayed on board and settled the affairs of the world. We spent some time with Alfredo talking about ways to improve the service offered by the M/V *Margarita*. We suggested providing tanks or vats for fish that we had needed and didn't have or other types of specialized items depending on what type of group was using the boat. It was all a friendly give and take. We had been told by Holbrook that there would be tanks to hold the fish but there were none. But this wasn't Alfredo's fault. Had we known, we would have arranged our luggage to hold small plastic tubs. Considering what I saw coming from Miami, I could have gotten a 50 gallon tub down without any trouble. I went to bed about 11:00 and kept a pair of socks on to keep my feet warm and dry.

Gene's adventures will be continued in the next issue. What fish will he catch, will he find his lost luggage? Stay tuned...

Ancistrus dolichopterus: Bristle-nose Plecostomus

Gene Moy

Bristle-nose Plecostomus used to be more common back in the '70s. These oddities would come in from the wholesalers along with the regular Plecos, *Hypostomus plecostomus.* Depending on one's perspective, these are curiosities or monstrosities. Bristle-nose Plecostomus have catfish whisker types of growth on top of their lips. Some even have growths on other parts of their heads. *Ancistrus dolichopterus* (I think that's the species that I have) males have more bristles than the females. These Plecos are reportedly easy to breed and are exceptional algae eaters.

In February 1999, while visiting one of my favorite aquarium shops in Clementon, NJ, I picked up a pair of these interesting Bristle-nose Plecos. (I occasionally have business meetings near Camden, NJ, and have checked out the fish stores in that area.)

The Plecos went into a 40-gallon community tank with lots of *Corydoras* and some other mostly peaceful residents. The *Ancistrus* proved their exceptional ability to scrape things clean. After settling in, they cleaned the aquarium glass as well as some newly introduced driftwood. The Plecos quickly removed the caked mud from the wood to reveal the true color of the wood. As a result of all their cleaning, a corresponding amount of waste is produced. During the day, the Plecos hid on the underside of a large piece of driftwood.

The *Ancistrus* seemed to enjoy the shrimp pellets that I offered my Corys. The Plecos would cover the pellets with their mouths and suck. This approach annoyed my Corys some. Other foods were placed into the tank, included flakes, some live blackworms or frozen bloodworms. I don't believe that the Plecos ate much of the worms.

After eight months, while looking into a piece of bamboo, I saw a mass of something inside. I wasn't sure that this was not just pieces of gravel until I stuck my finger inside. The mass felt soft. Using a flashlight, I saw what I thought to be eggs. The eggs were huge, some 3 mm in diameter, and orange! I guessed that there might be 15 to 30 eggs all clumped together. The male was partially inside the bamboo hovering over the eggs. I couldn't tell if he was fanning the eggs or not.

I discovered that I had unwittingly raised the temperature of the tank to 87ºF. I decided to leave the heater at that setting. The high temperature might have been a spawning inducement. I did decide to remove several clown loaches and some *Anomalachromis thomasi.*

The eggs hatched three days later. The male was seen to place his mouth over the eggs, possibly breathing over the young wrigglers to provide aeration. Seven days after that, the Pleco fry were free-swimming. The one reference that I had on *Ancistrus* breeding indicated better results with paternal care. I left the young with the parents for two days, then changed my mind when I started seeing several young (10 mm) Plecos on the aquarium glass. As most of the newly hatched young were still in the bamboo with the father, it was an easy matter to transfer them to a 5 1/2-gallon tank. The young that were on their own were siphoned or netted out and put with their brethren.

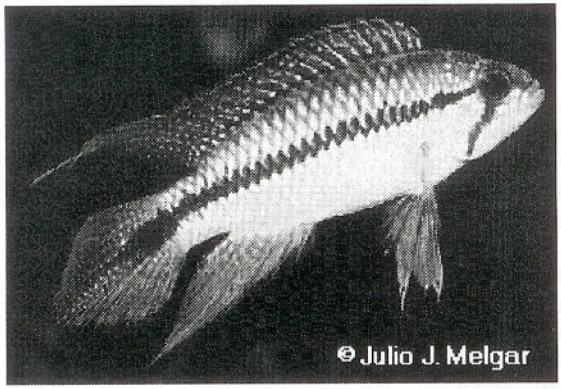
One of the reasons that I wanted to move the young was to provide food for them. The 40 gallon had very little algae as the parents had been very dutiful, while the 5 1/2 gallon tank had a fair amount of algae on the glass. The young quickly settled in. I could see several individuals grazing on the algae. After one day, I could see that the young were eating well. I could see strings of turd attached to several young Plecos as well as elsewhere in the aquarium. Within two days, the 20 or so youngsters had cleaned all the algae off the aquarium glass and almost everything else in the tank. They were now working on the individual grains of gravel. Wow! I may have to move them to bountiful quarters.

The young Bristle-noses are fairly hardy. They enjoy a strong current created by a power filter. After two weeks, they have doubled their size to nearly 20 mm total length. After 60 days, they are 1" total length. The young are ravenous. Peas with the skin removed are relished, as well as sliced cucumbers.

Continued on page 15

Apistogramma gephyra

Francine Bethea



While putzing around in a mall, I found a small pet shop that catered mostly to dogs, cats and little rat things. The fish department consisted of a single row of tanks on either side. Needless to say, most of the tanks contained the usual bread and butter species we all know and love. Amongst them, I spied a tank labeled "Mixed Wild South American Dwarfs." Upon closer inspection, I realized that there were four different species of *Apistogramma* in that tank! I could not, however, determine which species they were. Nevertheless, I was taking some of these fish home, even if I didn't have room for them.

The sorting of the individual fish would have been much easier if I had been able to net my choices myself. Unfortunately, I was forced to endure a clerk with a lackadaisical attitude who was not interested in the subtle differences between the fish. He obviously was not as excited as I was. I was not in a position to annoy this guy, because he still had the fish in his store, so I began to explain to him what I was looking at in each fish so that he could get the captures underway.

While the fish became acclimated to their new homes, I began research to find out just what fish I had purchased. First, I carried every reference book I had into the fishroom and began to compare the fish with the pictures in the book. Then, I started photographing the fish. I sent some really bad shots to a few people on the apisto mailing list. I also printed some of the shots and showed them to a few experienced fish folk. I learned several things from my experience. In addition to color photos, it would be a good idea to also have black and white photos that will show the black markings of a species. Don't send bad photographs to anyone, anywhere. But most importantly, I learned that I now had in my possession *gephyra, hippolytae, gibbeceps*, and *pertensis*.

The *Apistogramma gephyra* are found in the Rio Negro of Amazonas in Brasil. The water these fish inhabit is very soft and extremely acidic. The water, however clear, is a tea color with a pH of 4 and 1º dH. The *gephyra* share waters with *A. agassizii* and exhibit almost identical coloration. These two fish are so similar in appearance that they are occasionally confused with one another, even though the *gephyra* is a much smaller fish. Also, the juveniles display two spots on the lateral line that may cause confusion with an *A. elizabethae* female. Furthermore, the breeding coloration of the female *gephyra* that I acquired very much resembled the *agassizii* on page 27 of *American Cichlids I: Dwarf Cichlids - A Handbook for Their Identification, Care and Breeding* (Linke/Staeck). Close scrutiny must be paid in regard to caudal shapes, stress patterns, horizontal and cheek stripes in order to clarify the species of *Apistogramma* in question.

To breed the *gephyra,* I chose a 10 gallon tank. The water was tap-filtered through peat. The water from my tap has a pH of 8.5 and is soft — unusable to breed apistos, so in a 30 gallon barrel, I used a Magnum 330 with sphagnum peat moss in a filter bag. Three days with this method of filtering brought the pH down to 5º and the hardness to <2º dH. The makeup of the tank consisted of a 25 watt heater set at 80ºF and a hydro sponge for filtration. To create a selection of caves, I broke a 3" clay pot into several pieces. The curved lip pieces were pushed into the gravel at an angle so that the shard was a little higher in the front. The amount of gravel I used was minimal, so there would be a couple of bare areas. The bare spots provided a place for the live food to settle and be removed if left uneaten. I made one mound to plant a *Vallisneria* for a little extra security for the four *gephyra*. Finally, a large clump of Java Moss was dropped in.

As the fish began to grow out, their sexual dimorphism became more apparent. I lucked up with two pair! One male began to exhibit aggressive

behavior and had pretty much herded one of the females to his side of the tank, which I might add was 3/4 of the tank, so the other pair was removed.

The breeding pair was heavily fed on tubifex worms, brine shrimp, daphnia and occasional bbs. I tried to use flake, but they would just look at it (I guess they were waiting for it to move). As you could imagine, I was greatly disappointed when nothing happened. I was doing 25 percent water changes weekly. I decided to change that to every other week, because it has been said that this method will sometimes trigger spawning, the idea being that a 50 percent water change imitates the beginning of the rainy season.

Initially, I thought my attempts at getting these fish to spawn were fruitless. However, one day I noticed one of the clay pots was partially sealed with gravel. At feeding time, the female would shimmy out of her cave to eat. Once she returned, the male would hover nearby. I used a flashlight to highlight the inside of the cave. Lo and behold, there were eggs attached to the ceiling. Every day, I checked the cave to make sure the eggs were still pink, thus fertile. The female tended to her clutch diligently and would attack the male when he came too close. One day, while spying in the cave, I noticed the eggs were gone. With the female outside the cave and the male munching on something, I came to the conclusion that the spawn had been eaten.

Two week later, the *gephyra* spawned again. I checked the cave and there were at least 30 or so pink eggs in the same place as before. This time, I removed the male, who unfortunately died a few days later. As the days dragged by, I made feeble attempts to fight the compulsion to constantly check the progress of the spawn. On the fourth day, while checking the cave, the eggs were gone! However, the female was a brilliant yellow and aggressively approaching my presence at the tank whereas her normal demeanor was quite timid. She had moved the wrigglers to another cave — you'd think my constant surveillance was annoying her or something. When I realized that this spawn would be successful, I relaxed and let her be, although I did keep an eye on her to make sure she was a good mother. Okay, I was less obtrusive by checking only four times an evening, instead of seven.

Three days later, the *gephyra* female was leading her fry around the tank. The first stop was the sponge filter. At this time, I began injecting a microworm and bbs cocktail into the swarm of fry. I continued feeding the female live foods. Actually, I doubled up on the amount of food I was giving her. In my mind, I figured that keeping the female full would deter her from filling up on my fry. All of the extra concern was unnecessary because, as it turned out, she was a very good parent indeed. Two weeks later, I removed the female and sold her with the other pair at the auction.

Apistogramma gephyra is an attractive species that does not require a large tank. Although the water requirements are somewhat crucial for reproduction, I imagine tank-raised fish would not require such stringent water requirements.

My First Reef Aquarium, continued from page 8

This looks like green fuzz growing on the rocks and is very difficult to remove once it has a foothold. At the first sign, initiate weekly water changes of two gallons. Start adding algavores (see livestock selection below) to attack the hair algae already in place. In the worst-case scenario, the rocks may have to be removed and scrubbed with a stiff-bristle brush dedicated to this purpose. Hair algae are not particularly dangerous to the reef organisms but it looks bad and prevents other beneficial organisms like coralline algae from growing.

In Part Two, to be printed in the next Delta Tale, look for information on Livestock, Maintenance and trouble shooting.

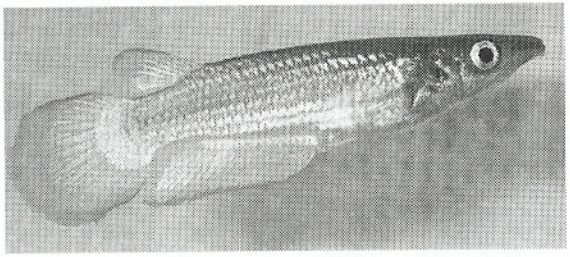
Ancistrus dolichopterus, *continued from page 13*

My pair breed on a regular basis of about every month, when the young are removed shortly after the free-swimming stage. When I left one batch with the male, other inhabitants apparently found the young. Subsequent spawns have been as much as 60 eggs.

Bristle-nose Plecos are very interesting, exceptional algae eaters, easy to take care of, and are easily bred and raised. What more can an aquarist ask of a fish?

Aplocheilus lineatus "Gold"

by Bill Pabst



Lineatus "Gold" is one of the "easier" killifish to keep and breed, and can sometimes be found in area fish stores at outrageous prices. They are usually sold under the name "Golden Wonder Killie" or the less creative "Yellow Killifish." They will eat flake food and are content to occupy the surface of a community tank. I started with a pair of fully-grown adults; each was the last one in a tank, found at separate stores but possibly from the same breeder. The male is 4 inches and the female is 3.5 inches, both of the solid body-color variety, with no vertical black stripes.

I kept the pair in a 5.5 gallon with a sponge filter and no other décor, except for the requisite tight-fitting lid. The spawning medium was a six-inch long mop of green yarn with a slightly course texture, clipped to the top of the tank for easy removal. The pair was fed predominantly on frozen brine shrimp, with occasional staple flake and frozen bloodworms. They eat with a vigorous snatching motion that is typical for surface-dwelling killies. The temperature was 73 to 76 F and I did approximately 50% water changes every two weeks or whenever waste built up. At some point I upgraded the sponge filter to an Aquaclear "Mini" power filter, with no noticeable affect on the fish behavior.

I rarely saw the pair actually spawning, but after a few days of getting acquainted there were eggs every night when I checked the mop. The male drives the female into the mop with a sideways pushing motion, and then the pair shakes as the eggs are released and fertilized. My harvesting method is to pull the mop out by one 'lifter' string, which is longer than the others and attached to the knot holding the strands together. I squeeze out the water and place the mop on a white paper towel, in order to see any eggs that fall off. The eggs are 1 to 2 mm in size and hard to the touch. I picked the eggs and put them in clear plastic cups, so that fungus or development of eyes would be easily visible. To discourage growth of fungus I used a very strong solution of methylene blue, about two drops per cup. I collected the eggs in batches of 7 to 10 days, letting them all soak in the chemical bath for a few more days before pouring off the blue water. I then put the eggs and fresh water in a shallow tupperware. Depending on the temperature, the eggs would start to "eye up" after about 10 days and hatch in 14. The fry are large enough to scoop up with a tablespoon or catch with a medicine dropper. I force hatched any eggs that had eyes, but had still not hatched after four weeks, by putting them in a jar with a little water and breathing into it before shutting the lid tight for a few hours.

I raised the fry in a 1-gallon plastic "shoebox" with an air line and some java moss to provide cover and microbes for snacking. I have since learned that a killie fry box works well with a little peat in the bottom to condition the water and give the fry hiding places, and a ram's horn or other snail to clean up uneaten food and to provide food for infusoria.

The fry were fed microworms and fresh hatched baby brine shrimp. In a few weeks I transferred them to a 5.5 gallon tank. It had an Aquaclear "Mini" filter with a sponge covering the intake tube, a rock with some java moss, and a dimmed fluorescent hood. The fry grew quickly on twice daily feedings of fresh bbs or Argent's "Cyclopeeze." The males began to develop their distinctive yellow-gold color around ¾ inches, with both sexes beginning to show orange-red tips on fins and tail.

Now they are growing out in a twenty-high with another younger batch, and the two age groups seem to get along well. They consume massive amounts of any frozen or flake food. After a few months, the largest male is 2.5 inches long and growing.

Corydoras duplicareus

Don Kinyon

In the tributaries of the upper *Rio Negro* in Brazil, there are a few small catfish with strikingly similar color patterns. *Corydoras adolphoi, Corydoras duplicareus, Corydoras serratus, Corydoras imitator, and Brachyrhamdia rambarrani* are a few. Of these, one of the most colorful and rare is the *C. duplicareus*, described by Dr. David Sands in 1995.

Corydoras duplicareus is an average-sized Cory, attaining a total length of around 2". Both male and female have a light-colored lower body, gradually changing to a jet black on the upper half. There is also a black stripe over the eyes. The fins, for the most part, are colorless. The most striking feature is the bright orange/gold mark that starts just behind and above the eye, and ends just in front of the dorsal fin. Looking at the fish from above, the mark forms a "V" pointing to the dorsal.

I found a group of these fish marked as "Corydoras Cats" in a pet shop. Thinking that they were *C. adolphoi*, which are very similar, I bought a group of seven. The fish were fairly young and were kept for almost a year in a tank by themselves as they grew. I was later sent another pair of these fish by a friend.

All the fish were kept in a 30 gallon long tank, kept at room temperature, filled with collected rain water. The pH was 6.0 to 6.3, hardness close to 0º, and temperature between 68 and 76°F. There were several pieces of sunken wood and live plants in the tank and the bottom was covered with a light-colored gravel. Filtration was performed by a large powerhead stuck into a large sponge filter and hung in the corner. Water changes were done at 30 percent weekly.

As with most *Corydoras*, feeding was not a problem. including live, frozen, freeze-dried, and flake foods. They seemed to be particularly fond of live white worms.

When the fish got to be close to 2" in length, I started to notice eggs attached to the aquarium glass, usually near the current caused by the filter. There were never a large number of eggs at any one time, but the fish spawned almost constantly, it seemed, and in a few weeks I'd gathered 30 eggs from the glass.

I removed the eggs to a separate tank: a 2 1/2 gallon, with a bare bottom and a small sponge filter. A few of the eggs were infertile and developed fungus, but most hatched seven days from spawning. For a few days, the babies looked like "an egg with a tail" and ate nothing, but they took microworms after that and baby brine shrimp a few days later. With water changes twice a day at 50 percent, the young fish grew even in their small home, but in two weeks they had outgrown the tank, so they were moved to larger quarters.

The young fish grew very well in their new home, another 30 gallon tank that they shared with some other species of young *Corydoras*, along with some Rainbowfish fry and young Killis. Slowly, over several weeks, the water in the rearing tank was replaced with tap water that seemed to have no ill effect on the young cats or tank mates. I was able to raise 18 fry from the eggs collected, and started to notice more small fish in the parents' tank. Apparently, I'd missed quite a few eggs and the adult fish didn't view them as dinner.

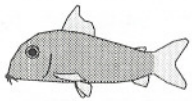
At this writing, the oldest of the fry are ten weeks old and doing fine. In the original breeding tank, there are the adults, some ten-week old fry, and gradually younger fish down to a few days old, all living at peace with each other.

For More Information:

Aqualog- All Corydoras, Glaser, Schafer & Glaser, p. 74, pictures & text
Back to Nature Guide to Catfishes, Dr. David Sands, pp. 43-44, pictures & text

Note: Thank you, Dr. Sands, for taking the time to explain to me the differences in the similar species, and for the hints on breeding the *C. duplicareus.*

Corydoras elegans



Gene Moy

Corydoras elegans used to be more readily available, but with the interest in new species, this former standby has become rare in the shops. I picked up my first elegant Cory about three years ago as an oddity in one of the local shops. It took me a while to figure out which species of Cory I had. It also took me a while to obtain more individuals to keep the single one company. I did keep my *Corydoras elegans* with other species of *Corydoras.*

On one occasion in August of 1998, I thought I could get a group of these from Rick's in Frederick, Maryland. When the shipment came and the Corys were in, they were in extremely bad shape. Rick could not offer them for sale, as the catfish were dying off in his tank.

On another occasion, while in Cleminton, NJ, I thought I saw a few remaining *Corydoras elegans.* When I brought them home, I found out that I had another species, *Corydoras undulatus.* On yet another occasion, I did pick up additional individuals from House of Tropicals in Glen Burnie, but these did not survive their quarantine period. Over the last year or so, I picked up the odd individual here or there until I did pick up enough for a breeding group.

The patterns on *Corydoras elegans* and *Corydoras undulatus* are similar. They both are somewhat difficult to describe, but are sort of a blackish-green-stripy pattern on a base of blush. The stripes are not as distinct as those on *Corydoras trilineatus. Corydoras undulatus* are short and stubby, compared to *Corydoras elegans. Corydoras elegans* is mildly sexually dimorphic, with the male of the species having a taller dorsal fin. The two species are also sexually dichromic, with the males having more of a reticulated pattern with more speckling, especially near the head. There are reportedly different population variants. My first elegant Cory showed a greenish sheen under certain light conditions, while the later arrivals are black.

I generally keep groups of Corys in a 40 gallon breeder or in a 29 gallon. Both tanks are set up as a community aquarium, with a emphasis on Corys. In this setup, the Corys do not have any opportunity to breed, even if they wanted to. The fish in these tanks are fed a variety of foods, from flakes to sinking shrimp pellets, frozen bloodworms and brine shrimp, and occasionally treated with live black worms.

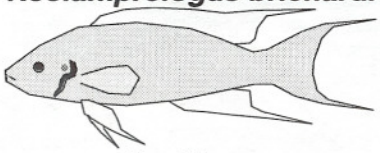
I finally gave the Elegant Corys a 20 gallon tank of their own this past winter. The tank had a thin layer of small gravel and a small clay flower pot. Filtration was with a small power filter as well as a sponge filter. Within weeks, I discovered over 200 white eggs pasted on the side of the tank. Most of the eggs were in the upper reaches of the tank and near the corners. As is my routine with Corys, I remove the parents from the tank. The power filter was turned off.

The eggs hatched in four days. Unlike *Corydoras aeneus,* I could see the young wrigglers immediately after hatching. A few days after hatching, I lowered the water level to half. The youngsters did not show much activity at first, but as they grew, they became more active foragers. The young were fed a dry, powdered fry food at first. As they grew, they were provided with occasional microworms and frozen baby brine. They soon were able to accept crumbled flakes. Around week two, I lost a sizable percentage of the young wrigglers. I am not sure of the cause.

The youngsters show a spotted pattern that is quite interesting. At one month, the young Corys are double their hatching size at almost 10 mm long. The youngsters have started losing their spotted pattern and started resembling their parents, with a strip in the midsection. At two months, the young are almost 20 mm long.

Corydoras elegans is easy to keep and have a very interesting pattern. Although not as easily available as in the past, finding and obtaining them is worth the effort.

Neolamprologus brichardi



Don Kinyon

Neolamprologus brichardi has been in the hobby for quite some time, since the late 1950s, in fact. It was described by Poll in 1974. It comes from Lake Tanganyika, one of the rift lakes of eastern Africa, where it inhabits the rocky shorelines.

These attractive fish are not as colorful as some of their other Rift Lake cousins, but make up for it with graceful lines and subtle hues. The male and female both have light brown body colors, with blue-white outlines to all the fins. The dorsal, anal, and caudal fins all have extensions, more so on the male than the female. They have bright blue markings on the face, dark brown gill spots, and bright blue eyes.

Years ago, a personal experience with these fish and a defective heater almost convinced me to give up the hobby. These fish won't live at 95ºF!

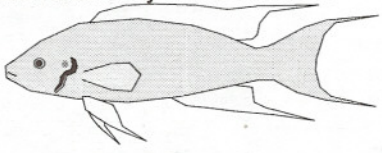
When a friend was moving out-of-state, I inherited five adult and semi-adult fish so that they wouldn't have to make the move. I put them in a "temporary" tank (anyone that's been in the hobby a while knows that there's no such thing — I have temporary tanks that were established YEARS ago) with tap water and some piles of slate to make them comfortable. My well water is fairly hard; 140 total ppm, and about 7.4º pH. They seemed to thrive in their new home, but didn't spawn.

Brichardi will eat pretty much any given food and, unlike some of the other Rift Lake species, aren't poorly affected by meaty foods; in fact, they thrive on them. They like live, frozen, or even dry foods. My adult and near-adult fish were active and healthy, even with periods of being fed strictly flake foods.

While going through a half-price bin at a local pet shop, I found some Rift Lake water conditioner, made by Kent. I bought it, used it as directed, and within two weeks, the fish were spawning like crazy. I can't say for sure that the conditioner was the trigger that got them into the mood, but the timing was coincidental at least. They had four broods in succession, four to five weeks apart.

One of the interesting and pleasing things about this particular cichlid is its willingness to live as an extended family. There were four broods of fry in the tank, all separated by a few months, living together and tolerating each other, even in such close quarters. The only reason to finally move some of the fish was a terrible lack of space. My "temporary" tank was a tall, show-type setup, and the fish had little room to swim, let alone grow well.

Through auctions, selling over the internet, and just giving the fish away, the mob was reduced to manageable size. The youngest of the fish ate newly-hatched brine shrimp and microworms, while the larger ate anything that the adults did, only more finely chopped. I plan a more suitable tank in the future for the fish that remain, something with more surface area and many rock formations.



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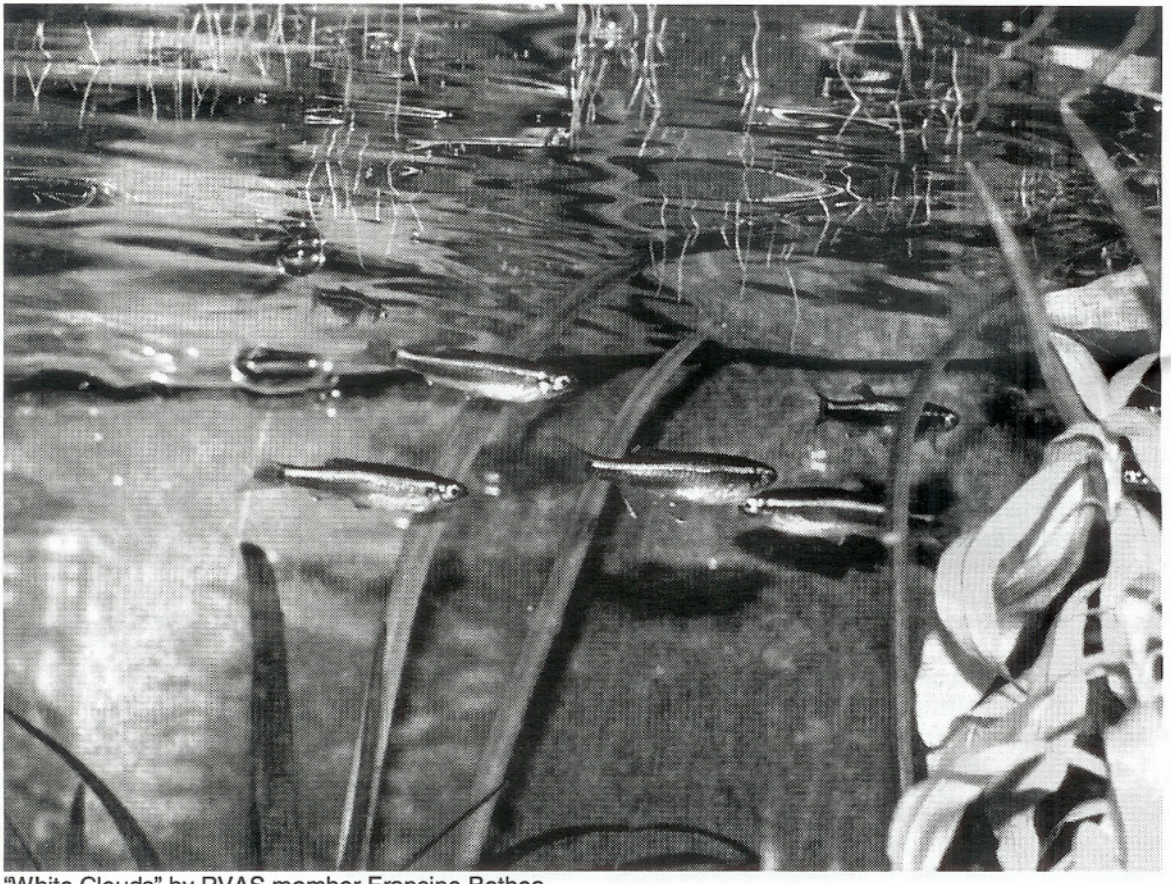

"White Clouds" by PVAS member Francine Bethea

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Wally's Aquarium
6493 Little River Turnpike
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Tanichthys albonubes

Francine Bethea

The White Cloud comes from the White Cloud Mountains in Canton, China. Probably all of the White Clouds available today are from fish farms in the United States. I have heard that it is now illegal to import this fish, but unfortunately, I cannot verify this statement.

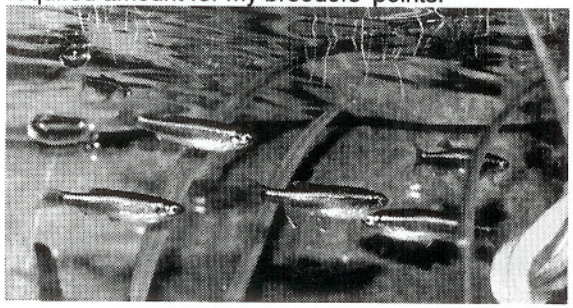
This fish can survive in temperatures ranging from 50 to 80ºF. For example, a few winters ago during a power outage, my apartment was without electricity because of a huge snowstorm. With 99 percent of my tanks housing *Apistogrammas*, I was delirious. The temperature in that apartment got down to 65ºF. I used every blanket and comforter I had to shroud the tanks, in hopes of keeping the tank water warm for as long as possible. I was unable to use the pop-bottles-filled-with-hot-water method because the house was on a well and, you know, the pump was electric. After the second night, I dared to take a peek into one of the tanks. Expecting to see lifeless bodies, I was taken aback by the White Clouds' flurry of activity. The frigid temperatures had not affected them at all. After the third day, the electricity was restored and the temperatures began to rise. Fortunately, I had not lost a single Apisto either, but it took them a few days to get back to normal.

Breeding the White Cloud is the easy part and pretty straightforward. Start with a group consisting of more males than females. In my case, I had 3 females and 3 males. In the breeding tank, be sure to have a large clump of Java Moss or some other bushy plant. Drop the pH to about 5.5. Then feed them plenty of live foods. The female will soon fill with roe. The males will then coerce the females over a spawning site and embrace her for the egg release. The eggs will hatch within 24 hours. Within a few days, there will be hundreds of miniscule fry hanging from the glass of the four corners of the tank. Surprisingly, well-fed White Clouds will neither eat their eggs nor fry.

Spawning the White Cloud is easy; raising the fry is the hard part. As I mentioned, the fry are miniscule. They are hard to see, unless the light hits them right. Therefore, a lot of them can and do get siphoned out with a water change. Checking the surface through the glass or taking the cover off the tank and looking straight down is another way of spying these little slivers. Another factor to consider is that, because the fry are so small, their mouths are not that big. Can you imagine fry so small that microworms would be considered huge? Alternatives for feeding would be infusoria or egg yolk pressed through a sieve, such as a handkerchief. The trick is to add a little water to the handkerchief, press a piece of egg yolk in the wet spot, and then squeeze the drops of water into the tank. The droplets will contain the nourishment. A good idea is to have floating plants, like Hornwort or Wisteria, and squeeze the juice over the plants. That way, a lot of the food will adhere to the plants, where the fry hang out. One must constantly check that their little stomachs are round. Full stomachs are an indication that your feeding method is successful.

One of my most successful spawns was fed some of David Snell's worm food concoction, mixed with liquid from an egg yolk paste. I mixed a very small amount with distilled water in an empty film container. I used a test tube as a grinder and made a watery juice. Using an eye dropper, I dispensed the food into the group of fry. I would stay there and make sure they were eating. It looked like they were chasing nothing, but their stomachs were filling. The surplus was refrigerated and used until it was time to make more.

Each time I spawned the White Cloud, out of 100 or so fry, I would always end up with 9. This last time, I had 100 get to 1/4" in a 20 gallon tank that housed an Anomala female with fry. For days, I kept telling myself to move them. But I didn't listen. I came home from work one day and found that the Anomala had eaten all the fry except 13. I was disappointed, but at least I had a few over the required amount for my breeders' points.



A Native Fish for Your Aquarium

Gerry Hoffman

This article first appeared in Delta Tale Volume 16, Number 12 (December 1985).

Most native American fish are overlooked in our area because they don't seem to measure up to the flashy colors or spawning rituals of the imports. A true native lover knows differently, that these fish are unique in their own way. Even I have come to adore one of our East Coast beauties because it fits in so well with my small overplanted tanks. This fish could only be the Pygmy Sunfish, *Elassoma evergladei.*

Here is a fish that can be caught from North Carolina to Florida and be maintained in almost any size aquarium. Being basically shy and somewhat timid, it is best kept by itself with plenty of plant cover for hiding when it needs to. *E. evergladei* can be loved by killie enthusiasts because of its small size (1 1/4") and spawning habits, by dwarf cichlid hobbyists because of similarities in behavior, and by the generalists because of its overall peaceful appeal.

Male Pygmy Sunfish in breeding dress are as attractive as any small fish can be. There are no reds, yellows or streaming filamentous finnage, but the velvety black body has shimmering blue green sparkling scales that make you sit back and say WOW! Females remain a brown-grey color and are noticeably plumper when kept supplied with good foods.

Unfortunately, live foods are the preferred items on the menu and they must be fairly small for these diminutive fish. At the first sign of food, fish dart out of the plants and gobble up daphnia, mosquito larvae, white worms or brine shrimp. In addition to giving these fish some security, numerous plants provide the spawning medium for these territorial egg layers. A "nest" of plant bits or a bunch of fine-leafed plants is used as a spawning receptacle. Thirty to sixty eggs can be deposited in the plants, and the male generally defends the area until they

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Don't Give Up

John Mangan

This article first appeared in Delta Tale Volume 15, Number 2 (February 1984).

Have you ever sat helplessly by and watched eggs, laid by fish you'd been hoping to spawn for months, slowly fungus away? If you have, you'll know how I felt recently as a watched my first spawn of Australian Desert Gobies (*Chlamydogobius eremius*) slowly dying.

The eggs were several days from hatching (they take six to eight days) so I decided it was time to move them into another tank. The male had been taking good care of them, fanning and protecting them, but I didn't want to risk having the fry eaten by the other fish in the tank.

The rock on which the eggs were laid was carefully lifted out of the aquarium and placed in a smaller tank. The eggs all looked fairly well developed and ready to hatch any day.

The day after moving the eggs, everything looked fine. About six o'clock on the second day I noticed a little fungus starting at the center of the egg mass so I added a little Acriflavine. By eleven o'clock that night about half the eggs were covered with fungus or had turned a milky color. By the next afternoon two thirds of the eggs were fungused or had gone bad.

I'd given up hope and was walking away when an idea suddenly occurred to me. Why not try to "surgically" remove all of the fungused eggs? I wasn't sure if it was possible since a sticky substance that holds them to a rock connects the eggs of this species (they hang upside-down under the rocks, much like bats in a cave). Pulling on the bad ones would also possibly pull off the good ones. I decided that I had nothing to lose by trying; they were all going to die if I did nothing.

The first thing I did was to get a piece of airline tubing and carefully siphon out the largest clump of fungus at the center of the egg mass. I hoped the fungus had destroyed the connective substance that holds the eggs together. It had, at least in the center, and the fungus clump was pulled off.

Next, using a dissecting probe, I began carefully scraping away at the remaining patches of fungus and bad eggs. The fungus came off easily but the milky eggs, which hadn't fungused, were still firmly attached to the good eggs. After removing as much as I could with the probe, I began using a teasing needle (this is a thin needle with a sharp point and a wooden handle used for "teasing" things apart when dissecting small or delicate items) to remove the milky eggs. This was where all of my dissecting experience paid off as patience and a steady hand were needed to keep from damaging the good eggs.

After all of the bad eggs were removed I once again used the piece of airline tubing as a siphon to remove debris off of the bottom. Now came the hardest part, waiting to see if all of this effort did any good. The next day everything looked healthy. The following day a few eggs hatched. Over the next few days almost all of the remaining eggs hatched, and only a few had gone bad (this species spawns over a period of up to a week, which is why the eggs hatched out on different days). The moral of the story is when things look hopeless, don't give up. Try something. You never know what might work. If you fail, at least you've tried and learned what won't work. Next time you can try something else.

A Native Fish... continued from the previous page

hatch in 2-3 days at their preferred temperature of 65-70 degrees. Pygmy Sunfish fry are very tiny, not unlike the fry of tetras. With a nice healthy plant cover, the fry will coexist with the parents and not be preyed upon if there is sufficient food for all. Infusoria, baby brine shrimp, or microworms are just fine for initial foods.

When you come across these wonderful native fish, take some home and get them established in any small tank. If you think the male is coloring up for breeding, grab your flashlight, shine it on him and close your mouth before your jaw hits the floor.

Aquarium Critters in Science: Sperm Drinking in *Corydoras* Catfish

Sallie S. Boggs

This article first appeared in the July, 2000 newsletter of the Greater Pittsburgh Area Aquarium Society, Inc.

One of the most fascinating aspects of keeping fish is observing their many different modes of breeding. Many aquarists have watched the breeding behavior of *Corydoras aeneus* (the most often spawned species of *Corydoras* in the hobby). Attentive fish keepers have seen the "T" formation. This occurs when the male presents his side and abdomen to the female's head. Often the male almost wraps himself around her mouth, they both seem to shudder, and eggs appear in a pouch made by her anal fins. After a rest, she then rushes about the aquarium until she finds a spot she likes and presses the eggs against it. The eggs are very sticky and adhere tightly. Soon they also harden. The male or males may follow her around during this search for the "right" spot, but often the male(s) are not even present when the eggs are deposited. The odd "T" formation and absence of the males when eggs are deposited have made people wonder how egg fertilization is accomplished.

A paper by Kohda M. Tanimura M. Kikue-Nakamura M and Yamagashi S in Environmental Biology of Fishes 42: 1-6, 1995 addresses these same questions. As scientists do, they put their questions in the form of hypotheses and then, following scientific method, they designed experiments to test them. The hypotheses were as follows:
Insemination occurs by:

1. sperm spread on the aquarium sides at various times after spawning;
2. sperm released from the female's mouth and spread on the eggs after they are deposited;
3. sperm taken in the female's mouth and passed through the gills and flowing along her body to the eggs in the fin pouch; and
4. sperm swallowed by the female and passed through the gut to the eggs in the fin pouch.

They reasoned that if #1 was correct, then if an albino female were bred with both albino and wild type (green) males, the eggs would be fertilized by both males and the fry would have mixed colors.

This was not the result when they studied at least 9 matings with each color male. If a female made a T with the white male all the fry from those eggs were white and if she formed a T with the green male (dominant genetically) all the fry from those eggs were green, so they rejected #1 hypothesis.

Next they reasoned that if sperm released from the female's mouth was spread on the eggs after they were deposited, then if the eggs were taken from her before she deposited them, they would not be fertile. When they captured females at different times after T formation and before the eggs were deposited, they found that the percentage of eggs that were fertile increased with the time the female rested, but was the same immediately before and after they were deposited. On the basis of these results, #2 was rejected.

For hypothesis #3, they reasoned that if sperm was taken in the female's mouth, passed through the gills and flowed along her body to the eggs in the fin pouch, then a blue dye, deposited near her mouth at the time of T formation should follow the same path. However, they found that when the T formation occurred, the female shut her gill flaps and the blue dye (and presumably sperm) was prevented from leaving through the gills and when she formed the fin pouch both eggs and blue due appeared in it. Thus, hypothesis #3 was rejected and #4 was supported.

The discussion suggests that many, if not all, of about 120 species of *Corydoras* may use this unusual technique of being sure the eggs have the best possible chance of being fertilized. About 20 species of *Corydoras* have been reported to use the T formation. *Corydoras* are anatomically suited to this method of breeding because they use intestinal breathing. They can gulp air from the surface of the water and, holding their gills shut, expel it through the anus. The gut of the *C. aeneus* is relatively short (~5.4 cm) and their pelvic fins are located just behind the anus (and egg vent). These conditions are also present in other small catfish. Also, the T formation has been observed with other catfish and even with some non-catfish. It would be interesting to do the dye test on some of these other types of fish. Even observing the T formation followed by deposition of the eggs where the male is absent

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Synodontis petricola

David Banks

This article first appeared in the June, 2000 issue of In Depth, a publication of the Tropical Fish Club of Burlington, Vermont.

When I first started in the hobby, I was always intrigued with the many species of *Synodontis*. I started buying them when I could, typically just one at a time because of the cost and also that was what was available. After several years I had an interesting group of eight or nine species, but for the most part only one or two of each species. I did get a group of *multipunctatus* and was able to get many fry from that group. Then I heard of a couple of hobbyists breeding *petricola* in Maine and Rhode Island. I thought this was an excellent opportunity to be able to get a group of these once really rare fish. I was able to get several groups and ended up with about fifteen 1 to 1½" juveniles. My thought was that within no time I would be having plenty of my own little catfish.

These dwarf cousins of *Synodontis multipunctatus* are every bit as attractive, but do differ in some of their behavioral characteristics. They are not as active during normal daylight, although they come right out at feeding time and they do dash about the tank from one place to another on a regular basis. The breeding habits of the *petricola* are also different. Where the *multipubctatus* tend to be cuckoo spawners, breeding with mouthbrooding cichlids, the *petricola* seem to be more traditional in their spawning behavior. The adult size is about half that of the larger *multipubctatus*, with the males being slightly longer and more slender than the females, which reach about 3½".

One major difference between *petricola* and *multipunctatus* that I found was how fast they grew. I was used to the multi fry growing to almost 1" within the first 2 months. Come to find out, these 1" *petricola* juveniles were much older than that and didn't grow very fast after that either. Of course they also didn't have as big to get, but it still took well over a year for these 1" fish to reach adult size. It wasn't until they were at least 3 years old that I noticed any activity that even looked like they might

be interested in spawning, and another 6 months after that I decided to do anything about it.

The first difference I noticed between males and what I guessed were the females was the size and shape difference. Then I noticed that the male had a breeding tube showing one day, and there was at least one female that was very plump with eggs. I then noticed that under one of the plastic loc-rocks there was a male and female going round and round apparently spawning. Of course all this was taking place in a 40 gallon tank with many other fish and there was really no chance of survival of the eggs, let alone any fry.

The tank setup included 8 *petricola*, two groups of different age; the older were over 3 years old and the others about a year younger. There is also a young *Synodontis eupterus* and 5 *Botia striata* and a breeding group of 8 *Cyprochromis leptasoma*. The tank has an undergravel filter and has dolomite as the substrate. There are a few rocks for the fish to hide around, but mostly there were loc-rocks for the fish to call home. These loc-rocks have a couple of advantages over regular rocks. They are made of plastic so are much lighter. They snap together to be able to form structures and places to hide in and around. One of the most important advantages is when they fall over, they won't break or hurt anything. No matter how secure you think the rocks are in your tank there is always a good chance they will fall over. Either the fish dig under them or even by cleaning the gravel around them.

The tanks were getting only minimal maintenance for about a year and then started receiving more normal water changes on at least a semi-regular basis. It was around this time that I had noticed the male with the breeding tube down, so I really tried to do regular water changes after that. I also had been cutting back on feeding since my maintenance had been lacking, but now that I was back on a regular schedule I went back to feeding twice a day and tried to include more foods that the *petricola* would get. They responded very well and I soon noticed several females with plump bellies full of eggs. This was also the time that I noticed the pair circling under the loc-rocks.

So now the trick was to be able to save some of the eggs and fry! From what I had heard in talking to three hobbyists who had been successful, they would lay their eggs in a cave type setting. All three had been using marbles in the base of their caves to help prevent the adults from eating the eggs as fast as they laid them. I took a 4" clay flowerpot and put a large hole in the side about the size of a quarter. As an experiment, I put the flowerpot in upside down and took away the loc-rock structure the pair had been using to spawn under. On the very next day, I saw the pair in the flowerpot! I left it in there for a couple of week sand let them get used to using it. I then filled a clay saucer with marbles and put the flowerpot over it upside down. I checked it the next day, but didn't find anything. I continued to check it every day but still nothing. After four or five days, I increased the feedings. A couple of days later I followed with a good water change and on the next day I found about a dozen very small eggs in the marbles. These eggs were much smaller than the *multipunctatus* eggs that I was used to; they were about the size of small rainbow fish eggs.

So now I had to figure out what to do with the eggs. I hung a very fine mesh fish net inside of a breeder trap inside the 40 gallon tank, but I wanted to get some water flow over them. I took a large siphon tube from an outside power filter, attached a sponge filter to the long end and drilled a small hole about a third of the way up the tube and inserted a piece of rigid airline. When I hooked up air, the air would bubble up nicely, but not very much water would flow over the bend at the top. I then drilled another small hole at the very top of the siphon tube to allow the air to escape and then plenty of water flowed over the top. I put the eggs in the net with the overflow from the siphon tube running right over them. I also added a handful of Java moss.

Of course I did all this, but what was I going to feed these very little fry? My microworm culture had dried up since I hadn't been using it. I tried using just powdered fry food and decapsulated brine shrimp. They did seem to do OK on that mixture and I added a snail to help eat the leftovers. I also was feeding them with what is best described as filter grunge. I would take a sponge filter and just squeeze it into the net. The first batch unfortunately didn't make it for very long; within a week and a half I had lost them all, probably due to over feeding. I had also removed the water flow from directly into the net, but still inside of the breeder trap so the flow wouldn't be too strong on the fry. I tried a couple

more times in the setup, but never was able to get the fry to a size where I thought they were growing.

Without having a fishroom setup where I could just set up another small tank, I had to think of something else. I took a small display tank, maybe a gallon in size and submerged it into another tank, a 20 gallon. I then took my fine mesh net and put it over the top of the display tank and ran the output from a small power filter into it. This setup has proven to be more effective. The water flows through the net and into the display tank and overflows out into the rest of the tank. I put the eggs into the net until they hatch, which is about 2 days from what I can tell as I am never 100% sure when the eggs were laid. After that I move them into the display tank where it is much easier to see how much the fry have been fed and how much they are eating. I imagine some are getting out of the display tank, but that is OK as there is only one small fish currently in the tank. There are many snails and they tend to congregate in the display tank because of the excess food. I don't think they are large enough to eat the catfish fry, but they may be getting some of them. Of course, the adults are laying more than enough eggs for me to be sacrificing a few to the snails, or the few that are getting out of the display tank where there is much less for them to eat. So far I have about 8 little catfish that have grown to where you can actually see their eyes and the largest is starting to develop some black coloring. This is after almost a month of feeding them and they are still only a little more than ¼", which is mostly tail.

I did finally get a culture of microworms going again and feed them once a day. I also still feed the decapsulated brine shrimp. I mix in the powdered fry food when they are very young and also add the filter grunge. They are fairly shy and don't seem to like the light much, so I do try to feed them around the time the lights go off. I feed the microworms heavily at that time because they stay alive overnight in the display tank and they can eat them all night long. Once the fry get to this size, they seem much more hardy. While I am having some luck raising them, it is still only about a 5% survival rate at best, but then again I am not looking for production, just the accomplishment of trying to breed these fascinating fish to be able to spread them to even more hobbyists.

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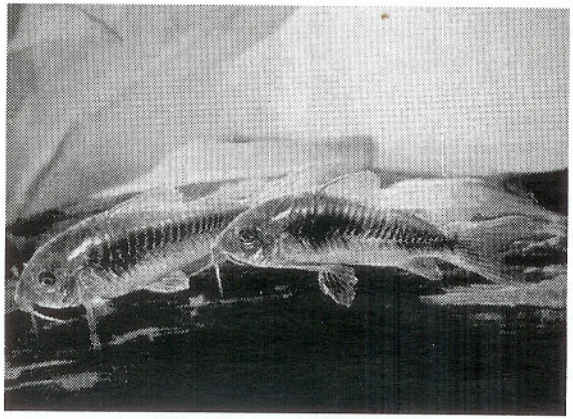
would suggest this type of insemination was being used. In fact, in a recent breeding of *C. Melini*, I observed the latter behavior repeatedly.

The timing of the various stages was also studied and may be critical for efficient fertilization. The T formation with the female's mouth attached to the male's anal region lasted about 6 seconds. The gill covers were closed for one second longer. If a female drinks water the sperm will be diluted. This may be a cause for infertility. The rest period for the female lasted 70 – 120 seconds after the eggs appeared in the pouch. During this time, the eggs are inseminated. Rapid movements may cause water to flow into the pouch and dilute the sperm.

So, it seems that the mystery has been solved. However, a cincher experiment would be to actually find sperm in the gut of the females. One wonders how many species use this mode of fertilization? Are Corys the only ones? Maybe the hobbyist has a role to play by careful observation of breeding pairs of fish to see if this behavior is involved.



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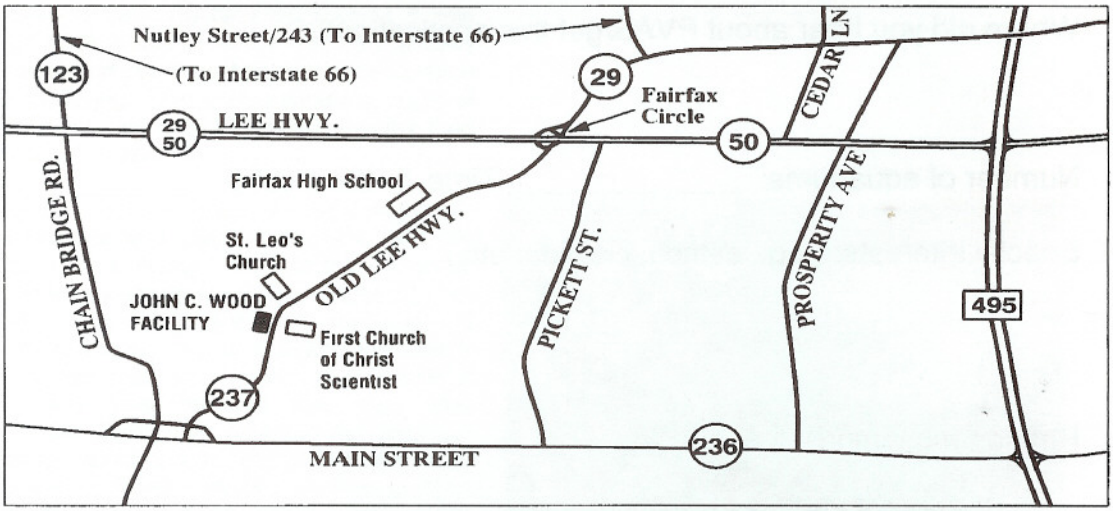

MEETINGS:are held at the John C. Wood Facility, 3730 Old Lee Highway (Route 237), Fairfax City, VA. We meet in Room 6, which is located behind the police station. Doors open at 7:30 and meetings start at 8:00 p.m.—EVERYONE IS WELCOME!