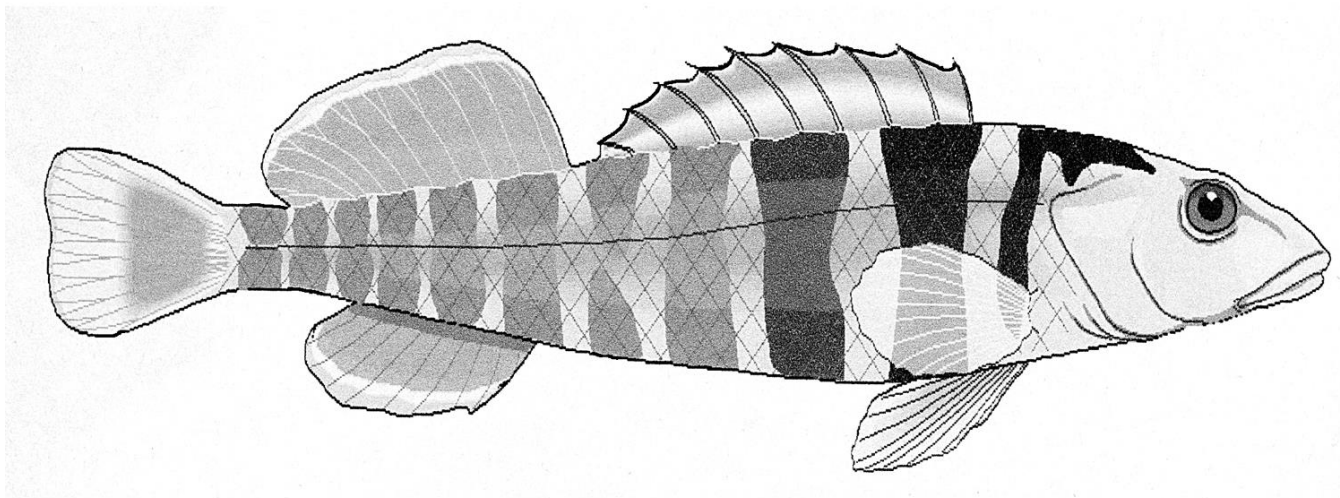


# *The Darter*

January - February 2007



**Missouri Aquarium Society, Inc**  
**St. Louis, Missouri**

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# Places to Be Things to See

SUNDAY February 11, 2007

Auction, 12:00 @ the Stratford Inn

Contact: John Van Asch – 618-277-6165, [johnsfishy@att.net](mailto:johnsfishy@att.net)

THURSDAY February 15, 2007

General Meeting, 7:30 PM @ Dorsett Village Baptist Church

THURSDAY March 15, 2007

General Meeting, 7:30 PM @ Dorsett Village Baptist Church

Bring Fish Raising Fish

THURSDAY April 19, 2007

General Meeting, 7:30 PM @ Dorsett Village Baptist Church

SATURDAY April 21, 2007

Workshop @ Jost Chemical

SUNDAY April 22, 2007

Auction, 12:00 @ the Stratford Inn

Contact: John Van Asch – 618-277-6165, [johnsfishy@att.net](mailto:johnsfishy@att.net)

THURSDAY May 17, 2007

General Meeting, 7:30 PM @ Dorsett Village Baptist Church

SUNDAY August 19, 2007

Auction, 12:00 @ the Stratford Inn

Contact: John Van Asch – 618-277-6165, [johnsfishy@att.net](mailto:johnsfishy@att.net)

SUNDAY October 7, 2007

Fall Swap Meet, Noon to 3:00 @ the Stratford Inn

SUNDAY November 18, 2007

Auction, 12:00 @ the Stratford Inn

Contact: John Van Asch – 618-277-6165, [johnsfishy@att.net](mailto:johnsfishy@att.net)

# Presidential Preamble

By Mike Hellweg

Happy New Year everyone!

I hope you all had an enjoyable Holiday Season, from Thanksgiving all the way through Hanukkah, Christmas, and New Years. And I hope with your New Year's Resolutions you've again remembered your finny friends. Resolve to do more water changes, clean the filter more often, try to spawn something or even try to propagate a plant. Don't forget MASI in your resolutions! Write an article for the Darter. Donate something for the auction. Offer to help Ed Millinger out at the Ronald McDonald House. Volunteer to work at a meeting or other event. I'm sure Jerry will need some extra hands to help with everything at the upcoming Workshop.

Speaking of the Workshop, it might be a bit confusing – the Workshop and Banquet will be on Saturday, April 21 hosted at Jost Chemical. It will be held in the beautiful atrium, complete with a couple of huge planted tanks for a backdrop!

Since the Workshop will be split up this year, and the talks and Banquet will be at Jerry Jost's office on Saturday, we need to have some help getting things set up and cleaning up afterwards. This is saving the club a lot of money, so we could use a lot of extra hands to make the work go faster. The Annual Spring Auction, on Sunday, April 22, will be at the Stratford Inn, as always.

We've got several great speakers lined up for our meetings in the coming year, and Gary is still looking for a few more to fill in the gaps. If you want to hear a particular topic, or a particular speaker, please let him know. We're always open to suggestions!

Important dates for 2007 (all will be held at the Stratford Inn except for the Saturday Workshop and the Picnic):

January 7 – The Winter Swap Meet

February 11 – The Winter Auction

April 21 – The Spring Workshop & Annual Award Banquet at Jost Chemical

April 22 – The Spring Auction

June ? – The Annual Picnic at the Thale's – watch the Darter for date

August 19 – The Summer Auction

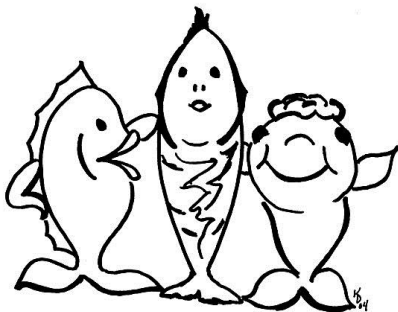
October 7 – The Fall Swap Meet

November 18 – The Fall Auction

...and for now, 'nuff said...

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## *Membership - Renew Now*



Yearly membership in the Missouri Aquarium Society, Inc. is \$20 per calendar year. Membership includes the Darter subscription for the year, which is currently 6 issues. New memberships and renewals can be submitted at club functions such as meetings and auctions, or by contacting our membership chair, Kathy Deutsch at 314-741-0474, [katfish@i1.net](mailto:katfish@i1.net), or 9 Old Jamestown Ct. Florissant MO 63034

# 2007 Monthly Bowl Show Classes

You must show in at least 7 monthly Bowl Shows to compete for the new Annual Bowl Show Champion Award. The winner will be determined by the entrant with the most points overall for the year.

Points earned for each entry: 5 points for first place, 3 points for second place, 2 points for 3<sup>rd</sup> place, one point each for all other entries – up to 5 non-placing entries per month. All entries are sight-judged.

Each month there will be one special class and one open class.

**January** - Cyprinids: Barbs, Danios, Rasboras, Minnows, Goldfish

**February** - Sharks, Loaches, Eels, and Oddballs

**March** - Cichlids

**April** - Killies

**May** - Characins: Tetras, Pencilfish, Piranhas, Pacu, Silver Dollars, etc.

**June** - Catfish

**July** - Livebearers

**August** - Anabantoids: Bettas, Gouramis, Ctenopomas, etc.

**September** - Rainbowfish

**October** - Aquatic Plants

**November** - Aquatic Critters: Aquatic Invertebrates, totally aquatic amphibians (Pipid frogs/toads, Caecilians)

## Editor's Notes

Steve Deutsch

We have three articles from members in this issue. Two are by Mike Hellweg. There are four more of his livebearer articles for later in the year. One is by Klaus Bertich, the first of two or three parts, depending on what else I need to fit in the next issue. This gives a little head start on the rest of the year, but more articles are needed. Last year we had 26 articles from 9 different members. It would be great to do as well this year. The most prolific author, with an asterisk, was Mike Hellweg with 7 articles. The asterisk is that they were previously used by the ALA. Gary McIlvaine had the most original articles with 6. We also had two original covers, and can always use more art. We have four exchange articles to round out the issue.

This is the start of my fourth year editing this publication. Time flies. I probably do less work than any previous editor, thanks to having a printer, a postman, an exchange editor with a good scanner, prompt committee chairs, and email submissions. I don't know how anyone did this in the 'old days'. All the help is greatly appreciated and allows me to continue doing this.

Article deadlines are February 15, April 15, June 15, August 15, and October 15.

**M A S I ANNUAL WEEKEND WORKSHOP/ GIANT AUCTION  
CO-SPONSORED BY THE St. LOUIS AREA KILLIFISH ASSOCIATION**

**SATURDAY AND SUNDAY, APRIL 21 & 22, 2007**

WORKSHOP LOCATION: JOST CHEMICAL CO., ST. LOUIS, MO

AUCTION LOCATION SUNDAY: STRATFORD INN, FENTON, MO

KILLIFISH BOX SALE AND DISPLAYS SATURDAY at the WORKSHOP- OPEN 9:00 AM

**SATURDAY SPEAKERS FEATURING:**

10:00 AM- JERRY JOST- "PLANT NUTRITION"

A summary of what some of the major plant gurus are saying about feeding aquatic plants. This is an attempt at taking some of the confusion out of all the seemingly conflicting information out there from various experts.

11:30 AM -MIKE HELLWEG - *Apistogramma* - a Lot of Cichlid in a Small Package

This talk introduces the colorful and interesting Dwarf Cichlids of the genus *Apistogramma*, with emphasis on Mike's experiences with their care, behavior, breeding and raising the fry. It covers most of the commonly available species, and several of the more challenging species, as well as some of the newer species just coming in to the hobby.

1:30 PM- TERRY FAIRFIELD- FISH HEALTH

Aquarists and author, Terry Fairfield, is author of Barron's A Commonsense Guide to Fish Health. He will be speaking specifically on preventing diseases in our aquaria.

3:00 PM- DAVID RAMSEY- FISH BREEDING

David has filmed and will show a number of fish in the act of spawning. These are excellent videos and David has some excellent tips on breeding fish. Some of the videos include *Badis ruber*, corys, angelfish, and bristlenose ancistrus.

6:00 ANNUAL AWARDS BANQUET FEATURING RANDY CAREY

Randy will discuss *Project Piaba*, a project established to understand the ecological and cultural systems of the middle Rio Negro basin, Amazonas, Brazil, in order to conserve and maintain the live ornamental fishery at a commercially feasible, and an ecologically sustainable level.

**SUNDAY 12:00 at the STRATFORD INN, FENTON, MO - GIANT ALL-SPECIES  
AUCTION FEATURING LOCALLY RAISED FISH, AQUARIUM PLANTS,  
EQUIPMENT, TANKS, AND MORE!**

# The Red Rocket *Alfaro huberi*

By Mike Hellweg

Coming from the Caribbean coast of Central America from Guatemala south to Nicaragua is an interesting and still uncommon livebearer, the Red Rocket. Closely resembling the knife belly shape of its cousin *Alfaro cultratus*, the Knife Belly Livebearer, the Red Rocket is a surface dwelling fish. Its upturned mouth, relatively flat back with only a slight dorsal hump near the dorsal fin, and narrow profile from above all speak to a fish evolved for living at or near the surface.

Males reach about 2 inches, and females can reach nearly three inches. Both are a basic golden olive color, with white bellies and two or three dark olive to red-brown stripes zigzagging along the scales down their flank. Males often have gold to red orange unpaired fins while those of females are usually clear.

They are reported to like a lot of water movement, but one of my local club members has had great luck with them in an unfiltered pond over the summer. I've kept them in a mixed colony with *Xiphophorus clemenciae* in a heavily planted 75 gallon tank, where they spent most of their time hanging near the surface just under the floating Water Sprite, waiting for food to pass by them in the current. The tank was filtered with an Emperor 400, so the current was pretty good.

Many hobbyists suggest adding salt to their tank. I never use salt except with true estuarine fish. The Red Rocket is a river fish that is found in coastal areas, but in pure freshwater. I added crushed coral to the filter to help keep the pH stable around 7.8 and the total hardness steady at around 250 ppm, which thanks to the slowly dissolving crushed coral was made up mostly of carbonates. That seemed to keep them very happy, and the swordtails didn't seem to mind, either.

I kept their tank at room temperature. In my fishroom that is in the upper 70's and low 80's as it fluctuates over the course of the year. The tank was planted with several large sword plants and large clumps of Java Ferns were attached to several large pieces of driftwood in the tank. The surface was about half covered with Water Sprite.

They were fed a carnivore based flake as a main diet, with supplemental feedings of frozen bloodworms, frozen brine shrimp, and other meaty foods, with an occasional feed of spirulina based flake. They ate everything with gusto.

Since they were reputed to be tough to breed and produce only small broods, the first broods from my colony surprised me. The first brood from my largest female numbered well into the 50's – each about 3/8" or so. Subsequent broods were a bit smaller, but I'm not sure if that was due to predation by the adults or if the females were actually dropping fewer fry. Obviously, smaller females dropped fewer fry, I'm guessing at 30 being about average. At least in my experience, they were neither delicate nor were they difficult to breed!

At first I did remove a group of fry to grow out on their own since it appeared that even though well fed, the adults did not have any qualms about nibbling on the occasional baby. To be fair, the newborns were about the size of the frozen brine shrimp that I was feeding, so perhaps that stimulated their feeding response. After I had a large enough colony and after adding the swordtails to the tank, there were always fish of all ages and observed fry predation seemed to decrease. After a while, I never noticed the large fish chasing the smaller ones. Perhaps they grew used to seeing smaller fish constantly and no longer associated them with food. I'm not sure.

It may seem heretical, but after about 6 months I had so many Red Rockets that I had passed them out to all who wanted them locally and via Aquabid. At that point I had to find another solution and I started using them as feeders for the *Pipa parva* (a smaller version of the Suriname Toad) that I was trying to breed at the same time. They provided me with enough feeders that I was able to feed the



frogs, their subsequent juveniles and a couple of other Pipid frog species that I was working with at the same time. I had enough food for them all for nearly a year!

If you get a chance to work with the Red Rocket, don't hesitate to give them a try.

For more information about these and other livebearers, consider joining the American Livebearer Association. You can get more information, and even join online, at [www.livebearers.org](http://www.livebearers.org) or by writing to:

**American Livebearer Association** Timothy J. Brady Membership Chairman 5 Zerbe Street  
Cressona, PA 17929-1513 (570) 385-0573 (H) (570) 385-2781 (FAX)

# Spiketail Paradise Fish

by Charley Grimes, CCAC

reprinted from Aug '02 *Fancy Fins* Of the Circle City Aquarium Club

With the exceptions of Spiketails & Moonlights, the regularly available Gouramis/Anabantoids have provided a lot of fun and gratification over my 40 years in the hobby. (Moonlights continue to be a source of frustration).

I have always had a love/hate relationship with the Paradise fishes because of their place in the history of the aquarium hobby and because they are such attractive, and usually, cooperative fishes.

My favorite anecdote regarding Paradise fishes involves a pair of the common Paradise fish that I picked up in a club auction but didn't have tank ready to house them. (Sound familiar?) Knowing the Paradise fishes have auxiliary breathing capability, I dumped the pair into a five-gallon bucket that was filled halfway with water and decorated with a handful of Java moss & water sprite.

Except for feeding every evening, I had ignored this pair of Paradise fish for about a week. One evening I noticed a big bubble nest in the floating water sprite and upon closer examination, I saw that the male was tending the nest and looked to be spitting eggs back into the bubble nest. The rascals had spawned in spite (or perhaps, because of) being ignored.

I watched the bucket for about 15 minutes and finally determined the female had a shiny belly region and was being ignored by the male, indicating she was 'spawned out'. Additionally, the male was tending eggs that seemed to show development in the beam of a strong flashlight, meaning that not only was the female's presence no longer desirable, there was only marginal reasons to keep the male in the bucket.

Making a decision, I netted out both the male and female, covered the bucket top with plastic wrap and did evening checks with the flashlight. In 3 or 4 days, the water surface in the bucket was teeming with little swimming dark specks.

I eventually raised about a hundred Paradise fish out of that bucket adventure -easy, huh?

On another occasion, I had a male Honey Gourami guard and hatch a bubble nest of fry in a well populated (planted) community tank. I finally took pity on him and floated the bubble nest into a shoebox and raised a gob of Honey Gouramis with no forethought and darn little effort - easy, huh?

Spiketails are, however, a different 'kettle of fish'.

Years ago, a friend gave me a bag of the UGLY Spiketail Paradise fish. Basically a dark gray fish with a faded red tail margin, ugh! Naturally, they spawned "Like crazy". I had 3-inch sections of one inch PVC pipe as little hidey-holes for the fish and they were constantly spawning in the PVC.

Whenever one of the males blew a serious bubble nest in one of the PVC pieces, the pipe would rise to float. It was interesting but I just didn't like the little runts.

The good looking, (tan, red, blue, etc.) Paradise Fish is a different story: I like them and they have driven me nuts. Over the years, whenever they were available, I would buy some. I always did my best to buy three or four males and an equal number of females. Even though, to be honest, I never saw any clear difference between the males and females and after a month in my tanks, all of them looked alike; all were good looking and all looked like males, great color and long fins. In all of those years, I never saw a hint of a bubble nest at the surface or in any of the PVC.

In January of this year, a bunch of us 'local yokels' carpooled to Champaign, IL for their winter auction. I went for the chicken livers at McGurdy's.

By default, I was forced to spend some time at the auction and saw a bag of 8 or 10 Spiketail Paradise fish listed as a "spawning group". I gave them a pretty good look; they were the good-looking variety/species but I couldn't even guess as to if there were both sexes in the bag.

I couldn't resist and bought the bag, took it home and plopped em into a heavily planted 15-gallon tank. I added inverted flowerpots and pieces of PVC and hoped for the best.

Within a couple of weeks, I started to see loose bubble nests at the surface. Occasionally, I could observe a fish sort of guarding/tending the nest. I really looked close at the nests and never saw any eggs or fry. I even dipped out the nests and tried to hatch out fry in a covered bowl-nothing!

Figuring my luck was running true to form on this fish, I just gave up except for providing maintenance care.

About the middle of May, while doing a water change, I saw an inch long Paradise fish scooting through the water. Closer examination revealed that I had four similar sized fry in the tank. As I dug around, I tried to pay attention, but still cannot tell males from the females.

Since then, I have seen the occasional new half-inch fry in the tank and I am still clueless as to how they spawn. I am pretty sure the surface bubble nests are just "goofing off" things these fish do. I haven't seen any bubble nests under the leaves of the plants so I surmise the rascals are building nests in the inverted flowerpots or in the pieces of PVC pipe.

Eventually, I have to get the gumption to break down the tank and reset the fish up so I can better observe what is going on. Instead of tossing in random PVC and flowerpots, I plan to orient them so I can better observe what is going on. I want to find out which are the females and how are the rascals spawning.

The Spiketail Paradise fish still frustrate me, but now, at least, it is a more enjoyable frustration.

# Club Hopping

Steve Edie

Mar 16-18, 2007 -- Hartford, CT: Northeast Aquarium Council – Annual Convention

July 2007 – Sacramento, CA: American Cichlid Association – Annual Show

Apr 11-13, 2008 -- Hartford, CT: Northeast Aquarium Council – Annual Convention

**R&J  
FISH  
FOOD**

**JIM  
314-638-1134**

# BAP Report

Steve Edie

Member	Species	Common	Pts	Total
Nov 2006				
Jim & Sue Amsden	<i>Macropodus opercularis</i>	Blue Paradisefish	5	5
Jack Berhorst	<i>Tilapia snyderae</i>		15	155
Charles Harrison	<i>Apistogramma macmasteri</i>		15	1477
Charles Harrison	<i>Fundulopanchax gardneri</i> "Akure"		15	1492
Charles Harrison	<i>Rivulus xiphidius</i> "Crique Blanche" (SFG04) *		20	1512
Charles Harrison	<i>Xenotoca eiseni</i>		15	1527
Mike Hellweg	<i>Betta falx</i> *	Redfin Betta	20	2557
Lawrence Kent	<i>Enantiopus</i> sp. "Kilesa"		20	125
Lawrence Kent	<i>Lamprologus ocellatus</i>		10	135
Lawrence Kent	<i>Telmatochromis vittatus</i>		10	145
Cory Koch	<i>Neolamprologus helianthus</i> *		20	325
Cory Koch	<i>Pelmatochromis nigrofasciatus</i> **		25	350
Cory Koch	<i>Pterophyllum scalare</i>		10	360
Cory Koch	<i>Xenotilapia melanogenys</i> *		25	385
Mark & Tammy Langer	<i>Geophagus</i> sp. "Red headed Tapajos" *		15	315
Gary McIlvaine	<i>Archocentrus spilurus</i>		10	186
Gary McIlvaine	<i>Charcodon audax</i>		15	201
Gary McIlvaine	<i>Limia tridens</i> *		10	211
Rick Tinklenberg	<i>Nematobrycon amphioxus</i>	German Black Emperor	15	1155
Rick Tinklenberg	<i>Pelvicachromis taeniatus</i> "Bandewouri"		15	1170
Rick Tinklenberg	<i>Xiphophorus nezahualcoytl</i>		5	1175

\* = First MASI species spawn (5 point bonus)

\*\* = First MASI species and genus spawn (10 point bonus)

\*\*\* = First MASI species, genus and family spawn (15 point bonus)

Member	Species	Common	Pts	Total
Dec 2006				
Mike Hellweg	<i>Aphyosemion zygaima</i> *	Mindouli Killie	20	2577
Mike Hellweg	<i>Limia melanonotata</i> "San Marias, Dominican Republic" *		10	2587
Cory Koch	<i>Archocentrus</i> sp. "Honduran Red Point"		10	395
Cory Koch	<i>Poecilia wingei</i>	Endler's Livebearer	5	400
Philip Newell	<i>Corydoras aeneus</i>	Albino Cory	10	10

\* = First MASI species spawn (5 point bonus)

\*\* = First MASI species and genus spawn (10 point bonus)

\*\*\* = First MASI species, genus and family spawn (15 point bonus)

After a recent discussion with a member of the Milwaukee Aquarium Society about their BAP program, a proposal was presented at the last MASI council meeting to amend our BAP fry donation requirements. Starting Jan 1, 2007, a breeder may receive BAP credit once per calendar year without donating fry. The spawn would need to be verified but this would allow extremely rare or expensive fish to be recognized in our program. Please note the "once per calendar year" part, because if you use your exemption up in January there won't be an exception made in November if you have an even rarer species then. Of course, we would welcome a donation of fry from all submitted spawns, but we'll try this and see how it works.

## Member Classifieds

Charles Harrison (314) 894-9761, [csharrison@inkmaker.net](mailto:csharrison@inkmaker.net) -

OTO Chlorine test kit, 4 ounces \$12.50 last for about 2 years, detects traces of Chlorine in tap/tank water, and other "Chemicals for the Fish hobby"

MASI Members can place a classified ad in the Darter for free. Ads may be up to 30 words in length. Send your ads to the editor. The ad will run for one issue unless you specify how long to run in, in which case it will run as requested.

# HAP Report

Mike Hellweg

Hello all,

Welcome to new HAP Participant Marlon Felman! And congratulations to Andy Walker, who reached the level of Advanced Aquatic Horticulturist! Great growing, guys!

All in all, a great year again for the HAP. Look for the Annual report either elsewhere in this issue, or in the next issue of the Darter, if this one was full.

Keep 'em green...

Member	Species	Common	Rep	Pts	Total
Nov/Dec '06					
Andy Walker	Bacopa caroliniana	Common Bacopa	V	10	120
Andy Walker	Rotala rotundifolia		V	15	120
Andy Walker	Taxiphyllum barbieri	Java Moss	V	5	120
Andy Walker	Egeria densa	Anacharis	V	5	120
Andy Walker	Microsorium pteropus	Java Fern	V	10	120
Andy Walker	Ludwigia sp. repens x palustris	Broadleaf Ludwigia	V	10	120
Marlon Felman	Phyllanthus fluitans	Red Root Floater	V	5	15
Marlon Felman	Phyllanthus fluitans	Red Root Floater	IB	10	15
Charles Harrison	Microsorium pteropus windelov	Lace Java Fern	V	10	500
Charles Harrison	Alternanthera reineckii	Red Hedge	IB	20	500

Reproduction Key: V = Vegetative, OB = Outdoor Bloom, IB = Indoor Bloom, S = Seedling



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# 2006 HAP Year End Totals

Mike Hellweg

80 entries from 72 species by 10 entrants

7 Outdoor Blooms

11 Indoor Blooms

3 Seed Reproductions

59 Vegetative Reproductions

Participant	Points this year	Species this year	Total Points	Total Species	Rank	Award Presented?
Andy Walker	125	12	125	12	Advanced	No
Brad Riley	30	3	30	3		
Charles & MaryAnn Lenau	25	2	305	26	Senior	Yes
Charles Harrison	150	11	500	41	Master	Yes
Gary Lange	15	1	1110	94	Senior	Yes
Jack Berhorst	25	3	135	15	Advanced	Yes
Jerry Jost	425	26	1070	69	Master	Yes
John Van Asch	60	6	615	54	Master	Yes
Marlon Felman	15	1	15	1		
Mike Hellweg	95	7	2540	178	Supreme Grand Master	No

## Supplementing Newly Hatched *Artemia*

by Bill Vannerson, David Kawahigashi, & Eric Lund

reprinted from May '99 *Cichlid Chatter* of the Greater Chicago Cichlid Association

There was a discussion on several Internet Killifish email lists regarding supplementing newly hatched baby brine shrimp (BBS), *Artemia*, with vitamins or calcium. The results of that discussion brought two important points to light for fish keepers of any species. One, hobbyists can supplement their BBS to add valuable nutrients to their fish, both fry and adults. Two, the power of the Internet as a resource.

### Supplementing BBS

Supplementing live food is nothing new. Many hobbyists have been adding vitamins to their worm cultures before feeding to fish and, to a lesser extent, adult brine shrimp as well. The strategy is to have the supplement ingested by the food and then by the fish when they consume the food. The debate on the mailing lists started when someone questioned the effectiveness of applying this technique to BBS. Would supplements added to the hatching water be ingested by brine shrimp nauplii and then consumed by the fish? Or would the supplement simply stay suspended in the hatching water without providing an additional value to our fish?

The answer comes down to whether or not newly hatched *Artemia* will consume the supplement. The answer is yes, but not right away. *Artemia* are filter feeders but don't start feeding until after their second molt, referred to as the instar 2 stage.

According to David Kawahigashi at San Francisco Bay Brand, the commercial fisheries have been practicing this for quite a while. "Supplementing nutritional components, such as vitamins or calcium, into live brine shrimp has been practiced by aquaculture hatcheries for around 10 years. This bio-enrichment or bioencapsulation of brine shrimp nauplii (instar 2 or adults) began using emulsified fish oils containing high HUFA's or highly unsaturated fatty acids for marine finfish and crustacean larvae. This 'break-through' enabled the culture of many other new marine species to be developed (flounder, sea bass, tuna, ornamental marine sp.)."

## Why Supplement

Eric Lund, researcher from University of Wisconsin, Madison, explains, "Briefly, saltwater fish all require a fatty acid that is common in marine fish oils called DMA (docosahexanoic acid) in their diet. They cannot make it from precursors, so it must be present in their food. Freshwater fish have a limited ability to make DHA from a particular precursor fatty acid of the omega-3 variety (linolenic acid), but they too can grow and reproduce well on a diet that includes DMA."

"Brine shrimp are a great food for all small carnivorous fish, but they contain virtually no DMA. Marine fish larvae fed only *Artemia* exhibit mass mortality a few days after they start feeding. Aquaculture operations get around this problem by adding an emulsion of phospholipids rich in DHA to newly hatched *Artemia*. The *Artemia* eat the emulsion (more of it also sticks to the outside of their bodies). The *Artemia* are then fed to the fish or can then be kept refrigerated for up to three days."

Enriching or bioencapsulation *Artemia* is essential for marine fish, but not for freshwater fish. Then why bother at all? Eric further explains, "I do believe, however, that for some delicate killies [and other freshwater fish] that experience high mortalities before sexing out, that enriching *Artemia* may be of some benefit. Another tactic worth trying is to feed enriched *Artemia* to the adults for several weeks prior to breeding them. In other species, fish eggs with low levels of DHA generally have poorer survivorship to first feeding than eggs that are rich in DHA. Giving females a diet high in DHA allows them to put more DHA into their eggs. As you all know, weak and feeble killie fry can be the result of several factors including inbreeding, bad water conditions and improper incubation conditions, but poor parental nutrition may play a role as well."

## Symptoms of Essential Fatty Acid Deficiency

The essential fatty acid end product, DHA, is an important component of cell membranes in retinal tissue (eyes), neural tissue and cardiac tissue. Deficiency symptoms may include:

- Sudden fright syndrome— Fish, usually juveniles, go into shock or twitch convulsively when frightened.
- Poor visual acuity— reduced ability to locate prey
- Worn fins
- Poor growth rates
- Poor egg viability
- High mortality rates under stressful conditions such as shipping

Note that factors other than essential fatty acid deficiency can cause all of these symptoms. Essential fatty acid deficiency is not a problem with most freshwater fish fed a varied diet. It is possible, however, that supplementation with a lipid emulsion may increase growth rates, fecundity and fry survivorship. So, if you are having problems raising a particular species, it may be worth a try.



## How to Supplement

There are three ways you can feed your fish bioenriched shrimp; buy enriched frozen shrimp, enrich live adult shrimp or enrich newly hatched nauplii.

### • Bioenriched frozen shrimp

Bioenriched frozen shrimp are available but may be difficult to find. David Kawahigashi explains, "Although we do not market any enrichment formula, we do enrich and freeze live adult *Artemia* with a HUFA formula and Spirulina algae for the aquaculture and aquarium markets. However, almost all of the sales for these two enriched products go to the aquaculture market due to the "unawareness" of the benefits of bioenrichment in the aquarium trade."

### • Enrich live adults

Enriching live adults is not difficult. Just add the supplement to brine shrimp 12-16 before feeding fish.

### • Enrich Nauplii

Adding supplements to newly hatch brine shrimp is a little more complicated. Baby brine shrimp will not ingest the supplements until after the instar 2 stage begins, about 12 hours after the nauplii hatch. However, most fish breeders prefer to feed newly hatched *Artemia* as close to hatching as possible in order to maximize the nutritional value.

Once the cyst hatches, the nauplii begin to consume stored protein reserves, just as newborn fry live off of their egg sac. The longer you wait to feed them, the less nutritional value that's passed on to the fish. The only way to counter act this is to feed the *Artemia*. This is not usually done because of difficulties in raising nauplii to adulthood. It's just not worth the effort when one can readily purchase adult brine shrimp.

A compromise solution is to maintain two separate sources of baby brine shrimp, one that is bioenriched and one that is not but has higher protein reserves. Follow your normal routine for collecting and feeding from hatcheries that are not enriched. Reduce the amount you would normally feed and replace with a portion from the enriched hatcheries. Since enriching requires extra time, you may want to set up multiple hatcheries to alternate. You also may store enriched *Artemia* in the refrigerator for up to three days.

## Quick List

Here's a quick checklist of the steps required to produce bioenriched *Artemia*:

- Prepare and hatch baby brine shrimp as normal, 24 hours for standard cysts or 16 hours for decapsulated cysts.
- Add bioenrichment 6 hours after hatching. This will be after the instar 2 or second molt.
- Feed within 12-16 hours or the shrimp will have digested the enhancement formula and you need to start over
- Store any unused nauplii in the refrigerator for up to three days.

## The Future

David mentions, "I am now working on bioenriching Haematococcus algae [super high astaxanthin for color enhancement] and some anti-bacterials into our live *Artemia* for product development. Because *Artemia* are non-selective and continuous filter-feeders, pretty much anything can be taken into the gut of a live *Artemia*, as long as the particle size is between 5 to 50 microns. Vitamin supplements must be in a non-soluble form, as *Artemia* cannot 'drink' soluble components."

# What Exactly is a Dwarf Cichlid?

by Neil Lilledoll

reprinted from Sept '03 Cichlid Blues of the Pacific Coast Cichlid Association

What exactly is a dwarf cichlid? The parameters one could use to determine whether or not a cichlid might fall into the "dwarf" category are extensive and complex at best. It must be noted that determining "exactly" what a dwarf cichlid is difficult. However, for the sake of establishing a list of species and genera that fall into this grouping, I will present a formula that may be useful.

I have always wondered why certain fish were considered dwarfs and others of a similar size were not. If you refer to different books on dwarf cichlids you will find many similarities but also a number of differences in the fish that they present. Not so surprisingly, even the authors of *American Cichlids I - Dwarf Cichlids*, Horst Linke and Wolfgang Steack, acknowledge the ambiguity. "Small Cichlids with a maximum length of 10 cm, in exceptional cases of up to 12 cm, are usually referred to as Dwarf Cichlids amongst aquarists." Additional uncertainty arises when they continue "Despite that this seems to be a clear criterion, experience shows that it is still a problem since many species do not exceed these lengths in the wild, but grow considerably larger in the home aquarium."

It seems to be widely accepted that all fish in the genus *Apistogramma*, *Apistogrammoides*, *Biotecus*, *Crenicara*, *Dicrossus*, *Microgeophagus*, *Nannacara*, and *Taeniacara* are dwarf cichlids. Furthermore, these fish are considered soft-water dwarfs and are all from South America. They are, however, not the only soft-water dwarfs in South America. Additionally there is a certain misleading quality to universally attribute the title "soft-water" to them. Many species in these genera come from neutral or relatively hard-water habitats. There seems to have been a widely held assumption in the past that these "soft-water" small fish are the only legitimately recognized dwarf cichlids. In the opinion of this author, that is far from the case. There are, in fact, dwarf cichlids from many continents with wide-ranging water chemistries in their natural biotopes.

Understanding why we might want to attribute the title "dwarf cichlid" to a fish or group of fish (aside from the obvious ichthyological categorization) can prove to be a valuable aid in developing a methodology of distinction. What is it about dwarf cichlids, for aquarists of that particular bent, that we recognize them as being different or special? Size is surely a strong contributing factor. The name "dwarf" itself carries the connotation of size as a predominant factor, but there is much more to it than size.

It is possible to make a case-by-case study of each genus and attribute independent criterion for the maximum size limit, the cutoff point, of which species would be considered a dwarf cichlid. This approach, however, lacks the universal consistency sought by this author for easy determination by the average aquarist. I do not claim any specific scientific merit in this article, nor do I expect universal acceptance of its arguments. I do suggest a method for understanding various attributes of the cichlids that we choose to work with and enjoy. Applying the following guidelines will lend a more critical evaluation of cichlids in general and, hopefully, aid in the requirements for their husbandry which is at the heart of what we as aquarists seek.

Although cichlids are dynamic animals and can grow to significantly larger sizes in a captive environment, the average total length in the wild is the first and primary consideration in determining their "dwarf" status. The tank size, feeding methodologies, water chemistry (ph, GH, KH, conductivity, cleanliness, temperature, movement, etc.), tank-mates, lighting, and infrastructure all have a bearing on the size a cichlid will ultimately reach in captivity. Surely the types of fish housed with a particular species will add to their security or insecurity, and may affect a fish's growth. Or who knows what role a lack of predation, con-specific aggression, or geographically "inappropriate" fish of the original natural habitat may play in the overall development of a cichlid.

Meeting the initial criterion of size is mandatory, but only the first step in determining the status of a particular fish. It is, however, the most important step and requires several points of examination. The following four criteria are all combined to distinguish a size standard for dwarf cichlids.

1. Male specimen can be no longer than 14 cm in their wild biotope. This length allows for larger fish to be considered, but is modified by the other criterion.
2. Female specimens may be no longer than 12 cm in their wild environment, regardless of their relationship to the males of their species.
3. Size at sexual maturity must be 10 cm for males and 8 cm for females.
4. For the larger candidates being considered that are close (within 2 cm) of the size limits, a minimal body depth should produce the "impression" of a smaller size. This means that long fish must not also be exceedingly tall or wide. Discus are a prime example of this and in many ways meet the requirements of a dwarf cichlid. However, they are far too high-bodied to be considered, even if the maximum length for a female in the wild was 12 cm. Whereas, *Crenicichia regani* (one of the dwarf pike cichlids) males are 13cm, but appear to be a smaller fish because of their slender body.

With the previous size requirements met, we may now look at several other factors that must be considered before assigning the "dwarf stamp of approval to any particular cichlid. The following is a checklist of criterion that can be used in conjunction with this simple formula:

"If a cichlid of the appropriate length and size can also meet at least 4 of the 8 criterion listed, and violates no more than 2, it may be considered a "dwarf."

This formula relates to the general qualities of a particular species and not to the exceptional individual. Because little work has been done with so many species of cichlid there is a lenient standard of 4 hits or 2 misses. These criteria all relate to the cichlids behavior (territoriality and aggression) in captivity and whether they are capable of a relatively peaceful captive existence during both breeding and non-breeding times.

1. No or minimal live plant destruction.
2. No or minimal substrate excavation. This does not include limited cave digging associated with breeding.
3. They can be housed individually with other cichlids. This means a single specimen can be kept with other species of cichlids.
4. Minimal predatory instincts. This suggests that they must have food requirements other than their tank-mates, as well as accepting of non-cichlid species (see 5)
5. Can be kept with "dither" fish. This suggests that other fish won't be regularly killed during non-breeding times.
6. Males and females of that species can be housed together.
7. Can be bred in a 30-inch x 12-inch tank (20gal. long), although larger quarters would be more appropriate.

8. Juveniles can be housed together as a group at sub-adult size. Some juvenile cichlids start killing or eating each other at a young age (i.e. Various *Hemichromis* species show cannibalism by 2 to 3cm).

Although Convict cichlids fit within the parameters of size, they are far too belligerent and aggressive to be considered a dwarf. Other cichlids are more marginal in terms of their behavior and should be closely examined for their ability to fit within the "dwarf scheme presented here.

The standard for a dwarf cichlid in general is a fish complying with the size requirement that will not kill their tank-mates and destroy the tank itself. They should be reasonable candidates for a planted aquarium and should not have a vicious quality warranting an isolated existence.

Cichlids are interesting for their behavior, including territoriality, aggression, and breeding practices. Dwarf cichlids have most of the same characteristics, only on a level that makes them more suitable for life in the home aquarium. It would seem apparent that it is worthwhile to know what exactly is a "dwarf cichlid."

# *Brochis splendens*

by Don Kinyon

reprinted from *Delta Tale* of the Potomac Valley Aquarium Society

*Brochis* are catfish from South America closely related to the *Corydoras*. The *Brochis splendens* is one of the most commonly available of the species and was first described in 1855 by Castelnau. They come from the Amazon, Rio Ucayali, Rio Ambiyacu and tributaries. Most of their habitat consists of soft, acidic, slower-moving waters that contain a good amount of vegetation.

*Brochis splendens*, as all the *Brochis*, generally attain a larger size than their *Corydoras* cousins. This species can grow to 3 1/2". One of the other differences is that *Brochis* species have more rays in the dorsal fin than the *Corydoras*. The basic body shape is higher and more laterally compressed.

This particular species can be from an attractive emerald green to almost solid black, depending on its mood and surroundings. The snout is long, bringing to mind the long-nosed *Corys*, such as *C. barbatus* or *C. seussi*. The belly of the fish is white to pale orange and fins clear to mud-brown.

I rescued five of these fish from a not-to-be-named pet store because it didn't look like they would last more than a few days in the conditions they were being kept under. Within a few weeks, two of the fish had died anyway, but the others seemed to respond to clean water and a variety of foods, even though their barbels were eroded and their pectoral fins were a little shorter than they should have been.

The three that remained looked to be two males and a female, so I planned on setting them up for breeding at some time in the future. For the time being, they were housed in a 30-gallon community tank along with some *Corydoras* species, *Bunocephalus* catfish, some *Rasbora* species, and Endler's livebearers. Foods consisted of live, frozen and dry prepared, given twice a day. Water changes were once weekly, usually about 35 percent, with tap water: pH of 7.4 and a total hardness of 140 parts per million.

One evening while feeding the fish, I noticed some small eggs along the top third of the glass, most of which were near the surface of the water. After observing the tank for a while, it was clear that I had missed the spawning and the fish weren't going to let me in on whose eggs were on the glass. I scraped all the eggs that I could find from the tank with a razor blade and put them into a small plastic tub for hatching. About one inch of water, a little acriflavin, some Java moss and an air stone seem to

work very well with *Corydoras*, and that's what I had assumed the eggs were from, so it's the set-up I used.

The eggs were tiny, at least as small as eggs of the diminutive *Corydoras pygmaeus*, and numbered about forty. I kept watch on them and removed any that went bad, and in four days they started to hatch. About thirty fry were present when all the eggs had hatched. The youngsters were about an eighth of an inch long, and looked pretty much like an egg with a tail. They didn't start to eat until they were three days hatched.

The young catfish stayed in the plastic tub until they were about three weeks old and about three eighths of an inch in length. They grew steadily on a diet mostly of micro worms, with an occasional feeding of baby brine shrimp.

Feedings were twice daily, as were ninety-percent water changes. I found it best to be careful not to change the water level, and therefore the pressure, too suddenly: it seems to have an ill effect on the baby cats, sending them into a shock-like state, and even killing some of the young.

By this time they had outgrown their container and needed a more permanent home. I had just moved some larger *Corydoras* fry from a 15-gallon tank, so it was available to be used. I emptied the tank and cleaned it, adding just enough new water to equal the one-inch level of the plastic tub. When the tub was dumped into the tank it raised the level a little, but not enough to hurt the fish. An air stone kept the water circulating and oxygenated. Instead of water changes, the fish got new water added once daily at about three quarters of a gallon each time until the level was sufficient to add a sponge filter to the set-up.

I had suspected that the eggs had been left there by some of the *Corydoras similis* in the tank that I had hoped would spawn, and by the time the fry were four weeks old I was sure that this was the case. They developed an oversized dorsal fin, which was a dark orange color with white edging. The other fins and the eyes matched its color. The body was silver with black markings, and the belly gold. Not exactly a perfect match for the adult *C. similis*, but so dissimilar to any other fish in the tank that it had to be related just by the process of elimination.

A week or two later, the juvenile fish were eating some of the same foods as adult catfish: live, frozen, and freeze-dried or flake, chopped into smaller pieces. The young fish were growing well now and looking more bizarre by the day. The oversized dorsal fin just continued to grow faster than the rest of the fish, and the colors were starting to change again. The dark orange in the fins got brighter, the upper body was mottled silver and black, and the lower body iridescent green. At this point I had no idea what these fish were.

At ten weeks, the snouts of the fry started to develop a definite pointed shape and I started to suspect the fish were *Brochis*. Some of the odd coloration faded to a shiny green and the growth of the fish started to catch up with that of the dorsal fin. The youngsters ate all the same foods as the adults by now and always seemed to be ravenous. They grew very quickly at this age and were over an inch long.

I finally confirmed that the eggs were those of *Brochis splendens* by twelve weeks of age. They were smaller versions of the adults, though still not quite the same coloration. A little of the speckling was still evident, and the dorsal, anal, and ventral fins were still orange-brown, but fading quickly.

I can recommend this fish to anyone for a community tank, species tank, or breeding scheme, as it offers no real problems in maintenance or breeding, and is an interesting addition to any hobbyist's tanks. The fry are an education in themselves to watch as they change color and shape, almost by the day.

# The Computer Page

Steve Deutsch

MASI's official web page: [www.missouriaquariumsociety.org](http://www.missouriaquariumsociety.org)

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# The Tiger Teddy *Neoheterandria elegans*

By Mike Hellweg

The Tiger Teddy comes to the hobby from the Rio Truando in Northern Columbia, just south of the border with Panama, where it spends most of its time hiding in the plants in shallow water along the shoreline. It is a diminutive fish, with adult males seldom reaching  $\frac{3}{4}$ " and adult females barely topping an inch.

Coloration is amazing for such a small fish. Both males and females are a deep olive brown with six to nine vertical bands of varying width. The band under the dorsal fin widens into a wedge shaped to round spot, which is bordered by an elegant metallic gold to amber ring – hence the name. In some specimens this ring can even be orange or red, though personally I've only seen that in photos. Unpaired fins are often dark gold to dark brown, outlined in a deep blue color. Their eyes are ringed in gold.

A colony can be maintained for generations in a 10 gallon planted tank. There is no need to move the female as she nears her due date, as there appears to be very little, if any, predation on the fry by the adults. This may be due to the relatively large size of the fry compared to the adults. As long as there are plenty of plants in the tank, there will always be fish of all ages in the colony. My colony tank is planted with *Najas*, Java Fern, and has some Water Sprite floating on the surface.

This is one of the tiny fish that utilizes a unique reproductive strategy known as superfetation (also spelled superfoetation in older texts). This is where the female drops only a few fry at a time, and may drop a couple of fry every day or two for a week or more until the entire batch is dropped. Batches are fairly small, maybe a dozen or so fry over the course of the week.

The new born fry are about a quarter inch long and already have the unique gold ringed spot and gold ringed eyes. They will take the same foods as the adults. Newly hatched brine shrimp are a staple for small fish and fry in my fishroom, and both adults and fry feed greedily upon it. They also get daphnia, Moina, Grindal worms, Mikroworms, and various finely ground flakes. I don't feed them frozen foods only because I don't usually have any that are small enough for their tiny mouths. I'm sure they'd eat them, too, if they were cut up.

I do 50% water changes in all of my tanks weekly, and the tanks are maintained at room temperature in my fishroom (usually about 76 - 78 degrees Fahrenheit). The Tiger Teddy seems to prefer warmer water, so I keep them in the top row of tanks, which normally stay around 80 degrees Fahrenheit.

I use sponge filters in all of my tanks, too. I don't know how they would do with a power filter, but due to their small size, it would probably be best to stay away from them in a Tiger Teddy colony tank. pH is usually between 7.2 and 7.4, and total hardness out of the tap is around 125 ppm. I add crushed coral to the Tiger Teddy tank to help keep up the carbonate hardness.

If you are looking for a small, yet beautiful wild-type livebearer, you can't go wrong with the Tiger Teddy. They are attractive, easy to keep, and easy to breed as long as you keep them warm. I'm only surprised that they are so uncommon, and have no idea why that would be.

For more information about these and other livebearers, consider joining the American Livebearer Association. You can get more information, and even join online, at [www.livebearers.org](http://www.livebearers.org) or by writing to:

**American Livebearer Association** Timothy J. Brady Membership Chairman 5 Zerbe Street  
Cressona, PA 17929-1513 (570) 385-0573 (H) (570) 385-2781 (FAX)

# The Expedition - Part 1

By Klaus Bertich

The South American Cichlids in the tank at the local tropical fish store were rare and they were juveniles. This was the first time that *Cichlasoma Invertulatus* a.k.a. the upside down cichlid has been seen outside of its native country of Brazil. The label on the tank said that it had been bred locally. But how did it get here and who was the breeder. A quick look at the list of characters in this story will make our trip up the Amazon a little easier.

Jerry Oaks has kept and raised fish for a long time. He has also kept cichlids most of his life. The one thing that he has always wanted to do was to collect tropical fish in the wild. This would be his chance. Jerry Oaks was a buyer for a small local hardware chain. He liked his job well enough but the love of his life, next to his wife, were his tropical fish. Jerry and his wife never had any children and his wife Jenny also worked. They always talked about him going on a collecting trip, but time was the one thing Jerry was short of. Jerry had been keeping tropical fish for over 20 years. He belongs to Omaha Regional Cichlid Association, ORCA. This is one of the local fish clubs and he is an active member, holding various positions in the club through the years. He is particularly interested in small South American Cichlids. Jerry has lot of Cichlids from all over the world, but he is always interested in something new. He had read of a few breeds that are only available if caught in the wild, the upside down cichlid is one of the fish on his wish list. If the trip went well, and they caught just a few of the fish on the wish list, then Jerry could concentrate on the rest of his fantasy, breeding them.

Bill Frankenburger heads a trip to South America on fish collecting trips every year. Bill works for the local zoo and specializes in aquarium fish and other aquatic animals. He has a B.S. (*Sure go ahead and read what you want into this*) in Micro Biology and a M. S. (That's right go on you know the joke) in Ichthyology, and a P.H.D. (That's right piled higher . . . . .) in Botany. He wishes he knew more about insects. Bill is a natural storyteller. He can tell the best stories on fish collecting. He's been making these trips for about ten years. He always goes to the same place, uses the same guide and gets a little more for his money because of this. He goes to a small town called Quiche. It's a small town and is located along the Rio Negro River. José Villagomentte will be the guide he owns and operates the guide service, drives the boat and does the cooking, kind of a One Man show.

Jack Wallenberg is the second person to sign up to go, this is his third trip. Jack not only goes for the fish collecting, he is also interested in music of all kinds. In the evenings when they go out to eat, Jack's ears are peeled for any good local talent that may have a tape or a C.D. for sale. Jack takes along a large Boom Box with recording inputs and a collection of wires that only he and God are privy as to their nature and use. If a group is performing at the local café, and he likes what he hears, he'll ask to set up and make a tape of them for himself and of coarse a few extra copies for the band.

The itinerary is to fly to New Orleans from Omaha and then on to Manaus city. Manaus is in northwestern Brazil and is the capital of the state of Amazonas. It is a port town as opposed to a river town, as ocean going vessels coming up the Amazon River dock here. This is where our trio will spend their first night waiting for José to pick them up. They will also spend their last night of the trip there, getting the fish ready for shipment back home. Manaus is a large modern city and one of its industries is tourism. Jerry didn't sleep well that night just thinking about the fish collecting. If the trip is only half as good as Bill's stories about them then Jerry is in for a treat, we'll see.

Quiche (Kwichi and you thought it would sound like that spinachy thing) is where our trio will head the next day. This is an all day boat ride, about 100 miles by water, northwest of Manàus. José meets the threesome at breakfast. They stayed at a hotel close to the river. After breakfast they all carry everything to José's boat and they are on the way. All they had were their three suitcases, and of course



Jacks Boom Box. The boat cruises at 60 M.P.H. The ride out of Manaus is a little rough seeing that they are on the Amazon River and the water here is a little choppy from all of the river traffic. As they make the turn North toward Quiche on the Rio Negro the water becomes almost like glass and José opens up all of the twin 300 horsepower outboards. Remember gas down here is about \$.25 a gallon. This is José's world and he puts on a good show for the guys. They make a few stops on the way just to look at the local flora and fauna. Now we're having fun. Jerry has always said if you ain't catchin fish at least you can go boat riding. Our three friends arrive at José's villa just around dinnertime and our three friends clean up and rest a bit. Dinner is not at the villa but at a local café. Jack bags his first Group here. The group is called Musicasa. The "Musicasa" play some modern and some folk music on all kinds of instruments, but steel pans are their favorite and best. The food is of normal South American tastes, beef, chicken, fish, and some local things. The language is Portuguese. The food, the music, the drink are a welcome end to very long day.

The next morning José has breakfast ready for the group. The fare is tortilla bread and eggs that Jose had collected in the jungle, near the cabin where they had spent the night. He had also caught a large Iguana, this would liven up the meal a little. José knows the Americanos will think its chicken. Americanos think every thing tastes like chicken. Our friends wake to the smell of coffee cooking on the stove. Jerry is the first up and is ready for the first day, but he needs that cup of coffee. He helps himself to a cup and takes a careful first sip for he knew it would be hot, but he didn't think it would be that strong. This is the coffee capital of the world, and the strong coffee just proved that. Jerry thought that maybe Juan Valdezs' mule just kicked his taste buds. Bill and Jack woke up shortly thereafter and as they ate they planned the day. Jerry told José that the chicken had an unusual taste but was very good. Bill and Jack knew about the Iguana, but they just drank their coffee and smiled.

José said that there were some collectable fish reported near a village about a days travel up stream. They would break this up into two days and collect some fish along the way. They had two dug out canoes powered by 20 horsepower outboards and a tag along boat with the camping supplies. The threesome had not brought along a lot of equipment, José had all that they needed. To get the fish back to the states, all that they needed was some plastic bags to put the fish into and a few Styrofoam coolers. José would ship these at the same time their plane departed. Their precious fish would be on the same plane as they were and would be collected upon arrival back in Omaha. It was about noon and time to take a break for lunch. Jose found a place along shore and got lunch going. Bill, Jack and Jerry went exploring the waters for some fish. Collecting tropical fish is not like a normal rod and reel fishing trip, you don't want to catch the biggest fish. You want young almost mature fish, or you want to steal the babies from the parents. This is not as easy as it seems. First, find a nesting mated pair and then wait for them to relax their guard. Well our three friends luck out and find a spot in the river with some nice nesting fish and they break out the hand nets. Bill says we need to get all around the fish. That's right, surround the fish with three people. That would be a three-ringed circus by my way of looking at things. Every thing would have gone all right if the fish had had just one bone of cooperation in their body. Well Bill being the leader took first stab at the nesting twosome. He ended up with a net full of nada. Jack takes a try and he comes up with a net full of bottom. Jerry was just watching, he didn't want to upset things. They regroup and try again. This time they put the nets in the water together side by side and approach the nest. The fish hold tight, as the nets slowly get closer. "Easy does it guys, this is going good," Jack says. Jerry sees a movement close to shore. "Hey guys the cows sure are big down here," he whispers. Bill looks toward shore and the cow is a Biiiiig bull, and the threesome are in his watering hole. His spot on the river and he wants it back. He pawed the ground snorted a few warnings and charged the water full tilt. This part of the collecting trip is over, Done, Alles, Finito. Looks like the only one that is going to collect anything here is the bull. The three left the water just as fast as they could, well Bill and Jack made it. No such luck for Jerry, he didn't make it up the bank. He slipped and fell back into the water. Old Bossie runs up to Jerry splashing and snorting, then just stops short of him. Jerry couldn't move, something to do with some kind of weight in his swim trunks. The bull looks at

Jerry; Jerry looks back. The bull paws at the water and splashes water in Jerry's face. Jerry was getting a little nervous. Bill and Jack are on shore watching the whole thing and just glad it wasn't them down there. Jerry was in deep trouble. What to do? Bill picks up some rocks and started throwing them at the bull. It works! It works too good maybe. Now he turns his massive head, with the biggest horns he had ever seen, and looks at Bill and Jack on shore. Up and out of the water he comes, like a runaway train. Bill heads for a tree and Jack for another, up they go. That was close! Jerry in the water had gotten up was running up stream towards camp. The bull has forgotten all about Jerry. He hadn't forgotten about his two trapped buddies though, he goes to the tree that Jack was in and looks up at Jack. He seemed to be thinking, how do I get this clown out of this tree. He starts to push on the tree with his head. Jack is wishing he were in a larger tree. The bull the stands on his hind legs and like a bear puts his hooves on the trunk and pushes on the tree. Jack hears the tree give a sickening crack but it doesn't break, yet. Just a few more pushes and Jack will be a doormat for El Toro. The bull gives the tree a few more pushes and more cracks are heard but the tree holds. Just as Jack is about to give up hope, José and Jerry come running around the corner. José comes in yelling and screaming and waving his arms. Old Bossy takes one look at this crazy man and heads back up to his field leaving the four to sort out what had just happened. I guess that dessert for supper had been served, a little humble pie for our three friends. Back at camp the three collect themselves and try to laugh the whole thing off. José tells them that this area belongs to a friend of his. He has been coming here for a few years, and that the old bull is more show than anything else. They all laugh and eat the dinner that José has fixed.

José is a pretty good cook. He can make a feast out of almost anything. He has brought along a lot of dried and smoked foods. None of which our threesome have ever seen in the States. José has a pot of stew going over a fire, coffee, and some local fruit he had collected in the fields next to the river. The stew had a good smell and was a little spicy. Jerry really likes it. He tells Jose that it's like the Chili he gets at the local O.P. Codger's chili parlor. He asks José what's in it. Now we all know that he really doesn't want to know, TMI Jerry, To Much Information. Senor Jerry, I put in a little bit of hot pepper, beans, bacon grease, chili beans, and some smoked snake. Well that's nice José, Jerry says as he heads for the river to lose his lunch. Now Jack and Bill have a good laugh and some more of the chili and coffee. Jerry comes back, sits down and drinks his coffee. He's not feeling well. Why didn't you guys tell me I was eating snake. Jerry would you have eaten it? Asks Bill. Well no, says Jerry. You thought it was pretty good until you ask what was in it? Asked Jack. Well yes, says Jerry, but, he looks off into the distant and just drinks his coffee.

Lunch being over the threesome decide that they'll have another try at the fish, Lets go back and see if those fish are still in El Toro's watering hole, says Jerry. I'll break camp, says Jose. O.K., we'll be back in a short time, says Bill. They walk to the spot where they had spotted the fish and look around for the bull, he's nowhere to be seen. They look into the water and there they are, a pair of *C. Invertulatus* tending to the nest. They watch for a moment as both fish swim over the nest upside down and fan debris out of the nest. They do this with the dorsal fin some how. One of the pair rights itself and starts to pick out debris from the nest and deposits it some distance downstream from the nest. Bill has an idea. He picks up some fine gravel and with net in the other hand walks into the water, and slowly approaches the nest. The pair of fish sees him but hold their ground. Bill lets a few of the rocks fall into the water from upstream and they fall into the nest. The two fish see the debris fall into the nest and do their house cleaning. They find the rocks and haul them away, leaving the nest unguarded for just a moment. Bill can see that these fry are just the right size for collecting. He waits for the parents to return and then lets some more rocks fall in to the nest. The adults do their thing and clean out the debris and while they are gone from the nest Bill lowers his net comes away with most of the fry. He backs away from the nest slowly so as not to disturb the nest any more than he already has. The two fish see most of their fry are gone and are a little puzzled, but soon they just go back to attending what's left of their family. The guys take their fish back to camp and put them into some plastic bags and then into one of the coolers. The first fish of the trip are secure and our friends are quite happy with themselves.



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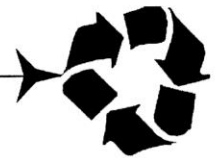
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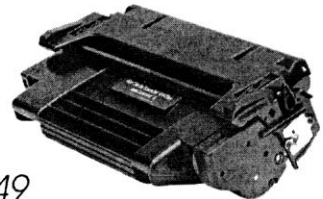
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