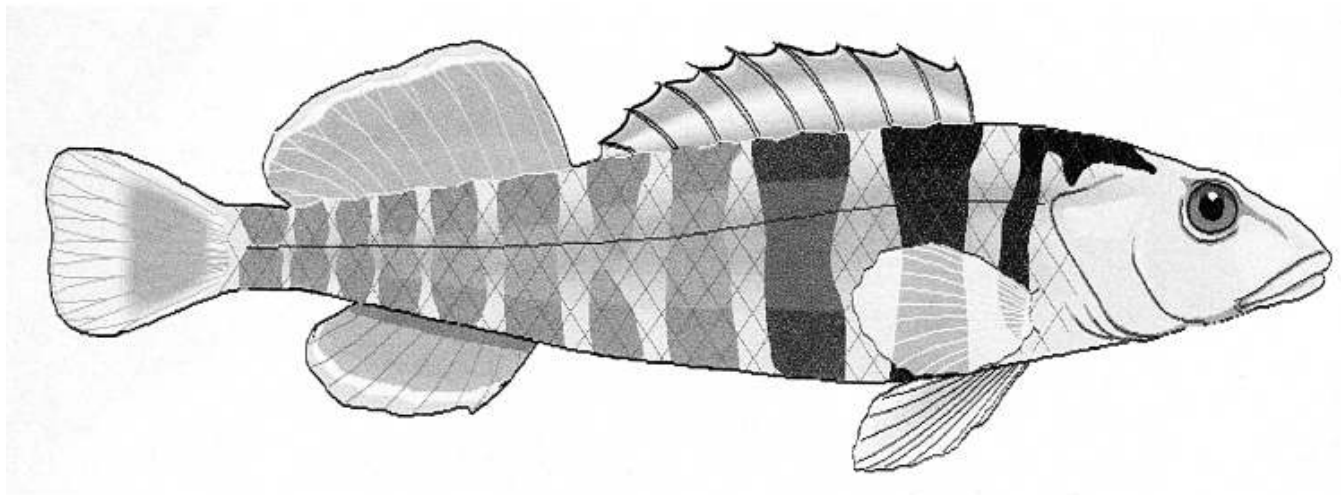


# *The Darter*

March - April 2010



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

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

Join the all-new MASI FishHeads Forum. See web page for instructions.

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THE DARTER (ISSN 0192-78333) is published bi-monthly by the Missouri Aquarium Society, Inc., 1813 Locks Mill Drive, Fenton, MO 63026-2662. Periodicals Postage Rates paid at Fenton, MO. This publication is free to members of the Missouri Aquarium Society, Inc. and other qualified requesters as determined by the publisher. Subscription requests can be sent to: Missouri Aquarium Society, Inc., 1813 Locks Mill Drive, Fenton, MO 63026-2662.

POSTMASTER: Please send all address changes to Missouri Aquarium Society, Inc., P.O. Box 1682 Maryland Heights, MO 63043-1682. Please allow 6-8 weeks for change of address. Include your old address as well as new - enclosing, if possible, an address label from a recent issue.

Opinions expressed by the contributors are their own and do not necessarily reflect the opinions of the Missouri Aquarium Society, Incorporated.

This Darter has been printed with remanufactured toner cartridges from InkForYourPrinter.com

# Places to Be / Things to See

SATURDAY March 27, 2010

Executive Council, hosted by Steve Edie

THURSDAY April 15, 2010

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

SATURDAY April 17, 2010

Executive Council, TBA

April 30 – May 2 2010

MASI Annual Show and Spring Auction, Gardenville Masonic Hall

THURSDAY May 20, 2010

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

SATURDAY May 22, 2010

Executive Council, Hosted by John Van Asch

THURSDAY June 17, 2010

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

SUNDAY August 8, 2010

Auction, 12:00 Start, Gardenville Masonic Hall

SUNDAY October 3, 2010

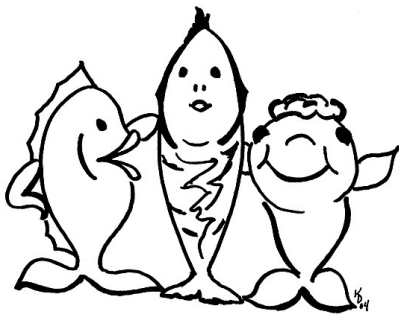
Swap Meet, Gardenville Masonic Hall

SUNDAY November 14, 2010

Auction, 12:00 Start, Gardenville Masonic Hall

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## *Membership*



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 Ron Huck, our membership chair.

# Presidential Preamble

By Mike Hellweg

The 50th annual show is almost here. I hope everyone can find the time to enjoy some of our weekend workshop. This is going to be a GREAT weekend! We've got a great lineup of speakers for the Saturday workshop. And this year you are competing for CASH prizes! Gary and his Show Committee have worked hard to make this one of the best free events in the aquarium hobby anywhere in the USA. I've been to many other events at other clubs around the country, so I know what I'm speaking about. We do have one of the best all-round groups to be found anywhere. And our events are all free. Many clubs charge even their members for talks. Believe it or not, some clubs are even starting to charge premiums to the bidders at their auctions in addition to charging the seller an auction split! Unbelievable! I can't imagine MASI ever having to do that, or our membership standing for it if we would. But we don't have to worry about that. Thanks to years of careful management by our Executive Council, our Treasury is sound and we have the luxury of being able to continue presenting free events to our membership and the general public.

It's time to start thinking about moving some or all of your fish outside for the spring/summer. You don't need to have a huge pond. You can start out by "tubbing" as TFH columnist Ted Coletti calls it. A simple, inexpensive 18 to 50 gallon tub with a few potted plants will serve as a temporary summer home for your fish. If you've got problems with raccoons or other critters, simply covering it with a wide mesh cloth like chicken wire will keep them out, and the plants and light can still easily get through the mesh. If you haven't tried it before, maybe this is the year to give it a try. Be warned, though. Tubbing is fun and can be addictive! Soon you might have the entire deck or patio lined with tubs! And you may be rewarded with fish and/or plants reproducing outdoors, so come the fall, you might even have some entries for the BAP or HAP.

Don't forget your indoor fish as you start spending more time outdoors. They still need water changes and filter cleanings. As an added bonus, you can use the waste water from the water changes for your garden. You'll be surprised how beautifully your plants respond to fish waste water.

And finally, it's time to start signing up for running for Council or an office for the 2010/2011 elections which are coming up fast. I've heard from a few people who have expressed interest in running for various positions. I hope you follow through and give it a try. It is a bit of extra work, but it is a lot of fun, and you get a chance to make new friends, visit fishrooms, and have your voice heard in the operation of our Society. In addition, it will give the current office holders a break. They've all been working hard for you for many years and they deserve someone else stepping up and volunteering.

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

# From the Fishroom

Ed Millinger

As your points tabulator I can report the average attendance this past year was 45 per meeting. That's a great turnout no matter how you look at it. We have a great group of people with varied interests and terrific leadership from our officers and council. As points tabulator I can also say that the show champion and service champion both had a run for their money this year. The winners will be revealed at the show banquet.

I really enjoyed Tony McMillan's article in the November-December Darter recounting his first show experience. At my first show I remember thinking it would be a great idea to use red gravel as a backdrop against my red tailed shark. Apparently I forgot the advice at the general meeting leading up to the show that it was a best to use natural gravel. Although my idea didn't work out years later Barb and Eric Miller won the family class that had albino brichardi in a tank of black gravel. I guess the red I used was a little overpowering and cancelled out the red tail.

If you are considering entering the show this spring for the first time don't hesitate to ask a long time member for advice. You never know how your fish will stack up. I remember members saying years ago "I don't want to hear someone at the show remark that they have a fish at home that would beat a certain show fish." Bring it , show it, and you might just win.

A while back on Aquabid I saw 3000 one inch Pacu advertised for \$450. I guess if you lived in a warm climate and could turn your outdoor pool into an aquarium you might bid on them. Oh and I guess if you also lived on a fruit plantation that would help also as they eat a lot of fruit and grow very large. I also saw a red tailed golden arowana up for bid with no reserve price set. The first bid was \$470 and five bids later it was at \$15,010. The forth bid was \$10,000 so I guess someone really wanted it badly.

Remember it's a hobby not a job, enjoy it.

## Help Wanted

Want to support your club and help shape its future? Elections are nearing. Nominations close in May; we will vote in June.

President  
Vice President  
Treasurer  
Secretary

Executive Council positions (these members make decisions for the running of the club)

Please email or call me if you would like more information about this – Kathy Deutsch

# Learning How to Aquascape Your Planted Tank

By Derek Walker

Aquascaping has become a form of art in many planted aquariums. Aquarists from all over the world have tried to keep a nice planted tank by gathering rocks, wood, and beautiful plants. They can become disappointed because they don't like the way they set up their tank. We can thank Takashi Amano for that! His planted tanks are a sight to see but it takes a lot of time and effort to create one.

I would like to share some aquascape tank ideas. The first thing I do is consider the size and shape of the tank I want to use. There are so many tank shapes and sizes on the market today. Once you pick out your tank, you simply need to use your imagination.

Imagine which type of layout you'd like to see. There are three basic types of layouts- concave, convex, and triangle. Once you pick the type of layout you want, you'll need to gather your plants. I choose plants for a variety of reasons. I imagine where they'll be planted in the tank- in the foreground, midground, or background. You want to buy plants that fit the layout of your tank.

The next step to creating an aquascaped tank is to choose your substrate. There is a wide variety of substrate to choose from. For example, if you want a natural looking tank, you might choose a sand color. Remember this is something that everyone will see. This is one of many focal points in your tank. Then, collect rocks and wood that you want to use. People consider all different types of rocks for their tanks. You can search for rocks by a creek or a riverbank. You can find some nice rocks along trails. While you take a walk, look for wood as well. Rocks and wood are a good addition to a creative tank design.

The final step in creating your aquascaped tank is putting all of the pieces together. Decide what your focal point is going to be. Place it in the tank and build around it. Create a marvelous looking tank by adding plants, rocks, and wood. There are no rules to creating the perfect masterpiece- just use your imagination and be creative. Maintaining a tank of this nature can be a challenge. Weekly water changes, cutting, and the right balance of light, CO<sub>2</sub>, and fertilizer are a must. You may have to rearrange your tank several times before you get your masterpiece just right.

## Vice-President's Program Report

by Kathy Deutsch

April: Killifish-an overview

The major species and their care. A great time to get info. This is an entry-level killifish talk, but there will be information everyone can use.

May: Rit Forcier on livebearers

# BAP Report

Steve Edie

Member	Species	Common	Pts	Total
Jan 2010				
Mike Hellweg	<i>Fundulopanchax scheeli</i>	Scheel's Lyretail	15	3529
Mike Hellweg	<i>Scriptaphyosemion guignardi</i>	"Souguetta" Blue Lyretail Panchax	15	3544
Jerry Jost	<i>Aphyosemion hera</i>	(ARKansas 1-2/96)	15	725
Jerry Jost	<i>Xenotoca variata</i>	"Jesus Maria – Aquascalientes"	15	740
Cory Koch	<i>Mbipia lutea</i>	"Yala Swamp" **@	30	1117
Gary McIlvaine	<i>Badis badis</i>		15	906
Gary McIlvaine	<i>Gymnogeophagus labiatus</i>	"Rio Olimas" *	15	921
Gary McIlvaine	<i>Hypsophys nematopus</i>		15	936
Gary McIlvaine	<i>Vieja maculicauda</i>	Black Belt Cichlid	15	951
Pat Tosie	<i>Anomalochromis thomasi</i>	"Guinea" *	20	3167
Pat Tosie	<i>Herichthys carpentis</i>	"Escondoto" *	15	3182
Pat Tosie	<i>Tilapia snyderae</i>	#@	15	3197
Pat Tosie	<i>Xenotoca eiseni</i>	#@ Red Tailed Goodeid	15	3212
Derek Walker	<i>Xystichromis phytophagus</i>	#@ Christmas Fulu	10	993
Harold Walker	<i>Skiffia multipunctata</i>	@	40	790
Harold Walker	<i>Xiphophorus</i> sp.	"Domestic Variatus" Tuxedo Variatus	5	795
Feb 2010				
Kathy & Marc Daly	<i>Xenotoca eiseni</i>	@ Red Tailed Goodeid	30	619
Charles Harrison	<i>Scleromystax barbatus</i>		15	2270
Mike Hellweg	<i>Betta picta</i>	Painted Betta	15	3559
Mike Hellweg	<i>Hemigrammus vorderwinkleri</i>	* Vorderwinkler's Tetra	20	3579
Mike Hellweg	<i>Pseudomugil cyanodorsalis</i>		10	3589
Steven Hoffman	<i>Limia caymanensis</i>		5	55
Jerry Jost	<i>Aphlocheilus panchax</i>	Blue Panchax	10	750
Jerry Jost	<i>Nematobrycon palmeri</i>	Emperor Tetra	15	765



Cory Koch	<i>Cardiopharynx schoutedeni</i> **	25	1142
Cory Koch	<i>Dario dario</i>	15	1157
Cory Koch	<i>Lamprologus congoensis</i> *	20	1177
Cory Koch	<i>Neolamprologus buescheri</i> “Kamakonde” *	20	1197
Cory Koch	<i>Neolamprologus modestus</i> *	15	1212
Cory Koch	<i>Paracyprichromis nigripinnis</i> **	30	1242
Gary McIlvaine	<i>Geophagus altifrons</i>	15	966
Gary McIlvaine	<i>Sewellia lineolata</i> ***	35	1001
Rick Tinklenberg	<i>Pelvicachromis subocellatus</i> “Moanda”	15	1980
Rick Tinklenberg	<i>Steatocranus casuarius</i>	15	1995
Rick Tinklenberg	<i>Tilapia mariae</i>	10	2005
Pat Tosie	<i>Ancistrus</i> sp. “Albino Bristlenose”	10	3222

\* = 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)

@ = C.A.R.E.S Species at Risk (Double base points)

# = Species previously submitted = 0 points, except for C.A.R.E.S. = base point bonus

^ = Species previously submitted, limited points for additional color varieties

At the last meeting the #@?&% Historian gave me two large boxes of old Darters to check against the BAP records. I’m still wading through them but I’m finding some spawns published in the old Darter BAP reports that were not included in the records I received when I became BAP chair several years ago. This means a couple of things: one, I have a lot of work to do, as I want the records to be as complete and accurate as possible. Secondly, some of what we thought were first MASI spawns were actually turned in many years earlier. This will mean some first spawn credits will need to be changed. When the updates are complete, we will post a new master list on the website.

On the current front, Gary McIlvaine scored a hat trick when he spawned one of the Hillstream Loaches, *Sewellia lineolata*, getting the 15 point bonus for 1<sup>st</sup> of species, 1<sup>st</sup> in genus, and 1<sup>st</sup> in family – Balitoridae. Nice going, Gary.

Sources:

Cal Academy - <http://research.calacademy.org>

CARES - <http://www.carespreservation.com>

## Fish Stories...

### *Invasive species hits too close to home-literally.*

By Tony McMillan

As knowledgeable aquarists we've all heard the horror stories of how introduced and invasive species of fish and other wildlife are wreaking havoc on ecosystems all over the globe. The Nile Perch has devastated the native cichlids of Lake Victoria. Tilapia and Largemouth Bass introduced into Mexico and Central America are decimating native species in those regions. Marine Lionfish, native to the Indo-Pacific, are devastating the Bahamas. The Mosquito Fish has been released worldwide to combat Malaria and is credited by some with saving millions of lives, but little research exists on their effects on native killies. A recent fishing trip I took to the Kaskaskia river only highlighted how bad this problem has also become in the United States itself.

As a young man in the late 80's and early 90's I used to enjoy fishing the Kaskaskia River Day Use Recreation Area. The Kaskaskia River Day Use Recreation Area is an oxbow on the Kaskaskia river near Ballwin, Illinois managed by the Illinois Department of Natural Resources. I didn't have a boat so this place was ideal as it was a good place to fish from the bank. Species caught included both Channel and Flathead catfish, White Crappie, Bluegill, both White and Yellow Bass, Green Sunfish, and Warmouth. I even caught a 11' long Largemouth Bass once that had scars from the beak of a very large gar running up both sides of its mid-section! It was my kind of place to fish as I enjoy angling different varieties of fish. I only dreamed of the day I would have a boat and fish the farther stretches of the large oxbow and the river itself.

Then in 2005 my Dad retired and decided to take up fishing as a hobby again. He had not owned a boat in many years so he bought a brand new one. He told me he and a neighbor took the boat to the Kaskaskia river and had caught a bass; they didn't have much luck but the area they fished looked promising. He mentioned he would like to take me there to try the area out again. Dad also mentioned that as he was heading back to the boat launch two very large Silver Carp (*Hypophthalmichthys molitrix*), had leapt into the boat.

The Silver Carp and its cousin, the Bighead Carp (*Hypophthalmichthys nobilis*) are the ubiquitous leaping fish of Youtube and blooper television that jump into peoples boats unawares and all sort of hilarity ensues. Apparently boat propellers and trolling motors excite the fish so to escape the commotion they leap right out of the water into any and every direction. Visualize the countless videos you have seen of Salmon migrating upstream and leaping up waterfalls, rapids, and past the mouths of Grizzly Bears and you get the general idea. Except this is in the calm waters of the Midwest. Originally from China, they were used as algae control in catfish farms in the south. Then a levee broke in 1993 and flooded one of those farms. And the rest is history.

So in the summer of '07 Dad took me to the Kaskaskia. Our area was in the midst of a drought so to launch we had to go all the way to New Athens as the Ballwin boat launch was too shallow. We launched our boat and made our way to the Ballwin oxbows which was uneventful enough. As Dad steered the boat into the oxbow I recognized some of the landmarks and realized we were fishing the Kaskaskia River Day Use Area! We tried both casting and trolling for about an hour but with no luck. This was far different than what I remember as by now I would usually have caught a dozen or so fish. Not all of them would have been keepers, mind you, but there was always a lot of activity. I didn't know what it was, but something had changed about this fishery. And that something was about to jump in my

lap.

We had stopped for lunch for 20 or so minutes then continued on up the oxbow. I was enjoying my bottle of water when I heard a splash. The next thing I knew a 12 or 15 pound airborne Silver Carp nailed me broadside across my chest and abdomen. Not only did I get the wind knocked out of me and lose my bottled water but slime and blood from the fish was all over my shirt and getting all over the inside the boat as it was flopping around. We stopped the boat, put it in the live well (the IDNR asks you to dispose of the fish on land and not return it to the water as it is invasive) and continued on. Just two minutes later another 10-12 pounder nailed me football style headfirst in my right hip. Not only was I hurting, this one knocked over the minnow bucket and was getting more blood and slime inside the boat. When Dad opened the live well to put this fish in the first fish jumped out and more hilarity ensued.

Seriously, though, it was not hilarious. These fish create dangerous and unsafe conditions for boaters. In my details I'm not trying to sound monotonous or redundant, I just want the reader to understand the chaos and confusion these carp create. Over the past decade we've seen in the news countless stories of boats being found abandoned and said duck hunter-fishermen-boater is reported missing. The bodies are usually found downstream a few days later. No one ever seems to know exactly what happened. Did a similar situation to the one my Dad and I encountered happen to these people and end up with a man overboard? Just food for thought.

We ended up catching four large Silver Carp this way. Not to mention the dozens that bounced off the side of the boat and back into water. Or the ones that flew over bow and landed back in the water on the other side of the boat. Or the one that narrowly missed my head. And when we did stop to fish, guess what? Not a single bite. These carp are filter feeders; so you're not going to catch them with hook and line. But who needs fishing tackle when the fish jumps into the boat?

Disgusted, we headed back to New Athens. We did stop to fish the mouth of a small creek and were not bothered by any carp. A few jumped but none actually landed in the boat. Dad did actually catch a small Largemouth Bass at this location. After five hours this was the only luck we had. We finished the rest of the sojourn back to New Athens and hauled the boat out of the water, disposing of our "trophy" carp in the trash (they are very bony and have very little edible flesh despite their size). I would later analyze the events of this day; how the hell had this happened to this productive river that I had loved since my youth? I also swore this was my last boat ride on the Kaskaskia river.

Keep in mind, I'm no scientist, but I do have some theories. Theories as to how this ecosystem, which is literally in our backyard, got turned on its head by these two species. We have our own large native filter feeders - namely the three species of Buffalo (genus *Ictiobus*) and the North American Spoonbill or Paddlefish (*Polyodon spatula*). I remember back in my childhood in the 70's there was controversy surrounding the Spoonbill. It seemed for decades nobody quite knew where or how they spawned. Then their spawning grounds were discovered on or near the Osage river in southwest Missouri, and that they actually migrated from all over North America to reach this spawning site.

What was more tragic is that this very site was slated by the Army Corps of Engineers to become the location for the Harry S. Truman Dam and reservoir. As all of you who travel to "the Lake" are aware, the dam was built, thus wiping out the spoonbills spawning site and hatchery. Except for one small spawning site that was later discovered in the Dakotas, all the Paddlefish hatched since the mid-70's are from government hatcheries. The government didn't do as good a job as Mother Nature as the Spoonbill all but disappeared from the Kaskaskia (snagging for Paddlefish below Carlyle Dam on the Kaskaskia was outlawed in the 1990's) and other tributaries of the Mississippi.

And into this vacuum left by the Spoonbill emerged the Silver and Bighead Carp, newly liberated by flood from their catfish farms in the south. Reproductively speaking they are obviously more prolific than the Buffalofish or they wouldn't be out competing and replacing them. They've

overrun the Mississippi river drainage system and recent reports suggest the electric barrier keeping them from escaping from the Chicago canal and getting into the Great Lakes has failed. This gives the carp the opportunity expand its range into all of eastern Canada and the northeastern United States.

What makes this an ironic twist of fate is that the carps place of origin-China-is also the only other place on earth that a species of Spoonbill exists. The Chinese Spoonbill (either *Polydon gladius* or *Psephurus gladius*) is reported to grow 23 feet in length and weigh 1100 lbs. Pollution, over-fishing, and the Three Gorges Dam all contributed to its demise much the same way the Harry S. Truman Dam did here. I say "its demise" because it has not been seen in the wild since 2007. What is unknown is what role competition from the genus *Hypophthalmichthys* may have played in its possible extinction.

But what about the other species - the species that do not directly compete with the filter-feeding carp for food? What about the sportfish - the Black Bass, the White Bass, the Crappie, and Sunfish? The reason they weren't biting that day is while they don't compete with the carp for food they do compete with them for something else - oxygen.

I've seen it before in oxbows. During a dry spell, the oxbow or other body of water shrinks depleting the water source of its oxygen supply. Just like an over-crowded aquarium, less oxygen, same amount of fish equals a fish kill of some sort. Usually the only fish left alive after these episodes are species of gar and catfish (because they can gulp air directly from the surface). I don't know whether the Asian carps can gulp air or not, but their fecundity must be playing a role in squeezing the sport species out of their habitats.

That's why we caught the lonely bass up past the mouth of creek. Up in the watershed of this creek, out of the destructive reach of the Asian carp, bass and sport species still live, hunt, and reproduce. Their young can still grow to maturity and make their way down to the river. Most of the oxbows don't have this luxury and must suffer the destruction of the carp.

Other than the discussion of invasive species, how else is this relevant to us as hobbyists? Because while aquarists and hobbyists are not to blame for this introduction, fish farming and aquaculture are to blame. Some of us may have outdoor ponds or tubs. This, like catfish farming, falls under aquaculture. Study the geography and landscape of your environment. Is your pond in a floodplain? How close to a creek are you? Remember all the rain we've had the last two years? I've had my tubs overflow and have lost Mollies before. In my rural town I'm 4 or 5 miles from nearest creek. But they still probably made it to the sewer. And once they get to sewer, then what? This area is Karst topography, meaning it's full of sinkholes. Did they make it to a cave? Who knows? Thankfully the Mollies I lost were both males.

Which means after this initially happened, because of all the rain I've had to work a lot harder this year displacing water to keep it from happening again. What's a pond owner to do though? If your in a flash flood situation do you take the fish with you or euthanize them some how? More food for thought.

Its kind of sad that most government and conservation authorities have a fatalistic attitude toward the invasion of the Silver and Bighead carp. I remember reading stories of how pioneers would seine and dredge rivers to pull out tons of sturgeon and grind them up for fertilizer. This, combined with the sturgeons slow reproductive rates is why many species of sturgeon are close to extinction. There's been talk of exploiting the carp for cat food and some commercial fisherman have begun exporting them back to Asia. Other than these instances there is not much being done to harvest them. Where is that old Yankee ingenuity? We've killed off and driven to the brink of extinction some of the most abundant species on Earth. Because if there is a species that needs to be over-fished, the introduced Asian carp is it.

## Editor's Notes

The Reet Thomas cartoon in this issue is an unpublished original, provided for use by Mike Hellweg. Thanks Mike. The "Lost Killifish of Madagascar" article is one Steve Edie pulled when he was exchange editor, but I have not had room to run due to length. This issue had few enough articles it fit. Not sure if that is good or bad. We do have articles by Tony McMillan, Derek Walker, and Ed Millinger, and artwork by Kurt Zahringer.

The deadlines for the rest of this year's issues will April 15, June 15, August 15, and October 15.

## Member Classifieds

I have beef heart and brine shrimp. I am looking for a 200 gallon tank. Jim Miller, 314-638-1134.

Wanted: 1 Female Red-Tailed Goodeid *Xenotaca eiseni* and 1 juvenile Male Yucatan Sailfin Molly *Poecilia velifera*. Contact Tony McMillan at (618) 509-3985.

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

Thiosulfate crystals (Chlorine Remover) .....	\$3.00 a half pound
OTO double strength Chlorine/Chloroamine test kits - 4 ounce -	\$12.50
Flubendazole, 5% powder 10 grams .....	\$5.00, 25 grams - \$20.00
Lavamisole HCl Powder - 5 grams treats 100 gallons .....	\$10.00
Methylene Blue 5% solution (2 ounces) .....	\$12.75
Acriflavine Concentrate (4%) solution, 2 ounces .....	\$12.70
Bromthymol Blue pH test solution, 4 ounces .....	\$7

Wanted: Small Styro shipping boxes - 12 x 12 x 12 or a little bit smaller. If your company uses them and throws them away, save them! Bring to the meeting or I'll come pick them up. Mike 636-240-2443

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 it, in which case it will run as requested.



MASI Logo merchandise is now available from Café Press. Thanks to Bart Kraeger for creating the site and Michelle Berhorst for creating a high-resolution digital version of the logo, you can now purchase logo merchandise on-line. Pick from T-shirts, jerseys, caps, tote bags, coffee cups, and more.

Go to [www.cafepress.com/MOAQS](http://www.cafepress.com/MOAQS) to view and order the merchandise.

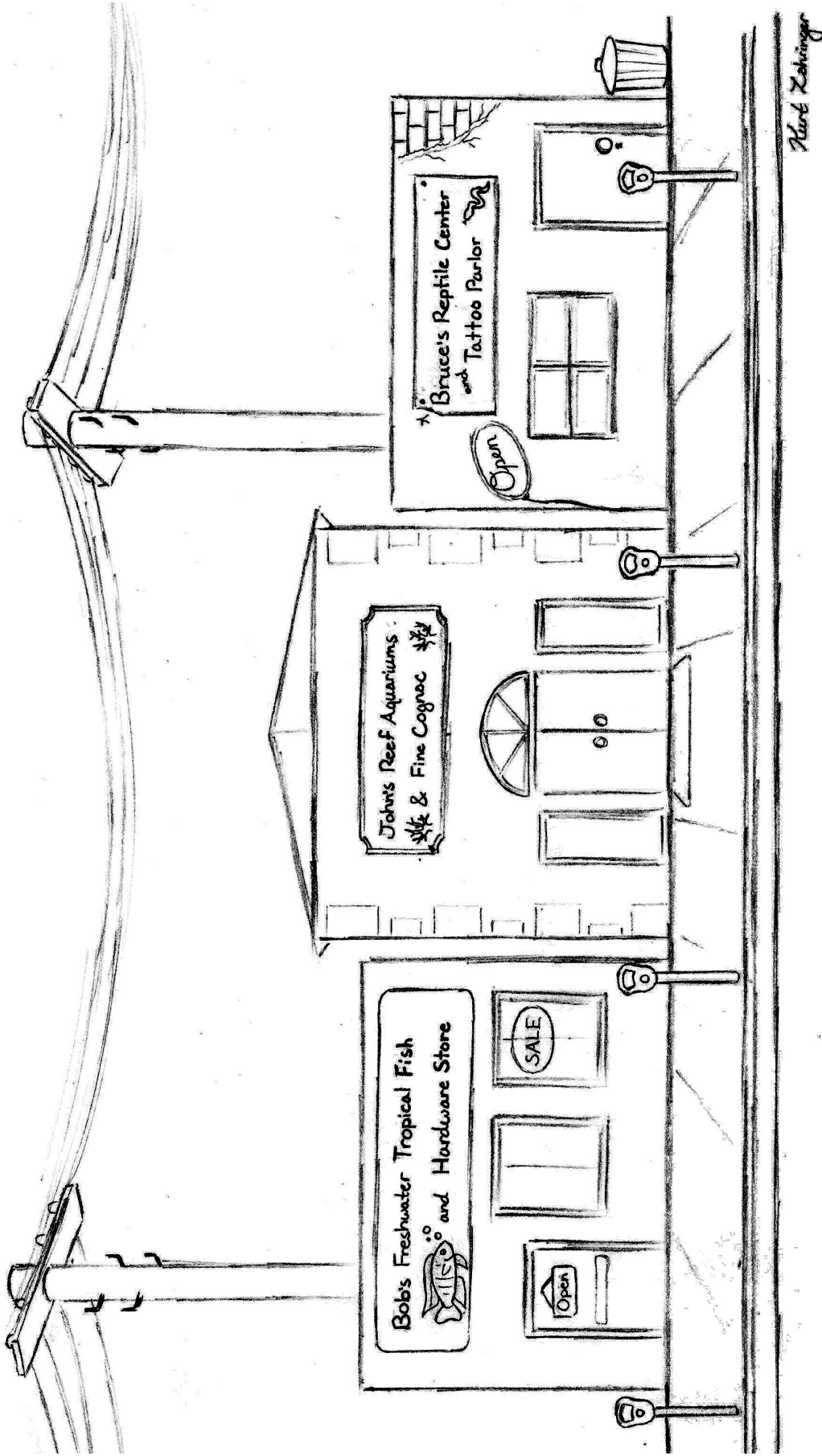
# HAP Report Nov 2009 – Feb 2010

Mike Hellweg

Member	Species	Common	Rep	Pts	Total
Charles Harrison	Lilaeopsis mauritiana	Dwarf Micro Sword	V	10	740
Mike Hellweg	Taxiphyllum alternans*	Taiwan Moss	V	5	2845
	Ceratophyllumsubmersum	Narrow leaf Hornwort	V	5	2850
Derek Walker	Cryptocoryne ciliata ciliata		V	15	2760
Derek Walker	Lemna perpusilla		V	5	2765
Derek Walker	Cryptocoryne parva	Pygmy Crypt	V	15	2780
Derek Walker	Lemna aequinoctialis		V	5	2785
Derek Walker	Microsorium sp. narrow leaf	Narrow Leaf Java fern	V	10	2795
Derek Walker	Ceratophyllumsubmersum	Narrow leaf Hornwort	V	5	2800
Derek Walker	Lemna valdiviana		V	5	2805
Pat Tosie	Riccia fluitans	Crystalwort	V	0**	255
Kurt Zahringer	Sagittaria subulata pusilla	Dwarf Sag	V	5	20
Ryan Bush	Alternanthera reineckii roseafolia	Copperleaf Alternanthera	V	15	15
Ryan Bush	Echinodorus tenellus	Pygmy Chain Sword	V	10	25
Ryan Bush	Eichhornia diversifolia	Fan Leaf Hyacinth	V	15	40
Ryan Bush	Ludwigia sp. repens x arcuata	Narrow Leaf Ludwigia	V	10	50
Ryan Bush	Sagittaria subulata pusilla	Dwarf Sag	V	5	55
Jerry Jost	Ceratophyllumdemersum	Hornwort	V	5	1615
Harold Walker	Aponogeton boivinianus		V	10	1055
Harold Walker	Echinodorus sp. Red Rubin	Red Rubin Sword	V	15	1070
Harold Walker	Nymphaea rubra		V	20	1090
Harold Walker	Sagittaria platyphyta	Fountain Sag	V	5	1095

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

\* = MASI First \*\* = Already submitted 8/21/96



## 2009 HAP Totals

Participant	Points 2009	Submissions 2009	Total Points	Total Species	Indoor Bloom	Outdoor Bloom	Seed	Rank	Award Status
Charles Harrison	60	5	740	58	11	1	3	Master	Needs 2 species for Grand Master
Derek Walker	375	31	2805	213	18	16	13	Supreme Grand Master	Needs 2 articles for Ultimate Grand Master To be presented
Dwayne Peters	35	5	80	10	0	0	0	General	Needs 1 seed for Master, 2 articles or program for Grand Master, 100 species to be presented
Gary Lange	25	3	1165	101	5	8	0	Senior	To be presented
Gary McIlvaine	15	1	50	7	0	0	0	General	To be presented
Harold Walker	165	13	1045	84	10	0	5	Grand Master	To be presented, 100 species aqIso to be presented
Jerry Jost	30	2	1615	102	22	0	2	Advanced Grand Master	
Kurt Zahringer	15	2	20	3	0	0	0		
Laura & Dave Wagner	10	2	25	5	0	0	0		
Marc & Kathy Daly	25	2	285	29	3	3	0	Senior	
Mickey Lee	30	2	635	52	2	22	1	Master	Needs 8 species, 1 seed, articles or program for Grand Master
Mike Hellweg	180	17	2850	205	32	14	11	Ultimate Grand Master	To be presented
Philip Newell	120	15	120	15	1	0	0	Advanced	General and Advanced To be presented
Scott Bush	10	2	10	2	0	0	0		
Tony McMillan	250	21	345	31	0	0	0	Senior	To be presented, Needs 1 seed for Mater



2009 HAP Year End totals

123 entries from 15 entrants represent 91 different species from 29 different families

3 Outdoor Blooms

8 Indoor Blooms

3 Seed Reproductions

109 Vegetative Reproductions

The most widely propagated species in 2009 was Anubia barteri, submitted 6 times



HOW YOU DOING IN THE  
H.A.P. PROGRAM MIKE?

# The Natural History and Aquarium Husbandry of *Pachypanchax sakaramyi* (Holly, 1928), The Lost Killifish of Madagascar

Dr. Paul V. Loisel and Joseph Ferdenzi

Reprinted from June 2005 Modern Aquarium Of the Greater City Aquarium Society

## Introduction

The island of Madagascar is widely recognized as a "biodiversity hotspot" (Jolly et al., 1984; Groombridge, 1992). Such distinctive – and highly photogenic - terrestrial elements of the Malagasy biota as lemurs and chameleons are at least passingly familiar to the substantial segment of the television audience with a taste for nature programming. Far fewer people are aware that Madagascar also supports an equally unique assemblage of freshwater fishes. Because this mini-continent achieved its final separation from the remainder of Gondwanaland nearly 165 million years ago, its freshwater fishes are characterized by high endemism - 100% at the species level – and great antiquity (Stiassny and Raminosoa, 1994). The most primitive representatives of their respective lineages, Malagasy fishes afford ichthyologists a unique perspective on the evolution of many teleost groups. Thus, while Cyprinodontiform fishes are represented in the Malagasy ichthyofauna by only two genera, *Pachypanchax* and *Pantanodon*, these taxa are of extreme scientific interest.

The genus *Pachypanchax* Myers, 1933 comprises three species. Their nearest relatives appear to be representatives of the south Asian genus *Aplocheilichthys* and its west and central African counterpart *Epiplatys* (see Parenti, 1981). The type species of the genus, *Pachypanchax playfairii* (Gunther, 1866), is native to the Seychelles, with an introduced population well established on Zanzibar. The remaining two species of the genus are restricted to Madagascar. Originally described from the offshore island of Nosy Be, the Malagasy Killifish, *Pachypanchax omalonotus* (Dumeril, 1861), is found along the western versant of Madagascar from the region of Morondrava northwards to Cap d'Ambre (Kiener, 1963). The final species of the genus, the Sakaramy Killifish, *Pachypanchax sakaramyi*, was described in 1928 by the German aquarist Holly from specimens collected in the Sakaramy River, which drains the northern slope of the Montagne d'Ambre, an ancient volcanic massif located on the northern tip of Madagascar.

Following its description, the Sakaramy Killifish effectively disappeared from the scientific literature until it was figured and its life colors described by Amoult (1959), who regarded it as a subspecies of *P. playfairii*. Apart from Kiener (1963), this assessment of its taxonomic status has not been accepted by subsequent workers, who have continued to afford *P. sakaramyi* full specific rank (Scheel, 1968; Parenti, 1981; Lazara, 1984). More significantly, Amoult extended its range to include Grand Lac, highest of the Massif d'Ambre's series of crater lakes. Amoult's paper represented the last word on the natural history of this species for over thirty years. Indeed, by the time that Reinthal and Stiassny (1991) published their overview of the Malagasy ichthyofauna, it was unclear whether *P. sakaramyi* still survived.

As part of an ongoing effort to establish secure captive populations of Madagascar's endangered fishes as a hedge against their likely extinction *in situ*, Loisel visited the Massif d'Ambre in early October of 1994 and 1995 to search for *P. sakaramyi*. While he found this species no longer present at its type locality, he was able to collect breeding stock from a point several kilometers further upstream. These fish were successfully exported to the United States, where they were bred at the Aquarium for Wildlife Conservation in Brooklyn, New York. The resulting F<sub>1</sub> progeny have been distributed to the Vancouver Aquarium, the Denver Zoo, and the Columbus Zoo, as well as to a number of accomplished

amateur aquarists who had expressed a prior interest in participating in a long-term captive breeding program for this species.

Unlike many endangered species, *P. sakaramyi* has collaborated so enthusiastically in these conservation efforts that its wider dissemination in the aquarium hobby has become as essential (to keep it from overrunning the public aquaria cited above!) as it is desirable. The purpose of this article is to introduce Killifish enthusiasts to the Sakaramy Killifish and summarize available information on its natural history and aquarium husbandry for the benefit of anyone wishing to work with this attractive species.

## Identification

*Pachypanchax sakaramyi* is a robust Killifish, growing to 10.0 cm standard length (SL). Viewed from above, the head is reddish, and the back is dusky on its anterior half and pale beige on its posterior half. This tricolor pattern is particularly evident in large individuals of both sexes. This distinct coloration, taken with a blunter snout, the presence of dark markings in the relatively short, and more rounded, unpaired fins of males, and the absence of discrete metallic spangles on the flanks of both sexes, distinguishes the Sakaramy Killifish from the more widely distributed *P. omalonotus*.

It is not difficult to understand what led earlier authors to consider *P. sakaramyi* to be a subspecies of *P. playfairii*. Both species have relatively rounded snouts and unpaired fins, while males of both sport a pattern of red dots on their flanks and share a bright yellow base color when sexually active. However, even the largest male *P. sakaramyi* never develop the slightly raised squamation characteristic of their Seychellois congener. For their part, female *P. sakaramyi* lack the distinct dark spot typically present basally in the dorsal fin of female *P. playfairii* as well as any trace of red spotting on the flanks. Of considerably more importance to aquarists is the fact that the two species manifest significant behavioral differences in captivity. Males of *P. playfairii* are notoriously intolerant of one another, often behave aggressively towards heterospecific tankmates, and will routinely injure or even kill sexually unreceptive females unable to escape their attentions. None of these observations applies to *P. sakaramyi*.

## Natural History

### Distribution

*Pachypanchax sakaramyi* was originally described from specimens collected from the Sakaramy River at the village of the same name, some 30 km south of the city of Antsirana (Diego Saurez) at an altitude of 500 m above sea level. Intensive sampling at this locality in 1995 yielded only Guppies (*Poecilia reticulata*). Mozambique mouthbrooders (*Oreochromis mossambicus*) were also observed. Lac Sahely, a nearby endorheic lake, also contained only introduced *Tilapia* and Guppies. Substantial populations of *Zoto* (pronounced "zoot"), as *P. sakaramyi* is known to the Malagasy, were observed both years in the high-gradient upper reaches of the Sakaramy River from just upstream of the type locality to its source immediately above the town of Joffreville.

Efforts undertaken in 1994 to locate additional populations of *P. sakaramyi* in the low-gradient portions of the eastward-flowing Anambato and Ankazome-falana rivers accessible from the Antsirana-Ambilobe road were unsuccessful. Only Guppies and Mozambique Mouthbrooders were collected at these locations. Sakaramy Killifish and Guppies were observed in the Antsahalalina River, the next drainage to the south, in 1995. Local residents shown color photographs of this species recognized it immediately and declared it to be present in small numbers in the high-gradient tributaries of the Antsahalalina that rose further up the slopes of the Massif d'Ambre. They have also reported it as abundant in Lac Texier, a low-altitude crater lake in the southeastern corner of Montagne d'Ambre National Park.

Grand Lac is the highest of a series of crater lakes in the upper basin of the Riviere des Makis, a river that drains the western slope of the Massif d'Ambre. Park rangers at Montagne d'Ambre National

Park, when asked about the occurrence of *P. sakaramyi* therein, expressed extreme skepticism, that a tropical lowland species could survive the decidedly chilly water temperatures prevalent in a lake situated 1445 meters above sea level. However, given the putative presence of *P. sakaramyi* therein (Amoult, 1959), efforts to locate this species in the two lower lakes of the series, Petit Lac and Lac Maudit, as well as in the upper reaches of the Riviere des Makis itself, were mounted in 1994. These proved unproductive. The stretch of this river that flows through Montagne d'Ambre National Park is completely devoid of fish life, although it does support a diverse assemblage of aquatic invertebrates and tadpoles.

The absence of native fish from this section of the Riviere des Makis is probably due to the obstacle to upstream movement posed by the Grande Cascade, a spectacular waterfall 80 meters high that separates its upper and lower reaches at a point just outside the park boundaries. Further sampling of the Riviere des Makis below the Grande Cascade needs to be undertaken to unequivocally establish the presence or absence of *Zoto* therein. However, as the lower reaches of the westward-flowing streams that rise in the Massif d'Ambre flow through lowland habitats inhabited by *P. omalonotus*, it would be surprising to find the ecologically analogous *P. sakaramyi* there as well.

Petit Lac is inhabited by two introduced species, *Gambusia affinis* and *Tilapia rendalli*, and Lac Maudit by the equally exotic carp (*Cyprinus carpio*) and Black Bass (*Micropterus salmoides*). In the absence of pre-introduction baseline data, the hypothesis that these exotics extirpated pre-existing populations of *P. sakaramyi* from these two lakes can never be disproved. However, given the absence of native fish from the upper reaches of the Riviere des Makis, it is difficult to envisage how these lakes could have been colonized by this or any other Malagasy species. The thermal profile of Grand Lac as well as the absence of *P. sakaramyi* from the upper Riviere des Makis strongly suggest that Amoult conflated Lac Texier, a larger body of water that can quite legitimately be described as "un grand lac du Montagne d'Ambre" ("a large Lake of Montagne d'Ambre") with the smaller and somewhat misleadingly named Grand Lac.

Based upon the data in hand, the present range of the Sakaramy Killifish appears to be restricted to the high-gradient stretches of rivers draining the eastern versant of the Massif d'Ambre and to Lac Texier. Its occurrence in the nearby Lac Fantany, another sizable low-altitude crater lake in the southeastern quadrant of Montagne d'Ambre National Park, also seems likely.

### *Habitat*

*Pachypanchax sakaramyi* inhabits streams flowing under both degraded and intact forest cover. While individuals of all sizes have been observed in flowing stretches of the Sakaramy River as well as in relatively tranquil pools, *Zoto* are most abundant in the latter microhabitats. This affinity for standing water probably accounts for its success in colonizing Lac Texier. Water temperatures measured in partially shaded segments of the Sakaramy River between 9:00 AM and 12:00 noon on 5 October 1995 using a laser thermoscanner yielded readings between 20.5° and 22.2°C. The water was absolutely free of suspended matter and unstained by tannins or humic acid. The pH values, measured using both a portable pH meter and a colorimetric test kit, ranged from 7.2 to 7.5. The Sakaramy River, like all the bodies of water draining the Massif d'Ambre, is deficient in dissolved minerals. Conductivity values for *P. sakaramyi* habitats in the Sakaramy and Antsahalalina rivers ranged from 58.0 to 75.0 umho; total and carbonate hardness values ranged from 2° to 4° DH.

The Massif d'Ambre is composed of ancient volcanic basalts. Stream bottoms on *P. sakaramyi* habitats ranged from bare bedrock to rounded basaltic cobble interspersed with boulders up to 60 cm in diameter. Waterlogged branches were not uncommon along the margins of larger pools. Local people have artificially widened several stretches of the Sakaramy River near Joffreville with crude stone weirs in order to cultivate watercress therein. Apart from this introduced exotic, no

submerged aquatic plants were observed growing in the upper Sakaramy River, although a dwarf form of the umbrella papyrus (*Cyperus alternifolius*) does occur in small numbers wherever the stream margin is well illuminated. The Madagascar Laceplant (*Aponogeton fenestralis*), an unidentified epilithic horsetail-like plant, and the exotic water hyacinth (*Eichhornia crassipes*) were found in Sakaramy Killifish habitat in the Antsahalalina River.

#### *Feeding Pattern and Enemies*

*Zoto* have well developed teeth in their jaws and short gill rakers. These Killifish feed upon stranded terrestrial insects and small aquatic invertebrates. As the upper Sakaramy River is devoid of other fish, its only enemies therein appear to be predatory aquatic insects such as dragonfly larvae and the Malagasy malachite kingfisher (*Corythornis vinfsioides*). The tendency of individuals to dive to the stream bottom and hide under rocks when disturbed represents an effective response to the threat posed by fish-eating birds. Lac Texier supports sizable populations of two eel species, *Anguilla mossambica* and *A. marmorata*, both capable of preying upon *P. sakaramyi*. Although small numbers of the Sakaramy River population are caught, usually by children, and consumed locally, this species is not the object of a sustained fishery.

#### *Social and Reproductive Behavior*

In the wild, juvenile Sakaramy Killifish are typically observed in the shallows in loose associations of up to a dozen individuals. Adults frequent deeper water away from the banks. Large individuals of both sexes are solitary. Females tend to swim slowly in a stop-go manner, while males are in constant, active motion throughout their habitat. Territorial behavior was not observed, although courtship and spawning were. This suggests that *P. sakaramyi* has an aterritorial or consort-type mating system in which males contend for access to ripe females rather than for control of spawning sites. No aggressive interactions were observed between males. As the fins of wild-caught males often show bite marks, however, bouts of serious fighting must occasionally occur.

Pairs in nature were observed spawning upon waterlogged branches and among the cobbles of the stream bottom. Under aquarium conditions, *P. sakaramyi* will spawn in nylon mops and will deposit their eggs on the gravel bottom even when alternative spawning sites are available. Data on the position of eggs deposited in such a mop by a very young pair over a month's time are presented in Table 1. These data further suggest a clear preference for oviposition sites in the lower third of the water column.

Courtship behavior in this species appears relatively simple. Observations of consorting pairs in nature indicate that the male assumes a position alongside and slightly to the rear of the female and attempts to maintain body contact while driving her towards a spawning site. Oviposition follows the typical cyprinodont pattern, with the pair assuming an S-curve, both sexes quivering intensely for a moment, and the female then jerking abruptly away from the male. Multiple spawnings can occur in rapid succession.

The clear, spherical eggs measure 1.2-1.5 mm in diameter. At a temperature of 22°C (ca. 72°F), the embryo is clearly pigmented by the end of the first week of development. In captivity, most eggs collected were observed to hatch after 10 days at 25°C (ca. 77°F). At 22°C, the developmental interval is considerably longer, the first fry appearing 25 days postspawning. Most eggs hatch without any need for external intervention, but occasionally the fully developed fry appear incapable of emerging from the chorion in the absence of an external stimulus. The newly hatched fry measure 4.0 mm TL. Growth is fairly rapid, the fry measuring 15.0 mm TL within four weeks of hatching. Sexual maturity is attained about 12 weeks posthatching, at a length of 38.0 mm SL for males, slightly smaller for females. Juveniles ranging in size from 10.0 to 30.0 mm TL were observed in both the Sakaramy and Antsahalalina rivers in October 1995. Extrapolating from growth rates observed in captivity, such a size distribution suggests either a completely a seasonal reproductive pattern or, at the very least, a protracted breeding season.

## Aquarium Husbandry

### General Maintenance

The maintenance needs of the Sakaramy Killifish are modest. This species does well over a temperature range of 22-27°C (72-81°F). When an aquarium heater became stuck in the "on" position, one of us (JF) discovered that both adults and fry could tolerate brief exposure (< 24 hours) to temperatures above 95°F. Although it occurs in soft water habitats in nature, *P. sakaramyi* will prosper in moderately hard water (up to 6 DH) in captivity. A pH range of 6.8-7.5 suffices for both day-to-day maintenance and breeding. Fish exposed to pH values lower than 6.0 lose their color and swim listlessly with clamped fins. The addition of a calcareous substrate such as dolomite to their aquarium will keep pH values within an acceptable range in those parts of the country that have very soft tap water. Like other Killies native to stream habitats, this species is very intolerant of dissolved metabolites. An efficient biological filter is essential for its successful husbandry. Replacing 25% of the tank's volume with fresh, dechlorinated water of the same temperature every 10-14 days will keep dissolved nitrate at an acceptable level. Although this species is less of a "jumper" than most Killies, prudence still dictates that their tank should be securely covered.

This fish is catholic in its feeding habits and displays a healthy appetite. Newly captured specimens accepted medicated flake food within half an hour of their capture. Both flake and granular foods are eagerly taken in captivity. Such frozen foods as *Mysis* shrimp, krill (*Euphasia pacifica*), and bloodworms are greatly relished as are live foods such as newly hatched *Artemia* nauplii, *Daphnia*, and tubificid worms. Food is pursued at all levels of the water column.

### Breeding

The Sakaramy Killifish is easily bred. Adults do not appear to search out their eggs and, unless very hungry, ignore their free-swimming fry. A single pair placed in a permanent setup will quickly populate their aquarium with young of all sizes. Recruitment effectively ceases when the first young hatched grow large enough to prey upon their newly hatched siblings.

A single pair can also be set up in a 5-1/2 gallon aquarium with a floating mop of nylon yarn (Markis and Langton, 1974; Terceira, 1974; and Hellner, 1990 discuss mop-making) and the eggs removed from its strands daily or every other day. At a temperature of 25°C (ca. 78°F), a well-fed pair will produce 3-11 eggs daily. The chorion is well supplied with short filaments that adhere firmly to the nylon strands of a spawning mop. The eggs are very tough and can be safely picked from the mop with forceps or between thumb and forefinger. Fertile eggs seem very resistant to fungus. Of a batch of 22 eggs placed in a hatching tray containing untreated water from the breeding tank, only one was lost to fungus. As noted previously, the developmental interval in *P. sakaramyi* is strongly influenced by ambient temperature, and development can sometimes be arrested at a point just prior to hatching. The manipulation of ambient concentrations of dissolved O<sub>2</sub>, and CO<sub>2</sub> by adding a pinch of prepared food or microworm culture to the hatching dish or, in extreme cases, to a stoppered vial containing water from the hatching dish and these "stubborn" eggs suffices to trigger hatching.

Although they will take microworms for their initial meal, *P. sakaramyi* are large enough to consume newly hatched brine shrimp. Within a week of hatching, they will also take finely divided prepared food as well. The fry of the Sakaramy Killifish are good hunters and have voracious appetites. With heavy feeding and frequent partial water changes, growth is rapid. Under aquarium conditions, young *P. sakaramyi* can be reliably sexed about 8 weeks postspawning on the strength of the dark markings that begin to appear in the vertical fins of males at a length of 23.0-25.0 mm TL.

Under aquarium conditions, fry that hatch within two weeks of one another do not show any cannibalistic tendencies. Older fry will prey upon newly hatched siblings, however. The developing young are in other respects quite tolerant of one another. Unlike many African Killifish, even young

males do not display any noticeable degree of aggression towards one another. The gratifying ease of its aquarium husbandry makes the Sakaramy Killifish suitable for both novice and expert alike, and augurs well for its future in the hobby.

### Conservation Status

Threatened by habitat degradation and a suite of competitively superior exotic species, the freshwater fishes of Madagascar enjoy the dubious distinction of being the island's most threatened vertebrates. Of the approximately eighty species of freshwater fish native to Madagascar, four are believed to be extinct. According to the latest criteria established by the International Union for the Conservation of Nature, eight of the remainder are classified as critically endangered and seven as vulnerable. Sakaramy Killifish clearly falls into the last of these categories.

Available data on its present distribution and ecology suggest that *P. sakaramyi* was aboriginally present along the entire eastern versant of the Massif d'Ambre in both streams flowing under some sort of forest cover and in their associated crater lakes from sea level to an altitude of 700 m above sea level. Since its description in 1928, the Sakaramy Killifish has been replaced at lower altitudes by naturalized exotic species such as the guppy and Mozambique Mouthbrooder. It apparently owes its persistence in high gradient reaches of these streams to behavioral adaptations that allow it to escape the scouring effect of rainy season spates that wash less well adapted exotics down into their lower reaches.

Although conversations with local residents suggest that *P. sakaramyi* can still be found in numerous streams of three drainages and in one sizable crater lake, the fact remains that recent searches for this species have only succeeded in finding it at two riverine localities. Because both lie outside the boundaries of Montagne d'Ambre National Park, their immediate watersheds have been subject to severe deforestation. This does not augur well for the future of these populations of the Sakaramy Killifish.

Contrary to the situation of many West African Killifish species, the threat to the survival of *P. sakaramyi* does not stem from the immediate effects of the loss of riparian forest. The section of the Sakaramy River that flows past the town of Joffreville continues to support a considerable population of Sakaramy Killifish notwithstanding the intensive *tavy* (slash-and-burn agriculture) practiced along its banks. This suggests that the presence of intact gallery forest is not essential to the survival of this species. The danger posed by deforestation stems from the effect that loss of forest cover has upon patterns of stream flow in a climate characterized by markedly seasonal precipitation. A forested watershed acts as a sponge, absorbing rainfall and releasing it slowly during the dry season. When the forest has been cut, rivers that formerly flowed throughout the year become intermittent. Small streams often disappear completely during the dry season, dooming those of their inhabitants incapable of either moving into persistent habitats or undergoing some sort of aestivation.

Although the forests of the Massif d'Ambre enjoy an impressive degree of statutory protection, the reality on the ground affords little basis for optimism. Those of Montagne d'Ambre National Park have to date been afforded effective protection and for the moment appear secure. However, timber poaching, primarily for the local market, is an ongoing problem, while *tavy*, with its associated illegal seasonal burning, continues to be practiced right up to the park borders. According to park officials, only eighteen of the Massif d'Ambre's sixty five formerly permanent streams still flow year round. Admittedly, many of these now seasonal streams are tributary to larger rivers that are permanent at lower altitudes. However, these habitats are now dominated by exotic species and as such are unavailable as refugia for Sakaramy Killifish. Given these trends, the continued persistence of habitat suitable for *P. sakaramyi* outside the boundaries of Montagne d'Ambre National Park is, at best, a highly questionable proposition.

The long-term survival of the Sakaramy Killifish in Madagascar can best be assured by maintaining the integrity of the watersheds of Lac Texier and any streams supporting *Zoto* that do rise within the park. However, given the uncertainties associated with *in situ* conservation programs in the Third World, prudence also dictates that a viable captive population of *P. sakaramyi* be maintained as

insurance against unforeseen contingencies. Several member institutions of the American Association of Zoos and Aquariums are committed to establishing a secure population of the Sakaramy Killifish in captivity. The adoption of *P. sakaramyi* by Killifish enthusiasts would also go far towards assuring its global survival. Hopefully this article will persuade some of its readers to breed and further distribute to their fellow hobbyists this colorful, undemanding, and seriously threatened species.

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This article originally appeared in the January/April 1997 issue of the Journal of the American Killifish Association. At the time this article was written, all the scientific names were current and correct. No effort has been made to verify any of the information in this article based on current information or nomenclature.

Because this fish is listed as "Critically Endangered" by the International Union for Conservation of Nature and Natural Resources ("IUCN"), it is in the GCAS C.A.R.E.S. Preservation Program.



# Club Hopping 2010

Steve Edie

Mar 20 – East Peoria: Tri-County Tropical Fish Society - Auction

Apr 18 - Chicago: Greater Chicago Cichlid Association – Auction

Apr 22-25 - Detroit: American Livebearer Association – Annual Convention

Apr 30-May 2 – St Louis: Missouri Aquarium Society - Annual Show

May 28-30 – Cleveland: American Killifish Association – Annual Convention

June 10-13 – Irving, TX: North American Discus Association -

June 24-27 – Indianapolis: International Betta Congress – Annual Convention

July 10 – Urbana, IL: Champaign Area Fish Exchange - Auction

July 22-25 – Milwaukee: American Cichlid Association – Annual Convention

Aug 8 - St Louis: Missouri Aquarium Society - Auction

Sep 3-5 – Peoria: Tri-County Tropical Fish Society – Annual Show

Sept 17-19 - Iowa: Midwest Cichlid Association – Annual Convention

Oct 3 - St Louis: Missouri Aquarium Society – Swap Meet

Oct 14-19 – Ash Meadows, NV – North American Native Fishes Association – Annual Convention

Oct 16 – East Peoria: Tri-County Tropical Fish Society - Auction

Oct 21-24 – Baltimore: All Aquarium Catfish Convention

Nov 14 - St Louis: Missouri Aquarium Society - Auction

Nov 19-21 – Cleveland: Ohio Cichlid Association – Extravaganza

Jan 14, 2011 – Urbana, IL: Champaign Area Fish Exchange - Auction

July 14, 2011 - Urbana, IL: Champaign Area Fish Exchange - Auction

Note: The 2010 Chicago Cichlid Classic will not be held on Memorial Day Weekend this year. They will be helping with the ACA Convention.

More dates will be added as clubs firm up their plans.

# The Computer Page

Steve Deutsch

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

MASI's email group: MASIFishHeads Yahoo Group - see web site for joining instructions

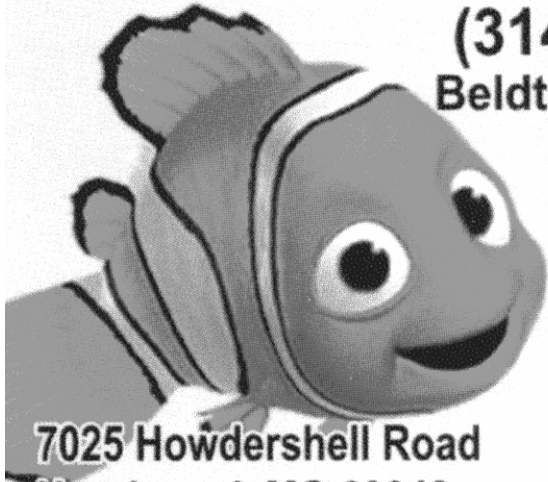
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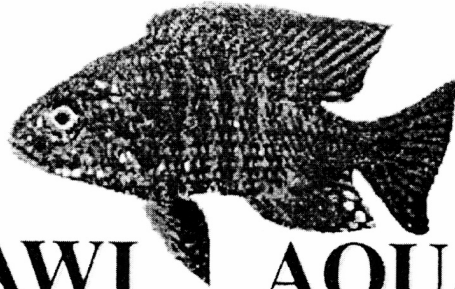
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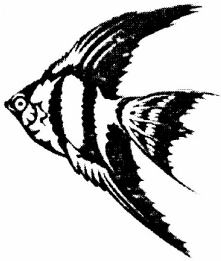


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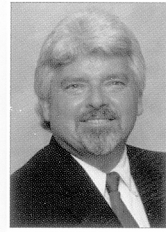
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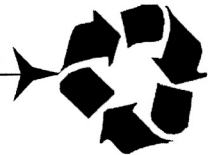
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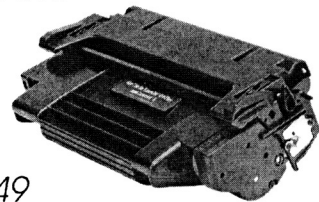
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