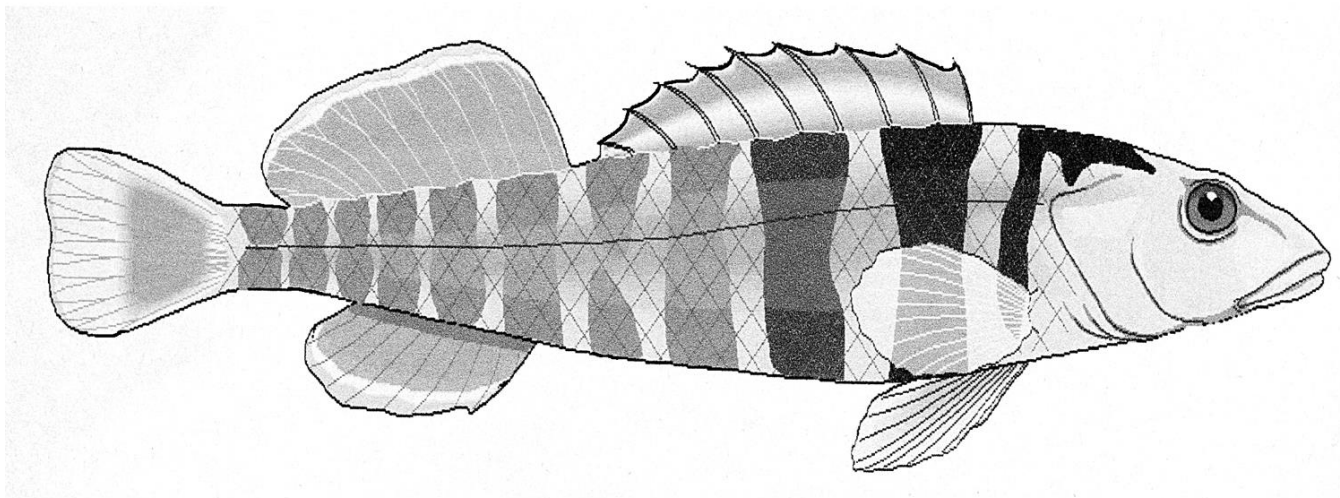


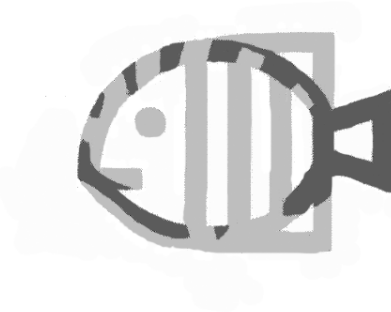
The Darter

January - February 2006



Missouri Aquarium Society, Inc
St. Louis, Missouri

Aquatico



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2005-2006 MASI OFFICIALS

PRESIDENT:

Mike Hellweg
511 Sunward Drive
O'Fallon, MO 63366
636-240-2443
mhellweg511@charter.net

VICE PRESIDENT:

Gary Lange
2590 Cheshire
Florissant, MO 63033
314-837-6181
gwlange@sbcglobal.net

TREASURER:

Steve Edie
5 Green Ridge Ct.
St. Peters, MO 63376
636-922-4232
sredie@charter.net

SECRETARY:

Angela Hellweg
511 Sunward Drive
O'Fallon, MO 63366
636-240-2443
pugdog64@yahoo.com

EXECUTIVE COUNCIL:

Roy Brandhorst	Skipperoy4@juno.com	314-838-8093
Diane Brown	debunix@well.com	314-361-4193
Kathy Deutsch	katfish@i1.net	314-741-0474
Charles Harrison	csharrison@inkmaker.net	314-894-9761
Jerry Jost	jerryjost@jostchemical.com	314-961-0419
Patrick A. Tosie, Sr.	pattosie@juno.com	636-225-7625

COMMITTEES:

Advertising & Promotions	Scott Brandt	314-838-3928
Auction Chairman	John Van Asch	618-277-6165
Breeders' Award Program	Steve Edie	636-922-4232
Corresponding Secretary	Patrick A. Tosie, Sr	636-225-7625
Editor	Steve Deutsch	314-741-0474
-Mail - fishfan@i1.net	9 Old Jamestown Ct. Florissant, MO 63034	
Exchange Editor	Steve Edie	636-922-4232
Fish Raising Contest	Bob Buckles	314-849-0587
Horticultural Award Program	Mike Hellweg	636-240-2443
Historian	Klaus Bertich	314-849-2164
Librarian	Dave Rush	314-291-8932
Membership	Kathy Deutsch	314-741-0474
Monthly Bowl Show	Diane Brown	debunix@well.com
Points Tabulator	Ed Millinger	314-968-8104
Postman	Jim Miller	314-638-1134
Printer	Charles Harrison	314-894-9761
Refreshments	Roy Brandhorst	314-838-8093
Web Mistress	Michele Berhorst	314-894-5543
Welcoming	Ron Huck	314-481-2915
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Places to Be Things to See

SUNDAY Feb. 12, 2006

Annual Winter Auction @ Stratford

Contact: John Van Asch – 618-277-6165, johnsfishy@att.net

THURSDAY, February 16, 2006

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

THURSDAY, March 16, 2006

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

THURSDAY, April 20, 2006

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

SATURDAY and SUNDAY April 22 – 23, 2006

Annual Weekend Workshop/Giant Auction

(Speakers all day Saturday, Banquet Saturday evening, Auction all day Sunday)

Contacts: Workshop: Marlon Felman – 636-536-4804, marlonf@bigfoot.com
Auction: John Van Asch – 618-277-6165, johnsfishy@att.net

SATURDAY, June 17, 2006 (SATURDAY June 24 in case of rain)

MASI Picnic @ Jim and Brenda Thale's

Executive Council following Picnic

SUNDAY August 13, 2006

Annual Summer Auction @ Stratford

Contact: John Van Asch – 618-277-6165, johnsfishy@att.net

SUNDAY October 1, 2006

Annual Fall Swap Meet

Contact: Mike Hellweg – 636-240-2443, mhellweg511@charter.net

SUNDAY November 19, 2006

Annual Fall Auction

Contact: John Van Asch – 618-277-6165, johnsfishy@att.net

Presidential Preamble

By Mike Hellweg

Well, it's now 2006! By now we were supposed to have flying cars that fold up into briefcases, have a colony on Mars, and dinner was supposed to be in the shape of a tiny pill. None of those things has come to pass yet. But fortunately, neither have some of the dire predictions like the last tree in the last rainforest would be cut down in 1995 (a very popular myth that floated around in the 1980's), or that the human population would be over 10 billion by now and all wildlife would be gone. Predictions not coming true might be a good thing, too. Anyway, what does this have to do with fish and aquaria?

Well, I was just thinking of some of the neat gadgets that are available now that make our fishkeeping lives a lot easier, things that could not have even been predicted 20 years ago. Things like the Python No Spill Clean and Fill – probably the greatest single invention for the aquarium since the all glass tank. You can now buy a canister filter that has a heater built into it so you don't have to worry about fish burning themselves on a heater anymore. And speaking of heaters – the new ones are no longer made of glass at all! I just opened up a couple of brand new Visitherm heaters for Steve Edie and the outer case is now made of some sort of composite material – no glass! Finally!

And of course there are still (and always have been) products that claim to eliminate the need for water changes. None of them has worked yet. Nothing can substitute for a good water change. Think of it as a breath of fresh air for your fish. Resolve to do more water changes more frequently in the new year. Your fish will thank you for it.

This coming spring MASI will be trying something different instead of our annual show. We'll be doing a weekend workshop in conjunction with the folks of SLAKA. We'll have speakers on a variety of aquarium topics on Saturday from 10 AM 'till 4 PM, a banquet Saturday evening, and our traditional gigantic all-species auction on Sunday. It will be the weekend after Easter – April 22 and 23, 2006. I hope you can come spend some time with us. You'll certainly learn a lot! No matter how much I learn, every new talk I hear I learn something more. No one will ever get even close to "knowing it all".

We'll also be doing another Swap Meet this coming fall. Watch your Darter for details. And of course, our fantastic Auctions will continue. The dates are published elsewhere in this very issue. Don't forget the regular meetings, too. We've got a great lineup of programs for the coming year. We have great mini-auctions each month with a fantastic selection of fish and plants. Every month we have a great raffle featuring some of the latest and greatest products from the manufacturers, and attendance prizes, too. Every month we also feature a bowl show where everyone can show off their prize fish. And of course you have access to our club library, refreshments, and a chance to talk fish.

Renew Now for 2006

Membership in the Missouri Aquarium Society, Inc. is \$20 per calendar year. Renewals can be submitted at meetings and auctions, or by contacting our membership chair, Kathy Deutsch at 314-741-0474, katfish@i1.net, or 9 Old Jamestown Ct. Florissant MO 63034

“I’ll Take Dumb Luck for a Hundred, Alex” Or “Oh Look! Babies!”

By Steve Edie

Have you ever noticed how hobbyists tend to categorize most aquarium fish as either “easy to breed” or “hard to breed”? And, generally speaking, this is true. But. Ever noticed that either the hobbyists are occasionally mistaken or that fish pay no attention to conventional wisdom? I have not always been successful with the “easy ones,” but have had occasional success with some of the “hard ones”, sometimes without extreme efforts on my part. (Okay, I confess. Sometimes with no effort on my part.) That is, special efforts to stimulate breeding conditions: precise water parameters; large or small water changes; warmer or cooler water; pH shifts; special rocks, driftwood, plants or substrate; special vitamins, hormones, stimulants or water conditioners; special live or frozen foods; mood music or pagan chants. I heard of one fellow who tried to simulate a thunderstorm (reputed to stimulate *Corydoras*) by putting a strobe light in the fishroom and banging on a metal garbage can. Whatever works. And granted, there are many fish that do seem to need some external “trigger”, often provided by the hobbyist, to stimulate them to spawn.

For some reason, I’ve never successfully spawned *Neolamprologus leleupi*, although I’ve tried on several occasions. I’ve gotten eggs, but never fry. It may not be considered “easy”, but few would call it “hard” either, as it is very common in the hobby. Someone’s breeding them. A lot of someones. My Goodeids routinely killed each other. On the other hand, I’ve had very good success with *Cyphotilapia frontosa*, although I made several concessions to conventional wisdom. I did make a concerted effort to provide them with what I thought were “ideal” breeding conditions, and it paid off.

However, after over forty-five years in the hobby, I am generally content to raise my fish in display-like settings, and if they breed, they breed. For most of the seventies, I kept Malawi Cichlids exclusively. For another fifteen years, I kept Tanganyikan Cichlids only. During this period, I did work to breed many species and successfully raised many offspring. Over half of the fishroom was devoted to “growout” tanks. I still keep about 25% Tanganyikans, but I also have a few plant tanks, some Asian tanks with Barbs and *Rasboras*, *Altum* Angels, Pike Cichlids, Plecos, Corys, freshwater shrimp, and a few others. In my 180-gallon planted tank, the Diamond Tetras breed non-stop. No special effort; just clean water, lots of plant cover, mostly flake food with an occasional treat. Sometimes, a particular species will warrant special effort, but generally I let them decide on their own. The main reason I don’t focus on breeding as much lately is that if I’m very successful, the fishroom becomes full of “growout” tanks rather than the display tanks I now prefer. I know some would consider this a good problem to have.

So the point of this article started in July of 2004 at the American Cichlid Association convention in Denver. One afternoon we went shop-hopping to a few of the local fish shops. At one shop, “Golden Fish”, I saw a tank of cute little *Uaru* cichlids, about the size of a quarter in body size. I had never kept these before, in my pre-African Cichlid life, so I thought I’d give them a try. I got six; with the ACA discount, they came to a little over eight bucks each. I took them back to the hotel, kept them in a rental tank for a few days, and then drove them back to Missouri. When I got home, I checked them and found that I now had – all six! That was a good sign, as I had heard they could be a bit delicate. In fact, they are sometimes referred to as “Poor man’s Discus.” Now my prior experiences with Discus can be labeled as unqualified failure, so I was a little leery of any fish associated with Discus. I prefer to call them “Rich man’s Severum.”

So anyway, I threw them in a 30-gallon quarantine tank for a month or so, and then moved them into a 75 with some *Geophagus*. They ate anything and everything and grew to the point that I removed

the Geos. Last fall, I attended the All-Aquarium Catfish convention in Baltimore/D.C., and took a trip to the National Aquarium in Baltimore. In their huge Amazon River display, they had several *Uaru* the size of Frisbees! I was stunned that they got that large, and shelved any ideas that I might be breeding them any time soon, if at all. The 75 was as large as I was prepared to offer and it seemed like it would be way too small. So six more months passed by and they were now between baseball and softball size, far from Frisbee stature. Growing, but still likely immature.

On evening as I was feeding the fish, I noticed that two of the *Uaru* had claimed one corner of the tank away from the other four. As I looked closer I saw about two dozen babies swimming around underneath the parents. I was certainly surprised, as I had not seen any pre-spawning, spawning or brooding behavior at all. I don't even know what they laid their eggs on: maybe some driftwood or plastic plants. There had been nothing more than the regular water changes; no live foods; no Barry White. I didn't really deserve this. The parents made rather mild attempts to chase the others away. *Uaru* are decidedly non-aggressive. Their feeding instincts are stronger than their parenting instincts. The next day there only were about a dozen fry left, so I figured I had better step in if I wanted any proof of my breeding prowess. I siphoned out eleven fry and put them in a 5-gallon tank with water from the parent's tank. I feed the parents again and they seemed to forget all about the missing fry. A couple of weeks later, I headed off to the 05 ACA convention in Ft Worth. When I returned, only six of the babies were still alive. Most fish can easily go a week without eating, but it was a bit much for some of the fry. Those six are now about the size of a quarter, so we've come full circle.

Well, not wanting to believe it was a total fluke, I decided to put in a little effort to see if it could be repeated. I removed the other four adults, put in a piece of slate, and did a big water change. After about a week, the pair seemed very interested in the slate, although I never noticed any courtship behavior. A couple of days later, there was a nice group of eggs on the slate. When fed, both parents left the eggs to eat, returning when no crumbs remained. After about three days, the eggs were gone, but the parents seemed to be occupied with something behind the driftwood. Rather than bother them to check, I decided to wait. After another four or five days, there was a swarm of babies surrounding the parents. I estimated there were around a hundred. I left them together for another two weeks, and then began to wonder how long was safe. So I siphoned out about 75 of them and left about 25 for the parents to play with. After about three weeks "my" babies were about 3/8" while "their" babies were about 3/4." I noticed during this time that the parents allowed the babies to "slime feed" like Discus do. Hmmm. I was unprepared to offer this to my group. Well, another month later, my group is now about 3/4" but the rest are now about penny size and still in with the parents. There doesn't seem to be any danger leaving them with the parents after all. I suspect that when I remove the rest of the babies, the parents will spawn again. But that would require another "growout" tank.

So what's the secret? I can't really tell you for sure. The six I started with looked strong and healthy. Water was tap water, not RO, medium hardness; I didn't really check. pH was neutral to slightly acetic. They do like it warm, around 82-84 F. I did 50% water changes every two to three weeks. Fairly strong filtration. They love Romaine lettuce, and can strip a couple of large leaves down to a little stub in fifteen minutes. A net full of duckweed about baseball size will be gone in two days. They also like flake, pellet and frozen foods, but they love their veggies. I fed the new babies with frozen baby brine shrimp directed to them with a turkey baster. I was too lazy to hatch live baby brine. After a couple of weeks, they ate flake food readily. The young constantly pick about the bottom looking for something to eat.

So why me? I hear I'm only the second person in the fifty year history of my club to successfully spawn *Uaru*. So while I hear that this a cool accomplishment, I now have about five tanks tied up with *Uaru*: the original parents, the group of four adult outcasts (two of them are looking like they want to pair off!), and grow-out tanks for three different sizes of young. It's beginning to look like the old African days.

A little dumb luck never hurts. Right Alex?

The Next Level

By: Gary McIlvaine

I am so excited about what happened in my fish room tonight. The first thing I would like to say is that I am not trying to brag, and the one thing I have learned in the tropical fish hobby is that there is always someone who knows more than me, and that I can always learn from fellow hobbyists.

That is why I am writing this today. I want to share some of my experiences. I wanted to explain some things that have given me new energy in my pursuit of the next level. I like to set goals and at this time of year most of us look for goals to set. My goal entails attaining the next level of fish keeping. I am proud to say that I feel I have conquered one of the levels of fish keeping and am ready to conquer the next level in our hobby.

The levels I speak of is what I think draws a lot of us into the hobby. I have found that keeping tropical fish is one thing, however becoming a hobbyist is quite another. One of the things that make the hobby so diverse is that there are always fish that you have not ever kept, or spawned. I have found myself looking at my fish room at times and thinking "Gary, you have lost it!!" (This is something I have heard some people say after seeing the fish room for the first time.) They have yet to really get it, you see they are the unlucky ones who have yet to be enlightened. The thing about the hobby I enjoy most is the sense of accomplishment it provides me. I have watched my fish keeping slowly expand to new proportions over my lifetime. I went from a single 10 gallon setup as a twelve year old to the full blown fish room this past year. I now maintain 37 tanks and found myself pondering tonight about the other wall in my basement and that it was time to build a new rack for tanks on that bare wall as well. It is just in the planning phases though and my wife and I will be having our 2nd child in 5 months., so I may put this on hold for another level of fish keeping down the road.

The level I am proud to have achieved tonight is one of my goals from childhood. You see I was a pretty good hobbyist when I was 13 and one of the fish I wanted to keep then was Discus. When you are 13, however it is hard to even get one Discus fish on a meager allowance. I bred Angels at the time and had gotten my parents to agree to a 7 tank set up in the basement of my childhood home. I even became a member of MASI then. I never was able to get enough money together to try buying Discus. I had this goal on hold for 16 years.

The last level of fish keeping I had for myself I had recently passed. I was faced with the choice of going to the next level or staying at my current level. The levels I speak of are what draws a lot of us into fish keeping and then passing over into hobbyists. I find that tropical fish hobbyists are of above average intelligence, and have a level of persistence beyond that of the majority of the population. They enjoy doing something that takes work and would rather do things than sit and watch television. This is what makes us successful hobbyists. I also call them levels, because being a hobbyist is better than any video game or T.V. show. There is always a next level if fish keeping, ask even the most experienced hobbyists and there are things they would like to accomplish.

In July of this past year I started looking at Discus listings on Aqua Bid. I found myself following a link to a website on Aqua Bid. It was a Discus keeper in Ontario, California. His name was Bruce Wilson, and he donated the case of Discus books to MASI a few months ago. His business name is Majestic Aquatics. I have read a lot about Discus in my life and the more I read the more I had become afraid. I am a cautious person in my pursuits and I finally got up the guts to order some discus. I spoke with Bruce and talked with him about placing an order. It was a very pleasant conversation and I listened a lot to what he recommended. I spoke to him at length about Discus. I explained to him that I had never actually kept Discus and that I was going to give it a try. His first question was if I belonged to an aquarium club. He explained that I should probably start with a dozen discus for the 55 gallon I was going to devote to them. He also said it was good to belong to the club, because a dozen full grown

were too many for a 55, but a dozen was good to start with, because you never know what could happen. Also, If I were lucky and did not have any casualties I could always get rid of the spares at the club. I ended up ordering 9 super Red Turquoise, and 3 golden sunbursts. I wanted to get something different than the usual I see around town. The Discus were the first fish I had ever received air freight. It was shocking to me how quickly they arrived. The Discus left California at 5a.m. in the morning and I had them in my house in a drip line by 2:15 p.m. This is one of the levels of fish keeping I conquered this past year.

The reason for my excitement tonight, and the reason I speak of conquering a level of fish keeping is that I am proud to report that I have my first breeding pair of Discus. It gave me a new level of energy and a sense of great excitement to see the eggs in the tank. I know many of you have bred Discus and are thinking no big deal, but think back to the excitement of your first Discus eggs.

I wanted to share what I have been doing to get the Discus in this condition, and want to reiterate that I have read many books, articles, and columns. The one thing I have learned is that there is always a better or different way to do things and I may not necessarily be doing it, but I like to stick with what works for me. I also want to say that I do not think I am an expert or a know it all, or that I am not doing something crazy in regards to my fish keeping. I just wanted to share how I got my Discus to breed right here in town for those of you thinking about Discus. I also want to say that my method of discus keeping is a blend of things I have read and some that I have heard in the club by asking questions. The first thing is the tank itself. I set up a 55 gallon tank with a full hood and it has an Emperor Bio wheel 400. I also have a sponge filter with a tube that pushes the water out at the surface. I had been keeping the tank at 86 degrees Fahrenheit, but some advice I got convinced me to turn it down to 82 and the plants in the tank immediately started doing better when I did this with no change in the Discus behavior or adverse effects. I have two Amazon sword plants and some Naja grass in the tank. I also have two medium sized pieces of drift wood and one small piece in the tank. I do have 50 pounds of the Meramec gravel in the tank. I make this point, because a lot of the professionals write about keeping bare bottomed tanks, but I like the way the gravel makes the tank look. I do only have the Discus in the tank and they have a couple guppies in with them that I thought at the time were big enough for the Discus to eat, but they perform some clean up duty at this point.

I feed my discus frequently. My job, and family obligations make it hard to keep on an exact feeding routine, so there are no set times when I feed the fish, or an insane routine about what I feed on what days. I will say at the very least I feed the Discus at least twice a day. I like to feed them one of my flake foods first and I have a variety of flakes that I use from Angels Plus. I have an earthworm flake, brine shrimp flake, angel flake, and color flake. I usually mix up which variety of flake I give them first. I don't feed to much of the flake just enough that they consume it all in about 2 minutes. Then I feed them the good stuff that I keep in the freezer. I feed them blood worms, brine shrimp, and Jack Whatley Discus formula. I never feed them this all at once. If I do brine shrimp flake I feed blood worms, and if I do earth worm flake I feed Brine shrimp. I like to mix it up and never offer the same thing too often. I always feed the Discus enough frozen food that they take about 20 minutes to finish it all up. It's always my favorite time to observe the Discus as this is when they are the most active and I first noticed the pair behaviors starting.

Now comes the part of the article that will make some die hard Discus fans frown and that is what I do to the water. I do not own a reverse osmosis system and probably will not anytime soon, because of the success I have had without one. I also do not check water parameters. I do however change the discus water at least three times a week. I simply do a change 1/3 of the water. I use a gravel vacuum and siphon at 1/3 of the gravel each time. These are approximate terms, because I also rely heavily on how the water looks. If it is looking a little more dingy than normal I will move some of the rocks and driftwood and really get in there good and clean parts of the tank that I am normally not getting. Since I do the water changes so frequently I do have to admit that the tank never is really that dirty. I have found though in my fish keeping the one thing that helps fish the most is frequent water

changes. As I said before I keep drift wood in the tank with the Discus as this helps to soften the water a little. I also have been using Tetra black water extract and following the directions on the bottle. I only add enough to make up for the water I am adding back into the tank. I use water straight from the tap to refill the tank for the water changes. I usually make it a 20 minute process to refill the discus tank and make sure the water is close in temperature to the water in the tank. I do try to keep it at the colder side of the spectrum when refilling, because I have two Ebo Jager 200 watt heaters in the tank that do a great job keeping the tank at a constant temperature.

I also squirt in a little Amquel when I do the water change to get out any chlorine that may or may not be present.

I do not have fry as of yet, because the spawning took me by surprise. I will be making an effort today in fact to move the breeding pair into a 29 gallon tank of their own. So I am not fully in the discus breeder club, but I think I am getting close to knocking the door down. It was just a huge excitement booster that I finally achieved a good level of success with Discus, because I have kept all the specimens I have received alive and have gotten them to really increase in size and am doing enough things right that they decided to spawn. The next level of fish keeping that I would like to obtain is to become more involved in the BAP and breed a new kind of fish every month. I recently have had success with a number of beginner species. The success with the Discus have made me more confident. I want to try more things and achieve the next level of fish keeping. The next level I am going to achieve is to become a better member of the hobby and the club. I have set a goal to write an article for every Darter this year. These are the goals I have set for myself to obtain the next level of the hobby what are yours?

Tanganyikan Talk – Shipping Fish

by Eric Glab

reprinted from Sept 00 *Cichlid Chatter* of the Greater Chicago Cichlid Association

They say that there is more than one way to skin a cat and I believe that is very true of the fish-keeping hobby as well. This article discusses what I believe is the most successful way to ship fish, but there may be others who disagree with me - that's fine. However, I have shipped a thousand fish this way and it works almost all of the time.

During the early days of tropical fish transportation for the John G. Shedd aquarium here in Chicago, fish losses were cut tremendously after the shippers figured out not to feed the fish during the trip. All fish must be properly "cleaned out" before shipping. You clean out a fish by not feeding it for a designated amount of time. The time varies from species to species and the size of fish must be taken into consideration. Some cichlids require just a couple days of no food before their trip, while others—like adult frontosa—may require over a week! By starving the fish, we are able to reduce the amount of waste that will be excreted in the bag during the shipment. Fish waste is quickly converted to ammonia in the bag leading to stress or even death.

When you purchase fish from your local shop, they will put aquarium water in the bag with the fish. This is perfectly acceptable for short trips. This has its faults for longer trips. Aquarium water in an established aquarium should have no ammonia due to the nitrifying bacteria in the filter. Once the water is taken from the aquarium and put into a bag, the filter is taken out of the equation. Dissolved organics that are present in the tank water begin forming ammonia as soon as they enter our plastic bag for shipping. For this reason I do not use tank water for shipments. Instead, I use treated tap water. Since I do regular water changes, my tap water is very close in hardness and pH to my aquarium. Since there is almost no dissolved organics in treated tap water, it makes a great start to a long trip.

The biggest killer of fish is caused by stress. In order to reduce stress, I like to use a fish tranquilizer such as Hypno or Trance. When used properly, this tranquilizer will sedate a fish by causing its metabolism to slow down. If used in small doses, Hypno will cause the fish to be less jumpy. Larger doses will slow breathing and other involuntary actions. Overdosing can ultimately kill the fish, however if the directions are followed, Hypno works without any problems. For this reason, I highly recommend using Hypno when shipping fish that require more than several hours of bag time. It is important that you never add water that contains Hypno to the aquarium as it can damage the biological filtration.

Bottled oxygen is not necessary when shipping fish if you pack lightly and the shipment is not delayed. It does buy the fish more time if problems in shipping arise. Oxygen tanks and their valves can be purchased at your local welding store. Always be careful with any pressurized gas, as improperly handled tanks can be very dangerous.

The container of choice for shipping is the tried and true plastic bag. Doubling up bags is always recommended for thinner bags, as fish spines can be sharp. Don't skimp on quality bags, they are worth the extra couple cents. Bags are placed in a Styrofoam box that is surrounded by cardboard and then sealed with heavy-duty tape ensuring a warm environment for the fish.

During the coldest winter months here in the north part of the United States, heat packs may be required. These chemical bags are activated by shaking them a few times. Heat packs are available in various sizes and heating duration times. Experimentation with different brands and number of packs will produce the best results later. You can go overboard, so be cautious. No one wants a shipment of fish soup!

Shipping same day service through the local airport is the fastest way to move fish. Typically the airlines require that you call ahead in order to reserve space on a flight and receive an air-bill number. They usually require you to have your box at their facility an hour or two before the flight. The amount of time depends on the airline and service with two hours being typical. Do not cut this close or your fish will not make the flight. Add one hour to whatever time they tell you in order to be safe. Usually your flight is not guaranteed unless you pay extra for it. This may or may not be worth the money. Your box must be open for inspection at the airport and you must have proof of identification. Don't forget to bring your I.D. and packing tape.

The most frustrating problem that can arise when shipping fish is dealing with the airlines. If you have flown recently, you know that many flights are delayed or even cancelled. This is where the frustration sets in for both the shipper and recipient. Make sure the recipient is called with the flight number and the air-bill number in order to anticipate any delays. The best plan is to not go to the airport to pick up your box until you have confirmed that the fish have arrived. Most airlines require one to two hours of time after the flight has touched down before the cargo is available anyway. By waiting until you have confirmation, you may save yourself hours of waiting at an airport. Remind the recipient that I.D. is required to make the pickup. The airlines require I.D. for confirmation of signature. Always pack the fish so they can live much longer in the box then you anticipate the shipping time will be—better safe than sorry.

I have not shipped fish via the major delivery services like Federal Express and UPS. I was told that some carriers will not ship live tropical fish due to the risk of the contents leaking and damaging other packages. The cost can be higher to ship overnight with one of these carriers than shipping same day airfreight via the airlines. Why take the risk when you don't have to?

Shipping fish can be a very rewarding experience for you and the person expecting your fish. I highly recommend it to expanding your horizons in this great hobby.

**R&J
FISH
FOOD**

**JIM
314-638-1134**

BAP Report

Steve Edie

Member	Species	Common	Pts	Total
Oct 2005				
Mike Hellweg	<i>Betta strohi</i> *	Gold Bar Betta	25	2344
Mike Hellweg	<i>Tilapia snyderae</i> *	Christmas Tilapia	20	2364
Mike Hellweg	<i>Xiphophorus variatus</i> "Rio Axtla" *	Blue Parrot Variatus	10	2374
Cory Koch	<i>Xenotilapia bathyphila</i> **		30	75
Nov 2005				
Don Atkinson	<i>Apistogramma cacatuoides</i>		15	15
Don Atkinson	<i>Protomelas</i> sp. "Taiwan Reef" *		10	30
Don Atkinson	<i>Pterophyllum scalare</i>	Silver Angel	10	40
Charles Harrison	<i>Poecilia reticulata</i>	Half-Black Sunset Guppy	1	1251
Charles Harrison	<i>Poecilia</i> sp. "Endlers"	Endler's Livebearer	5	1256
Mike Hellweg	<i>Chlamydogobius eremius</i>	Desert Goby	15	2389
Rick Smith	<i>Puntius conchoni</i>	Longfin Rosy Barb	10	20
Rick Smith	<i>Xenotoca eiseni</i>	Red Tail Goodeid	15	35
Rick Tinklenberg	<i>Aspidoras eurycephalus</i> **		25	815
Rick Tinklenberg	<i>Benitochromis conjunctus</i> **		25	840
Rick Tinklenberg	<i>Benitochromis finleyi</i> *		20	860
Rick Tinklenberg	<i>Brachyrhaphis rhabdophora</i>	Lace Brachy	10	870
Rick Tinklenberg	<i>Ctenops nobilis</i> **	Noble Gourami	30	900
Rick Tinklenberg	<i>Girardinichthys viviparus</i> **	Black Sailfin Goodeid	25	925
Rick Tinklenberg	<i>Pelvicachromis taeniatus</i> "Kienke"		15	940
Rick Tinklenberg	<i>Pseudocrenilabrus nicholsi</i>		10	950
Rick Tinklenberg	<i>Xiphophorus xiphidium</i> "Rio Purificacion" *	Spiketail Platy	10	960

* = First MASI species spawn (5 point bonus)

** = First MASI genus spawn (5 point bonus)

*** = First MASI family spawn (5 point bonus)

Breeders Award Program 2005 Summary

By Steve Edie

Well, it was a pretty good year for BAP submissions, with 107 total spawns reported from 18 different members. Of these, 39 were the first MASI Species spawns, 10 were the first MASI Genus spawns, and 2 were the first MASI Family spawns. However, just two breeders recorded virtually half of the total 107 spawns. Mike Hellweg and Rick Tinklenberg carried on a spirited competition throughout the year, with Mike edging Rick out 28 spawns to 25. The rest of the club lagged far behind. We could certainly learn a lot from these guys. Let's see if the rest of us can get a few more spawns next year. Change your water.

<u>Breeder</u>	<u># of spawns</u>	<u># of points</u>	<u>1st species</u>	<u>1st genus</u>	<u>1st family</u>
Mike Hellweg	28	447	18	4	2
Rick Tinklenberg	25	375	11	4	
Gary McIlvaine	7	38			
Gary Lange	6	75	2		
Cory Koch	5	75	1	1	
Jim Miller	5	75	1	1	
Jerry Jost	4	55			
Ed Millinger	4	50	1		
Charles Harrison	4	46	2		
Diane Brown	3	60	2		
Jack Berhorst	3	45			
Don Atkinson	3	40	1		
Rick Smith	3	30			
Lawrence Kent	2	20			
Steven Hoffman	2	15			
Steve Edie	1	20			
Diane Ciezadlo	1	10			
Charles & Mary Ann Lenau	1	2			

Member Classifieds

Charles Harrison (314) 894-9761, 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.

Neolebias ansorgii - Spawning Report

Charles H Harrison, Ph D

www.inkmkr.com/Fish

Neolebias ansorgii Boulenger, 1912

This African characin is found in Benin and Nigeria in the Niger basin. It is a common fish in Cameroon, Gabon and the lower region of the Congo. Recent collections have been made in the area of Equatorial Guinea. It fits well into the scheme of my fish room for the *Aphyosemions*, *Fundulopanchax* and other Killifish. It is not an extremely colorful fish but interesting none-the-less. Adult size is about 1 in., males and females. The male is more colorful. The females tend to be more rounded and the males slimmer.

I began this breeding experiment with a pair of adult fish from the BAP auction one night when Mike Hellweg decided to give away an adult pair. When I returned home from the meeting I put them in a 5 gallon tank with a trio of *Aphy. elberti* N'tui. Over the next six weeks or so I fed the whole tank rather well with newly-hatched brine shrimp (BBS), grindal worms, and a few white worms. The group even takes Tetramin flake food in the afternoons or whenever I am out of town.

About the 1st of October, I decided to see if I could get these guys to do anything and so I netted them out and I put them into a 5 gallon tank on the top row. The tank was crowded with four 100 strand-floating mops and java moss and a couple of large java ferns. The fish had the front one third of the tank to swim around and considering their size there was plenty of room, but I still covered them just to be sure. They continued to get the same food but I started adding micro worms to their diet as well.

On the 24th of October, I took the adults out and put them back with the N'tui and followed with a half tank water change of the breeder tank. I continued to feed the breeder tank with micro worms but instead of just wiping off the side of the micro worm container and putting the adults into the tank water, I dipped my finger into the glop of material, the culture media, and added several drops of that stuff to the tank as well. On the 29th day of October, Sue came to me and said, "Charles, look in this tank! What is this? What are all those darting flickers diving to the bottom of the tank?" Yes, we had fry and seemingly lots of them!

I didn't have any infusoria or any food smaller than what can be found in a microworm culture that I could feed these guys. But, having looked at micro worms in the micro-worm culture material under the microscope enough to know that the culture material is teeming with life. If you slow down the movement of the culture by either adding a little water soluble cellulose or cooling it down with ice cubes, you can tell that the worms come from individuals which are a 10th of the size of the adults and there is always the yeast cells present as well. So I continued to add the culture material twice a day and really stir up the tank as best I could. The adult worms live for several days in the tank water and I was expecting the juveniles would too. I took out as many snails as I could find figuring they compete with the fish for this culture medium/juvenile worms. There had been plenty of them in the tank up until then just to help me keep things clean.

After removing the snails I let the water settle and then siphoned off about half of the tank and refilled it with de-chlorinated tap water. I keep a 55 gallon plastic drum of changing water in the fish room for this purpose. I de-chlorinate with Thiosulfate and bring the temperature to that about the same as the tanks in the room. The spawning setup ranged between 73 and 75° F from first setup through rearing. The water is St. Louis tap water which is 250 to 350 ppm dissolved solids and contains about 150 ppm total carbonate hardness. These parameters vary through the year depending on climate and what the St Louis County water people do with the turbidity, etc. The tap water is Chlorinated with

Chloramines as are most large municipalities. I generally ignore the Amine portion of this and simply test for Chlorine as use the water when it is free of Chlorine.

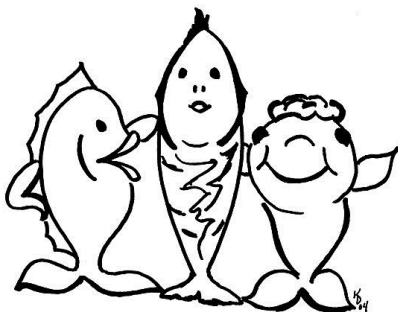
I was beginning to see a few of these diving flickers of light myself and as the days progressed, I wrote to Mike that there were, indeed, fry in the tank. On the 29th of October, I contacted Dr. Nevin Aspinwall and asked him for a starter of Paramecium but the fry were already 6-8 days old and I figured that they were probably beyond the stage of being helped, even if I had a protozoa culture to feed to them and this material I got from Nevin wouldn't be ready to feed to the fish for another day or two, anyway. I started the protozoa culture with 4 grains of cooked rice in the bottom of a gallon wide mouth jar about three fourths full of old tank water. The next day there were clouds of Paramecium floating above the rice and I knew I could feed from the culture.

There were definitely some large fry in the tank on the 29th and I started feeding newly hatched Brine Shrimp so the larger fry would stay satisfied and perhaps not go chasing after the smaller ones. I continued to feed Micro worms and Paramecium.

November 9th, - 16 days after the parents were removed from the tank. The fry are present in dozens. They are not all eating BBS yet but some are. It would seem the Micro worms and the culture material has been enough to keep them alive and growing. The fry are also being fed on the Protozoa culture.

Big thing though, we were gone Friday, Nov 4 through Sunday Nov. 6 to the WAKO Show and the fry received no food other than BBS. They had to be living on the fauna in the tank and the surviving Micro worms.

Nov. 19th I removed one of the big mops and some of the plants to give the fish more room and changed their water again, this time I tried to get most of the water out of the tank to change it as completely as possible. By now the fry were looking much like their parents with a black stripe down their body. The days past with steady growth of the young and I maintained 80 to 90% water changes a week. By the first of December most of the young were eating Grindal worms in addition to the BBS and some dry food. The number count of the fry has reached about 50 plus and I need to get them into larger quarters and turn them in to our BAP for points.



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 our membership chair, Kathy Deutsch at 314-741-0474, fishfan@i1.net, or 9 Old Jamestown Ct. Florissant MO 63034

The Computer Page

Steve Deutsch

MASI's official web page: www.missouriaquariumsociety.org

Addresses are only printed with permission of the owner. If your address is not printed and you would like it to be, please email me at fishfan@i1.net. If you would like yours removed, or if it needs correction, also please email me.

MASI MEMBERS E-Mail Addresses:

Jim & Sue Amsden	suzjimmie@aol.com
Al Andersen	alander602@hotmail.com
Michele Berhorst	mberhorst@aol.com
Klaus Bertich	kbertich@sbcglobal.net
Roy Brandhorst	Skipperoy4@juno.com
Jim Brodack	jbrodack@centurytel.net
Diane Brown	debunix@well.com
Scott Bush	sportspicks@charter.net
Dwane & Phyllis Cotton	Intofish@aol.com
Steve Deutsch	fishfan@i1.net
Karhy Deutsch	katfish@i1.net
Steve Edie	sredie@charter.net
Maureen Green	jmsgreen@iopener.net
Charles Harrison	csharrison@inkmaker.net
Mike Hellweg	mhellweg511@charter.net
Angela Hellweg	pugdog64@yahoo.com
Steven Hoffman	hoffmo@cablemo.net
Lawrence Kent	lawkentnorton@yahoo.com
Gary Lange	gwlange@sbcglobal.net
Charles & MaryAnn Lenau	cmlenau@direcway.com
Gary McIlvaine	gmcilvaine@msn.com
Ed Millinger	amazoneddy@sbcglobal.net
Jim Mueller	muellerj44@yahoo.com
Jim & Brenda Thale	tbird55jb@aol.com
Mark & Alice Theby	markrehabber@yahoo.com
Pat Tosie	pattosie@juno.com
Patrick A. Tosie, II	patricktosie@juno.com
John Van Asch	johnsfishy@att.net
Harold Walker, Jr.	fiveinall@sbcglobal.net
Jim & Rosie Yaekel	jryaekel@htc.net

Keeping It Fun

by Grant Gussie

reprinted from Nov 99 *Calquarium* of the Calgary Aquarium Society

The aquarium hobby has a high rate of drop out. It always has had, and probably always will have. Persons who drop out of the hobby will give you lots of different reasons for it: lack of time with a new job or increased family commitments; moved on to other interests; difficulty of moving tanks to a new home, etc. But the fact is that for all of the dropouts, the aquarium hobby had stopped being fun.

There are many reasons for the aquarium hobby to stop being fun. All of them are however avoidable.

The most common hobby killer is also the most easily avoided: lack of success. If you are reading this article you have had at least some exposure to our aquarium club; and as all its members can attest, fish can be kept alive, healthy, and reproducing. Success is available to anyone who will take the time to learn the techniques, and you can learn that technique most easily by simply talking to club members and be willing to learn.

So you get over the initial "how to" hurdle of the novice and can now expect your fish to grow and live out the normal lengths of their lives, and to even reproduce.

In all probability, you will then go through a "kid in the candy store" phase. There are so many beautiful fish that you could keep, if only if you had another tank. And of course, your previously-owned fish are now producing babies. More tanks! Always more!

This can lead to serious changes to your living quarters.

Sensibly, all the new tanks should end up in their own room; hence that peculiar invention, the "fish room". This is pretty much the only way to insure some degree of domestic harmony...the lack of which is almost guaranteed to kill your career in the hobby.

And tank proliferation has another side.

Every tank you own requires maintenance. How many tanks can you maintain before that maintenance becomes "work"?

Be realistic. Some club members have over 50 tanks, and although the sight of such a fish room may make you drool, could YOU actually take care of that many? Or rather, how many tanks can you realistically maintain and still enjoy it? When will raising that catfish spawn be a chore you dread... rather than an enjoyable challenge?

And don't be fooled into thinking that more tanks equals more profit. Turning your basement into a "fish factory" will not mean that you can quit your day job. Clearly a "fish factory" fish room can easily lead to burn out. Spawning and raising the same fish over and over again because that fish has a ready market will not keep you interested for long, especially since it is certain that, no matter how ready that market is, it will not put you in fine wine and sports cars. It is very difficult to make a living out of ornamental

fish...this is a hobby and don't forget it.

And it is a good one. Breeding fish is fun. It is a challenge. It is rewarding. It is very interesting. It even does have its own (modest) financial returns. And it is not excruciatingly difficult. So keep it fun by not taking on more than you can handle. If you do find yourself "working" rather than "enjoying", cut back.

Cutting back does however produce its own stresses. Your 50-tank fish room represents a significant financial investment. Can you stand seeing 45 of those tanks laying empty while you work with your five remaining active tanks? If not, can you sell the empty tanks off at, what will certainly be, a significant loss without resenting the hobby's financial realities? It is much better to not go over board

in the first place. You can also avoid burn out by pre-planning your fish room to reduce the maintenance involved. First of all, make sure your fish room has running water. Water is heavy. You don't want to carry it. And the second thing is to seriously consider a central filtration system. That way you only have to change water in one (very large) tank system, rather than in many individual tanks. Ditto for filter maintenance. This gets rid of more labor than you can imagine. You can therefore keep many more fish with very little more work. But central filtration systems do have their own problems. You must quarantine your fish before introducing them to your system. This means that at least one tank must be kept isolated from the system. I know, I know. Every one says to quarantine fish and nobody ever does....but when all your tanks are on one filter system, you have to. No fooling. I'm serious. Nothing will cause "burn out" faster than watching 50 tanks full of previously healthy fish die. And secondly, the books tell me some aquarists use stuff called "medications". I don't and never have, and don't know anybody who does, and quite frankly don't think you should, but if you do, dosing a central filter system is a royal pain.

You may even go one step further and build an automatic water change system for your central filter system. This can be a good idea for a lot of reasons. But be careful and make sure you keep it simple. Water change systems that rely on water level monitors, valves, or timers are almost guaranteed to fail (eventually). Instead, use a simple overflow. Have a tap slowly dripping water into a tank, and have the water in the central filter box flow into the sewer through a simple overflow pipe.

I would highly recommend that a plant filter be used for a central filtration system. Fast-growing plants, such as temple plants (*Nomaphila stricta*) are very good at removing nitrates and phosphates, especially when coupled with a continuous drip water change system. Such a system, coupled with reasonable stocking rates, will keep your water pure and algae growth low, so all you need to do is feed your fish!

Another thing to do to keep from burning out is to actively seek new challenges. If swordtails are old hat, or you no longer think the world really needs a blue and gold Cambodia *betta*, then move on to something else.

A lot of aquarists specialize within the hobby to some extent, which is fine unless they completely ignore other aspects of the hobby or are unwilling to "change specialties" if bored with their current one. Popular fresh water specialties include catfish, rainbowfish, killifish, livebearers (with the subspecialties of guppies, sword tails, wild types, etc.), cichlids (with the subspecialties of discus, Rift Lake, dwarfs, etc.), and aquatic plants. Marine specialties include corals and marine fish breeding. Participating in another specialty will introduce you to new facts, fish, and people, and can spark renewed interest in the hobby.

Another thing to avoid burnout is to find what is for you the right level of involvement in your aquarium club. If you do nothing with your club but skim through its magazine and go to the occasional auction, then your club won't help you keep up your enthusiasm level. Get more involved! You get out of a club - any club - what you put into it. On the other hand, if you find yourself taking on more and more of the club's duties because no one else will volunteer, you are in vast danger of burning out. Again, don't go overboard! Look at our annual show, which didn't happen this year. Why? Because the few people that did all the work simply burnt out over it. It is too big a job for just a few volunteers. If everyone did a moderate amount then people will neither burn out from overexertion, nor drop out from lack of enthusiasm.

There is enough content in the aquarium hobby to last a lifetime. A child with a bedroom goldfish could go on to spend an entire lifetime with aquatic creatures, all the while never ceasing to learn about biology or animal husbandry. Or that same child can spend a lifetime with an empty aquarium sitting in a closet. It's all a matter of keeping it fun.

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 and 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.

Editor's Notes

Steve Deutsch

Dianne Brown was the lucky winner of our author's drawing this year - hopefully the Baensch Catfish Atlas is in her hands by the time this is published. We still need to get the articles judged for the first Ralph Wilhelm Publication Award, which is a \$100 cash prize. I will start assembling articles for the judge as soon as this goes to press.

We have three new articles from MASI members this issue, as well as three exchange articles. Thanks to Steve Edie, Charles Harrison, and Gary McIlvaine for their articles. I personally enjoyed Gary's the best because he set a goal of writing something for each Darter this year! Seriously though, he raises interesting thoughts - what is the "next level" for you? Maybe we all need to look for what we are going to do new this year, either for our own hobby, or for our organization. In any activity it is too easy to get caught up doing more of the same and not stretch, until it becomes more like work than like fun. And if anyone else wants to make a resolution to share their experience, in writing, with their friends, we have five Darters to go . . . (I'm not sure if fish are telepathic, but I think as I wrote that I got a message from the tank next to the computer saying a water change might be something new for me to try! Or maybe its just that pesky conscience.)

We have completed the fiftieth year of MASI, so we are back to the Darter on the cover. It will continue to reside there until someone sends me different cover art. Not that there's anything wrong with a Darter on the cover of The Darter.

HAP Report

Mike Hellweg

Welcome to new HAP participant Don Atkinson! It looks like we've had another great year for the HAP. More details to follow.

Keep 'em green!

Member	Species	Common	Rep	Pts	Total
November '05					
Jerry Jost	<i>Cryptocoryne retrospiralis</i>	Retro Crypt	V	15	625
Jerry Jost	<i>Eleocharis montevidensis</i> *	Giant Hairgrass	V	10	625
Jerry Jost	<i>Bacopa myriophylloides</i>	Needle Leaf Bacopa	V	10	625
Charles Harrison	<i>Myriophyllum aquaticum</i>	Parrot's Feather	V	5	350
Charles Harrison	<i>Cabomba palaeformis</i>		V	10	350
Charles Harrison	<i>Vallisneria spiralis</i>	Tiger Val	IB	10	350
Don Atkinson	<i>Anubias barteri nana</i>	Dwarf Anubias	IB	20	25
Don Atkinson	<i>Vallisneria spiralis</i>	Italian Val	V	5	25
Mike Hellweg	<i>Polygonum pedunculare</i> *	Water Buckwheat	V	20	2440
Mike Hellweg	<i>Potamogeton perfoliatus</i>	Red Pond Weed	V	10	2440
Mike Hellweg	<i>Bacopa lanigera</i>	Hairy Leaf Bacopa	IB	15	2440

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

*= MASI First

Club Hopping

Steve Edie

March xx, 2006 – Hartford, CT: Northeast Council – Annual Convention

July xx, 2006 – Chicago: American Cichlid Association – 2006 Annual Convention

Oct xx, 2006 – Laurel, MD: All Aquarium Catfish Convention

Missouri Aquarium Society, Inc Horticultural Award Program (HAP)

Name _____ Date _____

Scientific name: _____

Common name/ variety: _____

Publication cited for identification and page number: _____

Type of Propagation: Vegetative Bloom Seed (see rules for definition)

Growing conditions:

Water – pH _____ Hardness _____ Temperature _____ ° F
Water changes done? _____ Frequency _____

Substrate: Sand Gravel Gravelw/laterite Flourite
EcoComplete Aquatic plant soil mud clay soil
Other _____

Lighting: Incandescent Metal Halide
Fluorescent T- 12 T-8 T- 5 Power Compact
LED Natural sunlight

Fertilizer: Liquid (type) _____
Tablet (type) _____
Frequency of use _____

CO2 added? Yes No

Fish in container? Yes No Snails? Yes No Other Inverts?
Yes No Types _____

HAPC Official Use

Observed Date _____ Class _____ Points _____ Total points _____
(_____ bags donated for auction – only required for Vegetative credit)

Family: _____ MO BOT verified? _____

Article submitted (optional, except as required in the rules) _____ Pub. Date _____

Home inspection date (if required) _____ by _____

HAP Level (if changed) _____

Certified by: _____

Use back for additional comments or to attach photos

Revised 12-5-05

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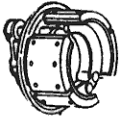
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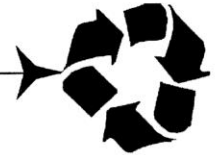
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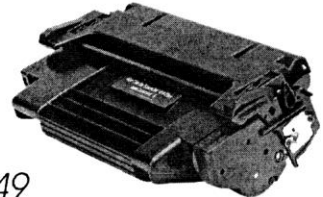
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