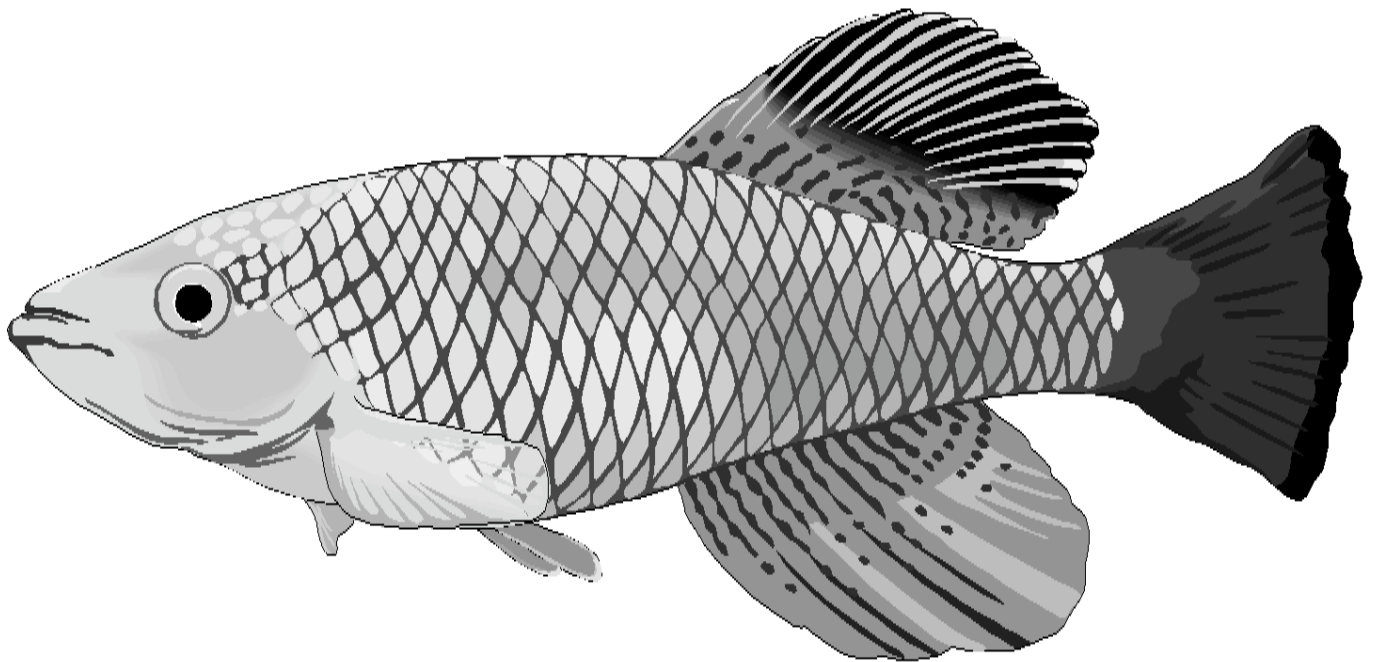


The DARTER

July – August - September 2003

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



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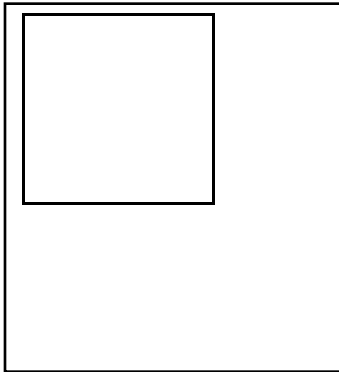
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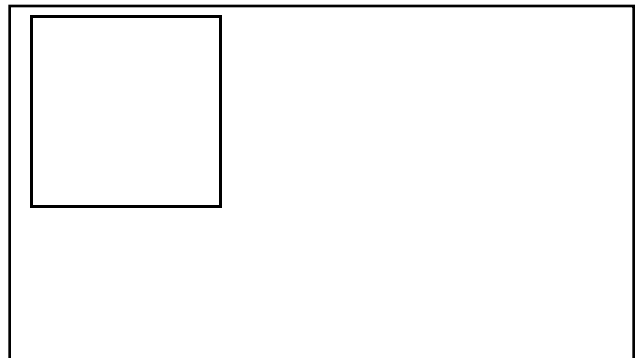
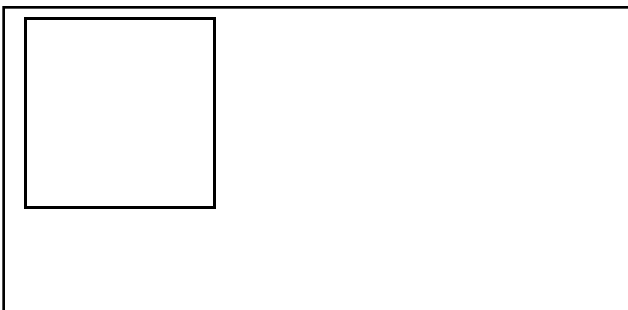
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Places to Be/Things to See

- THURSDAY, August 21, 2003 General Meeting, 7:30 PM @ Dorsett Village Baptist Church
Program: ? Bowl Show: OPEN
- SATURDAY, August 23, 2003 Executive Council Meeting, 7:30 PM @ The home of John Van Asch
- THURSDAY, September 18, 2003 General Meeting, 7:30 PM @ Dorsett Village Baptist Church
Program: ? Bowl Show: OPEN
- THURSDAY, October 21, 2003 General Meeting, 7:30 PM @ Dorsett Village Baptist Church
Program: Rusty Wessel will talk to us about Collecting in Mexico
Bowl Show: OPEN
- THURSDAY, November 20, 2003 General Meeting, 7:30 PM @ Dorsett Village Baptist Church
Program: ? Bowl Show: **SUPERBOWL 2003**

About Rusty

Rusty maintains over 3000 gallons of freshwater aquariums, predominantly containing cichlids and livebearers, which he successfully raise and breeds.

Rusty's specialty is Central American fishes. He has taken his hobby to a point where he has successfully collected fish from the countries of Belize, Costa Rica, Cuba, Guatemala, Honduras and Mexico, from 1983 to the present, for over 30 trips to this date. Considered by many to be the ultimate collector, he has introduced many new species of fish to the aquarium hobby. If it lives in the water, chances are that Rusty has either caught it or been bit or stung by it. Dr. Robert Rush Miller, emeritus professor of the University of Michigan named a beautiful and elusive cichlid discovered during one of his expeditions to Honduras, after Rusty in the June 1996 edition of Tropical Fish Hobbyist magazine, Theraps Wesseli.

Rusty is as well a prolific author and photographer, his writings or photographs have appeared in a wide distribution of specialized publications, like Aquarium Fish Magazine, Aquarist & Pondkeeper, Buntbarsche Bulletin, Cichlid News, Ad Konings' Cichlids yearbooks, Freshwater and Marine Aquarium and Tropical Fish Hobbyist.

In the organized hobby, Rusty is currently "Convention liaison" and "Back issue Sales Person" for the American Cichlid Association and a speaker participant for the ACA/Marineland Speaker's Program. He is past chair of the ACA board of trustees (1990) and past convention chair (1992). In addition, he is an active solicitor for the "Guy Jordan Endowment Fund" (A fund set up under the ACA to grant endowments for cichlid research). On the local level, he is currently treasurer for the Louisville Tropical Fish Fanciers. Rusty has been awarded with the greatest honor the American Cichlid Association gives to its distinguished members, the ACA fellowship in 1997.

Rusty has lectured and judged numerous fish shows throughout the United States, including the annual "Florida Tropical Fish Farmers" show and several ACA conventions. Clubs can easily contact him at the below address.

Mr. Rusty Wessel 6815 Carolyn Road, Louisville, Kentucky 40214
(502) 448-1625 Work (502) 447-7142 Fax

PRESIDENTS PAGE

Jack Berhorst

Wow, where did summer go! By the time you are reading this, the club will have had its Summer/Fall Auction. It's about time to start thinking about winterizing the ponds and preparing tank space if you have fish outside. It is also time to start thinking about those nice fish you have and what will be entered into this years Super Bowl which is back after a one year hiatus and will be held now in November (more about this in Gary Lange's article on the subject.)

The council of MASI is currently trying to decide a few issues that are important to should be all members, and this would be a good time to voice an opinion if you have one on the following issues.

Money, yes it is a necessary evil without it we cannot hold our annual show, rent our meeting room, send out the darter or bring speakers. Several ideas have been suggested and some maybe tried. First is a significant change in Auction splits between the club and sellers, the current suggested plan is to go with a the first \$2 going to MASI and for every dollar above the first \$2 the seller get 85 cents. Other suggestions include a fund raising activity such as working a concession stand at sporting event, selling discount cards for Krispy Crème, and/or working with fish magazines to collect a commission on renewal of the magazine by club members (this one has been approved and will start at August meeting speak to Gary Lange about it.)

Another change currently in the works the club is intending to assemble the Darter using members of the club to put together the publication, this could save some money on printing and copying. If you would like to help please contact me or Pat Tosie.

Other issues that need be considered by all club members is What Do You Want MASI to be, it is many things to many different people. Is it a place where you can gain greater access to different fish types and additional knowledge on these fish? Is it a social organization to get out of the house on a Thursday night? Is it a place to find potential buyers for the spawns of fish? Is it a place get free fish food in the monthly give away?

Remember we as the members of the council can only make MASI a better club for you, if you tell us want you want MASI to be.

And most important What Can I do for MASI. You don't have to be a fish expert to help the club, we always need help with something. Things small as dropping flyers off at local pet stores, running at our auctions, helping to assemble the Darter, write an article for the Darter (make Pat's day) or talk to people about the club and get them to come to meetings we always need more new members.

Thank you for your time and remember keep them swimming.

HAP REPORT

Mike Hellweg

June 2003 Submissions

Mike Hellweg 1720 pts

<i>Najas guadalupensis</i>	5	V	
<i>Nymphoides cristatum</i> Yellow Variegated Snowflake	20	V	Yes
<i>Colocasia antiquorum</i> Black Majic Taro	10	V	

Micky Lee 420 pts

<i>Iris fulva</i> Bronze Water Iris	10	V	Yes
<i>Iris fulva</i> Bronze Water Iris	10	OB	
<i>Typha gracilis</i> Dwarf Cattail	5	V	
<i>Typha gracilis</i> Dwarf Cattail	5	OB	
<i>Iris virginica</i> Blue Water Iris	10	V	
<i>Iris virginica</i> Blue Water Iris	10	OB	
<i>Apium inundatum</i> Water Celery	10	V	
<i>Apium inundatum</i> Water Celery	10	OB	

July

2003

Submissions

Mike Hellweg 1880pts

<i>Vallisneria americana</i> var. <i>tortissima</i> Corkscrew Val	5	V	
<i>Myriophyllum simulans</i> Filigree Myrio	5	V	
<i>Ludwigia palustris</i> Red Water Purslane	5	V	
<i>Echinodorus</i> sp. "Oriental" Oriental Sword	15	V	MASI First!
<i>Cryptocoryne retrospiralis</i> Retro Crypt	15	V	MASI First!
<i>Alternanthera sessilis</i> Scarlet Hygro	5	V	MASI First!
<i>Bolbitis heudelotii</i> African Water Fern	10	V	
<i>Alocasia amazonica</i> Variegated Taro	10	V	MASI First!
<i>Vesicularia</i> sp. Christmas Moss	10	V	MASI First!
<i>Hypnaceae</i> sp. Fineleaf Liverwort	10	V	MASI First!

Gary Lange 955 pts

<i>Rotala</i> sp. "nanjenshan"	5	V	MASI First!
<i>Eleocharis acicularis</i> Dwarf Hairgrass	5	V	
<i>Potamogeton wrightii</i>	10	V	MASI First!

NOTES ABOUT OUR HAP PROGRAM

Mike Hellweg

The HAP is continuing to move right along, though at a slower pace than in years past. Hopefully with the end of Pond Season coming, several of you will be turning in your outdoor propagations. Don't forget that you can send me electronic photos of your blooms - great looking photos will even be added to the website with appropriate credit! Check out the photos that are already there! I will also accept propagation reports at the auctions, so if you can't make the meetings, you can turn in your propagations at that time. HAP forms can be downloaded from the website, too!

We have several members coming up on milestones in the program, and I hope I will be able to report that they have reached those milestones in the upcoming months! In addition, now that Steve Edie has finished making all of the changes to the BAP, I in the process of modifying the HAP data so that both programs mirror one another as much as possible. This includes the addition of new awards levels above the level of Grand Master! This will hopefully encourage members to keep going once they reach that level.

Points for several genera and species will be changed as well, since we have all learned a lot in the last decade and we have not made any points changes yet. Just like with the changes in the BAP, no one will loose total points or standings, so don't worry about that! Right now I am in the process of adding all inactive members' propagations to the HAP database, and eventually hope to have full records posted on the website for all members, so that anyone can access their stats at any time (this is still a while away, so if you want a copy of your information, let me know).

As always, I encourage you to send me any questions that you may have - I'll try to cover them in the HAP column in the Darter - but it only works if you send me questions!!!!

.....keep 'em green!

SUPERBOWL

MASI HAP Current Ranking Updated January 2003

<u>Name</u>	<u>Points</u>	<u>Rank</u>	<u>Last Submission Date</u>
Alfred B. Andersen	10		June '92
John Beck	225	Senior	November '98
Jack Berhorst	70	General	August '00
Angela Bohn	110	General	June '01
Chris Brazzil	85		September '93
Jim & Susan Brodack	115	General	July '01
Browne Family	10		July '01
Dwayne & Phillis Cotton	10		August '98
Marc & Kathy Daly	230	Senior	July '98
Steve & Kathy Deutsch	50	General	December '95
Chuck Dyn	20		November '97
Kaye Farrar	10		August '96
Michael Faulk	30		April '94
Sue Ferrario	25		August '98
John Frese	25		October '92
Maureen Green	1135	Master	August '02
John Gregory	50	Novice	February '00
Scott Hancock	110	Advanced	January '95
Charles Harrison	85	General	December '95
Jack Heller	25		September '98
Mike Hellweg	1635	Grand Master	September '02
Dennis Heltzel	105	Advanced	August '94
Charlie Hoppe	40		February '93
Mike Huber	150	Advanced	April '00
Randy Ison	20		September '98
Charles LaRocca	160	Advanced	January '00
Gary Lange	935	Master	January '03
Micky Lee	350	Senior	July '02
Charles & MaryAnn Lenau	245	Senior	May '02
Bruce Mayhew	130	Advanced	January '00
Tony McMillan	5		February '95
Ed Millinger	280	Senior	December '02
Jim Mueller	165	Advanced	December '93
Matt Ormsby	240	Advanced	March '99
Chris Roberts	5		April '93
Noel Roberts	780	Grand Master	August '01
Ray Schlund	1395	Grand Master	September '93
Manuel Schmerber	15		June '93
Tom Schnur	130	General	February '02
Joe Schraeder	110	Advanced	July '92
Ronald V. Spittler	35		July '92
Jim & Brenda Thale	740	Master	July '01
Robyn Sue Thompson	15		November '92
Pat Tosie	240	Senior	August '02
Patrick Tosie	15		September '99
John Van Asch	465	Senior	August '01
Mary Viviano	215	Advanced	October '98
Derek Walker	960	Grand Master	July '02
Harold Walker	405	Master	March '02
Ralph Wilhelm	55	General	February '94
Chris Winkelmann	30	Novice	October '94
Jim Yael	370	Master	February '98

Show Chairman's Report

Well, council has decided that we are going to start up the Super Bowl again. This time around we are NOT going to be giving out plaques. Our budget has really nipped that but it just wouldn't be right to cause us to cancel this completely. Note, that because of the sudden change of heart, the Super Bowl will NOT be in its usual October slot but rather on November 20th (a week before Thanksgiving). That will give you a few more weeks to get ready. Besides I will be down-under that week and you just can't have the Super Bowl w/o your show chairman! Classes, show rules and forms are available in this Darter. NOTE! Fees are only fifty cents per entry! We'll have plaques for the best of show, judges award and best junior entry. This is a good tune-up for the main event in the spring. If you have fish that show nicely in bowls by all means bring them. I'm still looking for judges so if you'd like to judge please send me an email or give me a call.

Spring Show

Our 2004 show will be our 44th annual show (celebrating our 45th year as a club). It will be April 23rd 24th and 25th, the last full weekend in April at the same hotel, the Stratford Inn.

Changes for this year!! I really like the "tank lights only" part of our Saturday evening -after the banquet. It was something that we have done for years. If you haven't been to the show and banquet, let me explain. After the food has been eaten, the awards have been won, the speaker is finished and the show chairman is done.... We open up the showroom again and display the tanks with tank lights only, no room lights. The fish are much happier under these conditions and really look nice. They've had a full 24 hours to get their bearings and they start to feel at home. This is the time for everyone to admire the Best-of-Show, Judges Awards and the other winners. This is the time when I usually congratulate Jim Jr. (Jim Miller) for his Best of Show award and vow to take 'em down next year. Always the bridesmaid, never the bride! For the last few years however we have avoided having our banquet at the Stratford and have instead elected to have it off site. That has been such a hassle that few of our members come back to the show site for another look. Frankly the reason we went off site was that there had been some issues with the meals at the Stratford. THAT HAS CHANGED! The management has changed several things at the hotel and the meals for weddings and banquets are a big part of that change. Mike Hellweg and I looked over the menu (looks good and the prices reasonable) and were assured that things have gotten better. Most likely we will be attending a tasting to make sure things have really changed! But most importantly this will allow us to continue with our tradition of "tank lights only". Don't forget – you can get a free banquet ticket for each member of your family that wants to attend, if you donate items in their name at the auctions. That's the extra 2 slots at the bottom of each auction sheet. See John Van Asch for additional sheets for banquet donations for other members of your family.

Start looking for those winning fish now! If you already have some with good potential this is the time to start giving them extra attention and more water changes. Planning now will pay off later. See you at the Show!

Algae in a Planted Tank

Derek Walker

Having algae in a planted tank can be hard to maintain if it gets away from you. Almost all the tanks we set up all consist of a kind of algae. Sometimes we don't see the algae in the tanks because of the water and the condition of the tank. There are a couple of types of algae that affects a tank. They are green algae, blue-green algae, and brown algae. There are several ways to get algae under control.

Algae grows from having too much phosphorus and nitrogen in the water. This means that there are too many fish in proportion to the number of plants in the tank. If this is the case, then you will need to put more plants in the tank and decrease the number of fish. There are cases of algae coming from the lighting off the tank, which almost always happens to everyone, even if the tank is not planted. If the algae is from the lighting then all you need is to cut back on the number of hours your lights are on. A general rule is to keep your lights on for about ten to twelve hours a day. Also, if your tank is in direct sunlight you will want to move it.

Finding things to control the algae growth in your tank is the best way to go before you use any type of chemicals. You can find some good algae eating fish in the LFS and in our club as well. There are a number of fish you can use in you planted tank that can control algae. Some examples of good algae eaters are Otocinclus, Crossocheilus siamensis, Ancistrus, Rosy Barbs, and Florida Flag Fish.

One of the main things to control algae is changing the water in the tank frequently. If you can do a 30% water change every two weeks than you will be controlling your algae as well. If you can't control the algae by just 30% water changes every two weeks, try to change the water weekly.

When adding your plants to the tank, you will want to buy some plants that are anti-algae plants. You may also find these plants in our club as well if you ask Mike Hellweg or Gary Lange. Here are some plants that are good anti-algae plants- Hygrophila, Sagittaria, Ceratopteris, Ceratophyllum, Vallisneria. When putting these anti-algae plants in your tank you are taking the nutrients away from the algae that it needs to live on.

Algae can make your planted tank look awful if it is not under control. I hope that these little tips can help you if you tank is under an algae bloom.

November 20, 2003

Attaching Riccia for Decoration

Derek Walker

Riccia is one of the best plants to decorate your aquarium with. Attaching riccia to rocks or pieces of wood in your aquascape can create an unbelievable appearance. I believe this idea came from Takashi Amano of Japan. He has designed aquariums with plants to make an amazing site.

Riccia is a floating plant that grows together and forms a tight wand. When Riccia is attached to rocks or wood it also grows in a tight wand, but you need to attach it with something. There are different types of material and even aquatic plants to help it stay down on the object you use. A few examples of materials you can use are hairnets, nylon string, and thin fishing string. If you want to use aquatic plants, you can use different types of moss or bladderwort.

Attaching your Riccia is fairly simple. The first thing you want to do is pick what you are going to use to attach the Riccia with. Next you will need to know where your rockwork or wood is going. Make sure you know what side you want to place the plant on. Once you decide this, you need to take the Riccia out and make sure that it has no other plants in it. You want the Riccia to be as tight as possible, so remove all the loose Riccia that is not in a tight wand.

Now you are ready to attach the Riccia to your object. Take the Riccia and place it on the object you are using. You need to make sure that it does not cover the entire object, because you still want the plant to grow. Also, you will want the bottom of the plant to get light. Next, wrap the riccia and object up. When wrapping the object you want to make a tight criss-cross pattern across the object. If you don't make it tight the Riccia will end up at the top of your tank.

It is now time to place the object in your tank. Make sure you do not place your object where it is going to be shaded by the other plants in the tank. Now, all of you will need to do is make sure your tank has enough light and CO2 for the Riccia to survive. If you have all of this complete, the only thing you need is to trim and shape the Riccia once it starts to grow. As the Riccia grows in the tank, it will stay submersed and it will eventually stay down at the bottom of the tank.

ARE YOU READY?????

SUPERBOWL is coming!

The Madagascar Lace Plant

Mike Hellweg

Coming originally from the Isle of Madagascar, and transplanted to several other lands, including Australia, the Madagascar Lace Plant, or just Lace Plant, has been a part of the mystique of the aquarium hobby for nearly a century. This gorgeous plant's delicate, lattice-like leaf structure has captivated the imagination of many an aquatic gardener. It is even the logo of the Aquatic Gardener's Association. I have seen it used as part or all of the logos of dozens of pet stores and aquarium related businesses over the years. And yet it has confounded nearly all that have tried to maintain it for any length of time, even more so in recent years than in the past.

The Madagascar Lace Plant has long been one of my favorite plants. I have had the good fortune to "rediscover" some of the tricks associated with keeping this plant alive long term, and even in getting it to reproduce to the point that it became almost a "weed" in my tanks! I passed many of them out to fellow hobbyists, some of whom had success, and more of whom failed. Looking at the parameters of those fellow hobbyists, both the failures and successes, and looking back at the past literature, has helped me to formulate a guide to grow these beauties into stunning specimen plants.

First, it is necessary to know a bit about the history of the plant in science, nature and in the hobby. The confusion of multiple scientific names and even changing names is not limited to the tropical fish end of the hobby. The Lace Plant was originally described twice within just a few years in the early 1800's. This has led to a great bit of confusion when people have tried to look up information about the plant. Mirbel first described it as *Uvirandra madagascariensis* in 1802. Three years later, Persoon unknowingly described it again, this time as *Hydrogeton fenestralis*. Later it was moved to the genus *Aponogeton*, where it remains to this day. But the specific name was not yet settled. Until 1968, it was known as *A. fenestralis*, based on the second description by Persoon. If you look for it in any book published before 1968, or any poorly researched book published after that date, you will find it listed as *A. fenestralis*. In 1968, van Bruggen renamed it with the correct specific name, as *madagascariensis* was published first and has priority over *fenestralis*. Therefore today it is correctly referred to as *Aponogeton madagascariensis*.

Now, just when we think that's settled, let's add just a bit more confusion! There are at least two, if not three, species of Lace plants occurring on Madagascar. Depending on the author, you may also find *A. henkelianus* and *A. guillotti*. Having kept *A. madagascariensis*, *A. henkelianus*, and *A. guillotti* at the same time under similar conditions, I would contend that at least *A. guillotti* and *A. madagascariensis* are true, separate species in that their blooms are rather dissimilar, as described below. I'm not sure about *A. henkelianus*, as the blooms are very similar in structure and coloration to *A. madagascariensis*, if just a bit larger, but the leaf structure is rather different, even in the same tank. I'm only going by the outward appearances, as I did not dissect the blooms – I was more interested in getting them to seed.

The “True” Lace Plant, *A. madagascariensis*, has HUGE dark green to olive brown oval-shaped leaves. The edges of the leaves have gentle waves along their entire length, adding to the beauty. The mother plant I had for almost 7 years had leaves nearly as long as my arm, and at least 6” across. True to their common name, the leaves are made up entirely of veins, forming a beautiful lacy veil. There are up to ten pairs of veins running parallel to the petiole. They bloom readily in the aquarium under the conditions described below. The blooms usually have two “fingers” called spadix, enclosed in a greenish colored sheath called a spathe. Over the period of a few days, the spathe disintegrates from bottom to top and the tiny white flowers emerge.

The leaf structure of the “False” Lace Plant, *A. henkelianus*, is only slightly different from *A. madagascariensis*. But it is different enough that once you have seen both plants, you can readily tell them apart. The leaves are nearly as large. They appear a bit “heavier”. It’s hard to describe, but they just have a more solid look to their construction than *A. madagascariensis*. Sometimes there is tissue between a few of the veins, reminding one of a fancy scroll-worked window in an abandoned building where most, but not quite all of the glass panes have been knocked out. The leaves are not as oval. They taper more to a pointed oval on the bottom where the leaf meets the petiole. The end of the leaf is more blunt, almost squared-off, while in the “True” Lace Plant the ends are much more ovate. If you were to look at the leaves from the two plants when they are laid out flat, the “True” Lace Plant would appear much more symmetrical top and bottom. The blooms are nearly identical. The only difference I noticed, and it may just have been an optical illusion related to the “heavier” appearance of the plant, is that the blooms on *A. henkelianus* appear just a bit “beefier” too.

Moving on to *A. guillotti*, we find a plant that is clearly different from either of the two above plants. This, too, has a lacy structure to the leaf, but whereas the above two plants have “squared” off openings in their lace-work, here the openings here are more oval. Again, we see tissue filling in many of the openings, especially on the lower portions of the leaf. The leaf is much narrower, at about an inch-and-a-half to two inches at the widest point. It is also much shorter, topping out at less than 18”. The terminal end is rounded, while the base of the leaf gently tapers into the petiole. The white flowers have 4 spadix, and have a slight purplish cast to them.

Let’s move on to husbandry of the plants.

All of the Lace Plants come from the streams of Madagascar. They are all truly aquatic plants, spending all of their time submerged. None of them produces aerial or floating leaves. In the wild, when the stream dries up and it’s banks shrink, the Lace Plants have an interesting survival strategy. They go into a period of rest where they shed their leaves until the next rainy season. All of the energy is stored in the tuber. When the rains return, the dried out tuber swells and sends out new leaves and new roots to feed it until it’s next rest cycle. As totally aquatic plants, they would seem like ideal aquarium plants. Why then do so many of us have trouble with them?

Firstly, they are cool water plants. They can be found in mountain streams up to nearly a mile above sea level. This is the biggest clue to their husbandry, and one of the reasons that “old time” aquatic gardeners had better luck than many of us do today. Their unheated tanks were more suitable to the Lace Plants than our often over-heated tanks are today. They do not tolerate warm water for any length of time. This often causes them to drop their leaves in anticipation of the “dry season”. When the drying out never comes, the tubers begin to rot and the plant dies.

I did not have much success with them until I moved them to the bottom row of tanks, which are the coolest ones in my fishroom. The average temperature in these tanks is about 72 degrees Fahrenheit. Within about a week of moving the first plant to one of these tanks, I started seeing a lot of new growth. After about a month, the single plant had literally filled the 30-gallon “long”, and nearly a half dozen blooms were on the surface at any one time! I quickly moved the other plants to lower tanks and had similar results.

Secondly, they are “low light” plants, coming from forest-shrouded streams. In bright light, algae often quickly cover the delicate latticework, which slowly smothers the plant. It may be hard to believe, but sometimes we aquatic gardeners over do it on the lighting to the detriment of some plants. This may be a second clue as to why the “old-timers” had better luck than we do. Several older publications mention keeping the production vats in greenhouses covered with slats to reduce the light that reaches the plants. Another clue. Over three of these 30-gallon tanks, I had just a double (end to end, not side by side) 32-watt T-8 fluorescent light fixture.

Thirdly, they are heavy root feeders. Since they lack many of the leaf structures of other aquatic plants, they must get most of their nutrients through their roots. The initial growth spurt is fed by the stored energy in the tuber. Unless the plant can replace this, it will gradually use it up and die. I pot all of my aquatic plants in what I call “the Reimer method” after Dorothy Reimer. Dorothy was my aquatic plant mentor way back when very few people outside of Europe were keeping planted tanks. This was the method she taught me. I still use this method because it works for me, and has for more than a decade. This method of husbandry works very well for the Lace Plant because you can give them the rich soil and heavy fertilizer they require without other plants interfering. Again, the “old timers” hit it right with giving these guys a “rich, loamy soil”.

In a standard 6” flowerpot, I first put a piece of sponge to cover the drain hole. I use a standard sterilized potting soil mix (without fertilizers added), to which I add a couple of teaspoons of laterite. I add this to a depth of about 4”. I then cover this with fine quartz gravel with a grain size of about 1mm in diameter. I gently submerge this into the tank, then add the bulb in the center of the pot. I partially bury the bulb, but leave at least half of it above the substrate. Just a note here, the bulb should be firm and have no “squishy” spots on it. It doesn’t have to have roots or leaves. Those are good indicators of life, but they may indicate a problem, too. They may be the last gasps of a dying plant if the plant has been in the dealer’s tank for a while. The plant may have already used all of its stored energy, and not have enough left to adjust to the new conditions you will be providing for it. Aquatic plants can suffer from “transplant shock”, too. A stressed Lace Plant that has already used up most of its stored energy just may not be able to recover. A firm bulb, with or without leaves and roots, is the best indicator of a healthy plant.

Don’t feed the plant for a week or two after the leaves appear. Allow it to settle in and send its roots all around the pot. I feed with commercial tablet foods, cut into quarters. I press them right down into the soil at the base of the plant. I push them in to a depth of about 3”.

Next, let’s talk a bit about water parameters. I could not find any reference to water parameters in Madagascar, so I had nothing to go on there; other than that the steams on the island flow mainly over basalt and limestone. Older texts refer to raising the Lace Plant in Oak Casks, which one would think would slowly give a more acid pH as the wood dissolved in the water. But this may not necessarily be the case, as they also mention regularly replacing the water. This clue, combined with the basalt (non-reactive) and limestone (increases carbonate hardness) clue lead me to believe

that slightly harder water with a neutral to slightly alkaline pH may be better for their husbandry. Guess what? I had better success in harder, alkaline water than in softer, slightly acid water. The overall parameters of the water I had the best success with were pH of 7.0 to 8.0 (depending on what came out of the tap) and an overall total hardness of about 250ppm, mostly coming from carbonates. I did not use CO₂ in their tanks.

The final bit of information for their husbandry is another tip from the “old timers”. I kept snails in the tank to help break down excess nutrients (i.e. fish food, dead leaves, missed dead fish, etc.) into more readily useable forms for the plants (and into more easily removable bits for the filter and water change siphon!). Snails help keep debris from building up on the leaves. I used Red Ramshorns (*Helisoma nigricans*), and Trumpet Snails (*Thiara granifera*) which are one of three species of *Thiara* commonly kept in the hobby. They are also called Malaysian Livebearing snails. Using the *Thiara* turned out to be a mistake! I am still trying to get rid of the Trumpet Snails over two decades later! They are everywhere. I would recommend against using them, not because they are harmful in any way, but because they are so invasive and annoying. The assistance of snails in algae control is often touted by the “old time” texts, but in practicality, it is dubious. As an aside, another snail to avoid in a planted tank, although it is very attractive is the so-called Columbian Ramshorn Snail (*Marisa cornuarietis*). It is an aquatic lawnmower!

The only types of snails I have found beneficial are the so-called Mystery Snails (*Pomacea bridgesi*) – again on a suggestion from Dorothy Reimer. They even come in many different color varieties. Don’t confuse these with the much larger so-called Apple snails (*Pomacea maculata* and *P. paludosa*)! While scientifically speaking they are all Apple snails, there is a huge difference and the trade name helps hobbyists to differentiate between the good snails and the not-so-good snails. These larger Apple snails eat all aquatic plants, not just algae. These days we have even better options that do not create the same problems of over population and potential threats to plants. Native American Glass shrimp (various species) which are often sold as bait for fishing and as feeders for larger fish, and Amano shrimp (*Caridina japonica*) do a much better job at controlling both debris and algae.

There you have it in a nutshell: cool water; low light; lots of food to the roots; carbonate rich, alkaline water; and some type of critter to keep the leaves clean. If you give them a little TLC, they will reward you with many years of beauty and interest in your Aquatic Garden.

In the next article I will cover reproduction with these beautiful plants and their other cousins in the genus *Aponogeton*.

Setting up a “Low Tech” Planted Tank

Mike Hellweg Email: michaelangelah@aol.com

In this article I will look at the things you need to set up a “Low Tech” planted tank. While super power lights, CO₂, innumerable chemicals, automatic pH adjusters, computer controllers, etc. may be appealing to some of you, they are not appealing to everyone, and that may turn some of you off from the idea of a beautiful planted tank. While all of the above will help you to succeed, none of the above is absolutely necessary for a planted tank. Hobbyists have been keeping planted aquaria for over 150 years, and only have had the benefits of the super tech toys for the last decade or so. How did they succeed before that? I am going to cover that in this article, updated so that you can see how easy it is nowadays, even without the gadgets. After you feel comfortable with the basics of a planted tank, you, too, may then want to take the next step and set up a “high tech” tank.

The first thing you always need to do is set up a budget on how much you think you will spend. This will be the guideline for where you will start your set up. I know, everyone buys the tank first because it’s a “good deal” and then goes back and buys everything else later. I’m going to go through this step-by-step so that you don’t wind up at the end wondering what you’ve gotten yourself into.

So, back to the budget. How much do you think you want to spend, or how much will you be able to spend before your spouse says “You spent how much???”. A simple rule of thumb is that you want to aim to spend about \$10 – 12 for each gallon of tank size. That allows for a lot of leeway, but is a good general rule to start with.

Now, look at the room you have available. What size tank will fit there? Can you work around it? Can you see it from a comfortable vantagepoint such as a couch or easy chair? Is there an electric outlet nearby? Will that circuit support your lighting, heating, and pump(s)? Is there natural light in the area? If so, can you control it (such as with shades or curtains)? Do you have access to water? Is the floor water resistant, or will water harm it? Some types of wood laminate flooring do not mix with water at all. Check first, or be sorry later.

Now for the big question: Will the floor support the weight? Water by itself weighs just over 8 pounds per gallon. Add in the tank, stand, gravel and you are at about 10 pounds to 12 pounds per gallon. In other words, a 55-gallon setup weighs about 600 pounds when complete! That is also something that you won’t want to move once it’s set up, so this is a crucial step. Make sure the floor will support the weight. Generally, if it’s up against a wall, and if you are putting the tank perpendicular to the joists below, or, even better, putting it over the support beam for that area of the house, you should be okay with up to a 75 gallon tank without additional reinforcement. If you are unsure, or if you have an older home, consult a contractor or a structural engineer. It may cost a few bucks up front, but that is better than watching a fully set up tank go through the floor!

Once you have a location that meets the requirements above and have worked out a budget, it’s time to go shopping. Look around. Don’t buy the first tank you see. Check out the paper and see if there is a used tank available that might suit your needs. If you can, buy the tank, glass top,

and stand together. It may be cheaper to buy a combo, and then switch out the lights. Don't worry about the lights that come in the "combos" or "complete setups". They are usually for "fish only" setups. You won't be using them.

The next most important thing, and the place to spend most of your money, at least as much as you spend on the tank, is on the lighting. You want to aim for around 2 watts of fluorescent lighting per gallon – remember this is going to be a "Low Tech" tank. For tanks over 55 gallons, you will probably want to go with the new Power Compact Fluorescent lighting. For a 55, two to three standard fluorescent tubes (T-8, T-10, or T-12) will be more than adequate. You will want to look for "Full Spectrum" lighting. Stay away from specialty "plant lights" or "grow lights". They aren't really suited for what we are going to use them for. Expand your horizons. Look not only in pet shops, but also in lighting and home improvement stores. You might also go to the Internet and check out some of the lighting specialty suppliers there. The most important part of the light fixture is the reflector. Look for one with a polished aluminum reflector. You will be amazed at the difference in light output vs. a standard reflector. Also, try to get one that has a parabolic reflector as opposed to a flat reflector. Again this greatly improves light output.

Another important thing to look for is an electronic ballast. It burns cooler and uses less energy than a standard tar ballast does. Don't get hung up in the lighting terminology about CRI or Kelvin temperature of the lights. Those are both measurements of how the light appears to human eyes and have nothing to do with the light that plants need. As long as it is a "Full Spectrum" or a "Sunlight" type bulb, you will be okay. Some newer lights make mention of their PAR rating. That is an important measure for plants. The higher the PAR rating, the better, but there is no one perfect light for everyone.

Another myth you will often hear is that florescent lights degrade to almost nothing over time. The myth is not wrong, it is just not quite right. And this only refers to the T-12 lights with a standard ballast. What actually happens is that the light starts out about 20 percent brighter than it's rated brightness. Over the first month, it "burns in" and the output declines to the normal or nominal level. After about 12 months, it degrades a further 5 percent or so, and continues at this level until the lamp burns out at around 20 – 24 months. There is no reason to replace the bulbs every 12 months. You are still getting 95 percent of the nominal value of the lamp until it burns out. You are just throwing money away. One thing you can do to increase the intensity of the light is to wipe down the reflector and the bulb, and to completely remove and clean the cover glass once every month. It only takes a few minutes, but it makes a huge difference. I do recommend having a glass cover between the water and the lights. It's a simple but sound safety precaution. Water and electricity don't mix. If you don't want the glass top, opt for the more expensive waterproof end caps for the lights, and wipe down the lights and reflector as part of your weekly maintenance.

The next most important aspect of the tank is the substrate. Plan on using about 2 – 4 pounds per gallon, depending on whether you have a wide or a tall tank. You want to shoot for about 3 to 4 inches of gravel. Keep it simple and go for what works for the most people, not what you have read is the "best thing" on the Internet. If that "best thing" doesn't work, it will be a huge job to tear down a planted tank and start over. Since the substrate is the first thing in, it will be the last thing out. Remember that. Use either a commercial plant substrate like *Flourite* by *Seachem* (that's the only product endorsement I'm going to do – but it is the best stuff out there) or use a

standard natural aquarium gravel. Choose one that is about 2 – 3mm in diameter. If you go with the natural gravel, you will need to add a supplement to it that is made of Laterite. Follow the manufacturer's instructions. Laterite is a tropical soil that is rich in iron. It is usually a bright red rust color. Don't go cheap. The red, iron rich soil here in Missouri and in other areas of the US is NOT the same thing.

The next most important thing is the water circulation system. Note that I did not say filter. You may not even need a filter for your tank. But you do need some way of moving the water around the tank without disturbing the surface too much. Power heads work well as a supplementary water movement system. The most often used type of filter for a planted tank is a canister filter. Note again that I said most "often used", not the "best". There is no "best" filter for a planted tank. The reason folks use canister filters is that they can place both the inflow and the outflow below the surface of the water at opposite ends of the tank to create a good water flow pattern across the tank. The next most often used filter is one of the waterfall types that have a return lip that goes below the surface. Avoid the ones with rotating wheels in planted tanks. They are great for and designed for "fish tanks", not plant tanks. The huge colonies of bacteria that grow on them will compete with the plants for food. They also have a higher "water fall" that is designed to disturb the surface to aid in driving off CO₂ and allowing for oxygen absorption. Also avoid air driven sponge or box filters, they will drive off most of the CO₂, which is important to the fish but which can be harmful to the plants! For extra water movement to prevent "dead spots" add a power head or two in areas where water movement is limited or prevented by either plant growth or decorations.

For heating, look to the newer generation of submersible heaters. Substrate cable or mat heating is an unnecessary expense. In a heated room like a living room, you want to shoot for 2 – 3 watts of heater per gallon. In an unheated basement, aim for 5 watts per gallon. It is better to use two heaters at half the wattage, than one at full wattage. For temperature, shoot for 74 to 76 degrees Fahrenheit. Too many American hobbyists keep their tanks too warm. Temperatures in the 80's are not natural for the fish or the plants. Certain areas of the tropics may have warmer water, but most do not. Water in the jungles is shaded from the sun and stays relatively cool. Your fish will live a lot longer and your plants will do better in cooler water. Keep it cooler. It works.

Next on the list is to plant the tank heavily, right from the start. For a 55-gallon tank, you may want to add 150 plants or even more! Don't panic! It's not as bad as it sounds. Each bunch of plants is equal to 5 or 6 plants (count each stem individually) and potted plants often contain a half-dozen or more plants. Since we are not going to start out with a "high tech" tank, stay away from high light plants. Choose those that are darker green. Try and stay away from red plants at first. They need the most light and care. Keep it simple. Stick with easy to grow plants like *Vallisneria*, *Sagittaria*, *Cryptocorynes*, Java Fern, Java Moss, *Aponogetons* (sold as "Mystery Bulbs"), and bunch plants like *Hygrophilas*, *Bacopas*, and *Ambulia*. You might also want to add some Water Sprite, either planted in the substrate or floating. You can attach the Java Fern and Java Moss to rocks or driftwood with staples or with cotton thread. You might also try the smaller *Anubias* plants such as *A. barteri*, *A. barteri nana*, *A. "Frazeri"*, *A. "Congensis"*, or *A. afzelli*. These are all lower light, slower growing plants that do well in a low-tech tank. They too can be "planted" by attaching them to driftwood or rocks.

Let the tank, fully planted, run for a week or two. Now you are ready for the fish. Start by adding the “algae crew”. Use *Otos* and *Ancistris sp* (Bushy Nose Plecos) for the primary algae “cleaner-uppers”. Don’t feed them anything else for the first few weeks. You can also add algae eating shrimp, such as Amano Shrimp (*Cardina japonica*) or Glass Shrimp (any one of a dozen or so species) at this time. After about a month, you can add the rest of the fish. Add a mixture of fish to be active at all levels. For the lower levels, think *Corys* in schools of a half dozen or more, maybe a Red Tail Black Shark, a few Botias or Clown Loaches (though these guys will grow rather large), dwarf and medium sized Cichlids (look for cave or open spawners, but NOT those that dig nests or eat plants!). For mid water levels, add schools of Characins or Cyprinids like Barbs, Rasboras, or Danios (again, avoid plant eaters!) and maybe a pair or two of Angels or Discus (but remember that these guys might eat both smaller fish and the shrimp). Don’t forget the upper level! You can add a school of Hatchet fish, some Livebearers, some Killies, or, for something really different, a couple of Butterfly Fish.

Finally, there is maintenance. For that you need to do the following: Change the water, Change the water, Change the water. Do this at least once a week. It’s even more important for the plants than it is for the fish. This will add vital minerals to the water for the plants. Change 20 percent or so every week. Wipe down the glass of any algae that may develop on the glass. You can also wipe it off of broad-leaved plants, rocks or other items it builds up on. Don’t use a gravel vac like you would in a fish only tank. Use it to clean only the debris that builds up on the surface of the gravel. The plant roots will clean up the subsurface detritus. Clean out your canister filter once every 6 months or so. Add a commercial broad- spectrum micronutrient fertilizer only if the plants show signs of distress such as yellowing leaves, or thinning leaves. Remove dead or dying leaves, cutting with a sharp knife or scissors at the base of the leaf. Trim back stem plants (bunch plants) by cutting off the top 6 inches, pulling the lower part slowly and carefully out of the substrate, and replanting the top 6 inches.

Notice I did not mention CO2 supplementation. While the addition of CO2 will increase plant growth, it is NOT NECESSARY for a LOW-TECH system. The fish will provide CO2, the plants will provide CO2, and every surface in the tank will be covered with microfauna that produces CO2. The goal of the low-tech tank is to “keep it simple” while getting lush, healthy plant growth in a controlled manner. As long as the surface of the tank is relatively calm, you won’t loose a lot of CO2 out the air-surface interface, so you won’t have to add any. Increasing the light, adding CO2, and the additional supplements are the subjects for another article on high-tech tanks. I’ll leave that to you, Gary?

Now, sit back and enjoy your planted tank. After all, isn’t that why you set it up in the first place? A well-maintained “low-tech” planted tank can be run for years without any major changes. If certain plants don’t do well in your set up, try other species. Don’t get discouraged if not all plants will thrive for you. Just like fish, certain plants may not be compatible. Don’t fight it. Just try others until you get a combination that works for you. Remember that people have been doing this successfully in their living rooms for more than a century and a half!

If this article raises any more questions, feel free to email me at the address above. I will answer them in the HAP column in the Darter.and for now, ‘nuff said...

Planting Aquarium Plants

Derek Walker

Planting aquarium plants can be a difficult task for some people. In this article I will explain the different methods that I use when planting aquarium plants. Using these methods may keep from having your plants die from being planted incorrectly in an aquarium.

Method 1

(Stem Plants) When getting stem plants that have lead weights on them, you should always take them off. After taking the weights off the plants, you should also take off two to three leaves from the bottom. Cut the bottom of the stem off about half an inch. If the plant has any rotted pieces at the end of the stem you will need to cut them off.

I like to plant my stems about a half an inch from each other so that the light can reach the bottom of the plant. This makes it easy to pull the stem out if it is dying from rot. If you bunch all your stems up and one stem is rotting, it can spread to the other stems. This will eventually kill the plant.

Method 2

(Rosettes plants) When planting rosette plants, cut back the roots a little bit. After you cut back the roots, separate the roots so that they are not all bunched up. Most people like to wrap the roots in a ball, and then they plant the rosettes with a huge root ball. When doing this, the roots don't spread out. Most of the time when the roots are all balled up, they eventually rot. In some cases the plants die from this.

Once you have done the root cutting and separating of the roots, then it is time to plant. Make sure you have a hole in the substrate where you are going to plant this. Place your plant in the hole and cover it up with the substrate, all the way to the leaves. Once you do this, you want to pull the plant up just above where the roots start. By pulling the plant up, you will keep the plant from rotting.

Method 3

(Rhizome plants) This plant can be planted in the substrate or on a piece of wood or rock. When planting this type of plant, you will need to trim the roots and untangle them depending on how long you want to keep the roots. I like to take the roots up to about two inches from the rhizome.

When planting, keep the rhizome above the substrate. I keep my rhizome about one inch above the substrate with just enough of the roots left in the substrate.

When planting the rhizome on a piece of wood or a rock, I like to put the piece in the tank so I know where to place the plant. Once you know where to place the plant you'll need something to tie it down with something. There are a lot of ways of tying the rhizome down. You can use string, rubber bands, and plastic wire ties. If you have a nice aquascape tank setup, then I would suggest you use some java moss. Java moss will make the tank have a natural appearance. Make sure that when you are tying the plant down, you tie it tight.

Keeping and Breeding Australian Rainbow Fish

Dan Gealy, SCAS

The Australian rainbow complex includes many colorful, interesting, and in some cases, rather spectacular fishes. Many species are easy to keep and breed and most make excellent community tank fish. The rainbow complex includes fish genera such as *Glossolepis*, *Melanotaenia*, *Pseudomugil*, *Iratherina*, *Telmatherina*, and *Chilatherina* which are characterized by both an anterior and a posterior dorsal fin. They come in all colors and generally exhibit stripes or simply colored scales running parallel to the lateral line. The *Glossolepis* have brightly reflecting silver scales interspersed with colored scales, which give these fast moving fish a particularly "flashy" appearance.

The colors of some of the rainbows are outstanding. The anterior half of *M. boesemani* is green/blue/turquoise while the posterior half is orange. When in breeding coloration, the blues on the anterior part of the male *M. boesemani* turn dark navy blue. *M. lacustris* is blue/turquoise/green above the lateral line and white below. Unpaired fins are blue/black. When in spawning coloration (which can occur daily), *M. lacustris* males turn fluorescent lime green/lemon yellow on the top of the head from the front of the anterior dorsal to the tip of the nose. This yellow "headlight" is visible across the fish room. Their blues get darker and their whites get whiter. *M. herbertaxelrodi* is yellow with a blue stripe running half the length of the body. Males have yellow to orange fins. *G. wanamensis* is green above the lateral line and has stripes of orange fading into yellow below it. The ventral fin on the males can be as wide as half the body width. As with other *Glossolepis*, *G. wanamensis* has silver scales interspersed with the colored ones. The colors and shapes of other species can be equally exotic and a tank full of these fish is easy to maintain and extremely attractive to behold.

Adult rainbow fish range in size from 1.5" to 6" TL with the *Glossolepis* being the largest. Adult specimens of *G. incisus* (New Guinea Red Rainbowfish) and *G. wanamensis* are on the order of 5-6" TL. The *Melanotaenia* come in a variety of sizes ranging from 3" to 5" TL. There are many smaller genera such as the *Iratherina* e.g. *Iratherina werneri* (Threadfin Rainbow), *Telmatherina* e.g. *Telmatherina ladigesii* (Celebes Rainbow), and *Pseudomugil* whose maximum size is on the order of 1.5" TL. *Glossolepis*, *Melanotaenia*, and *Telmatherina*, thrive in hard, alkaline water but typically do not thrive in soft acid water. *Iratherina* and *Pseudomugil* come from swampy areas and prefer neutral to slightly acid pH but will survive in more alkaline water. Rainbows are typically not aggressive with other species and, providing the pH and hardness of the tank in question are appropriate, they make robust community tank fish. Most rainbows are intensely active and quite fearless and as a consequence make excellent tankmates for cichlids. Their constant activity is a useful trait in bringing out shy cichlids, their speed keeps them out of harm's way, and they do not compete for the same ecological niches, so they are not viewed as threats. *Melanotaenia*,

Glossolepis, and *Telmatherina* have water requirements that are essentially the same as those for Rift Lake cichlids and these fish make excellent tankmates. As with all other cichlid compatibility issues, care must be taken when introducing rainbows to cichlid tanks in order to ascertain that the rainbows are sufficiently large and fast to hold their own against more aggressive tankmates.

Rainbows are non-pair bonding egg scatterers and can be bred in pairs, trios, or groups. When males are too aggressive it is best to breed with either several females or with additional males present in order to diffuse the aggression of the dominant male. If this is not possible, the breeding pair must be carefully observed in order to separate the two before irreversible damage is done to the less dominant female. A 20-gallon tank is generally sufficient for a large pair. These fish can also be bred in a community setting providing that no other rainbow species are present since most color morphs and species will interbreed. If bred in a community setting, it is also advisable not to have other fish present that are adept at picking eggs off the mop since this can reduce initial fry yield to zero. However there are many fish that have no interest in feeding off mops that make excellent tankmates. Examples of non-interactive tankmates include the *Aulonocara* complex, *Cyprichromis* complex, and the *Protomelas* complex. Adept egg eaters include the Victorian Haplochromines, Tanganyikan Lamprologines, Julidochromines, and the *Xenotilapia* complex.

Rainbows spawn in a manner similar to the *Aphyosemion* Killifish. Spawning coloration in many species is signaled by a color change on the top of the male's head, i.e., it gets much brighter. A yarn mop makes excellent spawning medium and can either be floated in the tank or allowed to settle on the bottom. Similarly, finely leafed or rooted plants such as Java moss, hornwort, or water sprite make excellent natural spawning media. The spawning pair will scatter eggs in the spawning media continually. Eggs have adhesive threads which bind them to the spawning media. The spawning media are then removed before the eggs start to hatch (6-12 days, depending on the species).

The adults are typically opportunistic feeders and while they do not actively hunt the fry down, they will eat the free-swimming fry sooner or later. Similarly, *G. incisus* and *G. wanamensis* will, on occasion, pick their own spawning mops clean. This necessitates changing spawning media daily. Upon hatching, the fry are quite small. The 1-2 mm fry are easy to miss since they are nearly transparent but can generally be seen just below the surface of the water.

The most critical time for the fry is immediately after hatching. If they do not have enough food at frequent intervals, they starve to death. The fry can be started out on fry foods (in order from largest to smallest) such as microworms, powdered spirulina, vinegar eels, powdered "APR" (artificial plankton/rotifer available from "Wet Thumb Aquatics", New Baltimore, MI.) but all are generally too small to take newly hatched brine shrimp. Some rainbow fry are easier to feed than others. "Easy" ones include the *Melanotaenia* species, such as *boesemani*, *lacustris*, *herbertaxelrodi* and *oktediensis*. These fry can take microworms immediately and *Artemia nauplii* after about 3 days. *Melanotaenia fluviatilis* fry are slightly smaller and as a consequence are more difficult to feed. The *Glossolepis* and *Iratherina* fry are yet even smaller and are much more difficult to feed during that first critical week. These fry require frequent feedings, i.e., every 1-2 hours of the smallest foods and still survival rates are poor. Another strategy for fry rearing that has been reported to work is to spawn the fish in a heavily planted tank and remove the parents after a week. A heavily planted tank has a large population of native microorganisms such as rotifers and

paramecium that act as food for the newborn fry. After about a week, they are big enough to take *Artemia nauplii*.

Success has also been reported simply using a bare tank, snails to clean up the uneaten food, and feeding microworms. However, large snails, when heavily fed, are also used to maintain high populations of "infusoria" which feed upon the partially digested snail waste. Consequently, snails may be providing enough microorganisms to transition the fry to larger foods.

Rainbow fry cannot be raised like killifish, i.e., a small confined space like a petri dish does not give the fry enough room to grow and develop and losses will be on the order of 100%. Since most aquarists lack enough tankspace, there is a strong tendency to use the smallest container possible to rear fry. Some rainbows are more sensitive to this "small rearing space" approach than others. 100 *boesemani* can be hatched in a gallon bucket and raised to 3/8" with losses on the order of 20% or less while losses with 20 *M. fluviatilis* in the same space will exceed 70%. As a general rule, the more room the fry have, the more they will thrive and the faster they will grow, but with some species more room is a requirement for success.

Growth is not blindingly rapid, but the juveniles of the larger species should be approaching 2-2.5" in 8-12 months. Juveniles at this size are typically old enough to breed although egg yields will be small. Juveniles of the aggressive *Glossolepis incisus* are easiest to breed at this size since they do not damage their partners as much. This breeding habit is extremely convenient for shipping. One of the easiest and most inexpensive ways to acquire new species is to buy a mop of eggs from another breeder and then hatch them in your own tanks. Egg mops weigh very little, can be shipped with a minimum of water, and can be shipped priority mail in the spring and fall or express mail when the temperature is more extreme. One can then acquire 30-60 fry for \$15 and have breeding adults in a year rather than spend \$60-90 up front for a spawning group of 6.

The best source of information about these fish is the *Rainbow Times*, the publication of the Rainbowfish Study Group, which also includes fish & egg listings. Rainbows are frequently offered for sale or trade through the North American Fishbreeder's Guild listings. The more common species are frequently available from fish retailers in the \$8- 15 range. Undocumented hybrids ("Australian Rainbows") out the Florida fish farms are typically available in the \$2-5 range. Rainbows are robust, easy to keep, colorful, active, and come in a variety of sizes and shapes. They make beautiful species or mix species tanks, and add color and variety to community tanks, whether they are populated with peaceful or aggressive inhabitants. As a consequence, I recommend them highly to the experienced and novice aquarist alike.

ROAD TRIPS FOR THE FISHBRAINED

Klaus Bertich (K2)

Peoria

Our first trip was to Peoria Illinois. It was in February 2002. It was to be four of us. John Van Asch, Randy Ison, Ed Millinger, and Klaus Bertich, that's me. Well we all listened to the weather report and Ed calls me up and says that's O.K. I'll stay home. Smart move as it turns out. Now we are down to three and we all listen to the weather. It was supposed to get real nasty with some accumulation of snow. They are telling me that the break line was to be right through Peoria or a little north of there and it would not get in till later in the day, early evening. Last minute decision was made and we go. The traffic on Sunday morning is light and we get there in plenty of time. Peoria had a real good auction considering the weather. That's right there were plenty of other fools up there looking for more than fish. We met Noel Roberts, Rick Tinklenberg, And a few other people I know from seeing them but I can't put names with the faces yet. John was asked to come up and auction for the club. John is a lot fun as an auctioneer and he pretty well knows his fish. Randy and I were waiting for the right fish to come up for auction, of coarse it would have to be at the perfect price also or we would stop bidding on it. We got a few good deals and we had a great time. This was a rather fast auction; it was around three on the afternoon, remember the weather. Well it's has arrived but it was just snowing. The streets seemed all right as we found a place to eat. After a 30 to 45 minute lunch\supper we get back on the highway, 155 I think it was and it then we realized we should have eaten faster. The road was a skating rink. If it wasn't ice covered it was slushy, heavy slush. The kind that will takes your car and put it in the ditch slush. I had two passengers with me that were very quiet for a long time. Other than a few moans and groans or hey look at that guy in the ditch not much was said. We were in the right hand lane and it was moving rather slowly. I decide that we need to go a little faster we were doing around 45. I try the passing lane and the van does a little dance and I get back into the right hand lane and do 45 MPH. I'll leave the passing to those a little braver than me. Gee I wish I were home with right about now. Top speed is 45. A van two cars ahead of us does a 180 and ends up in the ditch. Everybody goes down to 35 MPH. Why did I come to this auction, O God (we can say God in this book can't we Pat) please let me my van live. I've only had it a short time and my wife will kill me if I wreck the van. I'll never hear the end of it. O please I'll never go to another road trip. I'll be good. We make it to Springfield and it's like night and day. All is well we live. Well thanks God but Maybe just one more road trip if it's O.K. with you. You know promises made under duress God really doesn't hold to you these, I think.

Kansas City

This trip was a lot better in a lot of ways. Same three guys John Van Asch, Randy Ison, and Klaus Bertich. Ed Millinger stays home again; I think I see a pattern starting to develop here. Whatever. Kansas City was a slightly better auction. More sellers and better weather had a lot to do with it. The room was a little small but that was O.K. John was asked to auction, as were a few other people. I still like John's style. My point here is it's not the fish you could or could not buy but the people along the way. Sure some fish you see at these auctions you will rarely if ever see at a shop but if you figure the time and gas, food you could do better by mail order. But

go and buy a bag of fish any where for a dollar, unbelievable. Here again we meet a lot of people, I think John knows half of the people in the fish hobby, and as it turns out Randy knows the other half. These are the times when you get to talk fish with fellow hobbyists and they really listen. The wives at home will look at your fish and maybe OHH and AHH but what they really think is anybody's guess. This is the time you may be able to spark up your own interest in the hobby. Pick up that fish to fill that empty tank. Start in on BAP. At the time that I wrote this article the next trip planned is Atlanta, the ACA. The big Kahoona. Lot's of fish. Lets Go!!!!

Louisville (Randy Last Stand)

July 24th, 2002 Randy Ison, Mike Hellweg, Jack Berhorst, and Klaus Bertich leave at some unkind hour of the morning from Randy's, it was 6 a.m. That means Jack had to pick me up at 5:15. Well what the heck we can sleep in the car, I'm not driving this time, Randy is. I have it in my head that Louisville is no further than Kansas City, Wrong!!! The object of this trip is two fold or as it turned out Many folds, like an accordion. Pat Tosie is coming to Louisville on his own to pick up our speaker for our next meeting Juan Miguel Artigas Azas and to see Rusty Wessel's place. We also came to hear Juan Miguel and to see Rusty's Place. Rusty offered to have a little Bar-B-Que for those of us from out of town and as it turned out a lot of other people to. He also had a new project going he building a fish house. As I was told it is 1400 Square Foot. That's a lot of fish house. He is going to put all new tanks in the house and a lot of plants. I hope that Rusty has an open house when it's all done and that I'm asked to go along to see it. He and his wife (Suzy I think) were the perfect hosts. We all thank them for their time and hospitality. We arrive in Louisville around 11:00 am. We don't need to be at Rusty's till 3:00. Randy gives a tour of the fish shops of Louisville. These are like the shops we had around here until the big stores came in and did most of them away. I remember the old shops and it was good to see that they are making it. It was a good time at the shops. What I did see at these shops was the service and advice that was given to the people. It was like that here a few years ago. It still is in a few shops. The big stores just don't have the kind of people it takes to make a good fish store. I've gone in to some big shops and they will knowingly sell you sick fish. I know these fish would not make it overnight in your tanks. We went to 4 shops I think it was and then we were off to Rusty's. Pat and Juan are already there. We have introductions all around and one person I was introduced to was Charlie Pyles. This is one funny man. Never got to talk about fish with him but the trips he takes must be a riot. You have to be with this man for an afternoon to really appreciate his humor. Rusty's fish room was a sight to behold all those fish and the size of the tanks is just unbelievable. What's even more unbelievable is that he is making this bigger. He is building a separate house for just his fish. It's big, really big. He also has two fishponds on the property with Koi and Gambusia, lots of both. I just don't know how he finds time for his work, family, trips and hobby. No wonder he is so skinny. Juan gave his talk at the Louisville fish club meeting. Pat Tosie brought him to St. Louis on Monday for his talk at our club on Thursday. We came home on Sunday late. I stayed home from work the next day. See there are other benefits to these trips.

Now this was just another day trip with some fellow fish nuts, admit it we are fish nuts, and we had a very enjoyable day. It was a little long but with good planning it can turn out very good. On these trips you get to see things that no matter how long you are in M.A.S.I. you will never get to experience. If you hear one of us talking about going on a day trip and would like to come along room can always be found. We can even split up into 2, or 3 cars if needed.

A.C.A. Atlanta July 24, 2002

I've got only one thing to say about the ACA **WOW**. Lets get started on this trip. Same three guys, John Van Asch, Randy Ison, Klaus Bertich, on the way home Jack Berhorst comes back with us. We leave John's house around 6:30. Fish is not all we talk about on the way down. You have to look at who do we have together here. John - Auction Chair, Randy - Show Chair, Jack - President, and Klaus - Secretary. We do talk about and make some decisions on how to improve our club.

The show is held at the Airport Hilton, nice place, a very nice place. I know it wasn't the Stratford but we made do. We arrive a day early just to have time to unwind. Jack gets in early 4:00 am so we let him sleep in till 9:00 before we kick him out of bed. Man we have things to see places to go can't sleep all day.

Thursday We just hang out around the hotel and chill. The Atlanta club has a tour going to the aquarium in Chattanooga. We run into Steve Edie, of course Pat Tosie is there he brought Jack, and Juan Miguel Artigas Azas. Juan is going to give the same talk he did at our show only he has a bigger audience this time.

The ACA had a lot of entries I think they had about 500 tanks set up and they had fish in most of them. Now the thing that really blew me away was the amount of fish being sold out of the rooms. People set up fish racks in the rooms, its kind of like setting up a fish room in your bedroom. There were fish all over the place. These fish are all for sale outside of the regular auction. Some of these fish rooms are open till late (early for some). I saw one fish prettier than the other. Some of these fish are only available through these hobbyists. Prices are not always reasonable, but if you are the only that has a particular fish, what can I say. I didn't buy any fish, as I'm not really sure as to what I would do with them.

After dinner we go and see Rusty Wessel's talk on his fish collecting trips. He is a good speaker and he has some outstanding slides. We then have a speaker on Apistos, Mike Wise. He also has some fantastic slides. I don't understand how these people remember all of the names of the different Apistos, after some time they all kind of look the same to me. Been a long day time for bed it 10:00 it's late for me.

Friday We are up early 7:00 am, to go have breakfast at Waffle House, we ask Pat to come along but it was to early for him. After breakfast we look around the vendor rooms. Ray Kingfish Lucas is there with a lot of product that he represents. He has half of a good-sized room with his companies stock well represented, to many to list here. All of this product he donates to the Atlanta club for auction on Sunday morning. He himself will do the auctioning.

Jack has looked in the yellow pages and has located a fish shop that he says might be worth going to. We locate Pat and ask him if he would like to go and we all pack into the van off we go to a place called The Fish Store and More. Pat needs food first so we stop at an I-Hop, we all have had breakfast but what the heck that was 2 hours ago maybe I can eat just a small ice cream of some kind. Well as it turned out this was one of the nicest fish stores I've ever been in. We talk to Derrick Anderson and he tells they have been located at his location for 14 years and it looks like

they just moved in last week. All of the tanks were spotless and no sick fish. They were really big into saltwater fish. One display tank was a 300 gallon round tank that was a site to see. A short distance from there was a salt-water pond. That shows class. They were slightly high with their prices but the fish were not second rate and the service was second to no one.

After this we look for another fish shop but we unable to locate it must have been bad directions, could not have been the driver or the navigating. We head back to the hotel for a little siesta.

This evening we just kind of hang around the hotel. John has a meeting with the ACA group. We go to the rooms again to see if we missed anything. Hospitality room opens at 10:00 and we see a lot of people there. We stay about an hour or so and call it a night.

Saturday This is the big day. All of the fish are in and the speakers start early. I go to listen to David Herlong on Fish Photography. Real interesting talk. He shows slides with obvious problems and tells how the picture was taken and what to do to correct this. Next is a talk on Gizmos given by Ray McCaleb. Ray uses his fish room to show you how he has made his fish room work a lot easier. He does not, as I do not, carry water when he does a water change. He showed some real good ideas some of which I be using in my fish room shortly. The next speaker was Jack Wattley. I don't Discus, probably never will but I had to go here his talk, guess what? He did not talk on Discus, but rather the effects of raising fry in a tank to large. Too much to go into but ask me and I'll elaborate as best I can. Now it's time for the banquet they had an almost sold out room. We opted out for dinner and we go off to a little place that was recommended by a new friend of ours Mary Beth. Nuevo Laredo Cantina has some really good food and it was only about 25 minutes from the hotel. The also have some really good margaritas there. I would recommend this place to anyone. After dinner we head back to the hotel and wait for the party at the hospitality room to begin. They had just a small-subdued get together not at all what it has been in the past, Toga party indeed. It was just a Jammy party thank-you very much. Where do all of these people come from? Fish people are clam, I mean calm subdued, reserved. Well it was fun, it was adult, and it was worth it. Nobody died or got sick, film at 11:00. Bedtime for me was 2:30am I think?

Sunday It's 7:30 and John and Randy are at the door raring to go. Don't you people sleep? I get up what the heck we can always sleep next week. The auction starts at 9:00 and Ray Lucas will start off the auction himself by auctioning off all of the promotional products he was showing plus some things he just happened to bring along. 10:00 and the real auction starts. I look around and wonder what are they going to do. There just aren't that many fish to sell. This is going to be over by Noon. Well this was kind of like the miracle of loaves and fishes; they just kept coming, and coming. The auction went till 6:00 that night. I think that the auction, as well as their show was a total success. It was done first class and I'm ready for next year. O yes I almost forgot we went to eat at Malones after the auction.

Now through all of this I have met up with one of Randy's friends Gordon Forsneff, he comes to most of the shows he can and he brings rock. Not just any rock, Holy Rock, Holier than thou Holy, Holy Rock. A young man named, Brian, accompanies Gordon, and for the life of me I can't remember his last name but I know we'll meet again and then I'll find out. Now Gordon comes out

of Texas and Brian comes from Michigan and they are working together selling Holy Rock. Now you may selling rock how can this bring in any money. Lets just say Gordon won't go back home with any rock. He will sell out of Holy Rock. He will go by a few fish shops in Louisville and maybe Nashville and whatever small amount of rock he still had left will be gone.

Monday Time to go bring it all home. We decide to make a small side trip to a little shop recommended by Steve Edie in Nashville. I had done the road map work and it was just a little off of the highway. So we decide that if we were going to do this we needed to leave early. Fish were all packed the night before. Luggage was taken to the van. Coolers were iced down we were set. Now I thought this was going to be a hard time getting these guys up and out of there. It was I who was surprised by a knock at the door at 5:30 am John and Randy were ready. Jack had to be back home by 6:00pm that night and we wanted to make that stop. Well a road trip on a road trip. We skip breakfast; my stomach thought my throat was cut till we fed it. Well I didn't die and we made the shop before it opened so we went looking for lunch. The shop called The Aquatic Critter was a nice shop it's owned by Jay Kennedy III. He happened to be out of town but his staff showed us around and they were most helpful. Again this is one of those small shops that just can't compete with the big stores but some do survive. The rest of the trip is uneventful we get home as scheduled.

In summary these have all been very good trips. Even a little ice and snow didn't really spoil the day for us because we were lucky and we wouldn't let it happen. Not one argument or harsh words from any one all week long. Do as you please and when you please. Sounds like what the doctor would order for a soothing time away from reality.

I did find out one thing though. Maybe this is not a real fish club but an Eating club with a small fish hobby.

Thanks to my trip mates and the people that made my weekends a real success.

SUPERBOWL is coming!

November 20, 2003

Are you prepared?

The Black Banded Sunfish, Fragile Jewell of the East

By Bob Bock

Imagine a fish that looks like a cross between an angel fish and a tiger barb, but with a gentler nature than either species. This fish really does exist, and can be found, among other places, in New Jersey.

The black banded sunfish, *Enneacanthus chaetodon*, has a compact body with a striking array of black bands on a white background, its ventral fins etched with orange.

In their haste to possess this fragile jewel, however, many beginners often set themselves up for failure and end up killing the delicate creatures they had coveted.

To survive, Blackbandeds need soft, acid water with no discernible hardness. They will also steadfastly refuse flakes, pellets, and other prepared foods until they starve to death. These demure little sunfish also are extremely susceptible to ammonia waste and will soon sicken without good filtration and regular water changes. Unless you can consistently meet these conditions, you are predestined to fail with these marvelous animals. But anyone who has successfully kept and bred discus probably also will succeed with these charming little fish.

The blackbanded sunfish I've kept have done best in very soft water with a pH no higher than the mid 6s. My friend, Pierre Gagne keeps them in brightly lit tanks, injected with carbon dioxide and planted with *valisneria spiralis*. With CO₂ and intense lights the *valisneria* grow like weeds in the process, soaking up the fish's nitrogen wastes and absorbing calcium carbonate from the water.

At first, wild caught blackbandeds will eat only blackworms and other moving live foods. However, if you first pour frozen offerings through the filter stream to simulate movement, black bandeds will greedily accept frozen brine shrimp, blood worms, glass worms, and finely chopped cooked shrimp. Pierre keeps his blackbandeds with guppies. With a continuous supply of newborn guppies, the blackbandeds remain well-fed.

If you don't have naturally soft, acid water coming from your tap, it will probably be best to either buy a distillation apparatus or begin collecting rainwater. I've had no luck with those ion exchange pillows. They merely exchange calcium carbonate and other dissolved solids for sodium chloride, which blackbandeds can't tolerate either.

Blackbandeds breed like other sunfish, with the male staking out a nest site among plants or other cover. Females lay their eggs in the site, and then the males will drive them off. Like other sunfish, blackbanded males will guard their eggs until hatching, and perhaps for a week after, until the fry are free swimming. After absorbing their yolk sacs, the fry can take newly hatched brine shrimp.

Some hobbyists maintain that, before they will spawn, blackbandeds need to be kept at low temperatures for two or three months, to simulate winter. I've kept three or four in a picnic cooler in my back yard over the winter months. At about 40 to 50 degrees Fahrenheit, blackbandeds don't need to eat much, and I've found that four or five blackworms per fish each month will keep them healthy.

Many states do not allow blackbanded sunfish to be collected. And before you collect blackbanded sunfish-or any other species- it's a good idea to check the regulations with local natural resource or fish and wildlife. Blackbanded sunfish occur in New Jersey, Maryland, Virginia, Delaware, the Carolinas, and parts of Florida. Although I've collected them in the past under the terms of a scientific collection permit, I no longer remove these fish from the wild. Populations often are fragmented, and removing a few individuals can sometimes greatly affect the entire population. Larger aquarium stores sometimes carry blackbanded sunfish, often bred from captive stock overseas and they are occasionally available on the Internet. It may also be a good idea to prepare for blackbandeds by keeping a similar species.

Both the banded sunfish, *enneacanthus obesus*, and the bluespotted sunfish, *enneacanthus gloriosus*, are easier for beginners. Both are more numerous in their east coast ranges and are slightly more hardy than the black banded sunfish. With striking green or gold spots, both species are beautiful in their own right and allow you to try your hand with a fairly demanding fish without first risking failure with the rarer blackbandeds.

Bob Bock is past president of the North American Native Fishes Association, www.nanfa.org. His column is available free of charge to aquarium club publications.

Another group with an interest in native fish is the Native Fish Conservancy, www.nativefish.org.

Both a low resolution and high resolution image of the black banded sunfish are available at: <http://www.photolib.noaa.gov/historic/nmfs/figb0423.htm>

Please note: the black banded sunfish is now known as *Enneacanthus chaetodon*.

This image is not subject to copyright provisions, however, the National Oceanic and Atmospheric Administration/Department of Commerce asks that credit be given for the photo: <http://www.photolib.noaa.gov/aboutimages.html>

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Article Review

Terry Atherton

My contribution to our club's magazine this issue will be taken from "Why Are fish in Schools" by Eddy and Nancy Szyjewicz. This was as usual enjoyable and informative reading, from the June issue of Freshwater and Marine Aquarium Magazine.

This article was concerned about the question of why fish are used in elementary, middle and high schools in this country, and how teachers utilize aquariums in their classrooms. The two authors of this article visited California schools among them Loma Prieta School in the Santa Cruz Mountains. The schoolteacher they interviewed there is the daughter of a fish store owner and grew up with them as a part of her home life.

She pointed out that on the beginning of the school year the aquarium tank dispels a lot of fear and adjustments that the children, particularly younger ones, have on the first day of school. At this school there is also a goldfish bowl, owned by Laurie Brandt, which second graders enjoy. Theirs is the job of feeding and cleaning, a point of responsibility. Carole Carpenter's fifth graders have a tank with guppies and other livebearers. Hence the "miracle of life" is taught to the students in an easy way since live-bearers are simple to breed. In Los Gatos English Middle School the reader meets "Otis," a Siamese Fighting Fish. Dr. Wernick's assistant, Wernick is the principle and Otis calms kids who are called to her office, "slackens the emotional noose" and diffuses tension.

The article went on to cover information about an aquarium project in Northern California, a breeding plan. Fish were caught in local rivers then put in hatcheries. Eggs were collected and hatched, the students gained valuable insight from this project. The field trip was a great way to assist teaching in the life-science courses. Ruben and Erin Mejia who are instructors in this field, discussed environmental conditions, life paths of fish, etc. The couple has other pets in their classroom. Learning-disabled children can "reinforce their focus." Mrs. Mejia says, in conclusion, fish are advantageous in that "they don't talk back!"

A wonderful article, fish in school, to "learn, of course!"

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SUPER BOWL 2003

THURSDAY, November 20, 2003

Dorsett Village Baptist Church

ENTRY DEADLINE:

All entries will be accepted between 6:30 PM and 7:30 PM. Judging will begin promptly at 7:30, so ABSOLUTELY NO ENTRIES WILL BE ACCEPTED AFTER 7:30 PM.

SHOW CLASSES:

1. DOMESTIC AND FANCY FISH (All man-made and domestic colors, veils, long fins, and other varieties not occurring naturally: includes Betts, Goldfish, Guppies, and all popular color/finnage variants of Livebearers and Egglayers)

The following 8 classes are for naturally occurring species and subspecies or locality variants of the listed species for that class.

2. WILD LIVEBEARERS
3. CICHLIDS
4. ANABANTOIDS
5. CHARACINS
6. CYPRINIDS (includes Barbs, Danios, Rasboras, Minnows, Sharks, Loaches, and their kin)
7. LORICARIIDS (all Suckermouth Catfish)
8. CALLICHTHYIDS (all Armored Catfish – Corys, Aspidoras, Brochis, Hoplos, Rafaels, and their kin)
9. ALL OTHER AQUATIC LIFE (fish that don't fit into above classes; i.e. Eels, Gobies, Other Catfish, Nandids, Rainbows, Killies, Marines; plus Aquatic Invertebrates and adult fully Aquatic Amphibians)
10. TRUE AQUATIC PLANTS

These last two classes must be 100% the work of the entrant and must be fish or aquarium related.

11. PHOTOGRAPHY (photos, slides, electronics – entrant must provide means to view electronic entries)
12. ARTWORK AND CRAFTS

REMINDER: You must enter SUPER BOWL to be eligible for MASI's Novice or Hobbyist Of The Year honors.

RULES:

ENTRY:

Open to all with payment of entry fees.
One entry per appropriate size container.
Must be the property of the entrant for 60 days and/or must be work of entrant.
No hybrids, deformed, diseased, artificially colored (painted, dyed or injected) or illegal fish may be shown.

DISPLAY:

All entries must be staged and all paperwork turned in by 7:30 PM. **LATE ENTRIES NOT ACCEPTED.**

All fish are to be entered in bare tanks or flat sided drum bowls at least _ gallon in size or larger up to 30 gallons in size (for larger tanks, entrant must provide their own proper aquarium stand.

If you need electricity for an air pump or filter, contact Show Chairman Gary Lange at least 24 hours before the show.

No decorations, gravel, or backgrounds permitted. The bottom of the tank may be painted or covered on the outside.

JUDGING:

All entries will be sight judged based on appropriate standards for the fish entered. Decision of the judges and show chairman is final.

Show Chairman may move entries to appropriate classes in entered in wrong class or if there are not enough entries in the class.

AWARDS:

First, Second, and Third place in each class.
Best Junior Entry, Judges Award, and Best Fish in Show.

SUPERBOWL is HERE!

MISSOURI AQUARIUM SOCIETY, INC.

NAME(S): _____
(NOTE: ALL POINTS EARNED WILL BE AWARDED TO THE PERSON(S) NAMED ABOVE.)

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____ PHONE:(_____) _____

STATUS (Check one): Hobbyist _____ Novice _____ Junior _____ (See Show Rules for definitions.)

CLASS	LEAVE BLANK	VARIETY OF FISH OR DESCRIPTION SCIENTIFIC NAME/COMMON NAME	DIMENSIONS OF EXHIBIT L x W x H (in Inches)	ENTRY FEE ***	CHECK (✓) IF AUCTION ITEM
				.50	
If more space is needed, please use another sheet of paper			TOTAL		

*** ENTRY FEE: The entry fee for all exhibits is only fifty cents each!

Entrant agrees to abide by all show rules and the decisions of the judges. All exhibits are placed in the Show at the entrant's risk. Entrant agrees to release the Missouri Aquarium Society, Inc. and the Dorsett Village Baptist Church of any liability.

Signature _____ Date _____

Deadline for Show entries is 7:30 PM, November 20, 2003.

**R&J
FISH
FOOD
JIM
314-638-1134**

12/03

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A large, multi-pointed starburst graphic with a jagged, irregular outline, centered on the page. The text is contained within the starburst.

Don't miss our meeting
October 16th and hear our
speaker **RUSTY WESSEL**
talk about Collecting in
Mexico