

The
DARTER

V42-N2

MARCH/APRIL 2016

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You can join or renew your membership at any meeting, most club events, by PayPal from the MASI Website's Membership Page or by contacting Ron Huck, membership chair, at 314-481-2915.



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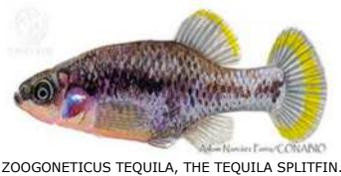
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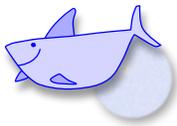
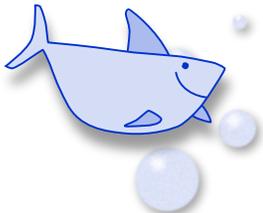
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Foolin' with Fish



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FROM THE PRESIDENT'S TANK

Pat Tosie



It's almost here!!! Our 2016 Annual Show, titled "Foolin' with Fish". Are you ready for it? Kathy and Holly have teamed up as co-chairs to make this years' show one to be remembered! Speakers include; Ted Judy, Rusty Wessel, and Chuck Davis and between the three of them, they have over 120 years of experience keeping fish!!! All

are very successful fish breeders and all have been on collecting trips. **YOU WILL WANT TO SEE WHAT THEY HAVE TO SHARE!!!**

Participate in this years show, you never know what you may win!

On another note, We have been working to re-organize the monthly meetings so that you have time to visit with each other without interrupting the regular meeting, speaker talks and auction. **PLEASE** give the meeting the respect it deserves and keep your talking to a minimum or go outside to talk during these times. When the

meeting runs smooth without interruptions, you should have at least 30 minutes to visit at the end of the meeting. With that said, we will no longer have a snack break, you can go **QUIETLY** and get a drink or snack during the meeting. In addition, the people selling items at the meeting can sell before the meeting and during the last 30 minutes of social time, but no sales will be held during the meeting (except raffle tickets). Attendance prizes will be reduced to save some time as well. These changes will allow you more time to visit and will help the business meeting, speaker and auction run smoother.

Be sure and sign up for our upcoming **FREE FISHY BOWL**, that John Van Asch has arranged. We will have 3 hours on 8 lanes of bowling for **FREE**. See John for details. (I think we may have a ugly fishy shirt contest as well)

We had 3 nominations for the 2015 MASI Member of the Year: Steve Deutsch nominated Mark England, Kevin Wise nominated Mike Hellweg and Ed Millinger nominated Gary Lange. Thank you for those nominations, all 3 candidates are well deserving, I wish you all the best in the voting.

Keep looking below water....

FROM THE EDITOR

Chuck Bremer

It's spring! This is a full issue! Extra space for the Challenge, the Show, the HAP rules, and more ads...but we did get a few fishy stories in. With a larger club comes more activities and news! Don't worry, next issue will be fuller of fishy stuff!

One of the biggest tasks for the Darter this year is to move further into the electronic age. You'll find lots of things in this issue that begin to extend the printed form into the web resources many now read it from. Over the course of the year our goal is to move enough members to reading the electronic version that mailing the printed format is less necessary. There are costs to

MASI for printing and for mailing but the major cost to members is that we have difficulty getting them mailed on time so they often arrive weeks or even months late. With an issue like this one there is just too much that goes out of date too quickly.

In this issue you will find that nearly every ad and sponsor logo is hot linked directly to a website or Facebook page. You can sit on the couch with your laptop or tablet, read the Darter and explore their offerings beyond the printed page at your leisure. There are also addresses hot linked to interactive maps to get you to MASI functions more easily. One of the things I think you will like the most are the

video links. They allow touring a Fishroom from your couch, watching a fish spawn or learning from an educational aquarium video. *In this issue there are four videos, can you find them? A complete set of the last 11 years of electronic Darter to the first who can send the list to my Editor Email address.*

Oh, see that little curleyQ in the lower right corner? It takes you directly back to the Table of Contents where you can jump to another article.

This should be an exciting year! Membership is growing. As new Darter Editor I've got big shoes to fill, a lot to learn and a lot of challenges ahead of me. If you



are a participant in either the HAP or the BAP programs you have a lot of challenges too. I look forward to publishing your successes! Keep the articles coming and we'll publish new techniques to improve your success and enjoyment of the aquarium hobby!

CHUCK B

[Send Feedback and Letters to the Editor to: editor@missouriaquariumsociety.com](mailto:editor@missouriaquariumsociety.com)



At the General MASI Meetings



Thursday, March 17
Lighting for Aquaria: An Overarching View
 By Cara Wade working for Build My LEDs based in Austin TX

Synopsis: Aquarium lighting technology evolved quickly over the last decade, and hobbyists have more options than ever before...so how do you choose between them? And what's with all the new terminology? Kelvin, lumens, lux, PAR, PUR, PPF, CRI, DLI, the list goes on...what do they mean, and do you really need to know them? Delve into the science behind lighting for photosynthesis, common myths and misunderstandings, the types of light emitters on the market today, and how to choose the best setup to ensure success for your particular system.

Primarily about LED lighting for the aquarium.



MASI meets on the third Thursday of each month at 7:30 PM.



Thursday, April 20

Aquascaping for Average People:

How to have a beautiful aquascape in your home without having to be a professional aquascaper

By Jennifer Williams



Jennifer: "I got my first tank when I was seven. Years later, a craigslist ad: "Firemouth Cichlids, bring a net and a bucket", introduced me to formidable former Army Lieutenant filling his bucket with fish, and telling me all about local fish clubs and planted tanks.

I attended my first Greater Washington Aquatic Plant Association (GWAPA) meeting and was completely hooked. I have served on the Board in several positions, and enjoyed participating in events with the other local clubs and the true friendships I have made in this hobby. I currently sit on the board for the Aquatic Gardener's Association (AGA). Now I have several wins from aquascaping contests, including most recently a repeat win at the 2015 Aquatic Experience/AGA Aquascaping Live! Invitational Competition in Chicago for my 75 gallon entry collaboration with Rachel O'Leary and her daughters.

I am an avid fan of Blue-eyed Rainbowfish and enjoy keeping and breeding them with my eclectic assortment of fish. To pay the electric and water bills that accompany all of the assorted gallons of aquatic madness, I work as a Graphic Designer...and also enjoy fast cars as a former professional drag racer and purring cats as a long-time volunteer/rescuer with the 4Paws Rescue Team."



MASI BOWLING PARTY

EPIPHANY LANES 6:00 - 9:00 PM

April 30, 2016



You Better be there!!

In appreciation of its Members, MASI is sponsoring a Bowling Party to get together, have some fun and exchange interests!

Free Bowling and Shoes provided for MASI Families and Guests

No outside food is allowed but there is plenty of food and drink offered at the Venue!



**3164 Ivanhoe Ave.
St. Louis, MO 63139
314-781-8684**

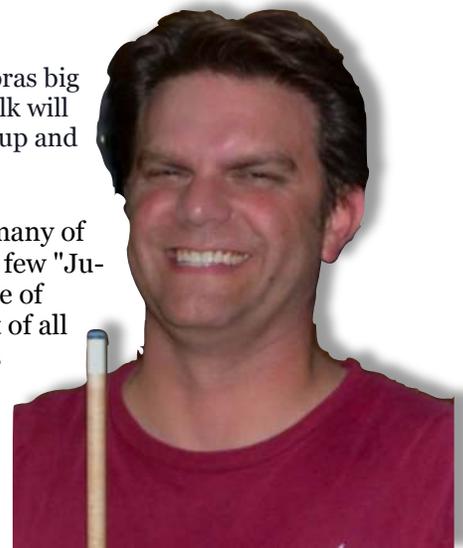
Just off I-44 At Arsenal or Jameson

Speaker Rob McLure – May 19th Meeting

"An Overview of Spawning, Husbandry & Raising of Corydoradinae fish"

"Rob will try to update you with the latest Corydoras news, let you know what Corydoras big and small like to eat, and show you breeding tips and tricks that have worked. The talk will show even the most dedicated aquarists something new about the Corydoradinae group and challenge you with Cory trivia!"

He has managed to breed nearly 40 species in the Corydoradinae group to date, many of those multiple times. Rob was introduced to Corydoras when his father bought a few "Julii catfish" at a local pet shop for his younger sister "Julie". After a spawning spree of breeding 25 different fish in one year, out of all the fish spawned that year, the Corydoras paleatus were by far the most fun. Three years later he has more than 80 types of Corydoradinae fish in his home and likely qualifies as an addict of some sort!



MASI Member of the Year Nominations

Mark England



I nominate Mark England as Member of the Year for his work as Editor of The Darter. Mark did a great job as editor, not just by producing the Darter, but by working to transform it. Mark greatly increased the electronic distribution, implemented a more contemporary layout, and increased the use of color and graphics, taking advantage of current standards and production

technology.

Mark did not just perform a job for MASI, he improved it. For this I nominate him for consideration as your member of the year.

Nominated by Steve Deutsch

Gary Lange



I would like to nominate Gary Lange as MASI member of the year. Gary does a great job of providing a terrific program each month through his many contacts in the hobby. He also helps organize the speaker dinner the night of our program and has saved us money by letting speakers stay at his residence. As if that was not enough Gary had the distinct honor of having a fish named after him.

Melanotaenia sp. "Dekai" is now known as Melanotaenia garylangei. Please join me in voting for this most worthwhile candidate.

Nominated by Ed Millinger

Mike Hellweg



I nominate Mike Hellweg for member of the year for a few reasons. First off there is no other member in my eyes that goes above and beyond what he or she needs to do, if there is a question, Mike is there to help, he will guide you on the correct path, never giving you all the answers, but just enough, so in the end you not only will have your answer, but also have learned something new.

He is a friend to all, has a great heart, and asks for nothing in return, his knowledge is free, his love for the hobby goes beyond himself, he is there not only for MASI, nor a sister club, but for everyone who has any interest in our hobby. Mike spend countless hours doing projects for our club, most the general membership doesnt know about, but benefits from his work, he has been our auction chair man for a number of years, and in that time our auctions have grown, to almost epic status. He is our clubs HAP chairman, that job in itself is huge just in the time it takes to make sure everything in that position is correct, and the paper work that is involved with that is no small feat. Then there is the fact that when something needs done, he makes sure it gets done, he is there always. He is one of our members, a teacher, and most of all, he is our friend.

Nominated by Kevin Wise

Mark your Ballots at the Meeting, March 17th

Award to be presented at the Award Banquet April 2



MASI CHALLENGE! With contributions by ALL MASI Members



The Amazon Research Center for Ornamental Fishes has again been chosen by the Executive Council as the major 2016 MASI Challenge recipient. You may remember the fish they sent to us to sell and auction in 2016: wolfish, Peruvian Altums, undescribed Apistogrammas, etc.

The Peruvian Amazon is being threatened by man. Not only the physical environment but also the aquatic life in the area.

The aquarium trade is a multimillion-dollar business for some of the poorest areas of Peru where most other business opportunities do not exist. Over Three million dollars goes directly into the local fishing communities, creating revenue that would otherwise have to be sought by cutting down the forests.

Because of unregulated logging, mining and environmental degradation, fish populations are decreasing- economies of villages which rely on the fish for their livelihood will be devastated.

In 2009, Anthony Inder Mazeroll, Ph.D -a professor of Biology at West Texas A&M University 8 years and at Soka University of America in Aliso Viejo, CA since 2002, and 2 fish biologists from Iquitos, Peru purchased 2 acres of land to build a research facility devoted to the research of sustainable breeding, diseases, ecology, and conservation

of ornamental fishes. Located 10 km southwest of Iquitos and ideal for the Amazon Research Center for Ornamental



Tap//click for Video

Fishes research center, the facility will be used by faculty, students and scientists from all over the world to conduct research on ecology and conservation of local fishes. They hope to help develop sustainable aquaculture practices of local aquarium fishes and share that information with local fish farmers resulting in the reduction of fish being extracted from the surrounding waterways.



Running River Rainbowfish Fund

Running River Rainbowfish could disappear in the wild!

In August 2015 Peter Unmack (University of Canberra) and Michael Hammer (Northern Territory Museum) discovered that Eastern Rainbowfish had been introduced upstream and are invading the habitat of Running River Rainbowfish. In order to conserve this population the Australian New Guinea Fishes Association (ANGFA) in collaboration with Peter Unmack and Diversity Arrays Technology will conduct a comprehensive



Tap/Click to read more

genetic evaluation of fish to be used to start a breeding population to ensure that no hybrids or Eastern Rainbowfish get included and that genetic diversity of the wild population is represented in the captive population.

The goal of the genetic work is to compare fish preserved in 1997 to captive stocks collected in 2012 by Keith Martin and Bruce Hansen, along with fish from Peter Ford and Peter Egglar, plus fish collected in 2015 by Peter Unmack and Michael Hammer. Once the identity and genetic diversity of potential breeders has been established, ANGFA will create a captive population which will be distributed to fish breeders

such as Ausyfish (Bruce Sambell), Aquagreen (Dave Wilson) and Guyra (Aimee and Steve Brooks) who can then breed and disperse Running River

Rainbowfish in large numbers across the native fish aquarium hobby.

The Fund hopes to raise at least \$3500 by March 2016 which will allow to test around 94 fish. 100% of your contribution goes to this project and donations by Australians are tax deductible.

Editor's Note: This project was brought to the attention of the Council by Gary Lange. It has been a hot topic in most of the US Aquarium Societies and has also garnered a lengthy article in the most recent issue of Amazonas. Most clubs that I know, including MASI, have voted to Donate about \$200 - \$250 to this worthy project to save these fish in their pure form. Tap the photo to read a more lengthy article about the habitat, problem and solution that is being attempted. This is one of 3 examples of your efforts at work in this issue.



Header from forwarded message:

> From: Omar Dominguez

> To: Michael Koeck, Kees De Jong, John D. - DNR Lyons, Kyle Piller, TRU GRUMM (Poecilia Scandinavia), Gerardo Garcia, Jean-François LORIEUX, **Pat Tosie**

> Subject: Rv: Artículo sobre Zoogoneticus

British zoo, Emirates foundation & Michoacan University unite to bring extinct fish back to Jalisco

*Published in the Guadalajara Reporter
04 March 2016, by John Pint*

I recently camped at Balneario el Rincón, a waterpark near Teuchitlán, with several friends who are into birdwatching. One of them approached me, while I was setting up my tent, with a large printed announcement.

“Have you seen this?” nature photographer Julio Alvarez asked me.

The announcement was an appeal for volunteers to help monitor the quality of water in the Teuchitlán River Basin, as part of a project called “Reintroduction of Zoogoneticus tequila into the springs of Teuchitlán, Jalisco.” What amazed me was that the project to bring back this Jalisco fish – which is now extinct in its natural environment – was being carried out by the



TEUCHITLÁN MAYOR DR. ARMANDO ANDRADE INTRODUCES HIS DAUGHTER TO THE TEQUILA SPLITFIN DURING A MEETING AT BALNEARIO EL RINCÓN. ANDRADE IS BACKING A PROJECT TO TURN LOCAL PEOPLE INTO “WATER QUALITY MONITORS.”

University of Michoacán, the Chester Zoo in Cheshire, England and the Mohamed bin Zayed Species Conservation Fund operating out of Abu

Dhabi.

Curious as to what this was all about, I headed up the hill to the Guachimontones where I hoped to get a few good photos of the circular pyramids in the light of the setting sun.

Stepping out of my car, I bumped right into one of the authors of the very announcement I had just seen, Rubén Hernández, a biologist in Morelia, Michoacán. I asked him to tell me about his project.

“This is a far-reaching program of the Universidad de Michoacán de San Nicolás de Hidalgo, under the direction of Dr. Omar Domínguez Domínguez,” Hernández told me. “The aim is the reintroduction of a little fish called the Tequila Splitfin (Zoogoneticus tequila) into its natural surroundings, right here around the Teuchitlán River. In 1980, some Englishmen collected a number of these fish and took them to the Chester Zoo, where they have been reproducing in captivity, while apparently disappearing here in their native environment. The population at the Chester Zoo has grown to 1,500 individuals and now

we want to bring a pilot group here to Balneario el Rincón, which will become the Colonizing Population for this area.”

Zoogoneticus tequila is one of some 40 species of fish belonging to the family of Splitfins (Goodeids, named after ichthyologist George Brown Goode). They are endemic to this area and are unusual in that they don’t produce eggs, but give birth to their young live. Another species of Goodeid, the Butterfly Splitfin (Ameca splendens) became popular all over the world thanks to British fish fanciers such as Ivan Dibble, founder of Fish Ark Mexico, which helps support the lab at San Nicolás de Hidalgo. Dibble worked for years towards bringing certain species of Splitfins back to Jalisco, right up to his death on Christmas Day in 2009.

he University of Michoacán’s plans are intricate and long-range. Said Hernández: “At El Rincón we will first put the fish into artificial pools made of basalt, where the biofilm (algae) which they eat can easily reproduce. Here they can begin to adapt to the conditions at Teuchitlán and here we will be able to see how they relate to other introduced species, to see if there will be competition for breeding areas or for food, because fish have a hierarchy. Z. tequila will have to find and achieve the place it used to occupy in this hierarchy.”



THE SPRINGS OF EL RINCÓN ARE THE SOURCE OF THE TEUCHITLÁN RIVER AND THE FOCAL POINT OF A PROJECT ORCHESTRATED BY THE UNIVERSITY OF MICHOACÁN TO RETURN THE TEQUILA SPLITFIN TO ITS NATIVE ENVIRONMENT.

Meanwhile, the researchers are concerned about present and future water quality in the Teuchitlán Basin. They would like to see a management plan put into place to keep pesticides, weed-killers, human waste, etcetera from contaminating the springs, the

Editor’s Note: This is a special article about the preservation of a CARES fish by a program MASI contributed to with our MASI Challenge. This Email has VIPs from all over the world that this reintroduction program. Including Pat Tosie! MASI is highly thought of for our Donations to such important projects.

Thanks to all that have contributed!!!

PS: If you want some of this species, many of us have been preserving them in our tanks by utilizing the CARES option of our BAP program.



ZOOGONETICUS TEQUILA, THE TEQUILA SPLITFIN.

river and the lake. One important part of their overall plan is the participation of local people in the study as “Water Quality Monitors.” This was the theme of the announcement I had seen at the Balneario. Backed with funding from the bin Zayed Species Conservation Fund, the University of Michoacán is offering free training courses to local fishermen, ejidatarios, property owners or any interested party in the community, to learn how to participate in the water-quality monitoring project. “If they come to understand how the eco-system works,” said Hernández, “and how important it is to all of us, they will make it their own. They will discover that not only are these fish important, but that the future of Teuchitlán is also on the line. This town has already suffered from a terrible flood and worse is forecast. All this is the fruit of the bad management of this microbasin. We are hoping the local people will one day return the deforested areas to their natural state. Everything we are doing to protect Zoogoneticus tequila will also help to protect the urban development of the area.”

Fortunately, local people are now rallying to the cause of saving their unique fish and improving water quality. “The new mayor of Teuchitlán, Dr. Armando Andrade Gutiérrez, is with us all the way and even attends our meetings,” says Manfred Meiners, head of Biodiverso A. C., which is fighting to clean up Presa de la Vega and the Teuchitlán River.

This project of international and local cooperation is focused just where the need is greatest. According to the United Nations World Conservation Monitoring Centre, Mexico’s Central Mesa is considered one of the most important places in the world for the conservation of fresh-water fish. It seems the number of species in Mexico alone is almost as great as those of the United States and Canada combined. And those of us who live on that Central Mesa know that the problem of water pollution here is way beyond bad. We owe a debt of gratitude to the dedicated biologists around the world working to bring Zoogoneticus back to Teuchitlán.



**Breeding
the Dwarf
Betta**
-
**Betta
Persephone**
Mike Hellweg

Most of you know I like small fish; the smaller, the better. Anything with "dwarf" or "micro" in its name is for me. I've had the good fortune to be able to work with about 50 species of wild

Most of you know I like small fish; the smaller, the better.

Bettas over the last 25 years, but the tiniest species, *Betta persephone*, eluded me until 2014, when I finally got the chance to work with them. These diminutive beauties barely top an inch, with males being just a bit larger than females. They are usually referred to as the Dwarf Betta or Dwarf Fighter, but some importers give them the name Batman Betta in reference to their dark blue and blackish color pattern.

They belong to a group of small, mostly red colored bubblenest building Bettas that are collectively known as the Wine Red Bettas, or the Coccina Complex. This name comes from the first species in the group to be described, *Betta coccina*. This was also the first species from the group that I had the chance to work with, and, until I kept *B. persephone*, it was my favorite. I've had a chance to work with all of the known members of the Coccina Complex and most of them are fairly similar, building small nests that are often hidden in caves or niches under an Anubias leaf out of the way. All but *B. hendra*, *B. miniopina* and *B. persephone* are red.

In the wild, *B. persephone* is found only in a very small area of the Malaysian state of Johor on the southern portion of the Island of Borneo. It comes from swampy areas that are rapidly disappearing due to the expansion of coconut palm plantations. Oddly, the production of this supposedly "green" fuel, coconut palm oil biodiesel, is arguably doing more harm to the environment, destroying thousands of acres of forest, streams and swampy areas than the petroleum based product it is supposed to replace! Its preferred habitat is slow flowing to stagnant areas where there is plenty of cover where the

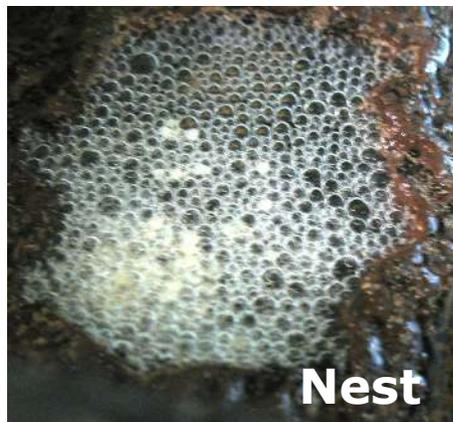
tiny males stake out territories and build their quarter sized nests in seclusion.



Nest during spawning in Zoomed Floating Betta Log

In captivity a two and a half to five gallon tank is perfect for a pair, though for a short time before I knew they were spawning, I had two males build nests in a two and a half gallon tank! While there was some fin damage, there was no permanent damage done. Each male had set up a territory and build a nest at the surface in a Zoo Med Floating Betta Log (see photo). The females spent most of their time near the bottom, in small terra cotta caves, under a pile of Penn Plax Loc Rocks, or hiding in a large Anubias barteri nana that was in the tank.

They prefer soft, acidic water with low carbonate hardness



Nest

I fed them live baby brine shrimp once every day. In addition, I added live Daphnia once or twice a week, and small blackworms a couple of times a week. To round out their diet, I also gave them finely ground Plankton Flakes a couple of times a week.



They prefer soft, acidic water with low carbonate hardness, so I used my

One day, 14 months later, a male could be seen building a nest in the floating log

regular RO mix that I use for most blackwater fish. I take a 5 gallon bucket, fill it with water from my RO/DI unit, and then filter it for several days with a large box filter stuffed with Canadian peat. When the water is a dark tea color, I remove the filter and add a cup of dechlorinated tap water to add some minerals back to the water and give it some buffering capacity. I cover the bucket and keep an airstone running in it until I use it. This gives me enough water to do a weekly 50% water change for four weeks in a two and a half gallon tank, or two weeks in a five gallon tank.



Male guarding nest

The tank was set up with a small Mattenfilter on the side wall that was bubbling very slowly, a pile of plastic Loc Rocks and a couple of terra cotta

caves, a big Anubias barteri nana, and two floating Betta logs, plus a handful of dried oak leaves.

They come from deep shadowed forest floor streams/swamps, so I only used ambient room lighting for the tank. The fish were literally glowing with color, and the Anubias didn't really seem to mind. Since they come from shaded streams, they don't really need the hot water many hobbyists assume when they hear the name Betta. Their tank was room temperature, fluctuating from about 78 F in the summer to about 72 F in the winter.

For over a year, all six young fish grew and hung out near the bottom of the tank, but one day about 14 months after I got them, one of the males could be seen building a nest in the floating log that was open to the front of the tank. About a week went by, but I never saw any courting or any eggs in the nest, and it slowly dissipated. I must have missed them...or the other male had spawned as well and I missed that. Either way, about a month after first seeing the nest, I noticed young Bettas about three eighths of an inch long down near the bottom of the tank. When I carefully began removing the structure in the tank, I found several more that same size, a couple that were nearly a half inch long, and about 20 that appeared to be just a few days old! I separated them by size and was able to raise them all in my lasagna tank hatcheries on newly hatched brine shrimp. Even though the smallest were eating the bbs, I also added some powdered Sera Micron food to the tank every day for the first week. They grew rapidly, and

all had evened out in size and reached about three quarters of an inch after about three months, after which their



Male tending nest

growth seemed to all but stop.

A month later I noticed young Bettas about 3/8" long near the bottom of the tank

Due to a small area of distribution and the above mentioned habitat loss Betta persephone is on the [IUCN Red List](#) as critically endangered and is a CARES species as well. It is not the easiest fish to find, to keep or to breed, but if you feel you're up to the task, Betta persephone is an excellent miniature species that will provide you with an exciting challenge. It certainly deserves our help in maintaining its very existence going forward since we're inadvertently destroying its habitat as a side effect of trying to go "green".

All Photos by Mike Hellweg

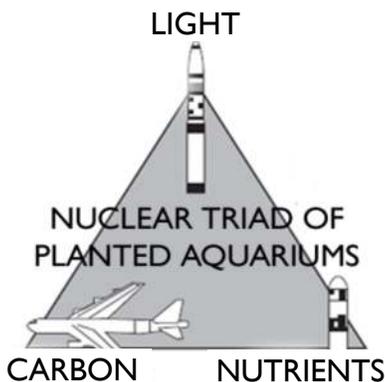


Substrates For The Planted Aquarium

Mark England

Light, carbon, and nutrients form the nuclear triad of planted aquariums. Planted tank enthusiasts love to debate their approaches to all three. It's important to understand that reaching a good balance among the three is the key to growing beautiful plants with minimal algae. As a part of the nutrients provided, the substrate chosen must complement the choices for lighting and carbon enrichment.

Plants absorb nutrients from the substrate through their roots and from



the water column through their leaves and stems. It seems intuitive from looking at our aquarium plants that those with well-developed root systems prefer substrate nutrients and those with few or no roots, such as floating plants, epiphytic plants like mosses and Java fern, and some stem plants take their sustenance from the water. Your approach should be tailored to your aquascape's design.

For example, a Dutch style aquarium with intense light, CO₂ injection, and primarily stem plants will not demand

a heavily fertilized substrate. A regimen of fertilizers added to the water column can maintain the needs of the plants. A tank with Amazon swords, Cryptocorynes, and Bucephalandras species will need to deliver most nutrients through the substrate for these heavy root feeders.

Won't all tanks benefit from fertile substrates? The short answer is yes, but some hobbyists feel they gain better control of nutrients delivered through the water column. They know precisely what is being added to the water and in what amounts. This allows the experienced hobbyist to tailor their feeding of more difficult plants.

What does a good substrate look like? Foremost, it contains all the nutrients needed in usable forms. Fortunately, this is not difficult to provide with most commercial substrates, but should be kept in mind if you DIY. In addition, good substrate supports healthy plant roots by maintaining good circulation and aeration. Or put another way, you don't get compaction and anaerobic activity. Christel Kasselman, the renowned German aquarium plant authority, notes in her book "Planted Aquariums, Creation and Maintenance" that in natural habitats with lush aquatic growth, soils are often found to be mixtures of sand, clay, and organic material, low in calcium and slightly acidic.

How does typical pet store aquarium gravel match our ideal? Not very well, as you might expect. It's really intended for fish only aquariums. It's easily available, comes in about any color, and is basically inert and devoid of nutrients. Despite the latter point, a mature aquarium that has developed a rich culture of mulm will support the easier aquarium plants even in pet store gravel.

Some hobbyists use coarse sand and this can work, but it's usually low in nutrients

and requires some supplemental fertilization. It looks good and limestone sand can be used to provide alkalinity to buffer pH if needed. And it's cheap. Supplemental fertilization can be in the form of root tabs or a program of water column fertilization.

Diana Walstad popularized the use of



soil topped by sand in her book "Ecology of the Planted Aquarium". This consists of 1"-2" of garden soil covered by 1" of common sand. The sand provides an attractive cover, is easy to plant in, and keeps small soil particles from suspending in the water column. It's a least cost alternative and thousands of hobbyists have been able to replicate her success. It works. However, if you're the kind that's never quite satisfied and wants to constantly shift plants about, you'll doubtless find some soil coming to the top. It's not harmful, but if you're after that "white beach" look, it won't last if you continually pull and replant. There is also some concern about garden soil bringing herbicides or pesticides or parasites, but, in my opinion, that risk is minimized if you select a source with care.

One popular version of the Walstad approach is to use Miracle Gro Organic potting mix capped by Black Diamond blasting sand. MGOPM provides



reliable results and is widely available at a modest cost. BDBS is the right grain size, available cheaply from Tractor Supply, and is a rich black color that makes plants stand out. Pool filter sand from the hardware store is just as good and is more natural in color.

Also popular are the commercial planting mediums. Manufacturers don't publish exactly what's in their substrates, but they intend to provide all essential nutrients and to look attractive in the tank. The top brands have been used and proven by aquarists around the world. If you go this route, know that they will all work. You can choose based on cost or appearance or reputation.

Aqua Design Amano (ADA) makes three varieties of fertile soils patterned after Amazonia, Malaysia, and Africa biotopes. Designed by the late, great Takashi Amano, the product is widely acknowledged as top shelf (as are their prices). The soils are ideal in grain size and shape and it is engineered to bring pH and general hardness down. Their exact composition is secret, but the results are unquestioned. One concern is the amount of ammonia generated while this soil cycles. It will take about a month, so be prepared to test and change water.

Eco-Complete by CaribSea has been popular for a long time. It's an attractive dark color, is widely available in the US, and is about 20% less than ADA products. It is made from "basaltic volcanic soil" according to CaribSea. This soil is inert although it has a high CEC factor, the ability to retain nutrients. It can be used directly from the bag without rinsing and is seeded with beneficial bacteria.

Flourite by Seachem is a similar product to Eco-Complete. It's made of porous clay and it comes in a reddish and black colors. Seachem claims it

lasts the life of the aquarium. The knock on Fluorite is that it requires extensive rinsing before use to avoid clouding the tank water.

There are several brands of treated clay in use by planted tank people, such as Turface and Soilmaster Select. They are originally designed for athletic turf and are basically fired clays. Generic products that are similar and can be used are cat litter (the cheapest kind with no additives) and fired clays for absorbing spilled oil (Oil Dri, for one). All are low in nutrients, but high in CEC. Some users complain of gradual break down of particles over time that results in an anaerobic mud in the substrate.

Many in the planted tank community find this confusing and it generates a lot of debate and rightfully so. Each product has its advocates and its flaws. Many in the hobby are confirmed DIY'ers and they try their hands at substrates, too. Most DIY recipes call for clay (for minerals), sand (for an attractive cap), and some form of organic material. The organic material decomposes to yield CO₂, a source of carbon and minerals that are nutrients. Typically, iron-rich clays like laterite are used or cheap kitty litter for the base. You can mix organic material like worm castings with it or use Scotts Osmocote, a granulated, time-release fertilizer. Cap it with Black Diamond blasting sand or another of your choice and you're ready.

Some hobbyists go all-in with Mineralized Top Soil. This is top soil that has been screened to remove rocks and wood and then put through alternating wet and dry cycles to allow bacteria to break down the organic content into minerals. The mineralized top soil is mixed with pottery clay and layered with muriate of potash and dolomite. Top with sand or gravel. Detailed instructions can be found at

the link below. Aquarists who have invested in the labor and days to produce this absolutely swear by it's results - fast cycling, superior nutrients, no rinsing or clouding, long lasting.

My recommendation for substrates is to choose one that complements your plan for lighting, carbon, and water column fertilization. If you're going low tech, meaning low to medium light levels (up



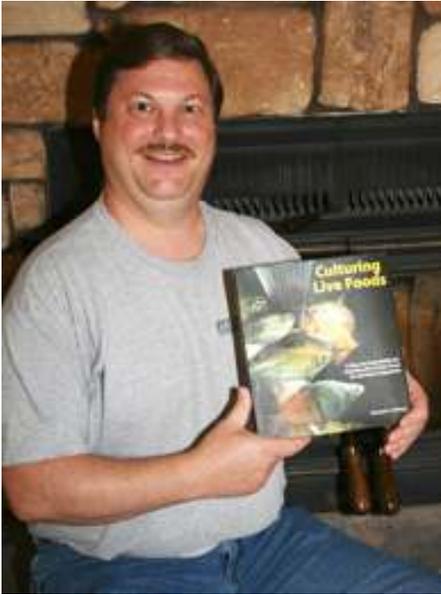
to 50 PAR) with no CO₂, and no fertilizers added to the water, you should plan on a nutrient-rich substrate. Choose dirt and sand, ADA soil, or mineralized topsoil. If you're at the other end of the range with high lights (50+ PAR), CO₂ injection, and water column fertilization, you can easily work with the commercial type substrates. Just remember - they all work.

Sources/Further Reading

1. Walstad, Diana. (2003) [Ecology of the Planted Aquarium](#), Chapel Hill: Echinodorus Publishing.
2. [Kasselmann, Christel. \(2005\) Planted Aquariums Creation and Maintenance](#), Malabar: Krieger Publishing Company.
3. Belton, Ben. "The Basics" Dallas Ft. Worth Aquatic Plant Club, online article, 2005, accessed 3/16, http://www.aquatic-plants.org/articles/basics/pages/06_substrate.html
4. Talbot, Aaron. "How-To: Mineralized Soil Substrate (MTS), The Planted Tank.Net, forum posting, 10/20/2011, accessed 3/16, <http://www.plantedtank.net/forums/29-substrate/184631-substrate-articles-faq.html>



Meet MASI Fishy Folk - Mike Hellweg



and a ceramic decoration. I haven't been without a fish since.

HOW MANY TANKS DO YOU HAVE SET UP RIGHT NOW: Over 100

FAVORITE FISH YOU HAVE/HAD AS A PET: Each new one that I get! It's hard to pick a single favorite. I've never met a fish I didn't like.

YOUR LATEST GOAL PERTAINING TO FISH: Reaching 500 species in the BAP- just a few more to go!

OTHER PETS: Pearl - 4 year old pug. We rescued her last spring. Plus a 2 year old female albino clawed frog (she is at Pearl's eye level and they interact each time we are in the fishroom).

If I could do it all over again, I would...build the fishroom upstairs



Jedi Grand Master

OTHER FAMILY MEMBERS Angela - she likes fish and lets me keep things in the fridge that would scare other wives away.

YEARS KEEPING FISH: 48

WHAT WAS IN YOUR FIRST TANK AND HOW OLD WERE YOU: I was three. A 2-1/2 gallon bowl, a small fantail goldfish, a spring of Anacharis

YOUR DREAM FISH: Any fish I haven't had a chance to keep!

YOUR DREAM TANK: A 16' long stream tank.

YOUR REALISTIC DREAM TANK: A six foot long stream tank - I'm working on that one right now!

YOUR LATEST FISH-RELATED ACCOMPLISHMENT: Getting the driftwood catfish Tatia intermedia to breed for me and successfully raising their fry. They spawned the evening of the Council meeting at our house, so I was able to share the excitement with some of my fishy friends. That was almost as cool as finally getting them to spawn for me. Also, this might surprise some folks, getting a good sized pair of Red Devils to spawn for me! That's the biggest fish I've kept. I prefer much smaller fish.



"Finished" Side

with access to natural daylight - it gets tiring lugging tanks up and down the stairs, and fish seem to do much better with daylight in the room, especially when you're trying to get them to spawn.

If I could tell a beginning fishkeeper one thing, it would be...develop the habit of regularly doing your water changes. Regular water changes are the key to success with fish.



**Always Under Construction!
Click/Tap for Video**



Meet MASI Fishy Folk - Daniell Kinder

FAMILY MEMBERS: Husband Corey and daughter River.

YEARS KEEPING FISH: About 4 years in college followed by a 7 year gap and then again for the last year and a half. So a little over 5 years in total.

WHAT WAS IN YOUR FIRST TANK AND HOW OLD WERE YOU: A bright red Betta splendens male my second year at UMSL at 21.

HOW MANY TANKS DO YOU HAVE SET UP RIGHT NOW: Right this moment there are 3, but there was one outside growing duckweed that will be moved back indoors soon and the bettas will move in there once I get the divider put back in.

FAVORITE FISH AS A PET: All the goldfish have received names and are here to stay. While the big orange fantail goldfish named Keeg is technically my daughter's fish, he's actually more like a family pet. Sure, she



Keeg & Drakchop

feeds him and helps with the water changes, but we all like watching him (and the other goldies) and I secretly feed him treats by hand when she's doing other things and can't see me with my hand in the tank. His big wen is super squishy and I giggle when he bumps into my hand when I'm feeding him. We also have a yellow/orange/black ranchu (possibly lionhead since he came from a Chinese breeder named Drakchop and a calico Chinese ryukin named Ugin (yes, after the MTG spirit dragon) in the same tank with Keeg but neither of them are very keen on eating out of my hand yet. River and I talk

to the goldfish every day and she even reads them stories and sometimes sings them songs while hugging the tank. I'm sure she'd climb in the tank with them if she



could, which is why I hand feed them in secret; hard enough to keep fingers out of the tanks as it is.

YOUR DREAM FISH: I really like goldfish; they're my favorite, particularly orandas, ryukins, and butterfly tail fancy varieties. I'd love to have a couple of red/white Thai ryukins, but that price tag is definitely not in our budget and even when I do finally get more space for more goldies I'll probably still buy from folks at the American Goldfish Association conventions. I wanted a goldfish when I was a kid, but my folks wouldn't allow it so basically I'm already living my childhood dream right now.

YOUR DREAM TANK: I have no idea about a single tank. I would love to some day have a greenhouse full of goldfish tubs, but that's not a single dream tank kind of thing.

YOUR REALISTIC DREAM TANK: At least 75 gallons with a sump in the stand so the filtration is out of sight, housing multiple big fancy goldies.

YOUR LATEST FISH-RELATED ACCOMPLISHMENT: I kept mollies in a tub outside last summer with a bunch of plants I picked up at the monthly auctions. I've never had a pond with fish before and the whole thing cost less than \$25 all

together, including the fish which I'd purchased at the MASI trip to Sailfin earlier in the year. I'd intended to try to breed bettas in it, but couldn't find a good female and then when I did I couldn't find the male so I put the female in and added the mollies to keep the mosquitoes under control.

YOUR LATEST GOAL : I still want to breed Betta splendens. I don't know if I'll try indoors in a tank, but I'll definitely give it a go again outdoors next summer.

OTHER PETS: Zombie is our 65 pound lab/beagle mix who was a rescue dog. She was originally named Ninja when we got her at 6 months old, but she's way too much of a klutz so it must have been intended ironically. We also have two quaker parrots named Bird and Lily who were also rescue animals. Bird has been my buddy since I was in junior high school; he mostly gets called Bubba now. Lily has really, really come out of her shell though I still have yet to meet a quieter parrot ever.

I should have looked for an aquarium or fish organization when I first got into fish in college, I would probably have become a MASI member then and not have become completely overwhelmed with Endler's and guppies and quit.

If I could tell a beginning fishkeeper one thing, it would be... to read all of the books and articles you can get your hands on. Even if it doesn't directly pertain to the kind of fish you have or want to have, there is still going to be useful information in there. Also: Yes, they can be pricey, but for crying out loud go get a test kit for your water parameters! Something is going to go wrong at some point and if you don't have an idea of what your normal tank parameters are there is no way to tell what went south.



River and young Keeg



Show Me Fish 2016 Report



2016 SHOW CLASSES & SPONSORS

1. Aquascaping-sponsor **
2. Best School/Family or Biotope-sponsored Ray "Kingfish" Lucas
3. All Other Fish-sponsored by **
4. Old World Cichlid-sponsored by Debbie Sultan and Tom Corradini
5. New World Cichlid-sponsored by **
6. Killifish/Rainbowfish-sponsored by Jack Heller
7. Livebearers Wild Type-sponsored by **
8. Livebearers Fancy Aquarium Type-sponsored by **
9. Egglayers, Cyprinids: Barbs, Danios, Rasboras, Minnows and Characins: Tetras, and relatives-sponsored by Mike and Angela Hellweg
10. Anabantoids and Fancy Betta Splendens-sponsored by Lynn Jacks
AND Best Fancy Betta Splendens-sponsored by Kathy Deutsch
11. Catfish: Corydoras, Scleromystax, and relatives-sponsored by Matt Schauer
12. Catfish, all other-sponsored by Mike Huber
13. Photography-sponsored by **
14. Art/Craft Item-sponsored by Kathy Daly

MAJOR AWARDS

- Best Fish in Show-sponsored by **
- Judge's Award-sponsored by **
- Best Junior (age 16 and under) sponsored by Chuck Bremer
- Reet Thomas Livebearer Award-sponsored by **
- Ralph Wilhelm Catfish Award-sponsored by Steve Edie

Speakers: TED JUDY RUSTY WESSEL CHUCK DAVIS

VENDORS, PRIZES, FISH SHOW AND A HUGE AQUARIUM AUCTION

Date: April 1-3, 2016

Location: Crowne Plaza Hotel St. Louis Airport

11228 Lone Eagle Dr, St Louis, MO 63044

COME ENJOY A FISH FUN FILLED WEEKEND HOSTED BY MASI

We Still Need a few Show Class Sponsors**

Pick one and see Kathy Deutsch at the MASI Meeting, March 17th



Foolin' with Fish Schedule

FRIDAY , APRIL 1ST , 2016

9 am- 5pm SHOW and Vendors room set up

5pm - Show/ Vendors room opens

7:00-8:00 pm- Talk #1 - Chuck Davis - Catfish- The Unscientific method.

8: 15- Social Hour

SATURDAY , APRIL 2ND, 2016

8am -10 :00 am - Judging followed by Continental breakfast for speakers, judges and vendors

10:00am - Show / Vendor's room Re-opens.

10:00 am- 11:30 am - Talk #2 - Ted Judy - " The Genus Pelvichromis "

11:30am - 1 pm - Lunch Break

1:15 pm- 2:30 pm - Talk #3 - Rusty Wesel - " Fish of the Maya "

2:45 pm - 4:00 pm - Talk #4 - Ted Judy - "African Tetras "

4:00- 4:45pm- Speakers room closes for Fish Sale Set Up

5:45 pm - 6:30 pm - Open Forum with Speakers - in SHOW ROOM

6:30 pm Banquet room opens for seating and drinks

7:30 pm, Banquet Dinner, Awards Ceremony, Speaker- Chuck Davis- Gadgets & Gizmos

9:30 pm - ? , Tank glow in Show room

Saturday Attendance Prizes, Raffle & More

There will be generous goody bags, and MORE!

SUNDAY, APRIL 3RD, 2016

9:00- Auction Set up / Show tear down / Vendors open

10:00 am- Auction Viewing, Vendors open to Auction Room

11:00 am - 6 pm (?) - Auction

Sunday Raffle

2 - 75 gallon tanks, tops & lights provided by Tropical World Pets. Tickets will be on sale ALL weekend. Drawing to be held SUNDAY afternoon. Must be present at drawing to Win.



Show Me Fish 2016, "Fooling with Fish"

is QUICKLY approaching. Don't forget to mark your calendars for April 1st - 3rd, as we have a great line up for you this year, and you really will not want to miss out on the fun! We have 3 great and knowledgeable speakers, a great line up of vendors, The show, Free pizza party, a Special Sale on Saturday, attendance prizes and more!

What is a fish show without LOTS of entrees?? I wanna see YOUR fish, and so does everyone else! We all enjoy seeing each other's fishrooms. We all love looking at various fish that are not our own... So... Bring a couple entries this year, and decorate them up! Each entry is automatically entered into the Aquascaping category! I challenge everyone to bring at least 1 FISH... just ONE... (not counting guppies, bettas and killies in tiny bowls- as I wanna see a TANK!) I'll be packing to vend, doing last minute Show chair stuff, and still plan on bringing in a few fish.... If I can do it, you all can too! :-)

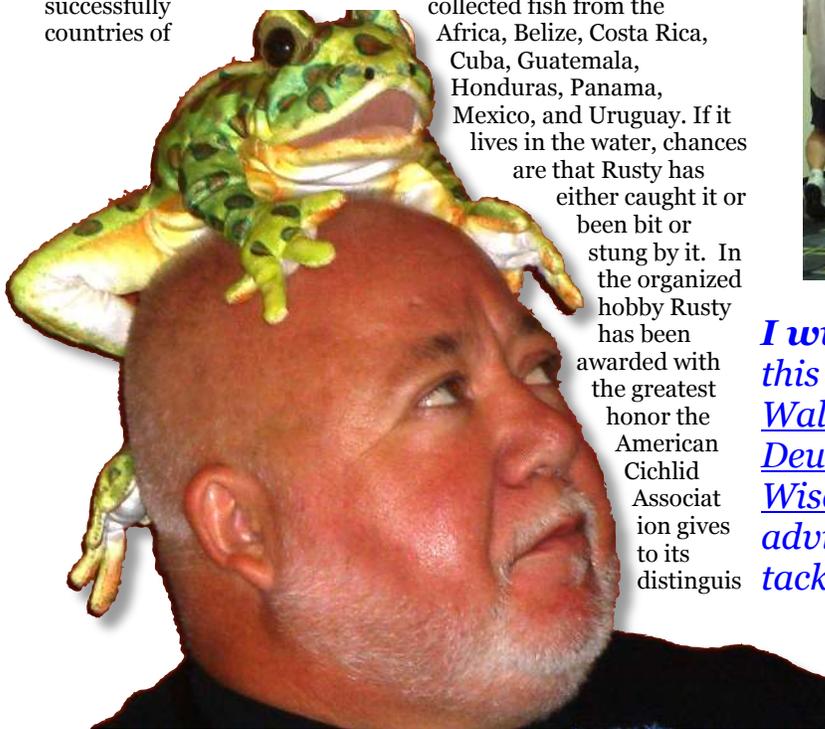
Speakers - [More INFO: MASI Web Page](#)

Chuck Davis - Chuck will be giving his first talk Friday evening, on "Catfish: The Unscientific Method". Chuck will also be our banquet speaker Saturday night, with his presentation on "Gizmos and Gadgets". He is looking forward to having us all belly laughing during the banquet, so should be a great night!

Ted Judy - Ted will be giving 2 presentations on Saturday, "African Tetras" and "The Genus Pelvichromis". He recently updated all his talks, so all now include new and up to date information. Ted Judy is an addicted aquarist with over 30 years of fish keeping and breeding experience. He is a prolific speaker, proficient writer, and wants to be a better photographer.

Rusty Wessel - Rusty will be speaking Saturday, on "Fish of the Maya". He has taken his hobby to a point where he has successfully collected fish from the

Africa, Belize, Costa Rica, Cuba, Guatemala, Honduras, Panama, Mexico, and Uruguay. If it lives in the water, chances are that Rusty has either caught it or been bit or stung by it. In the organized hobby Rusty has been awarded with the greatest honor the American Cichlid Association gives to its distinguis



hed members, the ACA fellowship in 1997.

Rusty has lectured and judged numerous fish shows throughout the United States.

Banquet information elsewhere in this issue

Look for our Vendors elsewhere in this issue!

SOME THINGS are NEW

Ideas... that were implemented this year... *Yes, I am listening to the feedback I get!!*

Attendance Prizes

YES, FREE STUFF !!!

SATURDAY SPECIAL SALE!

To get the BEST selection, of fish, plants, equipment & more, its worth your while to enter a fish or two, into the SHOW.

Sunday Auction Donations & Raffles-

We will have artworks from Sam Garcia, aka- Sammy Scalz Nature Artist, and other donations, during the auction at intervals throughout the day. Also we will be raffling off not ONE, BUT TWO- 75 gallon tank, tops, and lights. Keep watching the Website and Facebook for times!

If anyone has any questions, comments, or suggestions for the show, please let us know, as Derek Walker will be 2017 Chair.



I wish to thank those that helped me make this show possible: [Mike Hellweg](#), [Derek Walker](#), [Michael Steffen](#), [Gary Lange](#), [Kathy Deutsch](#), [Chris Morle](#), [Scott Bush](#) & [Kevin Wise](#), for always being there when I needed advise, to offer an opinion, to volunteer to tackle a job, and all the Lil Things it takes to

plan an event!

-Holly



Annual MASI Awards Banquet, April 2

The Annual MASI Awards Banquet is in a Banquet room of the Show venue, MASI members are especially invited but anyone can attend for \$42.00 per plate.

To reserve a spot sign up at the March 17th meeting or contact one of the Show Chairman prior to March 25th:

Kathy Deutsch - Kathy@skdeu.com

The Show Chairmen also know your Auction Banquet Credits accumulated over the last year to help defray your cost.

6:30 pm Banquet room opens for seating and drinks

7:30 pm, Banquet Dinner, Awards Ceremony, Speaker- Chuck Davis- Gadgets & Gizmos

Note: To save time, the Awards and the Keynote will be given during the meal

9:30 pm - ? , Tank glow in Show room

U Better B There!!

FREE Beer for Show Entries!

Offered by Gary Lange

Let me help you channel your best Homer Simpson. Slowly say "Do nuts" and then "Mmmm Beeer". Well I can't help you with the donuts but I can make that "Mmmm Beer" thing happen. Tasty Ferguson Brewery Pecan Brown Ale to be exact. This was the beer growler that was always empty at the end of the "extra speaker" talk that we used to do with the club so I know our members enjoy it. This is the deal; **Place a fish entry in the show coming up and get a ticket to tap the keg!** This is perhaps a fun way to bring you back into entering our annual event.

Entering fish into the show, getting them set up and watching and helping other members can be a lot fun. Certainly in the past much beer had been consumed during this event so this "bribe" was a logical choice. Hope you join with me and enter your best fish in the contest. We always hear about these fish you have but never get to see them, makes us wonder if they really exist :-). Now is your time to brag, Missouri is "The Show Me State" so now is the time to show it off. You do need to have your entry form turned in by the next meeting March 17th. Rules, classes and entry forms can be found at: <http://www.missouriaquariumsociety.com/2016ShowWeekend/> or [HERE](#) : <http://www.missouriaquariumsociety.com/MASI%20Foolin%20with%20Fish%202016.pdf>



Tasty Ferguson Brewery Pecan Brown Ale is brought to you by Kathy Deutsch, Cory Koch- our resident beer expert, and myself. Take advantage of this wonderful opportunity to get to know some of your fellow members better and sample some Beeceer! We're looking forward to seeing those fish of yours.



Training Your Fish to Show for the Judges

Kathy Deutsch

You have your fish conditioned. It's fins are perfect, it's color has never been better. But how is the fish's deportment? When judging a fish, deportment counts high towards a win.

Deportment means how the fish behaves. And while every species has a different deportment in the wild, when a fish is shown, how it reacts to humans is also important. Plecostomus, for example, will be judged on their behavior as if they were in the wild. So a fish who is stretched out, sideways-looking at the humans, is deporting well. But if the fish swims up to the glass, and

eyeballs the humans straight on, that is an appealing behavior!

How we get the fish to react positively to us humans is not



difficult. It does take time. And to be honest, my wild-caught angelfish are still skittish, despite daily training and people passing by their tank many times a day (the tank is just outside the bathroom).

The judges at the fish show will carry flashlights and clipboards. If you really want your fish to come up to the judges, you should feed them while holding a clipboard and shining a flashlight at the tank. This enforces the idea that the food comes along with humans who carry these things.

What I do with every tank of fish, every day, is to have the food ready, then I lightly tap twice on the tank front. I feed at the very front of the tank, so the fish have to come up close to get food. And I do the tap-tap, feed very quickly, so the fish relate the tap and the food. I do this so the fish understand a close noise is not scary.

How a fish deports in the wild is always seen by judges as a correct behavior. But if you want to add a little extra to your fish's showability, consistent training will imprint on them that humans can be the good guys.

- 1) Pen and paper - to make a list of the things you forget or overlook for next year!
- 2) Tank(s) - check ahead of time for leaks - better to set up for several days.
- 3) Lights - Most fish look and show way better with lights. You also need to cover the top completely to prevent jumping.
- 4) Background - Your fish will look better with a background. (Don't forget the background material, scissors, and tape to prepare and attach the backgrounds.) By the way, contact paper is really the better way to go but construction paper will do the trick. Cut square corners with a carpenter's angle and a box cutter.
- 5) Gravel, best at 1-1.5 inches worth. Don't forget rocks for decoration too.
- 6) Plants (and plant weights) aren't required, but you could enter the plant category without

Things to Take to a Fish Show

Gary Lange

- 7) Tank support (optional) - paint it black & make it ~1/2 inch larger on all sides so that you can carry gravel in the tanks to the show site without causing them to leak. The tanks can even be 1/3 filled

with water for the smaller ones like 2.5 & 5 gallon. I make my supports from 3/4" plywood. **Make sure that when you fill out your forms that you use the plywood as your base (length) measurement so that there will be space allow so it will slide right into place.

- 8) Buckets - small ones and large ones you'll have to carry water if you didn't bring most of it from home. We're on Missouri River water at the hotel (slightly hard,



125 ppm GH, 2 degrees KH) & that may not match your rock-hard well water. If you can bring 1/2 of your tank water the fish will almost never have a problem.

- 9) Siphon hose - How are you going to empty that tank when it's time to go home??
- 10) Net, thermometer (if you're not good at guessing), dechlor, a little salt. We will have a drum filled with water that is ready for your use.
- 11) Power filter - to "polish" the water in your display. If you use one of the flat sponge filters in your display please bury it in the gravel. Make sure that it's an

aged filter and it would be a good idea to go with "clean" but aged gravel too to avoid new tank – cloudy water syndrome – another reason to bring most of your own aged water. Don't use brand new gravel, even well cleaned your tank will be cloudy in no time.

- 12) Razor Blade, cleaner & paper towel - to soak up spills and "polish" the outside of your display.
- 13) Extra light bulbs - especially if you're using incandescent bulbs **THEY ALWAYS GO OUT AT SHOW!** It's a Murphy thing!
- 14) Extra airline and perhaps a gang valve or two.

- 15) The Fish! Pack carefully in large plastic fish bags & place in a styro. Or pack in large 3-5 gallon buckets with lids. For fairly large fish it is suggested that you use something square as they tend to swim round and round in and will sometimes damage one side. Take as much of your own water as possible. Make sure it's clean and clear!

Planning ahead helps take the hassle out of showing fish. Plan to spend the weekend at the show there will be lots of things to do.

Back To Basics by Daniell Kinder

Conditioning and Transporting Fish for the Show

Preparing your fish for show means anything from "just stop feeding for a few days" to an elaborate, multiple step, weeks long process. The elaborate processes are generally reserved for folks who are involved with showing fancy or display type fish bred for their looks and to meet very specific standards of conformity such as koi, goldfish, bettas, and guppies. While it may be of interest for some aquarists, it is not the kind of

preparation necessary to enter your fish in the MASI spring show. The following is a basic guide I've put together for those with an interest in entering their fish in the upcoming 2016 MASI show, Foolin' with Fish.

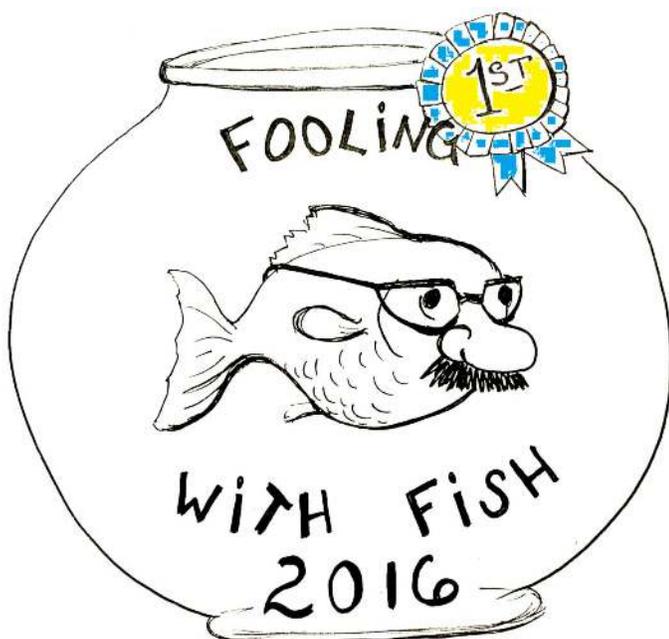
Choose fish that are in good health and display normal activity and behavior for their species and variety. Keeping up on good tank maintenance and

feeding a variety of nutritional foods is best way to make sure you have healthy stock from which to pull fish for the show. Showing is a stressful thing to put a fish through and great health goes a long way toward maximizing the resiliency of your fish, and minimizing the stress no matter what species or type of fish. Isolating fish you intend to show will make sure they stay in great condition and don't get sick or injured in



your display tank. It also allows you to get the fish accustomed to being looked at a lot and living in a small vessel, which can be major stressors on fish and can make them show poorly. Entering late term gravid livebearers is probably not a great idea even if they are wonderful specimens. The entire process put them through a lot of stress and the potential for this to cause preterm delivery and other complications is high.

"Just stop feeding them for a few days" is very sound advice. Depending on the species, anywhere from a couple of weeks to 48 hours prior to the show can be sufficient to clear out the digestive system and prevent undue waste production in the small and minimally filtered show tanks. Make an educated decision for your fish



based on the species and go from there. Fasting them will make their show enclosure tidier looking and ensure the water quality stays as high as possible. Also, shows are short and there isn't really any need to feed your fish during the show.

Everyone has chased fish around and around and around with a net. It's a frustrating experience for you, but it's hard on the fish, too. Bags, rigid containers, and even hands minimize or eliminate this process. Small species like bettas, livebearers, most barbs and tetras and sometimes even species like angelfish can be transported right in their show vessels or in bags inside a styro cooler or other insulated container to prevent drastic temperature shifts. Coolers make it easy to move multiple fish at one time. Larger species require a little more space and work. Things like fancy goldies and many cichlids are best transported in a lidded bucket and even larger fish like arowanas and big catfish may even require a snap-top lidded Rubbermaid style tote. Make sure there is a secured lid so the fish doesn't jump out. If you have a way to drive, you can add in a battery operated air pump with a stone.

At the location, set up your show tank. Most small species will show quite well in those little plastic keepers readily available from pet stores. Black plastic or black used



critter
avail
any
store.
paper or
cut to size
paint can be
to help
make
your
fish
feel

more secure and show their colors to the best effect no matter what size tank. Covering the bottom and back of the tank prevents back lighting effects that wash out colors and gives the fish a feeling of having a solid bottom, and not being entirely exposed. MASI's show guidelines do not prohibit use of gravel or other substrate, but other organizations may so be sure to check the rules carefully. There is usually water available for tank top ups at MASI's Show. Once you get your fish into the tank, use the preconditioned water provided to top up your tank. You may wish to add in a small sponge filter or an air stone to your tank depending on the tank and fish it's housing. Fish often show better with some plants or other decor in the tank. This is not against MASI's guidelines.

After the show, prepare your fish for transport back home pretty much the same way you did to get them to the show in the first place. You may choose to transport in the show tank if you only had an entry or two but most will need to bag their fish and change the water for the return trip. A brief quarantine period is probably a good idea once you get back home.



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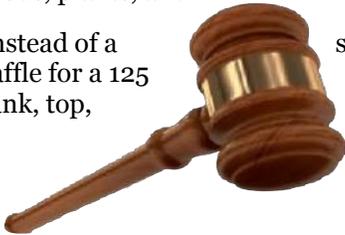
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AUCTION CHAIRMAN'S MESSAGE BY MIKE HELLWEG

The Annual Spring Weekend is upon us already! I'm sure Kathy and Holly have more about the weekend elsewhere in the Darter. All I'll say is that we're going to have a great weekend. This will be my 30th time at the MASI Annual Spring Weekend. While the name and location have changed a lot over the years, many things remain the same. That includes wrapping up the weekend with our Annual Spring Auction. This year's promises to be a great one, with lots of great fish, supplies, equipment, foods, plants, and more!

Instead of a raffle for a 125 tank, top,



single gallon light

and stand as we have in years past, this year we'll raffle off two 75 gallon tanks with tops, and lights plus chances to win a year's subscription to TFH and to Amazonas - that's four raffles in one! As I always remind you, don't forget to thank Chuck and Mark down at Tropical World Pets for helping us out once again with two 75 gallon tanks with top and light for the Spring auction raffle. It's rare to find a shop that's able to be this generous in today's economy, so be sure to not only thank them, but support them!

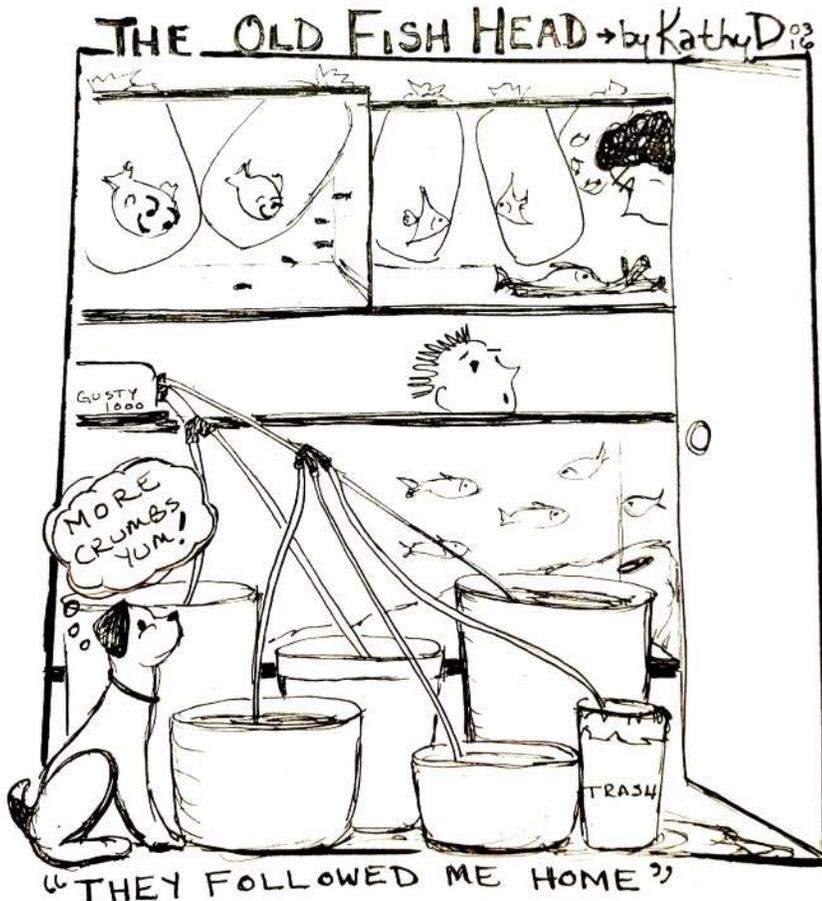
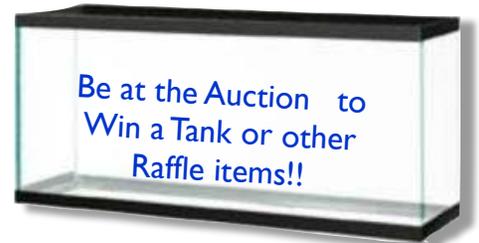
I hope we see you all at the Annual Spring Auction, April 3, 2016!

The next auction will be the Summer Auction which is August 14, and the Fall Auction is October 30.

And for now, 'nuff said

Mike

auction@missouriaquariumsociety.com



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FISHES AS DISHES

PATRICK A. TOSIE, SR.

We all love our fish! This column is dedicated to using fish for something tasty to enjoy. Try it, you may like it. If you have leftovers, bring them to a monthly meeting for others to enjoy!

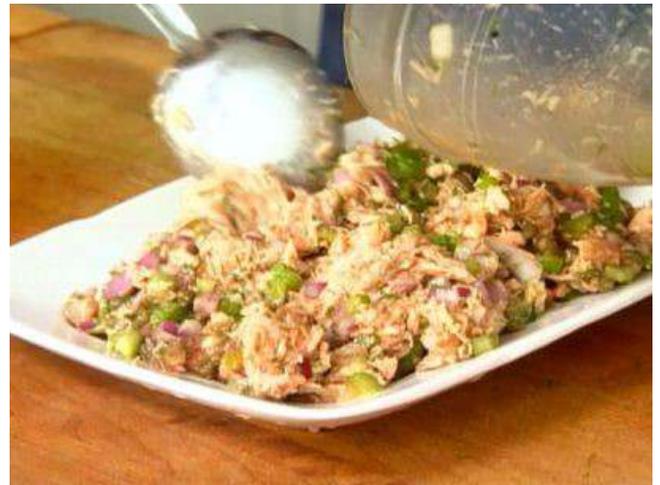
Salmon Salad

Ingredients:

- 2 pounds cooked salmon, chilled
- 1 cup small-diced celery (3 stalks)
- 1/2 cup small-diced red onion (1 small onion)
- 2 tablespoons minced fresh dill
- 2 tablespoons capers, drained
- 2 tablespoons raspberry vinegar
- 2 tablespoons good olive oil
- 1/2 teaspoon kosher salt
- 1/2 teaspoon freshly ground black pepper

Directions:

Break the salmon into very large flakes, removing any skin and bones, and place the salmon in a bowl. Add the celery, red onion, dill, capers, raspberry vinegar, olive oil, salt, and pepper. Season, to taste. Mix well and serve cold or at room temperature



Total Time: 30 minutes (Preparation: 15 minutes, Cook: 15 minutes) Yields 4 servings

Fried Eel

EAT MORE



FISH

Ingredients:

- 1 (1-pound) eel
- 1 cup all-purpose flour, plus more for dredging
- 1 teaspoon seafood seasoning
- 1 teaspoon Cajun seasoning
- 3 teaspoons salt
- 1 cup blended oil
- 1 teaspoon chopped garlic
- 1 teaspoon chopped onion
- 1 teaspoon freshly ground black pepper
- 1/2 cup white wine (Chablis)
- 2 teaspoons butter

Directions:

Clean and skin the eel, and then cut it into chunks. In a large bowl, mix together 1 cup flour, seasonings, oil, garlic, onion, and pepper. Add the eel to this mixture and then marinate in the refrigerator for 1 hour. Dredge the marinated eel in flour. In a saute pan over medium heat, sear the eel until golden brown, about 7 minutes. Add the white wine and cook until reduced by half. Add the butter and cook until it melts and browns slightly. Divide the eel among 4 serving plates and top with the butter sauce

Total Time: 30 minutes (Preparation: 20 minutes, Inactive: 1 hour, Cook: 12 minutes) Yields 4 servings



CLUB HOPPING By Steve Edie

- Mar 19 - Kansas City: Heart of America Aquarium Society - Auction
- Mar 19 - Peoria: Tri County Tropical Fish Society - Auction
- Mar 20 - Alsip, IL: Greenwater Aquarium Society - Swap
- Apr 1-3 - St Louis: MASI - Annual Show**
- Apr 16 - Cedar Rapids, IA: Eastern Iowa Aquarium Association - Auction
- Apr 29-May 2 - South Bend, IN: American Livebearer Association - Annual Convention
- May 27-29 - Chicago: Greater Chicago Cichlid Association - Cichlid Classic
- May 27-29 - Denver: American Killifish Association - Annual Convention
- Jun 9-12 - Portsmouth, NH: North American Native Fish Association - Annual Convention
- Jun 23-26 - Tulsa, OK: International Betta Congress - Annual Convention
- Jul 16 - Urbana, IL: Champaign Area Fish Exchange - Summer Auction
- Jul 16 - Kansas City: Heart of America Aquarium Society - Swap Meet
- July 7-10 - Cincinnati: American Cichlid Association - Annual Convention
- July 7-10 - Chicago: North American Discus Association - Annual Convention
- Aug 14 - St Louis: MASI - Summer Auction**

A Lot going on this Spring!
 Check with individual clubs for more details
 Links to most are on our [webpage](#).
 Convention Ads Hotlinked!



April 8-10
 Sheraton Hartford South
 100 Capital Blvd
 Rocky Hill, CT 06067
<http://northeastcouncil.org/NewNEC/index.php/all-about-the-convention>
Speakers:
 Joseph Ferdenzi,
 Lawrence Kent,
 Dr. Paul V. Loiselle,
 Steve Lundblad,
 Dr. John Lyons

***Friday dinner with keynote speaker**
***Sunday auction**
***Fish Show**



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2016 Breeders Award Program by Steve Edie

January

Member	Genus	Species	Common Name	Points	Bonus	CARES	Total
Mike Huber	Ameca	splendens #@	Butterfly Splitfin Goodeid	0		15	649
	Haplochromis	sp. "Ruby Green" #		0			649
	Psammachromis	riponianus #@		0		10	659
	Pundamilia	nyereri "Python Island" #@		0		10	669
	Xystichromis	phytophagus #@	Xmas Fulu	0		10	679
Cory Koch	Psammochromis	riponianus #@		0		10	4139
	Xystichromis	sp. "Kyoga Flameback" @		10		10	4159
Bruce Mayhew	Amatitlania	siquia	Honduran Red Point	10			390
	Ancistrus	sp. "Super Red Calico" *		10	5		405
Jim Miller	Aspidoras	albater		15			3064
	Danio	frankei		5			3069
Holly Paoni & Kevin Wise	Poecilia	wingei #^	Red Breasted Endler's Livebearer	0	1		710
	Barbodes	semifasciolatus	Gold Barb	10			720
	Tanichthys	albonubes	White Cloud	5			725
Scot Roach	Labidochromis	caeruleus	Yellow Lab	10			10
	Poecilia	reticulata	AOC Fancy Tail Guppy	5			15
	Xystichromis	sp. "Dayglow" @		10		10	35
Debbie Sultan & Tom Corradini	Sciaenochromis	fryeri	Iceberg Ahli	10			620
	Derek Walker	Ancistrus	sp. "Rio Tocantins" *		10	5	
Ancistrus		sp. "Super Red" *		10	5		3590
Hypancistrus		L066 @*	King Tiger Pleco	15	5	15	3625

February

Member	Genus	Species	Common Name	Points	Bonus	CARES	Total
Mike Huber	Hemichromis	guttatus		10			689
	Julidochromis	regani "Kipilli Yellow"		10			699
	Oryzias	woworae		10			709
	Xystichromis	sp. "Dayglow" @		10		10	729
Jerry Jost	Corydoras	semiquilus "Peru Black" *		10	5		2307
Cory Koch	Paralabidochromis	sp. "Red Fin Piebald" #@		0		10	4169
	Sarotherodon	caroli "Barombi Mbo" #@		0		10	4179
	Yssichromis	sp. "Blue Tipped" #@		0		10	4189
Jim Miller	Corydoras	schultzei		10			3079
Holly Paoni & Kevin Wise	Pachypanchax	sakarami @		10		10	745
Scot Roach	Pundamilia	nyererei "Makobe Island" @		10		10	55
Debbie Sultan & Tom Corradini	Synodontis	multipunctatus	Fatty Petunia	20			640
Pat Tosie	Girardinus	metallicus		5			4985
	Herichthys	tamasopoensis "Rio Tamasopo"		10			4995

* = First MASI species spawn (5 point bonus)

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

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

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

= Species previously submitted = 0 points, except for C.A.R.E.S. =

base point bonus

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

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

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



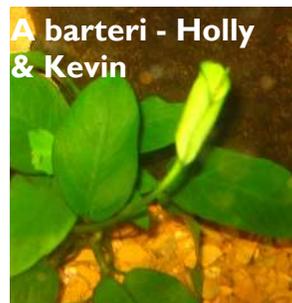
2016 Horticulture Award Program by Mike Hellweg

January & February

Member	Genus	Species	Variety	Common Name	Type	Points
Bruce Mayhew	255 points					
	<i>Cryptocoryne</i>	<i>wendtii</i>			V	15
	<i>Echinodoras</i>	<i>sp.</i>	Kleiner Bar	Kleiner Bar Sword	V	15
Robby Simmons*	20 points					
*First Entry!!	<i>Anubias</i>	<i>barteri</i>	<i>barteri</i>	Common Anubias	IB	20
Holly Paoni Wise/Kevin Wise	1300 points					
	<i>Anubias</i>	<i>barteri</i>	<i>nana</i> "Narrow Leaf"	Narrow leaf Dwarf Anubias	V	15
	<i>Aponogeton</i>	<i>madagascariensis</i>		Madagascar Lace Plant	V	10
	<i>Cryptocoryne</i>	<i>pontederifolia</i>			V	15
	<i>Hygrophila</i>	<i>corymbosa</i>	<i>angustifolia</i>	Willow Leaf Hygro	IB	10
	<i>Hygrophila</i>	<i>corymbosa</i>	<i>angustifolia</i>	Willow Leaf Hygro	V	5
	<i>Rotala</i>	<i>rotundifolia</i>			IB	20
	<i>Saururus</i>	<i>cernuus</i>		Lizard's Tail	V	5



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



Important message from the HAP Chairman

I don't often write a chairman's message for the HAP, but this past year we've had a few challenges that have caused the Executive Council to re-evaluate the program. We tweaked the rules to make things more clear as some basics which may not have been clearly understood. The program rules should now make more sense and are more enforceable. If there are still questions, feel free to ask. My phone number and email are in the Darter and I'm in the back of the room at each General meeting.

The HAP is a PROPAGATION program, not a COLLECTING program. Just like the BAP for fish -demonstrable reproduction is the key. When you turn in plants, you have to turn in the new growth. You turn in a whole new plant! Not only has it survived for 60 days, it must have reproduced. A bigger plant does not mean it has reproduced. The newest HAP rule revisions are designed to support documentation of the reproduction.

Plants reproduce both asexually and sexually, and credit is given for both in the same species and you also can get credit for the plant blooming. The plant has to both bud and bloom AFTER you buy it. Buying a plant with a bud or bloom does not count. Because blooms disappear, a dried bloom or a photo is all that is needed for credit.

To get credit for sexual reproduction, you must turn in several pictures - the bloom, the fruit that forms after fertilization, the seed or seed pod, and a seedling that is clearly recognizable to genus and then write a short 250 words about how you produced the seedling and got it to grow.

For vegetative credit on rhizome plants like Anubias, Bucephalandra and similar plants, you need to turn in NEW GROWTH with NEW leaves, NEW rhizome growth and NEW roots capable of surviving away from the mother plant. Keeping



alive for two months in a small container- then turning in is not reproduction, it's just maintenance.

Aponogetons are actually easier to reproduce sexually than vegetatively. For vegetative credit you must submit three photos - one of the plant before division, one of the two plants after division, and one of the two plants at least two weeks later showing they both survived. If one plant survives, that is not reproduction, just trimming the plant.

When turning in stem plants, turn in at least 5 or 6 stems each at least 5 or 6" long. The way you would want to buy it. For

floating plants turn in at least a cup full or a big handful. If you can't produce that much duckweed or water lettuce, then you really didn't get them to reproduce.

Hopefully, this clarifies some of the questions that have come up over the past year or so. These are simply rules that most have been following since the HAP started nearly 25 years ago and levels the playing field for the rest so we're all happier with the outcome of the program.

Mike

Below please find the updated rules for the HAP. These rules replace all previous rules and go into effect immediately.

Missouri Aquarium Society, Inc.

Horticultural Award Program (HAP)

Founded January 1, 1992

- Revised February 1, 2016 -

Purpose:

To promote and encourage the keeping and captive propagation of Aquatic Plants

To gather and disseminate information about Aquatic Plants, their cultivation, and propagation methods

To insure the availability of a variety of Aquatic Plant species for future generations of Aquarium Hobbyists

Definition:

An Aquatic Plant is a plant species which, in the wild or natural state, can be found growing wholly submersed; growing emerse with its roots submerged; or floating; as a regular, normal occurrence required for its survival at some time during the course of one complete growing season.

HAP Committee:

The HAP chairperson shall serve at the discretion of the President and the Executive Council, and shall be appointed by the incoming President at the start of each MASI fiscal year (the beginning of the first General Meeting in July) for a term of one year. Said Chairperson shall be charged with the responsibility of maintaining and complying with the Rules of the HAP as set forth herein. This Chairperson shall maintain accurate and complete permanent records. These records shall be maintained in a paper and/or an electronic file at the discretion of and within the means of the Chair; with an accurate, complete record available to the general membership upon written request either via a paper copy or through electronic media such as the club Website. If an electronic file is kept, separate accurate and up to date copies must be maintained to prevent the loss of all records. The Chairperson shall assign Points as specified in the Rules, and shall review (and amend, as needed) these Rules and Points. The Chairperson is empowered to appoint

trusted MASI members as HAP verifiers to help out as needed. Any disputes will be settled at the discretion of the Chairperson, with advice of the Executive Council if necessary. All such decisions rendered will be considered final. Submission of a propagation to the program signifies agreement with all rules below.

Identification:

Proper identification is the responsibility of the entrant. There are a wide variety of accurate sources for identification of Aquatic Plants. Christel Kassermann's 2003 Edition of *Aquarium Plants* is a recommended source for Aquarium Plant identification, and a copy is provided for the general membership in the MASI Library. Varietals, Hybrids, and Cultivars will be identified by the Cultivar name such as *Nymphaea sp. 'Rembrandt'*, etc. Any plant identified shall require literature cited as a source for said identification. Websites may be cited, but are not considered acceptable primary sources, except for the *Tropicos* database and certain other sites as approved by the HAP Committee. New species will be assigned Points by the HAP Chairperson, with the input of the entrant. All species identification will be verified in the Missouri Botanical Garden *Tropicos* plant database.

Requirements:

Entrant must be a member in good standing of MASI

As a matter of ethics, plants must be *OWNED* and *MAINTAINED* by the entrant for at least 60 days at the time of vegetative propagation. Any plant submitted for the HAP **MUST BE PROPAGATED IN THE ENTRANT'S OWN TANK OR POND**. **NEW GROWTH** must be submitted for credit. For blooms, the entrant must own the plant for at least three weeks before the plant begins to bloom. In the case where plants are purchased with blooms, fruits, or seeds, those growths are ineligible for submission.

Entrant must identify the plant and include a citation for their identification. The HAP Chairperson will only confirm the identification and guide the entrant to sources for proper identification.

A completed HAP Report, including references cited for identification, must be filled out and both the plant (or photo



in the case of blooms) and form submitted at the time of verification for each submission.

To receive Points for a Vegetative submission, entrant shall be required to donate their submission to MASI for auction at a general meeting or at one of the club sponsored public Auctions. For vegetative credit to be issued, stem plants should be submitted as a group of at least 5 stems 5" or longer. For floating plants, at least one cup of plants shall be submitted. For others, at least one identifiable plantlet shall be submitted. For vegetative credit for the genus *Aponogeton*, see special rule below. Blooms and Seedlings need not be donated for Points to be earned, but donations are always strongly encouraged. Blooms and seedlings may be submitted by photo.

All submissions shall be verified one time, except for submissions of a Seedling where the entrant shall submit entry for verification twice; once for the Bloom, and once when the Seedling has grown enough to be easily identifiable. All Seedlings submitted shall have roots, leaves, and be identifiable as to genus, at least.

No plant species deemed a non-indigenous invasive or nuisance species or a noxious weed by the State of Missouri Department of Agriculture or the U.S. Department of Agriculture will be allowed for submission. Any entrant submitting such species *BEFORE* the plant is placed on such list will not have points or credit for propagation taken away, but no further submissions will be accepted. Refer to list of prohibited species later in this document for any questionable species.

Propagation:

Each species, Cultivar, Hybrid, or Varietal shall be eligible for up to 3 submissions – once each
For Vegetative (V), Bloom (IB or OB), and Seedling (S) as defined below:

Vegetative (V): The asexual reproduction by natural means or human intervention. The Vegetative propagated plant must be able to survive on its own without the parent plant. Rhizome plants must include new growth with healthy rhizome, leaves and roots capable of surviving on its own. This includes, but is not limited to

- a. Cuttings (from leaves, roots, stems, etc.)
- b. Budding (plantlets and bulblets)
- c. Division
- d. Runners
- e. Layering
- f. Micro propagation
- g. *Aponogeton* special rule: A photo must be submitted of the plant prior to division, plus a second photo of the plants three weeks after division. Both plants must have leaves, corm and roots, and be capable of surviving on their own.

Blooms (IB or OB): Points are earned by bringing any Aquatic Plant into flower. Points for Blooms shall be awarded at the following rate

- a. Indoor Blooms (IB) shall be awarded Points at the next Point level above the Point level assigned for the Vegetative propagation of the entry, save for the genus *Aponogeton*, which shall be awarded 10 points, regardless of species or location.
- b. Outdoor Blooms (OB) shall be awarded Points at the same Point level assigned for the vegetative propagation of the entry, save for the genus *Nymphaea*, which shall be awarded 10 points for an Outdoor Bloom.
- c. All *Class D* (20 Point) plants shall be awarded only 20 Points for a Bloom, Indoor or Outdoor, save for the genus *Nymphaea* as outlined in 'b' above.

Seedlings (S): Points are earned by raising plants from seeds (Seedlings) produced from Blooms grown by entrant and submitted for HAP verification. Blooms must be grown at least three weeks *AFTER* entrant has acquired plant. As a matter of ethics entrant cannot submit Seedlings grown from flowers either budded or opened on the plant at the time of purchase. Due to time constraints of the live of a Bloom, photos (either electronic or hard copy) or dried Blooms are acceptable for verification of a submission of a Bloom. For seedling credit, entrant must submit four photos: a photo of the bloom, the fruit, the seed and the sprouted seedling; plus submit a minimum 250 word article to the Editor and the HAP chairman about how the entrant produced the seedling.

Prohibited Species List:

Certain plant species have not only become established in the wild, but have actually done so well that they are now considered a noxious weed or a nuisance species. Local, State and Federal Government agencies spend many millions of dollars every year trying to control them. No responsible hobbyist should ever keep, distribute, or discard any of these species in the wild or even down the drain. In fact, interstate distribution or sale and/or interstate transport of these species is illegal. These plants should be destroyed by burning. Composting is not an acceptable way to dispose of these plants. The species below are on the Federal list. Currently, as of February 1, 2016, the State of Missouri List of Noxious Weeds only lists Purple Loosestrife, *Lythrum salicaria*, and snot algae or Dydimio, *Didymosphenia geminate*, as prohibited Aquatic Species. Possession, sale or any other type of distribution of either species, either whole or any part, is prohibited.

For the most up-to-date list, check the MASI auction page Banned Species list.



Member's Classifieds

Buy/Sell	Member	Item	Bid/Asked	Contact
Sell	Jim Miller	Bloodworms and brine shrimp . Brine Shrimp eggs 16 oz. can.		314-638-1134
Sell	Charles Harrison	Thiosulfate crystals (Chlorine Remover) - pound	\$4.00	
		OTO double strength Chlorine/Chloramine test kits - 4 ounce	\$12.50	(314) 894-9761
		Flubendazole , 10% powder 25 grams	\$20.00	charles@inkmkr.com
		Lavamisole HCl Powder - 5 grams treats 100 gallons	\$10.00	
		Methylene Blue 5% solution (4 ounces)	\$12.75	
		Acriflavine Concentrate (4%) solution, 2 ounces	\$12.70	
		Bromthymol Blue pH test solution , 4 ounces	\$7.00	
Buy	Mike	Small Styro shipping boxes - 12 x 12 x 12 or a little bit smaller. If your company uses them and throws them away, save them! Bring to the meeting or I'll come pick them up	Free	636-240-2443

Sell: Power Compact Lighting - Contact: Gary Lange – gwlange@sbcglobal.net 314-412-7636

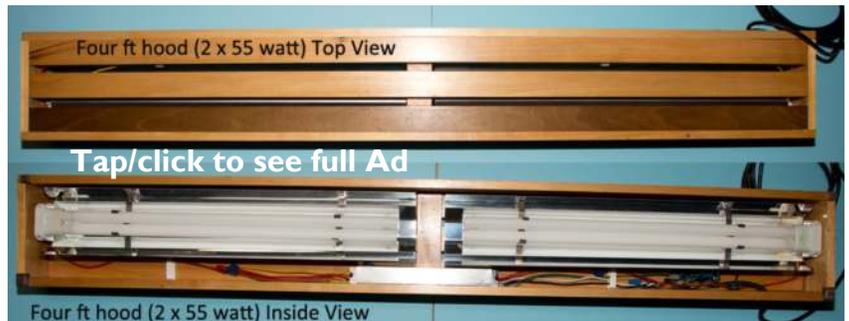
4 units available: A&H Lighting kits with their famous reflectors. Wood hoods, Poplar w light amber finish.

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- 2@ 36.75 x 6.5" wide x 3.5" high with 96 watt Power Compact (PC) Bulb. For 36" tanks- \$75 each
- 48" x 6.5" wide x 3.5" tall with 2 x 55 watt PC bulbs. 4 Ft tank - 55 or 75 gallon tank - asking \$70.
- 48.25" x 9.75" wide x 3 3/8th inch tall with 4 x 55 watt PC bulbs. High Light 4 Ft tank, asking \$120.

Recommend glass tops, ask how to build one.



MASI Members of good standing can place a fish related classified ad in the Darter for free. Free ads may be up to 30 words in length. Send your ads to the editor. The ad will run each issue unless specified how long to run, in which case it will run as requested.



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For those of you who missed **Bob Grauer's** talk on **The Fishes of Lake Tanganyika** you missed a good one. Click/Tap on the photo to get a tour of his fishroom courtesy of our friend Dustin Wunderlich of Dustin's Fishtanks.



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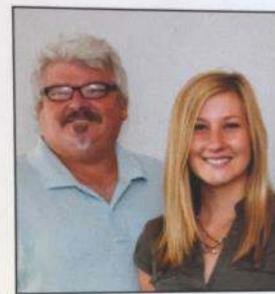
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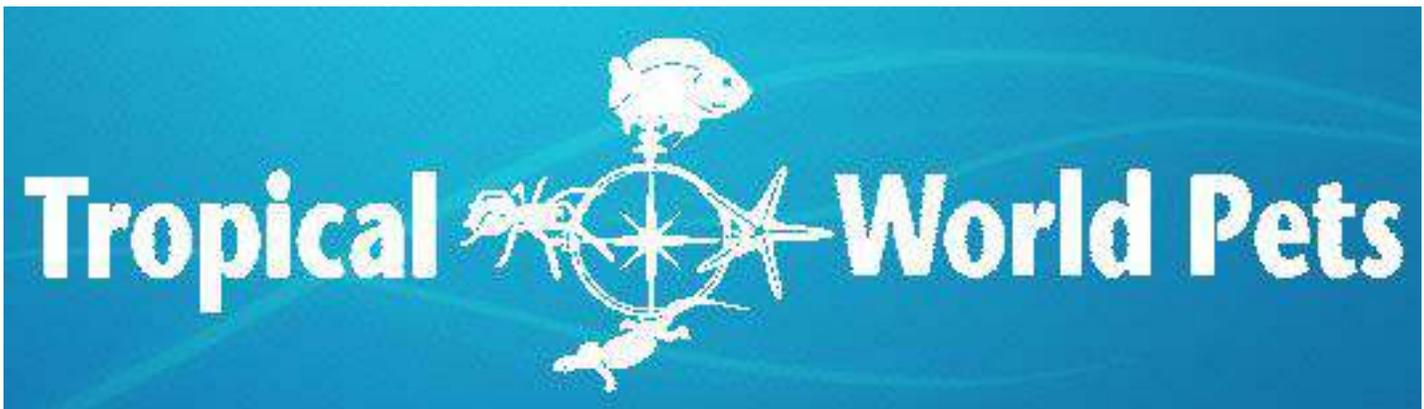


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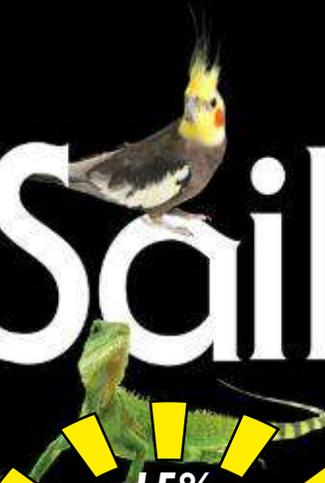
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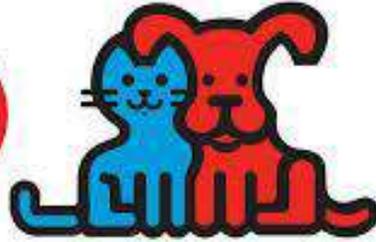
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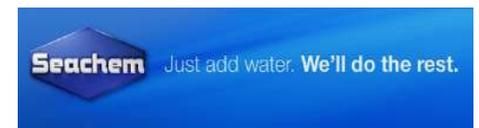
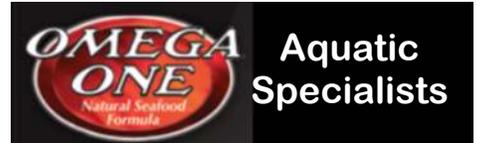
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