



Tank Topics

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Photo courtesy from Steve Brunn

Important Dates

Spring Auction
March 3rd, 2024

Ultra-Aqua
June 8th—9th

Fall Auction
November 3rd

January and February 2024

Ohio being Ohio we've had some seasonable and unseasonable weather these past two months. The end is in sight however and it will soon be tub and pond season! Get ready by attending The Greater Akron Aquarium Society's SPRING AUCTION on Sunday March 3rd, 2024.

Location: Tallmadge Community Center

80 Community Dr. Tallmadge, OH 44278

Registration begins at 10AM. Auction begins at 11AM.

Please complete the seller/buyer information at the table in the lobby.

In addition to the many items up for auction we will also feature a 50/50 raffle, Chinese raffle and refreshments available for purchase.

Full auction rules and details may be found [on our website](#).

Ultra-Aqua 2024

Remember that June 8th and 9th is the Ultra-Aqua Show at the Tallmadge Community Center. We will be setting up on June 7th at 7:00PM so please come help out if you can.

The GAAS board hopes to see you happy and healthy at both events!

2023-2024 Board

President - Bud White	BAP/HAP - Wayne Toven
Vice-President - Herb Kinney	Publicity - Morgan Dent
Secretary - Dave Girard	Refreshments - Elsie Swanson
Treasurer - Rich Serva	FAAS Representative - Ron Mullens
Membership - Mike Swanson	Website - Steve Brunn
Editor - Kristen Kodish	Multi-Media - Wayne Toven
Program - Steve Brunn	Historian - Dave Williamson
Bowl Show - Ken McGill	Raffle - Kristen Kodish

THE GREATER AKRON AQUARIUM SOCIETY

WHO ARE WE? We are a local group of aquatic enthusiasts. Formed in 1952, The Greater Akron Aquarium Society is a registered 501(c)(3) non-profit organization. Our membership ranges from the beginning hobbyist to the advanced aquarist with many years of experience. The goals of our club are to promote the care, study, breeding and exhibition of aquarium related aquatic life and to promote interest in the aquari-um hobby.

MEETINGS: Our meetings are held on the second Friday of each month at 8:00 p.m. at the Ritchie Memorial Shelter House, 109 West Ave-nue, Tallmadge, OH 44278. It is located West of Tallmadge Circle with access from Sperry Ave., behind Vet Clinic and across from the Chev-rolet dealer. Visitors are always welcome, it costs absolutely nothing to attend a meeting and look us over.

MEMBERSHIP: The cost is only \$10 for adults, a couple or a family (includes children under 10 years of age) and \$5.00 for a junior member-ship (10 to 17 years). Membership provides an opportunity to socialize with others that share your interests, a subscription to our bi-monthly electronic magazine and more.

AGENDA: Our meeting agenda is simple and informal. The meeting will begin at 8:00 p.m. with a short business meeting. Immediately following is the program for the evening which usually lasts about 45 minutes. Our programs consist of a speaker, slide program, movie or perhaps a panel discussion always on a particular subject related to the hobby or various species of fish. Following the program is a short refreshment break. After which the winners of the Bowl Show are announced, the Breeder's Award Program fish are auctioned and tickets are drawn for the raffle.

THE BOWL SHOW: Each month members can bring in fish for specific classes to compete for first, second and third place awards. The charge for each entry is only \$.25. Members also compete for annual awards by accumulating wins throughout the year.

BREEDER'S AWARD and HORTICULTURE AWARD PROGRAMS: members can receive recognition for spawning species of fish or propagating aquatic plants. All that is required is to turn in a minimum of six fry from the spawn that are between 30 and 90 days old. Members earn certificates for each species and can work towards plaques in different categories.

EQUIPMENT RAFFLE: The raffle table has such items as tanks, fish food and aquarium accessories that are donated by national manufacturers, area dealers or purchased by the Society. Tickets may be purchased by anyone attending the meeting.

ANNUAL SHOW: The Ultra-Aqua show is held during the summer at the Tallmadge community Center. This has become one of the largest all-species tropical fish shows in North America. It is an international gathering of hobbyists to display their fish in class competition, talk fish and to learn about the hobby from each other.

TANK TOPICS: is published on a bi-monthly basis for the members of the Greater Akron Aquarium Society. Articles and comments for this publication are welcome and encouraged. Such articles are to be submitted no later than the board meeting prior to publication. All articles may be reprinted as long as the author(s) and GAAS are given proper credit.

Check our website for membership information:

www.akronfishclub.com

Presidents Message

Bud White

Well hello folks,

It's been quite a while since we had a real Tank Topics with articles and reports (I hope I can still spell things) and thanks to Kristen and several others we have one here, so lets get going!

As a club I think we have been doing very well, BAP and HAP going strong, new members coming to the meetings and interesting speakers, YAY, GO GAAS.

Of course I do have to remind everyone that our auction is coming up March 3 and we need help setting up that morning, we open the doors at 8 am, so please consider being there to help, the more hands there the faster we get ready. This setup time change is because Tallmadge management has decided to charge us for coming in the night before to setup, so we have to adjust accordingly .

If you can not make it to setup consider helping during the auction such as being a runner or see me about something, I am good at finding things for others to do, (grin). Hope to see you there!

Bowl Show

Ken McGill

January

Goldfish

1st - Tom Clinton - Black Moor

2nd - Mike Thompson - popeye goldfish

Male Guppies

1st - Emilie Myatt & Travis Miller - Snake-skin

2nd - Tom Clinton - Pink Flamingo

Minnows Danios & Rasboras

1st - Emilie Myatt & Travis Miller -
Celestial Pearl Danio



Upcoming Categories

March: Barbs, Mollies, Corydoras
Aspidoras & Brochis

April: Swordtails & Platies, Aquatic
Invertebrates, Amphibians

February

Suckermouth Catfish

1st - Mike & Elsie Swanson - Green Phantom

2nd - Mike Thompson - Longfin Brown Pleco

3rd - Wayne Toven - L-14A Red Lizard

Male Bettas

1st - Ed Bush - Red Multi

Female Guppies

1st - Mike & Elsie Swanson - Platinum Blue Red tail

2nd - Steve Brunn - Blue Delta

3rd - Mike Thompson - Pink Flamingo

Totals

Emily & Travis	13
Tom Clinton	10
Mike & Elsie Swanson	10
Mike Thompson	9
Wayne Toven	5
Ed Bush	5
Steve Brunn	3

Membership Report

Mike Swanson

We are fast approaching auction season. I hope to see you all at these functions. Friends new and old, we all know that these auctions give us new stock and or space needed for new stuff. We had a few new members join in December: Clay Kinney & Richard Klusty. Welcome to the club!

Membership Expirations

The following members are coming up on membership expiration in March: Ed Bush, Paul Adkins, Judith Byrum, Dan Giltz, Seth Serva, Dave Waskowski, Robert Zickefoose, Amber Clayton, Stephanie Davis, Jason Godfrey, Don Grey, John Kaminski, Bart Kraeger, Ed Lengyel, Kris Secaur, Brian Strickland, Robert Woodford, Kristi Logue, Jeremiah Harsh. Please keep your membership going by contacting Mike Swanson at bigkid341@yahoo.com or visit the GAAS website to re-establish your membership.

BAP/HAP

Wayne Toven

Well it's a new year, we started fresh for the 2024 BAP / HAP year at the December meeting / Christmas party, and everyone was even at zero. Were starting off with a bang for 2024, we have 8 spawns, and 29 HAP submissions already, for December through February. Winter is really here, as of this writing (in January) the temperature is in the single digits, but this is Ohio and that can change at any time. Winter auctions will be starting in February so everyone can get their fish rooms cleared out of some of their old equipment and breeder fish to make room for new stock. Our spring auction will be here before you know it, keep it in mind the first Sunday in March the 3rd at 11 am. Don't forget to get a class sponsorship for our show in June. We trimmed some of the unfulfilled classes (5) with help from the records of the past 6 years of show entries and combined them with similar species so everything is covered. We still have the largest class show in North America! We also had an Advanced Breeder Award for Livebearers go to Justin Bahil, congratulations!

December 2023

BAP

Species	Common name	Class	Points
Adam Fox			
Xiphophorus helleri	Koi Kahaku Swordtail	Livebearer	5
Gymnocorymbus ternetzi	Black skirt tetra	Tetra & Characin	10
Oryzias latipes	Medaka ricefish	All other species	5

HAP

Adam Fox

Lagenandra meeboldii	meeboldii red	C – vegetative	15
Lagenandra keralensis		C – vegetative	15
Cryptocoryne cordata	Siamensis	C – vegetative	15
Cryptocoryne wendtii	wendtii tropica	C – vegetative	15
Cryptocoryne wendtii	wendtii red	C – vegetative	15

BAP/HAP Cont.**Wayne Toven**

<u>Species</u>	<u>Common name</u>	<u>Class</u>	<u>Points</u>
<i>Anubias barteri</i>	var. Coffeefolia	C – vegetative	15
<i>Rotala rotundifolia</i>	orange juice	B – vegetative	10
<i>Micranthemum tweediei</i>	Monte Carlo	B – vegetative	10
<i>Cryptocoryne nurii</i>	Pahang mutated	C – vegetative	15
<i>Cryptocoryne purpurea</i>		C – vegetative	15
<i>Samolus parviflorus</i>	parviflorus red	C – vegetative	15
<i>Rotala rotundifolia</i>	blood red	B – vegetative	10
<i>Bucephalandra</i> sp.	super blue	E – flowering	15
<i>Bucephalandra</i> sp.	Lamandau purple	E – flowering	15

January 2024*BAP****Justin Bahil***

<i>Ameca splendens</i>	Butterfly goodeid	Livebearer	10
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Wayne Toven

<i>Melanotaenia goldiei</i>	Goldie river rainbow	Rainbowfish	10
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<i>Placidochromis</i> sp.	Jalo Reef	Cichlid s.s.	10
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<i>Alloophorus robustus</i>	Bulldog goodeid	Livebearer	10
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*HAP****Justin Bahil***

<i>Anubias barteri</i>		E – flowering	15
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Adam Fox

<i>Echinodoras</i> sp.	Frans Stoffels	C – vegetative	15
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<i>Taxiphyllum</i> sp.	Peacock moss	B – vegetative	10
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<i>Ludwigia lacustris</i>		B – vegetative	10
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Dave Williamson

<i>Cryptocoryne aponogetifolia</i>		C – vegetative	15
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<i>Crinum calamistratum</i>	African onion plant	F – sexual propagation	15
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<i>Cryptocoryne nurii</i>	Rosen maiden	E – flowering	15
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February 2024*BAP****Dave Williamson***

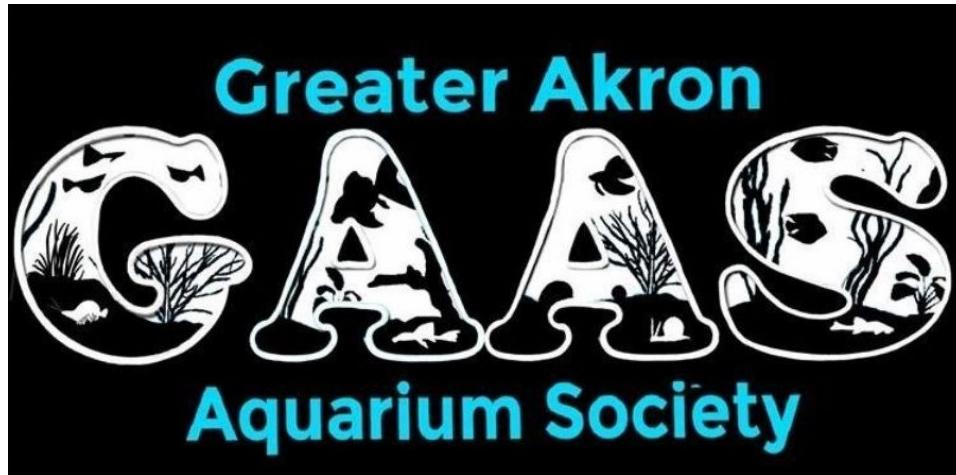
<i>Rocio octofasciata</i>	Jack Dempsey	Cichlid s.s.	5
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BAP/HAP Cont.

Wayne Toven

Species	Common name	Class	Points
<i>HAP</i>			
Adam Fox			
<i>Bucephalandra sp. silver powder</i>		C – vegetative	15
<i>Bucephalandra sp. Kedagang blue</i>		C – vegetative	15
<i>Bucephalandra sp. black leaf</i>		C – vegetative	15
<i>Bucephalandra sp. Lamandau blue</i>		C – vegetative	15
<i>Bucephalandra alamanda</i>		C – vegetative	15
<i>Anubias angii</i>		C – vegetative	15
<i>Hygrophila lancea</i>		A – vegetative	5
Rich Serva			
<i>Pogostemon erectus</i>		B – vegetative	10

2024 totals	BAP	Points	HAP	Points
Adam Fox	3	20	24	325
Wayne Toven	3	30	0	0
Justin Bahil	1	10	1	15
Dave Williamson	1	5	3	45
Rich Serva	0	0	1	10



Program rules and forms available by clicking the logo above.

Overwintering Waterlilies and Hardy Lotus

Steve Brunn

Overwintering Waterlilies and Hardy Lotus

By Steve Brunn

Understanding Plant Dormancy

Our aquarium and outdoor aquatic plants, like all plants, are chemical factories that produce hormones (chemical messengers) based on external stimuli such as seasonal changes in light, temperature, and water availability. It is from the signaling of hormones to the cells with the appropriate hormone receptors that determines (regulates) if plants either grow and bloom or go dormant (a state of inhibited growth and development). Every cell in a plant can potentially produce plant hormones, and the hormones are carried throughout the plant by way of the plant's vascular tissue (xylem and phloem) and then to the cells by cell-to-cell transport (1).

Of the many, many known plant hormones, the two major hormones that control leaf fall (abscission) and dormancy are ethylene and abscisic acid. The major hormone that produces plant growth is auxin. Interplay of these three major hormones throughout the growing season gives insight to the process that leads to plant dormancy (1).

Aging tissues (eg, older leaves) and nodes of stems produce ethylene—an unusual hormone because it is a gas. Ethylene is responsible for fruit ripening, flower wilting, and abscission. Abscission is regulated by interactions between auxin and ethylene. During the growing season, the leaf produces high levels of auxin, thereby blocking the dormancy activity of ethylene. As the photoperiod is reduced as the summer comes to a close, the leaf produces lower levels of auxin, which permits ethylene to begin the aging process at the site of leaf attachment to the stem. This allows the leaf to fall off in a manner that does not harm the rest of the plant. Additionally it should be noted that the application of ethylene has practical commercial use in controlling the timing of fruit ripening, and horticulturalists inhibit leaf dropping in ornamental plants by removing ethylene from greenhouses by using fans and ventilation (1).

Likewise, as a response to stressful environmental conditions, such as cold temperatures or shortened day lengths, abscisic acid accumulates and counteracts the growth hormone auxin. Abscisic acid causes leaf abscission, inhibits stem elongation, and induces dormancy in lateral buds and even seeds (1).

By applying these facts of hormone regulation to the dormancy of waterlilies (*Nymphaea* spp.) and lotus (*Nelumbo* spp), we can understand in the simplest of terms that the robust growth of waterlilies and lotus during summer months is followed by leaf abscission and inhibited growth due to the colder temperatures and shortened photoperiods that these plants experience outside. In late summer the older leaves and dying flowers of the waterlilies or lotus are producing ethylene and the abscisic acid levels build in certain areas of the plants to drive the plant into a dormant state. It is in this dormant condition that the gardener can either do nothing or take some action to help the plant successfully overwinter.



Figure 1: This hardy waterlily (*Nymphaea* var *Aurora*) covers its tub and provides cover and refuge for fry. This photo was taken in late July. Photo by the author.

Overwintering Waterlilies and Hardy Lotus

Steve Brunn

Overwintering Hardy Waterlilies and Hardy Lotus

Hardy waterlilies and hardy lotus are perennial, meaning they return year after year. They grow leaves and flowers from their horizontal rhizomes (for waterlilies) or tubers (for lotus) when water temperatures are warm enough (2). In all growth zones, hardy lotus will go dormant in winter. They form overwintering tubers with growing points that send out runners each spring (3). It is best to divide the mature rhizomes or tubers in the spring.

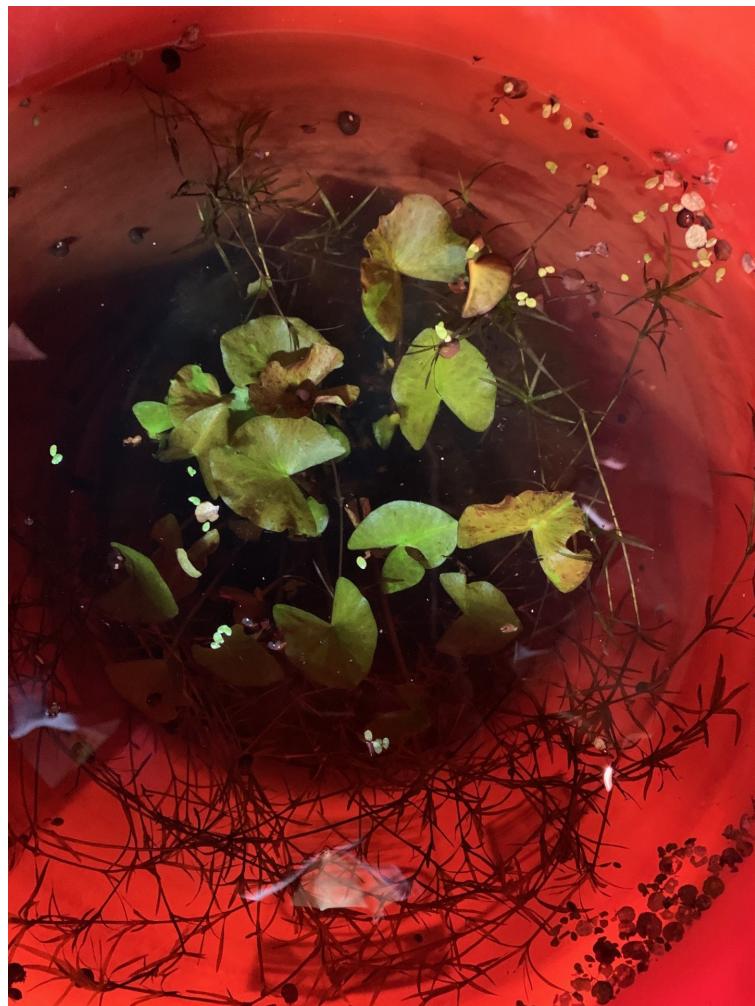


Figure 2

During the overwintering period it is of utmost importance to keep the rhizome or tuber consistently moist with some air exchange. Some hobbyists wrap the tuber in wet burlap, newspaper, or plastic wrap. Others leave the plants in their pots and place the pots in a large waterproof tray and then fill the tray with water so that it does not dry out (4). Success can also be found by keeping hardy waterlilies in 5-gallon buckets with a simple airline for oxygenation. The oxygenation prevents stagnation and, like a greenhouse fan, it prevents buildup of ethylene.

One method to safely overwinter these plants is to simply do nothing. After trimming off dead foliage but leaving any green leaves, leave the hardy waterlily or hardy lotus in the pond or tub outside through the winter months in hopes that that pond or container does not freeze solid. If the pond has a deeper level, and the plant is in a container, then the pot can be simply moved into deeper water and retrieved and repositioned in the spring, assuming that the pond will not freeze solid. The main idea is to avoid freezing the rhizome or tuber, which would cause death to the plant. In the spring the rhizome or tuber can be divided.

The other overwintering method is to bring the plant inside an attached garage or basement to prevent the risk of freezing. It is best to trim off the old-growth foliage to prevent rot and decay around the rhizome or tuber (but retain any living leaves). This prevents the over accumulation of ethylene, and the remaining green leaves will be the shoots for the spring growth. The hardy waterlily or lotus is firmly in a dormant state by the time you bring it indoors, and the limited heat and reduced lighting found in most basements or garages will not be enough stimulus to prompt auxin to bring the plant out of dormancy.

Figure 2: Shoots arising from this dormant hardy waterlily (*Nymphaea* var *Aurora*) keep the rhizome alive over the winter months and will be the energy producer for the plant when placed outdoors in spring. A hardy waterlily can be overwintered in a 5-gallon bucket with little concern about room temperature or lighting. The bucket acts as a light diffuser. This photo was taken in early February. Photo by the author.

Overwintering Waterlilies and Hardy Lotus

Steve Brunn

Watch for Shoots

Shoots (leaves with stems, called petioles) grow from the tip(s) on waterlily rhizomes. The shoots grow toward the sunlight at the water's surface. The petioles are filled with gases and aid the young lily pad to the surface. Once at the surface, the lily pad absorbs sunlight to make food for the rhizome below. Shoots carrying flower buds also emerge from the rhizome, but will not be visible until the plant matures (2).

Overwintering Tropical Waterlilies

Tropical waterlilies can be either sent into dormancy or kept growing (5). In either case, start by trimming old and dying leaves.

For the dormancy method, stop fertilizing them in the fall to slow their growth and help them prepare their tubers for winter. After the first frost, remove the waterlily tubers from the planting basket and rinse and trim each tuber. Then store the tubers in a plastic bag that is filled with damp (not wet) peat moss or sand. Dusting the tubers with a fungicide is a good precaution. Keep the container sealed and in a room that stays warmer than 50 °F. Check monthly to make sure the container is still damp; keep them damp but not wet (5).

For the continued growth method, treat the tubers as an aquarium plant with a grow light. After trimming the dead leaves, place the planting baskets and plants inside in an aquarium or suitable container that is filled with water. Use a grow light and keep the water temperature at room temperature (5).

In the spring and when your pond's water temperature returns to 60 °F or above, then transplant your lilies or add some fertilizer to their existing soil and submerge them. For the dormancy method, replant the tubers in a planting basket filled with fresh soil and position them just below the surface with the pointy side up and round side down (5).

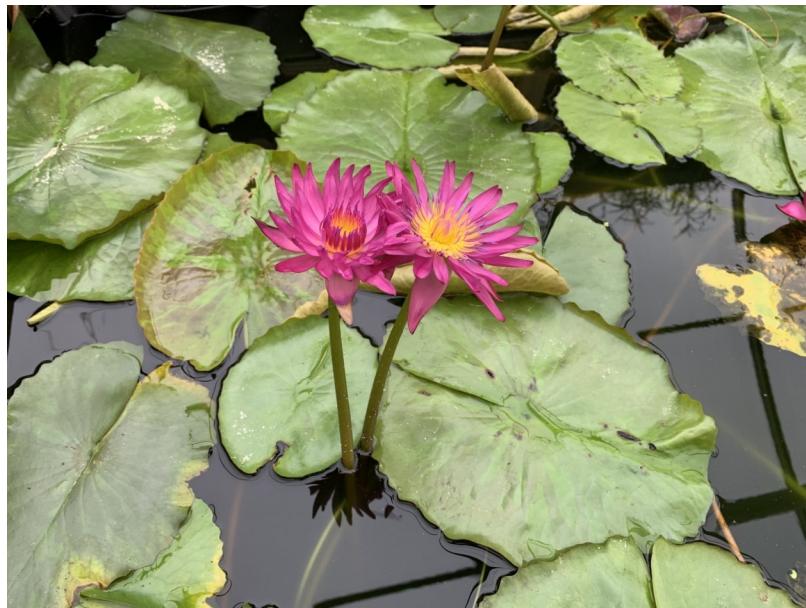


Figure 3: Overwintering tropical waterlilies is not difficult but does require some space and planning. This photo was taken in early July at Aquatic Gardens of Ohio. Photo by the author.

Springtime Considerations for Hardy Lotus

When springtime arrives and it is time to put your hardy lotus tuber back outside (or retrieve it from the safety of the deeper levels of the pond, you can temporarily position the pot

in the shallowest area to maximize solar heating and sunlight. Some lotus growers use heaters to accelerate growth (3).

Springtime is the best and only time to order hardy lotus and have them shipped (6,7). When they are dormant, hardy lotus can survive shipping. Disturbing a lotus when it is actively growing will likely kill the plant. This is because if hollow runners of the lotus tuber, which aid with respiration, are damaged, then the plant will die. This is why it is important to order your lotus in the winter months and to then expect it to be delivered at an optimum date for your growth zone.

Overwintering Waterlilies and Hardy Lotus

Steve Brunn



Figure 4: This photo of tropical waterlilies was taken in early July at Aquatic Gardens of Ohio. Photo by the author.

References

- 1) Georgia Tech Biological Sciences. *Organismal Biology*. Available at: <https://organismalbio.biosci.gatech.edu/chemical-and-electrical-signals/plant-hormones-and-sensory-systems/>
- 2) Wright, J. J. *Plant Parts of the Water Lily*. Available at: <https://www.hunker.com/13428192/plant-parts-of-the-water-lily>
- 3) International Waterlily & Water Gardening Society. Available at: <https://iwgs.org/lotus-care-sheet/>
- 4) Doug Greens Garden. Available at: <https://douggreengarden.com/overwintering-waterlilies/>
- 5) The Pond Guy, Inc. Available at: <https://www.thepondguy.com/learning-center/how-do-i-overwinter-my-tropical-lilies/>
- 6) Pond Mega Store. Available at: <https://pondmegastore.com/collections/sacred-lotus-plants-lotus-flowers-shipped>
- 7) Bergen Water Gardens & Nursery. Available at: <https://bergenwatergardens.com/how-to-pot-lotus-tubers/>

Publication Reviews

Wayne Toven

Hey, we're back, in case you forgot what this is, I get publication exchanges from various other fish clubs, I look for original articles by club members that are worthy of a read. Below are several articles, if you would like to read any of these let me know and I will email it to you or bring a hard copy to a meeting for you. This is the first review for 2022 so there are articles from 2020 up till now.

First of all a few of our members had article reprints by the **Missouri Aquarium Society Inc.** in the Apr 2020 issue of The Darter, *Fun Facts About Dr. John Endler*, by Steve Brunn, and *Aquatic Birds & the Bees, the Back Story in Fish Reproduction*, by Rich Serva. A reprint in **Bucks County Aquarium Society** in the Nov 2020 issue of the Buckette was Wayne Toven's article *A Jewel in the Barb Family* Another reprint in **Greater Detroit Aquarium Society**, Tropic Tank Talk: Apr 2021 was Elsie Swanson's article Youkihi Medaka Oryzias latipes var. Youkihi. In the **Bucks County Aquarium Society** Feb. 2022 issue of the Buckette was Wayne Toven's article *Basic Tales of the Crypts*. Yet another one in the **Bucks County Aquarium Society** March 2022 issue of the Buckette was Steve Brunn's article *Approaches to Fighting and Fostering Green Water*.

Editors Note: We currently have a backlog of information for the publication exchange and are reporting information from 2020 through 2021.

Youngstown Area Tropical Fish Society, the Youngstown Aquarist: Jun 2020
Aspidoras poecilus, by Dave Ayres

Aquarium Club of Lancaster County, Tank Tales:May 2020
Breeder Box Showdown – Comparing Marina and Ista Brands, by Karen Haas
Fifty Seven Years, by Bruce Zearfoss
Experiences with Aquaponics Part 1 – Hydroponic Beginnings, by Joel Antkowiak
Why Latin? by Joel Antkowiak
Ask Not What Your Fish Store Can Do For You, But What You Can Do For Them, by Karen Haas
Covid – 19 Upgrades, by Scott Schmidt Jr.
The Yoma Danio – Brachydanio feegradei, by Rich Bressler
Corydoras atropersonatus – the “Fairy Corydoras”, by Don Kinyon
Head & Taillight Tetra, by Rich Bressler

Greater Pittsburgh Aquarium Society Inc. Finformation: June 2020
Cubanichthys pengellyi, by Eric Bodrock
Betta edithae: a Charming Plain Jane, by Susan Everett

Circle City Aquarium Society, Fancy Fins: July 2020

Aquascaping without Plants, by Joseph Ferenzi

Missouri Aquarium Society Inc. The Darter: July/Aug. 2020

Missouri Department of Conservation Handling of Crayfish, by Mike Hellweg

The Search for the Right Cattail, by Chuck Bremer

Why Can't I Get Rid of That @#\$% Duckweed? By Mike Hellweg

The Bulldog Tetra – Rachoviscus grciliiceps, by Mike Hellweg

Spawning Polycentrus schomburgkii – the Dwarf South American Leaf Fish, by Patrick A. Tosie Sr.

Finding and Spawning Chortiheros (Theraps) wesseli, by Patrick A. Tosie Sr.

Feeding Fish Bloodworms (Chironomidae/Chironomus) Possible Health Risks to Hobbyists, by Thomas M. Keevin

Kitchener – Waterloo Aquarium Society, Fins & Tales: Oct 2020

Fish Room Lounge 2020 Part 2, Building Stands & Moving in Aquariums, by Zenin Skomorowski

Setting up a River Tank, by Glenn Roberts

Missouri Aquarium Society Inc. The Darter: Sep/Oct 2020

Things I Wish I Had Thought of: Location, Location, Location, by Kathy Deutsch

Three Spot Gourami – Trichopodus trichopterus, by Mike Hellweg

Spawning the Mega Clown Pleco – Hypancistrus sp. L340, by Caleb Pittman

The Triangle Cichlid: Uaru amphacanthoides, by Chase Klinesteker

Sarnia Aquarium Society, Aqua Antics: Oct/Nov 2020

Epiplatys dageti GH –CB 2018 Elubo, by Peter Melady

Hamilton & District Aquarium Society: Nov 2020

Daisy's Rice Fish, by Catherine Salmon

Ameca splendens, by Catherine Salmon

Circle City Aquarium Society, Fancy Fins: Oct 2020

Microgeophagus altispinosus, by John Stoller

Chapalichthys encaustus, the Barred Splitfin, by Ben Maurer

Greater Pittsburgh Aquarium Society Inc. Finformation: Nov 2020

The Charming Lamprologus ocellatus Blue, by Robin Shemela

Missouri Aquarium Society Inc. The Darter: Nov/Dec 2020

Hatching the Original “Ancient Mariner” Triops, by Ben Maurer
Pseudomugil mellis, by Gary Lange
Pterolebias longipinnis – a Beautiful Annual Killifish From Brazil & Paraguay, by Jack Heller
Artificial Soil Media for Substrate Spawning Killifish, by Jack Heller
Larval Fish Development, by Mike Hellweg
Follow up: Bloodworms & Potential Allergic Reactions in Your Cat or Dog, by Thomas M. Keevin
Potamogeton lucens Vegetative and Inflorescence, by Gary Lange

Hamilton & District Aquarium Society: Dec 2020

Betta falx, by Catherine Salmon
Danio Nigrofasciatus, by Catherine Salmon

Kitchener – Waterloo Aquarium Society, Fins & Tales:Dec 2020

How to Make Your Own Spawning Mops, by Zenin Skomorowski
Red & Blue Lighting Aquarium, by Karen Murray

Hamilton & District Aquarium Society: Jan 2021

Neolamprologus similis – Zebra Sheldweller/ Big - Eyed Multi, by Catherine Salmon
Fundulopanchax gardneri ‘Jos Plateau’, by Catherine Salmon

Circle City Aquarium Society, Fancy Fins: Jan 2021

Nothobranchius korthausae, by Bob Hargis
Breeding Lamprologus stappersi (melagris), by Chris Eichrodt

Ohio Cichlid Association, Buckeye Bulletin: Jan 2021

The Tank Says Geophagus surinamensis, by Jeremy Basch

Missouri Aquarium Society Inc. the Darter: Jan/Feb 2021

Sharing the Aquarium Hobby with Children, by Steve Coxon
Celestial Pearl Danio and Danio (Celestichthys) margaritatus, by Mike Hellweg
Taming Godzilla – Otellia ulvifolia “Okavango Delta” Flowers and Seeds, by Gary Lange
Water Hyacinth – Eichhornia crassipes From Seed, by Gary Lange
Pogostemon stellatus, by Gary Lange
Utricularia gibba, by Gary Lange

Kitchener – Waterloo Aquarium Society, Fins & Tales:Feb 2021

The Corydoras Corridor! How I Got Here, by Al Ridley

Hard and Soft Water – Explained, by Jeremy Gay

Sarnia Aquarium Society, *Aqua Antics*: Mar/Apr 2021

Trichopodus leeri A.K.A. Pearl Gourami, by Jack VanderAa

Missouri Aquarium Society Inc. *The Darter*: Mar/Apr 2021

Breeding Panaqolus sp. L 169, by Derek Walker

About My Betta Tank, by Kathy Duetsch

The Kuhli Loach, by Mike Hellweg

Kitchener – Waterloo Aquarium Society, *Fins & Tales*: Mar 2021

The Corydoras Corridor! Corydoras triliniatus – the False julii, by Al Ridley

Reviving a Second Hand Aquarium, by Zenin Shomorowski

A Very Rare Jewel – the Devil's Hole Pupfish, by Glenn Roberts

Bart the Clown Knife Fish, by Kathleen Breau

Greater Detroit Aquarium Society, *Tropic Tank Talk*: Apr 2021

Luck with Plecos, by Rick Embree

Brooklyn Aquarium Society, *Aquatic News*: Spring 2021

Pelmatochromis buettikoferi, by Joe Graffagnino

Gymnogeophagus terrapurpurea, by Joe Graffagnino

Hypselebias mediopapillatus "Pindas", by Joe Graffagnino

Greater Detroit Aquarium Society, *Tropic Tank Talk*: May 2021

The Multies, by Mark Allar

Java Fern "Trident", by Mark Allar

Missouri Aquarium Society Inc. *The Darter*: May/June 2021

When is a Jewel Not a Jewel? Hemichromis exsul, the Lake Turkana Jewel Cichlid, by Steve Edie

The Dwarf Banded Loach – Micronemacheilus cruciatus, by Charles Harrison

Juncus effuses – Smooth Rush, Common Rush, Soft Rush, Geddy Lee Plant, etc. by Micah L. Issitt

Thalia dealbata – Hardy Canna, Powdery Thalia, or Powdery Alligator – Flag, by Micah L. Issitt

Separating Eggs and Fry from Hungry Parents, by Mike Hellweg

Kitchener – Waterloo Aquarium Society, *Fins & Tales*: June 2021

Wood in the Aquarium, by Zenin Skomorowski

Greater Detroit Aquarium Society, Tropic Tank Talk: June 2021*Corydoras duplicareus*, by Mark Allar*Breeding Aspidoras poecilus*, by Mark Allar**Motor City Aquarium Society**, Tropiquarium: June 2021*Albino Bristlenose Pleco Breeding*, by Dave Costa**Missouri Aquarium Society Inc.** The Darter: June/July 2021*A Visit to Conservation Fisheries Inc. in Knoxville, Tennessee*, by Steve Coxon*Miulus ringens, Monkey Flower, Allegheny Monkey Flower, Square Stemmed Monkey Flower*, by Micah Issitt & Adrienne Legault*Pontederia cordata var. lanceolata – Pickerelweed, Purple Pickerel Rush*, by Micah Issitt & Adrienne Legault*Alcolapia ndalalani – the Narrow Mouth Natron Dwarf Cichlid*, by Mike Hellweg**Sarnia Aquarium Society**, Aqua Antics: Aug. 2021*Pelvicachromis taeniatus Moliwe*, by Peter Melady**Motor City Aquarium Society**, Tropiquarium: Sep. 2021*Methusulah of My Aquarium*, by Steve Bieda*Albino Bristlenose Plecos*, by Rick Embree**Missouri Aquarium Society Inc.** The Darter: Sep/ Oct 2021*Tub Breeding of Paradise Fish*, by Holly Paoni*Miniature Ponds*, by Chuck Bell*The Diamond Tetra – a Subtle Beauty*, by Mark England*1916 U-Boat Delivered Tropical Fish for St. Louis*, by Thomas M. Keevin & Chuck Bremer*Cnesterodon decemmaculatus – the 10 Spot Livebearer*, by Holly Paoni*The Outdoor Pond*, by Kevin Wise*The Sailfin Molly – Poecilia latipinna*, by Mike Hellweg*Eichhorina crassipes – Non – Native Invader in Warmer Climates*, by Micah Issitt*Aquatic Forget Me Nots – Myosotis scorpioides*, by Holly Paoni*Cannas from Seed*, by Connie & Chuck Bremer**Sarnia Aquarium Society**, Aqua Antics: Nov/Dec 2021*Corydoras loxozonus A.K.A. Corydoras deckeri*, by Jack VanderAa

Missouri Aquarium Society Inc. The Darter: Nov/Dec 2021

Consider Aging... of Both Fish and its Keeper, by Kathy Deutsch

Jenynsia onca – Spawning the Uncommon One – Sided Livebearer, by Mike Hellweg

Spawning the Golden Pencilfish, Nannostomus beckfordi, by Mike Hellweg

Spawning Apistogramma sp. "Abacaxis", by Steve Coxon

How to Tell the Boys from the Girls, by Mike Hellweg

Ludwigia alternifolia – Marsh Seedbox, Rattlebox, Bushy Seedbox, by Micah Issitt & Adrienne Legault

What's in a Name? by Micah Issitt

See you at the Richie Memorial Shelter on the following dates:

March 8th, April 12th, May 10th, June 14th, July 12th, September 13th, October 11th, November 8th, December 13th

August 9th Meeting Location To be Determined