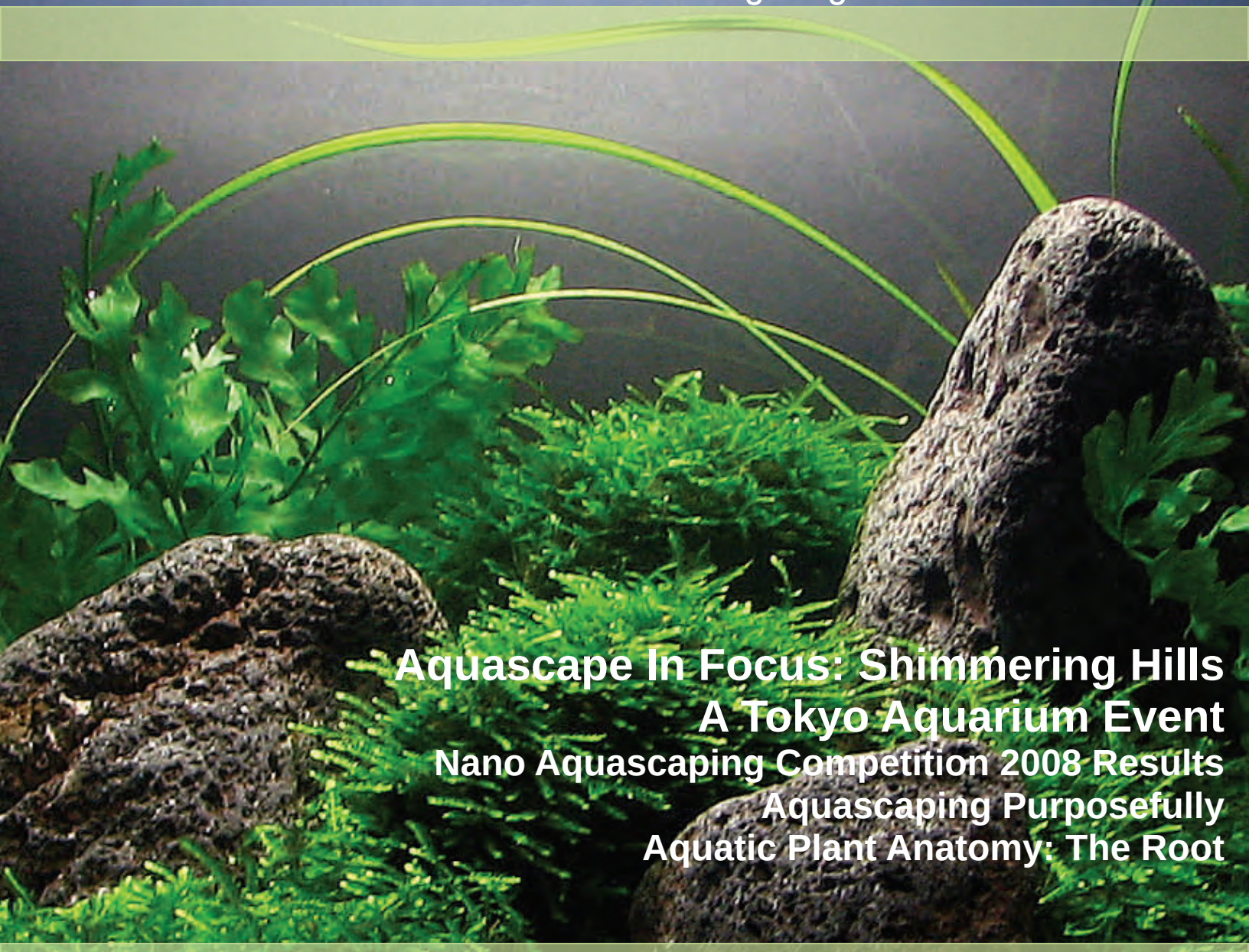
AquaScapingWorld

Making Magic In Glass Boxes



Aquascape In Focus: Shimmering Hills
A Tokyo Aquarium Event
Nano Aquascaping Competition 2008 Results
Aquascaping Purposefully
Aquatic Plant Anatomy: The Root

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Letter from the Editor

Inside our July Issue

Nano aquascapes are one of the hardest layouts to design and maintain because of their small sizes. But when done right, like our Aquascape in Focus this Month, *Shimming Hills* by Jeff Progob, they can be a great ascent piece to your home or office.

The nice thing about nano tanks is that they can be easily transported. This aspect came in handy for aquascapers in Kuala Lumpur, Malaysia, where local aquascapers gathered together to compete in a regional Nano Aquascaping Competition. They drained their aquariums, loaded them up, and brought their tanks back to their full beauty. Stan Chung gives us a blow by blow of the events at the Midvalley Convention Centre, and shows us some of the great nano aquascapes among the tables and tables of aquariums.

A few stone throws away, in Japan, Steven Chong visits a Tokyo Aquarium Event and shares with us photos of some of the top planted aquariums and rare fish brought to the event. Although some of these tanks aren't so nano, they are exquisite works of living art.

Try to stay cool this summer. Happy a great month aquascaping!

John Nguyen
Editor in Chief
AquaScaping World Magazine

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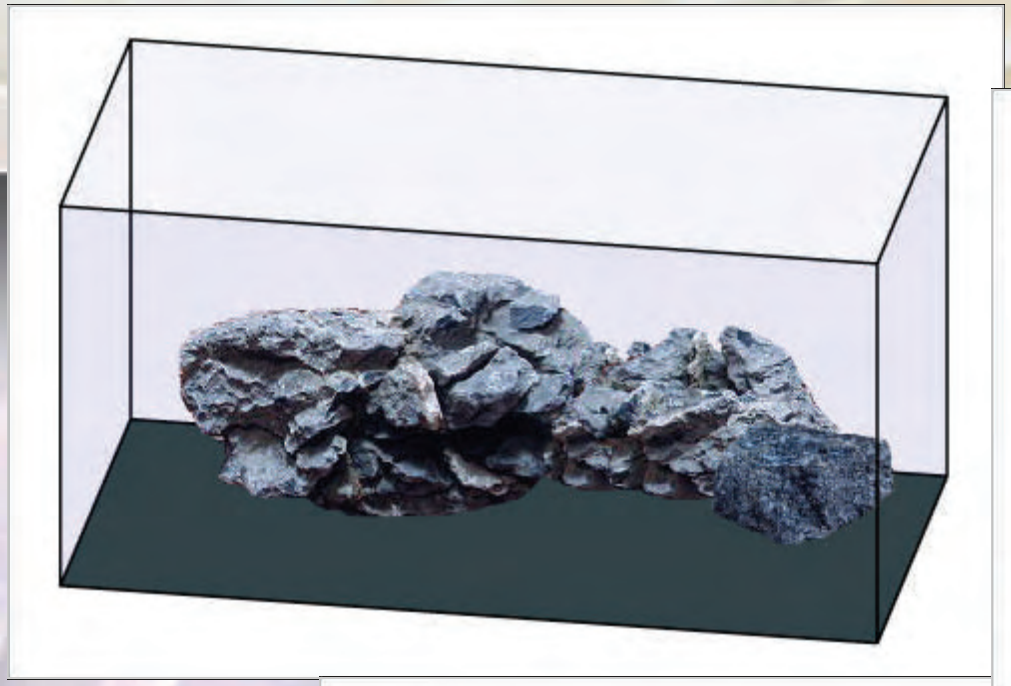

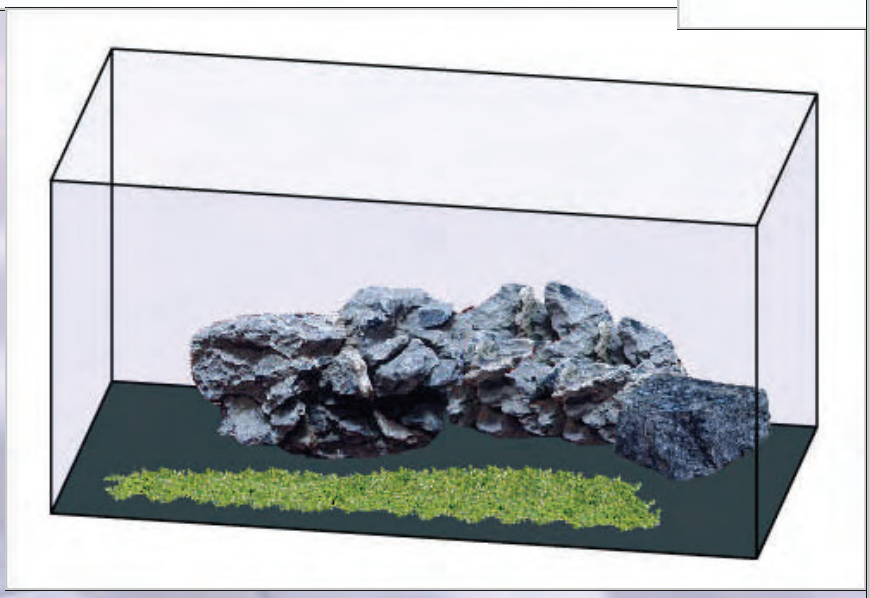

AquaSketcher

Design Your A

Aquarium

By Ofri Dagan

The aquarium is 180x90x70 cm that I sketched. Notice I eventually used Anubias instead of Hemianthus Cuba, which doesn't seem to grow in my large tank.

Browsing through several aquascaping contests, I notice people were required to provide some sort of a planting map along with pictures of their tanks. Sometimes it's difficult to see what plants are used and how exactly they were planted. I have even seen some contestants submit a hand-drawn sketch with the plant lists.

So at first, I just wanted to provide an easy way to make a planting map for a tank. After doing this it seemed very natural to also display a preview of the planting map. This is where the whole thing got interesting.

I spent a lot of time thinking about how this display would look like. At some point, I even thought about using 3D models of the plants. Realizing it would be very difficult to get real-3D models of aquatic plants and it will make the program much more complex, I decided to go for a relatively simple, pseudo 3D view. The view mainly consists of 2D images of plants placed inside a (real) 3D tank. As the tank rotates, the plants move correctly in the 3D space, but they will also rotate around the vertical axis to always point to the viewer.

As for the plants images themselves, I decided to use paintings of plants rather than photos – I found it looks much better. To make the preview display more realistic, I added a random factor that effect how the image will render. On every 'update' of the view the plant may look a little different and have a little different size.

In the first version of the AquaSketcher only plants images were included, but as people were repeatedly asking for hardscaping ability, I quickly added rocks and driftwoods.

Using the AquaSketcher

Since the purpose of the Aquasketcher is making a sketch of an aquascape, and not a realistic 3D picture, I wanted the program to be as simple as possible to use. Unlike most 3D programs, all of the work with the Aquasketcher is done in a 2D space - the planting map. This, in my opinion makes everything much simpler to use. Of course it also has some disadvantages that have to do with flexibility, but in this case I chose the simpler-to-use way. Here is how you can make a sketch using the AquaSketcher:

Step 1: Select Your Plants and Hardscape

When creating a sketch, you will first choose the objects (plants, rocks and woods) you are going to use in your sketch. This is done in the "Plants Manager" window (figure 1), by selecting the objects you want and clicking on 'Add'. When you are done choosing the objects, click on 'Continue' to close the plants manager – you will now see the main window (figure 2).

Step 2: Set Tank Dimensions

Next I recommend you set the tank's dimensions (figure 2). Simply enter the 'length', 'width' and 'height' fields (centimeters) and click on 'update'. You should see the tank and map change, unless your new dimensions have exactly the same ratio as the default ones.

Step 3: Set the Hardscape and Plants

Like in a real aquascape it is best to first set the hardscape. To add a rock (or any other object like plants and woods) choose one from the 'Plants Pool', pick a color for that object group (this will only effect the planting map – not the preview display), adjust it's height and finally "plant" the rock by clicking on the map (to delete a "pot" use ctrl+click on the pot). You should see a small circle on the map and the object added to the preview display (figure 3).

Step 4: Insert Plant species

Keep adding your rocks and woods to get the desired hardscape. Add the foreground, midground and finish the sketch.

The Future of the AquaTools

The AquaTools will be developed further to meet the needs of planted tank hobbyists. The first version of the program didn't include hardscape or the ability to save the sketch. Both of those features (implemented now) are a result of comments made by the people in the

The AquaSketcher

Figure1 Select Your Plants and Hardscape Materials

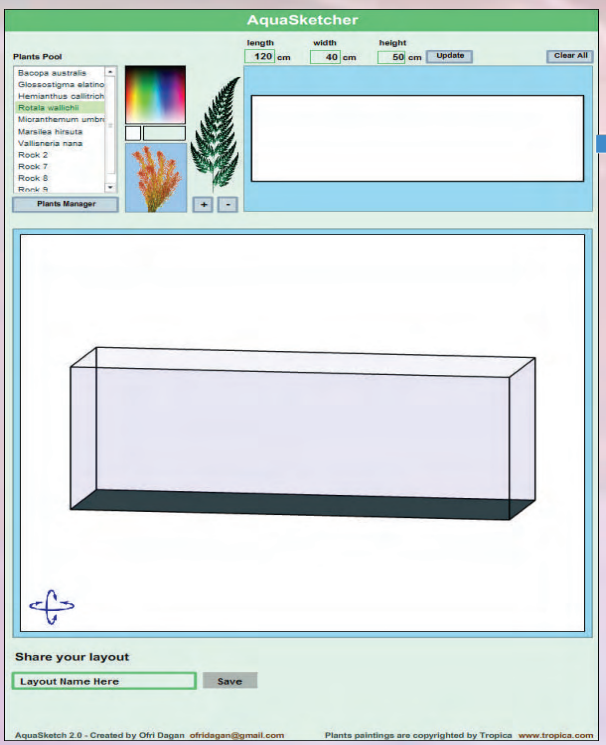

Figure 2 Main Window, Set Tank Dimensions

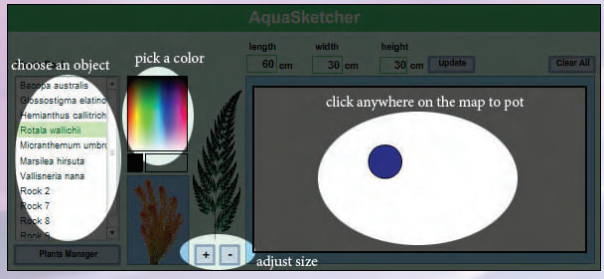

Figure 3: Define where you want to place the plants and rocks

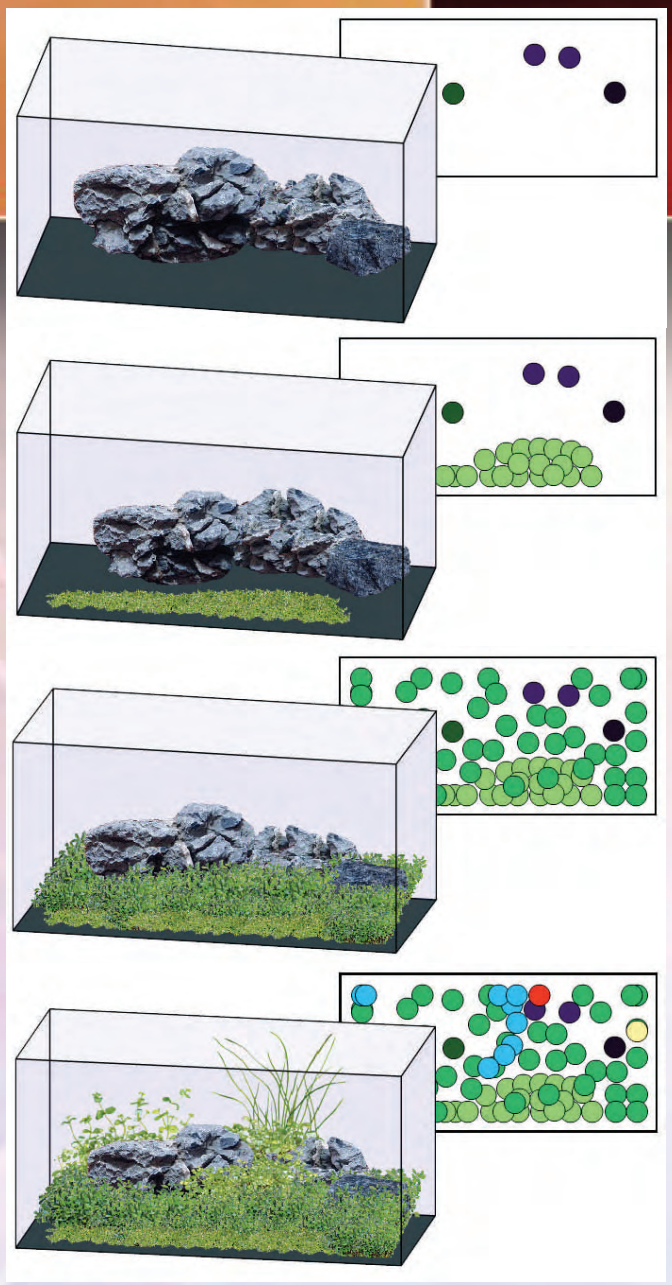

Figure 4: A progression of adding plants and hardscape elements

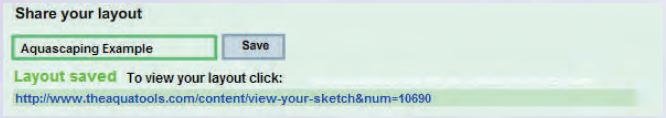

Figure 5: Save your layout and share it with the world

forums. There were also some suggestions I didn't implement, such as: different backgrounds, different bottom colors and texture, adding slopes, planting on rocks and more. I'm not going to implement all of those ideas, mostly because it will hurt the simplicity of the program – I need to consider the benefit versus the complexity.

Among the features I do plan to implement are: starting from a template-sketch instead of starting from scratch, to show plants names when the mouse moves over them, adding fish and adding more plants, rocks and woods.

I always listen to what people on the forums have to say, and try to keep up with the demand. I will continue to build on TheAquaTools.com – suggestions will be appreciated.

Aquascaping Plants Pu

Foreground, Midground, and Backgr

urposefully

ound

By Tom Messenger

A look at selecting and arranging aquatic plants for your planted aquarium

A well designed planted aquarium not only looks natural in its artificial environment, but it also stirs up calming emotions to each of the viewers. It is important to select the most ideal aquatic plant species for your aquascape, and arrange them in a harmonious design which looks organic and effortless. In this article, I will discuss exactly how to create these effects with commonly used aquatic plants, and the aquascaping arrangement concepts that will make your planted aquarium stand out.

Let's begin. Before plants are introduced to the layout, water should be added to the aquarium just to the top of the substrate line. This makes planting easier as plants stay in the substrate better when it is wet. Also, you don't have to get your whole arm wet!

In this scape, there are only two plant species used: *Rotala rotundifolia* and *Glossostigma elatinoides*. Though the scape exhibits healthy growth, the overall aquascape could benefit from a defined foreground, midground, and background transition. Trimming the *Rotala rotundifolia* so that it has a tier effect would greatly improve the aquascape's visual depth and transition from midground to background. Alternatively, inserting a new midground plant would help achieve a proper visual depth transition.

Foreground

The plants you use for the foreground of your layout will depend on the layout style. You may not even need foreground plants if you are attempting an open foreground layout, which have become quite popular recently. Common foreground plants include Glossostigma elatinoides, *Hemianthus callitrichoides* (HC), *Eleocharis sp*, *Riccia fluitans* and even moss species such as *Vesicularia* and *Taxiphyllum sp*.

In many Iwagumi layouts, *Glossostigma* or HC are used to good effect as a foreground plant. Iwagumis often use exclusively foreground plant species to create or accent that effect of rolling hills, or to form more dramatic coastline scenery for example.

Some Iwagumis incorporate two species of plants growing together, such as *Riccia fluitans* or various moss species, with Dwarf Hairgrass (*Eleocharis sp*.) growing through. This technique of growing different species intertwined together provides a very natural, wild, and almost unruly feel to the aquascape.

Midground Plans

The midground is the most important part of the aquascape, as it is responsible for pulling the foreground and background together. The midground can either make or break an aquascape. Once you have a strong hardscape formation, you need to place your plants to compliment it. Think of it as the transition period between the short and tall plants. You can use the midground space to create that sense of depth (or perspective) in the layout. By planting in diagonals, you can lead the viewer's eye further into the layout, Try varying the height of the plants too. You can trick your viewers into thinking your aquarium is larger than it really is. This is a very desirable trait, especially in Nature Aquaria.

You can see, in many ADA layouts in particular, how the midground can be used as a transition from low growing *E. tenellus* or *S. natans* for example, up to *Bolbitus heudelotii* and moss covered driftwood, through to stems or tall *Crypt. balansae* at the back. If you neglect the midground, your layout will often end up with what is known as Field in Front of Wall Syndrome, or FFWS. This is quite a self explanatory term, meaning that you have the foreground directly in front of the tall background plants, and it can ruin the aquascape.

Background

The background is probably the easiest area to manipulate in order to add shape to the layout. Most often used as background plants are the long-stemmed varieties such as *Rotala sp, Hygrophila sp, Ludwigia sp,* and *Mayacca sp*. Exceptions to this can include plants such as *Vallisneria sp*, the larger *Cryptocoryne sp*, and *Aponogeton sp*. Stems especially are easy to trim to a certain shape, but slower growing species such as Crypts have to be carefully selected to provide the intended look without outgrowing their quarters.

Plant.
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Feed. Grow. Thrive.
Monitor. Maintain.
Inspire.
Enjoy.

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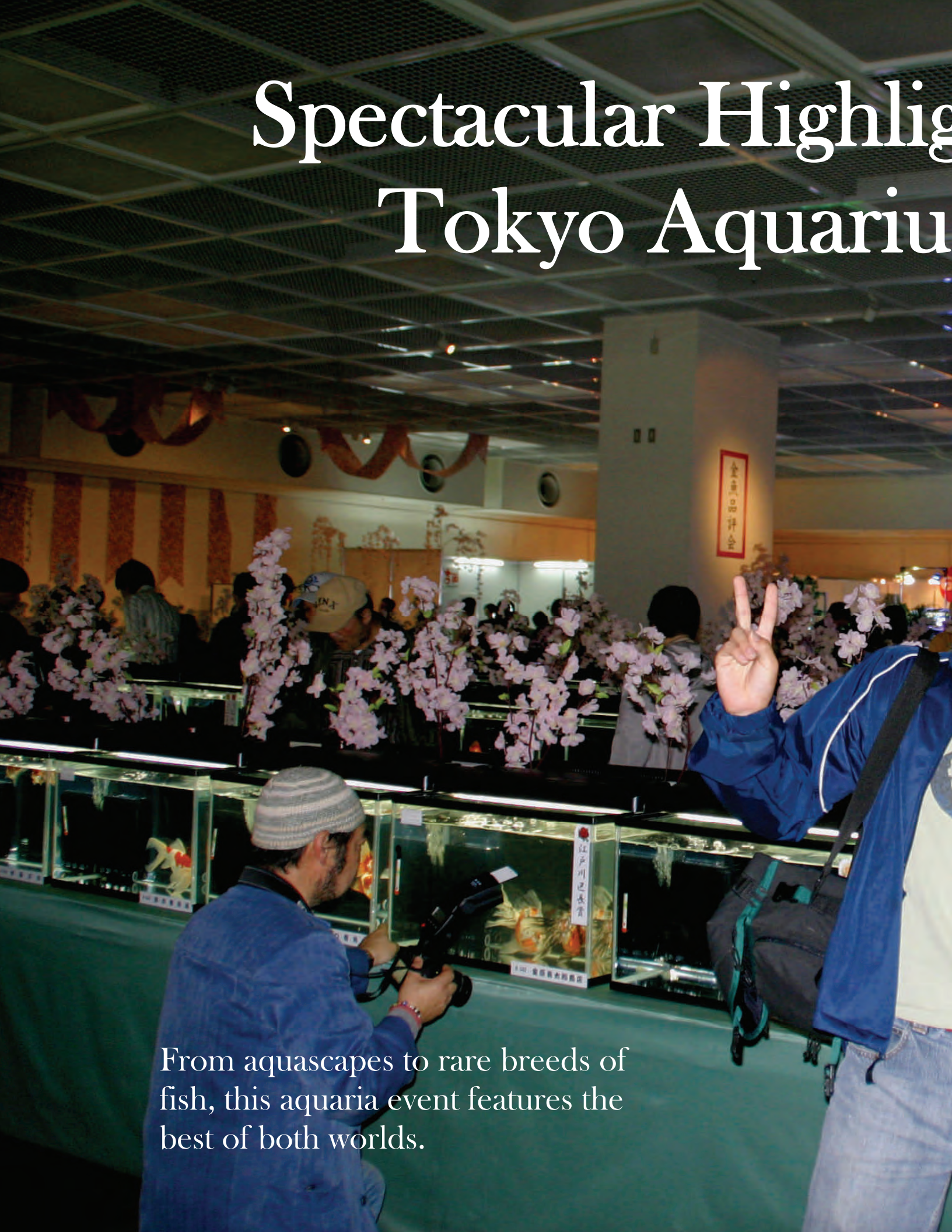


From aquascapes to rare breeds of fish, this aquaria event features the best of both worlds.

ghts from A
m Event

By Steven Chong

Last month I had the fortune of being able to attend an aquarium event Tokyo, Japan. This event focused on the different aspects of the aquarium hobby from fauna, equipment to aquatic plants. I went to the event with the staff and other customers of Aqua Forest Shinjuku, a fantastic ADA distributor in the busiest station in Tokyo (and the mid-point between my home and school here in Japan).

One of the primary showcases was the massive goldfish contests. Breeders from around the world featured some of the most beautiful goldfish I have ever seen. Rare Ryukin breeds (noted by a hump right after the head and special colorations) were showcased among the various Oranda, Fantail, Moor, and Telescope breed goldfish types.

There was an impressive aquascaping gallery featuring planted aquariums from talented Japanese aquascapers and local aquarium stores. They competed in a small aquascaping contest in which my collegues from Aqua Forest Shinjuku entered four tanks into. They won best of show awards for two of them which is very good considering the high quality aquascapes entered in from the other competitors. There were about twenty different planted aquariums ranging from a tiny shrimp tank with twigs to larger aquariums around 90cm or larger.

There was also quite a showing in complexly designed vivariums. I was especially shocked by a tall display with beautiful moss that featured two baby gars and one baby arowana in the approximately five gallon water area at the bottom. All I can say is "*Yappari Ajia tte chau wa*" (As expected, Asia is just different).

The aquarium that impressed me the most was a very stereotypical ADA type of design with cardinals and red torpedo barbs. Strictly designed to mimic the Nature Aquarium Style, it contained the beautiful soft texture of densely positioned plants and harmonious balance in layout that would make Takashi Amano proud.

However, the aquarium that stole the show is something far from the Nature Aquarium Style.

Did you Know?
We weren't always so Gold...

Goldfish are a popular fish among aquarium keepers. Most hobbyists get their first taste of aquaria by starting out with a goldfish. Little did they know their brightly colored goldfish weren't always so colorful. Thousands of years ago, Chinese Monks caught plain, dull gray color species of fish, and placed them in their outdoor ponds to ward off mosquito larvae. After many generations, they noticed color and shape variations which they developed further to what we know as a Goldfish.

Nowadays goldfish are specially bred for their colors and special phenotypic traits. Breeders will selectively breed out the different traits to create a gold fish that has two tails, larger eyes, certain color patterns and shapes. These beautiful goldfish are just a sample of the hundreds of different breeds brought to the Tokyo Aquarium Event by goldfish breeders around the region. In Asian cultures, goldfish are said to bring harmony, tranquility, and luck (if kept outdoors). They are a coldwater species and need ample room to grow and mature.

Stunning vivariums like this one illustrate the diversity of aquariums at the event.

It was a massive aquarium with a 70cm x 50cm front wall featuring a large *Bolbitis heudelotti* tree. I cannot help but think that Portugal's own Filipe Oliveira's little tank, *Syrah,* has made a creative impacted here in Asia.

The tree was certainly unique, as was the technique of using scattered stems of *Rotala macranda* as "flowers" amongst a field of *Hemianthus callitrichoides*. However for me, it was simply not my taste. The whole aquascape simply left a taste of "over-done" to me, from the forceful tree technique, to the *R.macrandra* flowers, down to the show-off livestock (in my opinion, red candy shrimp are just unnecessary in this type of large aquascape).

The tree also had the negative effect of being overly dark. This made the types of plants that could grow grow around the tree unbalanced with the rest of the scape. It created a large black "blob" that dominated too much of the display. Ultimately, the eye ended up going to brighter areas of the tank and staying there, resulting in a misuse of space. In addition, the shadow it casted required additional lighting to be added that made the whole design less attractive. Bottom line is that building a tree can work; but it can also not work when it is overly designed..

Certainly creative though, and it was apparent that the judges thought so too. Do not get me wrong, it was an excellent scape with a lot to learn from—I am simply critiquing to find the line between good and great.

I had an enjoyable time at the event. There is no other place that I've been to in the United States where one could see these spectacular

(Left) This aquascape impressed the competition judges with the unique *Bolbitis heudelotti* tree and carefully placed red stems of *Rotala macranda* throughout the scape.

(Bottom) Snapshot of a stunning aquascape entered into the competition.

aquascapes, extraordinary fish species. It was a truly fun and stunning sight to see. I hope you will take pleasure from the photos, and perhaps one day have a chance to attend one of these Tokyo aquarium events in the future yourself.

Measuring Carbon Dioxide

The pH/KH CO2 Relationship

By Cecil Griffith

pH/KH CO2 Relationship Chart

KH \ pH	6	6.2	6.4	6.6	6.8	7	7.2	7.4	7.6	7.8	8
1	30	19	12	8	5	3	2	1	1	1	0
2	60	38	24	15	10	6	4	2	2	1	1
3	90	57	36	23	14	9	6	4	1	1	1
4	120	76	48	30	19	12	7	5	2	2	1
5	150	95	60	39	23	15	8	7	2	2	1
6	180	114	72	47	28	18	11	8	2	3	2
7	210	133	84	55	32	21	13	9	3	3	2
8	240	152	96	63	37	24	15	10	3	4	2
9	270	171	108	71	41	27	17	11	3	4	2
10	300	190	120	79	46	30	19	12	3	5	3
11	330	209	132	87	50	33	21	13	4	5	3
12	360	228	144	95	55	36	24	14	4	6	4

Good Levels of CO2 15-35 ppm
Poor Levels of CO2

A few years ago, it was common practice among hobbyist to measure their CO2 injection levels based on a pH/KH CO2 Relationship chart. Hobbyists would measure the two variables, pH and KH, look at a chart and tah-dah they figured out they are injecting x amount of CO2 ppms in their aquarium. Sounds to easy to be true? Well it is.

The pH/KH CO2 Relationship

Let's discuss how the pH/KH/CO2 chart works. pH and KH variables operate together in a linear formula that tabulates CO2 levels. Without going to deep into the chemistry, as CO2 dissolves into water, it releases carbonic acid which will drive down the pH of the aquarium. When our tests read a lower pH from the initial without CO2 injection pH value, we have a good indicator that the CO2 is being dispersed into the aquarium. Now, KH refers to carbonic hardness which helps buffer the carbonic acids released during CO2. By measuring each value and applying it into a set mathematical formula , we can derive our CO2 levels.

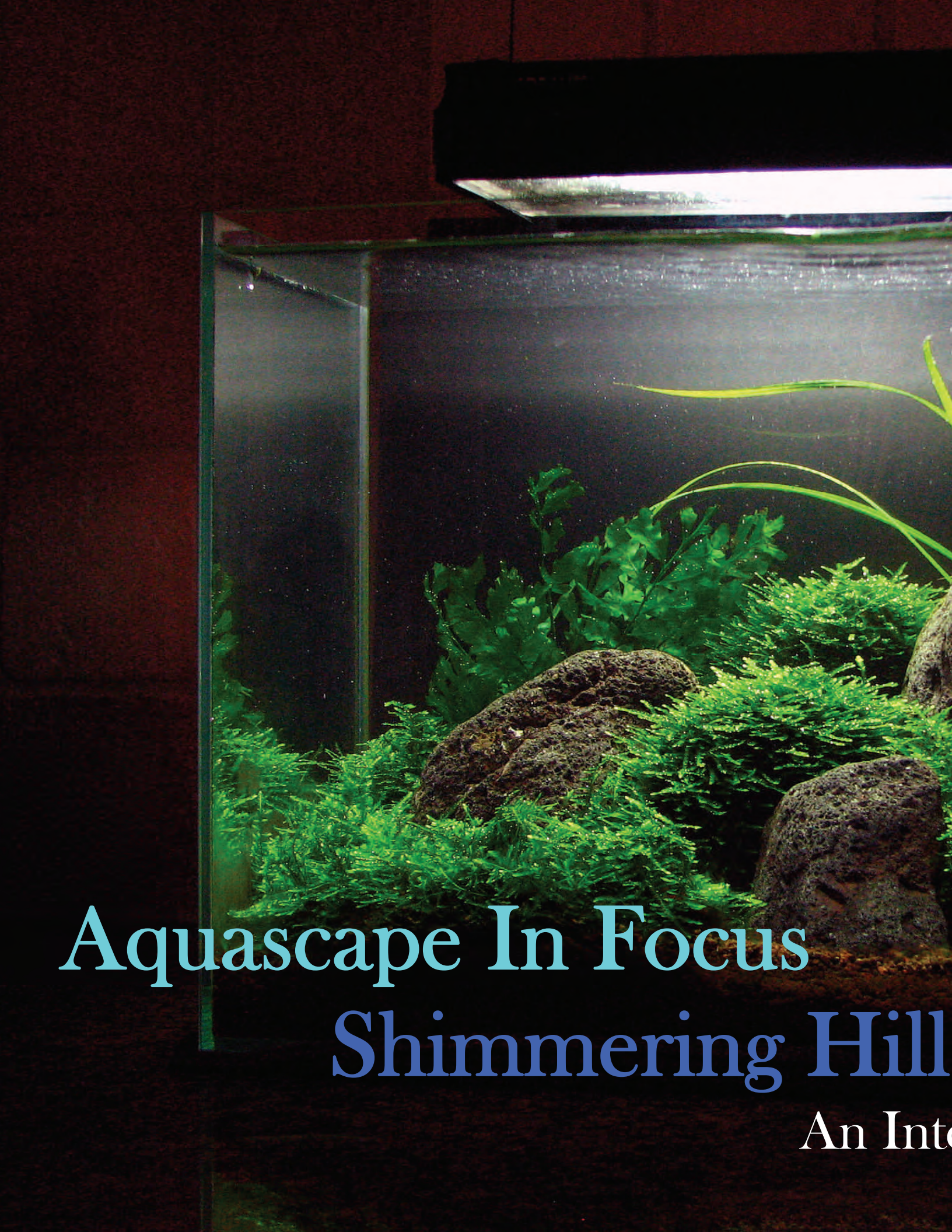
There are too many variables in aquarium water to use the pH/KH/CO2 chart/ calculator. The CO2 pH/KH relationship is a good guideline to get a generally reading of C02 levels, but it not exactly perfect. It assumes tested aquarium water has perfectly set levels of KH and pH which don't vary. In reality that's nearly impossible to have such water. There are phosphates, tannins, organic acids and bases that come from fish waste, decaying plant matter, and nitrifying bacteria that will affect the rising and falling of pH on a daily basis. KH readings can be misread due to dissolving minerals from stones, shells in the substrate, and other hardscape materials. As a result, if you rely on a strict value of KH and pH alone, you may find a false CO2 measurement which, in most instances, indicates that you have more CO2 than you actually have in your aquarium.

pH/KH Chart Results

As I mentioned before, the ph/KH/CO2 Chart can help beginners gain a basic understanding of how much C02 they are injecting. It's been a great tool that has taught many hobbyists how the acid affects pH levels, and how buffering KH can prevent pH from falling drastically. But in the end, it can only provide one a general gauge of their CO2 levels.

A C02 drop checker is one of the best way to monitor your CO2 level. We will discuss this further in future articles.

Reference:
http://www.csd.net/~cgadd/aqua/art_plant_co2chart.htm



Aquascape In Focus

Shimmering Hill

An Int

S

erview with Jeff Pogrob

When we asked Jeff Pogrob what's the key to having a successful planted aquarium. He told us we need three things. A Vision, plant knowledge, and a diverse inventory. Well, from the looks of his current aquascape, Jeff certainly had all three of those tools when he created this month's Aquascaping in Focus, *Shimmering Hills.* As we take a closer look at his aquascape, Jeff shares with us some of his aquascaping philosophies and past aquascapes.

Jeff Pogrob sits proudly next his aquascape, *Shimmering Hills*.

Q: Hi Jeff, before we get into your aquascape, please tell us a little about yourself.

A: I'm 45 years old, live in New York and have a very, very understanding family who allow me to have fun with this hobby. I always enjoyed keeping fish as a kid and although there might have been a few plants in the tank, it was the fish that were the primary focus. The plants or shall we say the "scape" were secondary. I really hadn't keep a fish tank in probably 20 years until I was influenced by seeing pictures of Takashi Amano's Aquascapes in the his Nature Aquarium World books. I was amazed that a "fish tank" could be transformed into a beautiful slice of nature, and it renewed my interest in the hobby.

Q: Since you saw Amano's aquascapes first are you more interested in Nature Style Aquariums?

A: I don't really favor one style or another. I can appreciate an Iwagumi scape as much as a lush forest type layout. I do like aquascapes that feature a good amount of hardscape.

Q: Where do you find your aquascaping inspiration?

A: I'm inspired by many different types of nature scenes. It really could be a famous vista or simply a small meadow that happens to have interesting character. Most of the time the inspiration is just exactly that: an inspiration. The initial design of an aquascape takes on a different look once I get a feel for the space and layout of the aquarium. Over the long haul of the aquascape, it's really a trial and error thing until the scape feels right. As I mentioned before, one of my original inspiring aquascapers was Takashi Amano. Another name that comes to mind would be Oliver Knott.

Q: Let's talk about your scape, Shimmering Hills. How did you develop this layout?

A: One of the most interesting things about this aquascape is the use of Boblitis heudelotii in such a small space. The three

The pearling oxygen bubbles from the Peacock moss in this ADA Mini-S often sparkles under the light inspiring the "shimmering" title of the aquascape.

plants used have completely different leaf patterns and growing habits. This combined with the rocks gives the tank a lot of contrast, but also keeps it very blissful with just shades of green and stone.

The title of the scape, *Shimmering Hills* was derived from the way the moss looks as it grows (and sometimes pearls) against the lava rocks.

Q: How did you choose your plant species and fish for this particular scape?

A: For this particular scape, due to its size it was going to house shrimp so deciding what fauna was going in the tank was easy. Based on what I had available I went with Cherry Shrimp. I definitely go by feel more than anything else and what I types of plants I can get my hands on. I do kind a think almost any plant species can fit any tank if it's arranged and trimmed properly.

Q: What does it take to maintain your layout?

A: Maintenance consists of 50% water change weekly. During the water change I dose dry ferts Macros (NPK) and I use Liquid Flourish for Micros. Trimming is as needed for the moss and other plants. These little scapes are great, since a 10 minute clean-up here and there usually does the trick. This tank is sourced by soft tap water.

Q: Jeff, you maintain your tank very well. I can't even see a spot of algae. Did you have any algae problems?

A: The only real algae that develops in this tank is on the glass and rocks, which is quickly remedied during one of the 10-minute clean-ups. For me I've always been successful in combating algae by defending the tank on several fronts. I recommend keeping as large a bio-filter as possible (both in the tank and in the filter). Also try to limit amount of fauna and instead maximize flora mass. Keeping up with water, filter media changes, and of course having limited light duration are important elements to having an algae free tank.

At startup I think it's essential to assist the stagnant plants and immature bio-filter by using organic removal products like carbon, Seachem Purigen, and keeping the photoperiod duration to around 6 to 7 hour. Increase the lighting time as the tank matures. If one does all these things, I believe algae issue will be kept to a minimum.

Q: What's the secret to being a successful aquascaper?

A: I've always thought there were three things you need to be a successful aquascaper: Vision, plant knowledge and inventory. Vision and plant knowledge are pretty obvious, but inventory can not be discounted. The more rocks, wood you have on hand the easier it is to make them work. It's much harder for example to create an Iwagumi style scape if you only have three rocks to work with.

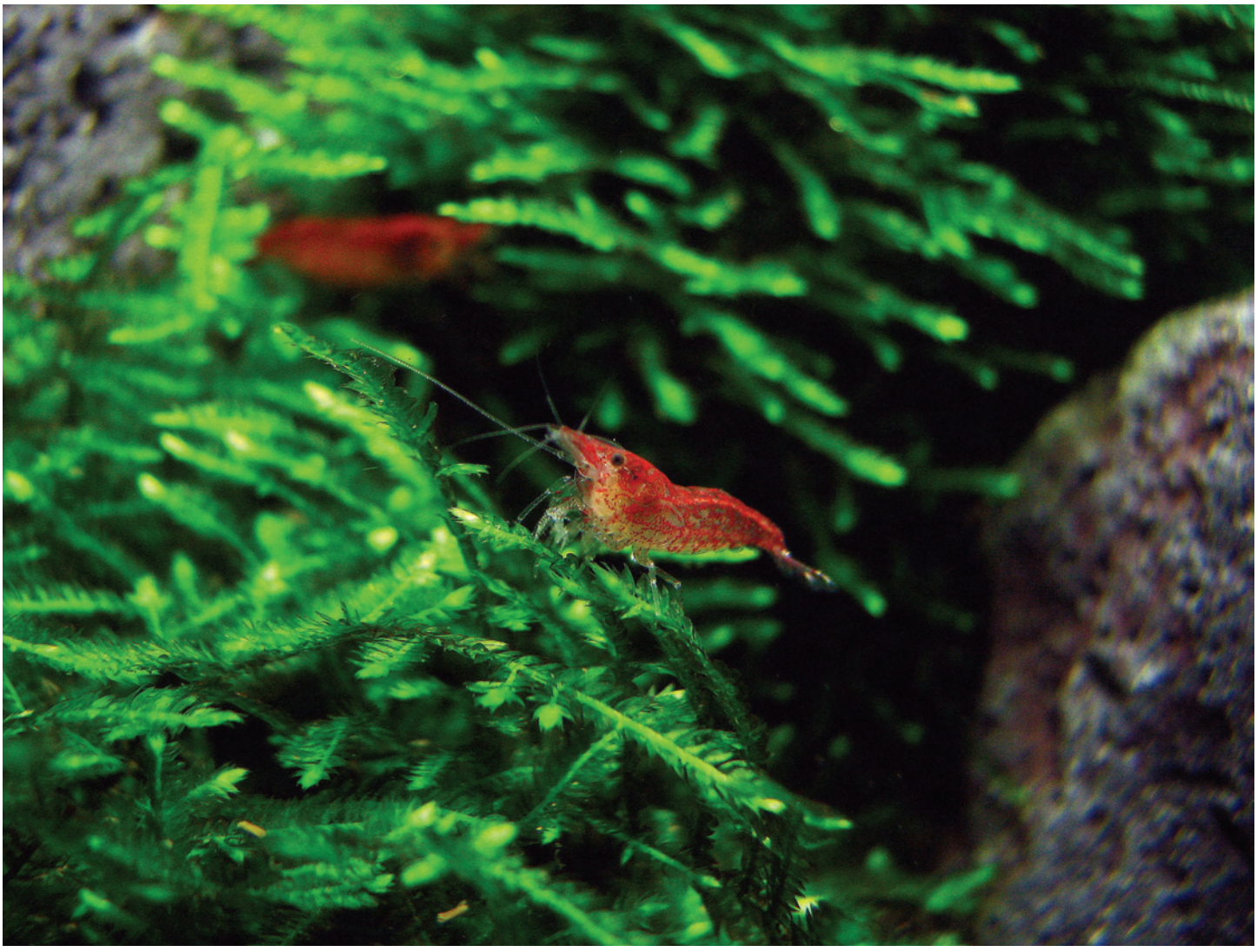
Q: Do you have a favourite aquascape?

A: One of my favorites, which I consider my first real aquascape where everything came together was *Petrified Valley*. As I mentioned I like a lot of hardscape and with this tank the hardscape was front and center literally. The tank was created in early 2007 and was the Tank of the Month for June on Aquatic Plant Central.

Q: Where is the future of planted aquariums headed in the United States?

A: I actually think the future for planted tanks is pretty bright in the US. I do think from my experiences that most still look at an aquarium as a place to house fish and not as an aquascape or do I say a piece of art. So it's no coincidence when looking at the high-end of the hobby most expenditure is on saltwater because of the fish.

Takashi Amano's influence, through his books and feature articles in main stream aquarium



A Red Cherry Shrimp balances on a frond of Peacock moss.

magazines, should definitely help to expand the planted tank end of the hobby. More distributors/ retailers will provide specific plant products on the shelves of local fish stores as the hobby grows.

In terms of American style, I don't know if that has come about yet in the same way the Dutch style developed and the Iwagumi style. But I won't be surprised if we see contest entries in the near future that state "American Style".

Q: Where would you like to see the hobby go?

A: I would like to see the planted tank hobby get to a point where someone who sees one of my scapes, refers to it has "Nice Scape" and not "That's a hell of a fish tank". I think once that happens the hobby has truly arrived.

Q: With this layout complete, what will you be doing next?

A: In terms of my future, I look forward to creating more scapes. I'm always looking for something that will be truly unique. Not sure what aquascape I will do next, but I'll definitely need vision, plant knowledge and the inventory to get it done.

Layers of Peacock moss form fluffy mounds and hills around the rocks.

Petrified Valley

Dimensions: 48" x 18" x 23"
Volume: AGA 72 Gallons
Light: 196 Compact Fluorescent Lighting
Photoperiod: 10 hours
Substrate: Carbisea Eco Complete
CO2: Pressurized CO2 with Glass diffuser

Plant List
Riccia fluitans,
Ludwigia repens x L. arcuata
Hemianthus callitrichoides
Rotala rotundifolia
Limnophila aromatic
Cryptocoryne wendtii Bronze
Hygrophila difformis

Fauna
Paracheirodon axelrodi
Hemigrammus rodwayi
Otocinclus affinis
Neocaridina denticulata sinensis
Caridina Multidentata

Shimmer Hills

Dimensions: 31x18x 24cm ADA Mini S
Volume: 0.8 liters
Light: Coralife Mini 2x9w 6700K
Photoperiod: 10 hours
Substrate: ADA Aquasoil II
Filtration: Eheim 2213
Fertilizer: Dry fertilizers NPK and Seachem Flourish once weekly
CO2: DIY Yeast CO2 with glass diffuser

Plant List
Taxiphyllum sp. "Peacock"
Boblitis heudelotii
Cyperus helferi

Fauna
Neocaridina denticulata sinensis

Venue: Midvalley Convention Centre Hall 3: Kuala Lumpur, Mala

Malaysian Aquascaping Cl
Nano Tank Competition 20

by Stan Chung

Jason Pang (MAC committee) having a quiet moment.

Great prizes thanks to our sponsors!

A little introduction of our club-**MAC**, it was formed unofficially in 2006 as a forum based club at **www.my-mac.net**. Our goal at the time was simple, get as many aquascaping crazy people together as possible!

What started as a handful of members has now picked up steadily with more than a hundred active members. Looking back, I think we have been lucky to have the continuing support of our sponsors who have helped us keep the site running and allow us to organize some competitions. The 1st was with East Aqua Studios and **ACT-Aquatic Creation Technologies** also known as **ADA Malaysia**.

The 1st competition was very challenging and took us more than 3 months to organize. This one took us a little over a month, and although it was short notice, we pulled it off by keeping the rules simple. **No bigger than 18" cube nature style aquascaped tank!**

1st - Nasir Abas

So anybody who had a ready tank at home could bring it over and have a go! No entry fees plus lots of goodies from our sponsors, **EA Studios, ACT and Advance Reef-distributors of Seachem in Malaysia.**

We decided that with so little could put in more than one only win one prize. Luckily we clause in or else our **chan Abas** would have walked a the 3rd prize as well!

Judges LC Chan, Kenny, Alex and Yee together with Nasir and yours truly.

aysia

lub

008

certificates for the participants

a school of ember tetra brighten up the scape and sets off a nice contrast with the bright green of the grass.

time, you
entry but
e had that
mp Nasir
way with

2nd-Stan Chung

3rd-Steve Yong

The 1st placed tank look stunning in person as the grass looked in perfect condition and contrasted well with the nicely textured rock. 2nd place was won by yours truly for my last minute put together effort. Not an excuse but I've never kept a nano tank, much prefering larger setups! **3rd place** was won by **Steve Yong** with a nice rock and wood design.

The judges said it was close between the top three scores and the decider being the category- '**aquatic plants condition'.**

After all the spoils have been divided, I would like to thank all our judges and sponsors including **Daisy and from Advance Reef** who could not make it for the prize presentation. Special thanks to the organizers of the event- **Jonathan Kan-FEM-Fairs and Events Management**, and **Pet World 2008** for sponsoring the show.

No rest for us as we prepare for the biggest Aquatic show in Malaysia in November 20-23, **Aquafair 2008**, it'll be more than nano tanks!

ng/Stan Chung


Photo Courtesy of
http://cccmkc.edu.hk/~kei-kph/Hydrophyte/hydrophyte.htm

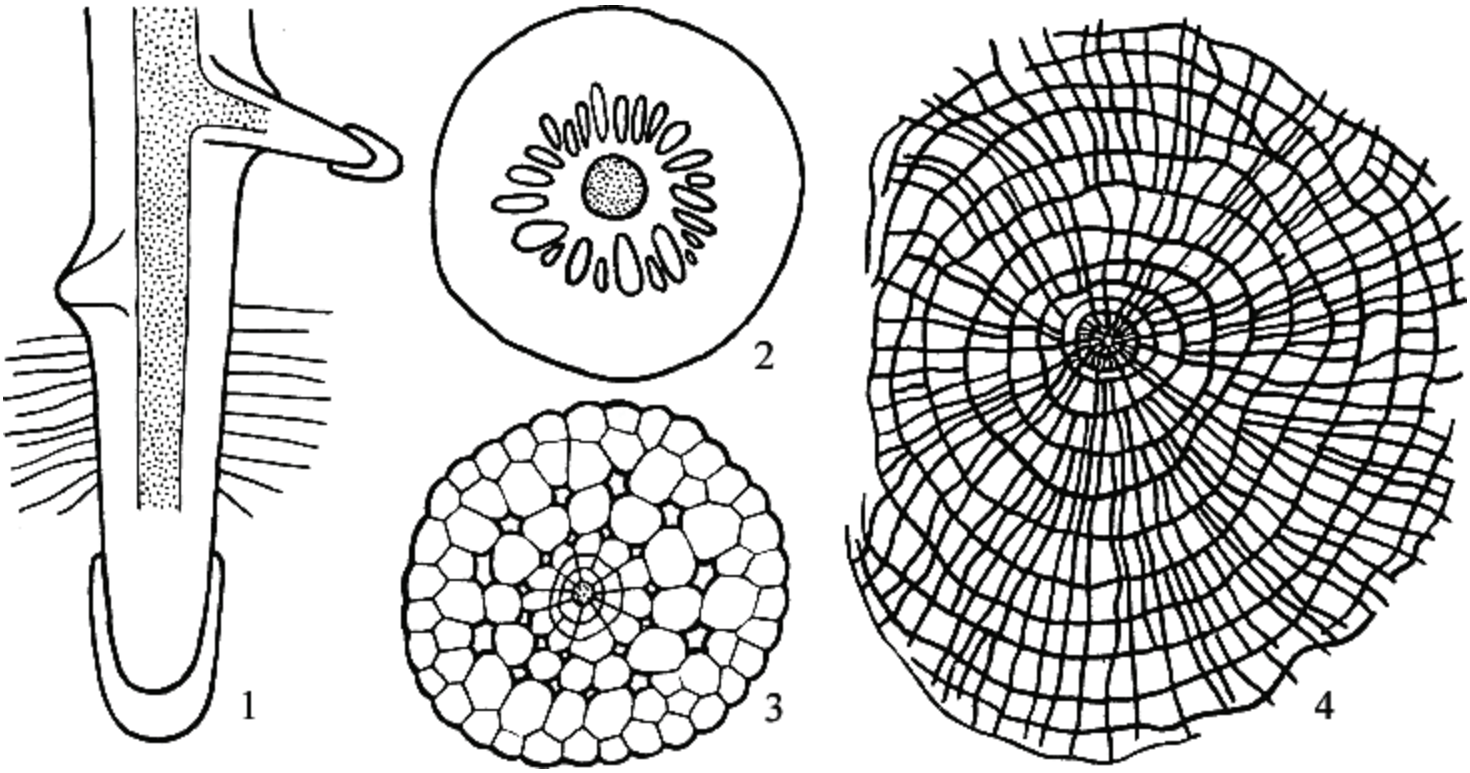
Aquatic Plant Anatomy Part III *Examining the Root*

By Freemann

Tiny root hairs help aquatic plants absorb essential nutrients and anchor them into the substrate of a planted aquarium.

In our previous examination of Aquatic Plant Anatomy we took a look at the stem and leaf. In this third installment of Aquatic Plant Anatomy I am introducing the root.

Although the root is axial in construction it lacks the leaves of the shoot axis. Generally, roots develop in the soil, but they may also form in the water and in the air. Roots not only absorb water and minerals; they also provide the plants with firm anchorage in the soil. Occasionally the roots



Ill.1 Structure of the Root

1. Schematic diagram of longitudinal section through a young root with root cap, area of root hair and beginning lateral root formation,
2. Schematic diagram of a cross section of a root of *Stratiotes Aloides,*
3. Cross section of root of *Vallisneria spiralis,* cellular, showing reduced central vascular strand,
4. Cross section of a respiratory root of *Ludwigia adscendens,* cellular, showing highly developed aeration tissue

take over the function of a storehouse for nutrients.

When a seed germinates, the primary root or radicle (already present in the embryo) develops first. In a number of dicotyledonous plants the main root throws out subsidiary roots; these branch, become fibrous and eventually form the whole root system. Other dicotyledonous plants develop additional, adventitious roots in the axis of the shoot. Most aquarium plants belong to the latter category. The primary root often dies at a later stage. Monocotyledons always have a short-lived primary root which is replaced by adventitious roots. Ferns have adventitious roots only.

For the aquarist, it is invaluable that the plants have the habit of forming adventitious roots. Thus various methods of asexual propagation are possible, e.g. the use of cuttings for growing new plants. All roots growing from newly planted rhizomes or nodules develop adventitious roots. Buds form on the roots of some plants, e.g. *Microsorium* and may develop into adventitious plants.

The root grows by means of a vegetation cone protected by a special covering—the root cap (Il. 1). The younger sections of the root are enclosed by a one-layered rhizodermis (epidermis of the root). It differs from the epidermis of the shoot axis and the leaves in that it has very thin cell walls and lacks a cuticular layer as well as any stomates. Slightly behind the vegetation cone root hairs develop; they embed themselves in the soil surrounding them and support water and mineral absorption.

Rhizodermis and root hairs die at a fairly early stage to be replaced by a cortical layer formed from cells which have become suberose. The cortical layer consists predominantly of fundamental tissue cells; in marsh and aquatic plants it may be crossed by ventilation ducts (Ill. 1.2).

The skin of the vertically upwards-growing respiratory roots of many *Ludwigia* species is made up almost entirely of spongy respiratory tissue (Ill. 1.4). In addition, central cylinder is situated immediately below the epidermis of the root. Lateral roots form in the outermost layer of cells of the central cylinder and branch off. Thus, they develop in direct contrast to lateral shoots, lateral roots having to push their way through the epidermis of the root (Ill. 1). The central cylinder is mainly composed of the vascular bundle of the root system. . It may be very reduced in plants with a permanently submerged habit (Ill. 1).

Some aquatic plants, e.g. *Ceratophyllum*, *Utricularia* and *Wolffia* are rootless.

Terminology

- **Radicle**: The first part of a seedling (a growing plant embryo) to emerge from the seed during the process of germination. The radicle is the embryonic root of the plant, and grows downward in the soil
- **Adventitious roots**: A root that grows from somewhere other than the primary root, for example, roots that arise from stems or leaves.
- **Cuticular layer**: Waxy covering produced by the epidermal cells of leaves, young shoots and all other aerial plant organs
- **Suberose**: Having the appearance of being gnawed
- **Rhizome**: Horizontal stem of a plant that is usually found underground, often sending out roots and shoots from its nodes
- **Adventitious**: Growing from an unusual part of the plant

www.aquascapingworld.com