

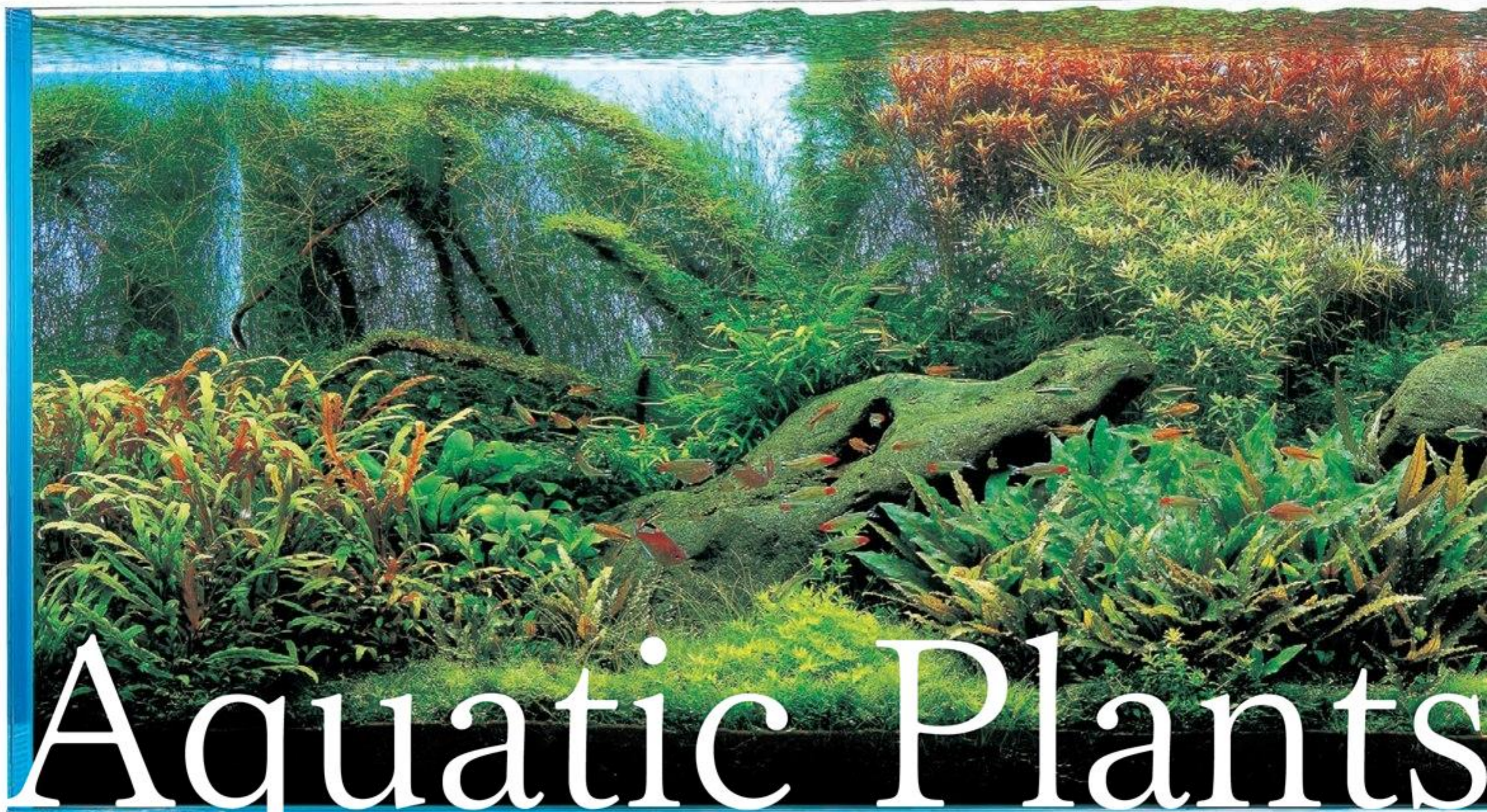
Nature Aquarium information magazine

AQUA JOURNAL



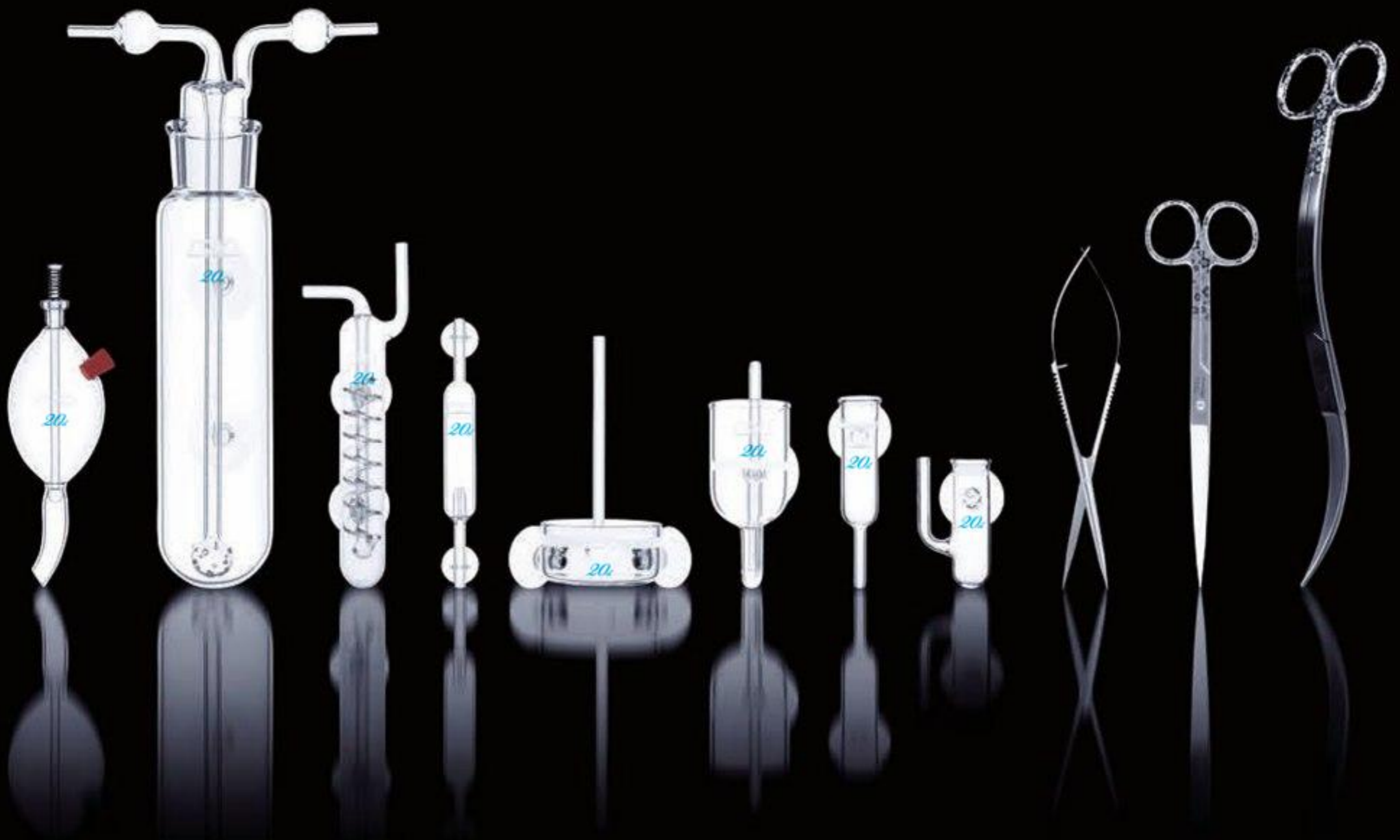
Special Feature

A Master of



Aquatic Plants

Passion Ignites Enjoyment of the Hobby
ADA PREMIUM



AQUA DESIGN AMANO The 20th ANNIVERSARY PRODUCTS





ADA products were born from actual hands-on experience with Nature Aquarium. “ADA-ism” is a reflection of our passion for product originality and has been proven through our product designs and high quality standard. For this reason, every single ADA product is a masterpiece that we proudly deliver to all of our loyal customers. With our 20th Anniversary, we are extremely excited to announce the release of “Anniversary Premium Goods,” as part of the celebration.

ADA Anniversary Premium Goods - Coming soon to your aquarium.

ADA's 20th Anniversary Pamphlet is now available in stores world wide. Please check your local ADA registered stores and distributors to get your copy! *Limited quantities available, so please act quickly.



ハクレンの卵を盗むのは違法行為です。
お見物の際はご注意ください。





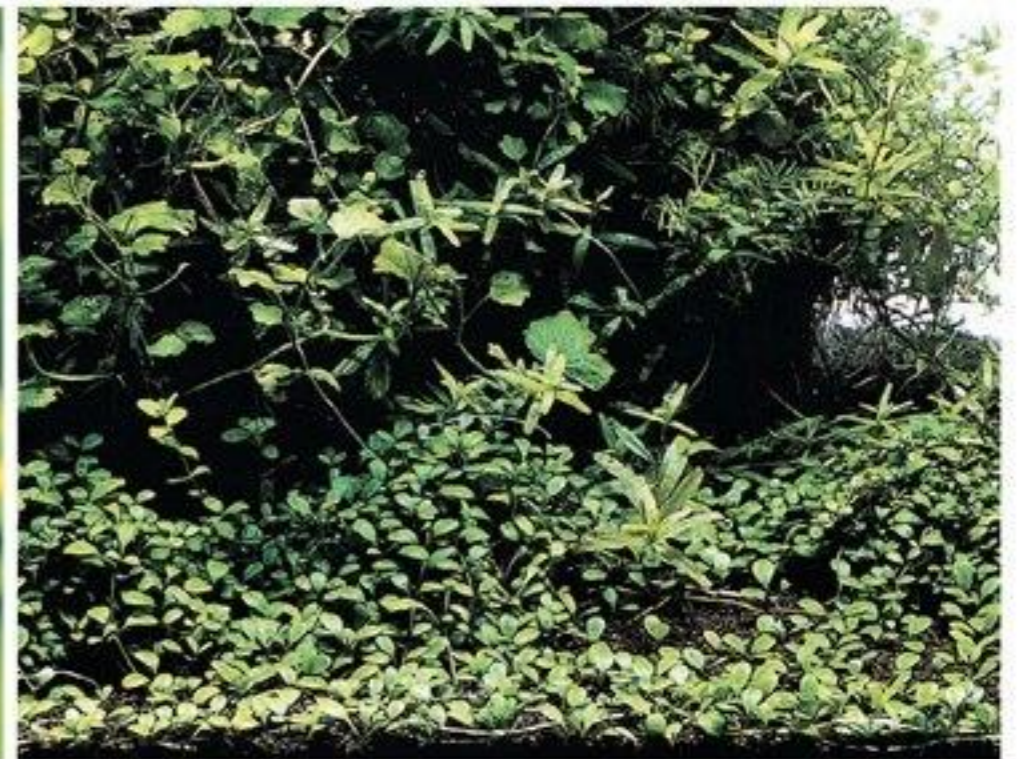
The newly released Super Luminosity LED Lamp capable of nurturing aquatic plants.



Brings an open feeling to the view of emersed-grown leaves.



Encourages photosynthesis with its high luminosity.



Develops sturdy undergrowth plants.

LED Lighting System for aquatic plants

AQUASKY

AQUASKY is a LED lighting system specifically designed for aquatic plant layouts in nano-size aquariums.

Whereas this product provides enough light intensity for plant growth, it requires less power consumption improving cost performance.

The slim lighting unit has a high radiation performance and its clear stand provides an open feeling to the top of the aquarium.

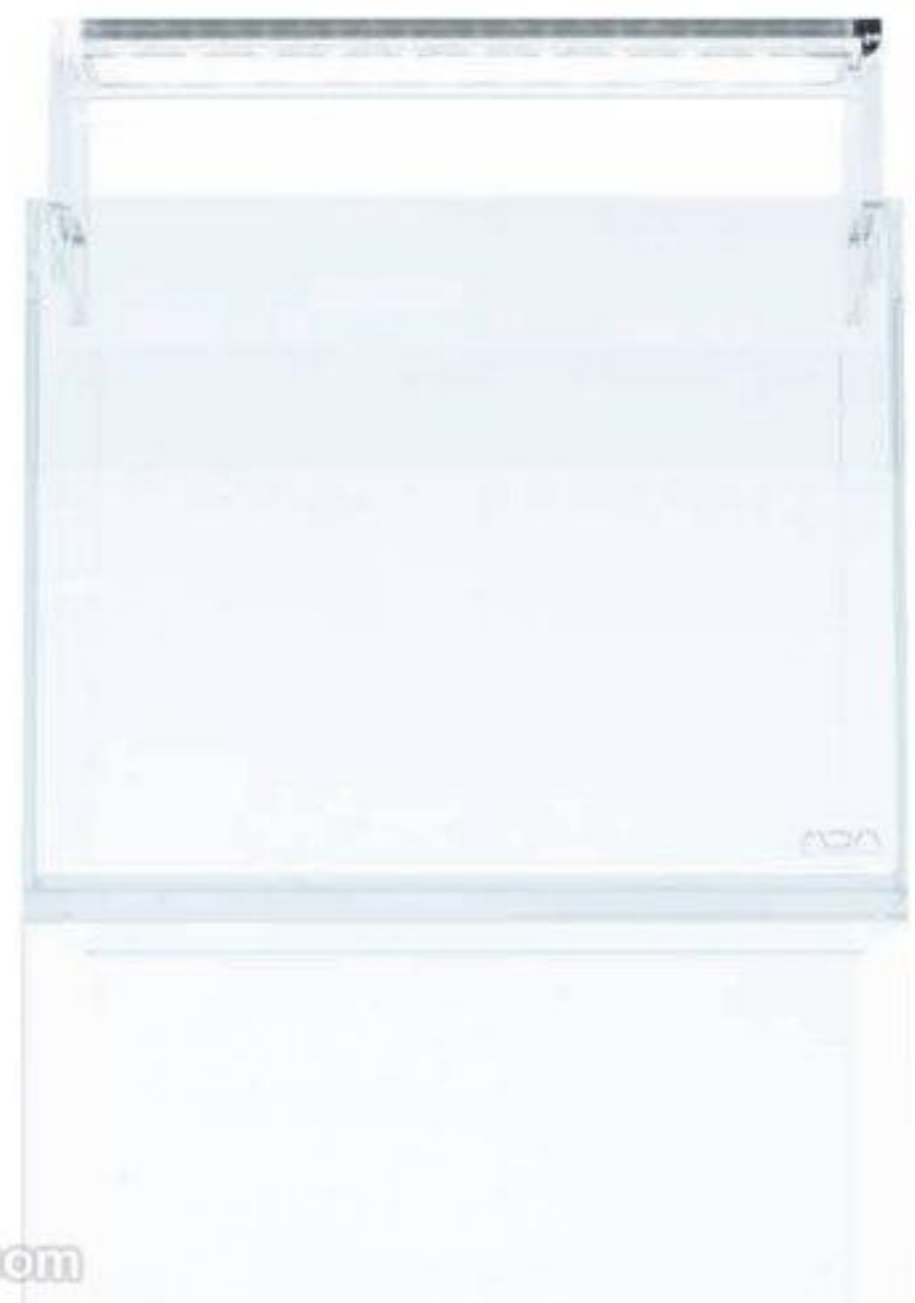
■ Light housing unit size: W280mm x D68mm x H9mm
 ■ Clear stand size: W300mm x D100mm x H95mm (for aquarium 30cm in width) / W360mm x D100 x H95mm (for aquarium 36cm in width)
 This product is compatible with Cube Garden / Cube Glass 30cm in width or 36cm (or with frameless aquarium tank of the size).
 Product specification / Input voltage: AC100 - 240V 50/60Hz / Power consumption: 17W /
 Current consumption: 0.4A / Color temperature: 7,000K - 8,000K / LED: 1xT0.4Wx30

Coming in June

*Photo is for image only. This product has a power supply cord on the side.



<http://www.adana.co.jp>





Pelicans in the Big City (Ikebukuro, Tokyo, Japan)

This is a picture of the pelican show organized by Sunshine Aquarium that was taken with an ultra wide-angle lens. The spectators are curiously watching the pelicans eat their food. I feel intrigued to see the mismatch of pelicans in Ikebukuro, the heart of metropolitan Tokyo.

Shooting data /Leica M7, Ultra Wide-Heliar 12mm, 1/125 at f5.6 (+1 EV), Velvia 100F
Text and photographs by Takashi Amano

AQUA JOURNAL

MAY 2012

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NA Layout Seminar ~Questions and Answers~



Special Feature

A Master of Aquatic Plants



It is crucial to know the main features and characteristics of aquatic plants in order to figure out the best layout composition and to create a beautiful and harmoniously-balanced Nature Aquarium.

Among the numerous species of aquatic plants available in aquarium shops today, the Aqua Journal Editorial Team have selected an essential aquatic plant lineup of 123 species. Master these aquatic plants to become a true Nature Aquarium expert!

Photographs by Takashi Amano

Text by Masatoshi Abe / Tsuyoshi Oiwa

Translation support by Laura Findley

How to Read the List



Cobra grass (New Zealand)

Lilaeopsis novaezealandiae

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Foreground

This species tends to grow taller than *Lilaeopsis brasiliensis*. Its dense leaves with aligned leaf tips look splendid, but it takes a long time to achieve it. Being slow growing, it is easy to maintain its good appearance. It is prone to damage from algae. The leaves heavily contaminated by algae should be trimmed off as early as possible.

Name

The common/commercial name is mentioned first.

pH

The optimal pH level for growth of the plant (intended as a guide only):

- Acidic: pH6 or below
- Mildly acidic: pH6-7
- Mildly alkaline: pH7-7.5

Hardness

The optimal TH level of water for growth of the plant (intended as a guide only):

- Soft water: TH20mg/ℓ or below
- Medium hard water: TH50 - 100mg/ℓ
- Hard water: TH100mg/ℓ and above

Light

The optimal light intensity for growth of the plants (intended as a guide only). This is based on a W60 X D30 X H36 (cm) tank, which is a very popular size.

- High: Three or more units of NA Lamp 20W
- Medium: Two units of NA Lamp 20W
- Low: One unit of NA Lamp 20W

CO₂

The optimal CO₂ injection amount for growth of the plants (intended as a guide only). This is based on a W60 X D30 X H36 (cm) tank, which is a very popular size.

- High: Three bubbles per second with CO₂ Glass Counter
- Medium: Two bubbles per second with CO₂ Glass Counter
- Low: One bubble per second with CO₂ Glass Counter

Planting

In a Nature Aquarium, the most suitable location for each type of plant is determined by the plant's height and characteristics:

- Foreground: Front side of the layout or on the substrate (foreground plant)
- Mid-ground: On top or at the side of the layout materials (such as stones and driftwood)
- Background: Back side of the layout



CLUB
MEDAKA NO GAKKOU

Becoming a Master of Aquatic Plants

“MEDAKA NO GAKKOU” NA Layout Seminar

“Medaka no Gakkou” seminar was held with 31 participants from ADA authorized dealers from all over Japan.

All the participants are aquarium professionals, yet they are still working very hard daily to brush up on their skills and expertise in the planted aquarium.

Their passion and enthusiasm was clearly visible at this seminar.



A: Participants planting the aquatic plants with the instructions of Takashi Amano



B: Riccia was attached to Riccia Stones by all the participants first thing in the morning.



C: Quick and careful preparation of foreground plants – this is the professional work!



The participants pay a great deal of attention to how Amano makes a composition using the driftwood that is apparently difficult to use for a layout. The woman sitting in the front row chose the driftwood.



Break the wood into several pieces of appropriate lengths and join them with Wood Tight. Amano has quite a plan!

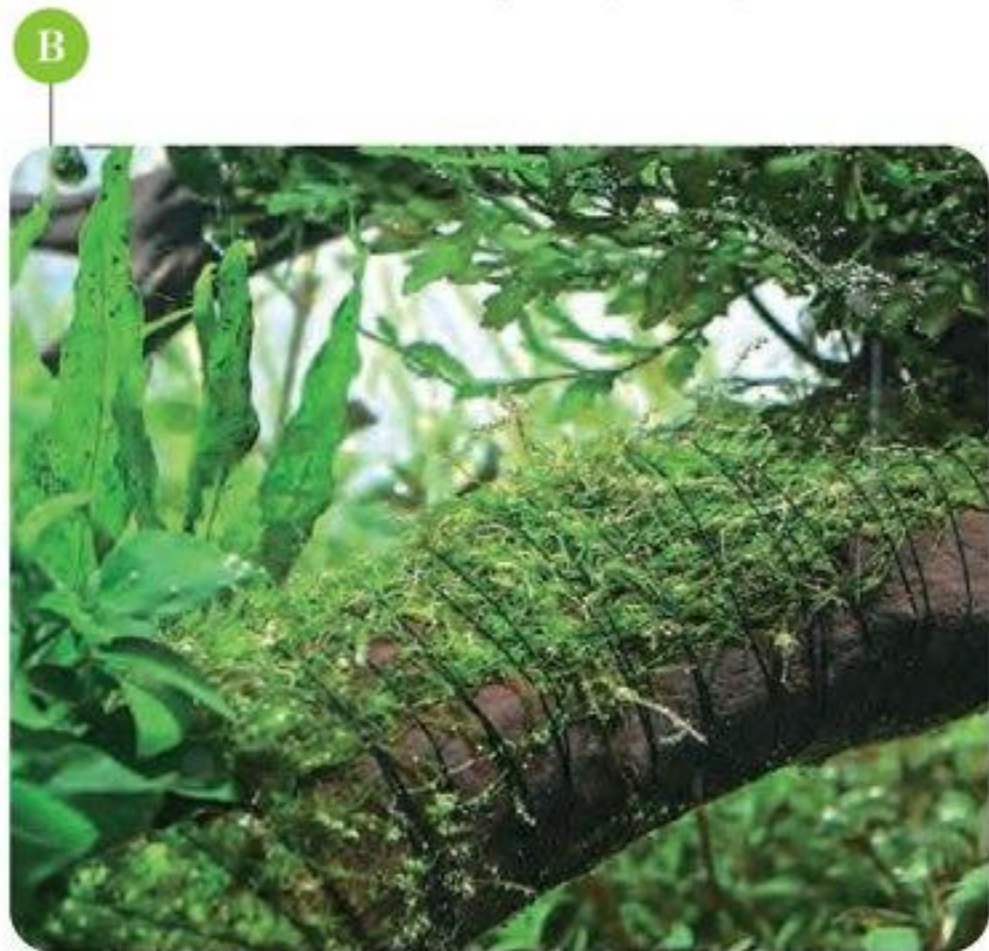
After thinking for a while, Amano suddenly started breaking the driftwood in half. What a bold and flexible idea it was!

1
Size : W90×D45×H45 (cm)
Concealing the Joints of Unattractive Driftwoods with Moss and Ferns

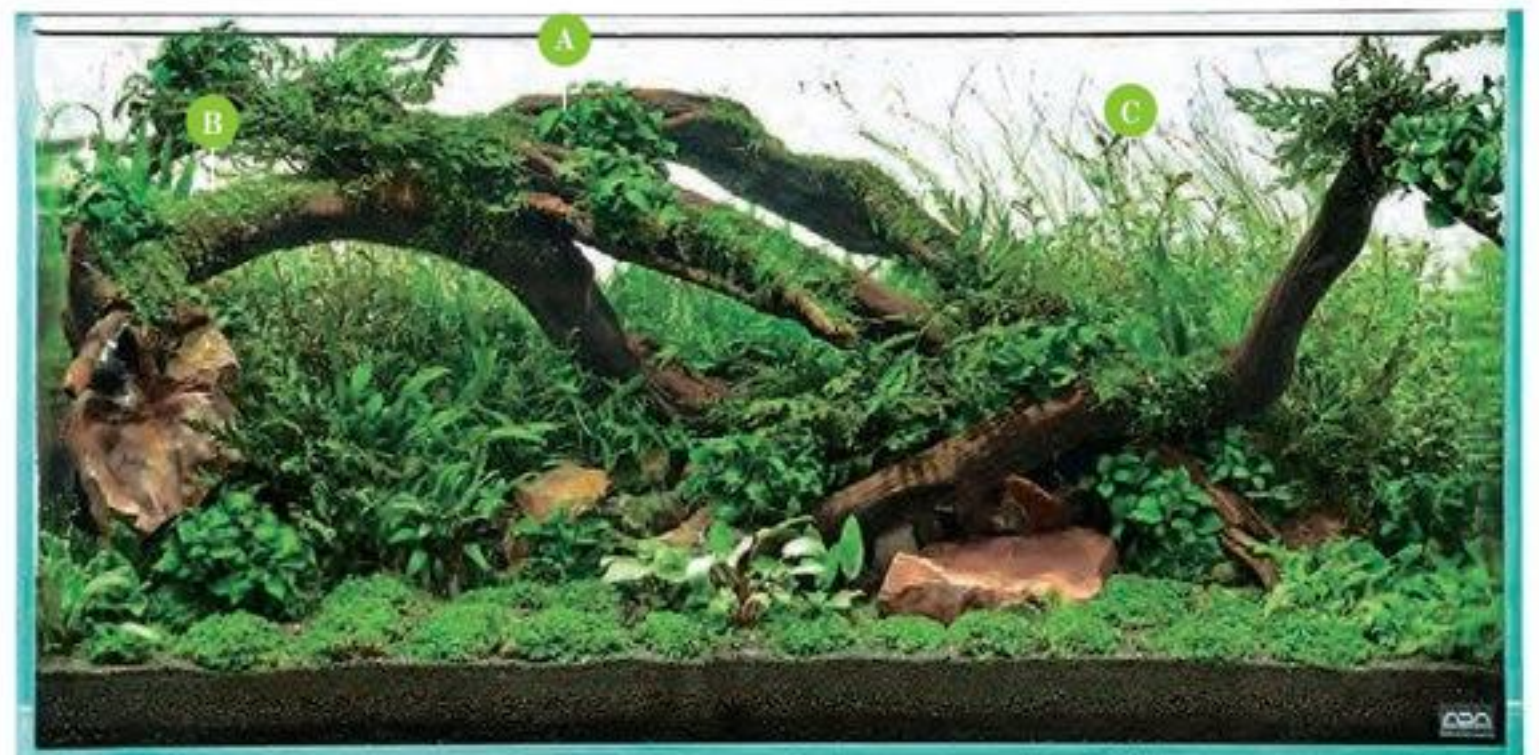


The broken driftwood pieces were joined with Wood Tight. The joints can be concealed and made invisible by covering them with willow moss. Epiphytic aquatic plants were also attached to the driftwood.

In response to a casual request by a participant, Takashi Amano began making the first layout of the day using a piece of driftwood that had such an unattractive shape that you would usually expect it to remain unsold. How did Mr. Amano use the rod-like piece of driftwood chosen by the participant?



Mixing Willow Moss with some Riccia adds depth to the moss grown on the driftwood.



Plants DATA

- Wabi-Kusa Hemianthus callitrichoides "Cuba"
- Cryptocoryne wendtii (Green)
- Cryptocoryne wendtii (Brown)
- Cryptocoryne petchii
- Lilaeopsis brasiliensis
- Bolbitis heudelotii
- Anubias barteri var.nana "Petit"
- Microsorium sp. (Semi Narrow)
- Wabi-Kusa Stem plant mix
- Eleocharis vivipara
- Fontinalis antipyretica
- Riccia fluitans



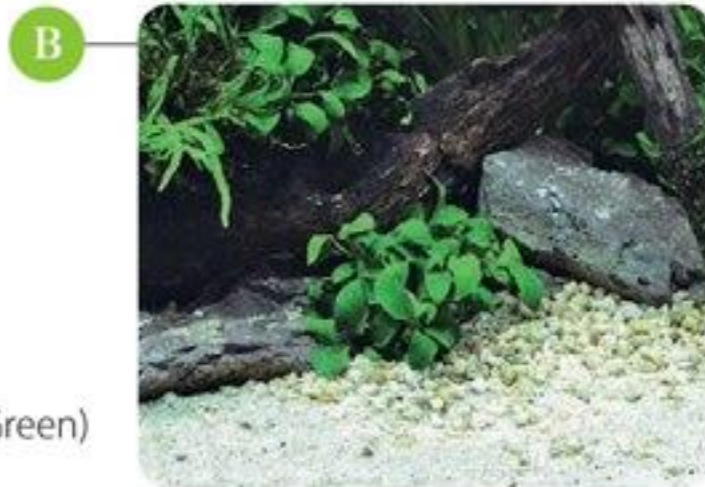
Eleocharis vivipara was planted behind the stem plants so that the beautiful aquascape can be maintained even after the stem plants are trimmed later on.



A symmetrical composition is purposely produced so that the open space in the center created by the arch of the driftwood can be highlighted effectively. Creation of such an open space has an effect of attracting the viewers' eyes to the center of the layout.

Plants DATA

- Cryptocoryne albida
- Microsorium sp. Trident Leaf
- Anubias barteri var.nana "Petit"
- Fantinalis antipyretica
- Vallisneria nana
- Cryptocoryne balansae
- Cyperus helferi
- Crinum calamistratum
- Ludwigia glandulosa
- Myriophyllum mattogrossense(Green)
- Rotala sp. "Vietnam"
- Ludwigia brevipes



Some La Plata Sand Big was sprinkled to make the boundary of the cosmetic sand less distinct and more natural.



Epiphytic plants were used to create a link between the driftwood and stone. These plants will become more stable once they take root.



Four types of aquatic plants are mixed for this layout. Their dominance will vary depending on the growth rate of each plant and this helps to enhance the natural ambience of the layout.

2

Size : W180×D60×H60 (cm)

A symmetrical composition was made to highlight the center area.



New Wabi-Kusa Utricularia graminifolia was unveiled.

Wabi-Kusa is effective even for these locations with only a thin layer of substrate.



- Plants DATA**
- Riccia fluitans
 - Glossostigma elatinoides
 - Wabi-Kusa Utricularia graminifolia (Sample item)
 - Eleocharis acicularis

3

Size : W180×D60×H60 (cm)

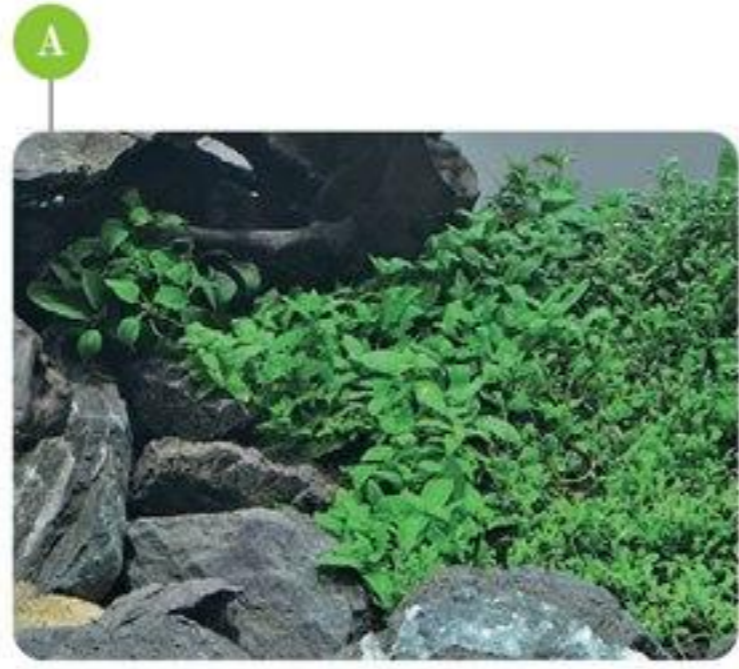
Using Wabi-Kusa on the slopes where the substrate is very thin and easily crumbles is a very effective method.

Sozo Haishoku was made for this Iwagumi layout where only aquatic plants were replaced while the stone arrangement remained unchanged. The substrate was elevated by a mound of soil, but there is no concern about crumbling of the substrate if Wabi-Kusa is used.



It is a good idea to use Wabi-Kusa just for the slopes and the locations where planting seems to be hard.

A natural flow is visually felt by this planting pattern consisting of Glossostigma, Staurogyne and Anubias.



4
Size : W120×D45×H60 (cm)
Layout technique using only a small amount of aquatic plants



Anubias nana "Petit" having small leaves is placed between the driftwood and stones.

In response to the request for Mr Amano to use only a small number of aquatic plants, Amano produced a cosmetic sand layout using Colorado sand. Stones were used to suppress the initial buoyancy of the Branch Wood.

※ Wabi-Kusa Hygrophila pinnatifida is placed at the base of the driftwood in the background.

Plants DATA

- Glossostigma elatinoides
- Staurogyne repens
- Anubias barteri var.nana "Petit"
- Wabi-Kusa Hygrophila pinnatifida (Sample Item)

5
Size : W180×D60×H60 (cm)
Cobra Grass was planted in locations with poor lighting.



This is a unique technique using Unzan stone and Wabi-Kusa. Hygrophila pinnatifida takes root in the stone.



Mixing of Glossostigma and Riccia is one of the common techniques.

Plants DATA

- Riccia fluitans
- Lilaeopsis brasiliensis
- Glossostigma elatinoides
- Eleocharis acicularis
- Eleocharis vivipara
- Wabi-Kusa Hygrophila pinnatifida (Sample item)

Sozo Haishoku was also made for the layout having the skillfully-balanced stone arrangement consisting of Unzan stones. Amano planted Lilaeopsis in the gap between the two stones in the center, which are the key point of this layout, taking into account that this area has low light levels.

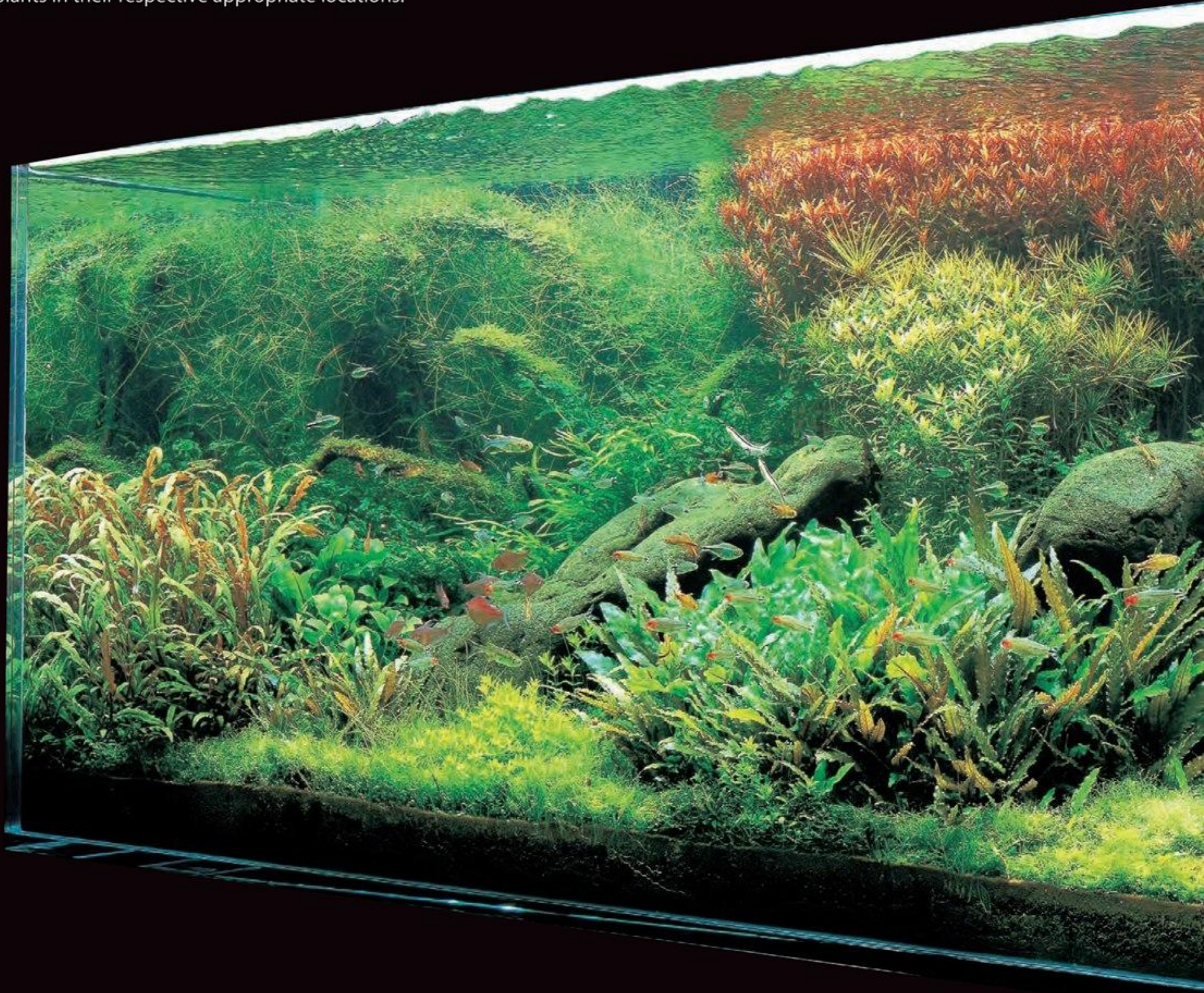


Lilaeopsis which is relatively resistant to low light conditions was planted between two stones.



Layout using Various Species of Aquatic Plants

A whole new way of using composition materials is presented in this layout where Hakkai stones and driftwood are combined. In view of the Hakkai stones' strong presence in the layout, various species of aquatic plants were planted around the stones to provide the plants with an equally impressive presence. Even though each aquatic plant looks uniquely different from each other, a natural ambience is created in the layout by planting these plants in their respective appropriate locations.



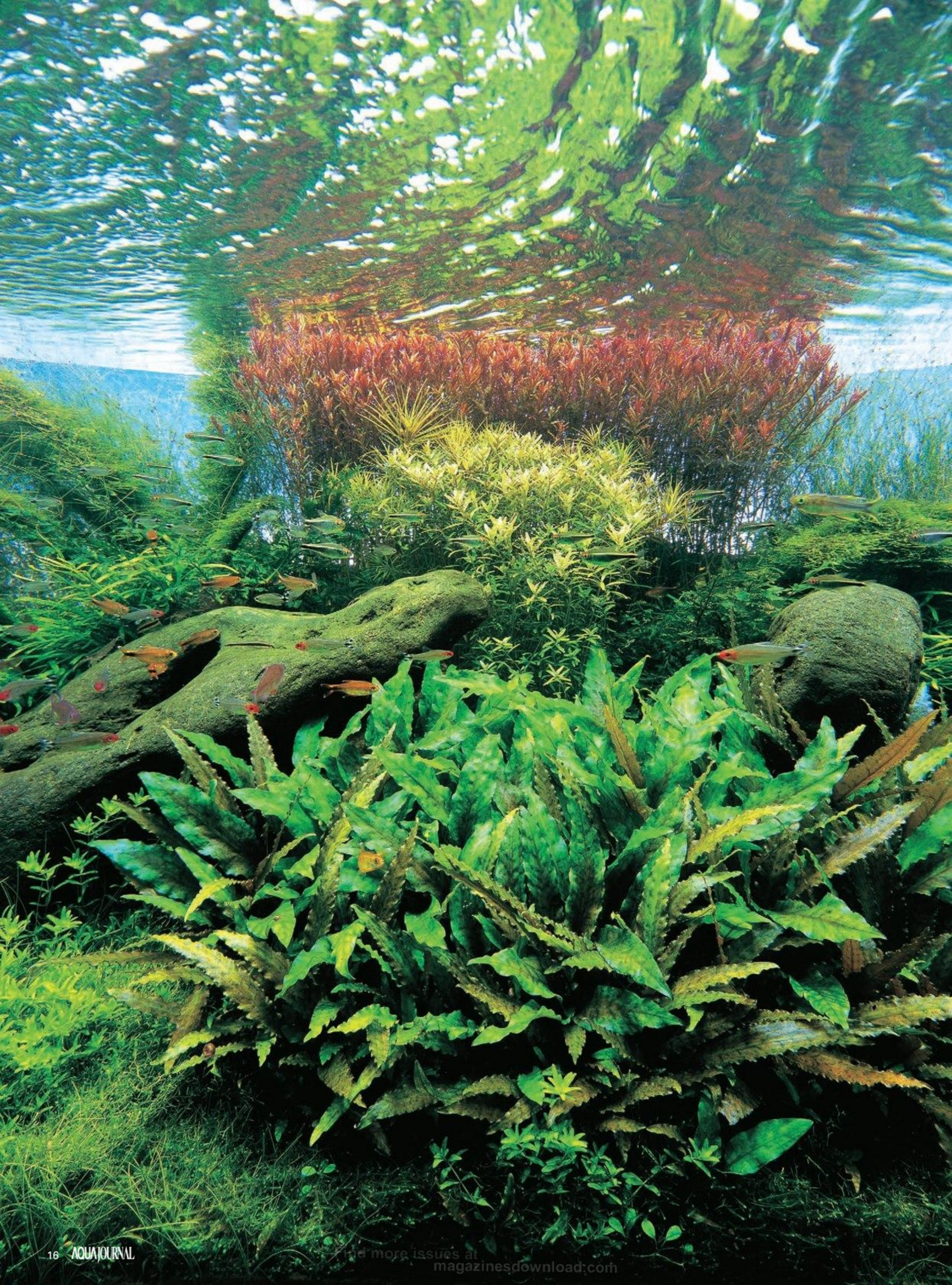
DATA

水槽 / キューブガーデン W180×D60×H60 (cm)
照明 / グランドソーラー-I (NAG-150W-グリーン×1灯、NAランプツイン36W×2灯) ×3基 1日10時間点灯
ろ過 / スーパージェットフィルター ES-2400 (バイオリオL、NAカーボン)
底床 / アクアソイル・アマゾン、パワーサンド・スペシャルL、バクター100、クリアスーパ、ペナックW、ペナックP、トルマリンBC
CO₂ / バレングラス・ビートル500、CO₂ビートルカウンターで1秒に6滴 (タワー使用)
AIR / リリパイプP-6によるエアレーション 夜間消灯時14時間
添加剤 / ブライテック、グリーンブライティSTEP2
換水 / 1週間に1度 1/3

水質 / 水温25°C pH:6.8 TH:20mg/l
水草 / ハイグロフィラ・ピンナティフィダ *Hygrophila pinnatifida*
 ロターラ・インディカ *Rotala rotundifolia*
 セイロンロータラ *Rotala sp. (Ceylon)*
 ポゴステモンsp. "ダッセン" *Pogostemon sp. "Dassen"*
 エレオカリス・ビビパラ *Eleocharis vivipara*
 クリプトコリネ・ベッチィ *Cryptocoryne petchii*
 クリプトコリネ・ウエンティ "リアルグリーン" *Cryptocoryne wendtii "Real Green"*
 クリプトコリネ・アルビダ *Cryptocoryne albida*
 アヌビアス・ナナ *Anubias barteri var. nana*
 ミクロソラム・トライデント *Microsorium sp. (Trident)*
 ボルビティス・ヒュデロッティ *Bolbitis heudelotii*
 ウィローモス *Fontinalis antipyretica*

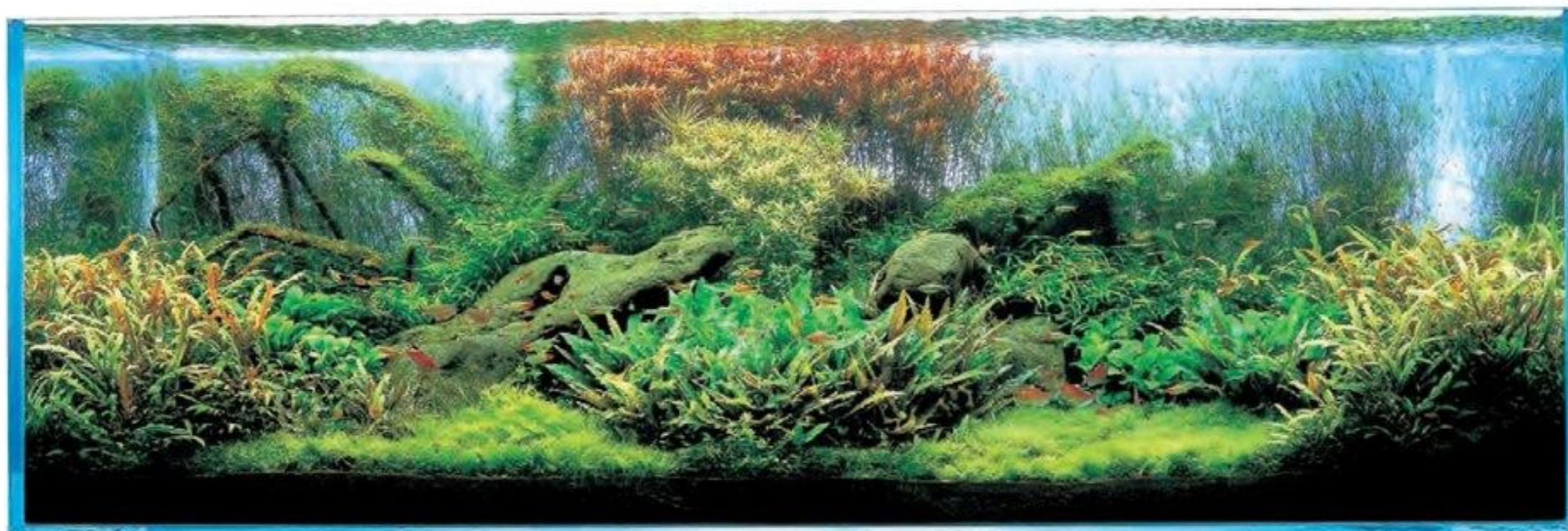
パールグラス *Hemianthus micranthemoides*
 ヘアーグラス *Eleocharis acicularis*
 キューバ・パールグラス *Hemianthus callitrichoides "Cuba"*
 リシア *Riccia fluitans*
魚種 / ダイヤモンド・ベレステトラ *Hyphessobrycon pyrrhonotus*
 ラミーノーズ・テトラ *Hemigrammus bleheri*
 テトラ・オーロ *Hyphessobrycon elachys*
 ハセマニア *Hasemania nana*
 ブラックネオン・テトラ *Hyphessobrycon herbertaxelrodi*
 セレバス・レインボー *Telmatherina ladigesi*
 サイアミーズ・フライングフォックス *Crossocheilus siamensis*
 オトシクルス *Otocinclus sp.*
 ヤマトヌマエビ *Caridina japonica*





Creating Harmony whilst Simultaneously Emphasizing the Uniqueness of Each aquatic plant

This aquascape was created with outstanding skill and a beautiful composition. The layout required careful trimming of the aquatic plants according to their various growth rates to ensure that the aquascape looked attractive over a long period of time. To our dismay, it was decided to have a makeover of this layout during the NA Seminar this year.



Complex yet stable and harmonious layout composition

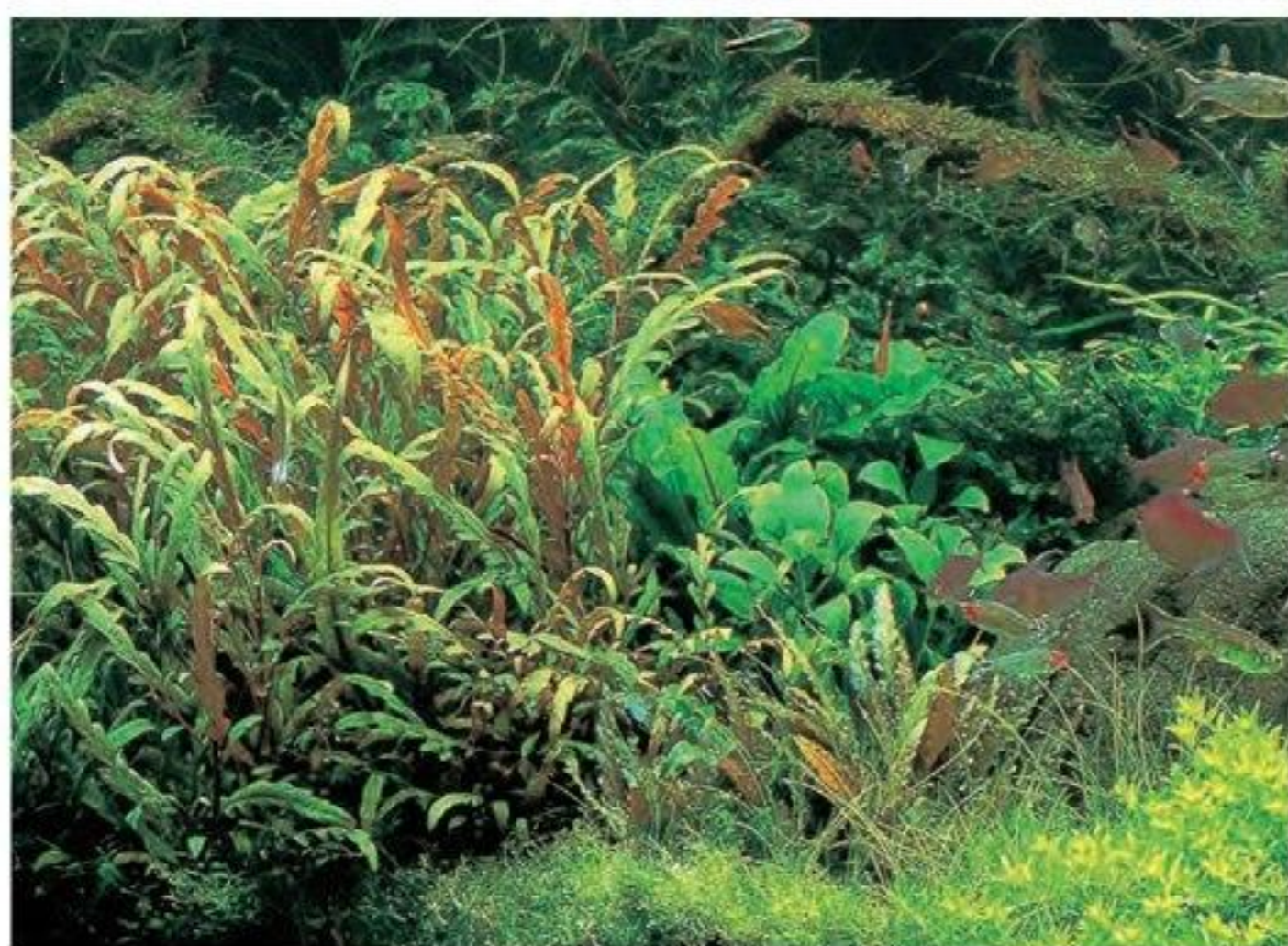


Demolishing starts with cutting of the stem plants.



Layout of the Center and Both Sides

Cryptocoryne planted in the front of the aquascape supports the bold presence of three species of stem plants in the center that serve as the focal point of this layout. A cluster of *Hygrophila pinnatifida* was planted on each side to form a triangle with the stem plants in the center in order to provide stability to the layout.



A: This aquascape consists of three species of stem plants, so it is necessary to take account of the different growth rates of each species when trimming.

B: *Hygrophila pinnatifida* develops large pinnate leaves. It should be pruned often to prevent it from growing excessively large.



Anubias has grown big through long-term care and maintenance.

Aquatic

Plant List

For N A

123 Species

1

Foreground Plants and Their Related Species

Familiarize Yourself with the Characteristics and Features of Each Aquatic Plant, Before Deciding on Layout Composition and Planting Patterns

Currently a variety of aquatic plants are available in the market, some of which are easy to use in a layout while some are not. Even among the aquatic plants that are easy to use for the layout, the suitable tank size and the optimal planting location (foreground, mid-ground or background) vary depending on their characteristics. It is convenient for hobbyists to keep this information in their mind as useful data for aquatic plant layouts.



Dwarf hairgrass

Eleocharis parvula

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Foreground

As can be seen from the fact that Hairgrass grows naturally in a field environment such as a paddy field, fertile substrate and high light are the vital elements for the growth of this plant. Dwarf hairgrass, in particular, grows well under high light conditions. Not all Dwarf hairgrass have a curly leaf tip. Whether the leaf tip is curled or not depends on the farm from which the plant was shipped.



Hairgrass

Eleocharis acicularis

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Foreground

This is one of the aquatic plants that drew renewed attention as a result of the popularization of the Nature Aquarium. If this plant seems too tall for the layout composition, it is possible to keep it relatively short by repeated, frequent pruning. Among foreground plants, this species is easy to maintain over a long period of time.



Eleocharis vivipara

Eleocharis vivipara

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Although sometimes called Long hairgrass, this species is easily distinguishable by the plantlets formed at the tip of its leaves. Another major difference from Long hairgrass is that *Eleocharis vivipara* do not grow rhizomes unlike Long hairgrass that propagates through splitting of the runners of rhizomes. Because of these characteristics, *Eleocharis vivipara* will become weak and show poor growth if plantlets on the leaf tips are not trimmed off.

Long hairgrass

Eleocharis sp.

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

This Hairgrass develops the same shape of leaves as *Eleocharis acicularis* but it grows taller up to a height of 20-25cm. Because of this characteristic, this species is suitable to be planted in the background. This hairgrass grows a little slower than *Eleocharis acicularis*. It is currently rarely available in the market.



Pygmy Chain Sagittaria

Sagittaria subulata

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : High
- Planting** : Foreground to mid-ground

It is not hard to grow this plant but its thick leaves often decay immediately after planting. Decaying leaves should be removed immediately by trimming or sucking them off. Forming bushes of Dwarf sagittaria in spots, rather than covering the whole foreground with this plant, adds a natural feel to the aquascape.

Cobra grass (Mauritian)

Lilaeopsis mauritiana

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Foreground to mid-ground

This plant does not develop a flat leaf tip like a cobra head but instead grows narrow, long and pointed leaves. With this feature, this species looks different from ordinary Cobra grass. It grows taller and faster and is easier to grow compared to the species from Brazil and New Zealand.

Cobra grass (Brazilian)

Lilaeopsis brasiliensis

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Foreground

At the time when sea gravels were used as a substrate material, it was hard to grow this plant at a high density. Now that Aqua Soil-Amazonia is commonly used for substrate, hobbyists can easily enjoy growing it densely. This plant is very slow growing and the initial density of planting has a significant impact on its subsequent appearance.

European clover

Marsilea angustifolia

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : High
- Planting** : Foreground

In contrast to its four-leaf emerged leaves, this plant develops spoon-like round submersed leaves. It is as short as below 1cm with high light while it grows taller with longer stems in low light conditions. European clover that has made the transition into the submersed form is vulnerable to replanting. Be aware that its floating roots and rhizomes easily become brownish and wilt.



Cobra grass (New Zealand)

Lilaeopsis novae-zelandiae

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Foreground

This species tends to grow taller than *Lilaeopsis brasiliensis*. Its dense leaves with aligned leaf tips look splendid, but it takes a long time to achieve it. Being slow growing, it is easy to maintain its good appearance. It is prone to damage from algae. The leaves heavily contaminated by algae should be trimmed off as early as possible.

Glossostigma elatinoides

Glossostigma elatinoides

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Foreground

It is not required to plant many *Glossostigma* initially because this plant is easy to grow and propagates very well. Growing upward instead of creeping sideways indicates insufficient light. In case of lack of nutrients, the leaves turn greenish yellow. The use of Power Sand is effective to maintain the plant's good leaf color for a long time.

※ Other aquatic plants suited for use as foreground plants are to be introduced on subsequent pages.

Aquatic

Plant List

For NA

123 Species

2

Blyxa
Hydrocotyle
Pearl Grass



Blyxa short leaf

Blyxa novoguineensis

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : High
- CO₂ : High
- Planting : Mid-ground

Having soft and delicate leaves, this attractive aquatic plant is excellent for use as a mid-ground plant in a layout. Blyxa short leaf planted in clumps besides the driftwood or stones adds a natural ambience to the aquascape. Its leaves turn reddish purple and show another beautiful side of it in environment when it is supplied with abundant light and nutrients. Since this plant does not reproduce by runners, its propagation should be done by dividing the large, mature plant..



Blyxa auberti

Blyxa auberti

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : High
- CO₂ : High
- Planting : Background

Blyxa auberti grows tape-like leaves like Vallisneria, but it does not produce runners unlike Vallisneria spreading long runners even up mid- and foreground. Consider such a difference in characteristics when deciding which species to be used for the layout. Its roots tend to float out of the substrate when this plant has grown large. Replant it or add new Aqua Soil if the roots are likely to float.



Brazilian Pennywort

Hydrocotyle leucocephala

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : High
- CO₂ : High
- Planting : Mid-ground to background

Unlike other small Hydrocotyle species, this Hydrocotyle leucocephala does not creep but grows upright in the water. Despite its fast-growing and easy-to-grow characteristics, it is hard to use this plant in a layout because, among other things, its roots will become obviously visible as its stems grow obliquely upward. Yet, its leaves floating on the water's surface create an atmosphere exactly like the water in tropical jungle.



Pygmy mushrooms

Hydrocotyle verticillata

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : High
- CO₂ : High
- Planting : Foreground to mid-ground

As indicated by its common name, Hydrocotyle verticillata has unique mushroom-like leaves that can provide a charming accent to the layout. Originally inhabiting marshes, this plant can grow well in submersed environment. Its old leaves can easily get green spot algae.



Australian dwarf Hydrocotyle

Hydrocotyle sp.

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : High
- CO₂ : High
- Planting : Foreground

It is not necessary to plant Australian dwarf Hydrocotyle to cover the whole substrate because it propagates vigorously. It adds a natural feel to the layout as long as it mixes well with other plants, but it will eventually overtake other species and become the dominant plant if not treated properly due to its invasive propagation. The growth of this plant should be carefully controlled by way of trimming.

Hydrocotyle maritima

Hydrocotyle maritima

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : High
- CO₂ : High
- Planting : Foreground to mid-ground

Hydrocotyle maritime closely resembles Australian dwarf Hydrocotyle except that it has slightly larger leaves and longer stems. It is not that fast growing and easy to maintain in the layout. High light and abundant CO₂ injection are required to grow this plant in a submersed environment.





Cuba pearl grass

Hemianthus callitrichoides "Cuba"

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Medium hard water
- Light** : High
- CO₂** : High
- Planting** : Foreground

The stage until it takes root is very critical for the growth of Cuba pearl grass. Since this plant easily decays, its initial planting should be as densely as possible, taking the possible plant loss into account. Use of Aqua Soil powder Type for the substrate helps hold the short roots of Cuba pearl grass, making the planting easier and root development quicker. Being a Pearl grass species that likes medium hard water, it grows well in layouts using Ryuh stone.

Pearl grass

Hemianthus micranthemoides

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Medium hard water
- Light** : High
- CO₂** : High
- Planting** : Mid-ground

Pearl grass may easily decay immediately after planting but once it has taken roots, it is very manageable since it has a good tolerance to trimming and the shape of its clump can be arranged easily by trimming. With adequate CO₂ injection, which is crucial for this plant, Pearl grass forms oxygen bubbles on its leaves. If no bubbles can be seen, the conditions under which this plant is grown should be reviewed for improvement.



Large Pearl Grass

Micranthemum suberosum

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Mid-ground to background

This species does not belong to the Pearl grass family although its common name contains "Pearl grass". It does not creep unlike Pearl grass but it grows straight upwards. With its fast-growing character, it is hard to maintain this species for a long time just by trimming. It is essential to snip off the stems and plant them to maintain this plant over a long period of time.



New pearl grass

Hemianthus micranthemoides var.

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Medium hard water
- Light** : High
- CO₂** : High
- Planting** : Mid-ground

In contrast to *Hemianthus micranthemoides* with three to four leaves in a whorl, this species has two opposite leaves, which makes these two plants easily distinguishable. The green leaves of this plant are darker than *Hemianthus micranthemoides*. It also has a stronger creeping growth habit and forms a lush bush by growing upward after creeping.

memo

Aquatic Plants under Stress?

One of the most difficult experiences hobbyists face, is to plant the aquarium and then find that over the next few days the plants start to decay. This decay is caused by many different types of stress and damages such as plant damage during shipping, damage to the roots during planting and environmental changes (the transition from above water to underwater). Popular Cuba pearl grass is one of the aquatic plants particularly prone to decay, but its Wabi-kusa version is almost free from this problem even under the same aquarium conditions. This fact tells us that the damage to aquatic plants can be substantially reduced by the use of Wabi-kusa.

Aquatic

Plant List

For NA

123 Species

3

Ludwigia
Rotala



Ludwigia peruensis

Ludwigia peruensis

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Mid-ground

With its large, vivid red leaves, Ludwigia peruensis is perhaps the stem plant having the strongest impact in terms of color among all the red aquatic plants. Its growth rate is very slow for a stem plant and it will eventually be overwhelmed by other fast-growing stem plants if it is planted in the background. For this reason, this plant is suited to the mid-ground of the aquascape to serve as an excellent focal point. This species is not suited to large, deep tanks because the leaves on the bottom stem easily fall.

Ludwigia repens

Ludwigia repens

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : Medium
- Planting** : Background

Ludwigia repens is a very tough and easy-to-grow plant with round leaves that grow on opposite sides of stem. Its leaf color changes from green to red according to the lighting intensity and it shows bright red color around the terminal bud under high light conditions. This plant is easy to manage even for beginners because it grows even with less amount of CO₂ injection and its growth rate is not that fast in those conditions.



Ludwigia sp. "Cuba"

Ludwigia sp. "Cuba"

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Ludwigia sp. "Cuba" creates the appearance of a large flower that has bloomed underwater with its very beautiful orange leaves in whorl that are very different from others of the Ludwigia genus. In addition to being vulnerable to repeated trimming, this plant is challenging for hobbyists as its lower leaves easily fall off and once it reaches the water line, it grows out of water and starts developing emerged leaves. Careful management by way of pruning and replanting is required to enjoy this plant for a long time.

Needle leaf ludwigia

Ludwigia arcuata

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

This species is one of the most popular plants used in planted aquariums along with three species of Rotala rotundifolia that are mentioned later in this section. Use of Needle leaf ludwigia together with Rotala having a different shape of leaves not only brings out the most of its signature red sharp leaves but it also provides a colorful accent to the layout. This plant poses a certain difficulty like decay of the lower stem immediately after planting. If this problem occurs, suction off the decayed stems immediately, snip off the robust part around the terminal bud and replant it in the substrate.



Ludwigia glandulosa

Ludwigia glandulosa

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : Medium
- Planting** : Background

This stem plant develops relatively large opposite leaves among Ludwigias and is suited to large tanks that are 90cm or more. With high light, the leaves of Ludwigia glandulosa turn slightly red and the leaf margin becomes slightly undulate. It has a good tolerance to trimming. However, trimming will not lead to a shorter internode length or increased density of this plant. Because Ludwigia glandulosa is not fast growing, it can easily be maintained in large tanks.

Ludwigia palustris (Green)

Ludwigia palustris

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : Medium
- Planting** : Background

In contrast to Ludwigia ovalis having round alternate leaves, this Ludwigia species has narrower round leaves that grow on opposite sides of stem. This is a very tough and easily manageable plant. This green plant is very rare and unique among Ludwigia species that are mostly reddish in color; it is always green regardless of light intensity and nutrient level.



Ludwigia brevipes

Ludwigia brevipes

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Although closely resembling Needle leaf ludwigia, this species is tougher and has wider and slightly curved leaves. Despite its slow-growing character, this plant is easy to grow with no concern about decay immediately after planting. Ludwigia brevipes is responsive to liquid fertilizer. Its reddish purple color will become more attractive by applying liquid fertilizers to the tank.

Rotala macrandra (Narrow Leaf)

Rotala macrandra (Narrow Leaf)

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

The brilliant red leaves of this stem plant really stands out in planted aquariums. Just like *Rotala macrandra*, this plant is prone to decay before adapting to the aquarium environment. When purchasing *Rotala macrandra* (Narrow Leaf), it is advisable to select the one that is in good condition that has been grown fully submersed even if the price is a little higher.



Rotala wallichii

Rotala wallichii

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Rotala wallichii has the narrowest leaf among red aquatic plants and gives a delicate impression. It has a tolerance to trimming but its bottom stem will eventually turn black and harden through repeated trimming. If these symptoms are observed, cut off and plant the robust portion of the stem to maintain the plant. Beautiful leaves can be enjoyed by purchasing and planting emerged leaves rather than purchasing submersed leaves.



Rotala macrandra

Rotala macrandra

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Being a stem plant that represents red aquatic plants, *Rotala macrandra* forms a very attractive clump. This plant is not easy to handle since it gets easily damaged and the plant newly arrived to the retail store often decays after planting. This *Rotala* will grow without any problem once it has adapted to the underwater environment. However, this plant demands a high level of conditions to thrive.



Rotala sp. "Green"

Rotala rotundifolia (Green)

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Under high lighting conditions, this *Rotala* creeps sideways and then grows upwards to form a clump. This feature is more remarkable under several units of fluorescent lamps rather than simply using a metal halide lamp. It is a great way to brush up your trimming skills by trimming this classic stem plant for the planted aquarium.



Rotala indica

Rotala rotundifolia

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

This is a *Rotala rotundifolia* that turns bright red. Its red color is emphasized by planting it together with some *Rotala* sp. "Green" because this creates an effective contrast of green and red colors. Application of ECA, an additive rich in highly absorbable iron, to the aquarium ultimately helps to bring out the brilliant red color of *Rotala indica*.



Rotala nanjean

Rotala nanjean

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : Medium to high
- Planting** : Background

The clump of this fine-leaf *Rotala* in yellow or orange will become denser and more attractive through repeated trimming. This plant is tougher than other *Rotalas* and grows even at low CO₂ levels. Its leaves will turn green instead of orange without high light.



Rotala sp. "Ceylon"

Rotala rotundifolia

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Rotala sp. "Ceylon" that has grown healthily has beautiful and glowing leaves with a pink underside. Among *Rotala* species that are easy to use for layout, this plant has a good tolerance to repeated trimming, which makes it one of the most long-lasting species.

Rotala macrandra "Green"

Rotala macrandra (Green)

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

As its name indicates, *Rotala macrandra* "Green" develops foliage resembling *Rotala macrandra* but in a green color. Its leaves may turn light pink depending on the conditions under which the plant is grown. *Rotala macrandra* "Green" is not very difficult to grow unlike *Rotala macrandra*, but the hobbyist should plant this species in a way that keeps the lower stems concealed because a dense cluster of *Rotala macrandra* "Green" is not usually achieved by pruning.



Aquatic

Plant List

For NA

123 Species

4

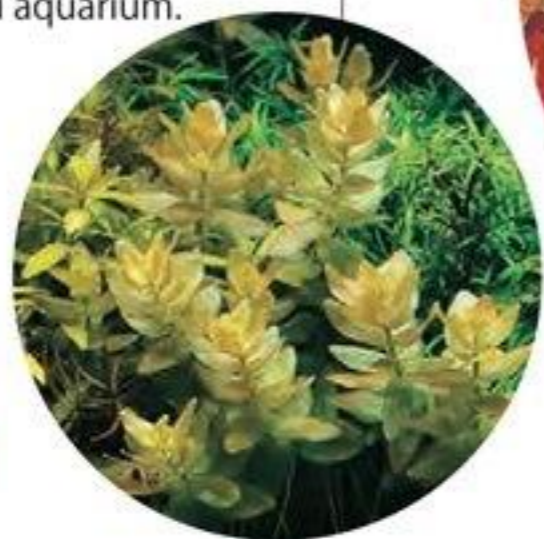
Bacopa
Hygrophila
Alternanthera
Myriophyllum
Cabomba & Limnophila

Bacopa caroliniana

Bacopa caroliniana

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : High
- Planting : Mid-ground

Bacopa caroliniana featuring thick leaf is usually in light green color, but the leaves near its terminal bud turn slightly reddish when in good condition. This species requires careful planting because its emersed leaves are highly buoyant and can easily come off of the substrate after planting. Although it is easy to grow, this plant is rather difficult to be used effectively in planted aquarium.



Water wisteria

Hygrophila difformis

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : Medium
- Planting : Background

Water wisteria develops pinnate leaves when grown submersed in striking contrast to its oval emersed leaves. The thread-like divisions of its submersed leaves are not uniform; some are deep and some are shallow. A bush of Water wisteria is uniquely appealing. You may cut the unsightly white roots grown from the nodes on the obliquely erect stems.

Hygrophila polysperma

Hygrophila polysperma

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : Medium
- Planting : Background

Hygrophila polysperma, a popular species as beginner's plant, is suited to the planted aquarium produced in a 90cm or larger tank because of its large leaves. Its internode length becomes longer in an established environment with CO₂ supplementation. A dense and appealing clump of this plant having short internodes with tightly packed leaves can be achieved through repeated trimmings.



Bacopa monnieri

Bacopa monnieri

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : High
- Planting : Mid-ground

Emersed and submersed leaves of Bacopa monnieri are both oval and there is not much difference between them. This rigid-looking plant is slow growing. It grows straight upright without inclining. Several stalks of Bacopa monnieri planted in groups in the mid-ground serve as a good accent of the layout. This plant is rather suited to small-sized tanks.

Alternanthera reineckii

Alternanthera reineckii

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : High
- Planting : Mid-ground to background

The red coloration of Alternanthera reineckii stands out when planted in spots among fine green plants. Its growth rate is slower than other stem plants, so this plant should be made slightly taller than other plants during trimming. Be aware that Cardina japonica (Yamato Numa Ebi) may eat and damage this plant.

Alternanthera "Lilacina"

Alternanthera reineckii "Lilacina"

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : High
- Planting : Mid-ground to background

Alternanthera "Lilacina" develops wider leaves and grows larger compared to Alternanthera reineckii. Due to this feature, this plant is suited to aquascapes in large tanks. This is an attractive red stem plant having leaves with a brownish top side and a pink underside. White roots that grow from its nodes may look untidy if there are too many. Cut them off because doing so will not affect the plant's growth.

Large-leaf hygrophilia "Stricta"

Hygrophila stricta

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : Medium
- Planting : Background

This very large hygrophilia is eye-catching in a planted aquarium. Because of its large leaves, adequate spacing is required between the plants so that light can reach its lower stem. If the light is blocked, the lower leaves easily fall off. Use of liquid fertilizer and substrate additives is important to prevent fading of leaf color (other than vein) due to lack of nutrients.



Hygrophila sp. "Pantanal Wavy"

Hygrophila sp.

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : High
- Planting : Mid-ground

As its name indicates, this Hygrophila has light-green wavy fine leaves, which adds a refreshingly cool touch to the aquascape. This slow-growing and creeping plant is very easy to maintain. Because of the way it grows, this plant is suited to the mid-ground location of an aquascape rather than background. It is advised to refrain from adding too many Cardina japonica (Yamato Numa Ebi) to the aquarium with this Hygrophila because they eat and damage this plant.

Myriophyllum mattogrossense

Myriophyllum mattogrossense (Green)

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: High
Planting	: Background

A cluster with a beautiful outline can be achieved by cutting the obliquely erect stems at an angle. This Myriophyllum is perhaps one of the easiest to use in the planted aquarium among aquatic plants with pinnately-divided leaves, as this plant produces a profusion of side shoots and its density can easily be increased by repeated trimming. This Myriophyllum is easy to grow but it turns white as its roots start floating out of the substrate or its lower stem hardens over time.

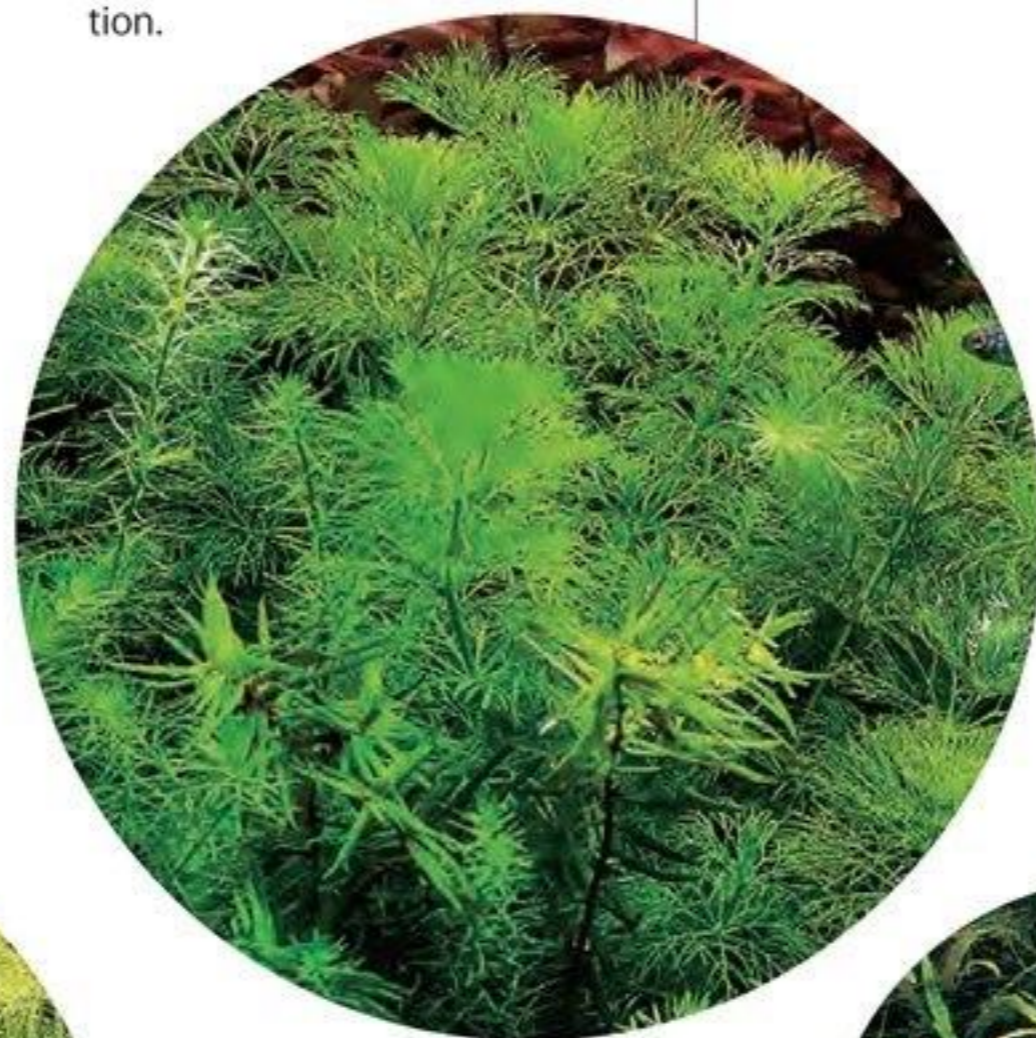


Yellow cabomba

Cabomba australis

pH	: Acidic to mildly acidic
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: High
Planting	: Mid-ground to background

Yellow cabomba gives a soft impression with its delicate opposite leaves in greenish yellow. Cabomba species are not very difficult to grow over a short time span, but it is rather difficult to maintain its attractive appearance for a long time in a planted aquarium. When in good condition, this plant propagates by growing rhizomes. Its new leaves turn white if the nutrients within the substrate are insufficient. For this problem, supplying nutrients to the substrate by substrate additives such as Iron Bottom can be an effective solution.



Giant Ambulia

Limnophila aquatica

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: High
Planting	: Background

This is the largest Limnophila and just a few stalks of this plant look striking even in a large tank. Its whorled leaves are very soft and fine, and therefore it will be hard to remove algae grown on them. This plant's stems will become thicker and larger through planting of the cut stems. The right timing of pruning and replanting is the key to keeping this plant to an appropriate size.



Red cabomba

Cabomba piashkyensis

pH	: Acidic to mildly acidic
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: High
Planting	: Mid-ground to background

With three fine leaves in a whorl, Red cabomba in gradient red color is outstandingly eye-catching in an aquarium. It is hard to grow over a long period of time and dislikes alkaline hard water. Red coloration of this plant requires high light and CO₂ along with the application of liquid fertilizer such as the Green Brighty series and ECA.



Red myriophyllum

Myriophyllum mattogrossense

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: High
Planting	: Mid-ground to background

This Myriophyllum grows red-brown fine leaves in whorls on its dark, hard stem. It is rather difficult to grow and requires abundant light and CO₂ supplementation along with the application of liquid fertilizers. This plant is often damaged when newly arrived to the retail shop. It is advisable to verify the condition of the plant before purchase.

Two-leaf temple plant

Hygrophila angustifolia

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Background

This Hygrophila is suited to large tanks. Its fine long leaves that grow on opposite sides of the stem are really appealing when gracefully swaying near the water's surface. Since repeated trimming leads to branching of fine stems and a narrower leaf width, the hobbyist can, to a certain extent, control the plant volume by trimming.



Hygrophila pinnatifida

Hygrophila pinnatifida

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground to background

With its unique pinnate leaves, Hygrophila pinnatifida has a great impact on the overall impression of the layout. Another great feature of this plant is its highly epiphytic roots that can be strongly attached to driftwoods and stones just like ferns. The plant's leaves turn green or red according to the light source; it turns green under metal halide lamp while it becomes reddish under fluorescent light.



Temple plant (corymbosa)

Hygrophila corymbosa

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Background

This large Hygrophila is suited to Nature Aquarium layouts in a large tank. Its green submersed leaves may turn slightly reddish when the environment provides ample light and nutrients. This plant will have larger stems and grow thick, long roots over time. In view of this, it is crucial to use Power Sand to supply an adequate amount of nutrients through the plant roots.

Aquatic

Plant List

For NA

123 Species

5

Tonina
Ammannia
Pogostemon
Others



Tonina fluviatilis

Tonina fluviatilis

- pH : Acidic to mildly acidic
- Hardness : Soft water
- Light : High
- CO₂ : High
- Planting : Mid-ground

Clusters of *Tonina fluviatilis* standing upright in the aquarium create a very striking appearance. In order to make this plant look more appealing it is necessary to prune this plant to form a bush with a gradient outline. This can be achieved by cutting and replanting the stems/shoots, although this will demand the hobbyists' constant, dedicated and careful efforts. *Tonina fluviatilis* starts to bend once reaches the water line, so it is advisable to snip off and replant the top portion before the stems reach the surface.

Tonina

Syngonanthus sp.

- pH : Acidic to mildly acidic
- Hardness : Soft water
- Light : High
- CO₂ : High
- Planting : Mid-ground to background

This plant made the world realize the attractiveness of South American aquatic plants. It has a uniquely appealing appearance, with its leaves curling down. This species, however, may not be well maintained by trimming and this makes the effective arrangement of this plant difficult in a layout where various species of aquatic plants are planted. It is important to use Aqua Soil-Amazonia as a substrate material and keep the carbonate hardness (KH) of the water low by using the additive "be Soft".



Yellow ammannia

Nesaea pedicellata

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : High
- Planting : Mid-ground to background

Yellow ammannia's yellow color is appreciated in planted aquariums as it is rarely seen in other aquatic plants. It is extremely slow growing for a stem plant and the difference in growth rate from other stem plants must be taken into account during trimming and other maintenance practices. If the lower stem turns noticeably black, it is advised to snip off and replant the top portion around the terminal bud that actively grows into new shoot as early as possible.

Pogostemon sp. "Dassen"

Pogostemon sp. "Dassen"

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : High
- Planting : Background

This plant looks like *Pogostemon stellatus*, but it has slightly narrower leaves with sharp jagged margins. Hobbyists can enjoy using *Pogostemon* sp. "Dassen" casually for aquarium layouts because, unlike *Pogostemon stellatus*, it poses no difficulties such as shrunk terminal buds and excessively short internode length as a result of trimming.



Didiplis diandra

Didiplis diandra

- pH : Mildly acidic to mildly alkaline
- Hardness : Medium hard water
- Light : Medium to high
- CO₂ : Medium
- Planting : Mid-ground

With linear, fine leaves that grow on opposite sides of the stem in a cross form, *Didiplis diandra* forms a lush cluster thanks to its short internode length. The leaves near the terminal bud will turn red with sufficient nutrient supplementation. This plant is slightly difficult to grow. Its lower stem may often turn black and wilt due to the problems such as deteriorated water quality and rise in water temperature. Slightly lower water temperature and supply of adequate light and CO₂ makes the growth of this plant easier.



Staurogyne repens

Staurogyne repens

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : Medium
- Planting : Mid-ground

Staurogyne repens belongs to the Family Acanthaceae and is closely related to *Hygrophila*. This plant has a hard stem and the leaves resembling those of *Hygrophila* but in a more compact size. Because of its vigorous creeping habit, this extremely slow-growing plant can be easily maintained at a short height. With these features, this plant is suited for planting at the side of driftwood and stones in spots.



Ammannia gracilis

Ammannia gracilis

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : High
- Planting : Background

With its elegant opposite leaves opening at an upward slant, this attractive *Ammannia gracilis* can be fully appreciated by using it as a focal point in a large tank. Transition from emersed to submersed form is rather hard, especially in summer when water temperature rises and the risk of plant decay is higher. This plant will be very easy to grow once it has adapted to aquatic environment.

Pogostemon stellatus

Pogostemon stellatus

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: High
Planting	: Background

Its fine whorled leaves turn from greenish yellow to reddish purple according to the nutrient conditions. To achieve bright red coloration, the application of ECA, an additive containing rich iron, is very effective. When purchasing this plant in emersed form, be sure to select a specimen with a thick, hard stem, or the plant may decay in a few days time. *Pogostemon stellatus* grows beautifully if it is planted near the center of the layout where adequate light is present.



Gratiola sp.

Gratiola sp.

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: High
Planting	: Background

Although sharing a part of the common name in Japanese (i.e., "Holland plant"), *Gratiola sp.* does not belong to the same family as *Pogostemon stellatus*. These two plants look very much different on the point that *Gratiola sp.* has jagged whorl leaves. Under high light intensity, this plant turns reddish purple and serves as a great accent or focal point in an aquascape. Iron supplementation by application of ECA is effective to bring out the plant's bright color.

Lagarosiphon madagascariensis

Lagarosiphon madagascariensis

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: High
Planting	: Background

With translucent linear leaves, *Lagarosiphon madagascariensis* grows fast and forms a bush by developing side shoots. This plant is best suited to create a layout having a bright impression. It is very easy to grow when in good condition, but the whole plant sometimes fades away and will eventually wilt and decay due to a suspected cause of change in water quality. If this symptom is observed, snip off the green stem near the terminal bud (favorably with roots grown from the nodes) and replant it in the substrate.



Eichhornia diversifolia

Eichhornia diversifolia

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: High
Planting	: Mid-ground to background

This plant resembles *Heteranthera zosterifolia* but it has slightly curled leaves and a hard stem that can be easily damaged and turn black. Nutrient supplementation is crucial for the beautiful growth of this plant; the use of good substrate fertilizer such as Power Sand is more effective than the use of just liquid fertilizers. Pruning should be done before this plant reaches the water line because it develops floating leaves if it is allowed to grow up to the water's surface.

Heteranthera

Heteranthera zosterifolia

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

Heteranthera is easy to grow and propagates well. Because its emersed leaf is buoyant, this plant should be planted by inserting it slightly diagonally into the substrate. When short stalks of this *Heteranthera* is planted, it creeps along the substrate first because of its creeping habit, and then it grows upward. If this plant is left dense, its lower stem will possibly turn black and wilt due to lack of light. Frequent trimming is required to prevent this problem. This plant is not used in the foreground of the layout.

Nesaea sp.

Nesaea sp.

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: High
Planting	: Mid-ground

Nesaea sp. that has just arrived from the farm is in bright red in color. To maintain the red color, a high light intensity is required. In view of this, it is advisable to plant *Nesaea sp.* in the center of the layout, rather than the sides as the sides are often subjected to low light conditions. *Nesaea sp.* is an extremely slow-growing plant. Be aware of black beard algae on the leaves, which can be easily observed when the tank water quality is not stable.



Saururus cernuus

Saururus cernuus

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: High
Planting	: Mid-ground

Saururus cernuus with large, heart-shaped leaves serves as a focal point plant in an aquarium. This plant grows large quite fast, and it easily breaks the water's surface due to its inherent characteristics as an emersed plant grown in swamps. It would be a great idea to use *Saururus cernuus* in an open aquarium with metal halide lamps.

Polygonum sp. "Pink"

Polygonum sp. "Pink"

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Background

The large pink leaves of *Polygonum sp. "Pink"* have a great presence that has the potential to determine the overall impression of the aquascape. Without adequate spacing between the plants, its lower leaves will turn yellow and fall off easily, or its stems will grow obliquely upward and develops long roots from the nodes.

Aquatic

Plant List

For NA

123 Species

6

Echinodorus



Echinodorus amazonicus

Echinodorus amazonicus

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : Medium
- Planting : Background

Known as Amazon sword plant, this Echinodorus is very popular among aquarium hobbyists. This plant is often introduced as a beginner's plant. Its mature appearance with a profusion of leaves is striking. Carefully think about the planting location to use this plant in a layout because it will grow very large.

Echinodorus "Ozelot"

Echinodorus "Ozelot"

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : Medium
- Planting : Background

Among hybrid Echinodorus species, Echinodorus "Ozelot" has distinctive leaves with dark spots. Many hybrid species usually look beautiful as a single plant, yet they give an odd impression when combined with other aquatic plants in a planted aquarium. This applies not only to this plant but to all the hybrid species.



Echinodorus "Rubin"

Echinodorus "Rubin"

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : Medium
- Planting : Background

Hybridization is fairly common among Echinodorus species. This Echinodorus "Rubin" is a representative hybrid Echinodorus in red color. This hybrid plant is easy to grow and will become very large. Its leaf color is more like reddish brown than bright red and slightly dull in hue. Its attractive appearance stands out when planted together with bright green plant.



Echinodorus veronikae

Echinodorus veronikae

- pH : Mildly acidic to mildly alkaline
- Hardness : Soft to medium hard water
- Light : Medium to high
- CO₂ : Medium
- Planting : Background

This Echinodorus develops long, narrow leaves resembling those of Echinodorus uruguayensis. Best suited as background plant. Hobbyists can enjoy to see the veins in light green leaves under the light. When in good condition, this plant grows many new leaves in slightly reddish-brown. Trim off the old leaves on the outer side for neater appearance.

Echinodorus angustifolia

Echinodorus angustifolia

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : High
- Planting** : Background

This narrow-leaf Echinodorus gives an impression resembling Vallisneria. Thus planting Echinodorus angustifolia together with Vallisneria will enhance the natural ambience of the aquascape. This plant propagates by sending out runners from background towards the front side of the layout. If this plant grows in an unintended location, it should be cut off to ensure the healthy condition of the parent plant.



Echinodorus latifolius

Echinodorus latifolius

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : High
- Planting** : Foreground

This plant grows a little larger than Echinodorus grisebachii and develops the leaves with sharply pointed tips. This Echinodorus can be used as foreground plant in a large tank and is suited to South American layout that also uses other large Echinodorus. The nutrient within the substrate is a significant factor for this plant. Regular fertilization of the substrate using additives such as Iron Bottom is required because the leaves will turn light greenish yellow under insufficient nutrient conditions.



Echinodorus tenellus "broad leaf"

Echinodorus sp.

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : High
- Planting** : Foreground

This Echinodorus is relatively slow growing and develops wider leaves than Echinodorus tenellus. Under high light conditions, this plant turns wine red and shows another side of its beauty. It hardly produces runners and it takes a long time to achieve a dense appearance.



Echinodorus uruguayensis

Echinodorus uruguayensis

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : Medium
- Planting** : Background

Echinodorus uruguayensis develops long, narrow leaves and is easy to use in the background location of large tanks. This Echinodorus plays an essential role in a layout producing South American atmosphere. The stem length of submersed leaves differs between the plants sold in retail shops. The one with shorter leaf stems is easier to use in a layout. When this plant starts overhanging along the water surface, it can block the lighting. Adequate trimming is required to solve this problem.



memo

Wild or Fantastic

Echinodorus evokes images associated with Amazon and its dark green leaves help create a layout filled with wild atmosphere. On the other hand, hybridization is very common among species of this genus and as a result, various hybrid Echinodorus having eye-catching red and spotty leaves have been created. These showy hybrid species may be great if a hobbyist wishes to express a world of fantasy, but in reality, they make us feel odd and do not look matching with other plants in the layout.

Echinodorus tenellus

Echinodorus tenellus

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : High
- Planting** : Foreground

This is one of the most popular foreground plants in Nature Aquarium. Its submersed leaves are vulnerable to stress, and this plant may not develop many new leaves in the tank where there are many Cardina japonica (Yamato Numa Ebi), an eater of this plant. It is recommended to purchase this plant in emersed state because new submersed leaves will eventually grow vigorously from it.

Echinodorus grisebachii

Echinodorus grisebachii

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : High
- Planting** : Foreground

This small Echinodorus can be used as foreground plant in layouts and is easy to grow. The nutrient condition of the substrate is a matter of significance for this plant. The good leaf color can be maintained if grown on the nutrient-rich substrate made with Aqua Soil and Power Sand Special.

Aquatic Plant List For NA 123 Species

7

Cryptocoryne

Cryptocoryne wendtii "Mi Oya"

Cryptocoryne wendtii "Mi Oya"

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

Cryptocoryne wendtii "Mi Oya" is one of the largest members of the *Cryptocoryne wendtii* group, which are known to be very easy to use in planted aquarium. Its broad leaf makes this plant very voluminous. The condition of this *Cryptocoryne* sold in retail stores is mostly stable and good. Transition into submersed state is very smooth. This plant has a good tolerance to water temperature rise.

Cryptocoryne pontederifolia

Cryptocoryne pontederifolia

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

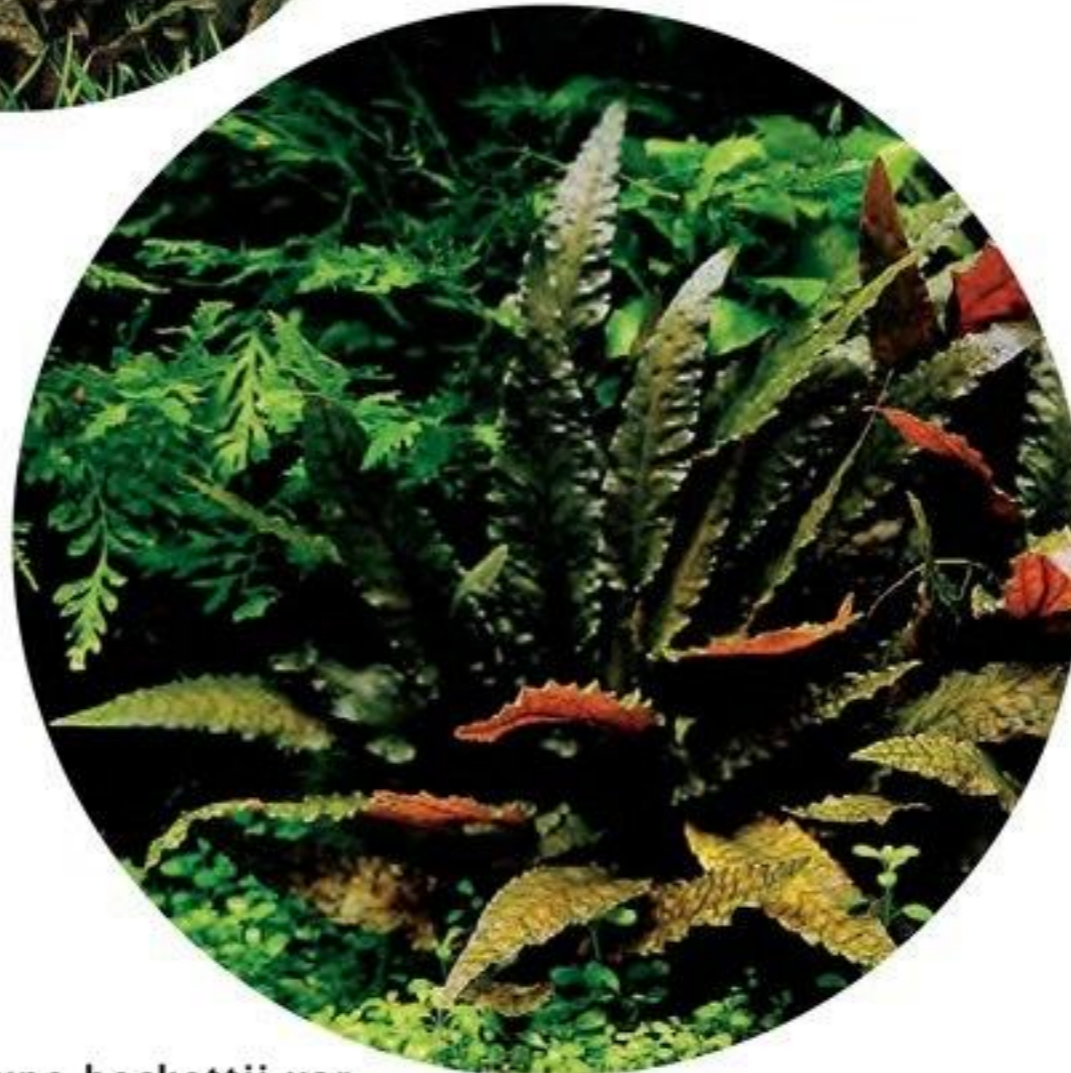
Cryptocoryne pontederifolia featuring heart-shaped leaves will look attractive if planted in groups beside driftwoods as an accent. This species may melt during transition from emerged to submersed form. Light-pink new leaves slowly developing from the inner part of the plant is very impressive.

Cryptocoryne wendtii "Real Green"

Cryptocoryne wendtii "Real Green"

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

This *Cryptocoryne* is robust and grows faster than *Cryptocoryne wendtii* (Green) that belongs to the same green *Cryptocoryne* group. It also seldom decays and melts away in water. These features make this plant beginner friendly. As a material for planted aquarium, this is a rare hybrid green species because the submersed leaves of most *Cryptocoryne* species are not always green.



Cryptocoryne wendtii (Brown)

Cryptocoryne wendtii (Brown)

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

Emerged leaves in a pot sold in retail stores are attractive with dark green topside and reddish-brown underside. Although it bears only small emerged leaves when sold in a pot, hobbyist must remember that its submersed leaves will eventually grow large. In view of this, the planting position of this plant should be determined according to its mature sizes, or the plant's presence may become too overpowering.

Cryptocoryne beckettii var. petchii

Cryptocoryne beckettii var. *petchii*

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

With its sharp, wavy leaves with pointed tips, *Cryptocoryne beckettii* var. *petchii* is easily distinguishable from other members of the *Cryptocoryne wendtii* group. Its attractive elegant leaf color varies ranging from brown to dark green depending on the environment. The color and ambience created by this *Cryptocoryne* is an important element in the expression of shade within a planted aquarium.

Cryptocoryne wendtii "Tropica"

Cryptocoryne wendtii "Tropica"

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

This is a *Cryptocoryne wendtii* that has been released by Tropica Aquarium Plants, a Danish aquatic plant farm well-known for its excellent species maintenance and good conditions of the plants. If grown under favorable growing conditions, the plant's beautiful hammered leaves glow in the light. Its reddish-brown underside of the leaves that can be occasionally glimpsed is one of the attractive aspects of this plant.

Cryptocoryne wendtii (Green)

Cryptocoryne wendtii (Green)

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

Besides *Cryptocoryne wendtii* "Real Green", this plant is the only popular *Cryptocoryne* species having submersed leaves that always stay green. If you wish to use green *Cryptocoryne* for the layout, this species or *Cryptocoryne wendtii* "Real Green" are the only options. Although it also grows a small amount of brown leaves, this *Cryptocoryne wendtii* (Green) looks really elegant in the layout. Its leaves easily melt away immediately after planting.

Cryptocoryne balansae

Cryptocoryne balansae

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : Medium
- Planting** : Background

Its tape-like wavy leaves are appealing and best suited for the background location of large tanks. The main leaf veins turn wine red color depending on the growing conditions and further enhance the plant's beautiful appearance. Cut off excessively long leaves from its base because the leaves overhanging along the water surface may block the light into the aquarium.

Cryptocoryne parva

Cryptocoryne parva

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : High
- Planting** : Foreground

Cryptocoryne parva is the smallest known Cryptocoryne and excellent for the foreground plant. The growth rate of this plant is very slow and it takes quite a long time to have a dense look unless planted densely during initial planting. Another key for the growth of this plant is patient and careful maintenance, since it is prone to algae due to its slow-growing characteristic.

Cryptocoryne retrospiralis

Cryptocoryne retrospiralis

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : Medium
- Planting** : Background

This plant closely resembles Cryptocoryne balansae, but its leaves do not turn red and are not as wavy as Cryptocoryne balansae. The leaves in olive-green color give an austere elegance impression. Compared to Cryptocoryne balansae, this species is more suited to 60-90cm tanks. When using this Cryptocoryne for a layout, bear in mind that this plant will eventually grow very large (and tall).



Cryptocoryne lucens

Cryptocoryne lucens

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : High
- Planting** : Mid-ground

Cryptocoryne parva, Cryptocoryne lucens and Cryptocoryne willisii are closely related and they often naturally hybridize with each other. Due to this reason, the condition of Cryptocoryne lucens grown in farms seems rather unstable. With its size and leaf shape, this Cryptocoryne is best suited to be planted in spots in the mid-ground of aquascape. Those shipped from Southeast Asian farms sometimes grow slow and has different types of leaves.

Cryptocoryne tonkinensis

Cryptocoryne tonkinensis

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : High
- Planting** : Background

This Cryptocoryne is easily identifiable with its signature narrow tape-like leaves. Its leaves color varies ranging from green to brown, sometimes with spots depending on the growing conditions. Because of its narrow and short (up to 40cm long) leaves, this plant is convenient for use in 60-90cm tanks. The volume of each plant is relatively small, so dense initial planting is recommended. It is slow growing and requires adequate light and CO₂ supplementation to thrive.

Cryptocoryne willisii

Cryptocoryne willisii

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : High
- Planting** : Mid-ground

Unlike closely-related Cryptocoryne lucens that develops submersed leaves with short leaf stem, this Cryptocoryne willisii has relatively long leaf stem on its submersed leaves. Due to this characteristic, the cluster of this plant gives a distinctive impression. Its growth rate is not constant just like Cryptocoryne lucens and its mature size is hardly predictable.

Cryptocoryne albida

Cryptocoryne albida

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium to high
- CO₂** : Medium
- Planting** : Mid-ground

This narrow-leaf Cryptocoryne is best suited for mid-ground location of tanks ranging from 60cm to very large tanks. Its submersed leaves turn green to brown, sometimes with spots. They are usually in green color under low light conditions. Its moderate size appropriate for any size of tank is one of the advantages of this plant.

Aquatic Plant List For N A 123 Species

8

Anubias
Ferns & Mosses
Bucephalandra
Riccia



Anubias nana "Yellow Heart"

Anubias barteri var. *nana* "Yellow Heart"

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Low to high
CO ₂	: Low to medium
Planting	: Mid-ground

Originally cultivated from the *Anubias barteri* var. *nana*, the "Yellow Heart" version having small leaves can be used in a wide range of aquascaping scenes. Be aware of pesticide residue in plant when using any *Anubias* just arrived from the suppliers. Be sure to add a few *Cardina japonica* (Yamato Numa Ebi) to the tank together with *Anubias* and see if the shrimps show any abnormal behavior. If any abnormalities are observed, add some activated carbon to the tank and change the tank water repeatedly to get rid of pesticide residue.



Bolbitis heudelotii

Bolbitis heudelotii

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Low to high
CO ₂	: Low to medium
Planting	: Mid-ground

The leaves of *Bolbitis heudelotii* having an appearance unique to fern produce wabi-sabi within the aquascape. If its leaves are damaged, cut them off from the base of the leaf stem and attach only rhizome to other object with Wood Tight. Subsequently, new submersed leaves that have adapted to aquarium environment will emerge. One may feel hesitate to cut the leaf of this slow-growing plant, but the damaged leaves should be cut off to promote the growth of new leaves.



Bucephalandra sp.

Bucephalandra sp.

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

A wide variety of *Bucephalandra* may stimulate the aquatic plant hobbyists' desire to collect. It is recommended to attach this plant to rocks and driftwood with Wood Tight and Riccia Line. *Bucephalandra* prefers clear water. When placed in water containing a large amount of organic materials, the plant may have holey leaves and deformed shoots.



Anubias barteri var. nana "Petit"

Anubias barteri var. *nana* "Petit"

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Low to high
CO ₂	: Low to medium
Planting	: Mid-ground

This smallest *Anubias* species is originally cultivated from the *Anubias barteri* var. *nana*. This plant develops tiny leaves that easily fall off due to deterioration in water quality or lack of water flow caused by excessively packed leaves. To avoid this problem, cut off the old or damaged leaves to ensure good water flow between the leaves. With this *Anubias*, hobbyists can make an expressions in great detail.



Anubias barteri var. nana

Anubias barteri var. *nana*

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Low to high
CO ₂	: Low to medium
Planting	: Mid-ground

Anubias barteri var. *nana* is one of the representative *Anubias* species. Due to its large leaf size, this plant is not suitable for tanks smaller than 90cm. Particularly for the layout using many stem plants, this *Anubias* species having rigid-looking leaves will not be an excellent choice. When planting in the substrate, do not plant it directly in the soil; but instead, attach the plant to a small stone with Wood Tight and place it on the substrate.



Anubias barteri var. barteri

Anubias barteri var. *barteri*

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Low to high
CO ₂	: Low to medium
Planting	: Mid-ground

Anubias barteri var. *barteri* grows large and therefore suited for the layout made in a large tank. This is very slow growing and prone to algae damage until it adapts to aquarium environment. Watch out for deterioration in water quality that can lead to algal growth. It is recommended to add many *Otocinclus* to the tank to control algae.

Willow moss

Taxiphyllum barbieri

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Low to medium
- CO₂** : Low
- Planting** : Mid-ground

Willow moss is a common name of *Taxiphyllum barbieri* originally found in Southeast Asia. It is easy to use and has a good tolerance to high water temperature compared to *Fontinalis antipyretica* native to Japan. Among aquatic moss, willow moss is highly epiphytic and easy to maintain. It is recommended to attach a thin layer of willow moss to driftwood and tie it with Moss Cotton. The moss grown on driftwood makes us feel the passage of time.



South American willow moss

Vesicularia sp.

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Low to medium
- CO₂** : Low
- Planting** : Mid-ground

The common name of this plant contains "South America", but it, in fact, is a moss native to Southeast Asia. This beautifully distinctive willow moss grows in the form of overlapped triangles. Because this plant is less epiphytic, it is advisable to use Riccia Line to attach it to stone or driftwood for its long-lasting attractive appearance.



Riccia

Riccia fluitans

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Foreground to mid-ground

Being one of the floating liverwort, *Riccia fluitans* is non-epiphytic and therefore attached to other objects with Riccia Line. To use Riccia as a foreground carpet, place Riccia onto Riccia Stones and put them all over the substrate. Although Riccia is naturally buoyant, its floating characteristics can be suppressed by planting Riccia together with Hair grass and *Glossostigma*. This arrangement also creates a rich natural feel within the layout.



Microsorium pteropus

Microsorium pteropus

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Low to high
- CO₂** : Low to medium
- Planting** : Mid-ground

Microsorium pteropus is a very robust plant and very easy to grow. Appropriate care is required to achieve its attractive appearance and maintain an adequate size for the layout. To make this plant look dense with a profusion of smaller leaves, it is advised to grow it under high light condition and cut off its old leaves frequently. Plantlet observed on the leaves is the sign of deteriorated water quality or weakened plant. In this case, improve the aquarium conditions and remove the plantlet or cut off the whole leaf with plantlets.



memo

Making Best Use of Epiphytic Aquatic Plants

How to make the mid-ground is one of the major key points in Nature Aquarium layouts that are designed under the concept of long-term maintenance of the aquascape. The mid-ground must be created based on the layout composition that can provide a link between the foreground and background and at the same time, conceal the bottom stems of the stem plants in the background. The aquatic plants that play the main role in achieving such a layout composition of the mid-ground are epiphytic plants such as ferns and Anubias that are attached to the driftwood, a composition material that serves as the framework of the layout. Creating an elaborate mid-ground using these aquatic plants also has an effect of keeping the attractive appearance of the stem plants even after trimming.

Microsorium sp. (Narrow Leaf)

Microsorium sp. (Narrow Leaf)

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Low to high
- CO₂** : Low to medium
- Planting** : Mid-ground

Microsorium sp. (Narrow Leaf) is a narrow-leaf variant of *Microsorium* sp. The leaf width varies depending on the plant. Excessively long leaf should be trimmed because the tip of the narrow leaf may touch the glass wall of the tank and become crooked.

Microsorium sp. (Trident)

Microsorium sp. (Trident)

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Low to high
- CO₂** : Low to medium
- Planting** : Mid-ground

Featuring its multi-forked leaves like a trident, *Microsorium* sp. (Trident) develops its uniquely-shaped leaves that are constantly trident-like throughout the growth processes. Among *Microsorium* species, this plant is fast growing and easy to use in layout. If sporangia are observed on underside of the leaves, deteriorated water quality or excessive application of liquid fertilizer can be suspected.

Aquatic

Plant List

For NA

123 Species

9

Nymphaea
Aponogeton
Bulbous aquatic plants

Banana plant

Nymphoides aquatica

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

Banana plant is a unique-looking plant and its attractive banana-shaped tubers can be enjoyed if planted in the foreground. It develops 5-6cm submersed leaves after planting and will eventually grow long stems and bear floating leaves on the water surface. This is an amusing plant that hobbyists can use for the layout for fun.



Nymphaea sp. (Red)

Nymphaea sp. (Red)

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

Nymphaea sp. (Red) develops round leaves that change color according to the growing conditions, ranging from greenish yellow to orange. With the red leaf underside, this plant serves as a focal point of the layout. Nymphaea sp. (Red) may suffer from bulb rot if the bulb is buried in the substrate. To promote the development of the leaves, just place the bulb on the substrate or lightly push it in the substrate so that it will not move with water flow.

Barclaya longifolia (Red)

Barclaya longifolia (Red)

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

Barclaya longifolia (Red) develops long narrow leaves, rare for water lilies. Its red leaves in contrast with other green aquatic plants resemble a flower that blooms in water. When purchasing this plant, select the one with firm and stout bulb. To plant this water lily, just place it on the substrate and refrain from pushing it deep inside the soil. Fertilization of the substrate using supplements such as Multi Bottom is required to provide the nutrients to the plant via the roots and maintain the energy stored in the bulb.



Tiger lotus

Nymphaea lotus

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

Tiger lotus is the largest water lily used in aquariums and suited for large tanks. This plant that was on sale many years ago was used to remain in submersed form for a long time, while currently-available Tiger lotus seems to develop floating leaves quite fast. In this sense, this plant is not very easy to use for layout now.

Nymphaea oxypetala

Nymphaea oxypetala

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Mid-ground

Among water lilies, *Nymphaea oxypetala* is relatively easy to use for layout because it can be enjoyed in submersed form for a long time. It is important to determine the planting location taking its large size of submersed leaves into account. The leaf has a long slit, making the leaf look like an ear of rabbit. This plant looks more attractive when the leaves become very wavy and undulating with clearly noticeable veins.

Aponogeton "Lanka"

Aponogeton "Lanka"

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Background

This is a hybrid *Aponogeton* having reddish-brown leaves with undulate margin. Its leaf stem will grow relatively long and become noticeable in aquascapes. The leaves will overhang along the water surface, but these leaves can block sunlight into the tank if overlapped and may affect the growth of other plants. This plant should be appropriately trimmed to avoid this problem.

Aponogeton ulvaceus

Aponogeton ulvaceus

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Background

Having loosely wavy leaves in bright green, this *Aponogeton* is suitable to be grown in large tanks at least 50cm deep due to its extremely large size. Use of this plant in layout requires careful consideration because its large leaves may affect the overall balance of the aquascape. *Aponogeton* species often flower on the water surface, but it is advisable to snip off the flower to make the plant last longer.



Lace plant

Aponogeton madagascariensis

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Background

Every hobbyist should grow this *Aponogeton* having elegant lace-like leaves at least once. Maintaining clean tank water is vital for this plant because poor water conditions lead to algal growth on the leaves which spoils the plant's attractive appearance. With the approach of dormant period, the leaves of lace plant start to have brown spots and will eventually wilt. The growth-dormancy cycle is beyond our control, so it should be used for the layout just for temporary amusement.

memo

Sleep Brings up a Plant Well?

Even under poor nutrient conditions within the tank, Bulbous aquatic plants can grow using the energy stored in their bulbs. This characteristic of bulbous plants makes them easy to grow. However, this type of plants become dormant and during the this period, the bulb may go bad without developing any leaves in aquarium environments. Another difficult aspect of bulbous plants is that they can no longer survive if they use up the energy in their bulbs due to lack of nutrients within the substrate or as a result of flowering. There is still room for the further study on know-how for long-term maintenance of this type of plants.

Aponogeton boivinianus

Aponogeton boivinianus

pH	: Mildly acidic to mildly alkaline
Hardness	: Soft to medium hard water
Light	: Medium to high
CO ₂	: Medium
Planting	: Background

Aponogeton boivinianus has attractive translucent dark-green leaves with indented surface. This large-growing *Aponogeton* will not develop floating leaves even if it reaches the water line, but instead its leaves coil up under the water surface. Wide open space is necessary to enjoy the attractive leaves of this plant.

Aquatic

Plant List

For N A

123 Species

10

Vallisneria n
Other Tape-Like Aquatic Plants
Japanese Aquatic Plants

Tiger Vallisneria

Vallisneria neotropicalis

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium
- CO₂** : Medium
- Planting** : Background

Originally cultivated from *Vallisneria spiralis*, this *Vallisneria neotropicalis* features its narrow tape-like leaves with small brown spots. These spots are prominent on new leaves, but they will fade as the leaves get older. Because this plant grows as tall as more than 1m, it is only suitable for large and deep tanks.

Vallisneria nana

Vallisneria nana

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium
- CO₂** : Medium
- Planting** : Background

Vallisneria nana is one of the smallest members of the *Vallisneria* group, which is suited to various tank sizes ranging from 60cm to very large tank. Frequent trimming to reduce the plant volume is not required. If it spreads its runners with new leaves to an unintended location, cut off the runners to maintain the neat appearance. Elegantly swaying *Vallisneria* makes us feel the presence of water.



Cyperus helferi

Cyperus helferi

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Cyperus helferi has a fresh impression like summer grass and adds a refreshing touch to the layout. Divide the plant sold in a pot and select the batch of the intended height to plant in the aquarium. This plant is only suitable for large and deep tanks because its tape-like leaves grows as tall as 40-50cm. If the tank is not deep, the leaves overhang along the water surface in a short period of time. Be aware of algae that may grow on the hard leaves of this plant.



Ottelia ulvifolia

Ottelia ulvifolia

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Ottelia ulvifolia having soft and translucent leaves creates an elegant atmosphere within the layout. This benefit can only be achieved when planted in large tank. This plant is easy to grow and will overhang along the water surface in a short period of time. The leaves can easily get damaged by the film on the tank water.

Vallisneria kauresen

Vallisneria kauresen

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : Medium
- CO₂** : Medium
- Planting** : Background

Vallisneria kauresen has a very voluminous appearance with its wide leaves. Its leaves have translucent margin and turn reddish when growing in good condition, making the plant look uniquely attractive. High light and application of liquid fertilizer are essential. Although this plant having unique leaves is rather difficult to use in the layout, planting it in the background location can create a distinctive atmosphere within the aquascape.

Ottelia alismoides

Ottelia alismoides

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Ottelia alismoides with cellophane-like translucent leaves has an outstanding presence in the layout. Due to its submerged nature, the height of this plant varies depending on the water depth. Even though it is possible to grow this plant even in 60cm tank, the plant should preferably be enjoyed in 90cm or larger tank. Be careful not to break this delicate and fragile plant during planting.

Isoetes japonica

Isoetes japonica

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Being one of aquatic ferns, *Isoetes japonica* has sporangia unique to ferns on the leaves near the base portion. This plant grows well in the tank. It is important to cut off its old leaves prone to algae frequently to promote development of new leaves. When purchasing *Isoetes japonica*, select young and fresh plant that is easier to grow and more adaptive to new environment.

Potamogeton dentatus

Potamogeton dentatus

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Potamogeton dentatus with wide leaves has a stronger presence than other members of *Potamogeton*. Because this plant is vulnerable to water temperature rise, the tank water should be maintained at a lower temperature so that the plant show its fresh green leaves at all times. It propagates itself from rhizomes. If a new shoot grows from unintended location, then cut it off as soon as possible.

Limnophila sessiliflora

Limnophila sessiliflora

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Limnophila sessiliflora is an aquatic plant native to Japan and commonly found in paddy fields. It is also called hornwort and popular among Japanese. In well-controlled environment within planted aquarium, this plant grows and expands extremely fast to the extent that it can affect the overall balance of the layout. It is easy to grow, but rather difficult to maintain in the layout for a long time.

Pogostemon yatabeana

Pogostemon yatabeana

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Mid-ground to background

Pogostemon yatabeana develops yellowish-green whorled leaves. Compared to *Pogostemon stellatus*, this plant looks less striking due to longer internode length and less number of leaves, i.e., three to four leaves per whorl. Nevertheless, *Pogostemon yatabeana* standing upright in groups is appealing and its bright green color provides a fresh touch to the layout. Frequent trimming is required because this plant easily grows out of the water surface.



memo

Knowing the Nature around Us

Placing the aquatic plants that you have collected on your own is a fun for hobbyists. In Japan, aquatic plants grow in various locations around you such as ponds, lakes, irrigation ditches and fallow paddy fields. However, these plants are rapidly disappearing recently primarily due to revetment lining the bed and banks of water channel and use of pesticides. Aquatic plant hobbyists should preferably be sensitive and keen to such environmental changes in the nature around them. For your information, the best time for collecting aquatic plants is September to October in Japan. Keep in mind to observe good manners and collect only the minimum necessary amount of plants.

Ludwigia ovaries

Ludwigia ovaris

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

Ludwigia ovaries features its round alternate leaves. The lower stem of this plant may be damaged due to heat when newly arrived in retail stores, posing a high risk of decay and melt immediately after planting. This plant will become very attractive with vivid pink leaves with high light and application of liquid fertilizer.

Pogostemon stellatus

Pogostemon stellatus

- pH** : Mildly acidic to mildly alkaline
- Hardness** : Soft to medium hard water
- Light** : High
- CO₂** : High
- Planting** : Background

In contrast with its sharp emerged leaves, *Pogostemon stellatus* develops delicate submersed leaves (4-6 leaves per whorl). Its stem will not bend while growing. Repeated trimming promotes the development of small side shoots and at the same time helps the lower stem of the plant grow bigger. Bright environment with adequate CO₂ injection is essential for this plant to thrive.



One of the attractive aspects of aquatic plants is its rich and diverse species. Aquatic plants have evolved into many different forms as a result of adaptation to the natural environment of the respective areas in the world. When creating a Nature Aquarium layout where natural beauty is expressed, it is crucial to understand the biological characteristics of each plant. For example, stem plants that grow their stems upward towards the water surface have appealing top portions, but on the other hand, the bottom part of their stems will gradually become unsightly over time. This is why Nature Aquarium uses the basic technique of planting rosette-type *Cryptocoryne*, among other plants, in front of stem plants to conceal their unsightly bottom portions. Using various aquatic plants of many different forms effectively in their respective appropriate locations is the most important key to bringing out the beauty of aquatic plants.



The Wisdom of the Masters Liquid Fertilizers Section 01
The Basics of Applying Liquid Fertilizers

GREEN BRIGHTY
STEP 1.2.3

In an aquarium with the substrate containing Power Sand and Aqua Soil Amazonia, nitrogen is provided from the substrate into the water. Nitrogen and phosphorus are also generated from fish waste and leftover fish food in a fish tank. As a result, they more likely become excessive, whereas potassium and trace elements become deficient in the aquarium. Brighty K is a liquid fertilizer specifically designed for providing potassium as Green Brighty STEP1, 2 and 3 for addressing trace element requirements. Applying

the combination of these fertilizers into the aquarium can satisfy nitrogen, phosphorus, potassium and trace element requirements, which are essential for healthy growth of aquatic plants. Once they are added to aquarium water, liquid fertilizers will be binded to other substances or absorbed into the filtration media. For best results, add the right amount of liquid fertilizers everyday in order for aquatic plants to take them in efficiently.

The Wisdom of the Masters

[Liquid Fertilizers Section]



The Wisdom of the Masters Liquid Fertilizers Section 02
Applying Liquid Fertilizers in Unique Environments

GREEN BRIGHTY SPECIAL
LIGHTS, SHADE

case of the aquarium where sand is the only substrate material or the aquarium without fish, the growth of aquatic plants can be interrupted because there is no source of nitrogen and phosphorus supply. In such unique environments, adding Green Brighty Special LIGHTS or Green Brighty Special SHADE to the aquarium water is ideal; they are both containing potassium and trace elements as well as nitrogen and phosphorus. Green Brighty Special LIGHTS contains more nitro-

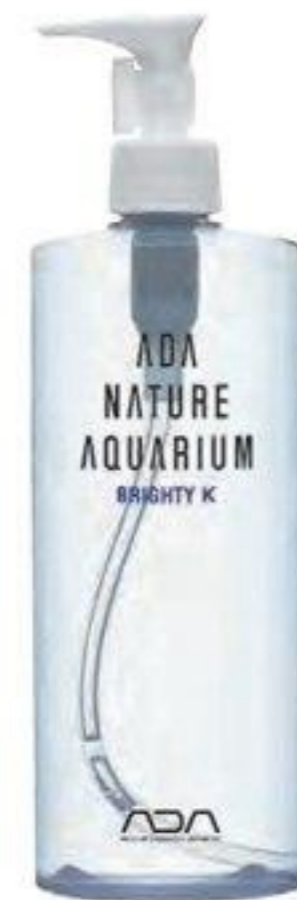
gen for fast-growing heliophytic (light loving) plants, whose leaves and stems grow rapidly. Green Brighty Special SHADE has more potassium for sciophytic (low-light) aquatic plants which spread over their roots. Though these two products are comprehensive in use for supplying nitrogen, phosphorus, potassium and trace elements in one bottle, they can enhance algae growth if overdosed. It is important to adjust the usage carefully depending on the condition of the aquarium.

Applying Potassium and the Water Quality

In Nature Aquarium, potassium is generally added with Brighty K. The levels of pH and carbonate hardness (KH) increase right after adding Brighty K into the aquarium water since Brighty K is an alkaline additive. This is only a temporal reaction, however. They will go down due to effects from Aqua Soil in the substrate and of CO2 injection, and it won't be harmful to most of aquatic plants. Whereas some South American stem plants including Syngonanthus

sp. are sensitive to the rise of carbonate hardness and they can be affected by adding Brighty K. To those plants, use Green Brighty Special SHADE. Green Brighty Special SHADE is a comprehensive fertilizer, rich in potassium, and is capable of supplying potassium without changing the quality of the water. The key is to choose fertilizers and additives depending on the characteristics of aquatic plants.

BRIGHTY K



The growth of aquatic plants and their colors are very much affected by nutrients. Plants will grow healthy when all the nutrient requirements of plants - nitrogen, phosphorus, potassium and trace elements, are met. Unbalanced nutrients can disturb the plant growth and cause discoloration of leaves. Applying fertilizers accordingly is recommended.

The Additives Supplying Trace Elements

In Nature Aquarium, Green Brighty STEP1, 2 and 3 are added everyday to supply trace elements into the aquarium water. Since iron is more required by aquatic plants than other trace elements, an additive, ECA, is sometimes used on top of liquid fertilizers. ECA is specifically designed for iron requirements of the water. It enhances the color of red stem plants and is effective for treating chlorosis of the plants.

Applying a high dosage of ECA brings an instant effect, but it can result in browning the water. Hence once the problem is treated by adding plenty of ECA, change the water and clear its color. In order to encourage the development of new buds right after trimming aquatic plants like stem plants and *Glossostigma elatinoides*, use an additive, Green Gain, which provides trace elements and plant hormones.

GREEN GAIN, ECA





In nature, aquatic plants grow naturally in various environments depending on the types. Environmental factors such as light intensity, hours of sunlight, substrate, water temperature and water quality vary between locations, and aquatic plants have evolved and adapted to their respective habitats. When growing many species of aquatic plants originated from different locations in the same aquarium, it is vital to create an environment that caters to the greatest common factor of these plants. The water quality has a significant impact particularly on the

aquatic plants that develop their leaves in the water. If the plant does not grow its leaves well, check the quality of the aquarium water first of all. The quality of tank water can easily be measured with Pack Checker. It is advisable to measure at least the pH and total hardness (TH) of the tap water to be used during the aquarium water changes so that you can get the basic information on water quality. The quality of tap water varies depending on the location and season. If the quality is not favorable, it is recommended to install a water filter.

The Wisdom of the Masters

[Water Quality Section]



Aquatic plants absorb CO₂ dissolved in water during photosynthesis. Under CO₂ deficient conditions, the photosynthesis process slows down and the growth of aquatic plants is affected. This is why CO₂ injection is performed in Nature Aquarium where aquatic plants are grown. CO₂ dissolved into water causes decline in pH and the water becomes more acidic. In contrast, when aquatic plants absorb CO₂, the pH rises and the water becomes more alkaline. As can be seen from

this, it can be said that if CO₂ supply to the tank and absorption of CO₂ by aquatic plants are well-balanced, there will be little change in pH level of the water. In actual fact, however, the state in which the pH level is mildly acidic is ideal for aquatic plants in view of the fact that the plants perform photosynthesis more vigorously with slightly more CO₂ supply. The change in pH as a result of CO₂ injection can be checked easily by installing a Drop Checker within the tank.

Most of aquatic plants thrive in acidic water containing abundant CO₂ and in contrast, they do not grow well in alkaline water. This is because neutral to alkaline water contain more carbonate (CO₃²⁻) as well as bicarbonate (HCO₃⁻) and accordingly, less amount of free carbon dioxide (CO₂) is present in these types of water. The water becomes more acidic with CO₂ injection to the tank; but a large amount of CO₂ needs to be supplied in order to cause

alkaline water high in KH to become acidic beyond neutral state. Aqua Soil has an effect of lowering KH and making the water more acidic, allowing the CO₂ supplied to be absorbed by aquatic plants more effectively and contributing to healthier growth of most of the aquatic plant species. Similarly, the additive “be Soft” sold under the “Dolaqua” series also has an effect of lowering pH and carbonate hardness.

AQUA SOIL AMAZONIA



Aquatic plants that grow underwater are greatly influenced by water quality. Not only reflected by the quality of tap water, the quality of tank water also changes depending on CO₂ injection to the tank, substrate and materials used. Make effective use of Pack Checker and items for water quality improvement for healthy growth of aquatic plants.

Although presenting different units, both total hardness (TH) and general hardness (GH) represent the total amount of calcium and magnesium present in water (Pack Checker measures TH only). Calcium and magnesium are the trace elements necessary for the growth of aquatic plants, but if they are extremely high in concentration, the plants' absorption of nutrients may be blocked or the plant leaves may become too small or bleach out. These symptoms appear

prominently in Glossostigma. The causes of the rise in total hardness within the tank include the influence of sand and stone. The carbonate calcium in the sand and stones leaches out by the reaction with acid in water and causes the total hardness of the aquarium water to rise. If the total hardness (TH) exceeds 100mg/l and the growth of aquatic plants seems to be affected, it is recommended to install a softener to bring down the total hardness level.

SOFTENIZER



Workshop by Takashi Amano in Germany

Pet Fair Hanover "The Art of Planted Aquarium"

Reported by: Yoshiki Kondo, Overseas Trade Department, ADA



The layout making is now at its height. The participants are drawn into Amano's creation.

The contest held during "The Art of Planted Aquarium", now in its fifth year, is one of the world's largest layout contests where the participants create their layout on the spot. A total of 64 entries, comprising 32 entries each for XL and Nano categories, were received this year. The main program of this event was the "Workshop by Takashi Amano". On January 27, the first day of "The Art of Planted Aquarium", there was the autograph session by Takashi Amano for his photo book "Glass no Naka no Daishizen" as a preliminary event. As can be seen from the fact that the German version was released first among several translated versions, this photo book has been much talked about since it was published and this autograph session attracted a number of fans, including the ones who brought the old version of the photo book in German language (published in 1994) for autograph. More than 10 years have passed since ADA first participated in German fair "Interzoo" in

May 2000 and we can now realize that ADA's efforts in publishing and public relations activities have led to legions of current fans. A lot of female fans were also seen in the event venue; they added a soft and relaxed atmosphere to the place.

The lecture and workshop held on January 28 drew more than 350 participants, not only from Germany but from all over Europe including Scandinavian Norway as well. All of them listened attentively to Amano's lecture that covered a wide range of topics from his philosophy in layout, three major tropical rainforests in the world to the layout creation based on natural landscapes. It is said that the fans from Germany and other European countries sympathize with the philosophy of Nature Aquarium. Among these fans, the ADA image brochure (German version) released in the beginning of year has become very popular and many of them were seen holding this brochure carefully with both hands during the

event.

The much-awaited workshop kicked off at 4pm on the same day, and when Amano went on the stage after the singing of Japanese and German national anthems, cheers and applause broke out from the crowd. Amano sought assistants and volunteers from among the audiences first, and then started creating a layout in a totally impromptu way. The audiences were strongly attracted to the live performance filled with tension and pleasurable surprises. One great attraction of this type of workshop is to catch a glimpse of Amano's unique creativity found through his actions and movements, which can only be felt by sharing the time with him. During the layout production, Amano always seems to be planting the aquatic plants solely based on his impromptu ideas, but to our surprise, he makes it a point to explain why he chose and used each plant in a logical manner. In this seminar, too, the fans present at the venue concentrated their

The aquarium event titled "The Art of Planted Aquarium" was held in conjunction with the Pet Fair Hanover from January 27 to 29, 2012 in Hanover, the capital of the German State of Lower Saxony. Takashi Amano was invited to this event as the special guest who gives lecture and workshop.



La Plata sand and Branch Woods were used during the workshop.



A. Besides planted aquarium, there were fishes and shrimps fairs.
 B. Some fans asked Amano for his autograph on the event poster.
 C. Photo session with the winners of the contest. The circle of planted aquarium hobbyists grows wider.

gaze on every scene of Amano's layout making while laughing at his jokes. Finally, a cosmetic-sand style layout using Branch Wood frameworks and newly-released La Plata sand was completed; and at the moment Grand Solar I lit up followed by the Amano's word "Finish!", the venue erupted in cheers and applause. After that, the completed aquarium and Amano were surrounded by a huge crowd rushed onto the stage. The workshop ended with autograph and photography session with Amano. After the workshop, the prize giving ceremony for the Layout Contest and gala dinner were held in another venue. The contest participants looked uneasy while waiting for the results of the contest. The results were announced after the dinner and the winner of the XL and Nano categories won the grand prize for the Takashi Amano Prize, Solar I and Solar II respectively, handed out by Amano. The participants who had seemed excited or

depressed about the contest results finally showed relaxed faces after the prizegiving ceremony. On that day, they talked with Amano about aquatic plants and layout until late at night. The 64 entries this contest received this year were all Nature Aquarium-style layout except for only two works. Up until a decade ago, people have been discussing about "Dutch layout or Nature Aquarium layout"; but now, the entries made for this contest held in Germany and also for the International Aquatic Plants Layout Contest clearly showed that the Nature Aquarium style originally created by ADA Japan has become today's world standard in planted aquarium. This means that planted aquarium equals to Nature Aquarium in the current situation and almost all the hobbyists across the globe are now enjoying the Nature Aquarium. Another thing that has been noticed during this contest is the high level of

German layouters. While the remarkably improved layout skills of aquarists from Hong Kong, China and other Asian countries is prominent in the International Aquatic Plants Layout Contest, the level of German aquarists is also comparably high. This contest revealed the real abilities of the people of Germany, one of the leading countries in the aquarium culture. "The Art of Planted Aquarium" showed us the fact that Nature Aquarium has become the mainstream in planted aquarium, to the extent that the future planted aquarium layouters will no longer use the term "Nature Aquarium style". The global hobby of planted aquarium will surely continue to spread from now. In Germany in the mid of cold season, ADA renewed its commitment to passing on the correct know-how steadily and continuously through the events and publications.

Making Effective Use of Substrate Materials according to Purposes

When creating a Nature Aquarium, the first thing to do is to build the substrate. The substrate serves as the place for aquatic plants to spread their roots for growth; the place where bacteria, which is an integral part of ecosystem, perform their activities; and the place used for expression of natural ambience of the layout. To achieve these effects of the substrate, there are various types of materials available. The Nature Aquarium Notes of this issue discusses about how to make effective use of the substrate materials.

● Purposes of Substrate

In Nature Aquarium, the bottom part of the tank covered by soil or sand is called "substrate". The base sand consisting only of sand/gravel (such as sea gravels) holds the aquatic plants and also purifies the water with the help of the beneficial bacteria colonizing the sand/gravel surface. On the other hand, the substrate used in Nature Aquarium helps propagation of beneficial bacteria for stabilizing of the ecosystem within the aquarium. At the same time, it also supplies the nutrients to the plants for their healthy growth. The contaminants such as waste of fishes and shrimps kept in Nature Aquarium will be broken down by the bacteria present within the substrate and as a result, the inorganic matters are generated and absorbed by the aquatic plants as nutrients. As can be seen from this, the promoting the growth of beneficial bacteria within the substrate for luxuriant growth of aquatic plants will ultimately lead to the stabilization of the entire aquarium. For this reason, Nature Aquarium attaches the highest importance to the substrate and thus various researches and innovations in relation to substrate have been carried out.

Another purpose of substrate is to produce a natural feel within the layout. While a carpet of foreground plant creates a natural ambience within the layout, the materials such as cosmetic sand or Aqua Gravel used for the substrate can add a natural touch to the aquascape. In nature, sand and gravels are seen together with clear stream and spring water. Therefore, the natural landscape where clear water is present can be expressed by using sand and gravels as a part of the substrate materials.

Furthermore, long-term maintenance of the substrate is another important purpose in Nature Aquarium. When making a layout to be enjoyed just for a relatively short period (a few months to about one year), there is no need to

make a highly elaborate substrate. However if the layout is to be maintained for a long time, how to build the substrate will be of great significance. Over the long time periods, the substrate is most likely to face the problems including compression of the substrate due to hydraulic pressure, poorer water circulation within the substrate due to such a compression and decrease in aerobic bacteria, which will eventually lead to weakened aquatic plants and deteriorated aquarium water. In view of this, various substrate materials should be used in combination with the aim of creating a substrate suitable for long-term maintenance.

● Use of Aqua Soil and Cosmetic Sand

The top layer of the substrate is sometimes made only with Aqua Soil while it sometimes consists of separate sections of Aqua Soil and cosmetic sand. One of the purposes of the single use of Aqua Soil is to fill the entire substrate with aquatic plants. With this type of substrate, you can produce the most traditional style of layout in Nature Aquarium by planting different species according to the suitable location (foreground, mid-ground and background). Trimming of aquatic plants is vital for keeping the Nature Aquarium. Nonetheless, foreground plants is relatively hard to maintain and inadequate trimming of foreground plants can lead to the foreground having an overpowering presence due to excessively thick layer of plants.

As a solution of this problem, the layout technique where cosmetic sand is used in substitution for a part of soil substrate has been developed. This method uses Aqua Soil-Amazonia (with Power Sand and substrate additives under it, when necessary) for the mid-and background where aquatic plants will be planted, and cosmetic sand for the foreground without planting any aquatic plants. Unlike on Aqua Soil-Amazonia rich in organic matters

and nitrogen, cosmetic sand is an inorganic material that contains no nutrients and thus aquatic plants will not grow well on it. Cosmetic sand is the substrate material that has been conceived by utilizing these disadvantages as its advantages. Cosmetic sand is now gradually becoming more widely used thanks to its effect of creating natural scenery resembling river bed within the layout.

In view of the fact that most of the foreground plants are sun-loving plants, there are only limited choices of plants if the sunlight shining into the aquarium is blocked by driftwoods/aquatic plants and the foreground location of a deep tank does not receive enough sunlight. In such circumstance, cosmetic sand is a very useful solution. Furthermore, the use of bright cosmetic sand for the substrate also has an effect of preventing the bottom part of the layout from appearing too dark. When growing foreground aquatic plants on Aqua Soil without using cosmetic sand, it is recommended to lay the normal type of Aqua Soil first and then put a thin layer of the powder type of Aqua Soil on top of it. The finer-grained powder type provides a neater appearance and helps the plants spread their roots steadily to thrive. For small and shallow tanks subjected to lower hydraulic pressure, the substrate can be built using the powder type of Aqua Soil only.

● When to Use and Not to Use the Power Sand?

There are three types of Power Sand having different grain sizes (S, M and L), and the right size should be selected according to the depth of the tank. This is because the substrate is subjected to greater hydraulic pressure and the gap between the grains becomes smaller as the tank water becomes deeper. Since Power Sand has rough, uneven surface that prevents the grains from getting stuck with each other, making a layer of Power Sand at

the very bottom of the substrate, where the applied hydraulic pressure is the greatest, helps minimize the hardening of substrate even under the prolonged high hydraulic pressure conditions. On the other hand, Power Sand is not necessarily used when making a layout in a very small and shallow tank or if the layout created in a large tank is not going to be maintained for a long time. If you wish to take it easy and create a planted aquarium in a small tank, you can grow aquatic plants without any problem on the substrate built just with Aqua Soil-Amazonia, but just for a limited period of time only. When upgrading to a larger tank or wishing to maintain the layout over longer period of time, the combined use of Power Sand and Aqua Soil-Amazonia is advisable.

● Use of Substrate Additives and Nutrient Supplementation

Although the substrate can be built even without using any substrate additives, it is still recommended to apply Bacter 100 and Clear Super when making a layout in a new aquarium using brand new filter media. This is to achieve established activities of beneficial bacteria as fast as possible. Bacter 100 is sort of a "seed of bacteria" and Clear Super serves as an initial food for the bacteria. In case of aquarium make-over, the existing beneficial bacteria can be transferred to the new aquarium by adding some old brown-color water containing the bacteria to the new substrate or using the existing filter media that has been well colonized with the bacteria. If the existing bacteria cannot be utilized in the

abovementioned ways, then Bacter 100 and Clear Super will be a great solution. Meanwhile, the long-maintained layout has abundant bacteria within its substrate yet its nutrient level is gradually decreasing. In this condition, the plant growth will slow down unless appropriate nutrient supplementation is provided. In this circumstance, it is advised to use Multi Bottom and Iron Bottom, both of which are substrate fertilizers. Multi Bottom containing various trace elements can be used for a wide range of applications, while Iron Bottom rich in iron is recommended for the growth of Echinodorus and Cryptocoryne. Use these products according to the majority group of aquatic plants used in the layout.

● Effects and Advantages of Substrate Materials

There are mainly four major types of materials used to build the substrate, namely Power Sand, Aqua Soil, cosmetic sand and substrate additives. The substrate of Nature Aquarium is built by placing these materials layer by layer or by placing them in separate sections. The effects and advantages of each substrate materials are introduced here.

Power Sand

Power Sand is a substrate material made from porous volcanic stones and contains organic and inorganic nutrients. By placing a layer of Power Sand on the very bottom of the substrate, its volcanic stones having rough and uneven surfaces will prevent the hardening of substrate caused by hydraulic pressure and the rich organic nutrients will promote the growth of beneficial bacteria. The organic nutrients are broken down by the bacteria and then converted into inorganic nutrients that can be absorbed by aquatic plants. Power Sand is an essential substrate material for deep tanks where the substrate is subjected to high hydraulic pressure and also for the aquariums that are to be maintained over a long period of time.



Aqua Soil

Aqua Soil is the main substrate material made from natural earth. There are three types of Aqua Soil, namely Aqua Soil-Amazonia, Aqua Soil-Africana and Aqua Soil-Malaya, each of which is made from different types of earth. All of them have coarser-grained "Normal type" and finer-grained "Powder type". The features common to these three types are the tendency to make the aquarium water more acidic and the adequately soft grains that will not hinder the healthy growth of aquatic plants. These three types differ not only in color but in the content of organic matters and nitrogen as well. Aqua Soil-Amazonia that contains these substances the most has the greatest advantages.



Cosmetic Sand

Cosmetic sand is a substrate material to be used in the foreground. It creates a natural ambience within the layout. Recently, new Colorado sand and La Plata sand were added to the existing lineup consisting of Nile sand, Sarawak sand, Congo sand (S & SS) and Mekong sand (S, SS & Powder). Meanwhile, Aqua Gravel (S, M, L & LL) that is coarser than cosmetic sand can be used in the same way as the cosmetic sand. There are many types of cosmetic sands having different colors and grain sizes. ADA offers a wide range of lineups so that the users can express the natural ambience having different images just by laying these sands on the substrate.



Substrate Additives

Bacter 100, Clear Super, Tourmaline BC, PENAC W and PENAC P are additives to be applied during the set up of the substrate. These additives are used mainly for the purposes of preventing hardening of substrate and lack of oxygen as well as promotion of the growth of bacteria. More specifically, they are used in combination with Power Sand in order to promote the effects of Power Sand and help create the substrate suitable for long-term maintenance. Even in the case where Power Sand is not used, sprinkling these additives at the bottom of the substrate helps the user to keep the substrate in good condition. These substrate additives are not essential items, but they make the maintenance of the substrate much easier.



In Nature Aquarium, the basic substrate building method is to pile up the above materials in layers in the order of substrate additives, Power Sand and Aqua Soil (single use or combination with cosmetic sand in separate sections) from the bottom. The order of substrate additives and Power Sand may be switched.



Amano gives frank and honest answers to all the questions from the participants.

“MEDAKA NO GAKKOU”

NA Layout Seminar ~Questions and Answers~



During this layout seminar, many questions were made to Takashi Amano during layout making, get-together and in various other scenes. Among the questions that covered a wide range of topics, from layout techniques, ADA products and management of the shop to the International Aquatic Plants Layout Contest, some questions are picked and introduced here. You will find the answer to “that” hot issue.

Q1.

How do you adopt the viewpoint as a photographer in layout production?

A.

I started making aquariums slightly earlier than photography, though I only kept fishes in aquarium tanks rather than making layout of planted aquariums in those days. I was 19 when I began to take photographs seriously. Since then, I was

deep into photography and I really have changed. At that time I liked to take pictures of rocks, stones and natural landscapes and I was taking a lot of pictures of ferns and wild plants grown on mossy driftwoods. Generally Japanese people find the world of wabi-sabi in tea houses and gardens, but I saw it in the landscape photographs. Making use of the inputs I gained while taking the landscape photographs, I was able to make planted aquariums perfectly when I was around 26 years old. Before that, my aquariums were successful if I was lucky; otherwise, they ended up with totally wilted aquatic

plants. Once I mastered the layout, I created aquascapes based on the compositions of the past landscape photographs in my memory. So now, I am creating a layout not by referring to the actual landscape photographs, but based on the images accumulated in my mind through taking landscape photographs. As you know, no one can produce a layout exactly the same as a natural landscape. Nonetheless, the flow of stones is always within a framework of the laws of nature. From this point of view, I personally feel that famous stone gardens in Kyoto are over-appreciated. Everyone gives a surprised or confused look when I say this, but I think even the world famous stone garden of Ryuan Temple is also overvalued. I guess that the person who made that garden must have put white sand so that the reflected light shines towards the dim portions, and he placed some stones just because a garden simply with white sand looked too flat. Then, why does the stone garden of Ryuan Temple makes us feel wonderful although not made by a prominent garden designer? It is because the overall balance of the garden is excellent. And the Iwagumi of that garden looks great because the stones are placed within a garden designed to have the dimensions based on the golden ratio and well-balance earth wall. On top of it, the Iwagumi looks better when moss grows on it over time. You might understand better if I say the Iwagumi that has been just made did not wear any makeup while the current Iwagumi is nicely wearing makeup... Oops, excuses me for having said something rude, ladies (the participants burst out laughing). Anyway, the elapse of time usually makes the Iwagumi look better. So you, too, please look at your own Iwagumi after some time. If your Iwagumi is really good, then you will feel it looks good. If you feel something odd about the Iwagumi you have made, then your stone arrangement is not perfect. Well, I hope I gave the right answer to the question.

Q2.

I think Mr. Amano’s media exposure greatly influences the further popularization of planted aquarium. How do you think about it?

A.

Well, I didn't quite like to make an appearance in the media until three to four years ago. I don't mean that I like it now, but I think it is important to spread the planted aquarium through media for its future development. ADA organize this Medaka no Gakko Seminar with the aim that our dealers across the nation will be able to make higher level displays of planted aquariums; and we believe it is one of the most important things for wide spreading of planted aquariums. It's hard to say this, but I clearly know why some shops record good sales while some do not. The shops that are committed to displaying planted aquariums are recording good sale. When I was running my own shop more than 30 years ago, I was also used to display a number of planted aquariums in my shop. I very often put a "Not for sale" tag on the fishes in a tip-top condition so that I can use those fishes for the planted aquariums I created, so people jokingly called my shop "the Shop for 'Not for Sale'".

In Niigata where the head office of ADA is located, many hospitals and other public facilities have installed planted aquariums and therefore the opportunity to see planted aquariums is much greater than other areas. Besides ADA, there are few companies engaged in the maintenance of aquariums, and indeed the citizens of Niigata have many opportunities of seeing planted aquariums. The more chances in seeing planted aquariums, the more people become interested in it and have an urge to start making their own aquariums. So, dear participants, please make your best to create many planted aquariums. But one thing you must remember is that you have create the layouts that can move the customers or, in other words, the layouts that can leave the customers wanting to give it a try. My media exposure is not enough. Let us all work together in make a wide

Q3.

You have said earlier during layout production that Aqua Soil-Amazonia may become unavailable in future. Could you explain about it in detail?

A.

I meant that it would be impossible to make an unlimited amount of Aqua Soil-Amazonia since the black earth used as its raw material is very rare and not simply found anywhere. It's not that any black earth can be used as the raw material of Amazonia because the nutrients contained and viscosity vary between the earths from different locations. The black earth currently used for Aqua Soil-Amazonia is of the best quality in terms of nutrients and viscosity, but this kind of black earth is almost depleted. What I want you to understand is that black earth is natural substance and therefore may be slightly different in quartz content even originated from the same location; and the pure black earth containing no quartz may become unavailable in future. As you all know, quartz has no impact on the growth of aquatic plants. And in the current situation, it can't be helped that the earth containing a small amount of quartz will be used as the raw material. Aqua Soil, which cannot be produced artificially, is great because it is made from 100% natural black earth. There is no soil as good as black earth used for Aqua Soil-Amazonia in the world. As mentioned earlier, the quartz contained in the soil will not affect the growth of aquatic plants. So, I hope everyone will continue using Aqua Soil-Amazonia with peace of mind.

Q4.

I would like to ask about this year's International Aquatic Plants Layout Contest. I heard that the points earned by voting by the participants in NA Party will be counted in the total point calculation in addition to the points granted by each jury. Since the majority of the party participants would be Japanese, I'm afraid if the overseas people may distrust the results of this international contest. How do you feel about this?

A.

I've heard that what you have mentioned is a concern among some people in overseas. Under the voting system to be

introduced, however, only the layout works will be unveiled without disclosing the contestants' names and countries. When the participants in NA Party will cast their votes for the final seven layouts, ADA will make thorough efforts to keep the rank of each layout and the difference in points with other works strictly confidential. Furthermore, the points earned by voting during the final judging stage will not account for a significant proportion of the total points and thus we believe its impact will not be great even if the participants in NA Party try to manipulate the votes. The IAPLC Committee is also aware that the concern for this issue will be raised. Anyway, it is planned that a wide range of voters, including aquarium shops and editors of aquarium magazines from all over the world, will cast their votes for the layouts. We will try our best to prevent accidental divulgation of the contestant details as well as any fraud or irregularities in relation to voting. We also do our very best to make arrangements so that no complaints or feedback will be raised by the people outside Japan against unfairness or the advantage of Japanese.

By the way, the reason why we decided to adopt a new voting system is the presence of people who are not satisfied with the result determined solely by the juries. We can of course ignore such a feedback because we can proudly say that the judgments made by the juries have been always strict and fair. However, after we heard such a comment, we thought it would be all right if there is an opportunity to have an open judgment. Of course, the points granted by voting won't be so big; it is something just like a popular vote open to the public for a singing competition. Since there is a difference in the points granted by the juries and popular votes, it is not easy to reverse the result. The important point of this new system is that the participants in NA Party can take part in the voting. Although reversal of the result will not take place easily in the ordinary situations, there would still be a chance of reversing the result in the event where a layout is not very highly regarded by the juries but it receives extremely high point by voting. I think this would be a good point of the new system and hope it works well. I wish this year's IAPLC will become another fun event in which more people come and participate. Thank you.

あなたが決める世界の頂点。

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