Master the Beauty of Plant Cluster

Colorful stem plants planted in the background of Nature Aquarium—they are essential background plants to bring a bright and vibrant atmosphere to the aquascape. Stem plants can grow as a single stem but their inherent beauty stands out when they grow in clusters.

The special feature of this issue introduces the layout techniques to grow clusters of stem plants to bring out the best of the plants' stunning perfection. Why don't you add a bright and colorful touch to your room with an aquascape having lush stem plants?

Aquascaping Photography by Takashi Amano
Text by Masahiro Aki / Takeshi Ota
Among aquatic plants, there are particularly a wide variety of stem plants. Their greatest attraction is the beautiful colors including bright green and red, which cannot be seen in other aquatic plants. If we look at only a single stem, it is not so impressive, but on the other hand, it stands out when the stem plants thrive in clumps. It is what we call “the beauty of plant cluster.” The trait of growing in clumps is the stem plants’ strategy to occupy a wider area to perform more advantageous photosynthesis. What is interesting is that this trait of stem plants also leads to their fascinating appearance all at once. The color of the leaves in the clusters of stem plants is like a dream with their distinct shapes and textures. It's a wonderful idea to grow stem plants in clusters and bring the best of their charm to your layout.
FEEL

SUKKEI GALLERY I

“Beauty of Plant Cluster Seen in Lush Background”

the Beauty of Plant Cluster

What brings out stem plants the most is the dense vegetation. It is overwhelming to see the beautiful clusters of stem plants growing luxuriantly to fill the entire background. This section introduces some aquascapes with gorgeous beauty in their backgrounds.

A

Beautiful Clusters Flowing Down the Background

A large clump of Microsorum sp. (Narrow Leaf) is surrounded by thriving Rotala rotundifolia (Green) and Hygrophila polysperma.

Task size: W140 X D60 X H60(cm)
Shot on: November 2000

Main stem plants used: Rotala rotundifolia (Green)/Rotala rotundifolia /Hygrophila polysperma

B

Stem Plants Arranged by Considering Color Effects

Dark red Rotala macrandra is planted slightly off the layout center to the right to keep the balance of the local point.

Task size: W90 X D45 X H45(cm)
Shot on: December 2003

Main stem plants used: Rotala macrandra / Rotala rotundifolia / Rotala rotundifolia (Green) / Nymphoides peltata

C

Stem Plants Arranged Alternately in Different Colors

Red and green stem plants are planted alternately to add a different touch to the background to avoid monotonous aquascapes.

Task size: W240 X D60 X H60(cm)
Shot on: October 2009

Main stem plants used: Rotala rotundifolia / Anubias gracilis / Nymphoides peltata / Ludwigia arcuata / Rotala nanoum

D

Arrangement of Assorted Stem Plants

This layout is composed of stem plants alone from the midground to the background. The assorted stem plants add a cheerful touch to the aquascape.

Task size: W60 X D30 X H60(cm)
Shot on: September 1993

Main stem plants used: Pogostemon stellatus / Pogostemon stellatus / Nymphoides sp. / Ludwigia aurita / Drymaria cordata / Lagarosiphon madagascariensis / Rotala superb / Hemianthus micranthemoides / Didiplis diandra
The composition framework of layout is formed by driftwood and stones. Stem plants play another important role there to flesh out the framework to form the composition. Enjoy the beauty of plant clusters creating various compositions.

**FEEL**

The Beauty of Plant Cluster

The layout shows color gradations by arranging Rotala sp. ‘Espera’, having the medium tone, between the red and green stem plants.

Tank size: W120 × D45 × H45(cm)

Shot on: November 2008

Main stem plants used: Rotala rotundifolia / Rotala macrandra / Alternanthera reineckii

**DA GALLERY**

Stem Plants Arranged to Enhance the Red Color in the Center

Large red leaves of Alternanthera reineckii planted in the center stand out in the layout by being surrounded by fine stem plants.

Tank size: W180 × D60 × H60(cm)

Shot on: April 2010

Main stem plants used: Alternanthera reineckii / Ludwigia arcuata / Myriophyllum matronasceum (Green)

**NA GALLERY**

Convex Composition Emphasized by Bright Red Color

The impression of the convex composition is emphasized by planting Rotala rotundifolia to the left of the layout center.

Tank size: W120 × D60 × H51(cm)

Shot on: October 2010

Main stem plants used: Rotala rotundifolia / Rotala sp. ‘Espera’ / Alternanthera reineckii / Ludwigia arcuata

**NA GALLERY**

Magnificence Created by Fine Leaves

Bushes arranged by several fine stem plants can give a larger impression of the aquascape. This produces a magnificent scale of the layout.

Tank size: W180 × D60 × H60(cm)

Shot on: October 2013

Main stem plants used: Myriophyllum matronasceum (Green) / Rotala nympha / Rotala rotundifolia (Green) / Rotala rotundifolia
FEEL SUKEI GALLERY 3
"Beauty of Plant Cluster Seen in Iwagumi Layout"

the Beauty of Plant Cluster

Stem plants are not often used in Iwagumi layout. However, these plants are used to make a significant change to the aquascape by so-called "Suzu Hanishoku" or to emphasize the perspective of the layout. Let's have a look at the beauty of plant clusters in Iwagumi layouts.

**NA GALLERY**
Beautiful Clusters of Stem Plants in Harmony with Hakkai Stones

Stem plants grown into a beautiful cluster wrap Hakkai stones from behind. They are harmonizing well with rounded Hakkai stones.
Task size: W100×D60×H60(cm)
Shot on: August 2010
Main stem plants: Hygrophila polysperma / Rotala rotundifolia / Rotala rotundifolia 'Green'

**NA GALLERY**
Beautiful Clusters of Stem Plants to Enhance Manten Stones

Soft colors of stem plants in the background match the earth color of Manten stones and enhance their presence.
Task size: W90×D60×H60(cm)
Shot on: December 2009
Main stem plants: Myriophyllum verticillatum 'Green' / Rotala sp. 'Green' / Ludwigia arcuata
Rotala nyanjan / Rotala macrandra 'Green'
Rotala rotundifolia 'Green'

**NA GALLERY**
Beautiful Clusters of Stem Plants

Perspective is skillfully expressed by placing Rynish stones in the center to depict a distant view of a mountain and having a clump of stem plants in front to depict a forest.
Task size: W130×D60×H60(cm)
Shot on: April 2010
Main stem plants: Hygrophila polysperma / Rotala rotundifolia
Beauty of Plant Cluster
SEEN in Natural Underwater

Nature Aquariums definite underwater beauty found in the wild as a sense of nature and expresses into a layout. The elements that help to create a sense of nature include clusters of aquatic plants, together with many other things like rocks, driftwood, sand, and pebbles. Clumps of aquatic plants are essential for underwater ecosystems as they are not only beautiful but also supply a large amount of oxygen into aquarium water and serve as ideal shelters for small and juvenile fish. Growing clusters of aquatic plants in a layout turns out to generate a sense of nature.
CREATE the Beauty of Plant Cluster

To create a beautiful cluster of stem plants, it is necessary to think of planting patterns and to plant them densely and carefully. This section introduces the visual impact and the planting methods of stem plants based on their leaves and their colors.

**GUNSEL-B1:** Select the Appropriate Shape and Size of Leaves

Stem plants come in various leaf colors, shapes, and sizes. If you select only a similar type of leaves, the cluster may look monotonous but if often becomes monotonous. Avoid excessive use of large leaves or the cluster might look flat.

**GUNSEL-B2:** Know the Different Impressions of Colors

Color impact varies depending on the leaf color. Red plants have a stronger impression than green plants. Taking that into consideration, let’s work on the plant arrangement raised for the center set on the layout composition (refer to C on the next page).

**Complementary color effect:**

Green complements red. Thus a red plant stands out when it is placed among green plants as an accent.

**GUNSEL-B3:** The Golden Ratio Supports the Balance of the Composition

The position of the focal point in the layout composition is very important. The balance of approximately 3:2 should basically be achieved in the layout as per the golden ratio of 1.618:1. In line with this thinking, the plants having larger leaves or stronger colors should be planted on the focal point side.

The basic plant arrangement is to locate high-impact plants, such as stem plants with large leaves or red plants, on the range of focal point in the layout (ie., red shaded area in the above illustration). When arranging red plants in one location, it is a cardinal rule to lay over the range of focal point.

“Preparation of stem plants with broad leaves”

For stem plants with broad leaves, such as Ludwigia, remove the leaves on two lower nodes.

“Tips for dense planting of stem plants”

For neat and dense planting of stem plants, it is important to tilt the plants against the planting direction to secure planting space. Make sure of planting direction before starting the job.

**GUNSEL-B4:** Planting Tips to Create a Beautiful Cluster

For stem plants which will develop large leaves, it is easier to achieve dense planting by removing their lower leaves in advance. It is also important to use specialized Pinettes for aquatic plants and to work on planting as checking the planting space left.
CREATE Lighting and CO₂ Supply the Beauty of Plant Cluster

Rate of photosynthesis is determined mainly by "light intensity", "CO₂" and "temperature". In the absence of any of these factors, it may become a limiting factor that lowers the rate of photosynthesis.

**GUNSEI-01** Light – The Most Important Factor for Plant Growth

The most important factor in growing aquatic plants is the light intensity. Therefore, it is necessary to choose a lighting system which can supply sufficient amounts of light for your tank. There are various types of light sources available, including metal halide lamp, fluorescent lamp and LED. For a 90cm or larger tank, it is recommended to use metal halide lamp which emits strong light.

**GUNSEI-02** Difference in Light Intensity between Center and Corners of Tank

Although appropriate lighting system is installed for the tank size, the center part of the tank tends to be brighter than the corners of the tank where the light is often much dimmer. Since red aquatic plants prefer strong light, they should be planted around the center of the tank to help them grow beautifully. It is good to remember that plants may grow slower on the corners of a tank due to low light intensities.

**GUNSEI-03** Observation of Photosynthesis and Environment

Under the environment with the right conditions for photosynthesis, aquatic plants generate oxygen bubbles from their leaves to show us their fantastic beauty of cluster. Oxygen bubbles are not always visible if the lighting and CO₂ concentration are not appropriate. It is important to observe the growing plants on a daily basis to provide the appropriate growing conditions for their growth.
CREATE the Beauty of Plant Cluster

In addition to ensuring good water condition, providing appropriate water flow is also important to grow a beautiful cluster of stem plants. Optimized filter functions and water flow help create the beauty of plant clusters.

Water flow equalizes CO2 concentrations

Install two outlet ports on both sides

Large aquariums often experience uneven CO2 concentrations. A solution to this problem is to install two separate filter outlet ports on both sides of the tank to create water flow that circulates the entire tank. This will help equalize CO2 concentration in the tank.

Divide CO2 supply into two branches

A higher efficiency in CO2 supply is achieved by supplying CO2 with two separate Bubbling Stones, rather than supplying a larger amount of CO2 by using a single unit. In a large aquarium, it is advisable to branch off the CO2 supply.

Surface Pull-in Flow

Lily Pipe, an accessory of Super Jet Filter, moderates the outflow of water and creates the ideal flow for the growth of stem plants.

Soft Spinning Flow

Lily Pipe Spin creates a swirling flow of water inside the loop section, and effectively reduces the string flow. Particularly suitable for small aquariums.

Straight Flow

Simple designed Lily Pipe Mini is suitable for combined use with an external filter with low flow rate designed for small aquariums.

Very Gentle Water Flow

Metal Jet Pipe for outflow slows down the water flow from the filter and creates very gentle current. Suitable for lighting fish that prefer gentle water flow such as Bettas.
CREATE

the Beauty of Plant Cluster

In Nature Aquarium, trimming is not merely a process to adjust the height of stem plants but it is a must-master technique in order to enhance the density of stems and leaves and to grow beautiful plant clusters.

A

B

Method of Replanting a Branched Stem

Cut a stem into several pieces
Cut a stem into several pieces which has a terminal bud. Throw the old and bud original stem away.

Align the stem length
In order to make the planting easier, gather the stems having similar lengths and trim them to the same length with scissors. Align the level of terminal bud and cut the bottom part of the stem.

Plant the stems with Pinserter
For stem plants, hold the bottom part of the stem with Pinserter to plant. If it has large leaves, remove them on the bottom part.

Subsequently, repeat the trimming of stem plants in the same way. The layout will perfectly look better with bush stems and leaves.

Main aquatic plants used: Hemianthus callitrichoides / Microsorum pteropus / Rotala rotundifolia (Green) / Kinjuroi scapes

3 weeks after planting. Before trimming

3 weeks after planting. After trimming

GUNSEL-38

Trimming of Stem Plants in an Actual Layout

Stem plants grow up to the water surface in 3-4 weeks after planting. This is the timing for the first trimming.
CREATE the Beauty of Plant Cluster

Utilizing Liquid Fertilizers and Additives

It is effective to use liquid fertilizers and additives to grow beautiful stem plants. Stem plants grow well with nutrients in the substrate and CO2 supplied. In addition, stem plants need potassium and other trace elements.

**GUNNEX-81 Examples of Use of Liquid Fertilizers and Additives**

In a newly set up planted aquarium, aquatic plants do not grow much and water quality is unstable. One of the first things to do is to establish beneficial bacteria colony to biological filtration.

- **Green Fertil**
  - Plant one week after setup

Once the aquatic plants start to grow, add potassium and trace elements to aquarium to promote the growth of healthy leaves. Apply an appropriate amount every morning.

- **Brighty K**
  - Green Brighty STEP 1
  - One week to three months after setup

Right after trimming, the growth of aquatic plants are temporarily suspended. Apply Green Gain which contains botanical hormones to promote the development of new buds.

- **Green Gain**
  - After trimming

Aquatic plants grow densely in this period. Their colors will become vivid by supplementing more iron particularly with other trace elements.

- **Brighty K**
  - Green Brighty STEP 2
  - 3 months after planting

**GUNNEX-82 Application of Liquid Fertilizer According to the Plant Condition**

Appropriate amount of trace elements and potassium differs depending on the condition of aquatic plants. For healthy growth of aquatic plants, trace elements should be given in a good balance when aquatic plants grow vigorously. When plants are thinning, more iron is required in addition to other trace elements. When the aquatic plants mature, supplementation of potassium is advantageous.

- **Green Brighty STEP 1 Brighty K**
  - Contains well-balanced trace elements. Promotes development of new leaves.

- **Green Brighty STEP 2 K**
  - Contains more iron required for growing plants. Maintains rich leaf colors.

- **Green Brighty STEP 3 Brighty K**
  - Rich in trace elements with potassium. Promotes photosynthesis and root development.

**GUNNEX-83 Supplementation of Iron for Vivid Red Color**

Nitrogen and iron especially affect the red color of aquatic plants. Unlike nitrogen which is always supplied from substrate and fish waste, iron is prone to be insufficient in planted aquarium. Adding iron-rich ECA helps plants to produce vivid red color.

- **ECA**
  - More intense and vivid red color with ECA

**GUNNEX-84 Improvement of Plant Growth and Color by Supplementing Nitrogen**

When aquatic plants thrive in an aquarium only with a small number of fish, the nitrogen in the aquarium becomes insufficient, which may affect the growth or colors of aquatic plants. Green Brighty Special containing nitrogen improves the plant growth and color.

- **Green Brighty Special SHOKE**
  - Green Brighty Special LIGHTS
Beautiful clusters of stem plants add bright and colorful touches to the aquascape representing a natural feel.

One of the good things about stem plants is their wide variety, so that we can choose the species having the same type of leaves in different colors. Taking advantage of this feature, this layout has a color gradient made by a combination of different species of stem plants. You can have a wider latitude of expression by using stem plants like paints.

Tank size: W180 × D60 × H60 (cm)

©Takanori Aramaki
Stem plants add a rich, vibrant color to a layout expressing a natural feel by using driftwood, stones, and epiphytic plants. They provide a spacious and comfortable living place for fish by supplying oxygen and purifying water.
Composition Framework Accentuating Clusters of Stem Plants by Using Sansui Stone and Driftwood

This layout is created based on a convex composition having clusters of stem plants in the center. Firstly, many Sansui stones are placed in an upright position near the center of the tank to make an enclosure. Then, a large amount of Aqua Soil-Amazonica is poured inside the enclosure to make a planting space for stem plants above the level of the rest. The driftwood, with the effect of Hygrophila pinnatifida attached, perfectly blends with the bush of stem plants.

Since the substrate for stem plants is raised high, the bushes of stem plants stand out without being hidden behind the driftwood or epiphytic plants.

Glossotrigma is planted around the Sansui stones as the main plants. Some Wabisuke Utricularia graminifolia is also placed to add a different touch to the carpet plants.

Data

- February 10, 2008
- Colored Stones: M78920X20X30 (cm)
- Lighting system: Grand Solar 3 (300W-550W-Green) + 30W Lamp Type 25W x 2 = Total Lighting 100W
- Filter system: Super Jolt Excel CT, JU, JUP-4, and 250W
- Substrate: Aqua Soil Amazonica, Power Sand Special L, Filler 20L, Clear Sifter, PRG61, PRG62, PRG63, PRG64, PRG65
- CO2: Pooling Glass B digestive 5000 
- Nitrate monitor with SSI DHC Counter" (SII tester 6000)
- AR: Night without light after running up for 1 hour
- Additives: Bright-6 & Green Brightly 111FPZ
- Water change: 1/10 water change 1 times
- Water quality: Water temperature: 27°C, pH 6.2, KH 2.0

You can find the video of this aquarium on ADA video: http://www.youtube.com/watch?v=dXoiIlQaFt4