AQUA JOURNAL

Nature Aquarium information magazine

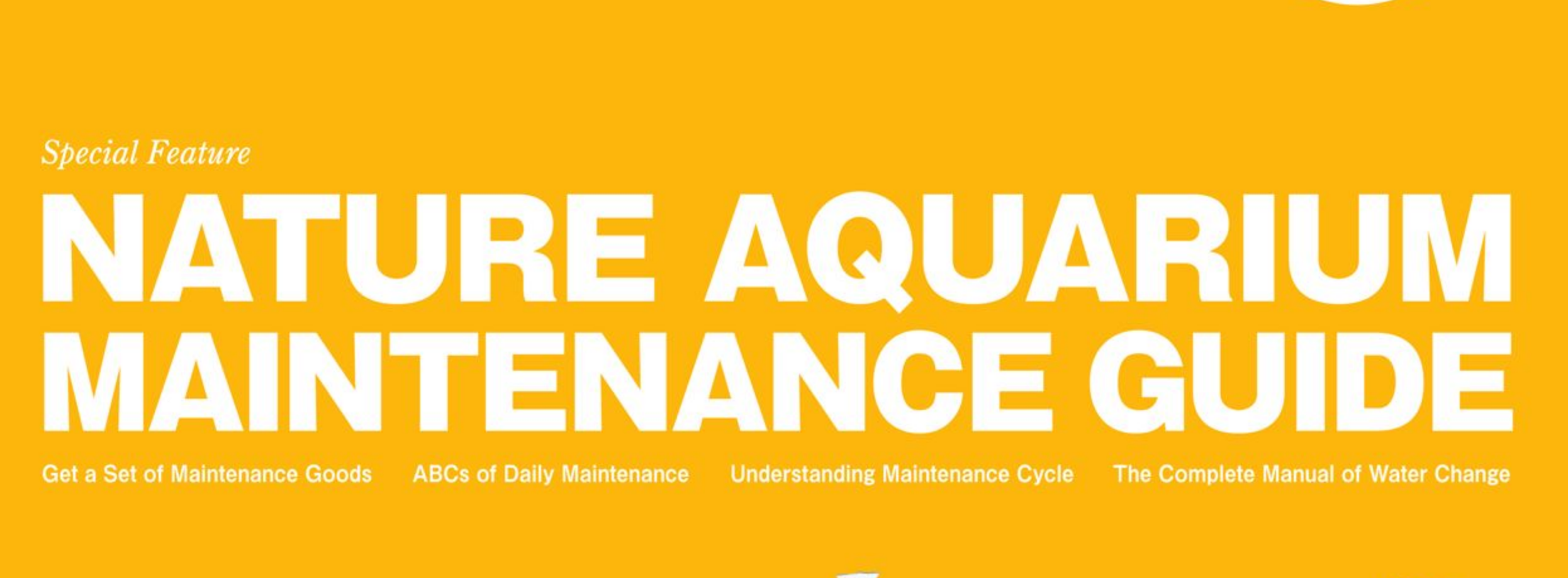
ADA aqua design amano

OCT.
2011

Special Feature

NATURE AQUARIUM MAINTENANCE GUIDE

Get a Set of Maintenance Goods　ABCs of Daily Maintenance　Understanding Maintenance Cycle　The Complete Manual of Water Change



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SUPER JET FILTER SERIES

NATURE AQUARIUM FILTRATION SYSTEM

THE PURSUIT OF AN IDEAL FILTER

ADA began the journey for an ideal filter when other sources of external filtration just didn't provide what was needed: stable water flow, consistent and long-term performance and the maximum capacity for as much filtration media as possible.

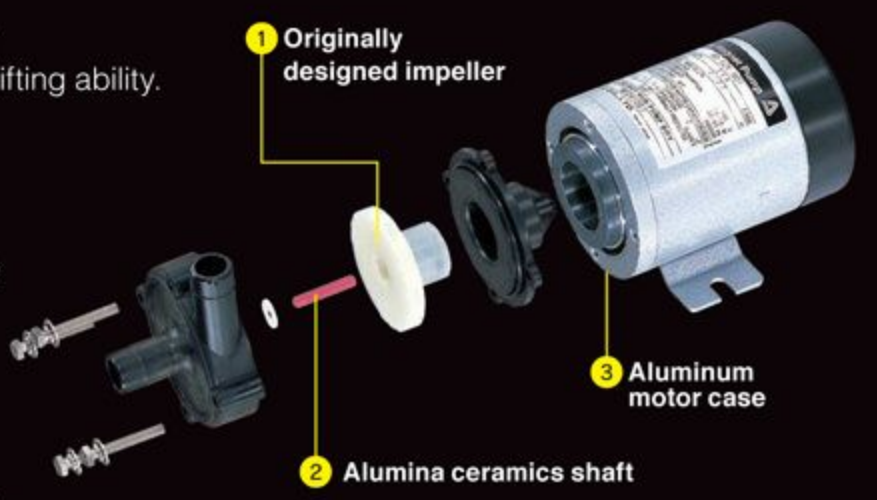
www.adana.co.jp/en

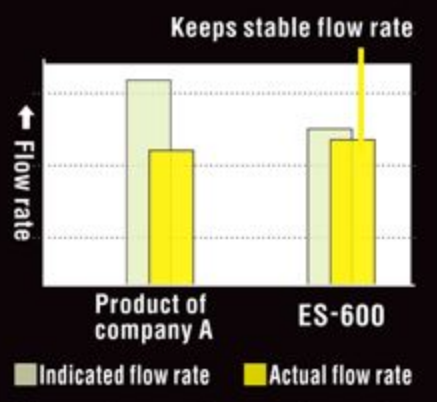
Super Jet Filter's consistent water flow is produced by the superior power of an IWAKI external pump.

1 Originally-designed impeller
Original impeller produces the high lifting ability.

2 Wear-resistant shaft
Alumina ceramics shaft with wear-resistant property supports the driving of impeller.

3 Aluminum motor case sustains high performance
The motor case with high durability is truly a professional quality.





Flow rate does not change much even after loaded with the filtration media.

Large capacity of filtration media produces extra filtration ability.

In order to fully realize the potential of ideal flow in the aquarium, the inside of the canister filter also had to be simple: using a cylindrical shape allows water to flow through the filter easily, and the absence of excess filter media baskets allows for water flow to be sustained and an infinite combination of filter media to be used for ideal bacteria growth for biological filtration.
The last touch was to make it long-lasting. We wanted a filter that wouldn't ever have to be replaced and had the finest professional grade quality. That's why all of our parts are built out of stainless steel and high-grade aluminum. By including all of the glass pipes, clear hose and filtration media with every SUPERJET filter, we finally created the best canister filter system in the world:

THE SUPER JET

Included with each Super Jet Filter:

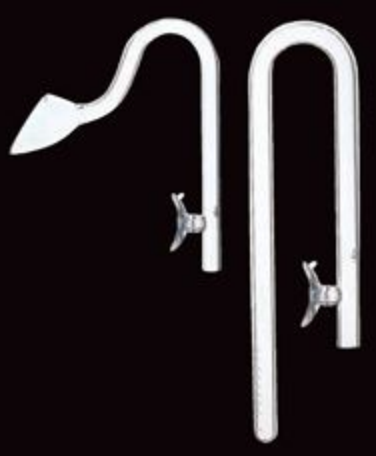
BIO RIO

BIO CUBE

Bio Rio filtration media for ideal biological filtration
(For ES-600, Bio Cube 20 and Anthracite are included.)

Glass Pipes

Glass Outflow and Inflow Pipes with corresponding Clear Hose tubing.



SUPER JET FILTER

High durability filter with professional quality, consisted with 3 series, 9 products

Products lineups of professional quality

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ADA's original oil film remover with superior effects

NEW

Water surface extractor

VUPPA-I

ADA NATURE AQUARIUM NEW GOODS

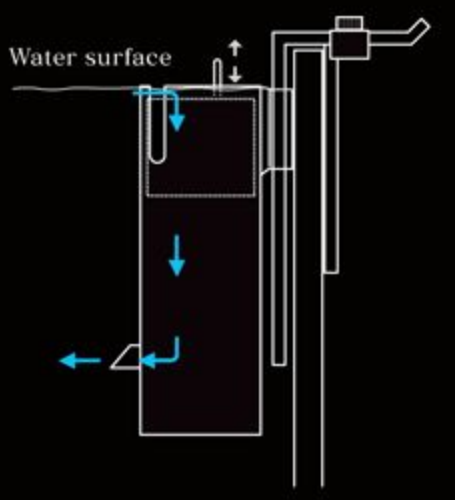
Simple and compact design	Original water volume adjustment function	Robust stainless body with high durability

Removes contamination on the water surface such as oil film effectively

Having oil film on the water surface spoils the allurement of an aquascape.
VUPPA-I developed with ADA's original structure eliminates such film effectively.
And all hand-crafted stainless body does not spoil the appearance of the aquarium.

SIZE : Ø38×H110mm ※Excluding the projection parts.

※The picture only shows the image of the product.
Actual product has the electric cord from the top of the main body.



Shining Thunberg Lilies (Sado, Niigata, Japan)

Thunberg lilies are spotted all over the rocky coast. I felt the vibrant vitality of these lilies striving to bloom in the narrow cracks of the rocks. I found a large cluster of Thunberg lilies on this shore overlooking the Sotokaifu Coast, and captured the moment the light illuminated the lilies swaying in the ocean breeze.

Shooting data / Deardorff 5×7, Super Angulon XL90mm, 1/2 sec at f32, RVP F, 5×7 inch film

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Contents

Special Feature

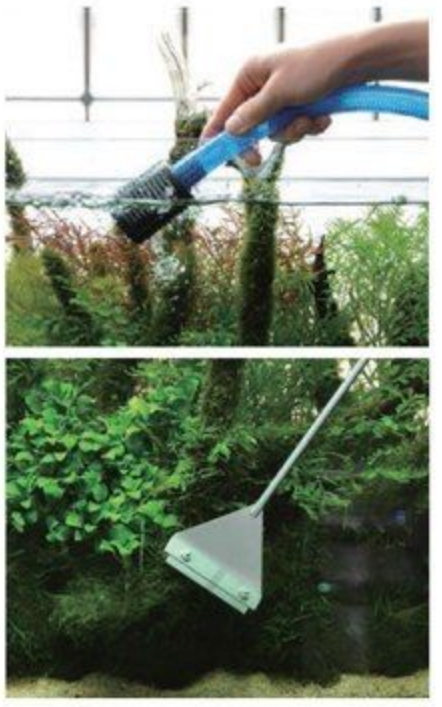
NATURE AQUARIUM

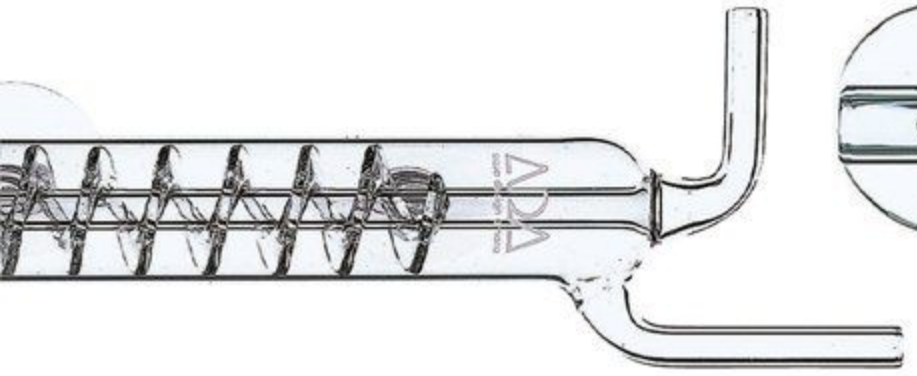
Maintenance Guide

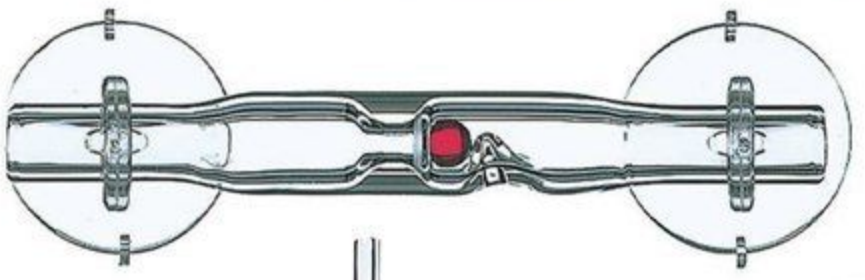
Fish, aquatic plants and microorganisms ··· The myriad lives in Nature Aquarium and the beautiful aquascape are sustained by proper maintenance scheduled at the right time.
You may find some of the maintenance work difficult, but you will be able to handle it smoothly, and at the same time have fun once you acquire the technique.
This issue of Aqua Journal provides you with comprehensive information on convenient maintenance tools and useful knowledge.
Learn the points of aquarium management and acquire enough know-how to become a master of maintenance today!

Aqua Scape Photographs by Takashi Amano

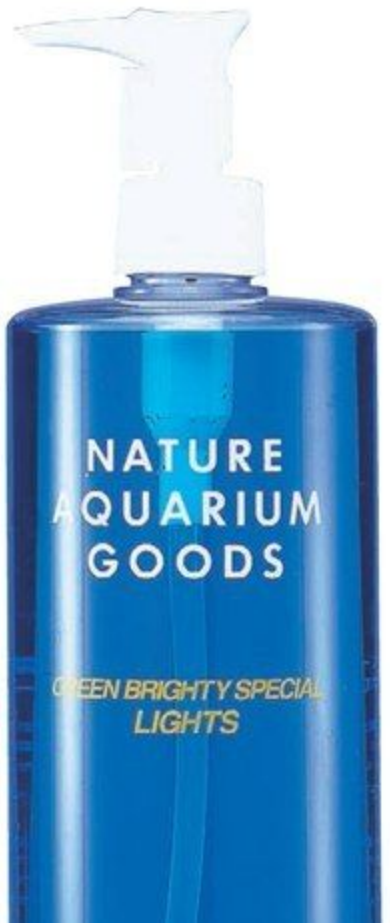
Text by Masatoshi Abe ／ Tsuyoshi Oiwa ／ Eriko Sekine








No.1
CO2 SYSTEM 74
TROPICAL FOREST
AMAZONIAN
NATURE
AQUARIUM
GOODS


NATURE
AQUARIUM
GOODS
GREEN BRIGHTY SPECIAL
LIGHTS


CLEAN BOTTLE


NATURE
AQUARIUM
GOODS

1 Pro-Scissors Spring ○

Compact-sized scissors that fit into your palm. Whichever way you hold these scissors, they'll still cut very nicely.

2 Pro-Scissors Short ◎

Ideal for pruning the aquatic plants near the water surface. Use the Curve Type to prune foreground plants.

3 Trimming Scissors ◎

Compact-sized scissors that fit into your palm. Whichever way you hold these scissors, they'll still cut very nicely. If you're not sure whether to choose the Curve or Straight type for your first pair of scissors, the Curve type is recommended.

4 Pro-Scissors Force △

Even the hard, thick stems of Bolbitis and Anubias can be easily cut with Pro-Scissors Force.

5 Pro-Scissors SS △

Pro-Scissors SS do a good job of pinpoint-trimming. They are so cool that you'll be happy just to own a pair.

6 Sand Flattener ○

Very popular among aquarists, this tool is useful for the flattening of cosmetic sand or even for stirring.

7 Pro Razor ◎

Ideal for removing algae on the glass surface. You won't stop using it once you've started working with it.

Be Prepared and Have No Regrets. Get a Set of Maintenance Goods Now!

Find maintenance troublesome and difficult? No, that shouldn't be. You may at times find it difficult, but maintenance should be great fun if you get hold of a series of maintenance items and learn how to use them.

You can find a wide range of specialized professional-use items in Nature Aquarium Goods. Wisely select the tools and additives best suited for your purposes and conditions. The symbols used on this page have the following meanings.

◎··· **Essential (Why don't you have one?)**

○··· **Recommended (Would be convenient if you have one)**

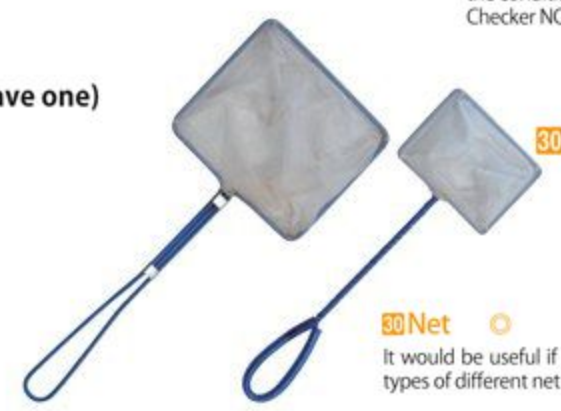
△··· **Nice to have (Wanna have one in the future?)**

14 pH Kit ◎

You can measure the pH level 150 times with this kit. Use this item also for checking the CO_2 supply level.

15 Pack Checker NO_2 ○

Various examinations can be performed with the Pack Checker series. First, check the condition of microorganisms with Pack Checker NO_2.



30 Net ◎

It would be useful if you have several types of different net and mesh sizes.

31 Dropper ○

Essential for feeding Brine Shrimp to the fish. It can also be used for many other purposes.

32 Spatula △

Convenient for scraping off the blue-green algae between the substrate and glass surface.

33 Brush △

Use a brush to apply Phyton Git for the removal of algae.

34 Stick △

Use a stick to remove algae growing in the cracks of the stone that cannot be reached even with Pro Picker.

26 Air Tube (ø6mm) ○

This is an effective tool for water adjustment for new fish and also for suctioning out filamentous algae.

27 Hose (ø10mm) ◎

This hose size (ø10mm) is most convenient for suctioning out algae and rubbish.

28 Hose (ø8mm) ○

For aquarists who pay meticulous attention to maintaining the aquascape. This item does a good job.

29 Hose (ø20mm) ◎

Essential for water change. It would be more convenient if you had the pressure-resistant type.

35 Kiddie's Toothbrush △

Ordinary toothbrush is often too large for mini aquarium.

36 Toothbrush (with diagonal bristle) ○

Fight stubborn algae with a toothbrush with diagonally-cut bristles.

37 Toothbrush ◎

A tool you should prepare for algae removal is the toothbrush. This is an essential item.

38 Plastic container ◎

Prepare a set of plastic cases when you become an aquarium owner. In Japan, people nickname this item "Plake".

39 Pail ◎

The most convenient size for anyone is 10 ℓ. Find your own favorite pails!

8 Pinsettes S △
More than a maintenance tool, this item is most useful for removing rockwool.

9 Pinsettes L ◎
The current standard method of planting aquatic plants with tweezers originated from this tool.

10 Pro-Pinsettes Triangle Type △
Holding a plant bulb with these uniquely shaped tweezers makes planting work fun.

11 Pro-Pinsettes Curve Type △
You can do the planting in a rugged or complicated location a lot easier with the tweezers with curved blades.

12 Pro Picker ◎
Recommended for aquarists who still use their fingernails to scrape off algae of the blackbeard type. This tool makes algae removal much easier.

13 Bottom Release △
This tool helps you insert solid nutrients such as Multi Bottom into the substrate accurately.

19 Phyton Git ◎
Effective when algae stick to the Anubias leaves and just after putting the fish in the aquarium. This item settles all your worries.

20 Multi Bottom ○
Supply additional nutrients to the roots of Echinodorus and Cryptocoryne with Multi Bottom. Use it before the leaf color deteriorates.

21 Chlor-Off ◎
Use Chlor-Off for neutralizing residual chlorine in tap water. This is a must item for every water change.

24 Superge ◎
Your glass items become like new just with Superge. This is a very powerful detergent for cleaning glassware.

25 Clean Bottle ○
This is the special bottle with a lid for soaking glassware such as Pollen Glass for cleaning.

16 Brighty K ◎
Lack of potassium can easily occur in the aquarium. Ensure an adequate supply of potassium with Brighty K.

17 Green Brighty STEP 2 ◎
For addition of trace elements, use Green Brighty STEP 1 to 3 according to the time lapse since the setup of your aquarium.

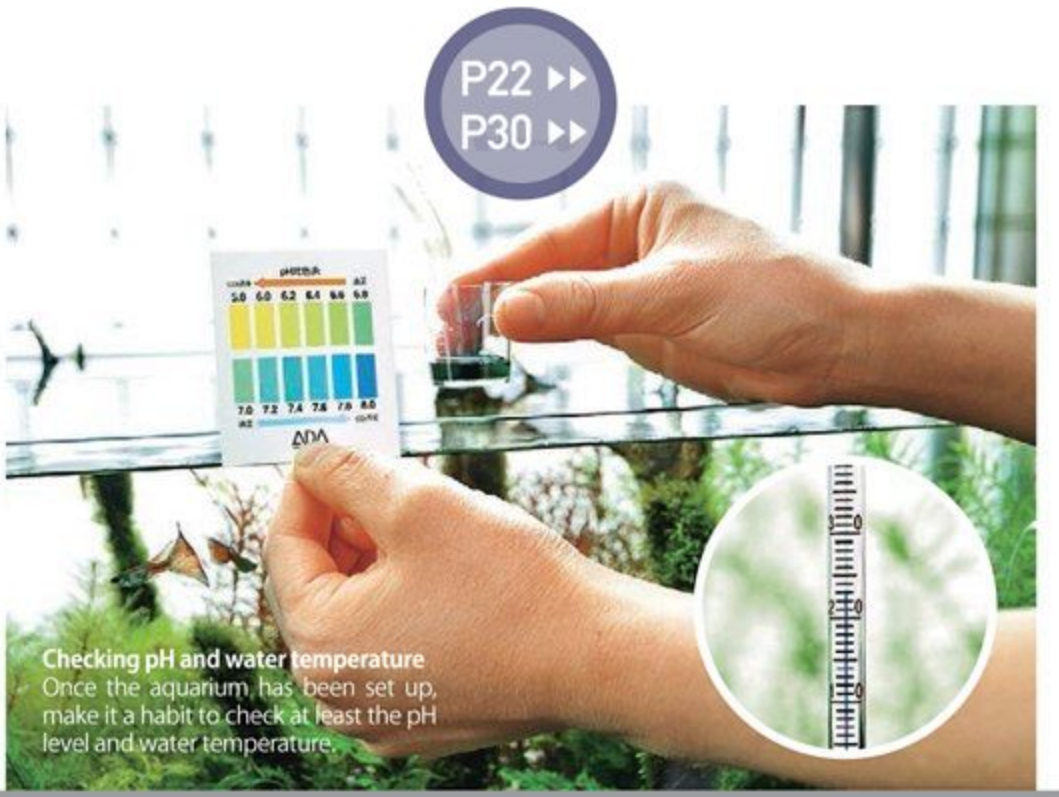
18 Green Brighty Special LIGHTS ○
Rich in nutrients including nitrogen and phosphorus, this additive is effective for enhancing the leaf color of Riccia and stem plants.

22 Tube Brush ◎
This special brush is essential for the cleaning of glassware such as Lily Pipe.

23 Spring Washer
This is a brush that reaches even as far as the inflow end of the Lily Pipe.

Check the overall impression of the aquarium

The impression of the water condition, aquatic plant growth and swimming fish at a glance is important. Then, check the details to determine what maintenance work is necessary.



Control of water quality

The key items for water quality measurement are pH level and water temperature. The pH level is an important check item as it is influenced by the amount of injected CO_2. Changes in water temperature have an impact on the growth of living organisms.

ABCs of Daily Maintenance

As we all know, aquatic plants, fish and microorganisms live in mutual interaction with each other and they keep changing day by day. No matter how advanced the equipment for cultivating aquatic plants is, these living things cannot be kept in good condition with just the use of equipment. Daily management is essential to maintain an aquarium in such a closed environment.

Adding liquid fertilizer

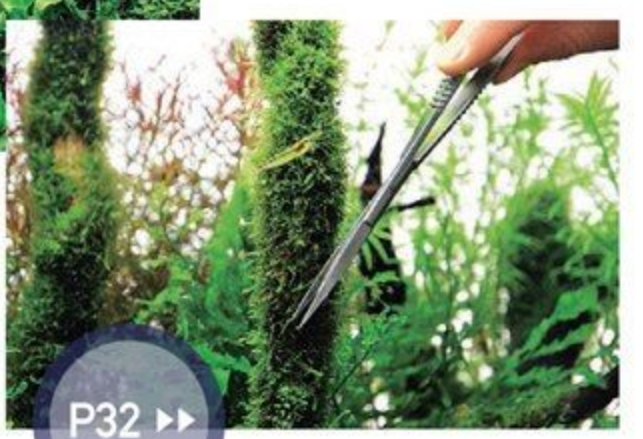
The basics of adding liquid fertilizer is to select the appropriate fertilizer according to the condition of the aquatic plants and add a little bit everyday. It is taboo to add a whole week's amount at the time of water change.

Trimming aquatic plants

The planted aquarium aquascape is maintained by trimming, which is one of the most important of the maintenance tasks. Prudent judgment is required for the timing of the task and the cutting line.

Cutting ferns
Cut the overgrown leaves of ferns as well as other plants to maintain a good balance of the aquascape.

Selecting appropriate tools
Select the best one from your set of trimming tools according to the purpose. This makes accurate trimming possible.



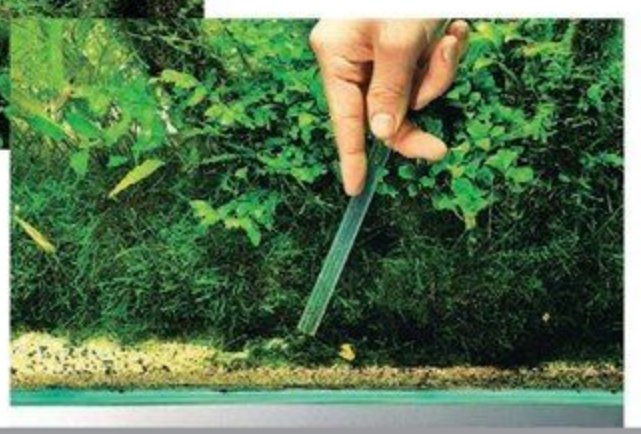

P23 ▸▸

Removal of algae

The tank glass through which people appreciate the aquarium should always be kept clean. If algae frequently grow on the glass surface, this indicates the unhealthy activities of microorganisms.


P16 ▸▸
P23 ▸▸

Suctioning out filamentous algae
Filamentous algae attached to aquatic plants should be suctioned out frequently using a hose.



Cleaning the cosmetic sand
Suction out the rubbish on the cosmetic sand during water change.

Suctioning out using a hose

Having several hoses of different bore sizes is very useful for maintenance. Use a fine hose for the cleaning of cosmetic sand and suctioning out of algae.

There are various types of things to be covered in maintenance, from daily work such as application of fertilizer to aquatic plants, to work which requires periodical checks such as rinsing of the filter media. Whatever the case, the most important factor is keen observation. It is important to grasp the environmental changes of the overall aquarium, not to mention the condition of each fish and aquatic plant.
First, observe the entire aquarium. If you have the impression that the aquarium seems to have a good shine when you casually observe it, then you know that the aquarium is in good condition. Vague as it sounds, the water and aquatic plant leaves look as if they are sparkling in the aquarium if they are in tip-top condition. Aquarium beginners may feel it hard to recognize this condition, but as they gain greater experience, they will be able to judge the aquarium condition at a glance according to this "sparkle".
Even for the same clear water, the look is different between tap water and water treated by filtration bacteria. This tells us what we should control in the planted aquarium: water, and more specifically, the microorganisms that make the water "alive".

The problems caused by algae, too, ultimately have to do with microorganism activity. We can visually observe the growth of fish and aquatic plants, but microorganisms are invisible. Yet, whether or not the microorganisms are in an active state, can be seen by the condition of water. In order to improve your maintenance skills, you will have to be able to recognize the condition of microorganisms through the condition of the water. This section will guide you through the basic tasks of aquarium maintenance using the most popular 60cm tank as an example.

Cleaning glassware

Aquarium glassware like Pollen Glass and Lily Pipe display their true potential only when they are kept clean.


P19 ▸▸

Water change

Many aquarists think that management of the aquarium is equal to water change. For water change, the key is timing and frequency.


P30 ▸▸

Feeding

Feeding is a surprisingly difficult task in the planted aquarium. The fish lose weight if they are fed too little, while too much food can result in algae growth.

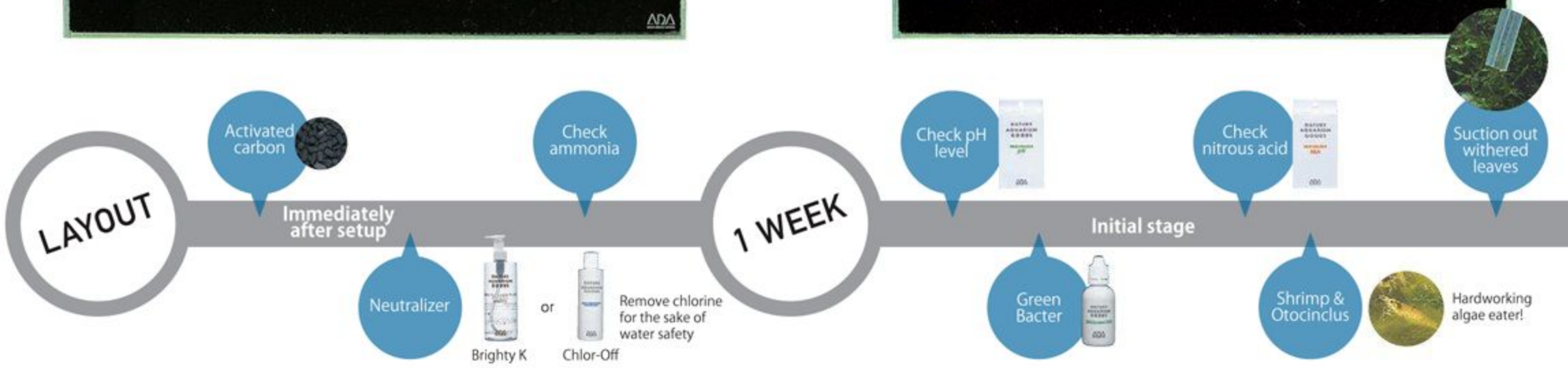

P35 ▸▸

Planting completed!

Cut the overgrown leaves of ferns as well as other plants to maintain a good balance of the aquascape.

Adding shrimps

Once ammonia and nitrous acid are no longer detected, you can add Yamato Numa Ebi (Caridina Japonica) and Otocinclus.



Understanding the Maintenance Cycle

A common concern of the layout novice might be "When and what should I do for maintenance?" This section takes the 60cm tank as an example and introduces the maintenance cycle from immediately after initial setup to aquascape completion in about 2 months.

After 58 days

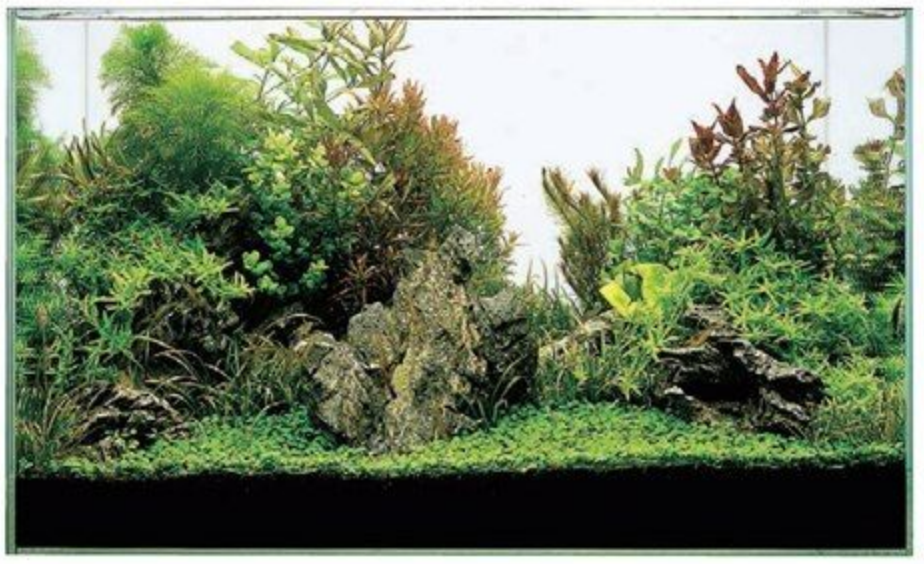
6 WEEK

Finally completed!

That unstable period called the "Terrible Two Weeks" is now over. A beautiful aquascape is produced, thanks to the maintenance that covered essential points.

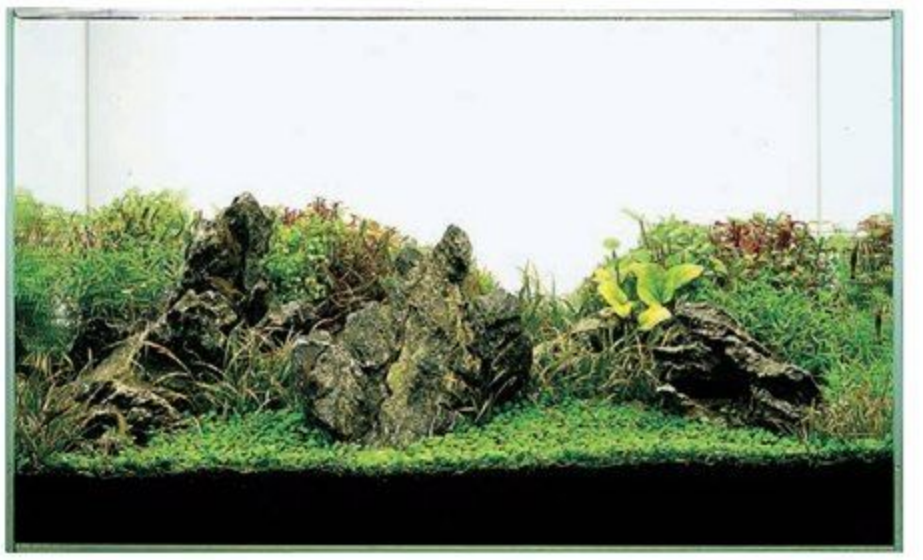
Increasing the CO_2 supply amount!

Increase the amount of CO_2 supply as the aquatic plants grow. The right amount of CO_2 is injected if the pH level 4 hours after commencement of CO_2 injection is 6.8-7.0. (Refer to ▶P19)



First trim

It's time for trimming when the roots of the aquatic plants have grown and the terminal buds have reached the water surface. During the first trim, the plants should be cut short to promote branching out of the stems. (Refer to ▶P32)



2 WEEK

Cut withered leaves

After 19 days

3 WEEK

STEP 1 + Brighty K

Provide adequate nutrition supplement to aquatic plants.

Trimming

After trimming

Green Gain

Care for the cut section after trimming

4 WEEK

What to do for maintenance and their timing vary with the environment of each aquarium. Therefore, the timing mentioned in this section is not absolute although the basic maintenance flow is common for any type of aquarium. Use the timing mentioned in this section as an approximate reference, taking into account the differences with your own aquarium.

Trimming of foreground plants

Pro-Scissors Wave is also recommended!

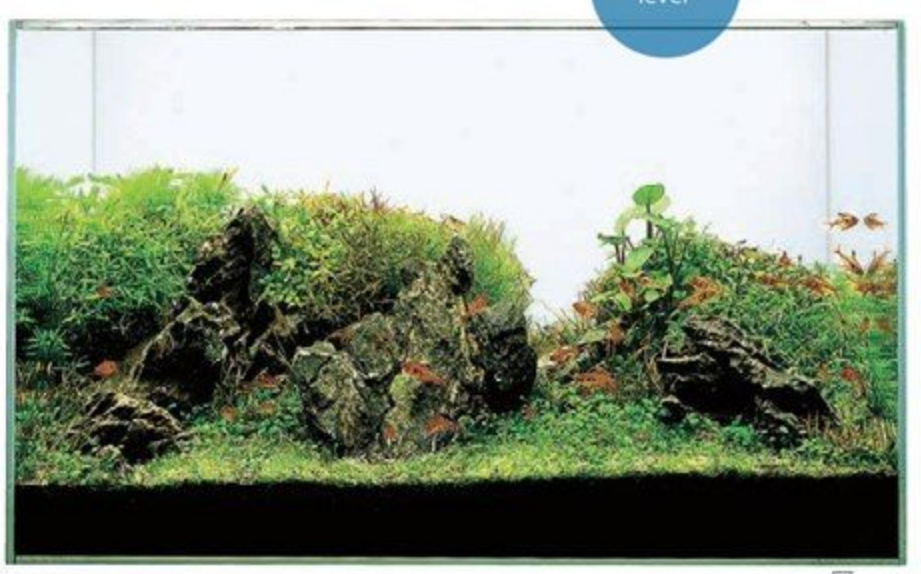
After 38 days

5 WEEK

Change to biological filtration media

After 33 days

Check pH level



Adding the fish, a main figure of the aquascape

You can add fish to the aquarium once the aquatic plants have grown healthily and the water quality is stabilized. Use of Rio Base is recommended to relieve the new fish of stress.

Rio Base

Change to biological filtration

Once the absorption capacity of the activated carbon is lost and microorganisms have been established in the filtration system, change the filter media to a biological one such as Bio Rio.

Substrate

The substrate which can be called the foundation of the planted aquarium tank is an important place that serves as a source of nutrition. It is also a place where the aquatic plants put down their roots, and microorganisms carry out their activities. The condition of the substrate deteriorates with excessive build-up of sludge.

Suctioning out sludge

Even if the substrate is covered by lush foreground plants, sludge should still be suctioned out using a stone cleaner and fine hose. Sludge easily accumulated in the places where there are dense aquatic plants and at the side of the rocks. Suction the sludge when you find that the growth of foreground plants has slowed down.

Be careful not to suction substrate material. Adjust the grip of your fingers to control flow rate during suctioning.

Removing blue-green algae on tank front

Blue-green algae sometimes grow in the front side of the substrate. These algae cannot be suctioned out as the hose cannot reach this part. Use a thin spatula to remove the blue-green algae. After being scraped off with a spatula, the algae can be suctioned out with a hose.

Taking care not to disturb the substrate line, carefully insert the spatula in the substrate to remove blue-green algae.

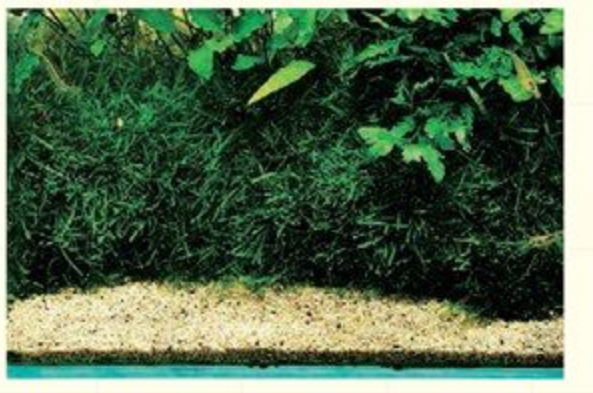
Cosmetic sand mixed with Aqua Soil is unsightly. Start cleaning if you observe this condition.

Cleaning cosmetic sand

You might think that a layout using cosmetic sand with no planted foreground plants is easy to maintain, but you still need to do a weekly clean-up by suctioning out the droppings of Yamato Numa Ebi and Aqua Soil on the cosmetic sand. Refer to the photos below for the basic maintenance procedures.

First, suction out Aqua Soil with a hose (optimal size: φ8～10mm).

After agitation, clean cosmetic sand comes up to the surface.



Flatten out the cosmetic sand to achieve a thin, level layer as shown in the photo.

Maintenance Guide

Layout Material

Unlike aquatic plants, layout materials such as driftwood and stones are not resistant to algae and are thus prone to algae growth. To avoid this problem, we need to take preventive measures including early detection.

Algae on the driftwood can be easily removed with Pro Picker.

A toothbrush is very useful for brushing the stones. It is one of the items we should always have on hand.

For brushing in a compact-size aquarium, a kiddie's toothbrush is small and convenient.

Removing algae on the surface

Algae grown thinly on the overall surface can easily be removed with a toothbrush. On the other hand, black algae patches are stubborn and hard to remove. This type of algae can be scraped off relatively easily with Pro Picker, but when you do this scraping, be careful not to scratch the glass surface placing the sharp point at the other end. Remove the algae frequently before it spreads out.

Scraping algae may leave scratches on the stone surface. These scratches are no longer visible if you brush the stone surface with a toothbrush after scraping.

Removing algae with Phyton Git

Algae can be scraped off with a tool such as Pro Picker if they are still at an early stage of growth. However, if they are left untreated and a large amount of algae has grown, there is no way to save the layout material. Nevertheless, it's too early to give up. As a last resort, try to drain the tank water and apply Phyton Git diluted with the same amount of water to the troubled layout material. In this way the algae may be eliminated.

Perform this action, taking care the solution does not come in contact with the aquatic plants. Use of a plastic container and a brush is convenient.

Lighting

First, prepare the lighting fixture according to your tank size during the setup of the aquarium. Whether Metal Halide or fluorescent, the light intensity gradually decreases, which makes periodic replacement of the lamp necessary.

Wear cotton gloves to install the metal halide lamp to prevent contamination of the lamp with dirt and oil on the hands.

Replace the fluorescent tube of the NA Lamp between 6 months to a year. Write the date of replacement on the lamp for convenience.

Periodic lamp replacement

Reduced light intensity may result in slower growth rate and leaf color deterioration in aquatic plants. Although the metal halide lamp emits intense light, stable light intensity can be expected only when the lamp is replaced after every 6,000 hours of use. For NAG that has the effect of making green aquatic plants look brighter, the lamp should be replaced after almost 4,000 hours or one year of use in order to maintain its original green spectrum and stable light intensity. Replace the lamp before its useful life expires.

If the cord is sagging, water does not reach the plug even when the water drips along the cord.

If the cord is tight, dripped water can reach the plug at the receptacle.

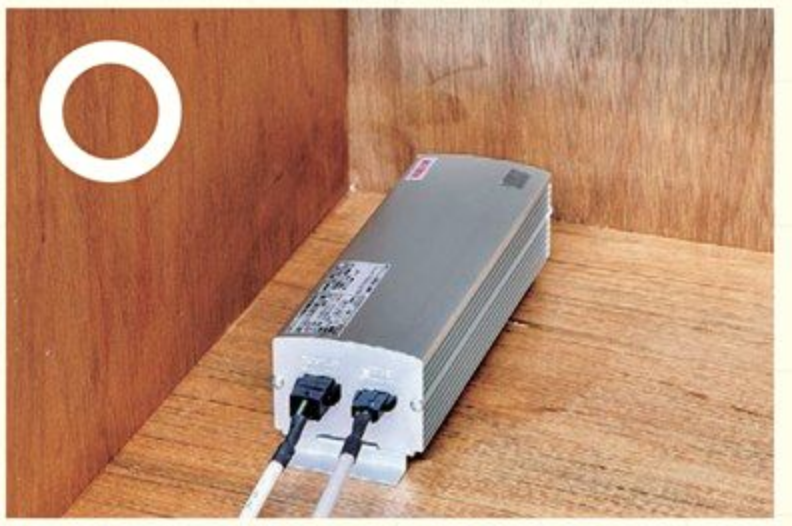
Power cord must be sagging

Side story

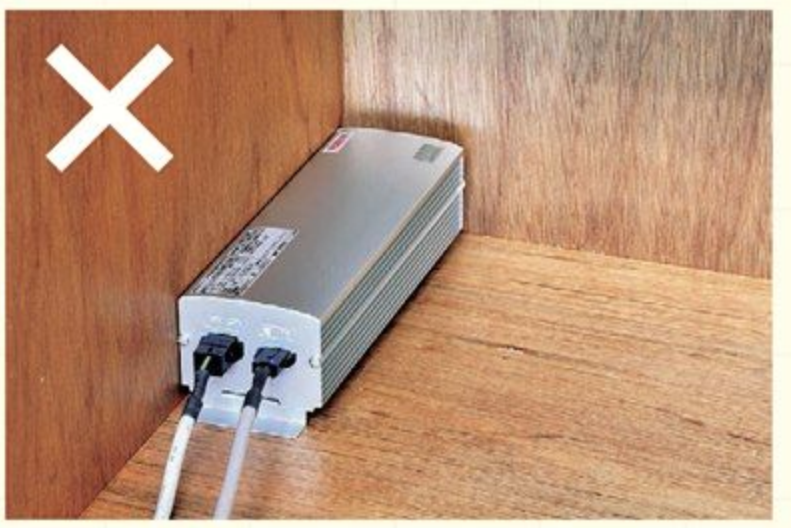
The tracking phenomenon, which is prone to fire through moistened dust build-up on the power plug, must be avoided as it may result in a fire accident (the power plug of Super Jet Filter is provided with an anti-tracking function). Make sure that no dust build-up is present on the power plug and allow the power cord to sag as shown in the above photo.

Correct installation of ballast

A ballast is a device that supports the high performance of the metal halide lamp. Since the ballast gets hot and is vulnerable to water, we need to select its installation location very carefully. Although the ballast is equipped with dissipation fins on both sides, it should still be installed away from the wall for more efficient heat dissipation. Placing the ballast within a cabinet might be a good way to avoid water splash, but in this case, you would need to be careful to avoid a temperature rise within the cabinet.



Heat can be released easily if the dissipation fin is located away from the wall surface.



If the dissipation fin is close to the cabinet wall, heat can hardly be released causing trouble.

Maintenance Guide

CO_2

In the effort to achieve efficient CO_2 injection, it is difficult to control and find the adequate CO_2 supply amount according to each growth stage of the aquatic plants. At the same time, cleaning and maintenance of CO_2 supply tools such as Pollen Glass is also important.

Control of CO_2 supply amount

Basically, you should start CO_2 supply at one bubble per second and then gradually increase the amount in line with the growing speed of aquatic plants. When you have trimmed the plants to half their height, you should reduce the CO_2 supply amount to half. Drop Checker helps you monitor the change of CO_2 level in the water by the change in color of its pH reagent ranging from blue, to greenish yellow, to yellow.

Insufficient

Adequate

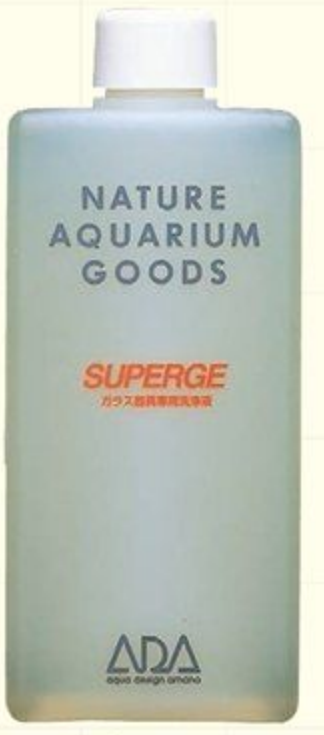
Excessive

The CO_2 injection amount is adequate if the pH increases in acidity by about 0.2 after the injection starts.

For a large tank which requires more CO_2 injection, count the number of bubbles using CO_2 Beetle Counter.

Cleaning diffusion filter

Clean Bottle



Superge

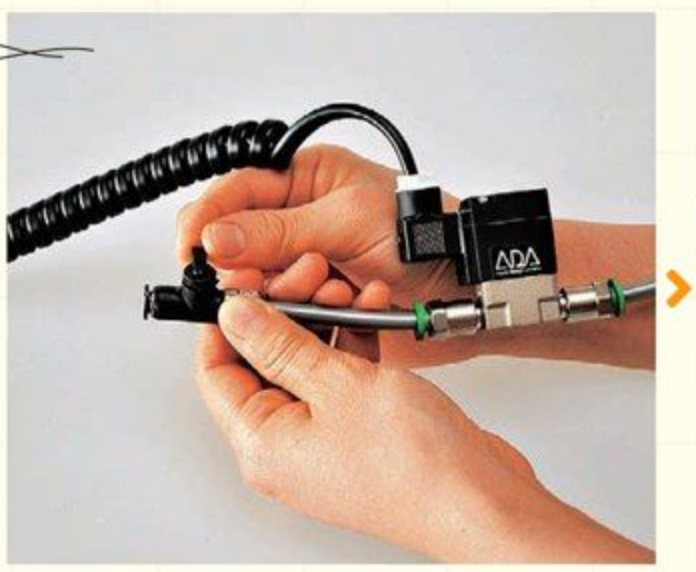
Before cleaning　　After cleaning

The diffusion filter becomes clean just by dropping some Superge on it. Rinse the surface well.

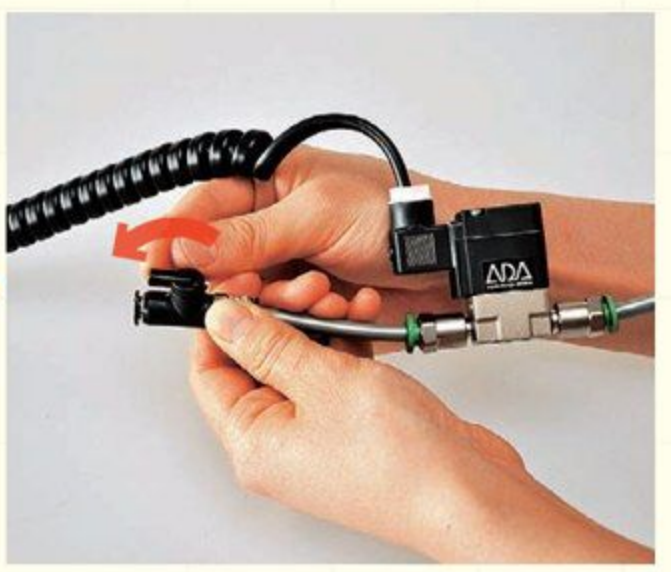
Algae growing on the white diffusion filter of Pollen Glass is not only unsightly but also produces large bubbles which cause a decline in diffusion efficiency. Clean the diffusion filter by soaking it in Superge, the cleaner specifically developed for glassware, on a weekly basis (as far as possible). If the filter is kept white, you can figure out the aquarium condition according to the dirt accumulating on the filter surface. If the white filter turns green in a week's time, the aquarium is not in a good condition.

Blowing of solenoid valve

The solenoid valve is a device necessary for automatic ON/OFF of the daily CO_2 supply. If its valve is clogged with fine dust or particles, the valve does not close completely. This problem can be suspected if CO_2 is still released even when the supply is set to OFF. If you experience this trouble, blow the solenoid valve repeatedly for a few times with reference to the photos on the right.



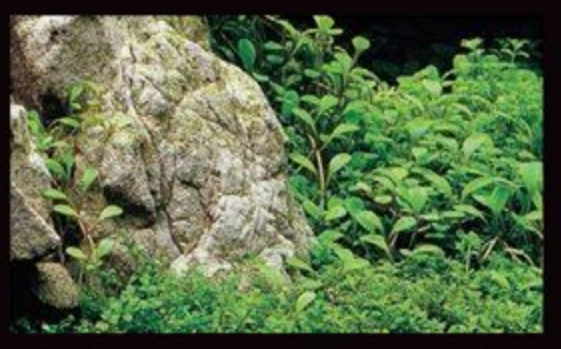
Connect the ball valve (in the OFF state) to the OUT side and produce internal pressure.



Then, turn the valve on at once to blow off the fine dust and particles inside.

Layout in Compact Tank using Keikan stone

In a compact-size tank, you can create a good layout by just using a single piece of your favorite stone as long as it can be fitted in the tank. This example uses a stone called Keikan stone, currently not on sale, to produce a stone arrangement in which the central position of the entire layout is determined according to the golden ratio. With this arrangement, the central position of this layout is slightly left-to-center of the tank at the ratio close to the golden ratio of 1:1.618. Furthermore, the height of Glossostigma and Cuba Pearl Grass is controlled so they are gradually inclined from high-inner-left to low-front-right in line with the left-to-right flow created by the stone shape and cracks on the stone surface. Glossostigma growing behind the stone along the lines on the stone surface produces a natural feel.



A natural feel is produced by allowing an appropriate amount of Glossostigma to grow along the cracks of the stone surface. It is important to determine how to use this know-how in the layout production.

It is essential to choose small fish in order to make the aquascape look larger. For this example, Ruby Tetra (Axelrodia riesei) was selected.

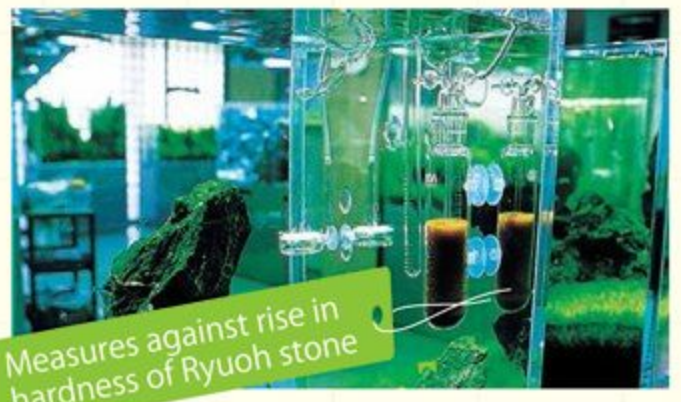
DATA

Tank	／	Cube Garden Mini S　W31×D18×H24 (cm)
Lighting system	／	Solar Mini (27W twin fluorescent lamp)　Lighting for 10 hours a day
Filtration system	／	External filter (NA Carbon)
Substrate system	／	Aqua Soil – Amazonia (Powder Type), Power Sand S, Bacter 100 & Clear Super
CO_2 system	／	Pollen Glass Mini – 3 bubbles per second with CO_2 Bubble Counter (branched at Tower/20)
Air	／	Aeration at reduced water level (while lighting is OFF at night)
Additives	／	Brighty K & Green Brighty STEP 2
Water change	／	1/2 water change once a week
Water quality	／	Water temperature: 25°C; pH: 6.8; TH: 20mg/ℓ
Aquatic plants	／	*Glossostigma elatinoides*
		Cuba pearl grass
Fish species	／	*Axelrodia riesei*
		Otocinclus sp.
		Caridina japonica


ADA

Water Quality (Filtration)

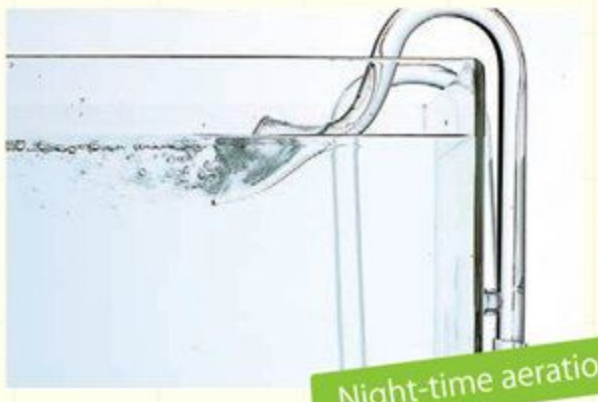
The filter which controls the condition of the water is truly the heart of the tank. Cleaning the filter media where microorganisms live is particularly important and essential for long-term maintenance of the aquarium.



Measures against rise in hardness of Ryuoh stone

Aqua Soil
Amazonia

The hardness of calcareous Ryuoh stone may increase slightly during CO_2 supply. An effective measure to offset this problem is to soften the water using Softenizer which contains ion-exchange resins. A rise in pH and water hardness can also be restrained by laying Aqua Soil – Amazonia on the substrate.



Unlike shower pipe, Lily Pipe P (outflow) can easily be lifted above the water for aeration.

Night-time aeration

Aquatic plants breathe the same way as fish and microorganisms do during the night. For this reason, the Lily Pipe P (outflow) should be lifted above the water to perform aeration after the lighting is turned off. The dissolved oxygen level rises and the activities of microorganisms are facilitated under aeration. During aeration, the water surface is agitated and the risk of surface film reduced.

First, fill the pail with breeding water used for rinsing the filter media.

If you notice the hose is dirty, wash it with a brush.

Even the top side of the filter media is quite dirty with sludge.

Keep the filter media in the net and soak them in breeding water.

Check the sludge on the filter media (for odor & viscosity).

Rinse the filter media while stirring lightly with the hand.

How to clean filter media

Clogged filter media slow down the water flow resulting in lower filtration performance from insufficient oxygen supply to microorganisms. To prevent such a situation, the filter media should be lightly rinsed to wash off the sludge build-up from time to time (about once every 3 months). Do not change a large amount of tank water after rinsing the filter media to avoid significant environmental change.

If the Lily Pipe is contaminated with algae this may lead to an outbreak of algae in the tank. Use the special Spring Washer to clean the Lily Pipe. If the Lily Pipe is heavily dirty, soak it first in Superge solution and then wash it with the Spring Washer.

Cleaning Lily Pipe

The brush has a long handle that can reach even the end of the inflow pipe. This brush makes washing of Lily Pipe easier.

Remove the front casing to take out the impeller. It is very dirty as you can see in the photo.

A toothbrush is useful for cleaning the impeller. Rinse it with tap water after brushing.

Cleaned impeller. This unique shape allows for constant high pumping performance.

Solve the chronic decline in flow rate

A reduced flow rate is usually due to clogged filter media. If the water flow still slows down even when the filter media is maintained periodically, it can be suspected that the impeller (the part to push up the water) incorporated in the filter pump is dirty. If this symptom is observed, remove the impeller from the filter and clean it.

Maintenance Guide

Algae

One of our biggest concerns is how to fight algae. Whatever the type, early detection of algae and frequent removal efforts are the key. Deliberate algae removal by the aquarist is needed before resorting to Yamato Numa Ebi (Caridina japonica) and Otocinclus.

Measures against diatoms during the initial stage

There is no need to worry too much about diatoms as they are generally observed one week after the setup of the aquarium. Diatoms will be eliminated if you keep about 10 Caridina japonicas in the tank.

Removing blue-green algae

Once you observe blue-green algae, suction them out with a ø8 - 10mm hose. Subseuently, sprinkle Bacter 100 and add Black Molly, a blue-green algae eater, into the water to restrain the algae growth.

Filamentous algae

To remove filamentous algae attached to aquatic plants, brush them off with a toothbrush and suction them out with a ø6 - 8mm hose. If a stem plant is severely affected by filamentous algae, you may cut off the affected area.

Removing algae on the glass

You can easily remove algae grown in a narrow and hardly reachable place using the Pro Razor. Connect the Extender to the Pro Razor to remove the algae in a large, deep tank.

Additives

The key point about growing beautiful aquatic plants is adequate application of liquid fertilizer. You must determine the condition of the aquatic plants accurately in order to supply the right amount of essential nutrients.

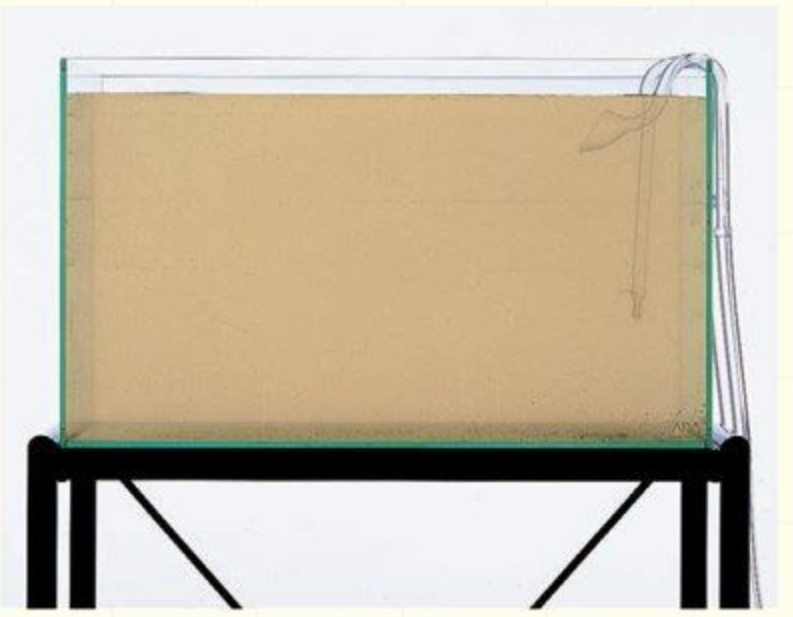
STEP Series – How to shift the steps

The environment within the aquarium is not always constant. Right after setup, the aquarium water contains excessive amounts of nitrogen and phosphorus. 2-3 months after setup when the aquatic plants have spread their roots and start growing vigorously, the aquarium will usually face a lack of iron, one of the trace elements which help to maintain leaf color, due to the vigorous absorption of nutrients by the growing plants. When about one year has lapsed, the aquarium water becomes increasingly acidic. The liquid fertilizer which contains different balances of trace elements commensurate with such changes in the aquarium environment is the Green Brighty STEP series. Be sure to use Brighty K together with this fertilizer series for potassium supplementation which always falls short in the tank, unlike nitrogen and phosphorus.

Be sure to add sufficient liquid fertilizer. The leaf color deteriorates if no liquid fertilizer is added due to the concern about algae growth.

STEP1 › STEP2 › STEP3

After setup – 3rd month	3rd month – 1 year	After 1 year
Contains well- balanced trace elements to promote new leaf growth.	Contains more iron ingredients vital during the plant growth period. Effective for maintaining leaf color.	Contains trace elements with potassium, which helps root growth and photosynthesis.

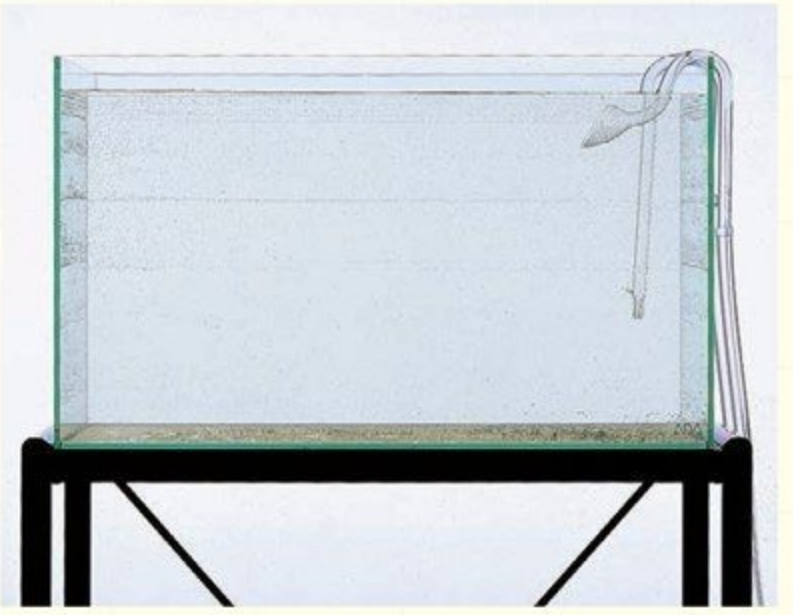


The root cause of various cases of cloudy water is poor condition of the filtration system.

Add Clear Dash for cloudy water

Clear Dash

In the course of managing your aquarium, you may experience a sudden water clouding or decreased water clarity. Add Clear Dash if these symptoms are observed. The polymers contained in Clear Dash bond with fine particles - the cause of cloudy water - and eventually form large particles. These large particles will eventually be captured by the mechanical filtration system and water clarity will be restored. However, the root cause of cloudy water is the deteriorated condition of microorganisms in the filtration system. Whether Clear Dash is added or not, check and rinse the filter media to clean them.



The water gets cloudy due to Clear Dash being bonded with fine particles, but will eventually become clear once it is filtered.

Adding Green Bacter after setup

Once the aquarium is set up with new filter media, the main focus is on how to develop and activate the microorganisms. Microorganisms increase in proportion to the amount of organic matter which forms their food supply. Therefore organic matters must be supplied to the aquarium to promote the development of microorganisms. Adding Green Bacter containing organic acid as the main ingredient to the aquarium facilitates the multiplication and activation of microorganisms. As you apply Green Bacter imagine you are feeding the microorganisms.

During the initial stage, Green Bacter is also effective when the performance of the filtration system has slowed down, and also after rinsing of the filter media.

Adding Green Gain after trimming

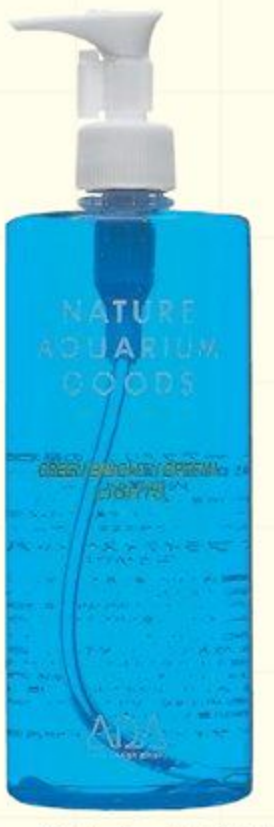
Plant hormone regulates the physiological functions of plants and promotes or restrains their growth. This hormone is usually produced actively in young tissue and thus cutting off the terminal buds, a growing point of plants, during trimming can be significantly detrimental to aquatic plants. To complement the lost source of hormone, adding of Green Gain which contains plant hormone as one its key ingredients is beneficial for the trimmed plants. Apply this additive for about a week after trimming.

Change a larger amount of water after trimming. The water easily gets dirty during this period.

How to use the Special series

Aquariums consisting mainly of Riccia and stem plants with very few fish often face the problem of poor leaf color due to lack of nitrogen and phosphorus. This symptom is obvious particularly in aquariums using gravel or sand-based substrate materials. Add Green Brighty Special LIGHTS to such an aquarium that lacks nitrogen and phosphorus.

A feature of the Special series is its ingredients containing nitrogen and phosphorus in addition to trace elements. Use this product effectively.



Green Brighty Special LIGHTS

Layout using Cosmetic Sand Featuring Shade Plants

One of the benefits derived from the use of cosmetic sand is easy maintenance of the foreground. In this example, a Manten stone is effectively used for fixing the driftwood to which Microsorum is attached; this prevents the Aqua Soil from drifting beyond the boundary. In addition, Echinodorus tenellus planted on both sides also steadily holds the Aqua Soil to prevent it from slipping onto the cosmetic sand. As you can see in this example, arranging the stones during the production stage in such a way as to prevent the movement of Aqua Soil is an effective way of achieving easy maintenance.

DATA

Tank	／	Cube Garden W60×D30×H36 (cm)
Lighting system	／	Solar II (NA Lamp Twin 36W (2 units)) Lighting for 10 hours a day
Filtration system	／	Super Jet Filter ES-600 (Bio Rio)
Substrate system	／	Aqua Soil, Sarawak Sand, Power Sand S, Bacter 100 & Clear Super
CO_2 system	／	Pollen Glass – 2 bubbles per second with CO_2 Bubble Counter (Tower/20 is used)
Air	／	Aeration with Lily Pipe P-2 for 14 hours when lighting is OFF at night
Additives	／	Brighty K & Green Brighty STEP 2
Water change	／	1/3 water change once a week
Water quality	／	Water temperature: 25°C; pH: 6.8; TH: 20mg/ℓ
Aquatic plants	／	*Microsorum pteropus "Narrow"* *Echinodorus tenellus* *Cryptocoryne petchii* *Cryptocoryne retrospiralis*
Fish species	／	*Trigonostigma espei* *Crossocheilus siamensis* *Otocinclus sp.* *Caridina japonica*

Sarawaku Sand

Warm brown color blends well with rustic shade plants.

Nile Sand

Whitish color reflects the illuminating light and produces a bright impression of the aquascape.

DATA

Tank	／	Cube Garden W60×D30×H36 (cm)
Lighting system	／	NA Lamp 20W (4 units) Lighting for 10 hours a day
Filtration system	／	Super Jet Filter ES-600 (Bio Rio)
Substrate system	／	Aqua Soil, Nile Sand, Power Sand S, Bacter 100 & Clear Super
CO_2 system	／	Pollen Glass – 3 bubbles per second with CO_2 Bubble Counter (Tower/20 is used)
Air	／	Aeration with Lily Pipe P-2 for 14 hours when lighting is OFF at night
Additives	／	Brighty K & Green Brighty STEP 2
Water change	／	1/3 water change once a week
Water quality	／	Water temperature: 25°C; pH: 6.8; TH: 20mg/ℓ
Aquatic plants	／	*Rotala rotundifolia (Green)*
		Pogostemon stellatus
		Rotala rotundifolia
		Rotala wallichii
Fish species	／	*Rasbora dorsiocellata macrophthalma*
		Otocinclus sp.
		Caridina japonica

Layout using Cosmetic Sand Featuring Sun Plants

A lovely layout using colorful stem plants gives a cheerful impression. This example further emphasizes the bright impression of the layout by the use of whitish cosmetic sand. As can be seen in the picture, cosmetic sand has the effect of producing a bright aquascape. Laying cosmetic sand on the substrate creates a wide open space. The balance between this open space and the dense bush of stem plants in a triangular composition is the key to the aquascape management. To achieve this balance, the formation of a trim line of stem plants is very important. We can master this only through experience.

Nature Aquarium Holds the Wisdom of Nature

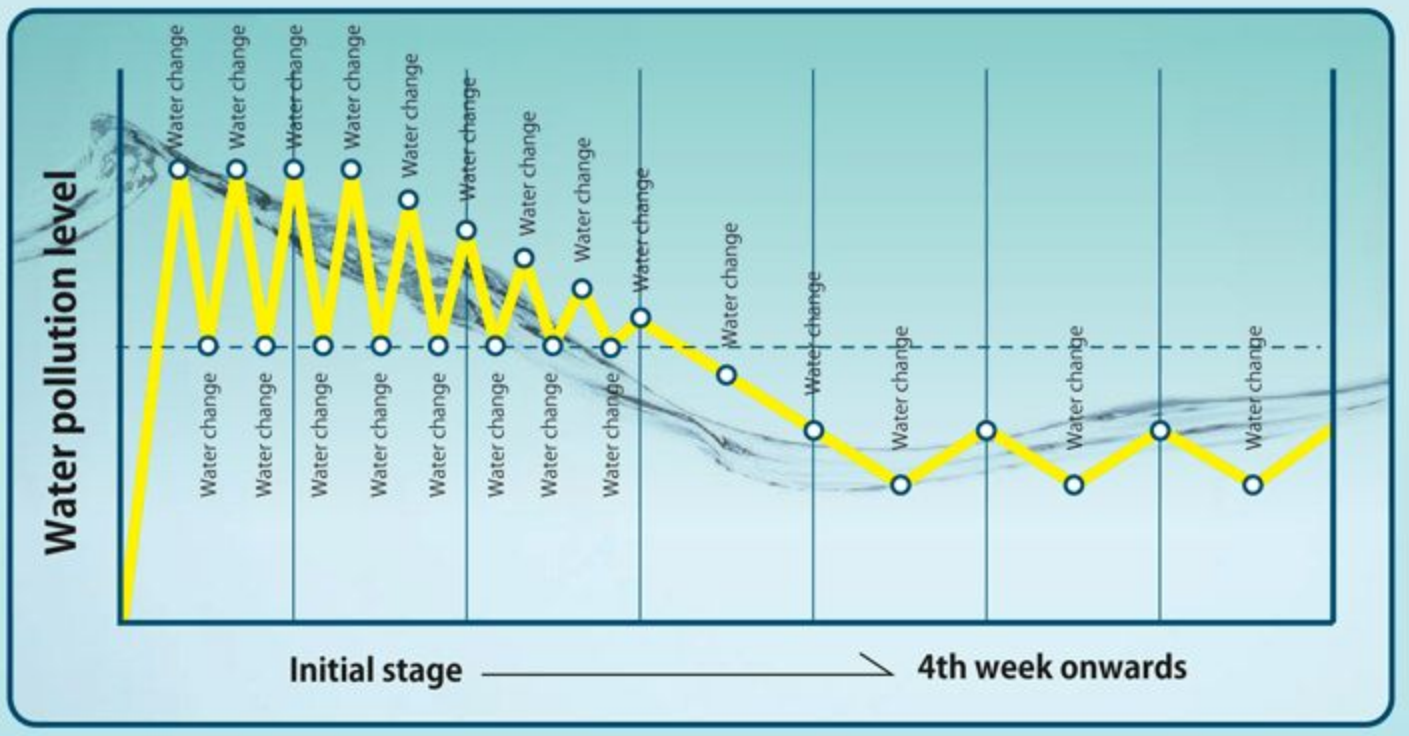
In recent days, we often see planted aquariums in hospitals and restaurants in town.
A carefully managed aquarium adds sparkle to the water and green aquatic plants, and has the dynamism of a living organism.
The world of Nature Aquarium in a tank is maintained through our management efforts but, at the same time, it certainly falls under the gracious wisdom of nature.
The healing effect of water and green may be one of the benefits of such wisdom.

A must-read for beginners!!!

The Complete Manual of Water Change

Understand the water pollution process for water change

Water change is the most popular routine task in aquarium management. It is a very simple procedure which involves only the draining and adding of water, but we still need to apply some simple know-how, such as frequency of change according to the lapsed time after the setup of the aquarium. The key is to understand how the water is polluted and carry out the water change accordingly. This section explains the basic procedures of water change in detail.



The water gets polluted at a significantly faster rate for about 3 weeks until the filtration system is established.

■ 3 weeks from initial setup is a crucial period

For about 3 weeks from the setup of the aquarium, microorganisms are not adequately developed and biological filtration is not yet functioning. This is why we need to change the water to maintain its quality. During this period, there is no limit to the frequency of water change. Increase the pace of water change as much as possible. A change of just a pail of water makes a difference to the aquarium condition.

■ According to the condition from the 4th week onwards

From the 4th week after initial setup, the biological filtration starts functioning and the water change frequency should be reduced to 1/3 to 1/2 once a week. Excessive water change may result in poor leaf color.

■ How pollution and nitrification take place in the water

Check the occurrence of nitrogenous substances such as NO_2 and NO_3 with the Pack Checker.

Droppings of the fish and Caridina japonica are also a cause of polluted water.

Withered and wilted leaves of emersed aquatic plants pollute the water.

Phosphorus and ammonia are also generated from leftover fish food.

Ammonia nitrogen contained in nutrients is also a cause of polluted water.

Ammonia

Nitrifying bacteria oxidizes ammonia into nitrites.

Degradation by nitrifying bacteria

Nitrites

Degradation by nitrifying bacteria

Nitrifying bacteria oxidizes nitrites into nitrates.

Nitrates

Water change is necessary until biological filtration by nitrifying bacteria starts functioning.

Water is always polluted during the initial stage due to insufficient nitrifying bacteria.

Aquatic plants can absorb nitrate nitrogen as a nutrient.

So water is not polluted easily if there are a lot of aquatic plants.

Accumulates in the aquarium if aquatic plants are few

Nitric acid exceeding the aquatic plants' absorption capacity accumulates in the aquarium and leads to the growth of algae.

Algae outbreak!!

■ Water change procedures

Check pH level and water temperature before commencing the water change.

01 ■ First of all, scrape off the algae on the glass surface.

Removal of algae on the glass surface

Even when the aquarium is in an almost stable condition, algae start to grow on the tank glass surface in more or less one to two weeks' time. Before draining the water, roughly scrape the overall glass surface with the Pro Razor.

Use a hose to drain off the water

After scraping the glass surface, the water is contaminated with the removed algae and should thus be drained as soon as possible. When you find algae on the aquatic plants or driftwood, use a fine hose to drain the water while suctioning out the algae.

To drain the water quickly, use a ø20mm hose and apply siphoning principles.

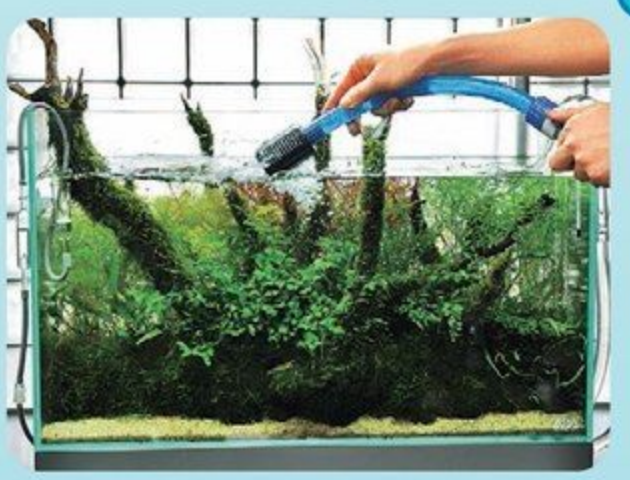
While draining the water, make sure that no water comes out of the thermo-sensor and heater.

02 ■ Drain 1/3 to 1/2 water.

03 a ■ Pour water using a pail

Neutralize the residual chlorine in tap water with Chlor-Off, and then gently pour the water into the tank while cushioning the water flow with your hand.

03 b ■ Put in water using a hose



You can easily put in the water with a hose. It is convenient if you install the ON-OFF tap at the end of the hose.

NA Water

Neutralization of residual chlorine is also essential in the case of filling the tank with water using a hose. You can directly hose in the water if you use NA Water, ADA's water purification system.

04 ■ Care after water change is also important

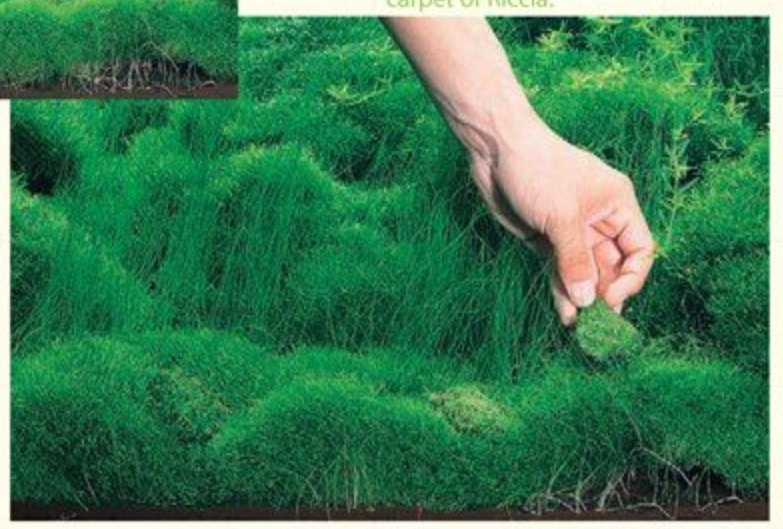
Precautions for water change

The concentration of residual chlorine tends to become higher in winter than in summer. When changing a large amount of water in winter, the impact of the water change can be eased by using the water treated by chlorine neutralization and addition of Rio Base.

Aquatic Plants

The aquascape can be sustained only when each aquatic plant is properly managed. Daily management of the aquatic plants leads to long-term maintenance of the aquascape. Have fun taking care of your aquatic plants with the use of special tools.

Riccia, a species of floating bladderwort, will sooner or later start floating in the water. Restrain its buoyancy with small stones.



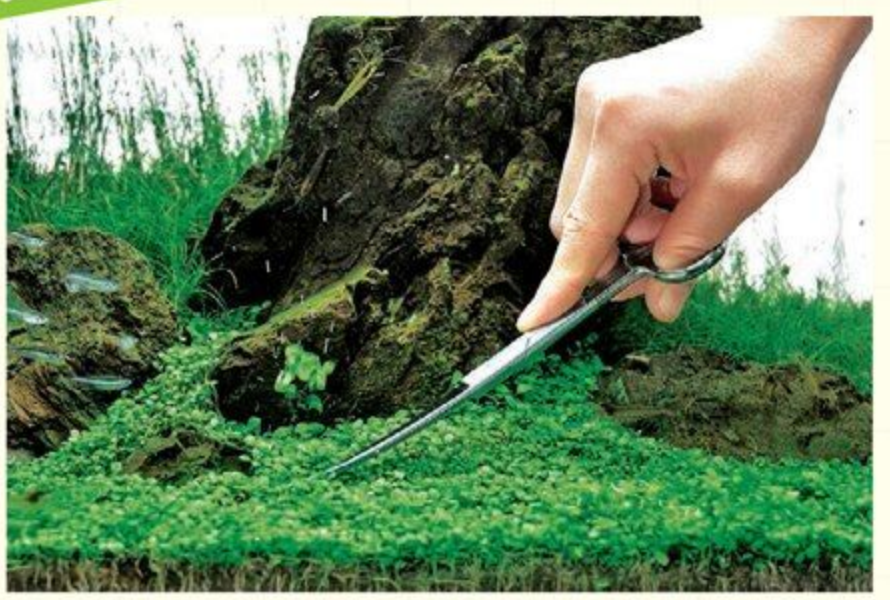
The placing of several pieces of Riccia-holding stones in different locations creates an undulating carpet of Riccia.

Maintenance of Riccia

If you feel that the Riccia carpet is fluffy when you press it with your finger, it is the sign of Riccia about to drift upwards. In this case, fix Riccia to the stones with the Riccia Line and place the stones in spots to minimize the buoyancy. Repeat this process to maintain the good appearance of Riccia. From time to time, the surface of Riccia should be pruned before the buoyancy becomes too great. Some Riccia turn to the submerged type and stop floating through the maintenance process.

Control the thickness of the foreground

For a layout with foreground plants, the point of management is the adjustment of foreground thickness. A thick layer of foreground plants produces visual pressure, so they should be pruned before they get unnecessarily thick. For Echinodorus Tenellus and Cobra Grass, there is another way besides trimming. You may cut the runners of these plants at a position 3cm away from the front and then remove them in strips.



Use of the Curve-Type scissors is more convenient and provides higher workability in trimming foreground plants.

Produce beauty of cluster by trimming

The trimming of stem plants has important benefits including: ❶ determining composition by trimming line; ❷ increasing plant density by promoting branching out; and ❸ achieving better appearance with aligned terminal buds. The trim position for stem plants should be as low as possible to delay the aging of the lower stem. This trimming method will eventually help achieve a long-lasting aquascape.

Decide on the trim line and prune the plants with trimming scissors.

Trimming is essential to keep easy-to-grow Willow Moss looking beautiful.

Withered or damaged leaves should be cut off to promote the sprouting of new leaves.

Cut off the damaged leaves immediately

The aged outer leaves of rosette-type aquatic plants are not actively growing and easily get damaged; thus they are prone to algae growth. These leaves should be cut off without hesitation. Cutting off aged leaves promotes the growth of new buds and improves the appearance of the plant. The Cryptocoryne leaves may wilt, but there is no need to worry. If these leaves are treated by suctioning them out with a ø8-10mm hose, the new leaves will eventually grow.

Carefully suction out wilted Cryptocoryne leaves.

Cryptocoryne leaves.

Creating a beautiful clump of Microsorium

Microsorium, a genus of fern, does not need strong light to grow. However, it is better to put this plant under intense light as it develops small dense leaves and forms a beautiful clump in such an environment. Remember to cut off damaged leaves to promote the development of new leaves. A number of viviparous buds found on the reverse side of the Microsorium leaves is a sign of water pollution or weakened roots. In this event, take measures such as cutting off the leaves with viviparous buds and changing the water; also check if the water temperature is not too high.

Pro-Scissors Short is also useful for cutting off Microsorium leaves.

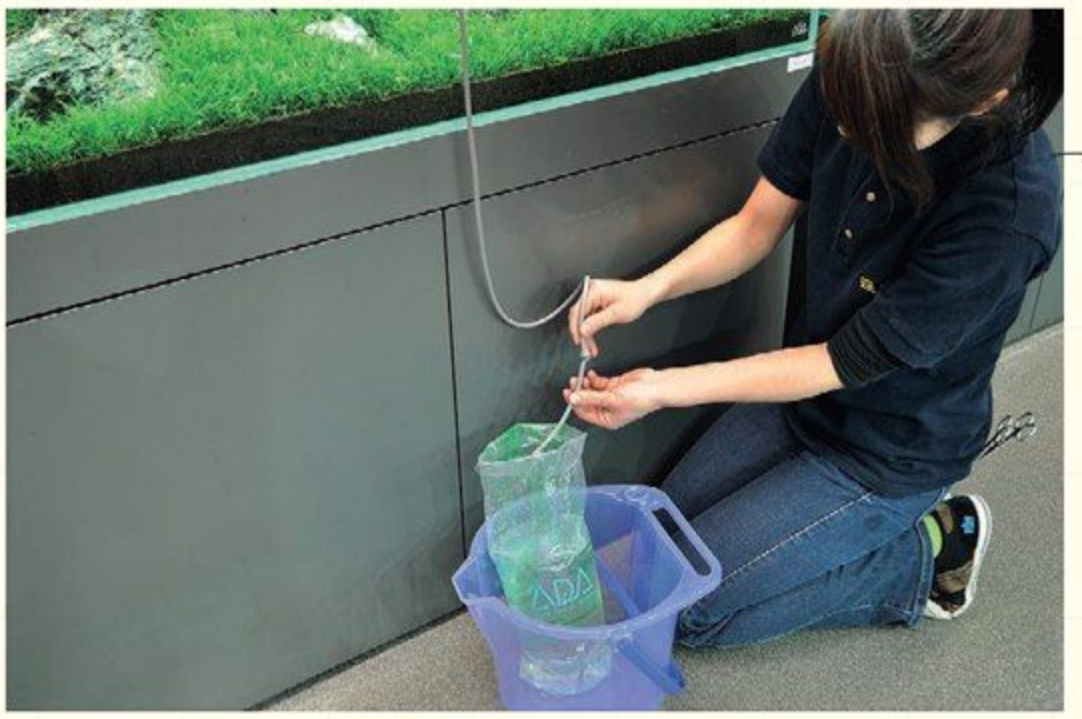
Maintain leaf color of Echinodorus by additional fertilization

Echinodorus is an aquatic plant that vigorously absorbs nutrients through the roots, and its leaf color significantly deteriorates if there is nutrient deficiency. Additional fertilization using solid fertilizer such as Multi Bottom and Iron Bottom is essential to growing Echinodorus. The fertilizers should be inserted into the substrate at a place slightly away from the base of the plant, almost at the tip of the roots (refer to the left photo). Avoid inserting solid fertilizers right at the base of the plant as the roots may suffer fertilizer injury.

Use of Bottom Release allows you to add fertilizer accurately even to a narrow and barely reachable place.

Fish

Most of the fish that swim in the planted aquarium are small-sized species which need to be handled with care. There are many considerations in rearing fish, from water adjustment to daily feeding and care during water change.



The impact on the fish is less severe if they are kept inside the bag placed in a pail during water adjustment.

Water adjustment

Water adjustment is essential before adding the newly purchased fish to the aquarium. Firstly, check and compare the pH of the tank water and the water of the bag containing the new fish. If the difference in pH is not big, float the new fish within their bag in the tank water for about 10-20 minutes in order for them to adjust to water temperature in the tank. If there is a difference in pH, slowly add the tank water to the bag with an air tube using siphoning principles. When the water level of the bag has almost doubled, check the pH again to make sure there is no difference in pH.

Precaution for use of fish medicine

When the fish get sick, we must give them medicine. Fish medicines that can be used in the planted aquarium are very limited. Some examples of fish medicine that can be used with no impact on the aquatic plants include Aguten which is malachite green solution (against white spot disease and water mold infection) and Parazan D containing oxolinic acid (against germ diseases). However, if NA Carbon is in use when these medicines are given, the effects will be wasted as it is absorbed by NA Carbon.

NA Carbon

Avoid combined use of fish medicine and NA Carbon.

Rio Base

Protection of body surface after water change

The body surface of the fish is usually protected by mucous membrane. However, some fish just brought from the shop may have damaged bodies due to friction with some other matter. When a large amount of tank water is changed, the mucous membranes of their body surfaces may be lost due to the inorganic matter contained in tap water. In these events, add Rio Base containing the humus-derived ingredients that protect the mucous membrane the way natural river water does.

The humus-derived mucosa protection ingredients, just as in tropical rivers, protect the delicate body surface of the fish.

Fish seem to become more responsive when they are chased with a fine-mesh net.

Effective use of net

For the net used for adding or scooping the fish, it would be useful if you have several types with different net and mesh sizes. When using a net, you should get things done as quickly as possible to avoid possible damage to the fish body surface caused by the net. To scoop up a fish, prepare two nets of different mesh sizes. You can easily catch a fish by using the fine-mesh net to chase the fish into the coarse-mesh net.

Tips on feeding

You should feed the fish slowly while watching them snatch their food. When vigorously eating fish slow down, it's time to stop feeding. For the mixed fish aquarium, however, some fish swimming at middle to bottom levels may have not taken enough food and need to be observed carefully. ADA's Fish Food AP floats at the water surface first and then sinks slowly. This allows fish at every level of the aquarium to get their food.

AP Glass allows clean and fun feeding.

Place a set square at the corner where the water flow usually changes.

Idea to prevent fish jumping out

What we need to be careful of in an open-style planted aquarium is the fish jumping out of the tank. In addition to being watchful of the typical fish such as killifish and Hatchet fish who have a habit of jumping out, we should know that any type of species could jump out of the tank due to changes in the environmental after water change and a few days after they have been newly added to the tank. You may avert this problem just by placing a set square at the corner of the tank.

Guppy

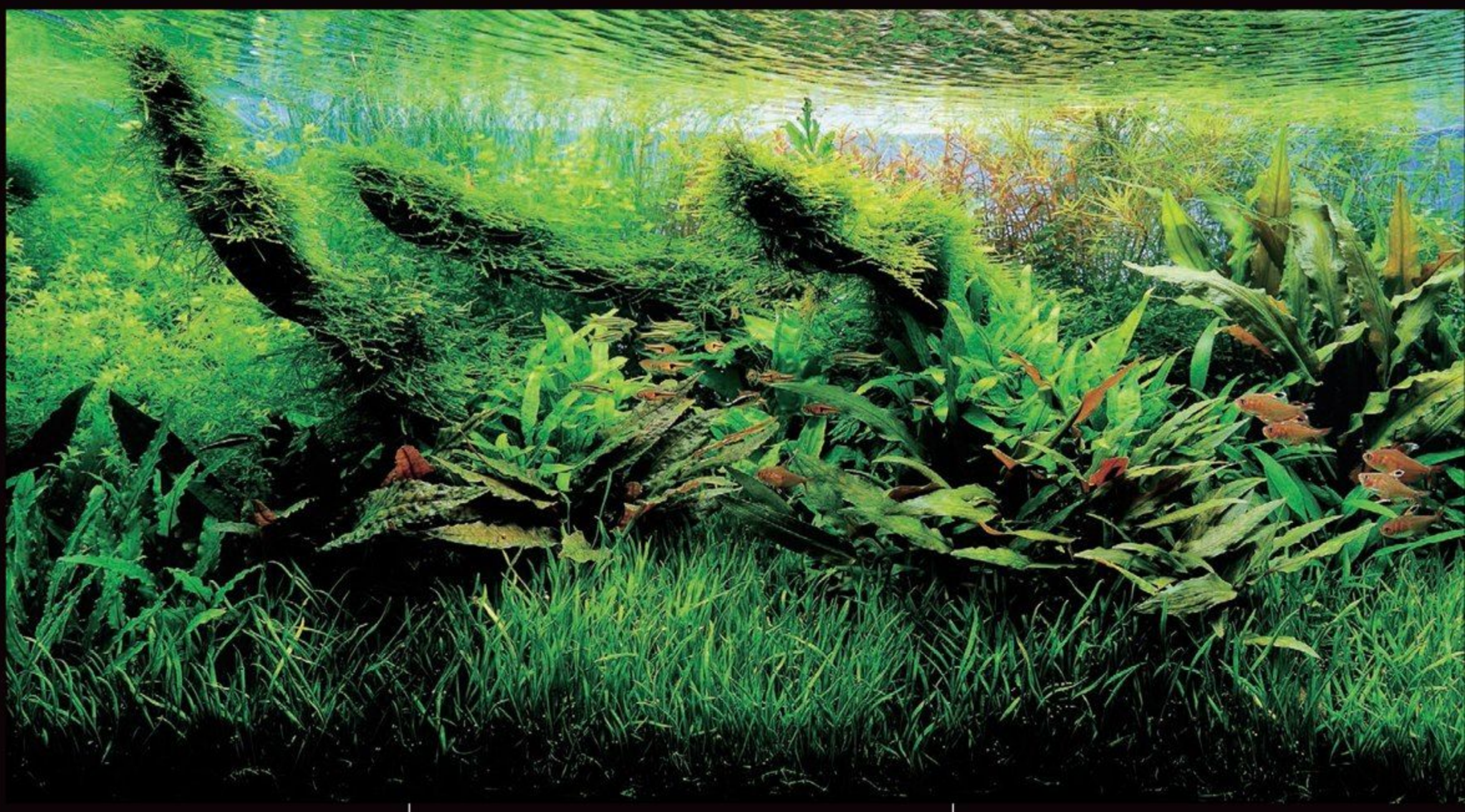
Males sometimes jump out of the tank when they aggressively chase the females.

African Lampeye

They jump out of the tank when they are surprised.

Thoracocharax stellatus

This species has the propensity to jump out of the tank.



Cutting Point.1

Cutting Point.2

DATA

Tank / Cube Garden W90×D45×H45 (cm)
Lighting system / Solar I (NAG-150W-Green) Lighting for 10 hours a day
Filtration system / Super Jet Filter ES-600 (Bio Rio & NA Carbon)
Substrate system / Aqua Soil – Amazonia, Power Sand Special M, Bacter 100, Clear Super, Tourmaline BC, PENAC W for Aquarium & PENAC P
CO_2 system / Pollen Glass Beetle 30ø – 3 bubbles per second with CO_2 Beetle Counter (Tower/20 is used)
Air / Aeration with Lily Pipe P-4 for 14 hours when lighting is OFF at night
Additives / Brighty K & Green Brighty STEP 2
Water change / 1/3 water change once a week
Water quality / Water temperature: 25°C; pH: 6.8; TH: 10mg/ℓ

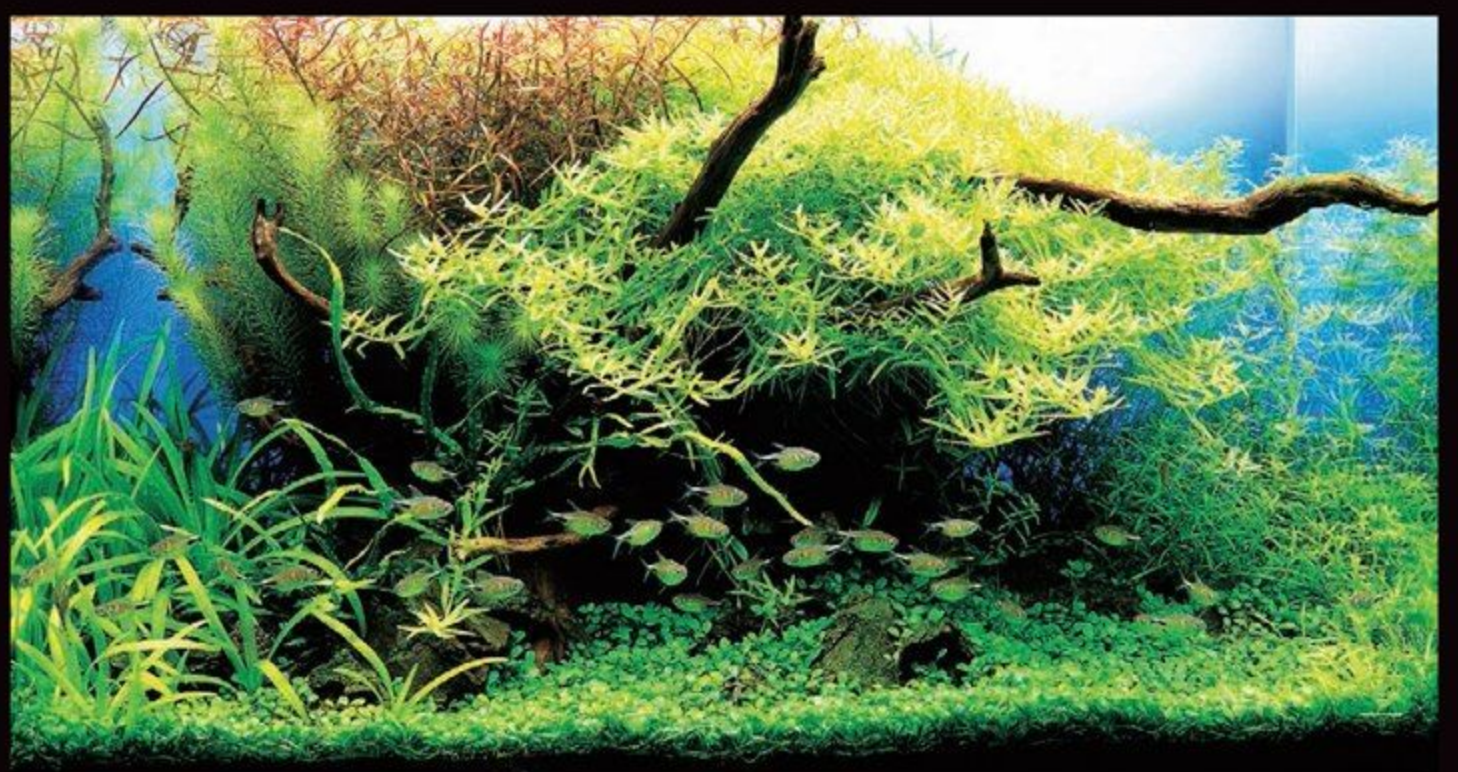
Aquatic plants / *Cryptocoryne wendtii "Tropica"*
Cryptocoryne wendtii (Green form)
Cryptocoryne petchii
Lilaeopsis novae zelandiae
Hemianthus micranthemoides
Micranthemum umbrosum
Rotala rotundifolia
Pogostemon sp.
Eleochalis vivipara
Microsorium pteropus"Narrow"
Bolbitis heudelotii
Taxiphyllum barbieri

Fish species / *Rasbora borapetensis*
Hyphessobrycon herbertaxelrodi
Hyphessobrycon sp.
Trigonostigma espei
Otocinclus sp.
Caridina japonica

Layout using Foreground Plants

As with the structure of natural forests, the planted aquarium basically adopts a layered structure according to plant height; this consists of foreground plants, middle-ground plants and background plants. Short aquatic plants such as Glossostigma and Cobra Grass are suitable for the foreground, while tall, sun-loving stem plants are mainly used for the background. Meanwhile the middle-ground serves as a seamless link between foreground and background and is a place for locating the composition materials such as driftwood. In such a middle-ground, epiphytic ferns and mosses as well as the shade-loving Cryptocoryne are commonly planted. We need to understand the characteristics and features of each aquatic plant to produce such a layout.

Aquatic plants in their optimal environment will grow steadily and thereby the aquascape is produced. During this process, some plants grow very rapidly, while others lose their vigor. This is similar to the process of natural selection and the aquascape will not be spoiled just by this fact as long as the aquatic plants are properly managed. You should also recognize that a conscious management of all the aspects must be avoided since the natural growth of aquatic plants beyond our control can be an important factor that provides that natural feel to the aquascape.



DATA

Tank / Cube Garden W60×D30×H36 (cm)
Lighting system / NA Lamp 20W (4 units) Lighting for 10 hours a day
Filtration system / External power filter (Bio Rio, NA Carbon & Palm Net)
Substrate system / Aqua Soil – Amazonia, Power Sand S, Aqua Gravel, Bacter 100 & Clear Super
CO_2 system / Pollen Glass – 2 bubbles per second with CO_2 Bubble Counter
Air / Pollen Glass (for Air) 14 hours when lighting is OFF at night with NA Control Timer
Additives / Brighty K & Green Brighty STEP 1
Water change / 1/5 water change three times a week
Water quality / Water temperature: 25°C; pH: 6.8; TH: 50mg/ℓ
Aquatic plants / *Ludwigia arcuata*
Mayaca sellowiana
Sagittaria subulata var. pusilla
Glossostigma alatinoides
Rotala rotundifolia(green)
Echinodorus tenellus
Microsorium sp.
Fish species / *Hemigrammus pulcher*
Otocinclus sp.
Caridina japonica

Display and Store Maintenance Goods on a Special Maintenance Stand

For the maintenance goods introduced on page 10 and all the other Nature Aquarium Goods, particular focus is also placed on design. Why don't you place these goods on the Maintenance Stand for display and storage purposes when they are not in use? This storage method will further enhance the interior of the place.

For highly professional use, the Nature Aquarium Goods cover a wide range of line-ups under each category, from layout tools such as pinsettes and trimming scissors to liquid additives, according to their applications. This is just like a professional chef using several types of knives according to the ingredient type instead of cutting everything with a single multi-purpose knife. Chefs are doing so in pursuit of perfection and accuracy in every aspect of their work, and the same applies to the maintenance of the aquarium. As we aim for greater heights in the planted aquarium, the need for highly professional tools arises.

In fact, all the Nature Aquarium Goods have been developed out of needs arising in the process of the production and maintenance of Nature Aquarium. For Nature Aquarium Goods, particular attention is given even to the design of the bottle of each liquid additive, not to mention the performance of each item. Since the first launch of Nature Aquarium Goods, ADA has been placing strong emphasis on a simple look with visual attractiveness of each product. High-end goods are equipped not only with excellent performance but also a sophisticated, beautiful appearance and design – this is how we think about tools. Particularly in the case of tools for hobbies, the users feel attached to them when attracted by their commanding presence.

01

Maintenance Stand Clear Type A

This stand is equipped with the storage space for the large CO_2 tank "Tower".
The stainless-steel body of the Tower and the straight acrylic line of the stand are a perfect match enhancing the design of the large-sized aquarium.

04

Maintenance Stand I

Neatly accommodates the minimum necessary items such as two Green Brighty bottles (500ml), liquid fertilizer, AP Glass and layout tools.

05

Maintenance Stand Tree

This is an elegant stainless-steel stand on which AP Glass, layout tools and additives can be neatly stored. It requires only a small area for its installation and can be placed in a narrow space.

02

Maintenance Stand Clear Type B

Accommodates a large number of trimming scissors and pinsettes. Its three-tier shelf is a perfect location for the storage of liquid fertilizers.
The great storage capacity of this product meets the needs of every heavy user.

03

Metal Hook Stand

This is the stand to keep a bottle under the Green Brighty series at the side of Cube Garden. It provides users with a handy setup, which allows them to have fun as they add fertilizer every morning.

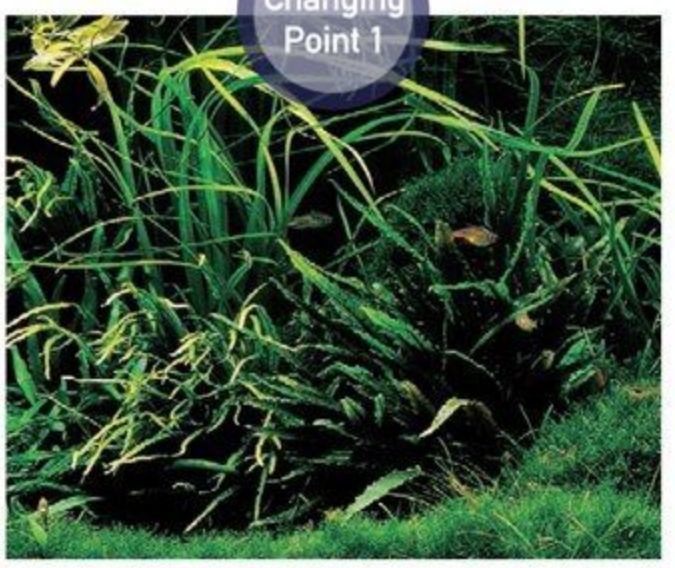
The Maintenance Stand has a great advantage in that users can store frequently-used maintenance goods neatly and also take them out whenever the need arises.

The concept that led to the development of the Maintenance Stand was, "It would be great if the layout tools under the Nature Aquarium Goods could be stored as if they were decorative items, instead of simply being cleared or "tidied up". What was required to realize this great idea was a sophisticated kind of storage that enhances the interior design and also is convenient for use.
The stand finally developed to meet all these storage requirements was the current line-up of Maintenance Stand. In the past, liquid fertilizers and trimming tools used to be stored in a cabinet or tool box to produce a neat and tidy environment around the aquarium. The launch of the Maintenance Stand made possible a storage method in which users can enjoy decorating by taking advantage of the excellent design of the Nature Aquarium Goods. We can display a beautiful aquarium in a simple manner. And now we can also enjoy aqua-interiors by producing the space incorporating the display of all types of aquarium goods. After all, the world of hobbies is enriched by the ultimate professional tools and accessories in addition to versatile tools. Such a concept of craftsmanship is reflected in the Maintenance Stand series.

This product allows users to perform timely maintenance as they can store frequently-used maintenance goods neatly on the stand and take them out very easily when needed.

Daily Maintenance Leads to Long-Term Sustainability

This section introduces the changes in a Nature Aquarium aquascape produced in a panoramic tank of W350×D75×H75 (cm). The aquascape in a large-sized tank is truly a product of daily maintenance techniques and the efforts made in the quality of maintenance can be felt throughout this work.

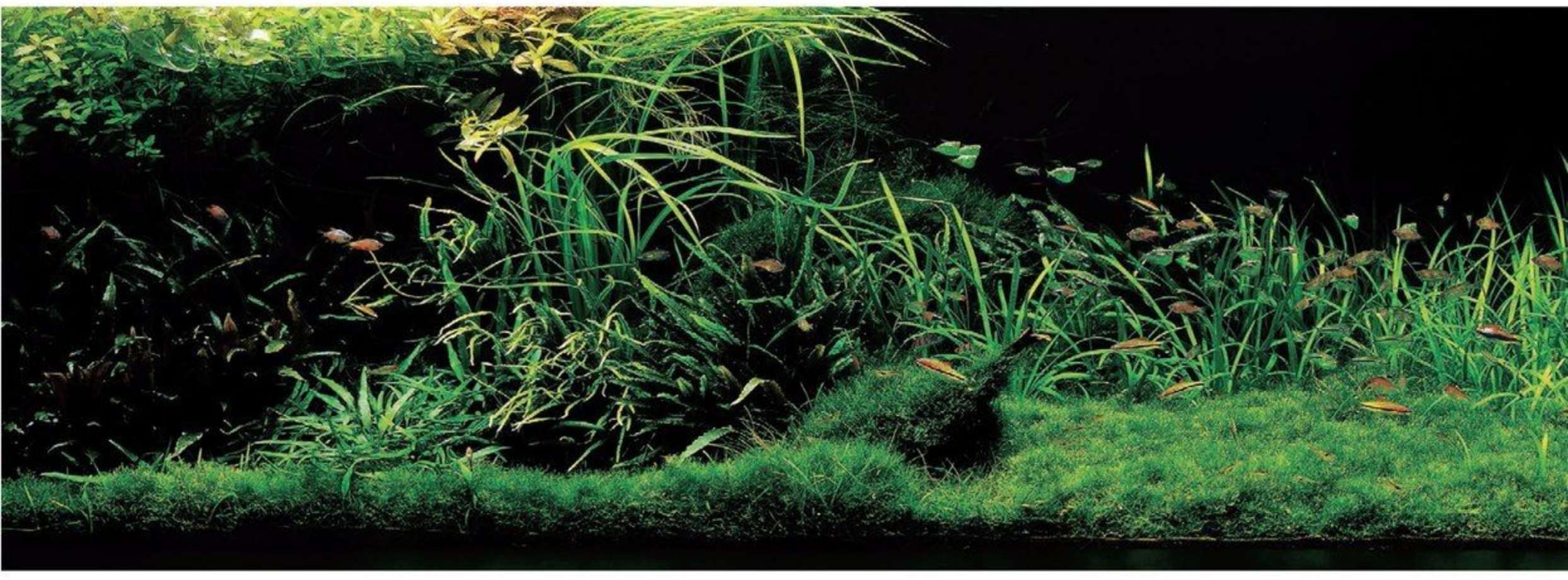


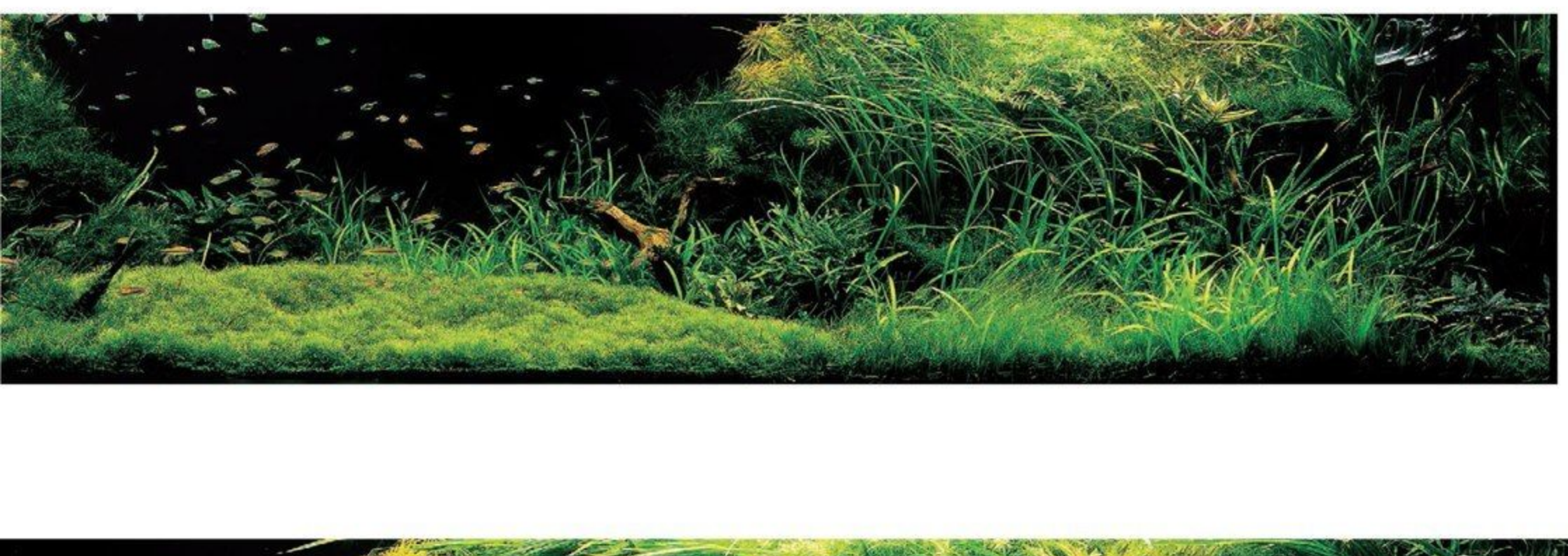
Vigorously growing Cryptocoryne

Brown Cryptocoryne that did not use to have much of a presence has now over time become prominent in the left side of the aquascape.

Management technique to avoid missing the right timing

Producing a layout in a large tank requires a lot of effort, and so does the maintenance work following the layout. But you will be able to properly maintain the layout with Riccia and stem plants delicately composed in a large tank only if you grasp the optimal timing through daily observation of the aquatic plants, and manage them carefully. In other words, you will become an expert in aquarium management only when you can maintain the layout in such a sophisticated composition in a large tank.



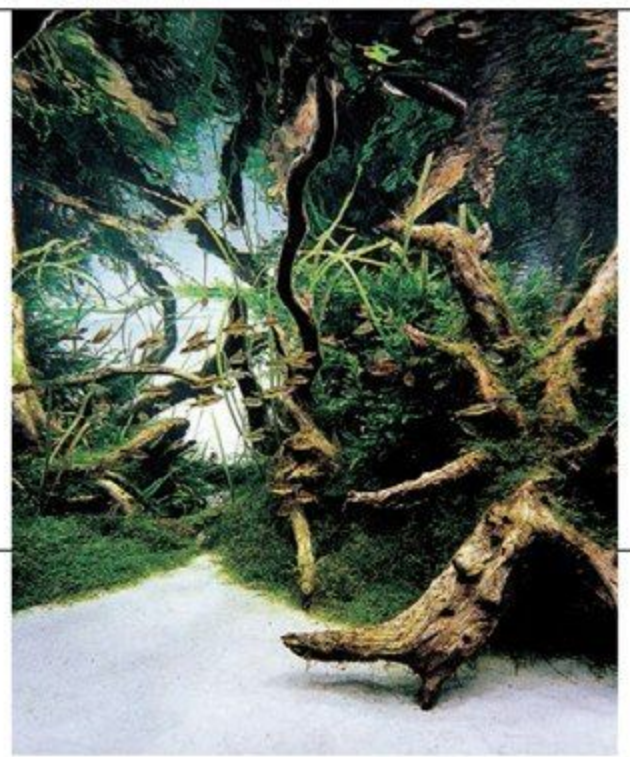


Collection of Maintenance Techniques!

Nature Aquarium Gallery

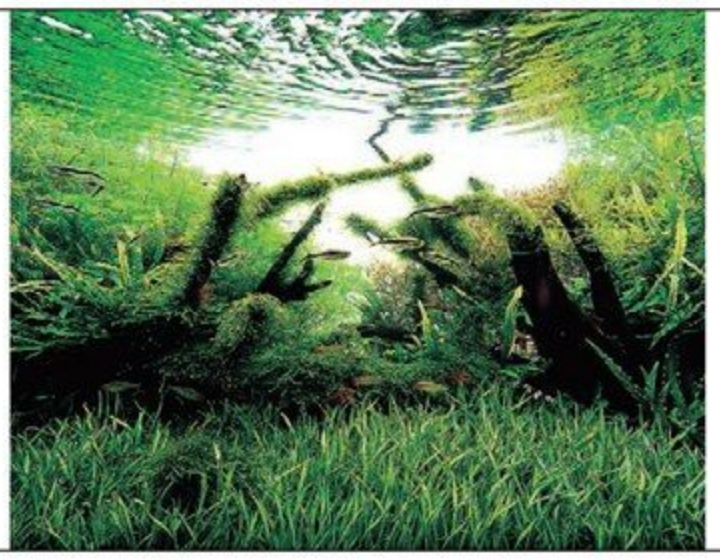
At the NA Gallery, maintenance is carried out on the basis of long-term sustainability, one of the concepts of Nature Aquarium. This aquascape has lasted more than 7 years.

01*



In this tank in which the natural aquatic environment is reproduced, a school of Red Line Torpedo Barb (Puntius denisoni) swims freely in a wide space. Adequate physical activity and appropriate feeding contribute to the healthy growth of fish.

04*

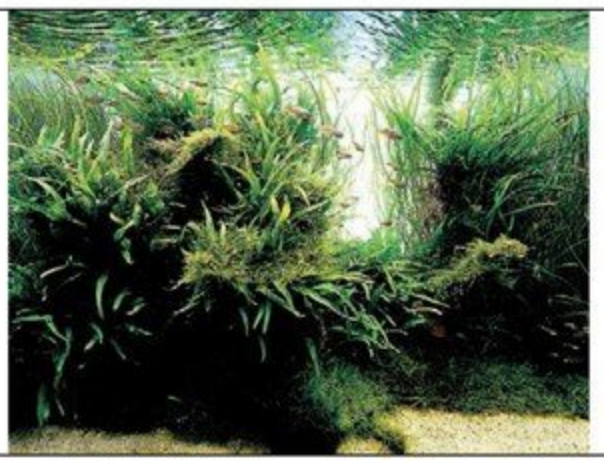


About 30 aquariums of different sizes, ranging from the mini to the gigantic 3.5m-long aquarium at the entrance, are displayed in Nature Aquarium Gallery. The aquascapes in the gallery have been well-maintained over a longa period of time by the professional staff.

The aquarium marked * is on display as of February 2009.

Ferns and mosses produce a profound atmosphere with the passage of time. Cut the overgrown brown roots of Microsorum together with its withered leaves to enhance its appearance.

02*



If the total hardness of water rises due to an Iwagumi layout using Ryuoh stones and it affects the growth of the new Glossostigma buds, the Softenizer is installed as a measure even at the NA Gallery.

03

The trimming of foreground and stem plants is one of the important tasks in maintaining the aquascape. At NA Gallery, the timing of the trimming is determined by considering its pre-set schedule as well as growth of the aquatic plants.

05

The Iwagimi layout is highly popular now. Visitors to the NA Gallery can see with their own eyes the sloping mound around the stones, which cannot normally be seen in any publication, not just its front view but also its side and rear views. This will be a great reference for layout production.

06

etc...

Learn maintenance techniques at the Nature Aquarium Gallery.

VIDA CAFÉ

Takashi Amano's way of living

"The Ultimate Choice"

Takashi Amano received the 63th Niigata Nippo Culture Award (in Art) for his achievement in establishing his unique ecological landscape photographs.
Amano had gone through several turning points until he established Aqua Design Amano after his successful career as a professional bicycle racer. From there on he started his activities as founder of Nature Aquarium and also as an ecological landscape photographer.
In this issue of VIDA CAFÉ , we look into strategies for making various decisions in life, taking Amano's words as a guide.

vol.08

Dream for Camera and Africa

After graduating from high school, Takashi Amano came to a crossroads in life, one path leading to academic life at university and the other leading to a bicycle racing career. In pursuit of a number of his dreams, Amano chose the path to professional bicycle racing. Amano's dreams in those days included getting a high-end Nikon F2 single-lens reflex and visiting Africa. Fond of the speed of bicycle racing and with a keen desire to fulfill his dreams, Amano declined the scheduled enrollment in the university and sat for the very difficult examination of a bicycle racing school, which turned out to be successful.
His school teacher who encouraged Amano to go to university really got furious when he knew that Amano had sat for the bicycle racing school examination without telling him. Yet, Amano still followed the path he believed in. He said, "I always decide what I will do without consulting anybody. I use my imagination and visualize my own success story. I don't think about failure. Once I'm done with formulating my success story, then I just move forward to realize it." A few years after Amano decided to become a professional racer, his dreams of getting a camera and visiting Africa really came to pass.

Imagination = Key to Success

Amano said that he was taught in his professional career that it is crucial to acquire imagination to overcome the worst possibility in order to win the race. Since then, Amano made it a habit to imagine the worst-case scenario and how to overcome it before each race. How could he have developed such an imagination? It is because he was reading all sorts of books in those days. Amano said, "When I was at bicycle racing school, I used to read under a small light even after all the lights of the school were turned off at 10 o'clock at night. I think I had read all the books in the school library. Even before and after the race, I was always reading whenever I had the time, and I made sure to bring books along with me when I went on a trip. I think the accumulated volume of books I have read must be enormous. The few thousand books I had read in those days sharpened my imagination and foresight."
And then, Amano made another big choice – retirement from bicycle racing and setting up a company. At that time, Japan was facing an economic slowdown right after its economic bubble had burst. To make matters worse, a fortune teller came and told Amano that his luck was running out to the extent that he would get stuck in a dead-end situation. But still, Amano believed in himself and decided to start a business despite the concern felt by people around that a business in aquatic plants was not really viable. Amano said, "For fortune-telling, too, I believe only good things. The time I started my business was right after the economic bubble had burst. I thought that if I started from the bottom, I couldn't be facing a worse situation than that. And I knew I must unlock my fortune on my own. It's true that I have gone through many failures, but I can be flexible in my judgment based on my imagination in every eventuality. I have heard of professional chess players thinking ahead more than 100 moves to win the game."

iPad and Takashi Amano

Amano believes that imagination is the common denominator between photographs and aquariums. This means that visualizing beautiful images leads to highly artistic output. In the current wave of digitalization, even Amano, who refers himself as an "analog person", is also using an iPad. A while back, movie director Hayao Miyazaki's negative comment on iPad, "All I need are pencil and paper" became the talk of the town. Amano, after actually using an iPad, also felt that

"VIDA" is a Portuguese word for "life". This corner introduces you to Takashi Amano's way of life through topics around us.

Interviewer/Editor: Miyuki Yamamoto (International Marketing Department, ADA)

e-books were impersonal and, at the same time, he was concerned that his unique imagination might be lost through the use of such an electronic device. He said, "I still like to read physical books by turning the pages. I don't feel such warmth from iPad; it's just like the difference between home cooking and instant food. Convenience is not everything, and we learn a lot from seemingly unproductive things. I hope people won't become like human clones in the further advancement of digitalization, and I really feel the significance of unique ideas and imagination. That's why I think right-brain thinking will become increasingly important from now. Computers cannot attain this type of thinking. On the other hand, left-brain thinking and information processing may eventually be taken over by computers."

"Live from ADA"

The world is now rapidly evolving towards digitalization and we are at another crossroads to decide how to face the new era. Amano commented about this matter: "Nature Aquarium is something super analog and I myself am and will always be a truly analog person. But I'm now thinking I need to achieve a good balance between analog and digital to make good use of them both. I want to make ADA's website even better - one day it is possible that our event will be broadcast live around the whole world. Doing super-analog activities and broadcasting them using digital tools seem contradictory. But what I am seeking is to let people realize the goodness of analog stuff through digital processes. Although the first point of contact is digital information, people will attain imagination and creativity from it and make use of the opportunity to interact with nature and living creatures – this is my desire."

Creation of storyline

Life is a succession of choices and we are more or less making some choices or decisions every day. And all of us must have a moment to be forced to make the "ultimate choice" at least several times in our lives. When we face that moment, why don't we remember Amano's words: "When we decide on something, use our imagination and visualize our success story. Once we have a clear image, then just go ahead and realize it." For Amano, what helped him maximize his imagination was "reading books". In today's digitally advanced society we are bombarded with all kinds of information and, in such an environment, it is important for us to actively understand the information by interacting with it through our brains, instead of just receiving it passively. Doing so, sharpens the imagination and judgment essential for us to think ahead. And with these qualities, our stories will move towards a happy outcome in the way we expect.

Amano in reflective mood during a photo shoot. Whether in bicycle racing or business, he uses his imagination to visualize the way to overcome the worst-case scenario to make things better.

News article on Amano winning the award. His thoughts on environmental conservation have successfully been conveyed to society through his photographs.

nature aquarium **notes**

27

Water Quality Measurement for Maintenance

Water quality is the indicator of the timing of water change, an essential task for the long-term maintenance of the planted aquarium. In the case of water pollution, some instances are visually identifiable, some are not. Colored or cloudy water can be visually observed, but accumulation of nitrogen is invisible. The Nature Aquarium Notes in this issue describe the measurement of water quality with the aim of keeping the planted aquarium in a good condition and the fish healthy.

● Measuring water quality with the Pack Checker

Among the various ways to measure water quality, the Pack Checker provides a simplified and standardized measurement. In this method, we can measure water quality just by pumping the water into the tube and checking the result against the color comparison chart. This allows the user to easily take a measurement whenever necessary and use the result as an indicator for maintenance needs.

Nitrogen is an essential nutrient for the growth of aquatic plants and must be generated in a tank with fish. However excessive nitrogen may cause algae growth and some nitrogen-containing substances may affect the health of the fish and shrimps. In addition, the pH level and total hardness of water may affect the growth of aquatic plants and health of the fish.

These factors vary with the materials used in the aquarium. They also vary with the water change process. Usually water change is carried out when the concentration of harmful substances rises in order to lower it. It can be said that water change is the easiest way to improve the quality of tank water. The water change should basically be carried out periodically and the appropriate interval of water change can be known through the measurement of the water quality using the Pack Checker. Among the various types of Pack Checkers, the ones which should be used for periodic checks in planted aquariums include:

• Pack Checker pH (hydrogen ion concentration)

Indicates acidity, neutrality and alkalinity of water, which influences the growth of aquatic plants and health of the fish.

• Pack Checker TH (total hardness)

Indicates the concentration of calcium and magnesium ions in the water, which influences the growth of aquatic plants.

• Pack Checker NO_2 (nitrite)

Nitrite is a substance converted from ammonia and is highly toxic. Ideally no NO_2 should be detected in the aquarium.

• Pack Checker NO_3 (nitrate)

Nitrate is a substance converted from nitrite. A high level of nitrate can promote algae growth.

• Pack Checker COD (chemical oxygen demand)

Indicates the level of contamination with organic matter. This serves as a reference to determine the adequate number of fish to be kept, their feeding amount and frequency of water change. For a pH level check, the pH Kit is also available besides the Pack Checker pH. The pH level can be checked using the pH Kit by dropping the reagent in the tank water. Measurement with the pH Kit is easy and also cost effective (pH level measurement can be performed 150 times with a bottle of reagent). The pH Kit is recommended for those who measure the pH level frequently.

● Water quality measurement during the initial stage of the aquarium

Water quality is significantly affected by substrate materials during the period immediately after the setup of Nature Aquarium. Particularly in the aquarium with an ordinary substrate system made up of a combination of Power Sand and Aqua Soil, the water becomes acidic and a large amount of nitrogen is released from the substrate into the water. During the initial stage in such an environment, the pH level sometimes dips below 6.0, but this level is suitable for the growth of many aquatic plants and poses no particular problem.

The problem that arises during the initial stage is the concentration of nitrogen-containing substances, such as ammonia and nitrite. These substances are highly toxic to fish and shrimp, so adding fish and shrimp to the tank should be avoided while the level of such substances is still high.

The source of nitrogen within the tank is organic matter. Ammonia produced from organic matter is converted into nitrite and then into nitrate. Through this process, the toxicity of ammonia is reduced. This conversion takes place mainly through the activity of filter bacteria in the filter system. When a filter with new filter media is used, the filter bacteria are not yet adequately established in the initial stage of the aquarium, and toxic ammonia and nitrite can easily accumulate. The period in which the aquarium is subjected to high levels of ammonia or nitrite will usually last for 3-4 weeks from setup. During this period, the tank water should be changed frequently to reduce the ammonia/nitrite level and, at the same time, the nitrite concentration should be checked with the Pack Checker NO_2.

Water with a high level of nitrite is prone to brown diatom. Adding Yamato Numa Ebi (Caridina Japonica), a diatom eater, to the tank is an effective way to fight this type of algae. However, this shrimp is particularly vulnerable to nitrite, and its leg movements slow down in the presence of just a trace amount of nitrite or it can even die if the nitrite concentration is high. It is therefore recommended to remove brown diatom by suctioning with a fine hose when nitrite is detected. Yamato Numa Ebi should be added only after nitrite is no longer present in the water through repeated water change.

Meanwhile, when using filter media that have been installed in another aquarium, the period in which nitrite is detected is usually shorter. However, the actual length of such a period varies with the condition of the filter media, so a check of the nitrite level before adding Caridina japonica is recommended. Besides nitrite, sudden changes in pH and total hardness of water may also affect the condition of this type of shrimp. Check the pH level of tank water with the Pack Checker pH or the pH Kit before adding the shrimp to the tank, and if the result shows a significantly low pH level, change the tank water immediately before adding the shrimp, and perform a thorough water adjustment. Through this procedure a sudden change in pH level can be averted.

● Water quality measurement for long-term maintenance

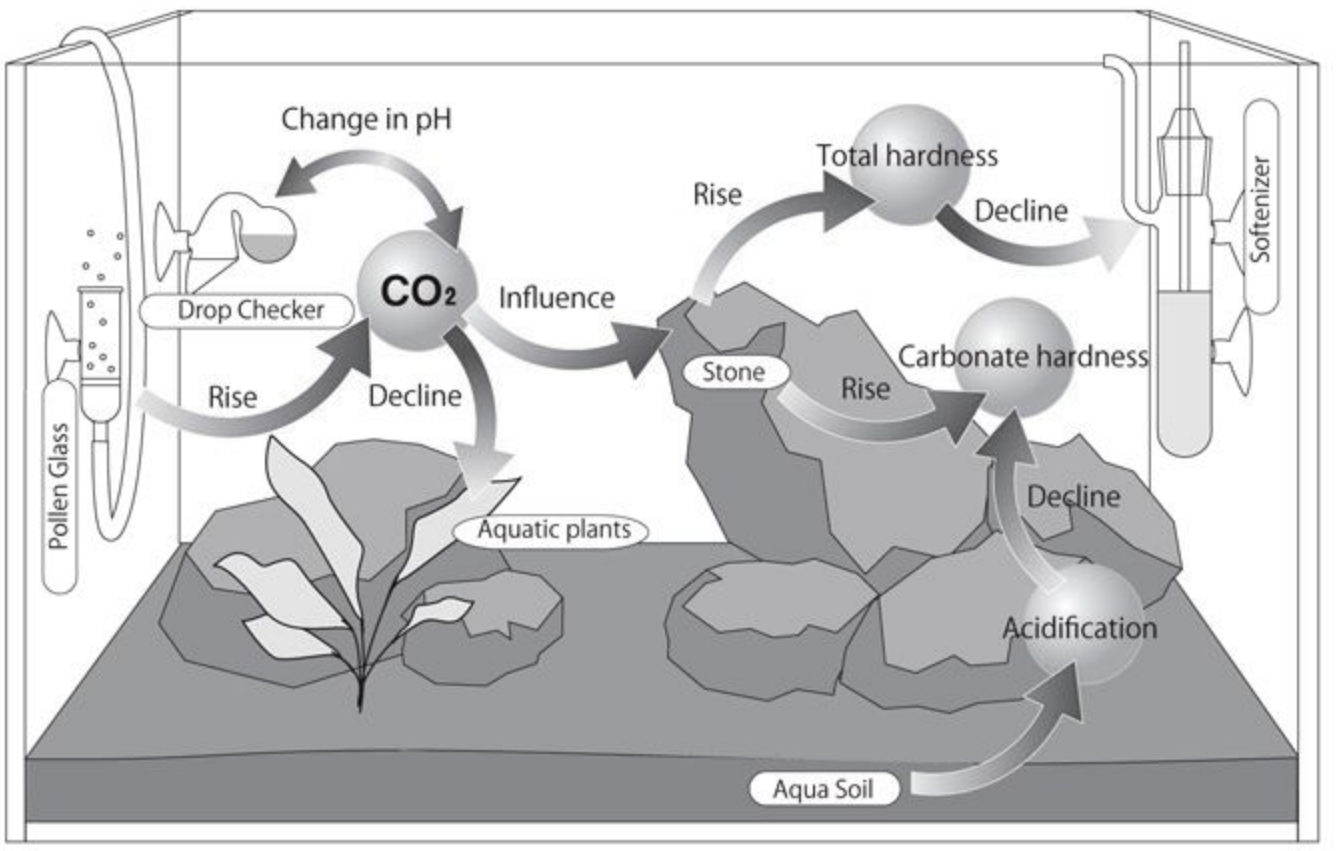
Once the initial stage of the aquarium has passed, the filter bacteria in the filter system start functioning fully and the aquatic plants grow vigorously. This is the time when the quality of tank water is stabilized. At this stage, there is no problem in adding fish to the tank. We must feed the fish to keep them in the aquarium environment. Most of the species to be reared in the planted aquarium can grow on an artificial diet, and

artificial fish food is the common feeding method. After the feeding, the tank water is always polluted with fish excreta and leftover food. This organic matter constantly generates ammonia but it is eventually converted into nitrite, and then into nitrate as long as the filter bacteria are very active. Therefore in aquariums with established filter bacteria, almost no ammonia and nitrite are detected through water quality measurement.

For this reason, there is usually no need to measure nitrite in aquariums which are in a stable condition. For such an aquarium, nitrate, instead of nitrite, is used as an indicator to know the timing of the water change. In a planted aquarium with lush aquatic plants, the nitrate in water is absorbed as an important nutrient and thus the nitrate concentration will not be too high. If a high level of nitrate is observed, an excessive feeding amount or an excessive number of fish in the aquarium can be suspected. In this case, the nitrate level can be lowered by water change. If the nitrate level rises again after a few days, we know that it is the right time to change the tank water. If the regular measurement shows a sudden spike of nitrate to as high as 10 times the original value, the nitrite level should be checked again.

The Pack Checker NO_3 measures the nitrate concentration accurately as long as no nitrite is detected, but it indicates abnormal values in the presence of nitrite. Although the toxicity level of nitrate is quite low, nitrate can be converted back to nitrite when its level is very high and when dissolved oxygen is lacking. If this phenomenon occurs, the toxicity level becomes very high and this causes the shrimps to die. The generation of nitrite due to lack of dissolved oxygen can be observed when the filter media is excessively dirty or night-time aeration is not performed in an aquarium with a lot of plants. In this event, check the filter media first and, if they are dirty, rinse them lightly with tank water in a pail and then put them back in the tank. After this rinse, it is recommended to perform stronger aeration by making use of the water flow of the filter for a whole day. This enables the rejuvenation of aerobic microorganisms in the filter, which eventually leads to the elimination of nitrite in the water. Even after the water condition is restored, be sure to continue aeration after the lighting is turned off at night. This can prevent poor aerobic microorganism activity due to lack of oxygen.

■ Key factors that influence water quality in an aquarium



In aquariums, the pH level falls with acidification of water due to the effect of Aqua Soil. On the other hand, when aquatic plants absorb CO_2 and when the carbonate hardness rises under the influence of stones, the pH level also rises. Changes in pH in conjunction with changes in CO_2 concentration can be checked by the Drop Checker. Meanwhile, the total hardness rises under the influence of stones but it declines with the use of Softenizer. The pH and total hardness of the aquarium water are influenced by such interactions.

● Water quality that influences growth of aquatic plants

The water quality is also influenced by the growth of aquatic plants which spread their leaves in the water. One of the contributing factors is nitrate. This substance is absorbed by aquatic plants as a nutrient. Nitrate can pose a problem if it is excessive rather than when it is in short supply. An excessive concentration of nitrate leads to algae growth in the aquarium. Other factors that have a direct impact on the growth of aquatic plants are the pH and total hardness of water.

Aquatic plants perform photosynthesis by absorbing CO_2 in the water. The pH of water influences the behavior of CO_2 in the water and its value reflects CO_2 concentration. With some exceptions, most aquatic plants used in the planted aquarium grow well in soft acidic water at a lower pH level. This is because of the principle: "The lower the pH level of water, the higher the concentration of CO_2 in the water, and vice versa". In contrast to acidic water, alkaline water at a higher pH level contains less CO_2. The pH level also rises when CO_2 is actively absorbed in the photosynthesis process.

With these facts in mind, it can be judged that the amount of CO_2 injection is insufficient if the water is found to be alkaline through the pH check conducted at the peak of photosynthesis (4-5 hours after the lighting is turned on). If such a condition becomes chronic, the aquatic plants are unable to perform photosynthesis adequately and suffer from poor growth. When the pH level of water is neutral (pH7.0) at the time the lighting is turned on (i.e. commencement of CO_2 injection), the pH level should be slightly acidic at about pH6.8 - 6.6 within 4-5 hours. The appropriate CO_2 level can be achieved at this pH level. Changes in pH level in conjunction with CO_2 concentration can be continuously measured with the Drop Checker (refer to page 19).

Meanwhile in regard to total water hardness, the growth of the aquatic plants is affected by this factor if a value as high as 100mg/ℓ is observed through the Pack Checker TH measurement. Total hardness indicates a concentration of calcium and magnesium ions in the water. If it is too high, absorption of other nutrients such as iron is hindered and chlorosis of the new buds of the aquatic plants or dwarf syndrome of leaves may occur. The aquarium which experiences a rise in total hardness tends to also face a rise in carbonate hardness (KH) and pH level at the same time, and this symptom may affect the growth of some aquatic plants.

Moreover, if the tap water used for the water change shows a high level of TH, KH or pH, the cause of the rise in total hardness in an aquarium can be the use of substrate sand or composition materials such as stone. Marine sand containing broken pieces of coral or seashells as well as calcareous stones such as Ryuoh stone tend to increase total water hardness. A higher total hardness becomes prominent particularly when CO_2 is supplied, so it is recommended to check total hardness if stones are used as composition materials in the planted aquarium. Excessively high total hardness can be moderated by installing Softenizer within the tank (refer to page 22). Carbonate hardness can be lowered by the use of substrate material, such as Aqua Soil – Amazonia, which has the effect of increasing the acidity of water.

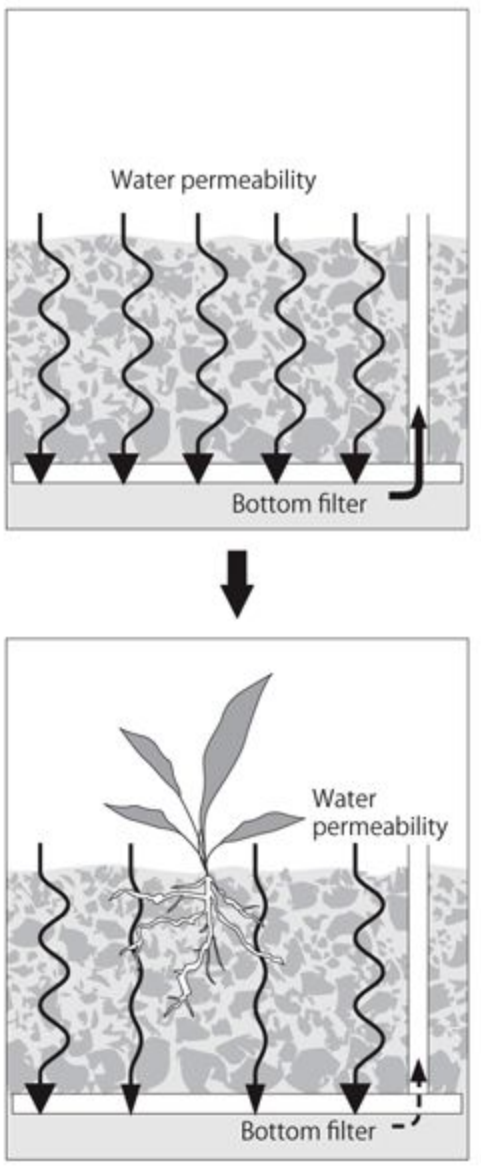
NATURE AQUARIUM Q&A

Now we feel the change of the season here in Niigata, when farmers start harvesting the rice. It is also good timing to start preparing a new planted aquarium layout for next year's International Aquatic Plants Layout Contest. We hope you maintain a beautiful layout for this winter season, and look forward to receiving your nice layout for the next year's contest.

Q I installed a bottom filter connected to the external filter and it occupies about 80% of the base area of the tank. The thickness of Aqua Soil is about 10cm for the thin-layer side but it exceeds 20cm at the thickest portion. Is my arrangement right?

A The bottom filter is good in terms of providing excellent water permeability in the substrate system if the aquarium is used only for rearing fish. However, in the planted aquarium the roots of aquatic plants can spread and block the passage of water. Once the aquatic plants have grown and spread their roots in the substrate, uniform water permeability might not be ensured throughout the substrate. Furthermore, the nutrients from such substrate material as Power Sand may easily run off if a bottom filter is used. From this point of view, the use of a bottom filter is not recommended in the planted aquarium. (*Aqua Soil cannot be used for the bottom filter.)

Water permeability in the substrate

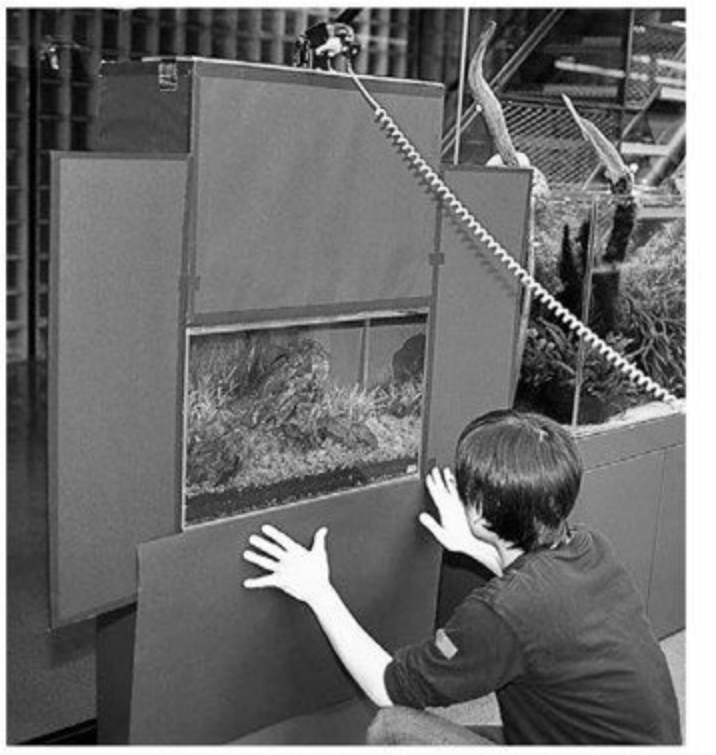


Q I'm using Pollen Glass Large 20Ø for CO_2 and for AIR. Is there any way I can remove brown algae grown on the diffusion filter? I have cleaned the filter using the Superge many times, but the filter still looks unclean. Why?

A Brown diatom is a common form of algae observed during the initial stage of the aquarium. If you feel the filter is still unclean even after washing it with the Superge, then the cause of the brown color on the diffusion surface is most likely the iron attached to the filter surface. Iron is an important trace element to enhance the leaf color of aquatic plants and is contained in various liquid fertilizers. Although this cannot be guaranteed due to usage conditions, the liquid fertilizer-derived iron observed on the filter can be remedied by soaking the filter in an acidic solution. Among ordinary household items, vinegar is the safest and easiest to use to make this acidic solution. Try it out.

Q I have read on the application guidelines for the International Aquatic Plants Layout Contest that applicants must send an "image of the overall aquarium". When I took photos of the entire aquarium, the area around the aquarium was also included in the image and it doesn't look good. Do I have to shoot the photo in such way that the surrounding does not appear in the image or will ADA crop the unnecessary portion around the aquarium for me? What kind of images do other applicants usually send?

A It is a requirement that the layout image for the entry into the Contest must cover the entire aquarium, but there is no problem even if the area or things around the aquarium appear in the image. As you can see from the photographing methods introduced in this issue, some applicants cover the surrounding of the aquarium with black drawing paper for the photo shoot. However, this has nothing to do with the evaluation, so you don't necessarily have to do it. Rather than worrying about the superfluous surrounding area, you should place more importance on taking a good photo of the entire aquarium from its front. You can take a better picture of the aquarium if you dim the room lights and brighten up the interior of the aquarium only (camera flash should be turned off). This is to prevent the reflection of other objects on the aquarium image. In addition, a tripod is recommended. When placing the aquarium photos on our publications such as portfolios, we crop off the aquarium surroundings when we edit. So you can send us your image without any processing.



If the surrounding of the aquarium is covered with black drawing paper, you can achieve higher perfection as in the aquarium images in Aqua Journal.

Q I have a question about the trimming of Eleochalis vivipara. Besides picking off viviparous buds, is it OK if I just cut off the leaves?

A As you can see from its leaf shape and scientific name, Eleochalis vivipara is a species of Hair Grass. So you can trim this plant the same way as you would trim Hair Grass. However, the Eleochalis vivipara leaves remain in the shape they are cut and the cut line can be very obvious if the leaves are trimmed in the middle. To avoid this, it is advisable to trim the Eleochalis Vivipara leaves at the lowest position possible. You should pay attention to the trim position particularly in the Iwagumi layout with a wide open space so that even the lower part of the background can be seen.

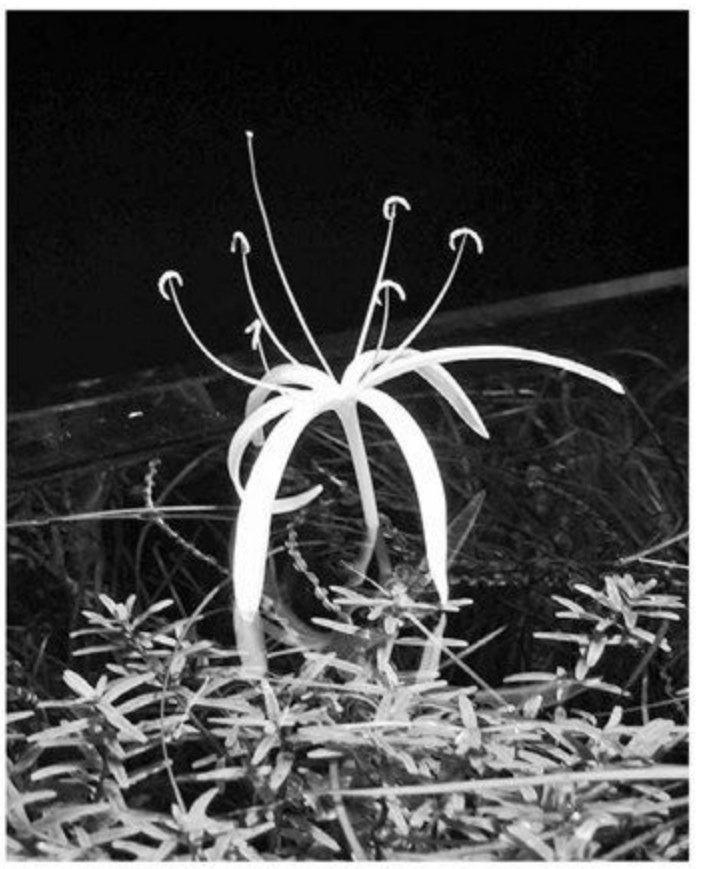
Send us your questions!

We welcome your questions and inquiries on Nature Aquarium. Please feel free to send your questions to ADA to our email address (ada@adana.co.jp).

Eleochalis vivipara

Q Sometimes my aquatic plants bloom in the aquarium. Should I cut off the flowers?

A You don't need to mind too much about the stem plants blooming above the water. However, Echinodorus shoots as well as Aponogeton and Crinum flowers should be cut off to prevent unnecessary consumption of the nutrients in the parent strain and bulb. Plants, including aquatic plants, focus on using their nutrients to cause the flower to bloom once the flower bud is formed, and this weakens the parent strain. Unless the layout is created in an open aquarium for the purpose of appreciating the flowers blooming above the water, it is advisable to cut off the flower buds of aquatic plants. This also applies to viviparous buds observed on Eleochalis Vivipara and Microsorum. These viviparous buds should be cut off.



Crinum flower bloom in the Nature Aquarium Gallery

Q I'm using Bio Rio in the net. May I know if this method affects its filtration performance? Are there any precautions?

A Even if you use Bio Rio in the net, there should be no problem as long as there is no gap between the net and canister wall inside the filter canister (the casing in which the filter media are placed). If this gap is created, more water flows through this gap than through the filter media and this affects filtration efficiency. Be careful not to allow any gap when you fill the canister with filter media in the net. Higher water permeability can be expected if you use a net with coarse mesh of the size through which no filter media can penetrate.

When using filter media in the net, sludge usually accumulates on the net.

Select the net with coarse mesh but not too coarse to allow the filter media to penetrate.

Q I have seen total hardness expressed in TH and GH. What's the difference?

A There are many German products in the tropical fish industry, which is why the German degrees of hardness scale (°dH) is often used to express water hardness. In Japan, "total hardness (TH)" ($mgCaCO_3/\ell$) is commonly used and our Pack Checker has also adopted this system. The water hardness range that has no impact on the growth of most aquatic plants is 50mg/ℓ or below in TH or 3° dH or below in GH. Between the German degree of hardness and the total hardness, there is a conversion formula as stated below.

Conversion formula between TH and GH

One German degree of hardness is defined as 10 milligrams of calcium oxide per liter of water ($mgCaO/\ell$). Based on the fact that the molecular weight of calcium oxide is 56 while that of calcium carbonate is 100, the concentration of calcium carbonate can be converted into the German degree of hardness using the following formula:

$$Y=X\times(56/100)\times(1/10)$$

$$Y=X\times0.056$$

Y: German degree of hardness X: Concentration of calcium carbonate ($mgCaCO_3/\ell$)

The following is the conversion table between the total hardness TH and German degree of hardness GH:

TH	→	GH
0		0.00
10		0.56
20		1.12
50		2.80
100		5.6
200		11.20

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