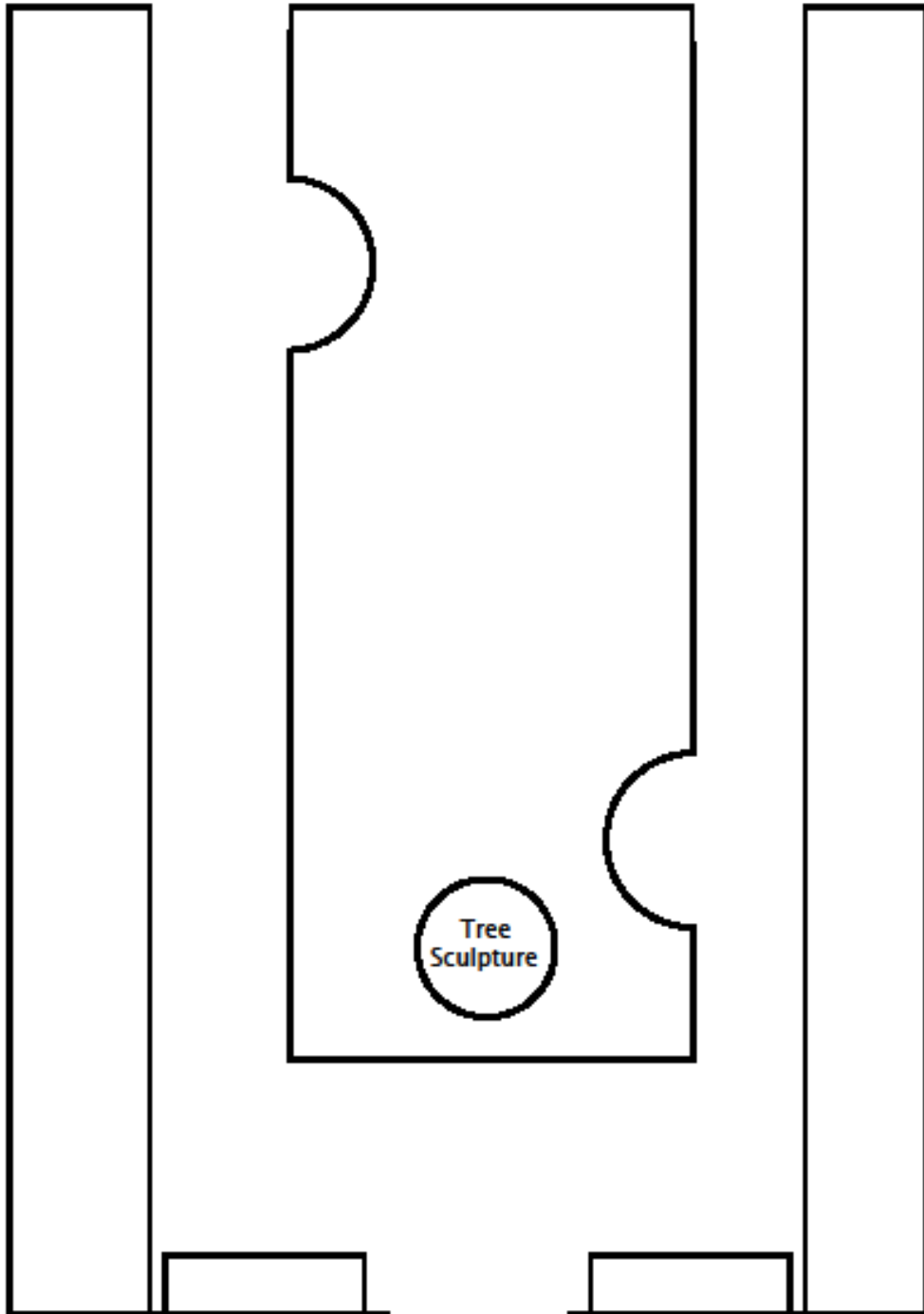


Highlands Gallery



Highland Tropics Gallery

The Conservatory's Highland Tropics may be just through the next door, but it is a world away from the low-lying rainforest. Here, temperatures are refreshingly cool, and colorful orchids grow on moss-covered trees. This gallery provides an intimate glimpse of the life in the mountain forests of the tropics.

Several kinds of forest occur in these mountainous regions – lower montane forest, cloud forest, upper montane forest and sometimes even alpine forest when mountains are tall enough. Of all of these high elevation jungles however, the cloud forest casts the greatest spell on the imagination.

The cloud forest is an eerie and wonderful place. Frequently shrouded in mist and fog, their steep hillsides cascading with waterfalls are covered by short trees, twisted and gnarled by the harsh elements and the weight of the thousands of plants that live on their limbs. The majority of cloud forests occur in the high mountains at elevations of 3000 to 10,000 feet generally. On steep and humid equatorial islands, they can begin as far down as 1600 feet.

Like the rainforest, these places are wet. Tropical cloud forests, cool though they may be, experience nearly 100% humidity throughout the year. They receive up to 200 inches of rain annually, and when it isn't raining, there are always the clouds. Trees and plants in this forest are highly adept at capturing water from fog and mist, storing it and slowly dripping it down to the ground. Cloud forest soil is like an enormous sponge, a mass of damp humus and peat that, like a natural water tap, slowly releases a steady supply of fresh, filtered water to animals, plants and people downstream.

With the plentiful supply of water, the cloud forest's biodiversity is spectacular and rivals that of the rainforest. Thousands of species of plants and animals live here most of whom are still unknown to science. Many of these are endemic which means that they can be found nowhere else. This becomes so pronounced that species can vary dramatically from mountaintop to mountaintop.

The above was excerpted from [Treasures of the Conservatory of Flowers](#) by Nina Sazevich.

GEOGRAPHY / CLIMATE / COUNTRIES

Countries with cloud forests include: Borneo, Colombia, Costa Rica, Ecuador, Indonesia, Malaysia, Mexico, Peru, Venezuela, Vietnam and Zaire. Most of the terrestrial plants in this gallery are from field-collected germplasm from Southeast Asia and Chiapas, Mexico.

- The plants in this gallery are found at 3,000-10,000 feet elevation in the mountains of the tropics.
- Large amounts of water condense on vegetation from clouds and light mist; the highest elevations of the forest are always dripping water from the leaves when shrouded in clouds.
- Cloud forest trees are covered in epiphytes, including orchids, mosses and filmy ferns. More than a thousand species of orchids have been found in the cloud forests of Peru alone. Most of the species in cloud forests are believed to be still unknown to science.
- Cloud forests play an extremely important role in the hydrology of tropical regions and watersheds. They capture, store, and filter water that feeds into local communities and large rivers hundreds of miles away.
- Cloud forests are especially vulnerable to global warming trends, because they rely on a combination of geographical and environmental factors that produce the misty and moist environment. Increasing temperatures would cause cloud lines to move farther up the mountain, reducing the area of cloud forests. In Monteverde, Costa Rica, where the cloud forest exists in a band only 4,900 to 5,900 feet in elevation on the Pacific side of the mountains, upward movement of the cloud line by even 165 to 330 feet would have a large impact. Local biologists have already noted that bird and bat species seem to be relocating their ranges upward, while amphibians that used to reside at the top of the mountain have disappeared altogether.
- Deforestation is also a severe threat to cloud forests. In the past, land has been cleared primarily for agricultural purposes, although development of housing and commercial enterprises could become an increasingly important factor in the future. The soil of cloud forests is generally quite fertile, but the topsoil layer is thin and is subject to rapid erosion once the forest is cleared because of the steep terrain. Decreasing soil quality causes farmers to resort to fertilizer and pesticide use, which creates a larger environmental problem because the cloud forest is often at the top of the watershed.
- A unique problem in some areas is that development to support the ecotourism industry has actually caused some additional damage to the forests themselves, or to other ecosystems and habitats that lie just beneath the edges of the cloud forests, where housing and supporting agriculture is likely to develop.

ARCHITECTURE / DESIGN / ARTWORK

- The center bed is five feet lower than the pathway. This was done to bring some variety to the floor area of the gallery. It's also a unique way to display the rather sprawling *Vireya* rhododendrons allowing us a bird's-eye view of their trumpet-shaped flowers. In addition, this sunken bed provides a subtle way to separate valuable plants from visitors by growing the plants just barely out of reach.
- The *Dracula* orchid model and the tree holding it were added to the gallery in July 2014. They were crafter b
- The large epiphyte tree in the center, towering in the center of the sunken bed, was sculpted with galvanized metal pipe core and are covered with moss. The orchid-bearing branches on them are from California manzanita. These can be removed from the "tree" and the orchids and other epiphytes can be cared for in our back greenhouses.
- On the medal railing is a stylized version of a *Dracula* orchid.
- The wooden orchid case resembles a Victorian armoires. It's made from ipé, a hardwood from Paraguay and Argentina. Ipé is extremely decay, pest and fire resistant. The wood is so dense and heavy that it sinks in water. This lumber was harvested from certified, sustainably managed forests.

Plant Families from the Highland Tropics

The following pages detail some of the most popular found in our collection. Many epiphytic plants are found in our Highland Tropics Gallery. The plants we will discuss in detail are:

1. Hawaiian Tree Fern, *Cibotium glaucum*
2. Medinillas, *Medinilla spp.*
3. Staghorn Fern, *Platynerium bifurcatum*
4. *Vireya* Rhododendrons
5. Cuckoo Flower Impatiens, *Impatiens naimniamensis*

PLANT INFORMATION SHEET



Family: Dicksoniaceae

Botanical Name: *Cibotium glaucum*

Common Name(s): Hawaiian tree fern, Hapu'u

Country of Origin: Hawaii

Native Habitat: Swampy gulleys of the rainforests

Galleries where found: Highlands

This plant is noteworthy because...

- *Cibotium* is a genus of 11 species of tropical tree ferns, all members of an ancient group of plants that predate the dinosaur.
- *Cibotium glaucum* is the most

encountered species in the horticultural trade.

- Hawaiians cooked the core of the tree as a carbohydrate in times of famine. It took 3 days to prepare.
- Hawaiians also collected the silky brown material, pulu, from the unfolding fiddleheads. Pulu used as surgical dressing and also in embalming process

An interesting adaptation of this plant is...

Tree ferns are interesting when compared to their "standard" fern relatives, as these have adapted to get more sunlight by growing tall to rise above understory plants.

Is this plant or its native habitat endangered or threatened?

It suffers from loss of habitat from development and also introduction of other invasive species whose spores can migrate many miles into pristine *Cibotium* territory.

General Plant Description & Characteristics: Trunk can reach over 35 feet tall and 3 feet in diameter. The green fronds have a yellow midrib. Young leaves are called fiddleheads. It reproduces by spores which form at frond ends but also asexually by "pups" growing as side shoots off of main trunk. The starchy core is covered by stiff hard fibers.

PLANT INFORMATION SHEET



Family: Melastomataceae

Botanical Name: *Medinilla magnifica* or *myriantha* (lots of species) Photo of a *Medinilla* spp.

Common Name(s): Malaysian Orchid, pink lantern

Country of Origin: *M. magnifica* and *M. myriantha* are native to the Philippines

Native Habitat: Epiphytic in the wild, growing in higher altitude rainforests.

Galleries where found: Highlands, Potted, and Aquatics

This plant is noteworthy because...

In the Philippines where more than 200 species of this genus are indigenous, *Medinilla* grows naturally at higher altitudes in the rainforest habitat. There are about 480 species in this genus.

An interesting adaptation of this plant is...

- The leaves alternate position as to not block sunlight from the leaves below.
- Rich glossy, thick, green leaves retain water.

Is this plant or its native habitat endangered or threatened?

Unknown.

General Plant Description & Characteristics: Easy to identify family because of the typical leaf venation of the Melastomes with the 3 prominent parallel paler colored veins usually in a palmately veined leaf. Small pink flowers are on a large pendulous panicle (an inflorescence where the primary axis has a lot of branching) primary axis is pink as well. The flowers are more obvious because of the large pink flower bracts attached to the flower clusters. Stems may be ribbed or even winged.

PLANT INFORMATION SHEET



Family: Polypodiaceae

Botanical Name:

Platycerium bifurcatum

Platy= "flat" & cerium= "horn" in Greek

Common Name(s): Staghorn Fern

Countries of Origin: Eastern Australia, New Guinea & New Caledonia, but world-wide tropical distribution for the 17 staghorn species.

Native Habitat: epiphytic (air) plants perennial; found in high trees but not growing "in" the bark;

Galleries where found: Highlands, Lowlands, Potted Plants

This plant is noteworthy because... They can reach several hundred pounds.

An interesting adaptation of this plant is...

- They get nutrition from air born soil and the decomposition of their own dead fronds or dead leaves that fall from other plants.
- Two kinds of fronds: The green fertile fronds have spores for reproduction; the brown fronds are disk-shaped and sterile, they help hold plant in place and collect water and dead decaying vegetation for extra nutrition.
- White small hairs on green frond surface inhibit moisture loss from leaf surface

Is this plant or its native habitat endangered or threatened? Loss of habitat, importation and loss of numbers in the natural environment all threaten this species.

General Plant Description & Characteristics: Antler-like fronds give it the common name. Plants produce no flowers, fruits or seeds as they are not flowering plants. Reproduction is by spores and also by "pups" which is their vegetative reproduction. They are not parasites because they make their own food through photosynthesis.

PLANT INFORMATION SHEET



Family: Ericaceae

Botanical Name: *Rhododendron* subspecies *Vireya*, 300 species, photos of *Rhododendron (lochiaie x auri)*

Common Name(s):
Tropical Rhododendron;
(means “rose tree” in Latin)

Countries of Origin:
Southeast Asia

Native Habitat: Grow as epiphytes in the moss covered tree branches, on rocks, or terrestrial on the ground. They grow on forest edges and in open grasslands seeking light.

Galleries where found: Highlands, Potted Plants

This plant is noteworthy because... There are over 300 *Vireya* species, approximately 1/3 of all rhododendrons. They are often first plants to colonize areas where original vegetation has been destroyed. Other plants in the same family (Ericaceae) are: azaleas, blueberries, cranberries, manzanitas, and madrones.

An interesting adaptation of this plant is... Many rhododendrons are poisonous and honey made from some rhododendron flowers can be poisonous. This helps to keep herbivores away.

Is this plant or its native habitat endangered or threatened? Quite the opposite, some species are invasive replacing the natural understory.

General Plant Description & Characteristics:

The tropical rhododendrons hybridize easily making classification difficult. Most have showy flower heads. They are shrubs or epiphytes in their native habitat. In some species, the underside of the leaves is covered by scales or hairs.



PLANT INFORMATION SHEET



Family: Balsaminaceae

Botanical Name: *Impatiens niamniamensis*

Common Name(s): Congo Cockatoo, Cuckoo Flower, African Queen, Parrot Impatiens

Country of Origin: East Africa

Native Habitat: Cool growing; sheltered from winds and from midday sun.

Galleries where found: Highlands

An interesting adaptation of this plant is... Seed distribution. These plants derive their scientific name *Impatiens* (Latin for "impatient") and the common name "touch-me-not" in reference to their seed capsules. When the capsules mature, they "explode" when touched, sending seeds several yards away.

Is this plant or its native habitat endangered or threatened? Unknown.

General Plant Description & Characteristics:

Impatiens niamniamensis has succulent stems which may grow up to 39 in long. Branching off them are not only the oblong leaves, but also thin stalks bearing pendulous flowers at their tips - like parrots on perches. The greenish to whitish petals are inconspicuous. Their task is taken over by the enlarged sepal, which forms a kind of horn and ends in a reflexed spur. This is either red, rose-red, or red and yellow. The final color combination is the most popular one for landscaping, and has led to cultivars being named *Impatiens niamniamensis* 'Arared' and *Impatiens niamniamensis* 'Congo Cockatoo.'

