2016 BOTANICAL BRIDGES

The Newsletter for the Caribbean and Central American Botanic Garden Network

https://thecaribbeanandcentralamericanbotanicgardennetwork.wordpress.com/
Hello,

I hope you are well and have had a good Christmas and New Year. I hope you enjoy the latest newsletter with contributions from around the region. If you would like to feature in the next edition in 6 months’ time please email Neville@belizebotanic.org

**Conference Panama 19th – 23rd September 2016.**

I would like to inform you of a conference for Caribbean and Central American Botanic Gardens that is currently planned to be held in Panama September 2016. The aim of the conference is to bring regional gardens together to build and develop a strong network and to discuss relevant practical botanical topics.

The network is working with Belize Botanic Garden and Summit Municipal Park in Panama to help make this happen and we would love it if you and the gardens could attend. The conference aims to continue the good work of the Caribbean Botanic Gardens for Conservation in a relaxed and social manner to forge partnerships and friendships. We are currently formulating a preliminary programme and costs.

**Some of the proposed themes.**

All gardens attending will present a short introduction to their garden. There will be trips and excursions to local sites throughout the conference.

**Other sessions included:**

- Botanic garden and collection management
- Fundraising alternatives for botanic gardens
- Training botanic garden staff and developing internships and exchanges
- Education and community outreach in botanic gardens (with a focus on biodiversity conservation)
- Plant procurement and propagation of native species. Growing a collections policy.
- Controlling invasive species
- Developing the action plan for a sustainable network.

It is hoped that BGCI (Botanic Gardens Conservation International) will be providing training for delegates on seed banking after the conference for delegates.

If you have any questions or would like to attend please feel free to contact me.
Email Neville@belizebotanic.org
Andromeda Botanic Gardens was created in the 1950s and in 1988 and left to the Barbados National Trust and currently leased by Passiflora Ltd, the garden is a tourist attraction as well as a botanical learning centre with a number of courses available. Has Andromeda Botanic Gardens evolved at all from that dual role? Although informal, the relationship with the Faculty of Biological Sciences at the University of the West Indies continues. The recent discovery of the previously undocumented Quassia amara was an exciting moment in 2014 – a sample of which is now in the university’s herbarium. Many botanists from across the globe visit Andromeda Botanic Gardens and a comprehensive botanical naming project is underway. The intention is to increase the collections and establish new ones within the ever-growing and changing environment of the Garden. So the Garden remains a hybrid of pleasure and science. The pleasure has changed from a strictly private one, to one shared with the general public. For Andromeda Botanic Gardens, Barbados, many of the ‘general public’ are tourists from temperate regions.

Today in 2015, there seems to be a growing global movement towards sustainability and/or organic practices. The managers of some tropical gardens, including Andromeda, private spaces and hotels grounds have a desire to be green and lush constantly in order to match the expectations of their owners and guests. However, Barbados is considered a water-scarce nation according to the UN and many parts of the island experience regular water service interruptions.

Millions of dollars are spent annually on landscaping, including watering, fertilizers and pesticides. One challenge is this ‘How can Barbados, this verdant, tropical paradise, reduce its water requirements, its chemical dependency and still be an attractive destination?’ or does it simply ignore and refuse to take part in the ‘journey towards sustainability’? At Andromeda we have a similar challenge. The management team is committed to sustainability, yet we need to be a beautiful tourist attraction.

Of course we need to conserve plants. Increased means of transportation, increasing wealth for some, advances in technology, including the growth of the internet, means information, people and objects can travel extremely quickly. Many species threatened with extinction in their native habitat, are growing abundantly in foreign lands, or indeed in botanical gardens.

The management of Andromeda Botanic Gardens changed in February 2014. There was an extended dry season that year and much time and energy was spent watering the Garden in the absence of an irrigation system. Many observations were made during this period. It became apparent which plants
needed watering and which ones were quite happy without additional wetting. The ‘which plants needed watering’ requires some clarification. Many plants, if not watered, simply die back and return with the rains. Although gingers and heliconias belong to that group, much of their continued presence in the Garden is deemed a necessity due to their location and numbers. Some plants that were not in ‘key’ locations were allowed to die back. A couple of plants were becoming extremely stressed and deemed as ‘requiring water’.

However, of particular interest were the plants that were happy without water and these plants varied in form such as the architectural Dracaena spp; typical shrubs such as colourful ixoras, or reliable Tabernaemontana spp; and interesting groundcovers such as members of the Ophiopogon genus. Basically, there is a decent mixture of different plant types that are quite content in drought conditions.

Jade Vine, one of the species deemed a priority for watering

At Andromeda we hope to be able to eventually sell a lot of these plants. Not only will Andromeda ‘educate the people’ about plants, it will also challenge the perception of gardens in Barbados. How many times have we heard that there are ‘no seasons’ in Barbados, or ‘things just grow all the time here’? Because we spend so much effort on creating gardens that survive under false conditions, our connection with the seasons appears to be vanishing. We do have noticeably cooler months and wetter months. Many plants do slow down their growth dramatically in the dry season. We are a water-scarce nation and we keep our plants artificially lush by increased irrigation, coupled with the required fertilizing, and the killing of weeds. This simply reinforces fabricated ideas. We hurriedly want to meet those false expectations, preferring to be more in tune with those beliefs, instead of being concordant with our true environment. Visitors have generally accepted ideas of ‘tropical’ gardens. We need to stop reinforcing those ideas/ideals. Show visitors what tropical gardens really are, as opposed to showing them what they want those gardens to be.

Kew Gardens is one of the great historical botanical gardens. Outside of the greenhouses, the area is vast. Guess what? The trees lose their leaves in winter! Daffodils only appear in the spring! Roses bloom in summer! Do we expect the management to create false heat, and false seasons? Of course not. We expect bare leaves in winter. So why on earth do we not expect our seasons to dictate our gardens in the tropics? Education of the people needs to start with ourselves. We need to free our minds and work with the seasons and the plants.

Set over a total of 8 ½ acres the water requirements at Andromeda Botanic Gardens need more sustainable management. Water shut-offs are common. Yes, we water those vital plants so people are still able to view some remarkable plants. But there is no need to water the entire site. It is vital that we conserve water and use it as sparingly as possible. We aim to collect rainwater wherever possible and use natural water courses. There are plenty of trees in the garden – great at creating shade and protecting many areas from the tropical sun. Many trees lose their leaves as the dry weather continues. This leaf litter is an ideal mulch. We rake leaves into the beds. Adopting that practice is sensible – far better than removing the
leaves, allowing moisture to evaporate, and nutrients to leach, thereby increasing the watering and feeding, which then encourages competitor such as weeds that one then has to kill.

Many gardens at flower shows are tackling the ideas of climate change. It is reassuring that botanical gardens, and others, have reserves of a wide range of plants able to cope with different environments and that these gardens are willing and able to take part in the process of greening foreign ecosystems. For us in Barbados, perhaps we need to look a bit closer to home. Are we experiencing a real change in our seasons in the West Indies? Recent recurrent droughts in Barbados have put severe pressure of our limited water resources. Should we be planting more plants mentioned above that can cope with drought conditions? A resounding yes. Maybe those are the sort of plants we should also be researching, protecting and propagating for use in the region. There are many. Perhaps we at Andromeda will develop a garden that is content with seasonal change with minimum watering requirements.

Let’s get ourselves and our visitors used to the idea of ‘seasons’. Let’s accept a seasonal drier landscape. Botanical gardens in temperate regions accept and even look forward to their seasonal changes. Let us all expect to see a different Barbados in May from that in November. Let us work with the rhythms of our natural world – not against it.

Andromeda Botanic Gardens needs visitors. However it also has a serious role in promoting sound garden practices. We need to find real solutions to real problems and still remain a beautiful, fascinating place to visit.

The collection of Iris Bannochie is brilliant. The trees are permanent. They tell the garden’s history and really make this Andromeda Botanic Gardens the jewel it is today. Mrs Bannochie left a truly amazing invaluable legacy. Yes, it is a tourist attraction. We need visitors to be happy – but we do not want to merely provide a place for their entertainment. Our role, as a botanical garden, is greater than that.

Sharon Cooke
Managing Director – Passiflora Ltd
Andromeda Botanic Gardens, St Joseph, Barbados http://www.andromedabarbados.com/
Botanical Gardens in Bocas del Toro, Panama

When we first opened the garden to the public in 2007 we did not have structured pathways so the visitors followed me around walking on the red clay which when wet is extremely slippery. Later we constructed about one and a half miles of concrete pathways, using imported treated pine for the borders, then pouring cement. It was a Herculean effort as the concrete mixer was situated in the driveway and our workers had to push wheel barrows of concrete mix all over the property of hills and valleys. With Bocas del Toro receiving over 200” of rain per year and the garden being in a rain forest environment the concrete under the trees soon grew mold and became very slippery. This created more work to keep it clean.

For phase two of the pathways we used 'tosca', the natural coral rock that occurs in various parts of the island. We don't have this on our property so we bought in truck loads. The pathways were leveled and bordered with treated pine, a material was laid down to prevent the tosca being pushed into the clay and the tosca added then compacted. This material does not require any maintenance.

With the concrete pathways we tried washing them with bleach to kill the mold, we painted them with non-slip paint, we painted them with tennis-court paint, we painted them with sand in the paint. All to no avail.

The latest brain wave of my husband's is to grind the surface back, then apply a tile cement which is troweled to add ridges and then to water proof it. We will wait to see what happens when the rains return.

http://www.bocasdeltorobotanicalgarden.com/
Queen Elizabeth II Botanic Garden in the Grand Cayman

A proposed Children’s Garden being planned for Queen Elizabeth II Botanic Garden in the Grand Cayman to allow for children to learn through play and interaction with the natural world. These future developments consist of half acre close to the reception building for local children, school groups and visitors to age 14 to cater for up to 50 children. With objective of making a science book come to life by climbing, listening, touching and building while being accessible to all and to meet the needs of special needs groups too. The site will have permanent structures for all weather teaching, washroom facilities.

Garden plans focused on:
- Nature Play and Science Learning
- Emphasis on Earth Sciences
- Sensory Garden – smell, taste and touch
- Larger than life bird nest
- Flower structure with parts of flowers and plants
- Climbing area to demonstrate tree structure
- Importance of Insects
- Preservation and Conservation

http://www.botanic-park.ky/
**Hope Royal Botanic Gardens, Jamaica – The Chinese Garden**

A new section of Hope Gardens was officially opened and handed over from The People’s Republic of China as a gift to the Government and People of Jamaica in August 2015:

The “Harmonious Enjoyment Garden” (the Tong Le Garden), or simply The Chinese Garden.

The Chinese garden is a landscape garden style which has evolved over three thousand years. It depicts both the vast gardens of the Chinese emperors and members of the Imperial Family, built for pleasure and to impress, and the more intimate gardens created by scholars, poets, former government officials, soldiers and merchants, made for reflection and escape from the outside world. They create an idealized miniature landscape, which is meant to express the harmony that should exist between man and nature.

The Chinese Garden at Hope Gardens is situated on approximately 11 acres, combining the water feature of the Lily Pond and oriental architecture, philosophy and religious thinking which express the love and expectation for nature, a better life and living environment.

This small-sized traditional Chinese Garden features an inner wall-enclosed Royal (Imperial) Garden, surrounded by a landscaped Private Garden.
Landscaping, which is currently being implemented will replicate typical oriental floral form, colour and species. Chinese Gardens are deliberately laid out to cause visitors to walk through in a particular order and direction. The typical Chinese Garden layout does not allow viewing of the entire garden all at once. Instead, small scenes are set up so that you wonder through the garden and come up on several intimate settings which are well planted and framed.

The most common water element of a Chinese Garden is a pond; the pond is usually situated in the centre of the garden and the water symbolizes “communication and dreams”. The Lily pond features the mythical lotus flower, which has several uses as food but more importantly represents the oriental philosophy that “beauty can arise from the most extreme and difficult circumstances”. Various colours of day blooming or night blooming water lilies also display spectacular colours and exude fragrances, to enhance the Chinese Garden experience.

The wildlife population abound with waterfowl which include gallinules, moorhens, herons, tilapia fish (African Perch) and endemic pond turtles.

Prepared by:
Leslie Chung, CEO of Nature Preservation Foundation
Doris C. Gross, Volunteer, Hope Gardens
The Acapulco Botanical Garden, Mexico

The Acapulco Botanical Garden is located on the hills overlooking the spectacular bay of Acapulco in Mexico. Its coordinates are between 16° 49' 38.36´ to 16° 41' 40´ North Latitude and 99° 36' 40´ West Longitude, on the Pacific Coast of Mexico, part of the Sierra Madre del Sur mountain range.

It is a nonprofit organization opened since 2002 which offers its visitors a Garden Center with office, projection room, store and a class room for courses and conferences. There is also an amphitheatre for outdoor events, ponds and an arboretum.

The garden spreads over an area of 14 acres, (6 hectares) of land, unique because of its location on a steep mountain slope bordered by two small creeks: a surface water creek and an underground water creek that only surfaces at certain points during the rainy season when you can hear it roaring.

The land includes huge rounded metamorphic boulders from the Cretaceous era. These reduce the planting space but offer a beautiful atmosphere.

The altitude varies between 660 and 1300 feet (200 and 400 meters) above sea level and the climate is semi tropical, sub humid.

Humidity level varies between 50 and 100%. It has an annual average temperature of 83 ° F (27.8 ° C) with a minimum temperature of 59 ° F (15 ° C) and a maximum of about 103 degrees F (40 ° C). Summer is the rainy season and the winter is dry. The annual precipitation is 55 inches (1,411.1 millimeters). September rains are more intense with 15 inches (386.7 millimeter) and, February and March are the driest months with almost no rain at all (0.9 millimeters). There is generally a light breeze and hardly ever strong winds.

The vegetation is deciduous sub tropical. Besides the native plants it includes areas of cacti and succulents, aeroids, collections of palms and cycads, hardwoods as well as flowering and fruit trees, shrubs, heliconias, bromeliads, gingers, ferns, vines and orchids among others.

Leaves, fruits, seeds and roots of different shrub and tree species provide food and refuge and the appropriate habitat for the native animal species. The majority of the native fauna is composed of birds, opossums, raccoons and reptiles such as iguanas and a few snakes.

Among the birds there are Pandion haliaetus (fisher eagle), Penelope purpurascens (type of pheasant), and Penelope nigra (black chachalaca bird). A few mammals such as Pseudocheirus peregrinus (ringtail possum) and Procyon lotor (raccoon). The reptiles are Ctenosaura pectinata.
(tropical lizard), Iguana (green iguana); and *Boa constrictor imerator* (Boa) and *Heloderma horridum* (beaded lizard).

The Acapulco Botanical Garden is a project created by the First Acapulco Garden Club. The Pacific Loyola University offered the land, and the garden club members and a few altruistic people have committed themselves to the development of this important conservation project. The botanical garden protects the area where it is located from disastrous consequences such as deforestation, scarcity of water and landslides; as well as, guaranties land preservation from the nearby village population growth.

It is affiliated to the Mexican Association of Botanical Gardens and the Botanic Gardens Conservation International Organization.

The Acapulco Botanical Garden was started by money collected in a fundraiser by the Acapulco Garden Club ladies and has a limited budget.

Things in Mexico are not the same as in developed countries so money is scarce. Thanks to the invaluable volunteer work provided by the women from the First Acapulco Garden Club and a few others, this project continues to comply with its mission statement which is:

* To offer a different, beautiful, and pleasant area of cultural entertainment;

* To involve children and youth in its educational activities;

* To educate through the appreciation of nature’s flora and fauna, and proper plant identification; and,

* To promote sustainability, ecological awareness while protecting native and endangered plant species.

Esther Pliego de Salinas  
Director Fundador / Founder & Director  
A fantastic resource for threatened conifers of the Caribbean and Central America

Threatened conifers of the world

A resource compiled by the International Conifer Conservation Programme, Royal Botanic Garden Edinburgh. For maps and more information of conifer species at risk in the region follow the link: http://threatenedconifers.rbge.org.uk/

Of the world’s 615 conifer species, 211 or 34% are listed by the International Union for Conservation of Nature (IUCN) as being threatened. This web resource will eventually include global and national assessments of all the threatened conifers using the 2001 IUCN Categories & Criteria (version 3.1). The global assessments, which have been compiled by members of the IUCN/SCC Conifer Specialist Group, have been published on the IUCN website (http://www.iucnredlist.org). For some taxa the taxonomic treatment will differ from that used by IUCN. If users of this website have further information and particularly photographs that will improve this site then we would be very pleased to hear from you.

Caribbean

The Caribbean Threatened Conifer Region consists of three large island groups: the Bahamas, the Lesser Antilles, and the Greater Antilles; also included in this Region is the island of Bermuda. The seasonal tropical climate of the Caribbean is moderated by the prevailing northeast trade winds. Temperatures vary between 24°C and 32°C depending on altitude and the annual precipitation ranges from 600 to 5000 m. The 18 conifer taxa in this Region are represented by the genera Juniperus, Pinus and Podocarpus; 16 taxa are globally threatened. Some juniper taxa (Juniperus barbadensis var. lucayana, J. gracilior var. ekmanii and J. saxisola) have only one or two locations with very small populations of less than 100 individuals. In contrast Pinus occidentalis endemic to Hispaniola and P. caribaea in the Bahamas cover relatively large areas. Podocarpus coriacea has the widest
distribution of any conifer species in the Region, with the rest of the podocarps occurring as endemics on a single island and confined to relatively small areas. Threats throughout the Region include deforestation, logging, fire and invasive exotic plants and pests.

**Southern Mesoamerica**

The Southern Mesoamerica Threatened Conifer Region extends from Guatemala and Belize southwards as far as the border between Panama and Colombia. Climates vary from warm, wet subtropical and tropical in the lowlands to cool and wet in the montane areas. For the conifers, it is an area of transition with major genera such as *Abies*, *Cupressus*, *Juniperus* and *Pinus* reaching their southern most distribution and where essentially southern hemisphere genera such as *Podocarpus* and *Prumnopitys* start become increasingly more frequent. Levels of endemism are relatively low. The majority of threatened species occur in biodiverse cloud forests especially at higher elevations in El Salvador, Guatemala and Honduras where subpopulations tend to be small or localised. Major threats include small and large scale logging, the conversion of forests for agriculture and grazing as well as over harvesting for Christmas trees.

**Example from:** http://threatenedconifers.rbge.org.uk/taxa/category/caribbean

**Juniperus barbadensis** *L.*

**Cupressaceae**

*Endemic to the Caribbean in the Bahamas, Cuba, Jamaica and St Lucia where threats include logging, fire and urbanisation*
Distribution

*Juniperus barbadensis* is endemic to the Caribbean where it is distributed in the Bahamas (5 islands), Cuba (2 locations), Jamaica (1 location) and St Lucia (1 location).

*J. barbadensis* var. *barbadensis* is confined to a single location on St. Lucia although it is thought to have previously been more common all along the southwestern coast of the island. Currently it is limited to a few trees situated at the top of the Petit Piton. It is extinct on Barbados.

*J. barbadensis* var. *lucayana* occurs in the Bahamas on the following islands: Great Abaco, Andros, Grand Bahama. In Cuba it is currently recorded from Camagüey (Cayo Sabinal), Holguín (Sierra de Nipe) and Isla de la Juventud, Pinar del Río (Sabanalamar), (Areces-Mallea, 1997; Adams, 1989), however it is thought to only be extant in the latter two locations (Adams, 1989). In Jamaica 15–20 trees grow in St Andrew Parish near to Clydesdale (Adams, 1989; pers. obs.) where it has an extent of occurrence of 30km². It is now extinct on Haiti.

Habitat and Ecology

Occurs from sea level to 1600m in a range of forest types depending on the country. In Cuba it is found in ‘bosque aciculifolio’ forest which is characterised as having about 30% forest cover dominated by *Pinus* spp. with evergreen trees and associated shrubs and herbaceous plants but very
few epiphytes and climbers (Berazaín, 2005). In contrast, on the Isle of Pines off the south coast of Cuba, it grows in forest swamps. In the Bahamas it is found in coppices on rocky slopes. On St Lucia it grows on rocky outcrops (volcanic origin) in deciduous seasonal forest (Graveson, 2009) 30m below the summit of a coastal mountain at an altitude of ca 700m. Associated species include: the endemic *Bernardia laurentii* (sole location) and occasional small gnarled trees bent by the wind such as *Capparis indica*, *Casearia decandra*, *Daphnopsis americana*, *Erithalis odifera*, *Krugiodendron ferreum*, *Tabebuia heterophylla*. Non-woody species include: *Agave caribaeciola*, *Peperomia magnoliifolia*, *Pitcairnia angustifolia*, *Tillandsia fasciculata* and *T. utriculata*.

### Human Uses

In Jamaica it is often used in furniture making due to its attractive wood and its excellent insect-repellant properties.

### Conservation Status

#### Global status

Vulnerable C2a(i)

#### Global rationale

*Juniperus barbadensis* has a wide distribution in the northern Caribbean, in about two restricted sites in Cuba, on five islands in northern part of the Bahamas and in one site on St Lucia in the southern Caribbean. Due to the nature of this distribution, particularly that in the Lucayan Archipelago of the Bahamas, it is not possible to give an accurate figure for the area of occupancy. Despite its protection in several locations, it is clearly in decline throughout its distribution mainly as a result of fire and urbanization. As the total population is estimated to be less than 10000 individuals with no subpopulation containing more than 1000 individuals, it has been assessed as Vulnerable under C2a(i).

#### Global threats

Exploitation for fuel wood and timber throughout its distribution; in Cuba fire is also a threat. In the Blue Mountains of Jamaica the species is under pressure from a number of threats including potential damage from bark beetle, selective cutting of old-growth trees although this illicit practise has been stopped in the Cinchona area since 1994 by the park authorities (Goodland & Healey, 1996). However, now that there are gaps in the canopy this can cause serious encroachment problems with
invasion non-native species such as *Pittosporum undulatum* (Goodland & Healey, 1996). In the Bahamas there has been a reduction of some stands due to urbanisation.

**Conservation Actions**

In the Bahamas it is afforded protection in a number of National Parks which are administered by the Bahamas National Trust. In Jamaica stands are within the Blue and John Crow Mountains National Park. In St Lucia the only location for *J. barbadensis* var *barbadensis* is protected in an UNESCO World Heritage Site.

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**UK Overseas Territories**

The UK Overseas Territories (UKOTs) comprise 16 former colonies that have elected to retain their direct British links and as such form part of the nation state of the UK. Mostly islands, UKOTs support critically important UK biodiversity in terms of both species and habitats. This biodiversity is under threat from habitat loss and fragmentation, invasive species, development and increasingly from the impacts of global climate change. Whilst rich in biodiversity, many UKOTs lack key resources needed to document their biodiversity and manage it sustainably.

The UK Overseas Territories Science Team was formed as a result of Kew’s 2001 Science Strategy Review which recognised the importance of UKOTs, their unique UK biodiversity and the need to provide support to implement the Global Strategy for Plant Conservation (GSPC). The UKOTs Science Team is a small multidisciplinary team based in the Conservation, Living Collections and Estates Directorate with strong links to the Jodrell Laboratory and Herbarium, enabling it to draw upon wide ranging expertise to undertake scientific research, support conservation, and help build capacity in the Territories.

- Bermuda
- Turks and Caicos Islands
- British Virgin Islands
- Anguilla
- Montserrat
- Pitcairn
- British Antarctic Territory
- South Georgia and South Sandwich Islands
- Falkland Islands
- Tristan da Cunha
- St Helena
- Cayman Islands
- Ascension
- Gibraltar
- Sovereign Base Areas on Cyprus
- British Indian Ocean Territory
In each Territory we work in partnership with Government Departments, NGOs and Civil Society with the overall aim of enabling each UKOT to implement the GSPC.

For an overview of the UKOTs Programme please read the blog posts at: http://www.kew.org/discover/blogs/uk-overseas-territories and for more current events follow them on Twitter @KewUKOTs.