

## Title

The Royal Botanic Gardens of Hope - contributing to Jamaica's plant diversity

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## **1.0** Abstract

The Royal Botanic Gardens of Hope and Hope Zoo are situated on a 230 acre property in Kingston, the capital of Jamaica, West Indies and comprises both a Botanic Garden and a Zoo. The Nature Preservation Foundation (NPF), which has responsibility for its management, has undertaken to improve the aesthetics and the biological content of the gardens, which has much significance for Jamaicans of all ages.

The Garden is perfectly poised as a prime location for the demonstration of some of Jamaica's conservation efforts whether through the propagation of endemic plants at the nursery, or the establishment of sites within the gardens. Some of these attractions will include a medicinal grove, a picnic forest, annual and perennial garden, a butterfly garden, as well as a plant conservation centre. While some of the projects have already begun to bear fruit, many are still in their infancy. Nevertheless, Hope Gardens continues to attract many visitors each year and with the onset of new projects these numbers will increase, as will the awareness of some of the plant material of which Jamaicans should be proud.

## **2.0** Introduction

### **2.1** Jamaica's plant diversity

The fact that Jamaica emerged from the ocean in the mid-Miocene period and has never been connected to any other landmass is of marked importance to Jamaica's rich biodiversity (as cited by Morgan, 2006). Jamaica has the fifth highest percentage of endemic flora among the world's islands (Davis *et al.*, 1997). It has 3,003 species of flowering plants, of which 830 (28%) are endemic. Of 579 fern species 82 (14%) are endemic; and within the Bromeliaceae and Orchidaceae, both of which are richly represented on Jamaica, endemism is 31% (Davis *et al.*, 1986).

At present, only the most remote and inaccessible forests on Jamaica are considered original and undisturbed. In 1983, less than 67,000 ha (6%) of Jamaica was covered in undisturbed natural forest (as cited by Morgan, 2006).

Some of the local hardwoods are: logwood (*Haematoxylon Campeachianum* (Lin.), lignum-vitae (*Guaiaacum officinale*), cedar (*Cedrela odorata*), West Indies mahogany (*Swietenia mahagoni*), mahoe (*Hibiscus elatus*), yacca (*Podocarpus urbanii*), satin-wood (*Zanthoxylum flavum*), and cashaw (*Acacia farnesiana*).

The medicinal woods and plants include quassia (*Quassia amara*), cinchona (*Cinchona pubescens*), sarsaparilla (*Smilax regelii*), senna (*Senna* sp.), castor-oil (*Ricinus communis*), ginger (*Zingiber* sp.), tamarind (*Tamarindus indica*), and tobacco (*Nicotiana* spp.).

Dietetic species on the island include: coffee (*Coffea* sp.), cocoa (*Theobroma cacao*), arrow-root (*Maranta arundinacea*), pimento (*Pimenta dioica*), sugarcane (*Saccharum* sp.), plantain (*Musa* sp.), yam and sweet potato (Family Dioscoreaceae).

Among the fruit trees, all the citrus (*Citrus* sp.) family abound, as well as mango (*Mangifera*), star-apple (*Chrysophyllum cainito*), bread-fruit (*Artocarpus altilis*), banana (*Musa*, sp.), coconut (*Cocos nucifera*), custard-apple (*Annona reticulata*), avocado (*Persea americana*), pineapple (*Ananas comosus*), etc.

## **2.2 Introduction to the Royal Botanic Gardens of Hope**

The Royal Botanic Gardens of Hope was established and laid out with key assistance from The Royal Botanic Gardens, Kew in London, England. As the largest botanical garden of the English-speaking West Indies, Hope Gardens was bestowed the epithet “Royal” by Her Majesty Queen Elizabeth II on her visit to Jamaica in the 1950’s. The property houses The Hope Botanic Gardens and Hope Zoo which features Caribbean wildlife including spectacular exotic, native and endemic flora and fauna. Over the years the property has suffered at the hands of vandals and hurricanes, and Nature Preservation Foundation (NPF) is now in a process of reviving the legacy of which Jamaicans are so privileged to be part.

The Gardens and Zoo are now being operated by the Nature Preservation Foundation, a non-profit charitable organization which began operations on May 16, 2005. The property has been leased from the Government of Jamaica for a period of 49 years.

It is anticipated that the networking opportunities which will be provided through the Botanic Gardens Conservation International (BGCI) Congress will afford an opportunity to network with various organizations the world over in an attempt to forge key linkages, share best practices and exchange germplasm within the ambits of the laws of each territory.

## **3.0 Work in Progress**

### **3.1 Establishment of a Plant Conservation Centre**

In keeping with the Garden’s mandate to improve plant conservation, a Plant Conservation Centre was set up at Hope Gardens in 2001 with funding provided by the Environmental Foundation of Jamaica (EFJ). This project sought to expand the plant propagation facility and to increase the National capacity to conserve plant species, with a focus on endemics.

One of the results was the establishment of Horticultural, Xerophytic and Palm gene banks. So far, 47 of the Palm species have been planted out at the Palmatum (Table.

1). The University of the West Indies (UWI) is now on board to help maintain this conservation centre by keeping live and herbarium specimen in their collection for teaching and research.

**Table 1 Palms species currently in Hope Gardens Palm gene bank (Family Palmae)**

Botanical Name	Common Name	Origin	Status	Botanical Name	Common Name	Origin	Status
<i>Acrocomia spinosa</i>	Macca Fat	Jamaica	End.	<i>Pinanga malaiana</i>		SE Asia	
<i>Bactris jamaicana</i>	Prickly Pole	Jamaica	End.	<i>Phoenix dactylifera</i>	Date Palm	N. Africa, W Asia	
<i>Calyptronoma occidentalis</i>	Long Thatch	Jamaica	End.	<i>Phoenix canariensis</i>	Canary Island Date Palm	Canary Islands	End.
<i>Caryota mitis</i>	Clustered Fishtail Palm	SE Asia		<i>Phoenix roebelenii</i>	Pigmy Date Palm	Laos	
<i>Chrysalidocarpus lutescens</i>	Areca/ Ostrich feather Palm			<i>Phoenix rupicola</i>	Cliff Date Palm	India	
<i>Cocos nucifera</i>	Coconut Palm			<i>Pritchardia thurstonii</i>	Fiji Fan Palm	Fiji	End.
<i>Coccothrinax jamaicensis</i>	Silver Thatch	Jamaica	End.	<i>Roystonea altissima</i>	Mountain cabbage	Jamaica	End.
<i>Corypha umbraculifera</i>	Century Palm			<i>Roystonea regia</i>	Cuban Royal Palm		
<i>Dictyosperma album</i>	Hurricane Palm	Mascarene Islands	End.	<i>Roystonea princeps</i>	Swamp cabbage	Jamaica	End.
<i>Dypsis decaryi</i>	Triangle Palm	Madagascar	End.	<i>Sabal jamaicensis</i>	Bull Thatch Palm	Jamaica	End.
<i>Elaeis guineensis</i>	African Oil Palm	Africa		<i>Thrinax parviflora</i>	Broom Thatch	Jamaica	End.
<i>Euterpe sp.</i>		S. America		<i>Thrinax radiata</i>	Broom Thatch	Jamaica	Natv.
<i>Latania loddigesii</i>	Blue Latan Palm	Mauritius	End.	<i>Washingtonia robusta</i>	Desert Palm	SW USA, Mexico	
<i>Livistonia chinensis</i>	Chinese Fan Palm	S. China	End.	<i>Wodyetia bifurcata</i>	Foxtail Palm	N Australia	End.
<i>Pinanga sp.</i>		S. Asia					

End. – Endemic, Nat. – Naturalized in Jamaica (introduced) Natv. – Native to Jamaica and other countries (not introduced)

As cited by National Arboretum Foundation's report to Nature Preservation Foundation, February, 2007

### 3.2 Medicinal Grove

In light of Jamaica's rich biodiversity and history of medicinal plants, a medicinal grove of approximately 0.5 acres is being established to showcase species which are known to have medicinal significance to Jamaica and other nations. This medicinal arboretum will be the first dendrological theme area and was laid out with assistance from The Forest Conservancy, a non profit organisation in Jamaica and the Medicinal Plant Research Group, University of the West Indies. As this information is underutilised and under recorded (largely carried on by oral tradition), future work

will include the documentation of the species uses, phylogeny and preparation of herbarium specimen once the herbarium is constructed.

UWI scientists have listed 366 plants as having medicinal qualities which are used by 62 – 97 percent of the Jamaican population (Mitchell, 2005). Of the 366 plants, 80 have been identified as trees which will be planted in the Gardens. Twenty-eight of these have been planted since 2006. The remaining shrubs and herbs will be planted in selected areas in the gardens. All species will be labelled with their scientific and common names and main ethnomedicinal use. All plants will be multiplied and hardened at the Plant Nursery.

### **3.3 Plant Nursery**

The Plant Nursery produces plants for sale to the general public. However, as Hope Gardens aims to become a repository for botanically important species, the Nursery produces plants that are planted out in the Gardens. As a result, a wide variety of plants are produced including ornamentals, hardwoods, shrubs and fruit trees.

The Nursery (Plate. 1) is as old as the Gardens and very little had been done to improve on it until 2005. Currently, it is the recipient of a grant from the European Union (EU) through the Jamaica Promotions Corporation (JAMPRO). This grant will allow for the construction of a new misting (Plate. 2) and hardening facility for the production of tissue culture plantlets from the Scientific Research Council (SRC) of Jamaica. The project is expected to achieve the following deliverables:

- Functional mist propagation unit
- Hardening-off green house
- Documentation of the production system necessary to produce export quality plants
- Training of nursery staff in production methodology, including packaging and labelling.



Plate. 1 Shadehouse at Hope Gardens



Plate. 2 Current Misting facility at Hope Gardens

### **3.4 The Orchid House**

The Orchid House was once the pride and joy of the Gardens. However it had fallen into disrepair and so under a new Memorandum of Understanding with the Jamaica Orchid Society, renovation of the structure and orchid collection are underway.

All Jamaican orchids are endangered and so as a contribution to the conservation of these orchids, specific location in the island have been named as conservation sites for the Jamaican orchids. Due to its location, Hope Gardens' Orchid House will be the conservation site for lowland orchids, there being high altitude and mid level sites already named.



There are some five hundred and seventy varieties of ferns in Jamaica, many of which are endemic. The new development of the Orchid House will include a Fernery (Plate. 3). Many of the fern species for this project are being grown in the plant Nursery.

Plate. 3 Staghorn fern at the Orchid House

#### 4.0 [Collaborative approach to Biodiversity](#)

The Hope Estate houses both the Royal Botanic Gardens and Hope Zoo. As a collaborative approach to biodiversity, the Nursery will produce plant species which are important to some animal species at the Zoo. The new thinking of the Zoo is to encourage natural food items for local animals. This is particularly important for species which will eventually be released to the wild namely the Jamaican iguana (*Cyclura collei*).

For fifty years, the Jamaican Iguana (*Cyclura collei*), was thought to be extinct but was rediscovered in 1990 by a pig hunter's dog in the Hellshire Hills. Since then, the animal has been involved in a successful Headstart programme by Hope Zoo in collaboration with Fort Worth and San Diego Zoos, *et al.*

These animals are periodically health screened and released into the wild and so feeding them on local plant material is to be encouraged. They will be fed a steady diet of natural foods which they like, and have their growth and weight measured on a regular basis. This will enable comparisons of growth rate while on commercial and cultivated produce with that of local plants. Iguanas' snout vent length (SVL), total length and weight are routinely measured as part of Iguana husbandry and growth data collection. The next set of hatchlings will arrive in September 2007.

Another exercise will be to improve on the quantity of bird feeding trees such as *Butea monosperma* (Flame of the Forest) and *Spathodea campanlata* (African tulip) in which yellow-billed parrots live. Most of those trees present on the property are old and dying. This will encourage the number of nesting sites for birds and hence birdwatchers.

## **5.0** [Conclusion](#)

Given the growing interest of the public in the Gardens, it is anticipated that the efforts of Nature Preservation will go a far way in terms of educating more persons about Jamaican biodiversity and the need to protect it.

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