

Merlin Trust Report

*Propagation and cultivation
of endangered plants*

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Propagation and cultivation of endangered plants

Between 15 and 20 April 2013 I went to visit the Conservatoire Botanique National de Brest, located in Brittany, France. My main aim was to observe and learn how some of the most critically endangered plant species in the world are being cultivated in this botanical garden. The Conservatoire Botanique National de Brest is slightly different from most other botanical institutions as it only specializes in the cultivation and propagation of plants facing danger of extinction. It was founded in the seventies by Jean-Yves Lesouëf, and since 1990 it is officially recognized as a Botanical Conservation Centre.

The garden is located between the cities of Brest and Guipavas, on the picturesque Stangalar valley. The proximity of the sea means that the winter temperatures are not too extreme and many frost tender species can be successfully grown outdoors in protected areas. The whole garden encompasses 32 hectares for the Conservatoire Botanique and an additional 17 acres for the public park.



Entrance to the Stangalar Valley, where the Conservatoire Botanique is located.

Propagation and cultivation of endangered plants

Nowadays the Conservatoire Botanique holds important native plant collections from Massif Armoricain area, a territory that includes the Brittany regions, Basse-Normandie and Pays de la Loire. The garden also cooperates with other international institutions and has current conservation projects with the Canary Islands, Madeirs Island, the Juan Fernandez archipelago, Hawaii, St. Helena, Madagascar, Mauritius and la Reunion.

I was honoured to be received in Brest by Jean-Yves Lesouëf himself who promptly gave me a guided tour of the entire garden, propagation facilities, laboratory and glasshouse range. I must confess i was very impressed by all the work and effort that is being made to keep critically endangered plants alive, to master their cultivation and ex situ propagation.

Once a target number of individuals are propagated and established, they are sent back to the country of origin for reintroduction. The Conservatoire Botanique manages and looks after about 1700 species of endangered plants, twenty of which are still alive thanks to their actions and probably the most famous example is *Cylindrocline lorencei*, endemic to the island of Mauritius.



Specimens on *Cylindrocline lorencei* on display in one of the glasshouses.

Propagation and cultivation of endangered plants

This species was described in 1973 from a single individual located in the Plaine Champagne within the boundaries of the Mauritian Black River Gorges National Park. In 1980 Yves Lesouëf himself collected some seed and introduced the species to cultivation while the last known wild individual died. However, the seeds failed to germinate and by then the plant was thought to be completely gone.

Further analysis of the seed revealed that vegetative propagation of a viable part of the embryo could be tried as a last chance to save the species and a number of years later the Conservatoire Botanique was able to produce small plants in vitro that reached maturity and flowered in 2003. Aside from the turbulent past, the species can be easily maintained in frost free conditions, but benefits of extra heating. I have learnt that it can also be propagated by cuttings and although there are no known ethnobotanic uses, I think it is a great contender for cultivation as an ornamental. Some specimens have been repatriated to Mauritius, but it is still unknown if they will be able to survive in the wild without any human intervention.

Nesocodon mauritianus is another extraordinary plant from Mauritius that is also in cultivation in the Conservatoire Botanique. Although it is not extinct in the wild, this monospecific genus has a very narrow distribution range and is only



Flower of *Nesocodon mauritianus* showing the striking red nectar that is produced at the base of the bloom.

Propagation and cultivation of endangered plants

known from 15 individuals that were discovered in 1976 on the rock face of the 500 feet waterfall in Mauritius. This species produces copious amounts of glistening red nectar which is a very unusual characteristic in the plant kingdom. The bright pigment on the nectar attracts a species of gecko that pollinates the plant. The species is considered as being Critically Endangered by the IUCN and a single landslide can destroy the entire wild population. I have learned that this species enjoys being cultivated in very damp conditions and that it does not like to be pruned. If any branches are removed, the remaining stem will never re-sprout and will die back to the nearest shoot. In addition to this, it can only be propagated from seed because cuttings are unable to root.

Growing besides the *Nesocodon* is a rather intriguing tree called *Hibiscadelphus giffardianus* that unfortunately was not in flower by the time of my visit. The genus is endemic to Hawaii and its generic name means “brother of the *Hibiscus*” due to the obvious resemblance between both genera, but *Hibiscadelphus* has a rather sad story to tell. Four of the seven species that comprise the genus *Hibiscadelphus* are already extinct, two are extinct in the wild and the remaining species has a small wild population which is severely threatened. *Hibiscadelphus giffardianus* was ever known from a single wild individual that was discovered in 1910 and which perished some years later.



Developing flower bud on *Hibiscadelphus giffardianus*. The flowers have a characteristic zygomorphic shape and do not fully open.

Propagation and cultivation of endangered plants

Meanwhile, some cuttings were collected, propagated and all plants in cultivation today originate from that single original tree. At the Conservatoire Botanique, the species sets seed if manually pollinated, but in the wild this does not happen because the natural pollinator, a type of bird known as the honey creeper, is extinct. I also have learned that the seeds have a low germination rate and even so they take many months to begin the germination process. Nevertheless, this fascinating tree seems to be safe in cultivation at the present time.

As I originally was born in Madeira Island, I was interested to see how the Conservatoire Botanique is dealing with the propagation of some of the most endangered plants endemic to my homeland. The well known *Geranium maderense* is a very good example of a popular garden plant in the milder parts of the UK which was already extinct in the wild when it was described and was ever known from plants in cultivation by local people in the island. Less widely known species such as *Normania triphylla* and *Cheirolophus massonianus* are equally important to preserve. *Normania* was the first European genus thought to be completely extinct until a single individual was found growing on the edge of the Laurel forest in Madeira. Plants originated from that individual are currently being grown in botanic gardens such as Kew and Brest, and the plant was not seen again in the wild for 2 decades.



***Geranium maderense* in full bloom at the Conservatoire. After blooming the plant will die, but it produces innumerable seeds that germinate easily.**

Propagation and cultivation of endangered plants

A second population was discovered in 2008 and it brings new hope for this plant as it is thought to be genetically distinctive and could improve the genetic pool of this species in cultivation. The only other species in the genus, *Normania nava* is endemic to the Canary Islands and is presumed extinct because there are no registered sightings of it since 1986.

Growing in the same environment is another plant from the Canaries called *Limonium dendroides* (see cover for image of this plant). It is closely related to the sea lavenders that are very popular as dried cut flowers, but this species is unusual within the genus because it is a shrub with stems measuring more than 2m long. The specific epithet *dendroides* means similar to a tree and is very distinguishable. There are a few arborescent species of *Limonium*, all endemic to the Canaries, but *Limonium dendroides* is the largest of them. It only occurs in the island of La Gomera and the population count in 2004 was of 39 individuals. Nowadays only 20 or so are known in the wild, unevenly scattered in four small subpopulations.

Landslides, overgrazing, drought and low seed set are the prime factors are contributing for the route of this species towards extinction. It is difficult to study because it grows in steep ravines that are unaccessible by conventional methods. The Conservatoire Botanique is one of the only places in the world which is



***Normania triphylla* flourishing in the cool conditions provided by the island flora house, at the Conservatoire Botanique de Brest.**

Propagation and cultivation of endangered plants

growing a few individuals of this species but, for several years, only one specimen was being cultivated. This species is self sterile, so no seeds were ever produced until 1991, when some seeds were collected in another expedition to the Canaries. These seeds produced 8 plants, all genetically different. They are currently being crossed aiming to produce fertile seeds. Vegetative propagation from cuttings is not easy, however the plant responds well to air layering, but it takes more than a year to produce a new plant by this method.

Working amongst so many endangered plants, where everything is so rare and precious, it is very easy to forget the true meaning of critically endangered. Many of the stories of success are quite similar amongst the majority of species from all over the world, that were saved either from cuttings or seed collected from the last remaining individuals. However, I chose the Cabbage tree as the last endangered plant of interest to my report. It is scientifically known as *Dendroseris littoralis* but, contradicting the vernacular name, it is not related to cabbages at all, but belongs to a completely different group of plants, the daisy family. However, the large leaves resemble those of a cabbage and the plant can also be eaten. This amazing giant of the daisy family comes to the Juan Fernandez Islands on the Pacific, which belong to Chile.

The population of cabbage trees was decimated due to the introduction of



Image of 3 young *Dendroseris littoralis* specimens growing in the island flora house.

Propagation and cultivation of endangered plants

goats and pigs in the island up to a point that only 3 trees were left. Nowadays, the area where they grow is protected by a natural park and the introduced herbivores have been eliminated but this species is still critically endangered and will need several decades to regenerate to a more stable level. I have noticed that there are very few flower scars up the stem which means that the cabbage tree seldom flowers in cultivation. In fact, the plants growing at Kew only flowered once during the last 7 years.

I now return to the UK with a more comprehensive knowledge about *ex situ* conservation, restoration ecology and what can be done in the future to save more species that continue to face the danger of extinction. For this, I thank the Merlin Trust for the support in funding my trip to Brest.