

Conifer Quarterly

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Picea pungens 'The Blues' 2008 Collectors Conifer of the Year



Full-size Selection

Photo Credit: Courtesy of Stanley & Sons Nursery, Inc.

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In Search of *Abies nebrodensis*

by Daniel Luscombe

One of the world's most threatened conifer species, *Abies nebrodensis*, is found only in one place on earth, the valley of Madonna degli Angeli in Italy. Only 29 remaining specimens of the original forest remain, all of which are restricted to a small area on Mt. Scalone in the Madonie Mountains in north-central Sicily. The species is currently listed by the International Union for the Conservation of Nature and Natural Resources (IUCN) as Critically Endangered.

With the exception of a group of 15 documented trees recently planted at Dawyck Botanic Garden, United Kingdom, there are very few well-documented trees cultivated in Britain and Ireland, and clearly there is a need to broaden the genetic base of trees in cultivation.

In 2005, along with Sabina Knees from the Royal Botanic Gardens and Stephen Dury from Reading University, we set out to find it. We were excited about our mission to collect leaf samples for DNA extraction towards a phylogenetic study of *Abies* around the Mediterranean Basin and to collect seedlings from a nursery near Piano Zucchi for distribution throughout the United Kingdom using the ICCP network of "Safe Sites." We were also excited to visit Sicily, which has rich flora for an island of relatively small size. So far, 2,650 taxa have been recorded, with approximately 10 percent of these being endemic.

Gianniantonio (Gianni) Domina from Palermo Botanic Garden, Italy,

picked us up the first morning and drove us up to the Madonie Mountains where we met up with Rosario Schicchi, who is in charge of looking after the national park. Fortunately for Gianni, there was a four-wheel-drive truck to take us up the track to the top of the mountain where we could drop down into the valley of Madonna degli Angeli - the one place on earth *Abies nebrodensis* can be found. The lower slopes are planted with non-native trees for forestry purposes. We saw pines and cedars, although it seemed strange for a national park to have introduced non-native species.

Research has shown that the natural range of *Abies nebrodensis* was once much wider across the Madonie Mountains, but by 1900, it was thought to be extinct. This near-extinction was brought about by extensive felling for building and firewood. The tree was rediscovered in 1957, growing in a garden in Polizzi, Italy, a small town nearby. Further exploration in the mountains eventually brought the numbers up to thirty mature trees and thirty juveniles. Fortunately for the *Abies*, the local foresters realized the importance of this tree and gathered seed every coning year (only ten of the trees produce seed) since 1978. These are grown in a local nursery for ex situ planting. Many of these plants (more than 100,000) have been planted in selected sites across the Madonie Mountain range, both in the national park and in summer houses in the area. It has not been a great success. High summer temperatures, lack

of water, and harsh soil conditions make it very difficult for young plants to establish. A project by the EU LIFE fund is providing help by paying for compost for planting and watering during the summer months.

After an exhilarating ride up the mountain in the back of the truck, we passed through a grove of stunted *Quercus petraea* where we stopped and looked out over the valley. From this vantage point, we could see the whole habitat. The ground is covered in white rocks with small stands of trees. Lone specimens of *Abies nebrodensis* stick up like green witches' hats. Rosario pointed to the trees and said, "that is tree number 7, number 8, ..." as though they were his children. The main tree species in this area are *Fagus sylvatica*, *Quercus petraea*, *Crataegus* sp. *Sorbus graeca*, *Ilex aquifolium*, and carpets of *Juniperus communis* var. *hemisphaerica*. Growing out of cracks between the rocks was *Cyclamen hederifolium* (possibly var. *confusum*) with beautiful purple flowers. At higher levels, the *Abies nebrodensis* grow in the open. Lower down, there are a few trees growing together in woodland. We stopped at one of the higher trees, and Rosario explained what they were doing to conserve the few remaining wild trees. Each tree is individually fenced off to stop damage from grazing animals. Even though grazing has been greatly reduced in the area, we could still hear the bells from some goats. Stonewalls have recently been built around the lower side of the trees to prevent erosion from around the roots, and the location of all the trees is recorded on GPS. An extensive survey has been made to find all of the seedlings, and these are recorded and measured an-

nually. Around the valley, we could see the barriers that had been put up to help control erosion. The numbers of visitors are carefully monitored, and visits are by appointment only!

In addition to grazing, another problem with the establishment of seedlings is that they seem to need a lot of shade when they are young. There is no shade around the lone specimens on the top of the mountain. We saw very few seedlings here, but on the trees growing lower down, as part of woodland, there were many more (relatively speaking).

Sabina made collections of a small number of needles for DNA sampling from all of the trees we passed. As we walked down the valley, we could see that the trees (mainly *Fagus*) had been coppiced extensively in the past. Rosario explained that this coppicing was for the production of charcoal and had since been stopped. Farther on, we passed the biggest, and probably oldest, wild *Abies nebrodensis*, estimated to be around 130 years old. Stephen had been to this area before and showed us a couple of shrubs of *Cotoneaster nebrodensis*, another rare endemic plant. Before we knew it, we had arrived at our pick up point, which marked the end of our visit. Looking back up the valley, you could still see the unmistakable shapes of the *Abies nebrodensis* and wonder at how rare it actually is.

Our next visit of the day was to the nursery where they raise all of the seedlings for ex situ plantings. The seedlings are sown in prepared beds outside (in shade) and then transferred to pots in the second year. We are not sure what is done with them after this time because there were only plants of this size

on the nursery. All of the plants are labeled according to which parent plant they came from. Our hosts were kind enough to give us seedlings from trees 11, 21, 22, and a ten-year-old plant that had lost its label. The ten-year-old plant was only about 10 cm high; this rate of growth is unusually slow for *Abies*. When we removed the plant from its pot, we found out why - almost the entire stem was buried by compost.

The final visit of the day was to see the old tree in Polizzi. This is quite a famous tree and had so many visitors over the years that the key to get in the garden is kept in the local patisserie. Unfortu-

nately for us, no one could seem to find it, so we could only view it over a wall. Sadly, this tree is not in very good condition and appeared as though it might be coming to the end of its natural life. It would be good to get some material off this tree for grafting and using DNA to see if it is genetically different to the trees in the mountains.

Gianni drove us back to Palermo, and after a quick shower, we went out to dinner with Professor Raimondo, one of the best and most admired botanists in Italy. It was a great way to end a fabulous day.



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