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The presence of *Pinus nigra* subsp. *nigra* on Cephalonia (Ionian Islands, Greece)

Abstract

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According to our research, the presence of *Pinus nigra* on Mt. Ainos of the island of Cephalonia, Greece is restricted to just five individuals within the *Abies cephalonica* forest at an altitude of 1200 m. The issues of its indigenous presence, as well as its conservation status are being discussed.

Key words: *Pinus*, Distribution, Red list, Greece.

Introduction

On November of 1997, during a botanical excursion to Mt. Ainos of the island of Cephalonia (Kefallinia), the first author with D. Vassiliades identified three individuals of *Pinus nigra* J.F. Arnold subsp. *nigra* within a dense stand of *Abies cephalonica* J.W. Loudon forest, at an altitude of 1200 m (Fig. 1). This finding encouraged subsequent visits to Mt. Ainos, in order to discover additional individuals and record relevant observation data. Until today, the existence of five individuals has been verified at an altitude of ca. 1200 m and within an area of approximately 1 hectare. Further research is expected to reveal the existence of additional individuals of *P. nigra*.

The island of Cephalonia is the only island of the Ionian Sea, where *A. cephalonica*, an endemic, Greek species, occurs, forming the respective forest on Mt. Ainos (alt.: 580-1600 m). The discovery of *Pinus nigra*, let alone within the *A. cephalonica* forest should not be perceived as a surprise for the reasons described below. However, what can be deemed surprising is the fact that until today and despite Mt. Ainos being considered very well studied from a floristic point of view, this forest species had not been located. It is, however, apparent that this is due to the fact that the *Pinus nigra* individuals are just five, occurring in a dense stand of *A. cephalonica*.

The presence of *Pinus nigra* on the island of Cephalonia is reported here for the first time. Despite our research, we were not able to verify the existence of any relevant report in documents of internal circulation in the State Forestry Services or in any other source.



Fig. 1. Upper part of *Pinus nigra* subsp. *nigra* trunk (above). *Pinus nigra* subsp. *nigra* branches, mixed with *Abies cephalonica* branches (below) (Photo: N. Katsouni).

Collected specimens

Pinus nigra J.F. Arnold, Reise Mariazell: 8 (1785)
subsp. *nigra*

Greece, Ionian Islands, isl. Cephalonia:

- Mt. Ainos, locality Voúnos, NW slopes, alt. 1200 m, within *Abies cephalonica* forest, 5 Nov 1997, *N. Katsouni & D. Vassiliades* s.n. (Mus. Nat. Hist. Cephalonia & Ithaca).
- Mt. Ainos, locality Voúnos, NW slopes, alt. 1200 m, within *Abies cephalonica* forest, 3 Oct 2010, *N. Katsouni & V. Karagianni* 1000 (Mus. Nat. Hist. Cephalonia & Ithaca).
- Mons Ainos, in loco Voúnos dicto, in declivibus boreoorientalibus, alt. ca. 1200 m, in *Abietis cephalonicae*, 38° 9' 20.30'' N, 20° 37' 51.69'' E, 24 Marc 2011, *D. Phitos & V. Karagianni* 27497 (UPA).
- Mt. Ainos, locality Voúnos, NW slopes, alt. 1200 m, within *Abies cephalonica* forest, 29 Oct 2011, *N. Katsouni & D. Tselentis* 1005 (Mus. Nat. Hist. Cephalonia & Ithaca).

Results and discussion

With regard to the presence of *Pinus nigra* in Cephalonia, we have no doubt whatsoever that it must be considered indigenous, mainly for the following reasons:

It is known that the Ionian Islands, which include Cephalonia, constitute a unique floristic region of Greece. Nevertheless, the fact that these islands are of terrigenous origin, neighbouring, at the same time, the western coasts of continental Greece, lends to their flora more of a continental, rather than of an insular floristic character. In particular, the appearance of *Abies cephalonica* in Cephalonia constitutes a characteristic example of this (Phitos & Kamari 2009) and the same is also true for *Pinus nigra*. Therefore, its appearance on Mt. Ainos should not be considered as a surprise from a phytogeographical point of view.

Outside Cephalonia, *Abies cephalonica* is also distributed in a large portion of Continental Greece, as well as on the island of Evvia (Christensen 1997a). *Pinus nigra* subsp. *nigra* is widely distributed in Continental Greece, as well as in the Aegean islands, Evvia, Samos, Lesvos and Samothraki (Christensen 1997b). In many regions of Greece (e.g. Peloponnisos, the island of Evvia etc.), the two species commonly coexist, forming mixed stands; besides, their altitudinal range of distribution largely coincides [600-1800 m for *Abies cephalonica* and (200-)400-1800 (-2150) m for *Pinus nigra* subsp. *nigra* (Christensen 1997a, b)]. The coexistence of *Pinus nigra* and *Abies cephalonica* has been described by Dafis (2010) as “temporary state”..These two species also coexist on Mt. Ainos.

The island of Cephalonia was known from ancient times, among other things, for the famous forests that covered a large proportion of the island and mainly of Mt. Ainos. Strabo (65 BC – 23 AD) reports that Cephalonia was also called ‘Melaina’, due to the dark color, derived from its dense forests. Moreover, the Venetians used the name ‘Monte Nero’ for Mt. Ainos. During the Venetian occupation of the island (1500-1797), the most catastrophic fires took place, particularly on Mt. Ainos. Towards the end of the 16th century, a

large fire wiped out two thirds of the forest area on Mt. Ainos. This was followed by other fires in 1730 and 1760 on the island. Nevertheless, in 1797, last year of the Venetian occupation, perhaps the most devastating fire took place, lasting for weeks and obliterating half of the forest area that had remained in the wider region of Mt. Ainos (Partsch 1890). We have every reason to believe that these fires contributed to the dramatic decrease of the *Pinus nigra* forests in Cephalonia, just as is the case also for *P. halepensis* (see below).

The inhabitants of the island of Cephalonia, already from antiquity, had a naval tradition. They participated in wars, in sea battles with a respectable number of ships, which were built on the island and they also conducted commercial activities with their own fleet (Efthymiatou-Katsouni 1998). The surviving coins of the 5th and 4th century B.C., with depictions of fir and pine cones (Fig. 2), proclaim the importance that the inhabitants attributed to the ample availability of raw materials for their shipbuilding needs, but also remind of the excessive exploitation of the *Abies* and *Pinus* forests that existed at that time.

As a result of all the above, i.e. destructive fires, irresponsible forest exploitation etc., today's forests constitute piteous remnants of the formerly famous forests of the island. The five discovered individuals of *Pinus nigra* on Mt. Ainos constitute a characteristic example of those remnants, because we believe that *Abies cephalonica* and *Pinus nigra* co-existed at least in certain localities of Mt. Ainos, mainly on its NE edges (slopes) as indigenous forest stands. It should be noted that Ntinou & Stratouli (2011), during a charcoal analysis for the Neolithic in Drakaina cave of S Cephalonia, discovered remains of *Pinus nigra*.

Whatever happened with *Pinus nigra*, occurred also with *P. halepensis*, which, as in the neighbouring islands of Zakynthos and Ithaca, used to cover the respective forest zone of Cephalonia (Phitos & Damboldt 1985). For the same reasons pertinent to the case of *P. nigra*, *P. halepensis* largely disappeared from the island. Heldreich, who visited Cephalonia three times, between 1861 and 1872 and remained for a total of more than three months, mentions in his work *Flore de l'île de Céphalonie* (1883) that nowhere did he come across *P. halepensis* "...sed nullo vidi in insulae loco". The same is also reported by Samios (1908) in his particularly thorough work *The forests of Cephalonia*. Only Spreitzenhofer (1877) reports some indigenous *P. halepensis* stands from the coast of Sami. During the interval 1936-1940 a great tree-planting effort for *P. halepensis* took place, particularly in the coastal zone of Cephalonia. Most of the *P. halepensis* stands that exist today are the result of that tree-planting effort.

Conservation status

It is obvious that the issue of conservation of *Pinus nigra* subsp. *nigra* solely concerns the island of Cephalonia, since this taxon is widely distributed in the rest of Greece. As already mentioned for this island, *P. nigra* is restricted to Mt. Ainos, where so far only five individuals have been recorded within the *Abies cephalonica* forest. In this particular, isolated case, and based on the IUCN Red List Categories and Criteria guidelines, the few individuals that represent subsp. *nigra* in Cephalonia, should be evaluated as Endangered. Of course, the fact that these individuals are located within the core of the National Park of Mt. Ainos, constitutes on its own a protection shield for them. Nevertheless, at least for

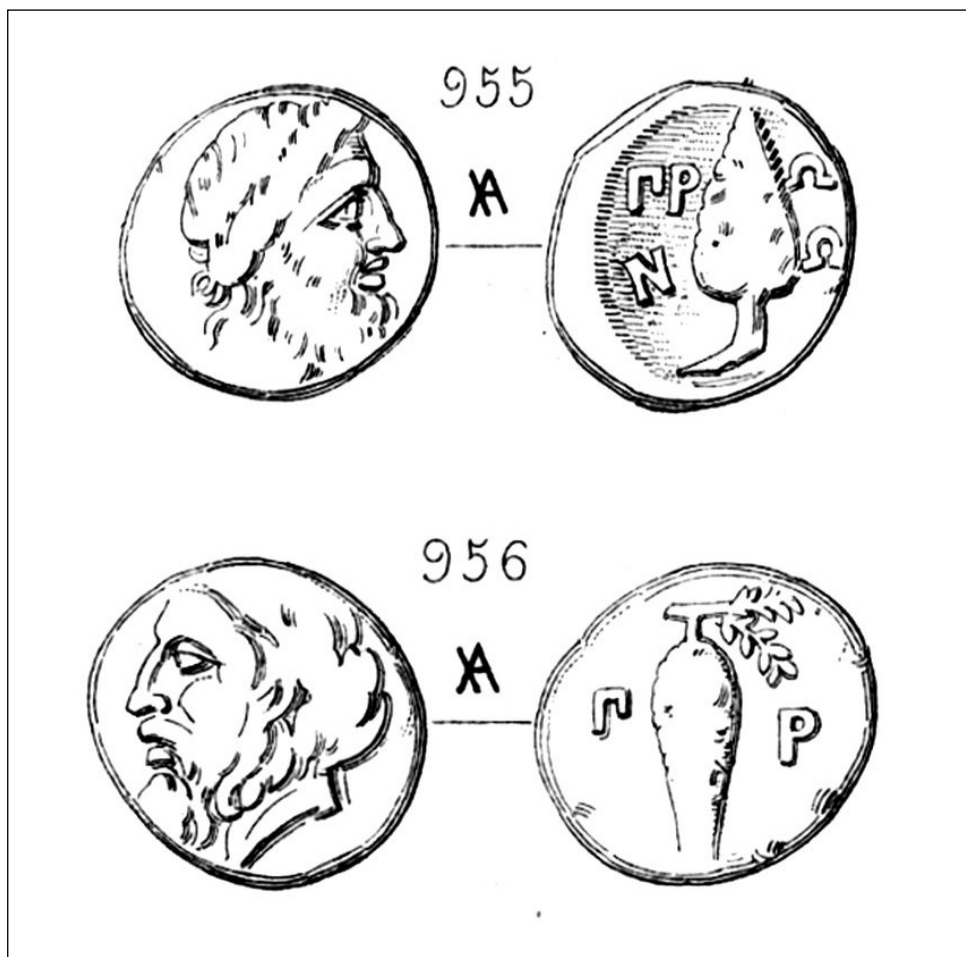


Fig. 2. Coins from Pronnoi (Cephalonia), 5th-4th century B.C. No. 955: Laurel-crowned Zeus on one side and a *Pinus* sp. cone on the other. No. 956: Zeus on one side and a small branch with an inverted *Abies cephalonica* cone on the other (Postolakas 1868).

historical reasons, not only must their monitoring be established, but the efforts for the potential discovery of additional individuals of this taxon on Mt. Ainos must continue.

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