# A note on *Abies cephalonica* (*Pinaceae*) from Greece and southern Albania

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- Abstract. Abies cephalonica (Pinaceae) had long been considered a species endemic to Greece. Its presence in Albania was considered doubtful, reports either referring to planted trees or to A. ×borisii-regis, a hybrid between A. alba and A. cephalonica. Recent evaluation confirmed that both A. cephalonica and A. ×borisii-regis occur in southern Albania; thus the former is no longer a Greek endemic. The new localities in Albania are provided and the name A. cephalonica is neotypified from a specimen deposited at the Institute of Dendrology, Kórnik, Poland (KOR).
- Key words: Abies, Balkans, distribution, endemic, neotype, new localities
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## Introduction

*Abies cephalonica* Loudon was described from the Ionian island of Kefallinia, where it forms dense forest in the summit area of Mt Enos (highest peak Mt Soros at 1628 m). During Venetian times (17<sup>th</sup> century) the mountain was also known as Monte Nero (Black Mountain) from its dark dense cover of Kefallonian Fir which supplied wood to the islands of present-day Kefallinia, Zakinthos, Ithaka and Kerkira. It is the dominant forest tree in the mountains of south and central Greece. While re-examining the endemic status of some plants from Greece Kit Tan noted that it was stated in POWO (accessed January 2024) that *A. cephalonica* Loudon occurs in Albania. Mitrushi (1955) had reported *A. cephalonica* from the slopes of Nemërçka Mt above Vjosa river near the Greek border, and also from Murgana a border mountain, the Greek part of which is called Chamandas. Meyer (2011) also mentioned the species from Nemërçka Mt, in the same locality stated by Mitrushi. However, in the most recent and comprehensive works on the flora of Albania (Barina 2017; Barina & al. 2018) it is written that although *A. cephalonica* has been reported, its presence needs confirmation. It is also stated in recent publications such as Siskas & al. (2023) as well as mapped in Strid (2024) that *A. cephalonica* is an endemic restricted to Greece.

## **Material and methods**

In Albania, *A. alba* Mill. occurs mainly in the northern and east central parts of the country at altitudes of 400-1800 m. *Abies* ×*borisii-regis* Mattf., the hybrid between *A. alba* and *A. cephalonica* is distributed in the southern part of the country where original stands are mostly destroyed and the trees scattered in scrubland at altitudes of 600-1900 m. There are now only few small fragmented subpopulations left intact in their natural state. These are located on mountain slopes mostly with N-facing exposition, e.g., the Hotova Fir National Park, Shelegur, Drenova and Gjergjevica Valley. *Abies alba* and *A.* ×*borisii-regis* are the only species of *Abies* included in the Atlas (Barina 2017) and checklist of vascular plants of Albania (Barina & al. 2018).

Photographs of trees considered *A*. ×*borisii-regis* from the southern part of Albania had been taken by L. Shuka on 4 May 2017; they are now carefully examined.

### **Results and discussion**

The photographs of *Abies* ×*borisii-regis* from Murgana and Stugara Mts in S Albania revealed they were of typical *A. cephalonica*. The first week of May is the time for formation of new branches. In the photos (Fig. 1) the few juvenile trees have paler green foliage with perhaps slightly more spreading leaves whereas older individuals, the majority, have dark green leaves radiating all round. *Abies alba* has densely brown-pubescent twigs and obtuse or emarginate leaves whereas *A*. *cephalonica* has yellowish-brown glabrous twigs and acute, acuminate or mucronate leaves. If the photos represent the hybrid *Abies* ×*borisii-regis* it should at least be morphologically intermediate and have some indumentum on the twigs and less acuminate-looking leaves. Thus the photographs represent *A. cephalonica* and its presence in Albania is confirmed without doubt (Fig. 2).

Mt Murgana holds the southernmost populations of A. ×borisii-regis, A. cephalonica and Fagus sylvatica in Albania. They are in a wonderful location on a not so easily accessible mountain, and it is difficult to believe that only now could one of the Abies taxa existing there be definitely confirmed as Abies cephalonica. Abies ×borisii-regis was observed in the Hotova National Park near the



**Fig. 1.** *Abies cephalonica* forest on limestone slopes of Murgana Mt, S Albania.

village of Frasher, not far distant from Nemërçka (Mitrushi 1955). There it is known locally as the Hotova Fir or Bredh i Hotoves, *bredh* meaning fir. North of the National Park, it also occurs between Drenova and Dardha villages, the Sheleguri area and Gjergjevica Valley. These localities represent the northernmost range of its distribution in Albania (Shuka & Jahollari 2007).



Fig. 2. Abies cephalonica with glabrous twigs, acute to acuminate leaves from: a, Murgana Mt; b, Stugara Mt; c, Llogora National Park.

#### Historical background and the case for typification

*Abies cephalonica* Loudon in Gard. Mag. (London) 14: 81 (1838). (Figs. 3 & 4)

Described from Mt Enos on the island of Kefallinia, Greece.

Neotype (designated here by Kit Tan, Shuka & Ziel.) – Greece. Nomos Kefallinias, Eparchia Kraneas: island of Kefallinia, Mt Ainos, fir forest below the sanatorium, calcareous rocks, c. 1300 m, 19 June 2010, *G. Iszkuło* & *A. Boratyński* 10.13.01 (KOR 47958).

The name Abies cephalonica has never been typified. When John Claudius Loudon described Abies cephalonica in 1838 (in Arboretum et Fruticetum Britannicum 1835-1838, now Gard. Mag.) the species had already been in cultivation in Britain for fourteen years, raised from a small quantity of seed sent from the Ionian Island of Kefallinia in 1824 by General Sir Charles Napier, governor of Kefallinia in 1824 and subsequent years. The first plants, few in number, were raised by Charles Hoare at Luscombe Castle, Devon and subsequently distributed to various gardens. 'Some time afterwards' a Mr Charlwood received 'a cask of cones' from General Napier (Elwes & Henry 1906-1913) and this second, much larger consignment yielded the first plants commercially available in Britain. It could also have been the source of early trees in European and N American arboreta.

One of the original plants raised at Luscombe was planted at Barton, Bury St Edmonds in 1838, being then 13-14 years old. Another of the original trees was growing at Luscombe Castle. Loudon (1838) and Ravenscroft (1884) provide an account of the distribution of the twelve or so original trees, included here for the sake of tracing the probable whereabouts of the earliest trees in Britain.

"In 1824, in compliance with a request of Henry L. Long, Esq. of Hampton Lodge, near Farnham, who was desirous of knowing the species of fir described by the ancient writers as the *peuké* and the *elaté*, Colonel Napier sent a packet of seeds of the Cephalonian Fir to England. The seeds were without the cones, and were sent to the Colonel's sister, Lady Bunbury. The packet was duly forwarded to Hampton Lodge, but some seeds having dropped from it, Lady Bunbury gave the seeds to Charles Hoare, Esq. of Luscombe. Three of the plants raised from them were given to Mr Pince of the Exeter Nursery, and one to Mr Pontey of the Plymouth Nursery. Four plants remained at Luscombe. The largest of these in 1837 was 3 feet 10 inches high, and the branches covered a space of 4 feet 3 inches in diameter. The plant sent to the Plymouth Nursery was, in 1837, sold to the Duke of Bedford for 25 guineas. Two of those sent to the Exeter Nursery were sold to the Rev. Theodore Williams, of Hendon Rectory, for about the same sum each; and the third is retained as a stock plant to propagate from.

The seeds sent to Hampton Lodge were safely received, and vegetated without difficulty. Mr Long, in a letter dated Dec. 3, 1837, says, I lost a great number of plants by spring frosts and by rabbits, owing to want of care while I was on the Continent. I have only three plants left, and they are in full vigour, and have made shoots during the past summer from 6 inches to 7 inches in length. I gave some plants to Lord Oxford for his Pinarium at Wolterton, in Norfolk; some to Lord King for his Collection at Ockham Park, Surrey; two to Robert Mangles, Esq. of Sunninghill; three I have planted out myself; and the remainder I gave this year to Mr Penny, the nursery-gardener at Milford. We are thus enabled to account for all the plants raised from the seeds sent home by General Napier".

It is unlikely that any of this material seen by Loudon has been preserved as herbarium material. It is more likely that if anything has been preserved only cone scales (zapfenschuppen) have been kept. We have not found any material of A. cephalonica at the Natural History Museum, London (BM), Kew (K), Berlin (B), Vienna (W & WU) or the Arnold Arboretum, Harvard (A) dating prior to 1838. In the absence of extant original material a neotype is proposed. The specimen selected was collected from Mt Enos, island of Kefallinia by G. Iszkuło & A. Boratyński and preserved at KOR (Fig. 4). The provenance of the neotype matches the known original provenance of A. cephalonica. Furthermore, the specimen is a well-preserved branch showing glabrous twigs and radiating leaves with acute to mucronate apex, characters typical of



Fig. 3. Abies cephalonica from Kefallinia, Mt Enos with acuminate leaves: Bornmüller 1435 (B) [https://ww2.bgbm.org/herbarium/object/B100217294].

Neotype of Abies cephalonica Loudon Kit Tan, Shuka & Ziel. 23 Jan 2024 colorchecker CLAS

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Abies cephalonica Loudon

10.13. Greece, Kefallonia Island, Ainos mountains, fir forest below the sanatorium, on the calcerous rocks, about 1300 m alt., N38°09'13" E20°37'57". 19.06.2010,

G. Iszkuło, A. Boratyński, 10.13.01

Imaged with number: KOR000409

Fig. 4. Abies cephalonica designated neotype from Kefallinia, Mt Enos: twig with female cone (KOR 47958).

the species. A specimen in vegetative state with acuminate leaves is also depicted (Fig. 3) as in cone-bearing branches the leaves are usually more acute than acuminate.

#### **Description of species**

Tree up to 30 m tall, conical becoming flat-topped or with multiple leading branches when old. Bark grey with darker fissures. Twigs glabrous, yellowish-brown. Buds ovoid, resinous. Leaves spreading outwards from all around shoot or curving upwards from the underside,  $18-30 \times 1.5-2.5$  mm, flat; upper surface dark lustrous green, longitudinally grooved; lower surface with 2 white stomatiferous bands; apex mucronate, acute to acuminate. Male cones small, ovoid, reddish-purple. Female cones erect, cylindrical,  $12-16 \times 4-6$  cm, disintegrating at maturity, leaving only the persistent, erect cone axis. Ovuliferous scales broad, woody; bract narrow. Seeds 2, winged.



#### Habitat and ecology

Mountain slopes, on various substrates of limestone, serpentine, evaporite, 600-1800 m.

Above the village of Sotira at altitudes of 600-900 m on Murgana and Stugara Mts, *Abies cephalonica* is found in evergreen or deciduous scrub of *Quercus coccifera*, *Q. ilex, Carpinus orientalis, Acer monspessulanum, A. opalus* subsp. *obtusatum, A. pseudoplatanus* or *Aesculus hippocastanum*. At higher altitudes of 900-1600 m the species becomes dominant except at the scree line where it mixes with *Pinus nigra, Juniperus oxycedrus* subsp. *deltoides* or a few *Fagus sylvatica* individuals occurring at tree line.

Flowering period: May.

#### Distribution

S Albania and Greece (Fig. 5).

Greece: Dominant forest tree in the mountains of south and central Greece. Occurring on W Aegean islands (Evvia), Ionian Islands (Kefallinia and probably on Lefkas), escaping from cultivation on E Aegean island of Lesvos.

S Albania: mountains south of the Vjosa river.

Gjirokastra district: Managed Nature Reserve/ Nature Park of Sotira, NW limestone slopes of Murgana Mt, 600-1600 m, 39°48'18.27"N, 20°22'52.00"E, 04.05.2017; northern limestone slopes of Stugara Mt, 39°47'32.89"N, 20°21'52.16"E, 04.05.2017, *L. Shuka* obs.

Përmeti district: northern limestone slopes of Nemërçka Mt above Draçova village, 1000-1450 m, 40° 6'29.27"N, 20°27'43.59"E, 07.08.2018, *L. Shuka* obs.

Vlora district: Llogora National Park, on limestone, 750-1650 m, 40°12'47.15"N, 19°33'27.29"E (Mitrushi 1955); Llogora National Park, NE limestone slopes of Thanasi Peak, 1080 m, 40°12'25.63"N, 19°34'18.86"E, 17.01.2024, *N. Hysolokaj* s.n. (TIR, herb. Shuka).

#### Chromosome number

2n = 24, material from Mt Menalo (Christensen 1997).

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