

**JUNIPERUS DELTOIDES, A NEW SPECIES, AND
NOMENCLATURAL NOTES ON JUNIPERUS POLYCARPOS
AND J. TURCOMANICA (CUPRESSACEAE)**

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ABSTRACT

A new *Juniperus* species from the Mediterranean, *Juniperus deltoides* R. P. Adams is recognized based on published data on DNA RAPDS, nrDNA sequence, morphology and terpenoids. *Juniperus turcomanica* B. Fedtsch is recognized as a variety of *J. polycarpus* K. Koch [*Juniperus polycarpus* K. Koch var. *turcomanica* (B. Fedtsch) R. P. Adams], based on RAPD data, terpenoids and morphology.

KEY WORDS: *Juniperus*, *Cupressaceae*, nomenclature.

Adams et al. (2003) examined the relationships among *Juniperus drupacea* Labill., *J. macrocarpa* Sibth. & Sm., *J. navicularis* Grand., *J. oxycedrus* L. (Greece and Spain), *J. oxycedrus* var. *badia* H. Gay comparing nrDNA (ITS) sequences, Random Amplified Polymorphic DNAs (RAPDs), Inter-Sequence Simple Repeats (ISSR) and terpenoids. Although the purpose of that work was to evaluate different kinds of data, we found that the two populations of *J. oxycedrus* (Greece, Spain) were as different in these four data sets as the other recognized species in the study. Comparing the specimens of *J. oxycedrus*, Spain, with the Linnaeus type for *J. oxycedrus* (LINN!) revealed that they are the same. Thus, the plants from Greece are appropriately recognized as a new species:

Juniperus deltoides R. P. Adams *sp. nov.* TYPE: GREECE. 14 km e. of Archova, 420 m, Lat. 38° 26.720' N; Long. 22° 41.678' E, 22 May 2001, R. P. Adams 9436 (HOLOTYPE: BAYLU, Paratypes: K, NY)

Plantas dioicas; frutices vel arbores usque 12 m, saepe coronis pyramidalis. Folia aciculares 9-17 mm longae 1.5-2.4 mm latae, base folio fere latiora quam lamina. Folia vittis glaucis duabus in superficiebus adaxialis plerumque non impressis. Strobilus in anno secundo maturescens, globosus viridis stramineo-brunneolescens atrorubens in maturitate. Semina plerumque tres.

Plants dioecous; shrubs or trees to 12m, often with pyramidal crowns. Leaves acicular, 9--17 mm long, 1.5--2.4 mm wide, base of the leaf nearly as wide as the blade. Leaves with two glaucous bands on the adaxial surface, generally not sunken. Cone ripening in second year, globose, dark red when ripe, green turning to brownish yellow when ripening. Seeds usually 3.

Juniperus oxycedrus (*sensu stricto*) can be distinguished from *J. deltoides* by having a narrowing of the leaf base (Fig. 1, a), whereas the leaf base is almost as wide as the blade (Fig. 1, b) in *J. deltoides* (thence the name). In addition, the stomatal bands in *J. oxycedrus* are sunken (Fig. 1 a), giving the midrib a raised appearance. In contrast, in *J. deltoides*, most of the leaves have stomatal bands that are not sunken, giving the leaf a flat surface appearance (actually concave as illustrated in Fig. 1 b).

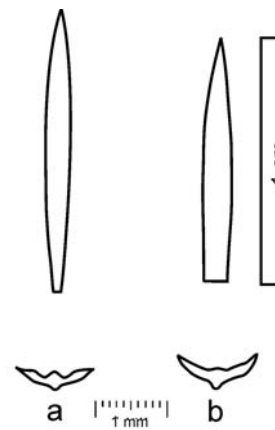


Fig. 1. Leaves *J. oxycedrus* (a) and *J. deltoides* (b).

Representative Specimens Examined.

Bulgaria. s Varna, 7 Dec 1923, *B. Gilliat-Smith* 373 (K).

Cyprus. Troodos, Prodhromos, 19 Jun 1939, *H. Lindberg s.n.* (K).
above Prodhromos, 15 May 1957, *L. F. H. Merton* 3179 (K).

Greece. Crete, Mt. Spathi, 1760m, 16 May 1967, *G. Barclay* 257 (K). 14 km e Arachova, 420 m, 22 May 2001, *R. P. Adams* 9436, 9437,

9438 (BAYLU). 8 km w Lemos, 1010 m, 27 Aug 1999, *R. P. Adams*, 8787, 8788 (BAYLU). Mt. Parnassus, 1,280 m, 3 Aug 1987, *R. P. Adams* 5642, 5643 (BAYLU). 10 km w Crysoritsi, 1200 m, 5 Aug 1987, *R. P. Adams* 5649, 5650 (BAYLU). s side Mt. Parnis, 1070 m, 8 Aug 1987, *R. P. Adams* 5656, 5657 (BAYLU). 7 km w Lemos, 1100 m, 5 Oct 1988, *R. P. Adams* 5988, 5989 (BAYLU). Lake Prespa, 850 m, 3 Jul 1932, *Alston & Sandwith* 1107 (K). Pyrgos, Athos Peninsula, 1938, *J. M. Loch* 15 (K). 2 km from Mazia, 760 m, 15 Nov 1973, *Brickell & Mathew* 8133 (K).

Iraq. Sarsank, 16 Jun 1970, *S. Omar* 37692 (K). 20 km ne Zarkko, 550m, 4 Aug 1957, *Ali Rawa* 23166 (K). Zawitah, 2750m, 30 Aug 1933, *Rustam* 4818 (K). Bekme Gorge, w end., 440 m, 13 Apr 1955, *H. Helbaek* 764 (K). near Tabriz, 1927, *B. Gilliat-Smith* 2117 (K).

Italy. 3 km w Raiano, 520 m, 26 May 2001, *R. P. Adams* 9445, 9446, 9447 (BAYLU).

Macedonia. near Zelenikovo, 23 Dec 1935, *Mrs. Ilic s.n.* (K).

Slovenia. between Parenzo & Rovigno, 16 Aug 1922, *W. B. Turrill* 1009 (K). sw Trebnje, 18 Apr 1935, *Jackson & Turrill* 86 (K).

Turkey. 30 km n Eskieshir, 1064 m, 20 May 2001, *R. P. Adams* 9430, 9431, 9432 (BAYLU). 8 km from Belen towards Antakya, 600 m, 6 May 1965, *M. J. E. Coode & B. M. G. Jones* 524 (K). Macka, 300m, 2 Apr 1960, *Stainton* 8152 (K). Elmali, 1800m, 19 Apr 1936, *T. A. Tengwall*, 400 (K). Artvin, 700m, 27 Jun 1957, *Davis & Hedge* 30095 (K). above Ankara, 400m, 5 Jul 1974, *P. H. Davis* 13062 (K).

Ukraine. Yalta, near Nikita, 150m, 29 May 1959, *Davis* 33086 (K).

Juniperus polycarpus K. Koch from central Asia is a very polymorphic species that is often included as a variety of *J. excelsa* M.-Bieb. (Farjon, 2001). Adams (2001) examined populations referable to *J. polycarpus* (*sensu stricto*) from Armenia, *J. seravschanica* Kom. (Kazakhstan, Pakistan) and *J. turcomanica* B. Fedtsch. (Turkmenistan). Both terpenoids and RAPDs showed *J. excelsa* to be quite resolved from the *J. polycarpus* complex (three aforementioned taxa). The leaf terpenoids showed that *J. turcomanica* to be somewhat different from *J. polycarpus* of Armenia and *J. seravschanica* from Kazakhstan and Pakistan. The RAPDs data suggested that the recognition of *J. polycarpus* K. Koch. var. *seravschanica* Kom.) Kitamura and *J.*

turcomanica as a infraspecific taxon of *J. polycarpus* might be warranted. Re-examination of the morphology of *J. polycarpus* and *J. turcomanica* suggests to the author that it would be prudent to recognize *J. turcomanica* as a variety of *J. polycarpus*.

Juniperus polycarpus* K. Koch var. *turcomanica* (B. Fedtsch.) R. P. Adams, *comb. nov.

BASIONYM: *Juniperus turcomanica* B. Fedtsch. in Fedtschenko & al., Fl. Turkmenii 1: 14. 1932. TYPE: lost or destroyed (Imkhaniskaya, 1990). (LECTOTYPE: *D. P. Gedevanov* & *D. A. Dranitsyn* 148, 3 v 1912, Turkmenia, Kopet Dag, Dschalilu, (chosen by Imkhaniskaya (1990) LE!)

Distribution: Elburz and Kopet Mts. of Iran and Turkmenistan.

The following key may be used to distinguish the recognized varieties of *J. polycarpus*:

1. Foliage slender, 0.7- 0.8 mm in cross section
on ultimate branchlets, seed cones 7-9(-10) mm,
scale leaves tightly appressed, giving a smooth
branchlet, (1-)2-3(-4) seeds/cone.....
.....*J. polycarpus* K. Koch var. *turcomanica* (B. Fedtsch) R. P. Adams
1. Foliage stout, 0.9-1 mm in cross section
on ultimate branchlets, seed cones 9-11 mm or
more, scale leaves with a beak or keel so branchlet
appears as a string of beads, 3-6 seeds/cone
 2. Seed cones 9-11mm, at least some scale leaves
with very narrow, elongated, brown glands,
not ruptured.....*J. polycarpus* K. Koch var. *polycarpus*
 2. Seed cones 8-10 mm, scale leaves with clear,
ellipsoid glands, often ruptured,with a clear exudates.....
.....*J. polycarpus* K. Koch var. *seravschanica* (Kom.) Kitamura

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