

Distribution and Synonymy of *Juniperus californica* Carr. (Cupressaceae) in Baja California, Mexico

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ZANONI, T. A. and R. P. ADAMS (Dept. Botany and Plant Pathology, Colorado State U., Ft. Collins, Colo. 80521). Distribution and synonymy of *Juniperus californica* Carr. (Cupressaceae) in Baja California, Mexico. Bull. Torrey Bot. Club 100: 364-367, 1973.—The geographical distribution and synonymy of this species in Baja California, Isla de Cedros, and Isla de Guadalupe are reviewed. *Juniperus cedrosiana* Kellogg and *J. cerrosianus* Kellogg are considered synonymous with *J. californica* Carr.

Vasek (1966) has recently discussed the distinctiveness of *Juniperus californica* Carr. and its relationship to *J. occidentalis* Hook. and *J. osteosperma* (Torrey) Little. The objective of this paper is to establish the geographical distribution and the synonymy of the species relative to Baja California. The distribution and synonymy of *J. californica* in Baja California are presented at this time since this taxon will not be treated in a detailed study of the junipers of Mexico which is currently being conducted by the authors. *Juniperus californica* in Baja California will be examined in detail in conjunction with *J. osteosperma*, *J. occidentalis*, etc. in the latter phases of the junior author's studies of the junipers of North America.

Juniperus californica Carr. is an arborescent (to 12 m tall) constituent of the conifer woodland in California, southern Nevada, eastern Arizona, and Baja California (see inset, Fig. 1). It is found in the Upper Sonoran and occasionally in the Lower Sonoran life zones (Shreve and Wiggins, 1964) of the Sierra Juarez, Sierra San Pedro Martir, Sierra San Borja, and Sierra de Calamujue y San Luis and in nearby desert fringes in Baja California from approximately 270 to 1200 m elevation (Fig. 1). It also exists at lower elevations on Isla de Cedros (75-1200 m) and Isla de Guadalupe (15-350 m).

Martinez (1963) listed this taxon for 5 localities on the mainland of Baja California, but did not note the occurrence on the two Pacific islands. It is now known from the length of Estado de Baja California. The insular localities have been re-

ported in the American botanical literature since 1859 (Kellogg, 1859, Watson, 1875).

The mainland trees and the Guadalupan trees have been consistently recognized as *Juniperus californica* Carr. However, several different names have been used for the specimens from Isla de Cedros (Cedros or Cerros Island). This confusion has arisen, in part, from the different names applied to Isla de Cedros. The confusion concerning the name of the island was examined by Eisen (1901). He determined that the true name of the island is Isla de Cedros (or Cedros Island) and that this is the name used by the island's discoverer, Ulloa, in 1539, although both Cedros and Cerros Island have been commonly used.

In 1859, Kellogg (1859) published a new species, *J. cerrosianus*, from Cerros Island (i.e., Isla de Cedros) using the specimen collected by Veatch (specimens at NY and GH). Later, Kellogg (1860) published the name *J. cedrosiana* for junipers from Cedros Island (i.e., Isla de Cedros). Veatch, in a note (Kellogg, 1860), indicated that the specimens were actually from Cerros Island! Thus, it appears that Kellogg had assigned two names to the same juniper from the Isla da Cedros. Examination of the species descriptions for *J. cer-*

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rosianus and *J. cedrosiana* revealed that they are identical!

Engelmann (1877) first recognized that *J. cerrosianus* was synonymous with *J. californica*. Standley (1920) and Shreve and Wiggins (1964) concurred. Examination of specimens from mainland Baja California, Isla de Cedros, and Isla de Guadalupe

leads us to conclude that they are all of the same species, *J. californica*.

Juniperus californica had been frequently reduced to synonymy under *J. occidentalis* Hooker by various European authors. This practice appears to have begun with Gordon (1862). Gordon's *J. occidentalis* is listed as being present in

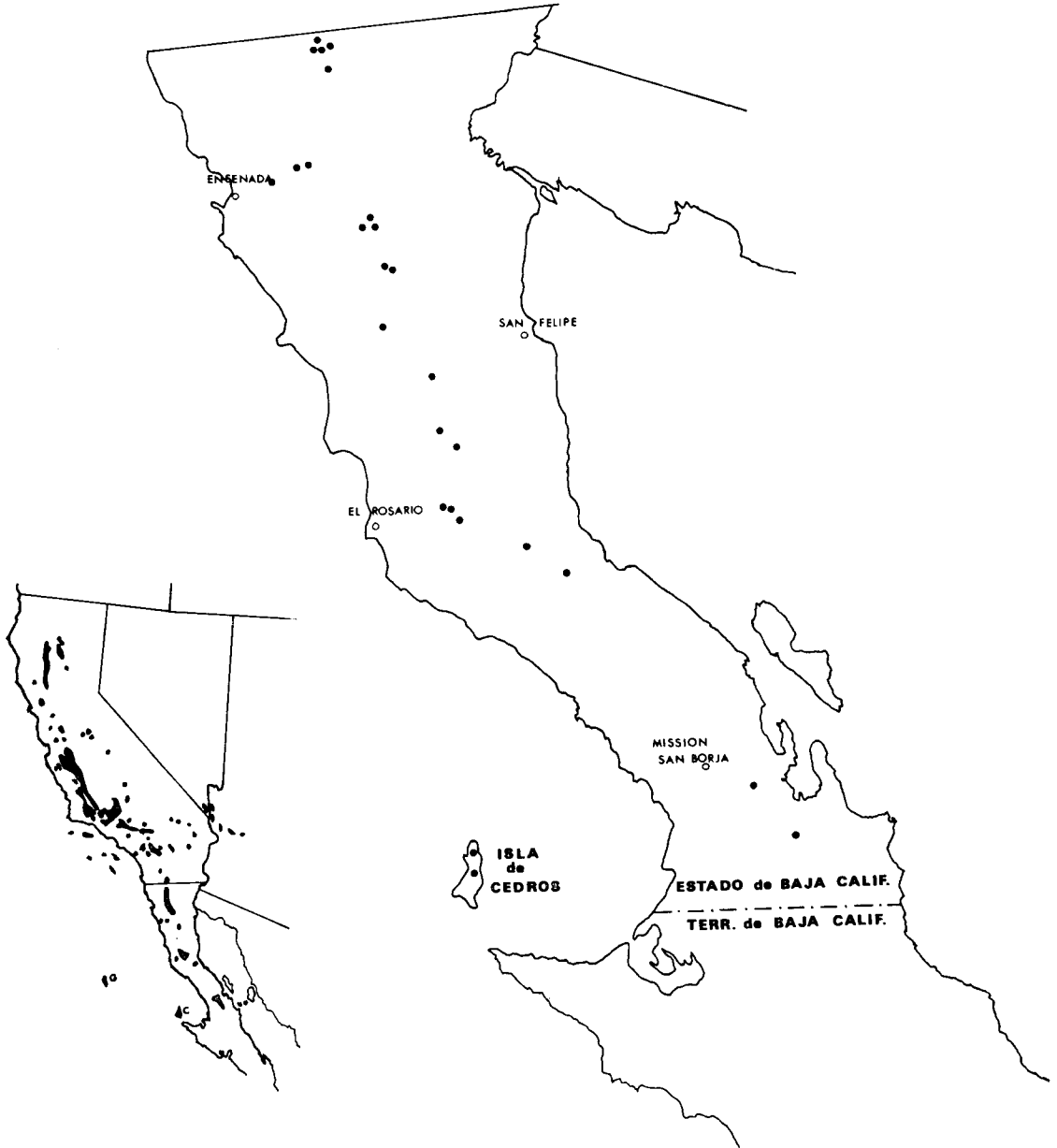


Fig. 1. Distribution of *Juniperus californica* Carr. in Baja California, Mexico. Inset shows distribution of the species in North America, including Isla de Cedros (C); Isla de Guadalupe (G) (adapted from Little, 1971).

Oregon Territory (states of Oregon and Washington). *Juniperus californica* is not known from that region. The two specimens cited are *J. occidentalis* Hooker as recognized today. However, Parlatore (1868) specifically includes *J. californica* Carr. under *J. occidentalis* since specimens from California and Cerros Island are cited.

The synonymy of *J. californica* as listed in Martinez (1963) is incorrect. We offer the following synonymy: *Juniperus californica* Carriere Rev., Hort. ser. IV. 3: 352, 353. 1854. *Sabina californica* Antoine. Cypress.-Gatt. 52. plates 71, 72. 1857. *Juniperus cerrosianus* Kellogg. Proc. Calif. Acad. 2: 37. 1859. *Juniperous cedrosiana* Kellogg. The Hesperian 4: 3, 4. 1860. In part *Juniperous occidentalis* Hook. sensu Parlatore in DeCandolle. Prodrumus 16 (2): 489, 490, 1868.

Common names of the species include cedro (apparently the only name used in Mexico), California juniper, Cedros Island juniper, Cedar Island juniper, desert white cedar, sweet-berried juniper, and white cedar (Kellogg, 1859, 1860; Eisen, 1901; Standley, 1920; Sudworth, 1927; Little, 1953; Gaussen, 1968). Distribution records were obtained from herbarium specimens from A, ARIZ, BH, CAS, DS, F, GH, INIF (Inst. Nacional de Investigaciones Forestales, Mexico), MEXU, MICH, MO, PH, POM, RSA, UC and US.

Specimens examined:

ESTADO DE BAJA CALIFORNIA. Mountains of N. Baja, *Orcutt* 830 (MO); Jacumba, *Fisher* 32 (US); 50 mi. SE of Tecate, *Munz* 9579 (RSA, UC); 10 mi. S of Alaska, *Harbison s.n.* (RSA, UC); 9 mi. W of Alaska on road to Ensenada and Tijuana, *Wiggins* 11248 (CAS, DS, UC); Alaska, *Cota s.n.* (UC); 8 mi. S of La Rumorosa near La Teta de la India, *Raven* 16814 (DS, GH, RSA); 8 mi. S of La Rumorosa, *Henrickson* 4160 (RSA); summit of grade about 6-8 mi. W of Ojos Negros Rancho, *Wiggins and Gillespie* 4064 (CAS, DS, F, GH, MEXU, MICH, MO, RSA, US); 10-20 mi. E of Ensenada to Ojos Negros, *Goldman* 1116 (US); vicinity of Ojos Negros, *Wiggins and Gillespie* 4081 (CAS, DS, F, GH, MICH, MO, RSA, US); Ojos Negros in Sierra de Juarez, *Madrigal S. s.n.* (INIF, MEXU); 3 mi. SW of Santa Catarina, *Broder* 453 (DS, US); 3 mi. W of Santa Catarina, *Broder* 447 (DS, US); hill of Santa Catarina Mission, *Broder* 302 (DS, US); 5 mi. W of Valle Trinidad,

Wiggins and Wiggins 16077 (ARIZ, CAS, DS, UC); 1.9 mi. NW of Trinidad de la Valle, *Hastings and Turner* 66-33 (ARIZ, DS); Arroyo Grande in Sierra Juarez, *Kaune* 698 (CAS, DS); El Coyote, Sierra San Pedro Martir, *Moran and Thorne* 14511 (RSA); Rancho Las Suerte in Sierra San Pedro Martir, *Thorne* 31903 (MICH, RSA); Vallederos, *Brandgee s.n.* (UC); 20 mi. E of El Socorro and 30 mi. N of El Rosario, *Humphrey* 6838a (ARIZ); 24.4 mi. E of El Rosario, *Hastings and Turner* 63-235 (ARIZ, DS); 27 mi. E of Rosario, *Wiggins* 7567 (F, MICH, UC, US); 5 mi. E of Quail Springs (27 mi. E of Rosario), *Wiggins* 7567 (DS); between Las Cuevas and Mission San Fernando, *Cronemiller* 3086 (DS); 7 mi. N of Rancho Arenosa between San Augustin and Rosario, *Wiggins* 20924 (DS, MICH); Agua Dulce, *Brandgee s.n.* (UC); Cerro Santa Maria, *Moran* 11469 (DS, INIF, RSA, UC); Cerro el Saucó in Sierra San Borja, *Moran* 8089 (DS, INIF, UC); San Juan Valley in Sierra Borja near El Terminal, *Thorne and Henrickson* 32741 (RSA); 1 mi. S of Rosarito on trail to San Antonio, *Wiggins* 9979 (DS, MICH, UC, US); Cerro Potrero, *Moran* 12151 (DS, INIF); Portezuelo de Jamau, *Moran* 13653 (ARIZ, INIF).

ISLA DE CEDROS. Cedros Island, *Rose* 16132 (A, US); *Greene s.n.* (GH); *Solis* 40 (US); *Palmer s.n.* (US); *Anthony* 107 (DS, GH, MO, PH, POM, US). Cerros Island, *Veatch s.n.* (A); *Stewart* 75 (CAS); Cerros Island, SE Anchorage *Hanna s.n.* (CAS, A, US); near middle of island, *Moran* 3025 (UC); Canyon 2 mi. W of village, *Haines and Hale s.n.* (UC); near spring above Cedros village, *Moran* 10579 (INIF, UC); arroyo bank, middle of east coast, *Moran* 10694 (DS); head of central valley, *Hanna s.n.* (CAS); south slopes of cerros Peak, *Haines and Hale s.n.* (CAS); "near type locality," *Mason* 1991 (CAS, GH, US); near top of Cedros Mt., NW side of peak, *Roderick* 189 (CAS). Also, Madrigal Sanchez (1970) notes the following localities: near the middle of the island at Agua Macheteada, Calipatria, and the extreme north end of the island.

ISLA DE GUADALUPE. Guadalupe Island, *Palmer* 91 (GH, MO, PH); on SE coast, *Lindsay* 2635A (CAS, DS, RSA); north of Lobster camp on SE shore, *Newcomb* 187 (BH, DS, UC, US); near ruins of old whaling operation on SE coast, *Kuijt and Miller* 1077 (UC); mouth of Juniper

canon, *Moran 6454* and *6454A* (DS, MEXU, RSA); cliff on south side of canyon on east slope of El Picacho, *Moran 12062* (ARIZ, INIF, MICH).

A California company purchased Isla de Guadalupe for raising Angora goats in approximately 1865. Palmer (see Watson, 1875) noted that the junipers were "all over the middle of the island and occasionally at the south end, in the ravines and low valleys, forming groves about fifteen feet high." By 1885, Greene (1885) had noted that the species was on the verge of extinction due to the excessive grazing by goats. Howell (1941) found a "ghost grove" of dead *J. californica* trees in the center of the island and reported the species as being extinct. However, collections by Newcomb in 1957 and Moran in 1965 indicated that a few trees still existed in several areas protected from the goats.

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