

## Juniperus communis in Europe: distribution, habitat, usage and threats

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*Juniperus communis* L., known as juniper or common juniper, is the most widespread of the European conifers worldwide. It is one of the main species within the genus *Juniperus*, which comprises a large number of species. Common juniper is the only one of them that occurs in both the Eastern and Western Hemispheres.

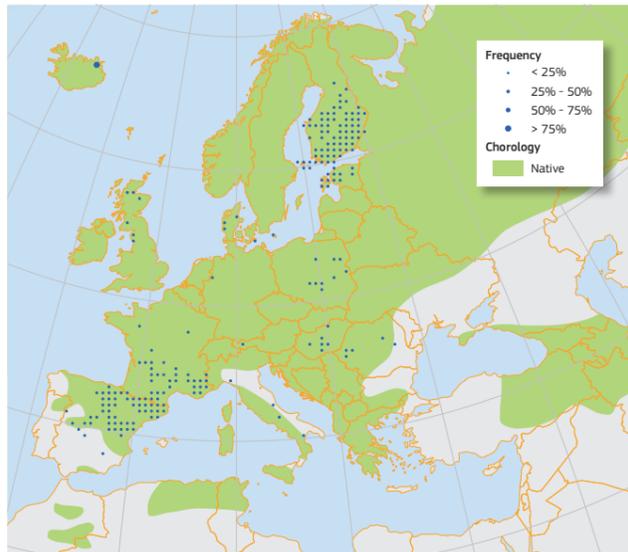
Common juniper is a slow-growing evergreen conifer<sup>1, 2</sup>. Across its wide distribution range, it may take the form of a multi-stemmed shrub or it can develop a tree-like shape<sup>2, 3</sup>. It is a very variable species (partly as a result of its enormous geographical range) and there is ongoing debate over how many distinct subspecies there are<sup>4-6</sup>. It can be easily recognised by its needle-like leaves which are borne in whorls of three. The needles are **sessile**, 5-12(15) mm long, and they have one white band on the upperside<sup>2</sup>. This species is usually **dioecious**<sup>7, 8</sup>, but is occasionally **monoecious**<sup>2, 9</sup>. The seed cones are fleshy berry-like (**galbulus**), purple to black in colour, up to 1 cm, globose or longer than broad. They ripen in the second or third year. The seeds are 4-5 mm long, **ovoid**, without wings, three-cornered, typically 1 to 3 per cone. They are usually dispersed by birds or other animals<sup>2</sup>.

### Distribution

Common juniper has the widest distribution range of all conifers<sup>6, 10</sup>, and can be found throughout the Northern Hemisphere: in North America, Europe, and Asia. It is the most northerly of the juniper species and one of the most northerly conifers in the world<sup>10</sup>. In Europe, it can be found from northern Scandinavia<sup>11</sup> to parts of southern Spain, although at more southern latitudes it is usually confined to mountain areas. Juniper grows in low elevations in pasture lands and abandoned fields, as well as at high elevations, above the treeline in Eurosiberian mountains<sup>7</sup>.

### Habitat and Ecology

Common juniper is a typical shrub species of poor soils and harsh environments<sup>7</sup>. It is drought and cold tolerant but requires plenty of light<sup>2</sup>. It can grow on acidic sandy or calcareous soils<sup>12</sup> and favours free-draining soils and rocky outcrops. In many areas, juniper is considered to be a pioneer species, able to colonise bare terrain and a range of soil types<sup>12</sup>. The subspecies *Juniperus communis* ssp. *alpina* occurs in a narrow band above or north of the treeline.



Map 1: Plot distribution and simplified chorology map for *Juniperus communis*. Frequency of *Juniperus communis* occurrences within the field observations as reported by the National Forest Inventories. The chorology of the native spatial range for *J. communis* is derived after Meusel and Jäger<sup>19</sup>.

### Importance and Usage

Juniper is amongst the most useful multi-purpose shrub species worldwide. Containing a large number of essential oils<sup>13</sup>, extracts from its twigs, leaves, and berries (the blue-black seed cones) have been used as traditional remedies against urinary infections<sup>2</sup>, dermatitis<sup>14</sup>, or as a diuretic<sup>15</sup>. The wood has even been shown suitable for artificial bone implants<sup>16</sup>. The twigs, leaves, and especially the berries represent an important food source for several small and large animals, such as birds, deer, elk, cattle, horses and sheep<sup>2</sup>, and humans use the berries for

culinary purposes and for the preparation of alcoholic drinks, such as flavouring gin<sup>17, 18</sup>.

### Threats and Diseases

Throughout Europe, common juniper is the primary host of the rusts *Gymnosporangium clavariiforme* and *G. cornutum*. Many fungi, such as the needle cast fungus (*Lophodermium juniperinum*), the juniper twig blight (*Phomopsis juniperovora*), and the root rot (*Phytophthora cinnamomi*) can cause severe infections on junipers<sup>2</sup>.



Fleshy berry-like seed cones; they become purple-blue in colour when mature. (Copyright Ettore Balocchi, www.flickr.com: CC-BY)



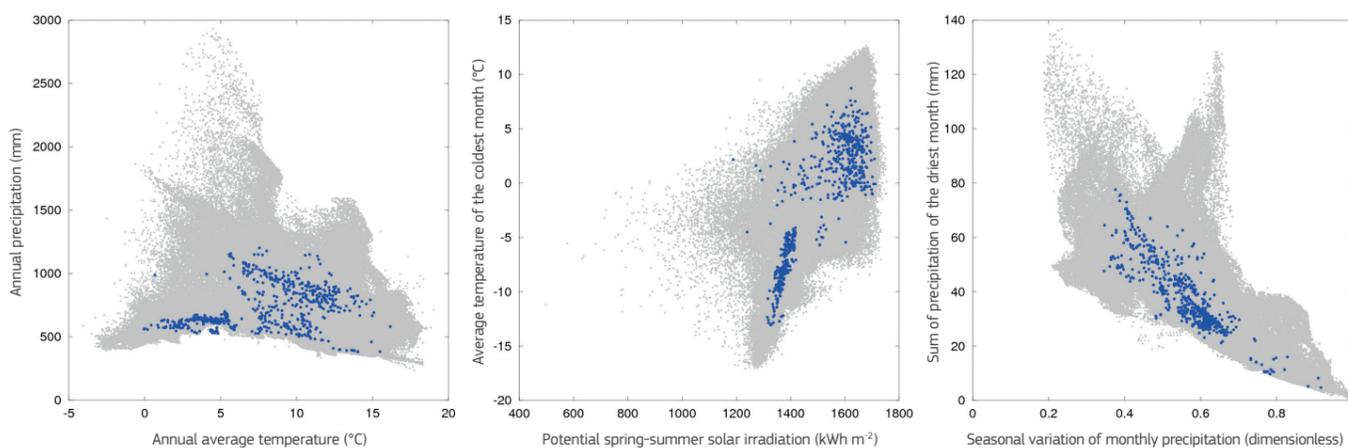
Needle-like leaves arranged in whorls of three in the branchlet with one white stomata band on the upper side. (Copyright Vito Buono, www.actaplantarum.org: AP)



Juniper in shrub form grown in a rocky habitat in the Ligurian Alps (Savona, North Italy). (Copyright Giovanni Caudullo: CC-BY)

Field data in Europe (including absences) ● Observed presences in Europe ●

Autoecology diagrams based on harmonised field observations from forest plots.



### References

- [1] A. F. Mitchell, *A field guide to the trees of Britain and northern Europe* (Collins, 1974).
- [2] P. A. Thomas, M. El-Barghathi, A. Polwart, *Journal of Ecology* **95**, 1404 (2007).
- [3] B. Beikircher, S. Mayr, *Plant, Cell & Environment* **31**, 1545 (2008).
- [4] R. P. Adams, R. N. Pandey, *Biochemical Systematics and Ecology* **31**, 1271 (2003).
- [5] R. P. Adams, A. E. Schwarzbach, *Phytologia* **95**(2), 179 (2013).
- [6] A. Farjon, D. Filer, *An Atlas of the World's Conifers: An Analysis of their Distribution, Biogeography, Diversity and Conservation Status* (Brill, 2013).
- [7] D. Garcia, R. Zamora, J. M. Gomez, P. Jordano, J. A. Hódar, *Journal of Ecology* **88**, 435 (2000).
- [8] L. O. Pedro, A. Montserrat, T. Salvador, *Annals of Botany* **89**, 205 (2002).
- [9] A. M. Ottley, *Botanical Gazette* **48**(1), 31 (1909).
- [10] J. E. Eckenwalder, *Conifers of the World: The Complete Reference* (Timber Press, 2009).
- [11] T. H. DeLuca, O. Zackrisson, *Plant and Soil* **294**, 147 (2007).
- [12] J. G. B. Oostermeijer, B. De Knegt, *Plant Species Biology* **19**, 175 (2004).
- [13] R. P. Adams, *Biochemical Systematics and Ecology* **26**, 637 (1998).
- [14] C. Cavaleiro, E. Pinto, M. J. Gonçalves, L. Salgueiro, *Journal of Applied Microbiology* **100**, 1333 (2006).
- [15] R. A. Halberstein, *Annals of Epidemiology* **15**, 686 (2005).
- [16] K. A. Gross, E. Ezerietis, *Journal of Biomedical Materials Research* **64A**, 672 (2003).
- [17] S. Vichi, M. R. Aumatell, S. Buxaderas, E. López-Tamames, *Analytica Chimica Acta* **628**, 222 (2008).
- [18] F. Cooper, R. E. Stone, P. McEvoy, T. Wilkins, N. Reid, *The conservation status of juniper formations in Ireland*, Department of Environment, Heritage and Local Government, Dublin, Ireland (2012).
- [19] H. Meusel, E. Jäger, eds., *Vergleichende Chorologie der Zentraleuropäischen Flora - Band I, II, III* (Gustav Fischer Verlag, Jena, 1998).

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