**Ilex aquifolium** in Europe: distribution, habitat, usage and threats

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The European holly (*Ilex aquifolium*) is a evergreen small tree or shrub, with characteristic *coriaceous* dark green leaves with spines and red berry fruits. Holly grows in Western Europe, Western Balkans and North Turkey up to the Caucasus, preferring Atlantic climates. It adapts to different soil conditions, occurring mainly as understorey vegetation in oak and beech temperate forests. It is widely planted as an ornamental plant and hedge shrub, and is also well known for Christmas decorations. Various fungi of genus *Phytophthora* cause roots to rot in cultivated hollies. However there are no critical threats for the conservation of this species.

The European holly (*Ilex aquifolium*) is a small evergreen tree or shrub 8-10m in height, which rarely exceeds 20m. It has a dense pyramidal crown and a straight woody stem with grey bark. The leaves are up to 10cm long, simple, alternate, *coriaceous* and *glabrous*. Their upper surface is dark-green and glossy and the lower surface is yellowish and matt. With an ovate, elliptic or oblong shape, the leaf margin may be undulate with spines, especially in the lower part of the tree. Flowers are small (6mm in diameter), white and placed in axillary cymes. Holly is normally *dioecious* and flowers between May and August. The fruit is a bright red drupe of 7-12 mm size. Its seeds ripen in late autumn and usually last throughout the winter, when birds, rodents and larger herbivores eat them.

**Distribution**

This species occurs in Western Europe, from Spain to western Norway, North-West Africa in the Atlas Mountains, western Balkan Peninsula, North Turkey up to the Caucasus. It grows in northern ranges at sea level, up to 2600m in Morocco. It is widely planted outside its natural range as an ornamental shrub in Europe and in other continents. On the west coast of the United States it is considered an invasive plant. Its distribution range is now starting to move over Europe, as a consequence of increased winter temperatures in northern regions and drought in the south, and in Scandinavia its range is spreading eastwards due to the hybridisation with native with ornamental genotypes.

**Habitat and Ecology**

The holly grows in Atlantic and sub-Atlantic climates, also in a sub-Mediterranean climate at higher elevations, characterised by mild winter temperatures, relatively high summer precipitation and limited temperature ranges. It is a slow-growing species with a lifespan of 300 years in optimal conditions. Reproduction takes place mostly by seed; however vegetative regeneration (suckers or adventitious roots) may be important within dense holly formations. This species occurs within different plant communities, mainly as an understorey tree or in edges of temperate deciduous forests and woodlands dominated by oaks (*Quercus robur*, *Quercus petrea*, *Quercus pubescens*) or beech (*Fagus sylvatica*). In the Mediterranean region it can be found in evergreen oak forests (*Quercus ilex*) in the scrub communities.

**Importance and Usage**

Holly is cultivated as an ornamental shrub, appreciated for the contrast between its dark green permanent foliage and the red fruits and traditionally used for Christmas decoration.

A variety of hybrids and cultivars have been developed for garden use, e.g. *Argentea Marginata* with white-edged leaves, ‘Bacciflava’ almost spineless and with yellow fruits. Holly is often used in hedges as it has spiny leaves, bears pruning well and it grows slowly. Since it is a *dioecious* species, hollies traditionally have grafted female or male branches to produce fruit from a single plant. The wood of holly is greyish white, hard, heavy and uniform, and used for woodcraft, tumery, handles, sledges, sticks.

It is a cheap substitute for ebony if dyed black. Its leaves are browsed by mammals and in the past were used as cattle fodder. The mucilaginous bark of young shoots is used to produce birdlime. Its drupes are purgative and emetic with strong effects, so considered toxic to humans.

**References**


[17] L. Ceballos, F. de J. del Olmo, *Field observations from forest plots. (Copyright AnRo0002, commons.wikimedia.org: CC0)

[18] Map 1. Flat distribution and simplified chorology map for the lowland holly. Frequency of lowland holly occurrences within the field observations as reported by the National Forest Inventories: the chorology of the native spatial range for I. aquifolium demarcated after Peterken and Lloyd. (Copyright AnRo0002, commons.wikimedia.org: CC0)

[19] Threats and Diseases

There are no critical diseases affecting the European holly in its natural habitat. Principally they are recorded for the ornamental plants in gardens and parks. Among the *phytophagous* insects, the most known is the holly leaf miner *Phytomyza dicta*, a fly whose larvæ burrow into leaves. The fungus *Phytophthora ilicis* causes black leaf spots and then cankers and shoot debacles. The holly tree is host for other *Phytophthora* root and debacle fungi, such as *Phytophthora communis* and *Phytophthora psychrophila*.