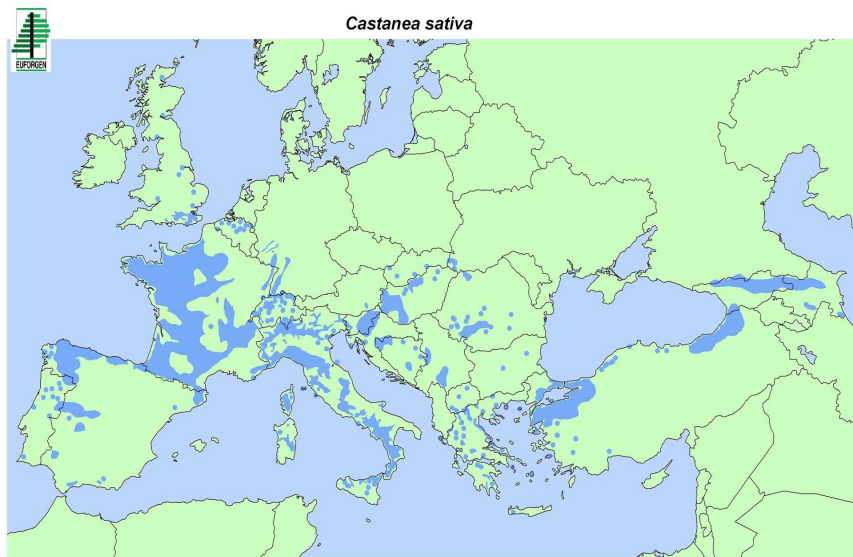


Fagaceae

Castanea sativa Miller



The distribution map, including both natural and naturalized occurrence, was compiled by members of the EUFORGEN Noble Hardwoods Network based on an earlier map published by (i) Maurer, W.D.; Fernández-López, J. in 2001 (Establishing an international sweet chestnut (*Castanea sativa* Mill.) provenance test: preliminary steps Forest Snow and Landscape Research, 76, 3: 482-498) and by (ii) Bounous G. in 2002 (Il Castagno: coltura, ambiente ed utilizzazione in Italia e nel mondo. Ed. Agricole - Bologna, Italy) and was published in: Fernández-López J. and R. Alia. 2003. EUFORGEN Technical Guidelines for genetic conservation and use for chestnut (*Castanea sativa*). International Plant Genetic Resources Institute, Rome, Italy, 6 pages.

Castanea



Pollen trizono colporate, isopolar, subprolate, very small (11-16 μm) Thin exine, rugulate. In polar view it appears more or less circular. Sharp and long colpi with protruding pores. Little polar area. **High allergenicity**

Chenopodiaceae – Amaranthaceae

Food species include *Quinoa*, *Kañiwa*, *Fat Hen*, *Good King Henry*, and *Epazote* (*Chenopodium* spp.), *Orache* (*Atriplex* spp.), spinach (*Spinacia oleracea*), and, of greatest commercial importance, the crops derived from *Beta vulgaris*: Sugar beet, Beet, etc.

Genera of some importance include *Atriplex*, *Beta*, *Chenopodium*, *Halogeton*, *Halosarcia*, *Salicornia*, *Salsola*, *Sarcocornia*.

cultivated ornamentals, e.g. *Amaranthus*, *Gomphrena*, *Iresine*, and some noxious weeds, notably from *Amaranthus*,

Leaves alternate, or opposite; 'herbaceous'; sheathing, or non-sheathing; simple. Lamina entire; one-veined, or pinnately veined. Plants usually hermaphrodite

Flowers solitary, or aggregated in 'inflorescences', with persistent bracts and bracteoles); in cymes, or in spikes, or in heads. The terminal inflorescence unit when flowers aggregated, cymose.

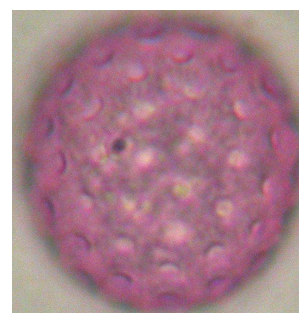
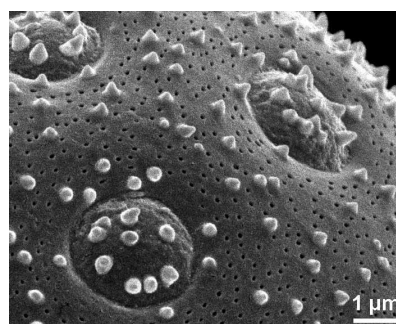
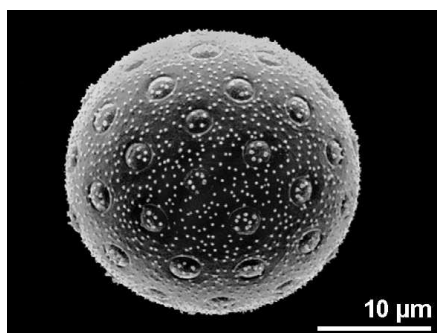


Chenopodium album



Amaranthus sp.

Pollen grains aperturate: 30-65 pores; spheroidal, apolar, small-medium size 20-33µm
Exine finely granulate, is thicker on mesoporus area. This determines that in optical section perimeter appears undulate. They bloom from June to November



Fam. OLEACEAE

Ligustrum vulgare

Description:

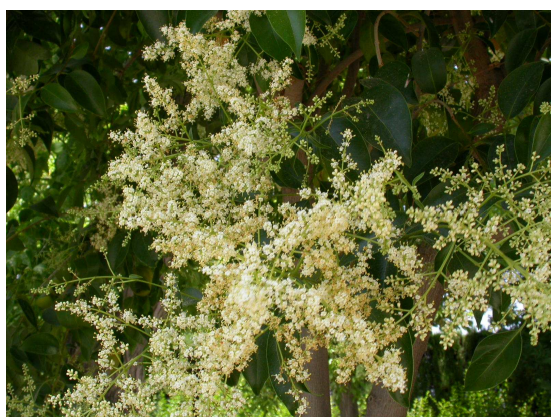
Little trees or Shrub, 3.5 - 4.5 m tall, 3.5 - 4.5 m wide. Stout with irregularly spreading branches.

Twigs: green and minutely hairy when young, becoming gray and hairless with age.

Leaves: opposite, short-stalked, dark green, 2.5 - 6 cm long, 0.5 - 1.5 cm wide, oblong egg-shaped to lance-shaped, tip rounded to pointed, margins non-toothed, glossy, smooth. Leaves turning purplish in autumn if deciduous (in cold area) or evergreen (in hot area).

Flowers: have both male and female reproductive organs (perfect); on short axillary branches; borne in a dense, terminal, branched inflorescence; white, small, tubular, petals four, unpleasant odour. The flower tube is equal to or shorter than the lobes.

Fruit: a berry-like drupe; in clusters on short axillary branches; lustrous black, 8.5 mm long, spherical

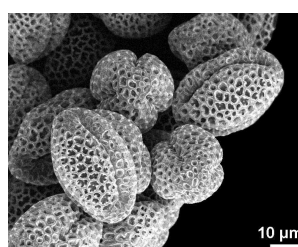
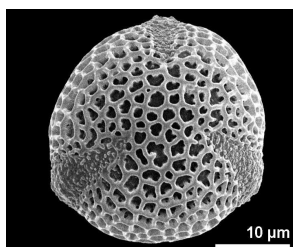


Hedge of *Ligustrum*

Trizonocolporate, isopolar, oblate spheroidal pollen,

medium size 22-30 μm Long fusiform colpi with sharp apices; polar area not wide.

Exine is thick with lumina over all the surface. It is possible to see columellae that support mura of reticulum



***Ligustrum lucidum* Ait.**

Leaf: evergreen, simple. Opposite, with entire margin Flower: inflorescence a panicle with many little flowers. Gamopetalous corolla a 4 petals.

Blooms in June and July.



Asteraceae = Compositae



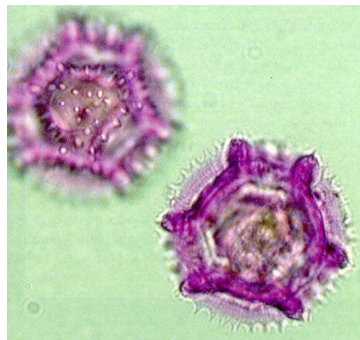
Compositae Tubuliflorae



Compositae Liguliflorae

All genera are entomophylous except *Ambrosia* and *Artemisia*.

Pollen of Asteraceae liguliflorae is fenestrate, characterized by large, window-like spaces lacking a tectum



Artemisia sp. (*Absinthium*)

A very common native of waste ground, rubbish heaps, roadsides, sites of demolished buildings in towns and a variety of other disturbed situations. The plant is fairly tall, generally about 3 - 4 feet in height, with much-divided grey-silver leaves which have a pleasant smell when bruised



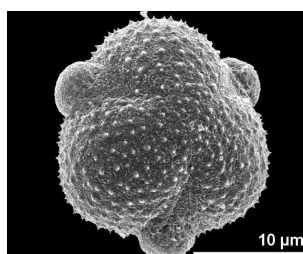
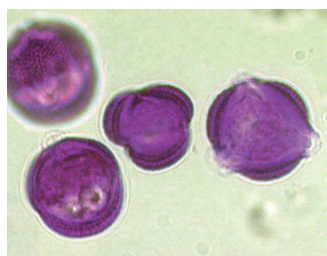
The leaves are 5-20 cm long, dark green, pinnate, with dense white tomentose hairs on the underside. The erect stem often has a red-purplish tinge. The flower-heads are small and inconspicuous and the whole plant has a rather untidy and unattractive appearance.

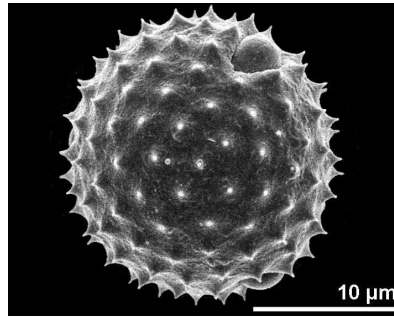
It blooms from July to september

- *Artemisia vulgaris*, *A. verlorutum*, *A. absinthium* etc



The *Artemisia* pollen type is routinely distinguished from other pollen produced by members of the sunflower (Asteraceae or Compositae) plant family. *Artemisia* is a tricolporate, echinate pollen grain recognized by its thick, tapered wall with large collumella





Racemes or spikes of tiny green "bells" contain the staminate (male) flowers. Each little bell is a five-lobed corolla with five stamens.

The pistillate (female) flowers are few, and are in the axils of the upper leaves. They have no corolla, only a forked pistil with an inferior ovary, surrounded by a ribbed calyx tube which becomes the achene (seed). These flowers depend upon the wind to bring the fine yellow grains of pollen for fertilization.

ASTERACEAE Martinov

Ambrosia artemisiifolia L.

(incl. *A. elatior* L.) outside Naturalized

Ambrosia coronopifolia Torrey et A. Gray outside Naturalized

Ambrosia trifida L. Cultivated Spontaneous

Ragweed is a coarse annual with leaves deeply bipinnately dissected, lower ones opposite, upper ones alternate. The plant is named for the raggedy shape of its leaves.

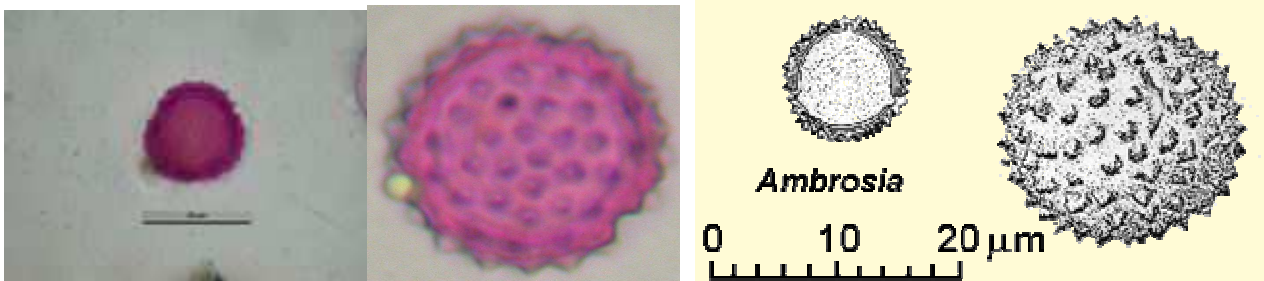
The foot layer and tectum are of uniform thickness, but the layer of thick columellae usually tapers toward the furrows (colpi). The short spines are hard to see with light microscopy, typically they are less prominent than the large columella in plan view. The spines and rods may interact to produce a reticulate patten in light microscopy.

Ambrosia sp. (Ambrosia)



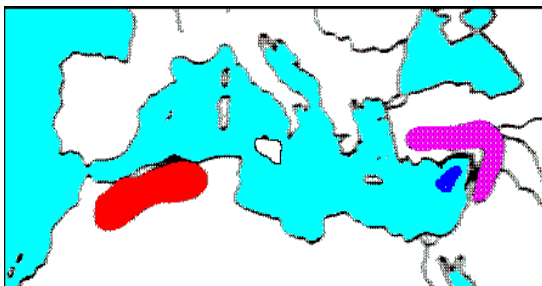
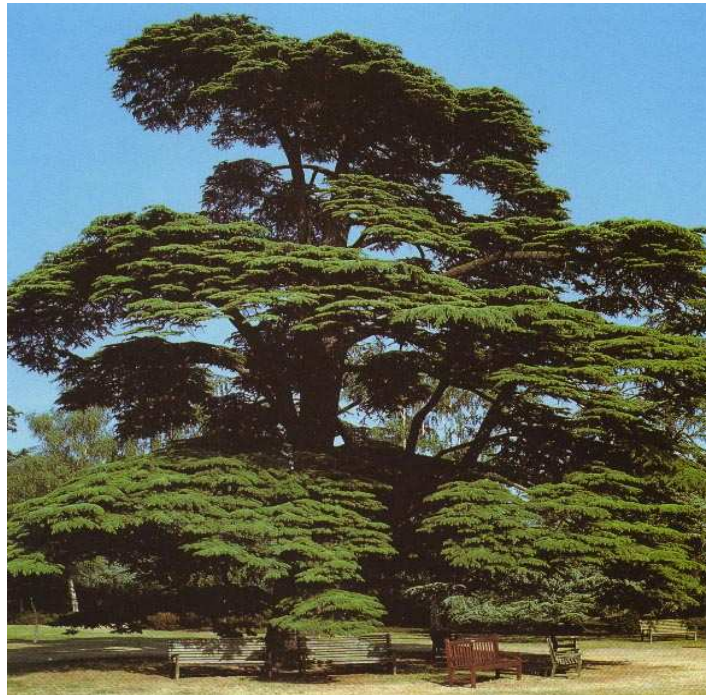
Plant genera producing this pollen type include *Ambrosia*, *Iva*, *Solidago*, and *Xanthium*.
Distribution: worldwide.

Grain echinate, trizonocolpote, small (15 - 24 μm), isopolar, oblate spheroidal. Very short colpi and wide polar area. Exine is echinate



This pollen type is routinely distinguished from other members of the sunflower Asteraceae or Compositae) plant family by its short and sparse spines, its short furrows, and the presence of **cavae** -- three gaps in the outer wall.

Pinaceae *Cedrus* (Cedar)



Heteropolar pollen. Bisaccate, large up to 80 micron, with longitudinal aperturoid in ventral position between two sacci (see arrows). Corpus of grain is spheroidal with exine with granulate surface, meanwhile it is reticulate on sacci

Low allergenicity

Cedrus blooms in autumn

Euphorbiaceae

Mercurialis sp

Annual herb, weed plant, diffuse in mediterranean basin near cultivated fields, street, woods, deteriorated and uncultivated environments. Opposite leaf, sharp, with dentate margin. Unisexual flowers on different plant. Female and male flowers little green



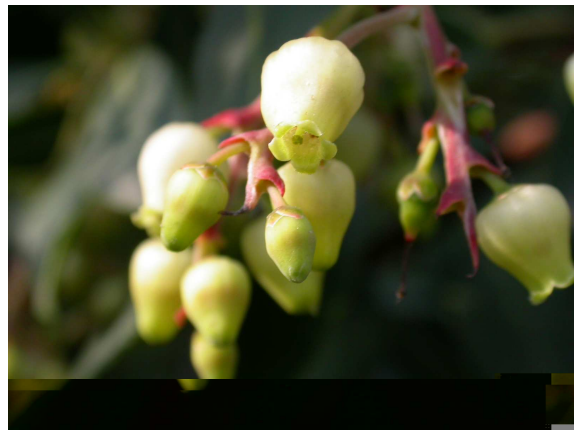
Pollen trizonocolporate, isopolar, subprolate, small 18-25 μm . Long colpi surrounding pores with sharp apex. In the colp membrane there is a thin sexinic insula (arrow) Pores show protruding margins (arrow) Exine rather thick in mesocolpium has microreticulate sculpture.

Low allergenicity.



Other pollen:

Arbutus unedo L.



Erica arborea

