

Pharmacognosy

lab exercise 6

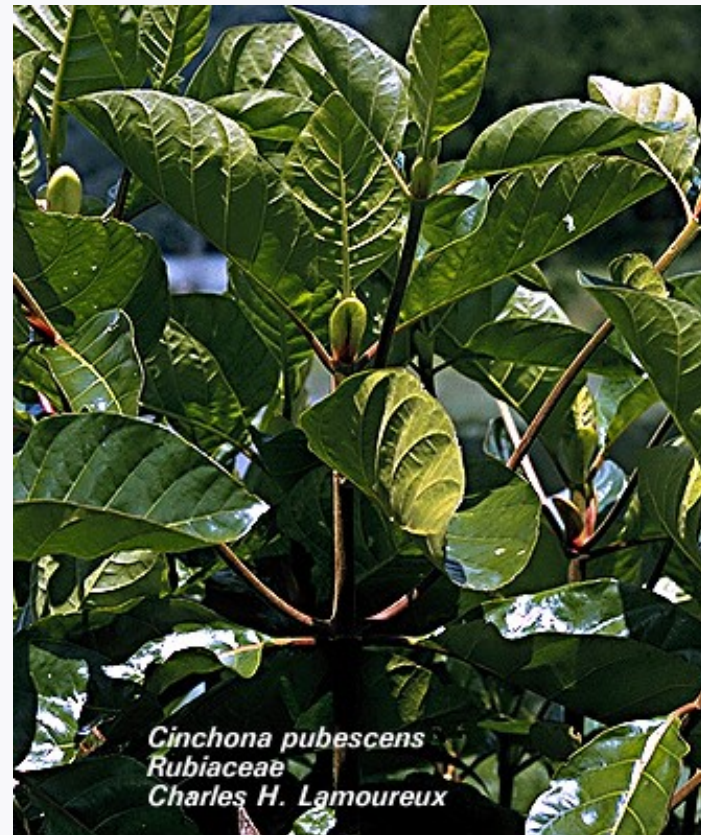


Drugs – cortex, wood, leaves



Cinchonae cortex CzPh 2017

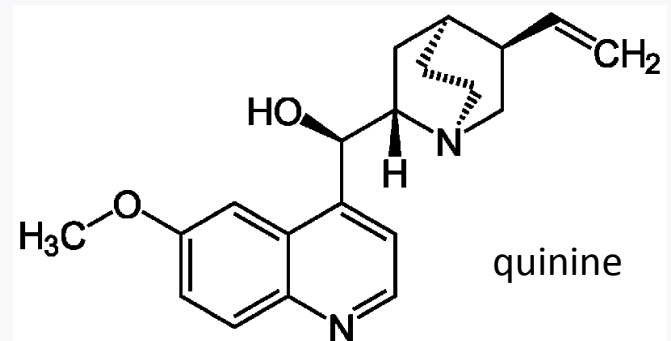
- Mother plant: *Cinchona pubescens* (*C. succirubra*), *C. calisaya*, *C. ledgeriana* Rubiaceae, (Cinchona)
- *Cinchonae extractum fluidum normatum* CzPh 2017



Cinchonae cortex CzPh 2017



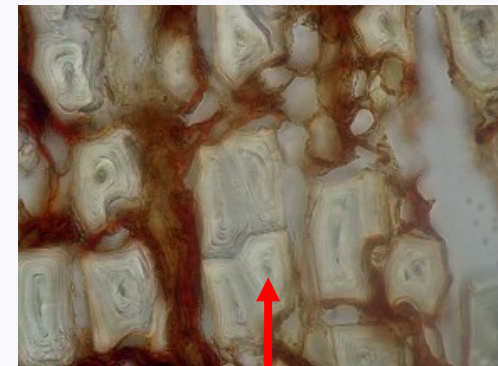
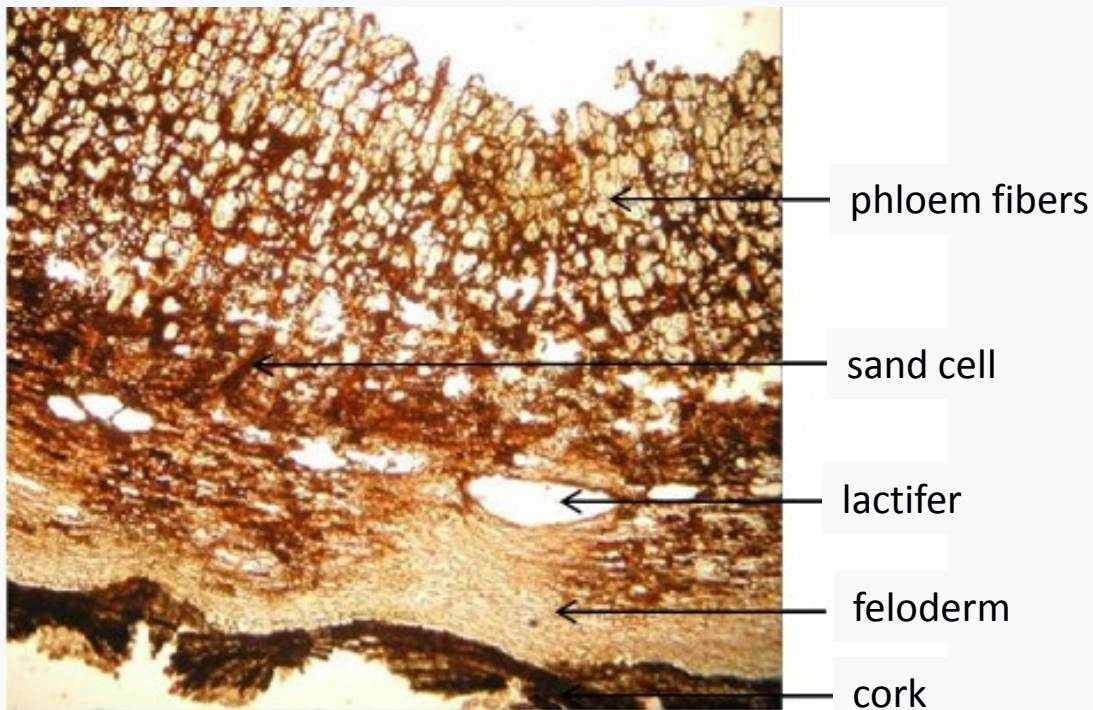
- **Macroscopy:** tubularly curled bark, externally grey-brown to brown, wrinkled and cracked, internal side brown-red, fracture from inner side is fibrous, outer side clean and smooth, aromatic odour, very bitter taste
- **Content compounds:** around 30 **alkaloids**, mainly **quinine**, **quinidine**, minor: cinchonine, cinchonidine
- **Usage:** isolation of alkaloids
 - quinine – direct effect on CNS - antipyretic, analgesic, antimalarial
 - quinidine - antiarrhythmic



Cinchonae cortex CzPh 2017



- Microscopy: surface cork, in cortex secretory cells (cellulae lactiferae), calcium oxalate sand cells, cells with starch, phloem fibers (with ruptures (infundibuliform pits)), medullar rays, sieve-tubes



Cinchonae cortex CzPh 2017



■ Microscopy:

cork

phelloderm

sand cell

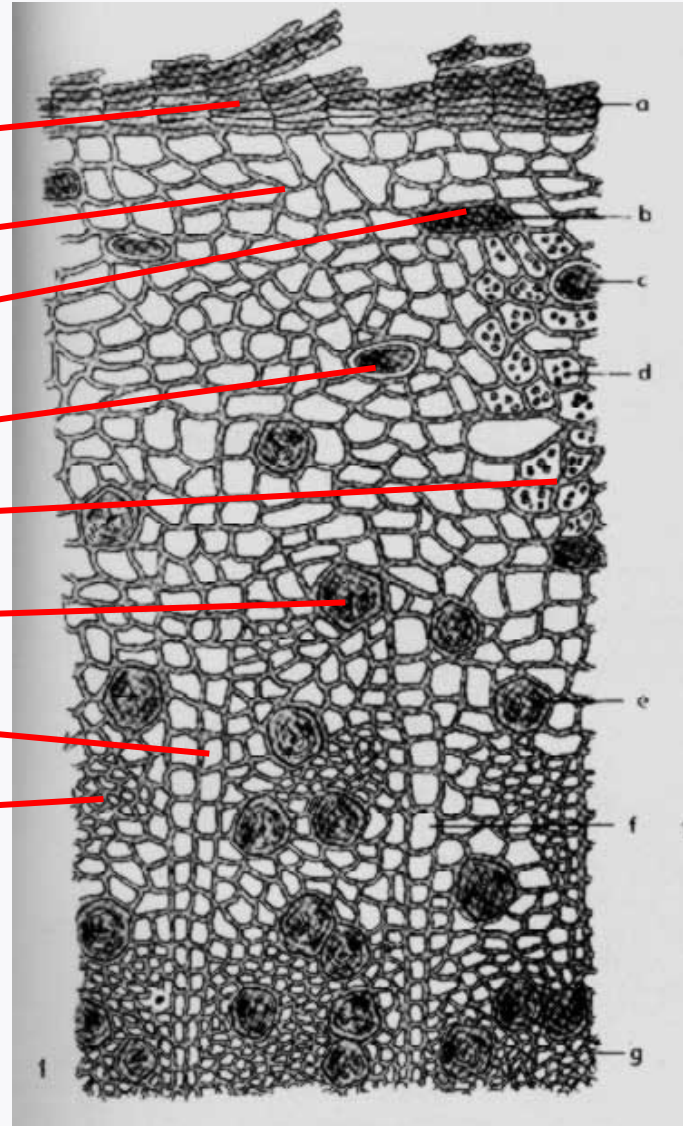
secretory cell

starch

phloem fiber

medullar rays

sieve-tubes



Frangulae cortex CzPh 2017



- Mother plant: *Rhamnus frangula* (*Frangula alnus*),
Rhamnaceae, (Buckthorn)

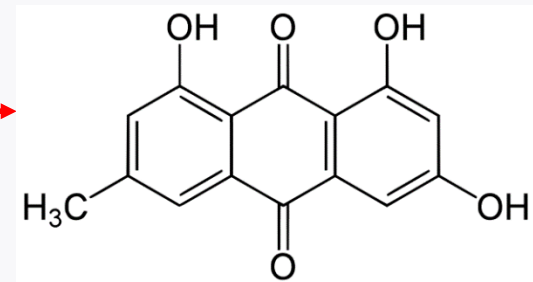
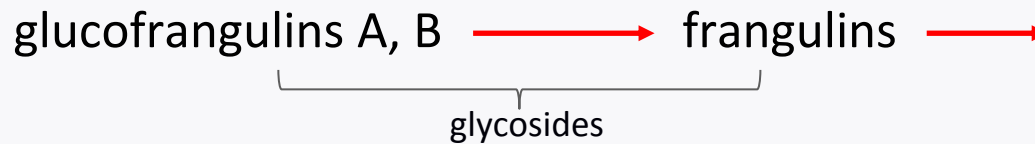


Frangulae cortex CzPh 2017



- Macroscopy: tubularly rolled, externally grey-brown, grayish transversal elongated lenticels, inner side smooth reddish brown, fibrous fracture, without odour, bitter-sweet taste

- Content compounds:
anthraquinone derivatives



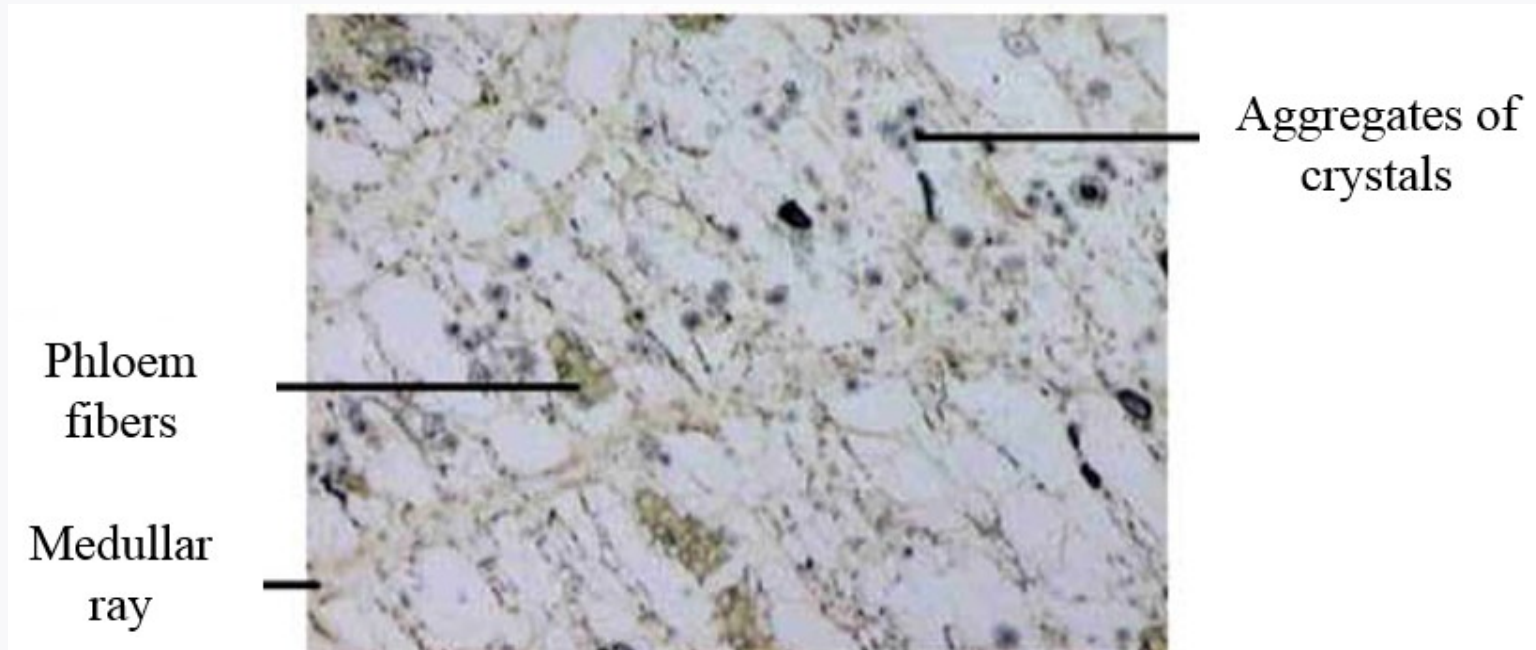
frangula-emodin
(aglycone)

- Usage: laxative

Frangulae cortex CzPh 2017



- Microscopy: several layers of cork, under cork collenchyma (Absence of sclerified parenchyma), cells with starch, aggregates of calcium oxalate crystals, mucilage cavities (young bark), medullar rays, typical groups of thick phloem fibers, sieve -tubes



Frangulae cortex CzPh 2017



■ Microscopy:

cork

phelloderm

starch

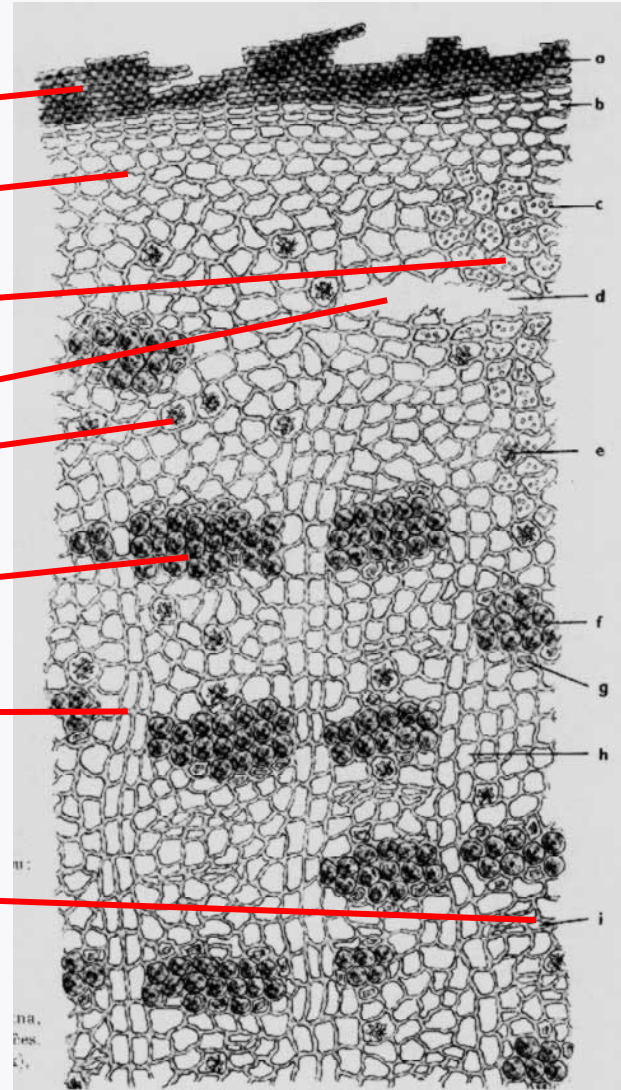
mucilage cavity

druse

phloem fibers

medullar rays

sieve-tubes



Quercus cortex CzPh 2017



- Mother plant: *Quercus robur*, *Q. petraea*, Fagaceae, (oak)



Q. robur



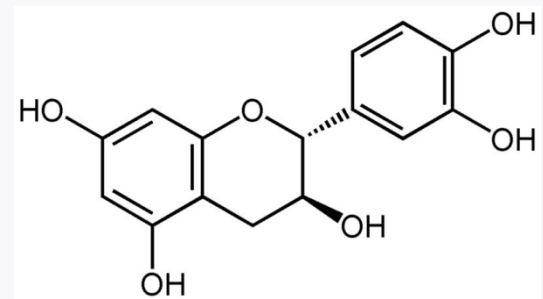
Q. petraea



Quercus cortex CzPh 2017



- Macroscopy: tubular pieces of cortex, externally smooth, shiny, silver-gray, inner side bright brown to reddish, with sharp ridges, typical odour, bitter astringent taste
- Content compounds: **condensed tannins (catechins)**, phlobaphens, flavonoids
- Usage: astringent, haemostyptic, antidiarrhoic

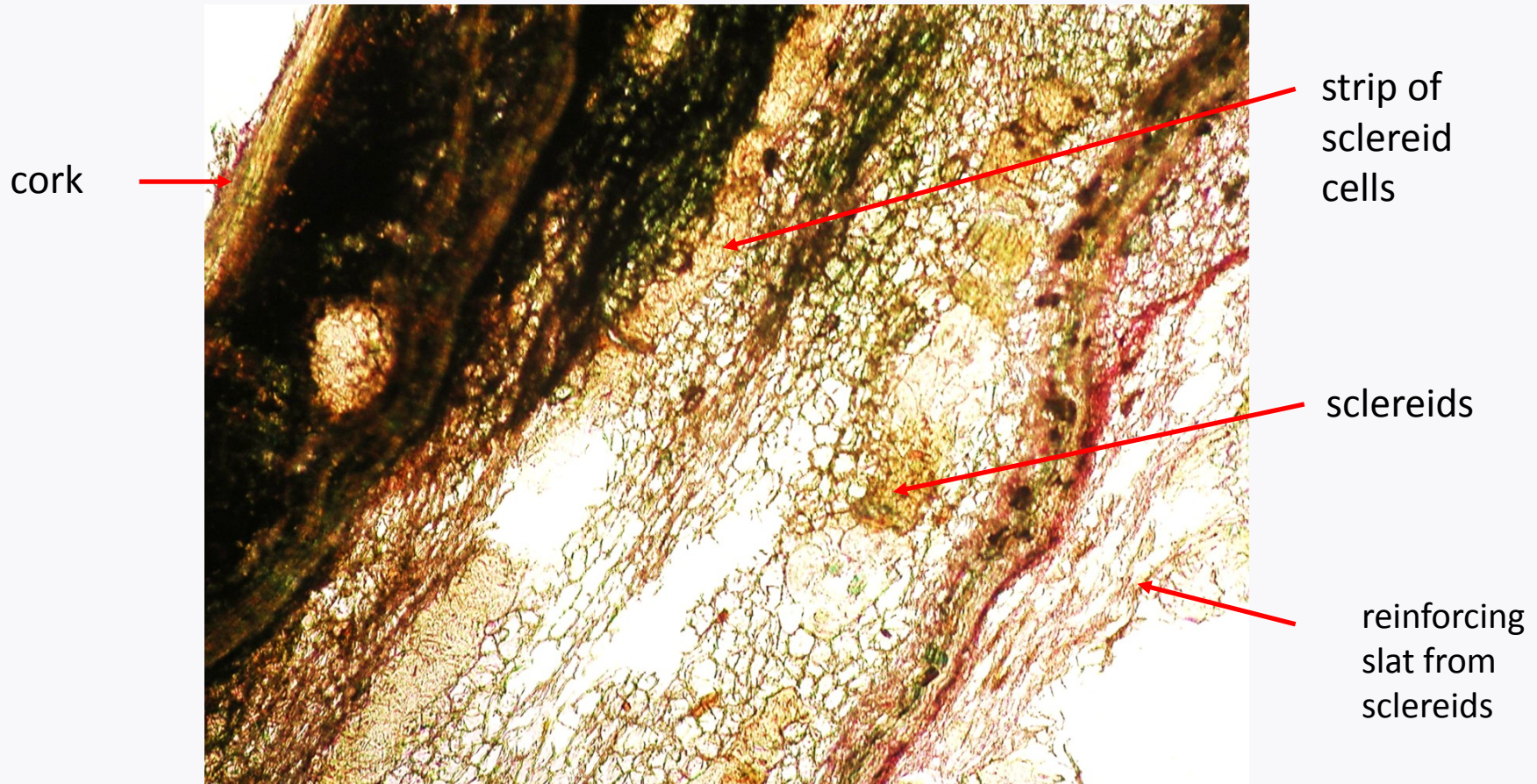


catechin



Quercus cortex CzPh 2017

■ Microscopy: cork, collenchyma, primary cortex separated from secondary by strip of sclereid cells, single sclereids (stone cells), phloem fibers, aggregates of calcium oxalate crystals, medullar rays, sieve-tubes, reinforcing slat from sclereids





Quercus cortex CzPh 2017

■ Microscopy:

cork

collenchyma

stone cells

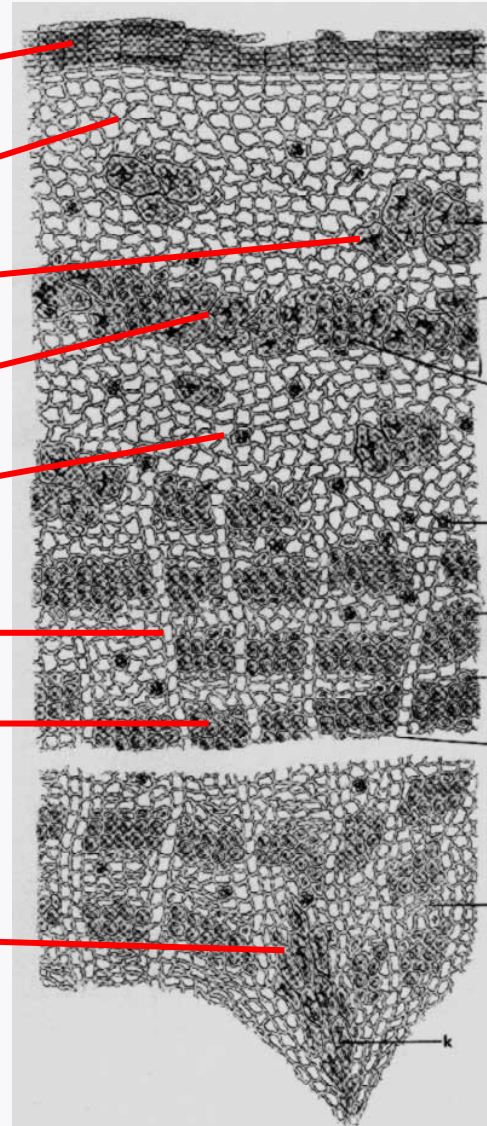
mechanical
strip

druses

medullar rays

phloem fibers

reinforcing
slat





Juniperi lignum

Mother plant: *Juniperus communis*, Cupressaceae, (Juniper)





Juniperi lignum

- Macroscopy: bright yellow to reddish wood, fibrous, aromatic odour and taste

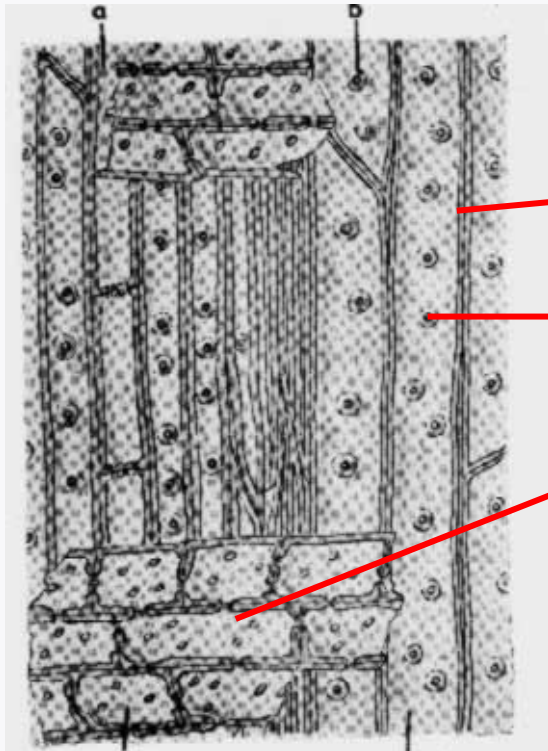


- Content compounds: essential oil (pinene, terpinene), resins
- Usage: diuretic, diaphoretic, derivans (irritant)



Juniperi lignum

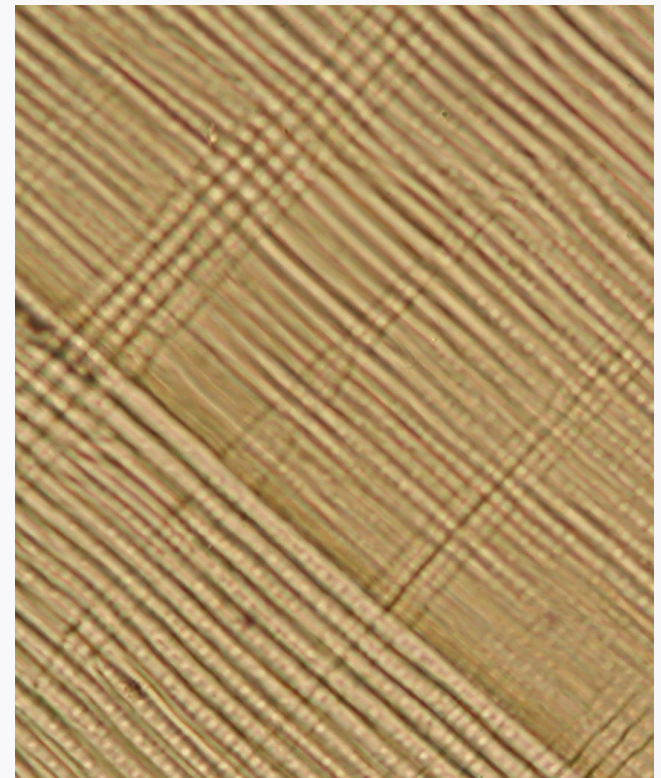
- Microscopy: parenchymatic cells (spring and summer wood), vessels with lenticels, vessels, medullar rays
- Radial section



vessels

lenticells

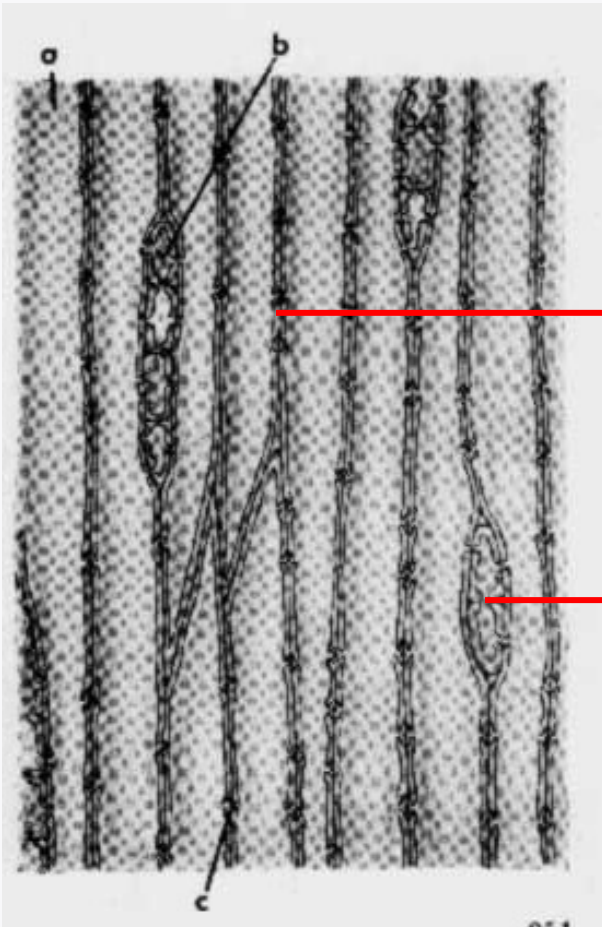
medullar rays





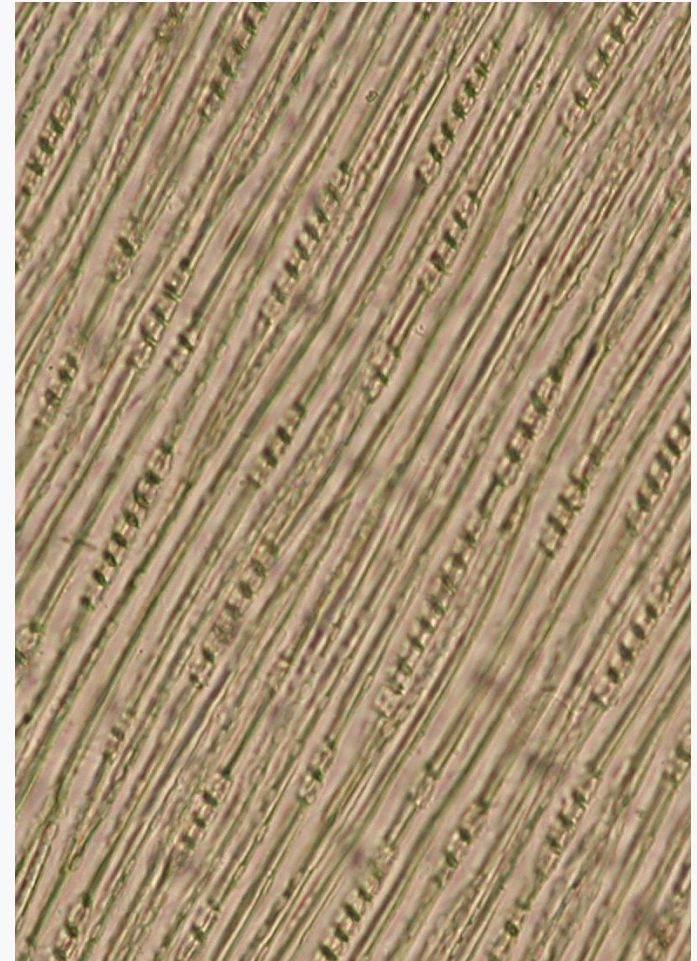
Juniperi lignum

- Microscopy:
tangential section



vessels

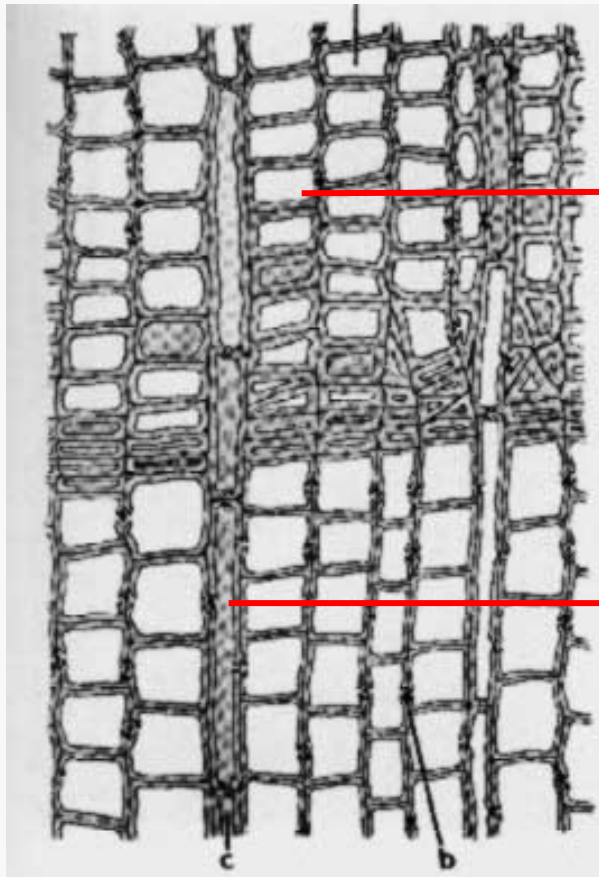
medullar rays





Juniperi lignum

- Microscopy:
transversal section



vessels

summer
wood

medullar
rays

spring
wood





Sennae folium CzPh 2017

- Mother plant: *Cassia senna* syn. *C. acutifolia*, *C. angustifolia*, **Fabaceae (Caesalpinioideae)**, (Senna)
- *Sennae folii extractum siccum normatum* CzPh 2017





Sennae folium CzPh 2017

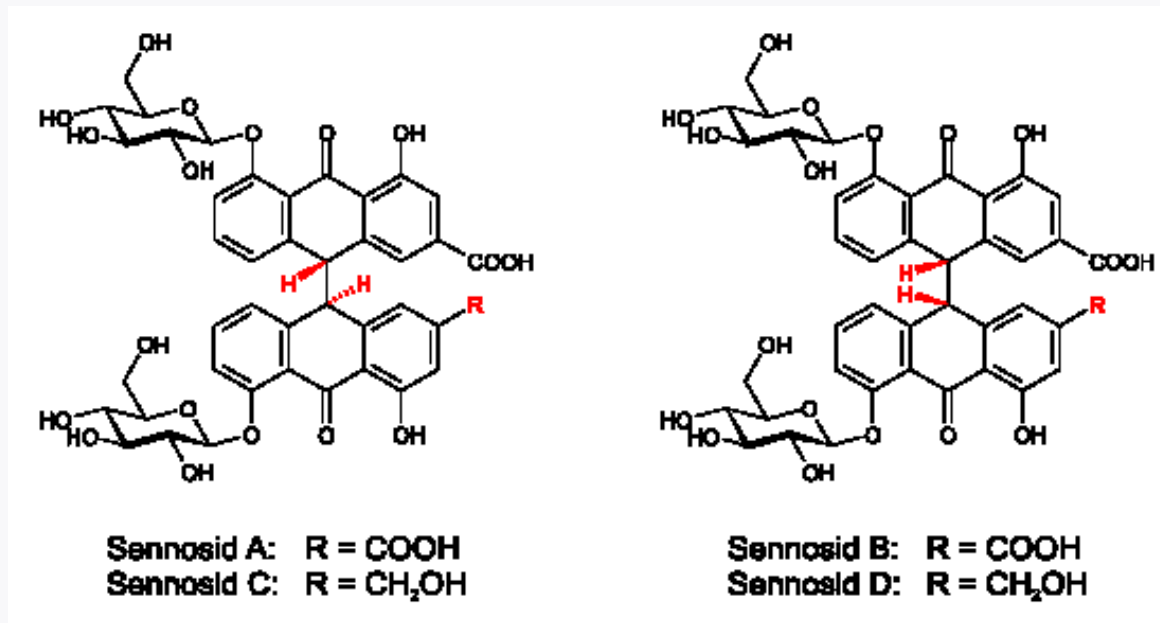
- Macroscopy: weak odour, taste firstly sweetish, later mucilaginous, bitter
 - *C. angustifolia* – narrow lanceolate leaves, sessile, notched, yellow-green to brown-green
 - *C. senna* – wider, oval, *integerrimum*, finely pubescent, gray-green to brown green





Sennae folium CzPh 2017

- Content compounds: dianthrone glycosides, flavonoids, bitter compounds, mucilage, tannins

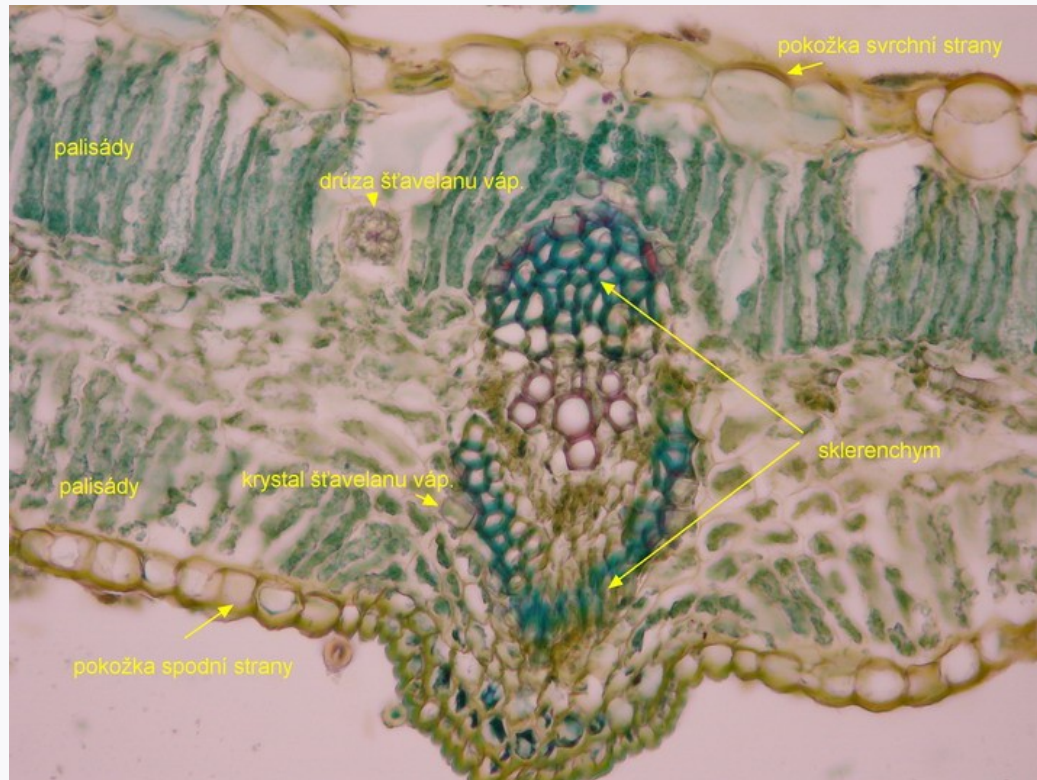


- Usage: laxative
- Interactions: risk of hypokalemia, treatment with digoxin, treatment with diuretics

Sennae folium CzPh 2017



- **Microscopy:** typical monofacial leaf with strong cuticle, layer of epidermal cells, mucilage cells, covering trichomes, stomata, palisade parenchyma, spongy parenchyma with aggregates of calcium oxalate, vascular bundle main and secondary with sclerenchymatic cells



Sennae folium CzPh 2017



■ Microscopy:

covering trichome

epidermis with cuticle

mucilage cell

palisade

spongy parenchyma

xylem

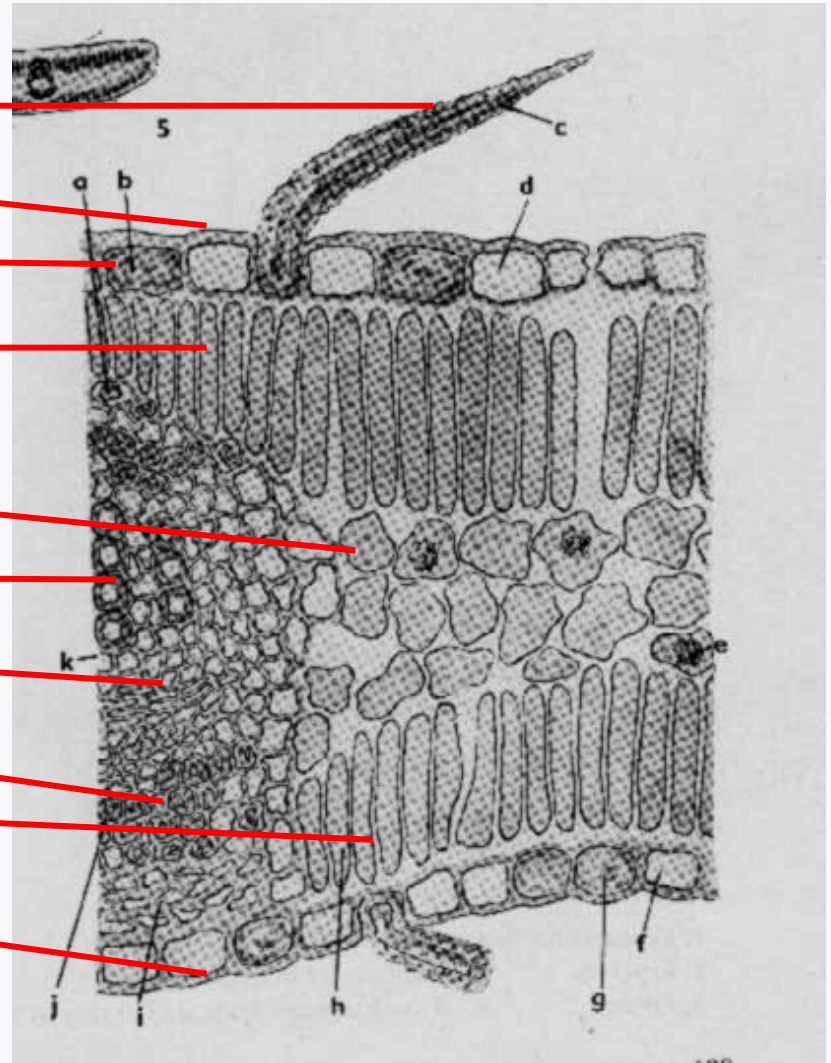
phloem

phloem fibers

palisades

epidermis

collateral vascular bundle





MACROSCOPY

Cinnamomi cortex CzPh 2017



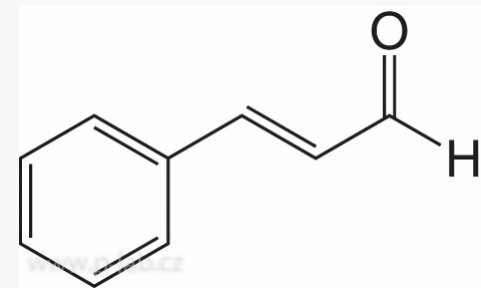
- Mother plant: *Cinnamomum zeylanicum* syn. *C. verum*, **Lauraceae**, (Ceylon Cinnamon)
 - *Cinnamomi zeylanici corticis etheroleum* CzPh 2017



Cinnamomi cortex CzPh 2017



- Macroscopy: pieces of cortex tubularly curled, on the surface smooth, finely striated, yellow-brown, inner side more dark, longitudinally wrinkled, characteristic odour, taste warm spicy and sweetish
- Content compounds: **essential oil** (cinnamaldehyde up to 75%, eugenol), condensed tannins, diterpens, mucilage
- Usage: stomachic, additive to correct taste and smell



cinnamaldehyde



Condurango cortex

- Mother plant: *Marsdenia condurango* Asclepiadaceae, (Condurango)





Condurango cortex

- Macroscopy: tubularly curled bark, gray peridermis, inner side gray-brown, weakly bitter taste, a bit irritant, balsamic odour



- Content compounds: **bitter substances - condurango glycosides**
– ester glycosides of pregnane type (steroid)
- Usage: amare, stomachic, appetite stimulant tonic



Rhamni purshianae cortex CzPh 2017

- Mother plant: *Rhamnus purshianus* syn. *Frangula purshiana*, **Rhamnaceae**, (Cascara sagrada)

Rhamni purshianae extractum siccum normatum CzPh 2017





Rhammi purshiana cortex CzPh 2017

- **Macroscopy:** pieces of bark, on the surface grey, often covered with mosses or lichens, inner side yellow-brown, without significant odour, bitter taste, irritating to vomit



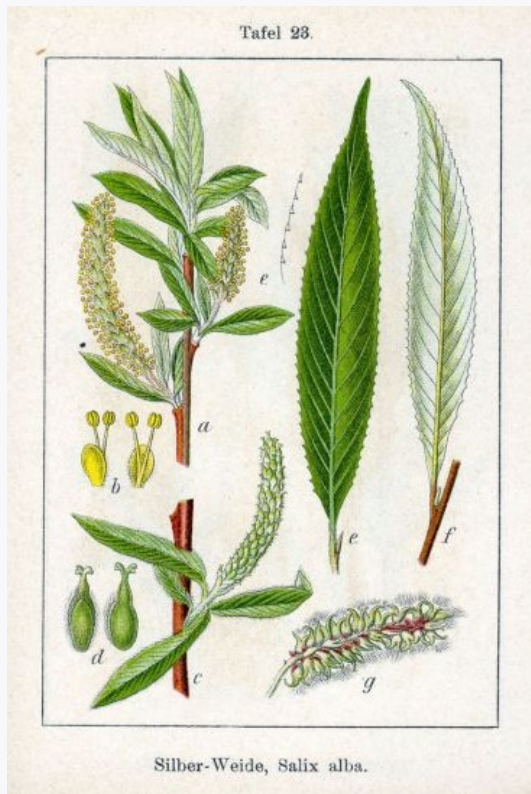
- **Content compounds:** hydroxyanthraquinone derivatives (**cascarosides**), flavonoids, bitter substances
- **Usage:** laxative, mild cholagogue and cholaretic



Salicis cortex CzPh 2017

- Mother plant: *Salix alba*, Salicaceae, also other species of genus *Salix*, (Willow)

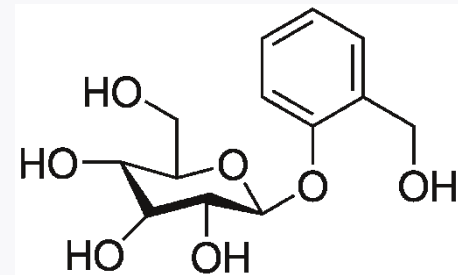
Salicis corticis extractum siccum CzPh 2017





Salicis cortex CzPh 2017

- Macroscopy: bark tubularly curled, elastic, surface smooth, shiny, without odour, bitter taste
- Content compounds: **phenolic glycosides** (salicin up to 10%, fragiline, populine), flavonoids, tannins,
- Usage: antipyretic, analgesic, antirheumatic, antiphlogistic



salicin



Quassiae lignum

- Mother plant: *Quassia amara*, Simaroubaceae – *Quassiae amarae lignum* (Surinam quassia)
- *Picrasma excelsa*, Simaroubaceae – *Quassiae jamaycensae lignum* (Jamaican quassia)





Quassiae lignum

- Macroscopy: whitish or yellowish wood, light and soft, easy to cut, no annual rings, without odour, bitter taste



- Content compounds: **quassinoids** (non-glycosidic bitter C20 or C25 compounds)
- Usage: bitter aperitif, tonic, insecticides, antimalarial



Bucco folium

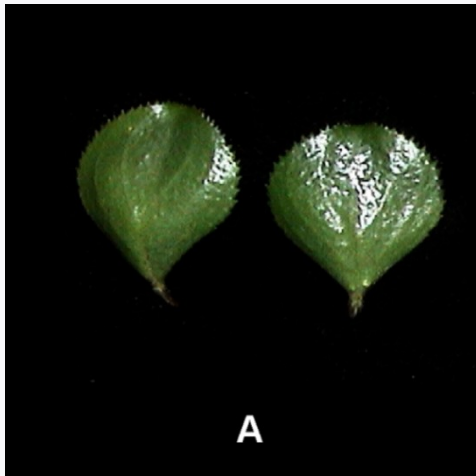
- Mother plant: *Barosma* spp., Rutaceae, (Buchu)





Bucco folium

- **Macroscopy:** leather-like, tough leaves, yellow-green colour, serrated, glandular pointed, aromatic odour and taste



Folium bucco rotunda
B. betulina – oval leaves



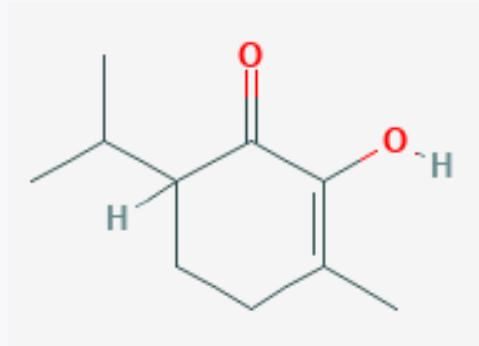
Folium bucco longa
B. serratifolia – ellipsoid longer leaves





Bucco folium

- Content compounds: essential oil (diosfenol), flavonoids (diosmin)



diosfenol

- Usage: urinary desinfectant, diuretic



Juglandis folium

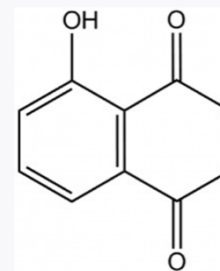
- Mother plant: *Juglans regia*, Juglandaceae, (Walnut tree)





Juglandis folium

- Macroscopy: leather-like, dark green, shiny, without stalk, *integerrimus*, pleasant odour, bitter and astringent taste
- Content compounds:
gallo-tannins,, naphthoquinones (juglone), volatiles
- Usage: astringent, haemostatic, externally to treat frostbite

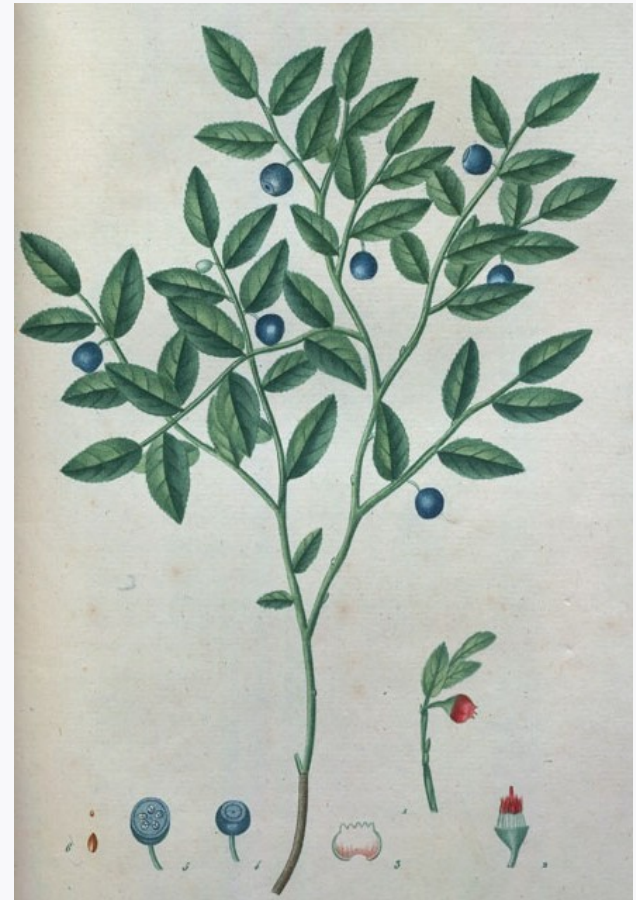


juglone



Myrtilli folium

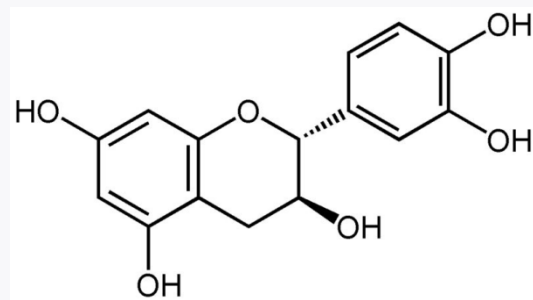
Mother plant: *Vaccinium myrtillus*, Ericaceae (Vaccinioideae),
(Blueberry)





Myrtilli folium

- Macroscopy: egg-like leaves with serrated margin, non-shiny, bright green, without odour, astringent taste
- Content compounds: **catechin tannins**, flavonoids, glucokinins, organic acids, trace amounts of phenolic glycosides
- Usage: astringent, antiseptic, antidiabetic, diuretic



catechin



Lauri folium

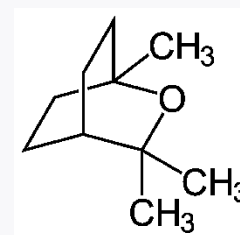
Mother plant: *Laurus nobilis*, Lauraceae, (Laurel)





Lauri folium

- Macroscopy: elongated, lanceolate, shiny, leather-like leaves, wavy margin, spicy odour, spicy bitterish taste
- Content compounds:
essential oil (cineol), tannins, isoquinoline alkaloids
- Usage: digestif, aromatic, spice



cineol



Vitis ideaei folium

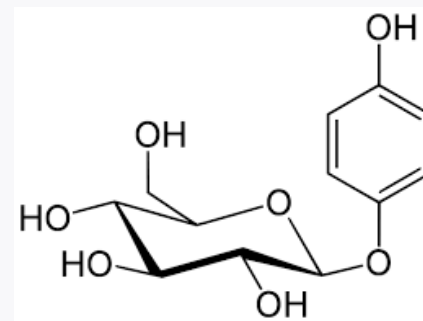
- Mother plant: *Vaccinium vitis idaeae*, Vacciniaceae (bearberry)





Vitis idaeae folium

- Macroscopy: leather-like leaves, opposite oval, *integerrimus*, on the face darker, without odour, bitter astringent taste
- Content compounds: **phenolic glycosides** (arbutin), condensed tannins, flavonoids
- Usage: astringent, urinary desinfectant

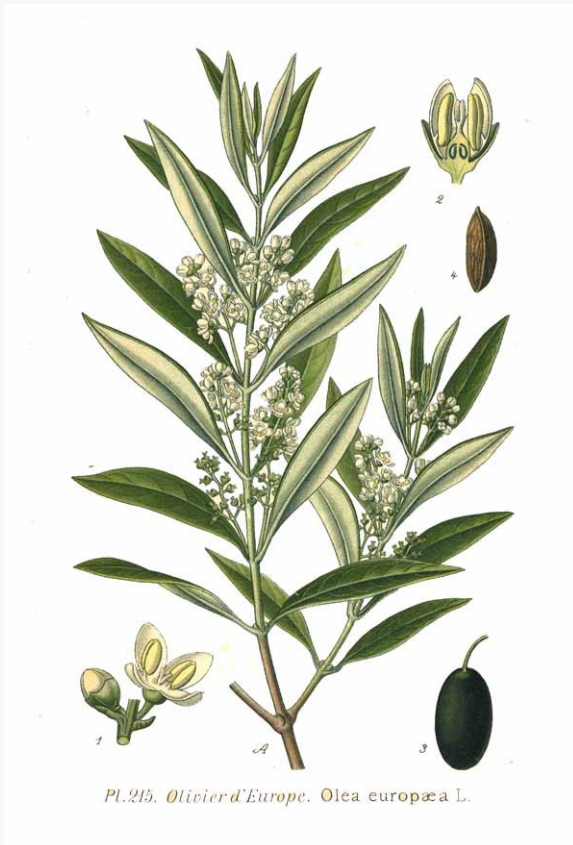


arbutin



Olivae folium

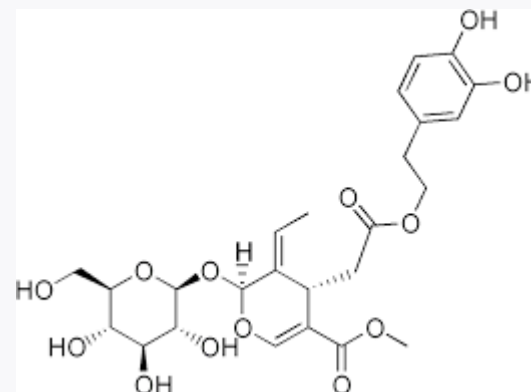
- Mother plant: **Olea europea, Oleaceae,** (Olive tree)





Olivae folium

- Macroscopy: leather-like leaves, opposite, subsessile, entire, coriaceous, grayish-green upper side, whitish underside, bitter taste
- Content compounds: secoiridoides (oleuropein), triterpenes, flavonoids
- Usage: hypoglycemic, hypotensive, diuretic



oleuropein