

Pharmacognosy

lab exercise 8



Leaves, herbs

Belladonnae folium CzPh 2017



- Mother plant: *Atropa belladonna*, **Solanaceae** (Deadly Nightshade)
- *Belladonnae folii extractum siccum normatum* CzPh 2017
- *Belladonnae folii tinctura normata* CzPh 2017
- *Belladonnae pulvis normatus* CzPh 2017

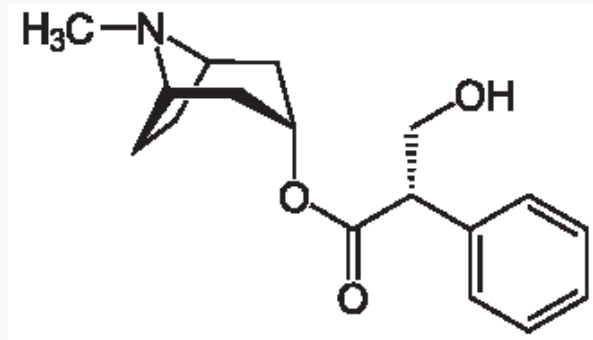


Belladonnae folium

CzPh 2017



- **Macroscopy:** oval leaves, sharpened, *integerrimum*, on the face brown-green, reversed side grey-green, infrequently and smoothly hairy, numerous grey dots, narcotic odour, sharp bitter taste
- **Content compounds:** **tropane alkaloids** (*L*-hyoscyamine – racemization to atropine), coumarins
- **Usage:** isolation of alkaloids: neurotropic parasympatolytic, spasmolytic, antiasthmatic



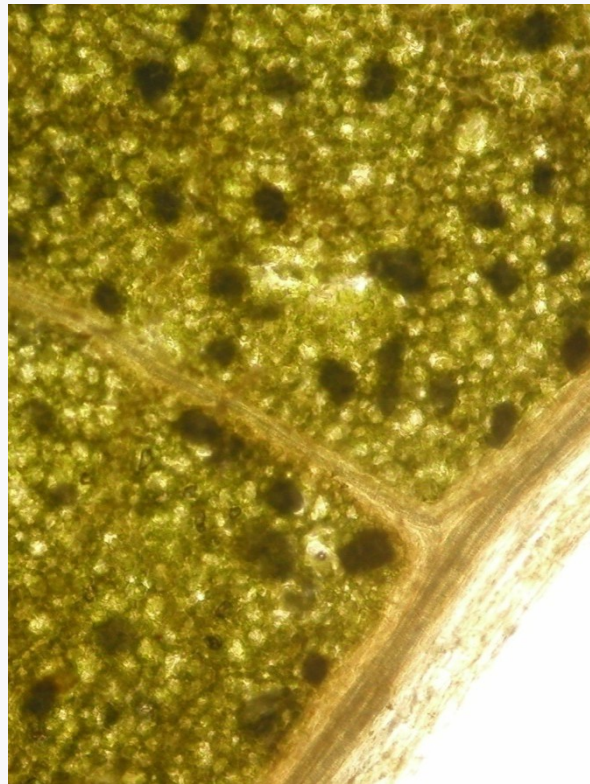
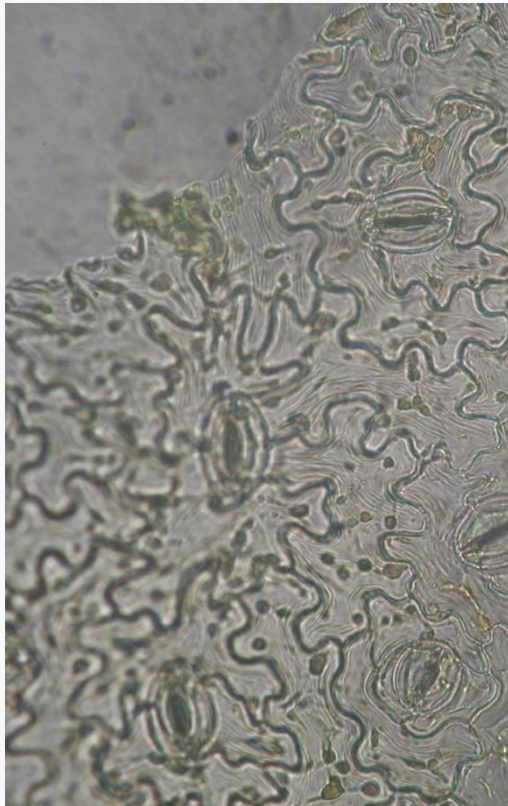
L-hyoscyamine

Belladonnae folium

CzPh 2017



- Microscopy: upper epidermis with covering trichomes (polycellular, spiky) and glandular trichomes with uni-cellular pod and uni- or poly-cellular head, sand cells, stomata of *Brassicaceae* type



Belladonnae folium

CzPh 2017

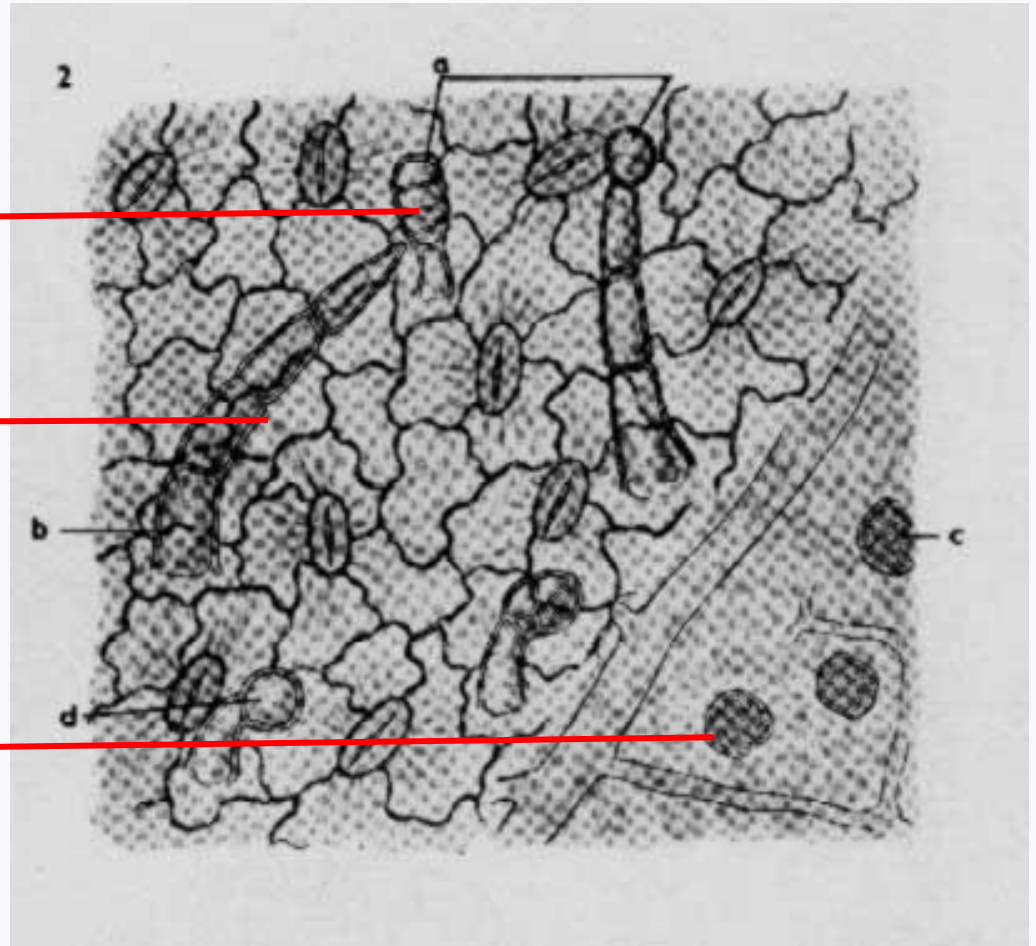


■ Microscopy:

glandular trichome

covering trichome

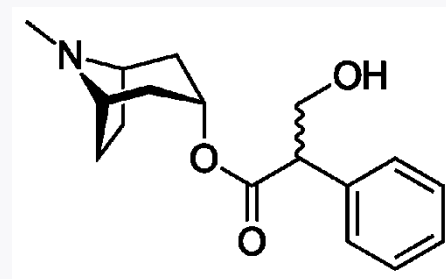
sand cells



Hyoscyami folium



- Macroscopy: long leaf, matt grey-green, both sides hairy, distinct central vein with higher number of trichomes, narcotic odour, sharp bitter-sweet taste
- Content compounds: **tropane alkaloids** (hyoscyamine, scopolamine)
- Usage: isolation of alkaloids: parasympatolytic

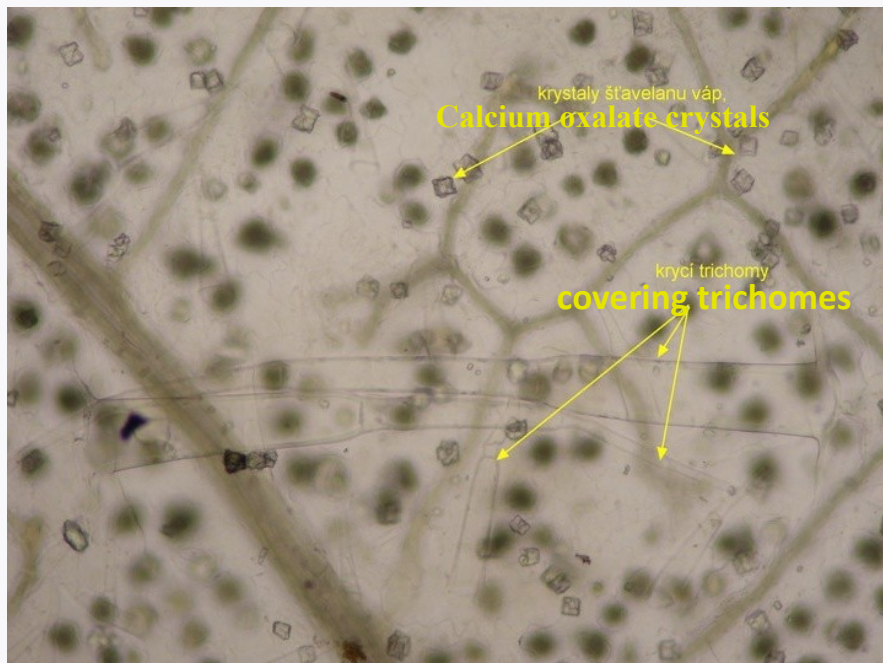


atropine

Hyoscyami folium



- Microscopy: stomata of *Brassicaceae* type, covering trichomes poly-cellular, glandular trichomes with poly-cellular pod and uni- or poly-cellular head, crystals of calcium oxalate in leaf mesophyll



Hyoscyami folium

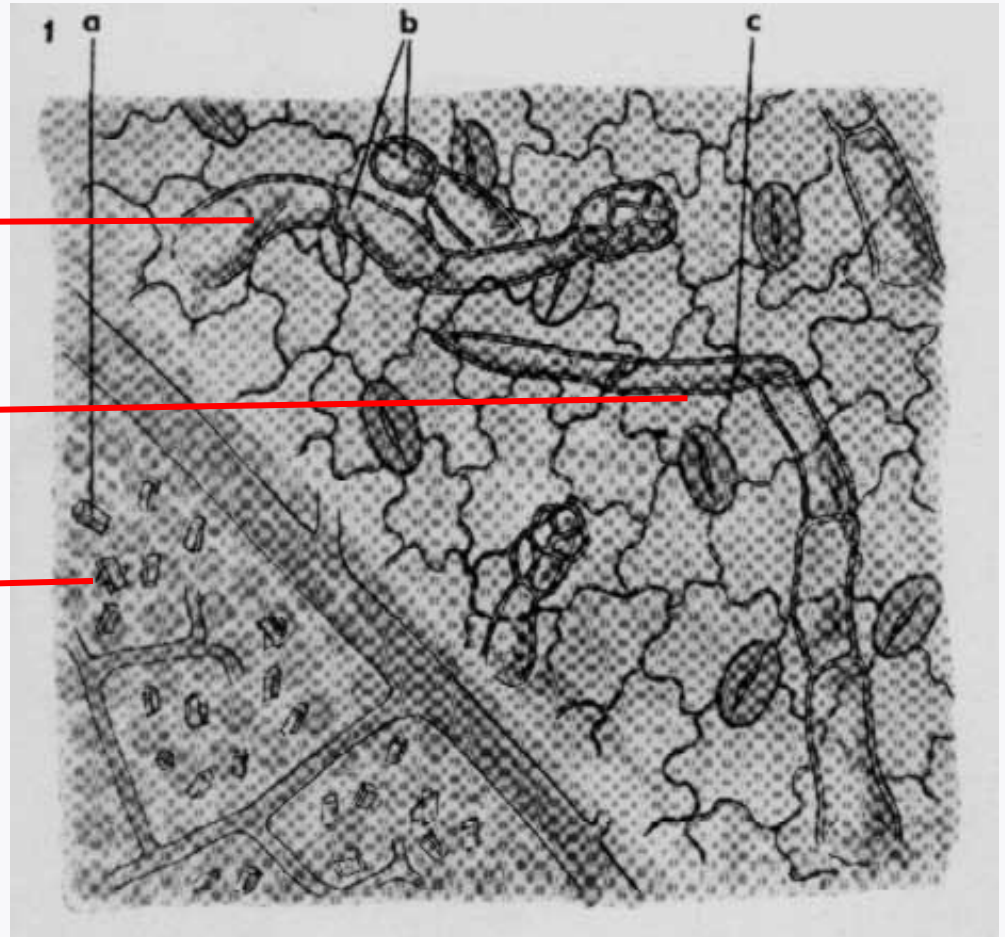


■ Microscopy:

glandular trichome

covering trichome

crystals





Stramonii folium

CzPh 2017



- Mother plant: *Datura stramonium*, **Solanaceae** (Thorn Apple, Devil s Weed)
- *Stramonii folii pulvis normatus* CzPh 2017

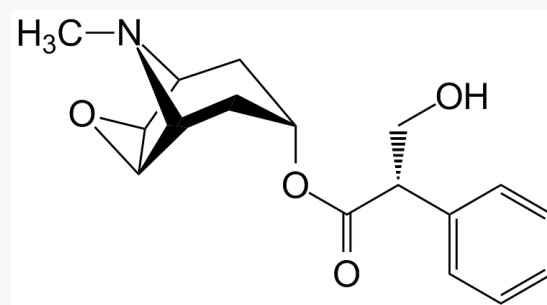


Stramonii folium

CzPh 2017



- Macroscopy: fragile leaf, thin, almost bald, stalked, strongly lobular, serrated, on the face richly green, on the reversed side brighter, weak narcotic odour, taste sharp bitter
- Content compounds: **tropane alkaloids** (up to 0.25%), higher scopolamine content
- Usage: isolation of alkaloids (sedative effect of scopolamine), production of semisynthetic derivatives



scopolamine

Stramonii folium

CzPh 2017

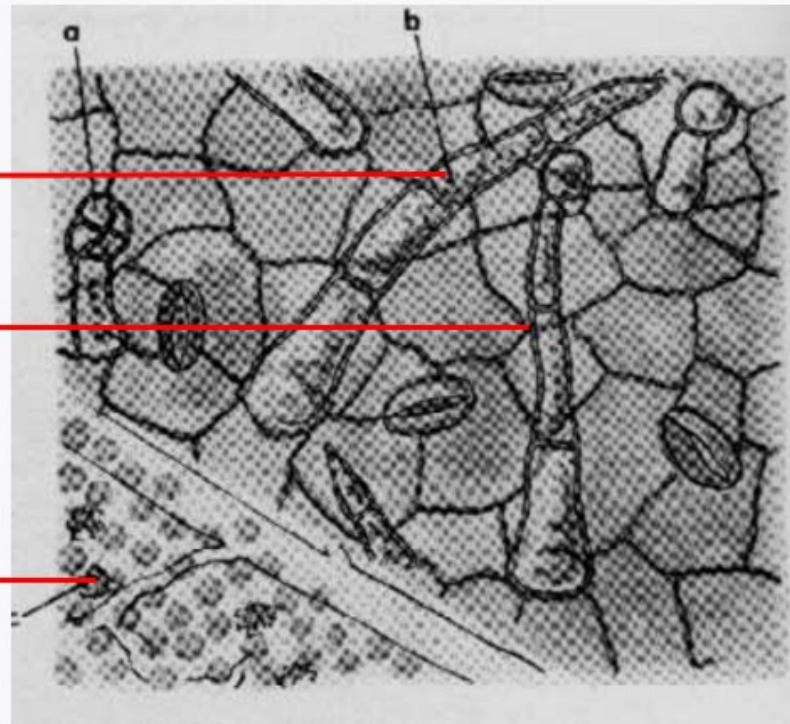


- Microscopy: stomata of *Brassicaceae* type, covering trichomes 2 - 5 cellular with grainy cuticle, shortly stalked glandular trichomes with poly-cellular head, aggregates of calcium oxalate in leaf mesophyll, multi-edged cells of epidermis

covering trichomes

glandular trichome

calcium oxalate
crystals aggregates

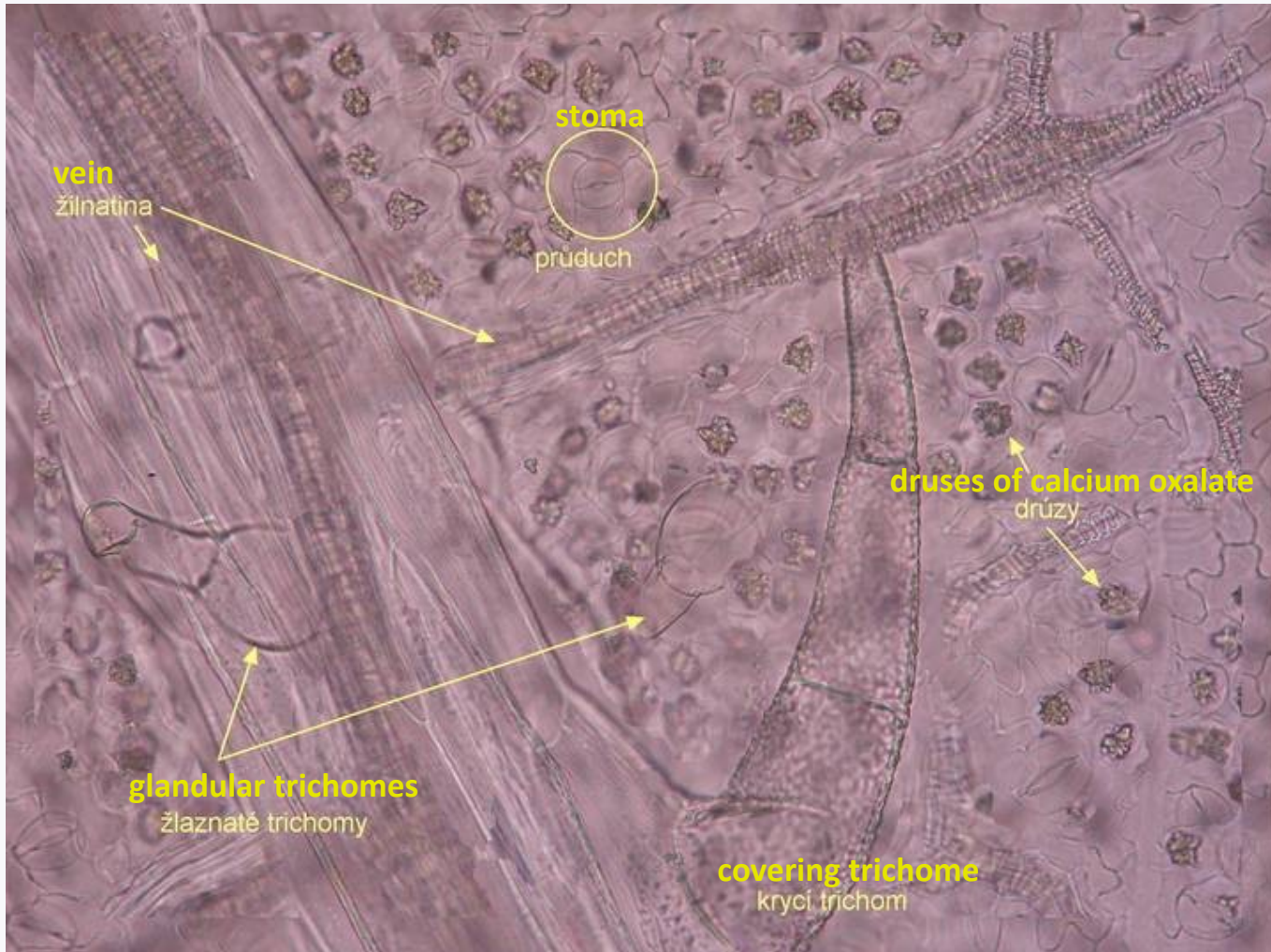


Stramonii folium

CzPh 2017



■ Microscopy:





Melissae folium CzPh 2017

Melissae herba CzPh 2017^{National part}

- ◆ Mother plant: *Melissa officinalis*, Lamiaceae Lemon Balm
 - *Melissae folii extractum siccum* CzPh 2017





Melissae folium CzPh 2017

Melissae herba CzPh 2017^{National part}

- Macroscopy: 4-edged stem, opposite leaves stalked broadly oval, serrate margins, on the face richly green, wrinkled, softly hairy, reversed side of leaves brighter, almost bald, white flowers in pseudo-verticilles, pleasant citrus odour, pleasant aromatic taste



- Content compounds: **essential oil** – monoterpenes (**citronellal**, citral, **nerole**, **geraniol**, linalool), sesquiterpens (caryophylen); rosmarinic acid, tannins, flavonoids
- Usage: sedative, nervinum; carminative, spasmolytic; antibacterial and antiviral effect

Melissae folium CzPh 2017

Melissae herba CzPh 2017^{National part}



■ Microscopy:

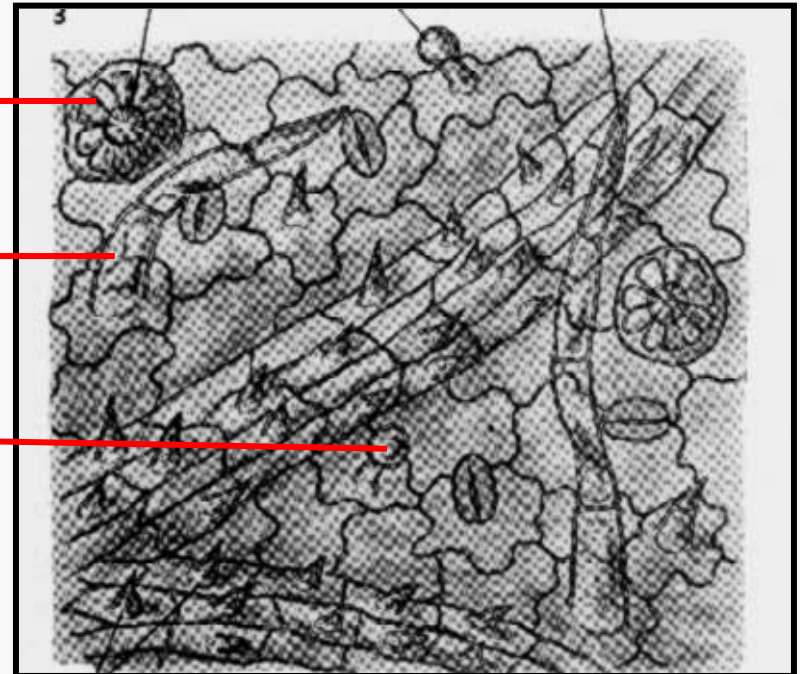
surface - stomata (*Caryophyllaceae* type),
covering and glandular trichomes,
glandules of *Lamiaceae* type



glandule

covering trichome

glandular trichome

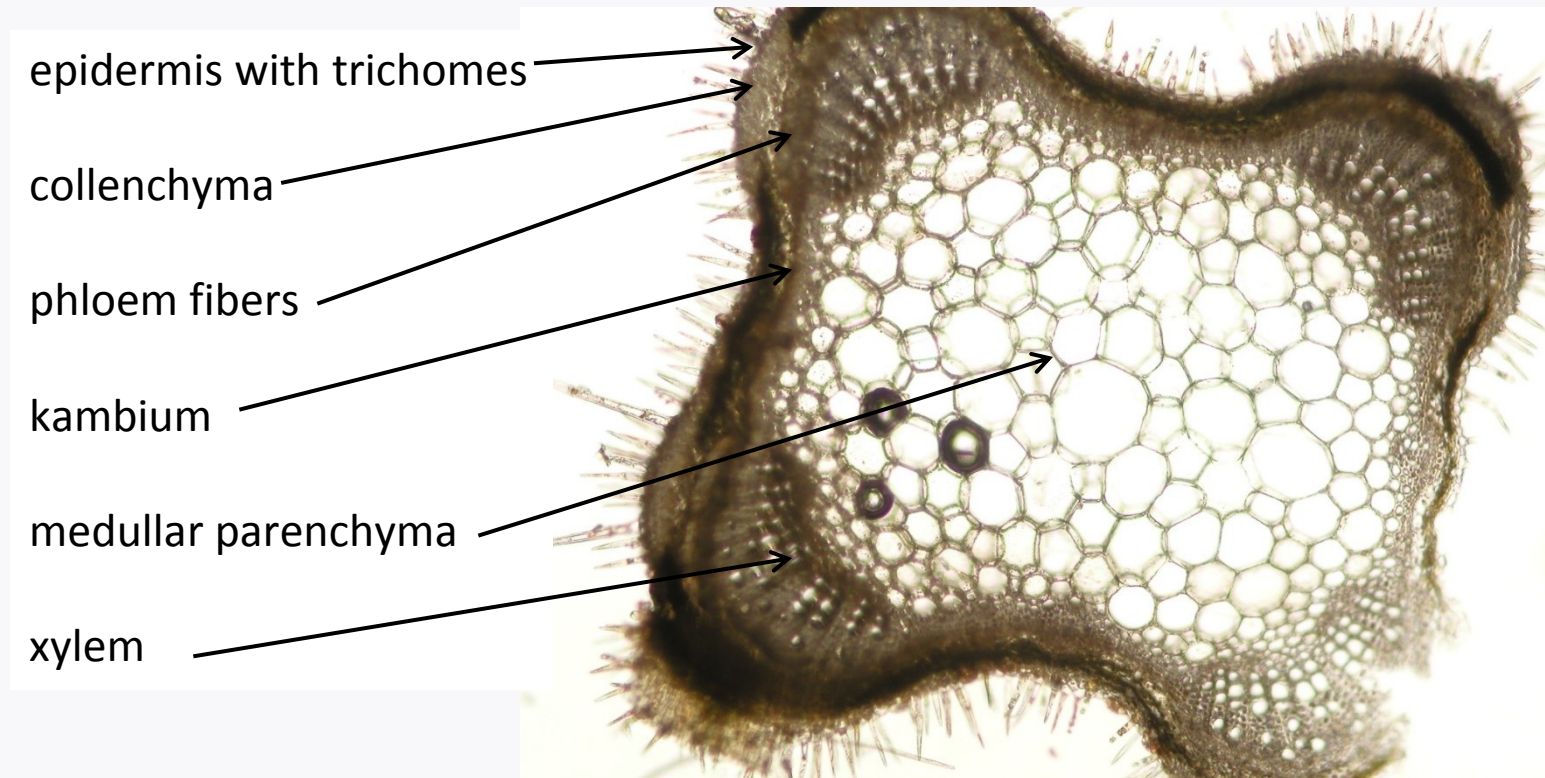


Melissae folium CzPh 2017

Melissae herba CzPh 2017^{National part}



- **Microscopy:** stem – transversal section – covering and glandular trichomes, epidermis, reinforcing collenchyma, cortex parenchyma, thickened phloem fibers, collateral vascular bundle with sclerenchymatic sheath





Menthae piperitae folium CzPh 2017

Menthae piperitae herba CzPh 2017

- Mother plant: *Mentha x piperita*, Lamiaceae (Peppermint)
- *Menthae piperitae folii extractum siccum* CzPh 2017
- *Menthae piperitae etheroleum* CzPh 2017





Menthae piperitae folium

CzPh 2017

- Macroscopy: 4-edged green-brown stems, opposite leaves stalked, oval, sharply serrated margins, slightly hairy, purple veins on the reversed side, purple flowers in pseudo-verticilles creating spikes, menthol odour, taste spicy hot taste, later cooling

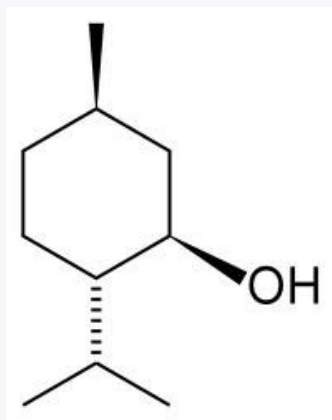




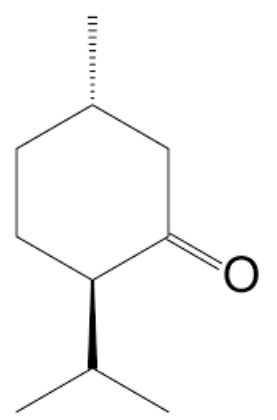
Menthae piperitae folium

CzPh 2017

- Content compounds: essential oil - monoterpenes (menthol, menthone), menthofurane, felandrene, piperidone; tannins, flavonoids



menthol



menthone

- Usage: stomachic, carminative, antiseptic, spasmolytic, choleric; taste and smell corrigens in tea mixtures; pure menthol: derivans, antiseptic, local anaesthetic

Menthae piperitae folium

CzPh 2017



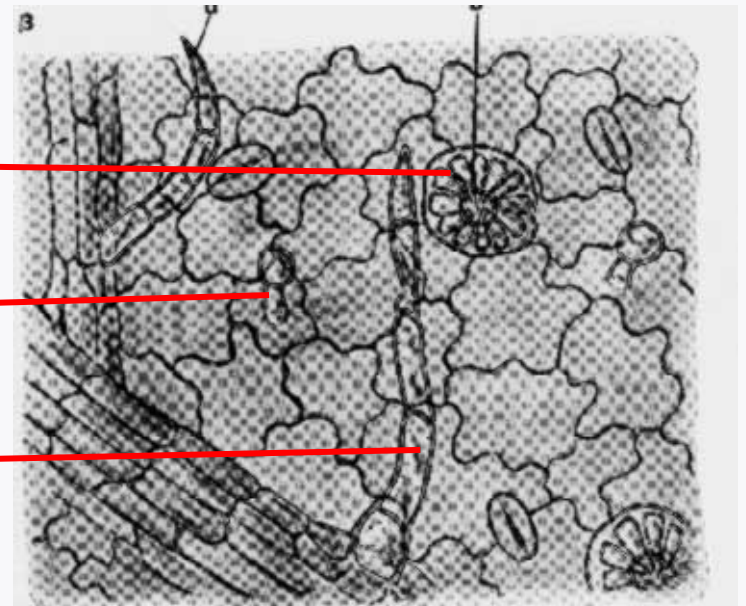
- **Microscopy:** surface – lobular cells, stomata (*Caryophyllaceae* type), on the reversed side covering and glandular trichomes, glandules of *Lamiaceae* type



glandule

glandular trichome

covering trichome

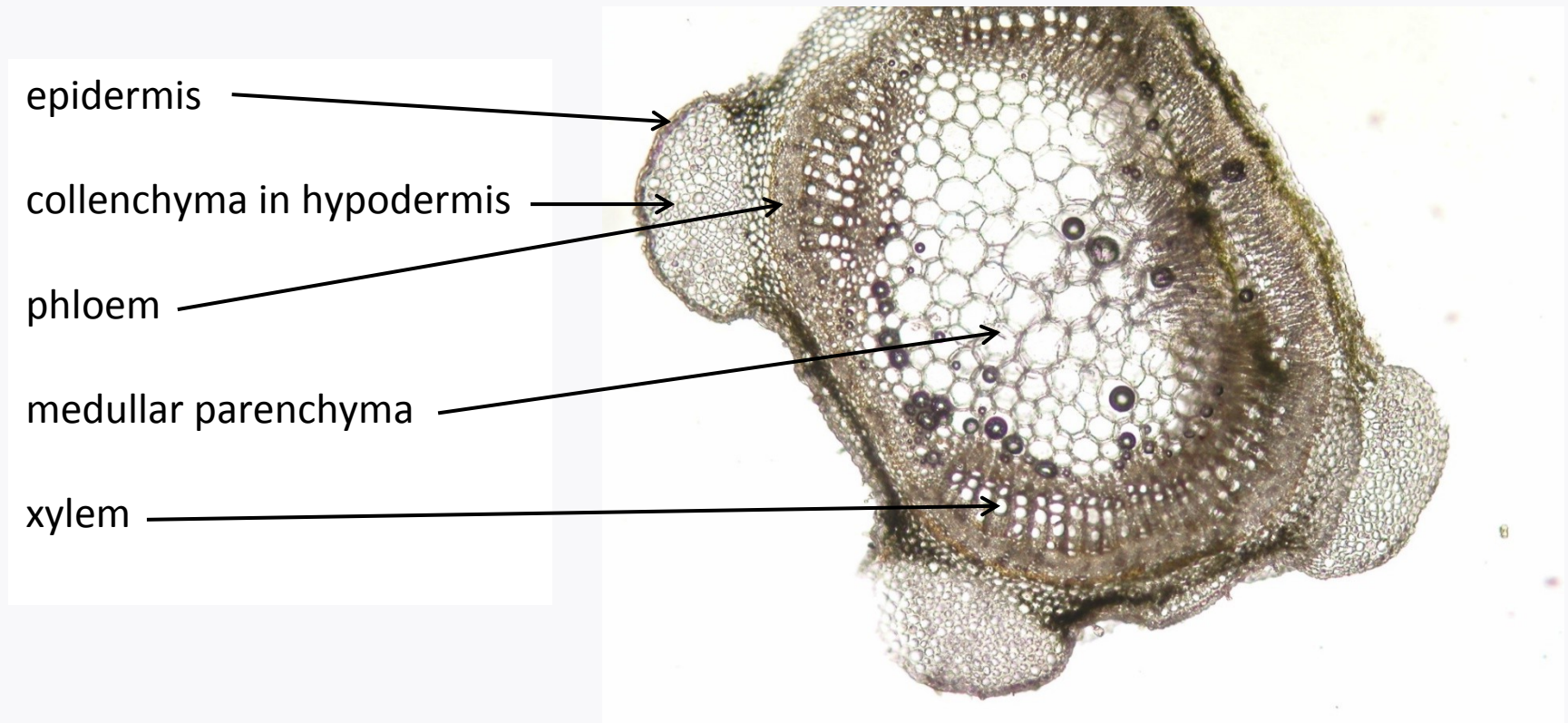


Menthae piperitae folium

CzPh 2017



- Microscopy: stem – transversal section: nipped cuticle with trichomes, epidermis, collenchymatic cells, narrow cortex, collateral vascular bundles, in wood parenchyma cells with crystals of calcium oxalate





Thymi herba CzPh 2017

- Mother plant: *Thymus vulgaris*, *Thymus zygis* Lamiaceae (Thyme)

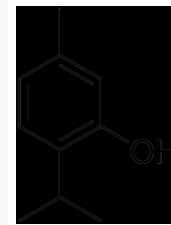
Thymi typo thymolo etheroleum CzPh 2017



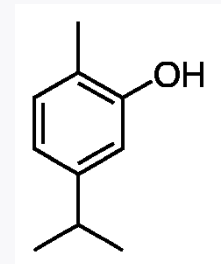
Thymi herba CzPh 2017



- **Macroscopy:** 4-edged stems, hairy sessile short line-like leaves with underwinded margin, on the face green and bald, on the reversed side glandular pointed, flowers white or purplish in verticiles, pleasant aromatic odour and taste
- **Content compounds:** essential oil – monoterpens (**thymol**, **carvacrol**); tannins, flavonoids
- **Usage:** expectorans, stomachic, antiseptic, astringent, antiphlogistic



thymol



carvacrol



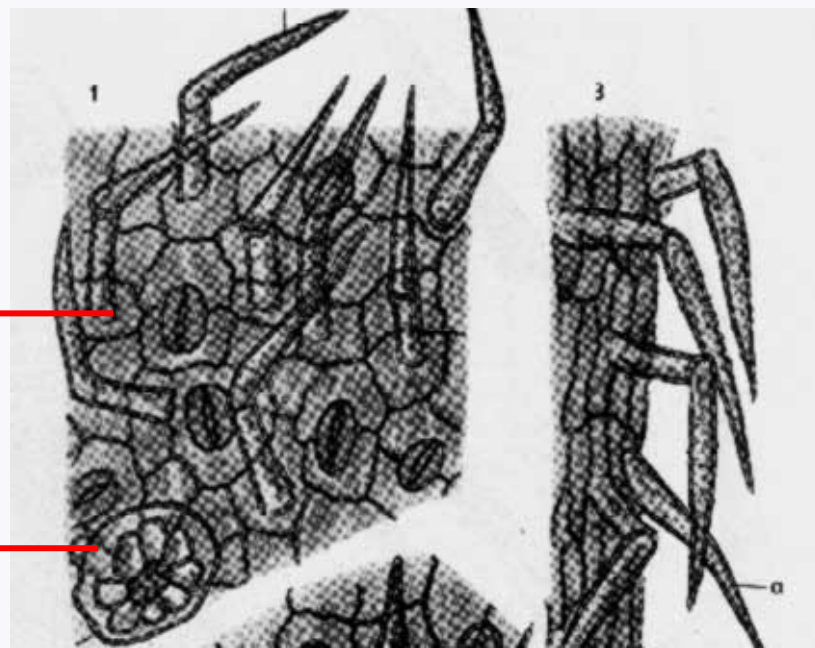
Thymi herba CzPh 2017

- Microscopy: surface – wavy epidermal cells, nodular covering trichomes, glandular trichomes, glandules of *Lamiaceae* type



covering trichome —

glandule —





Thymi herba CzPh 2017

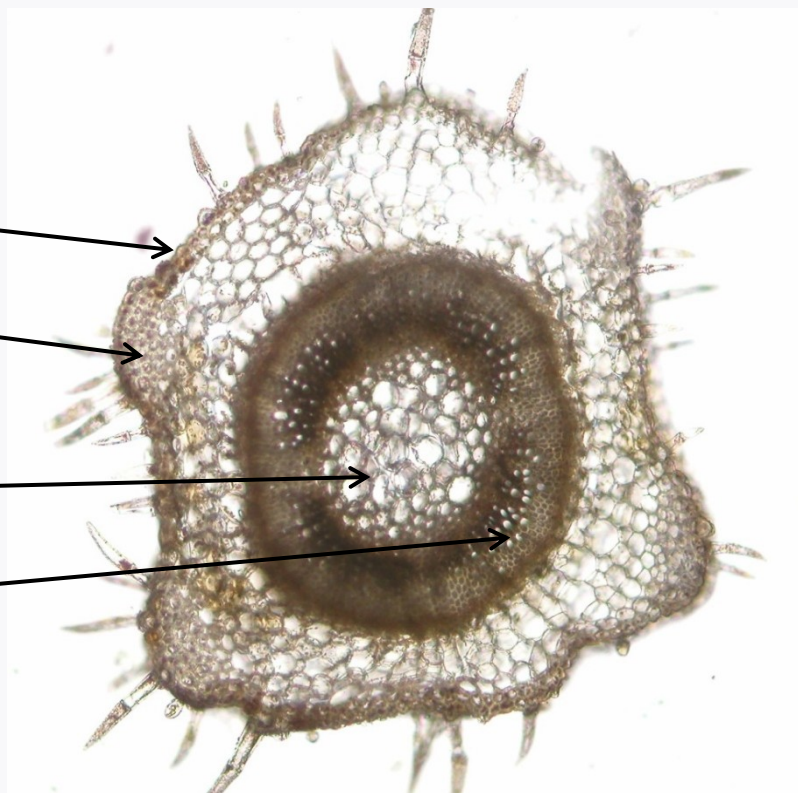
- Microscopy: Stem – transversal section – epidermis with plate-shaped cells with nipped cuticle, trichomes, reinforcing collenchyma, collateral vascular bundle, vessels with libriform, medullar rays unilinear, in medulla chain parenchyma

epidermis with cuticle

hypodermis with collenchyma

medullar parenchyma

veins with libriform



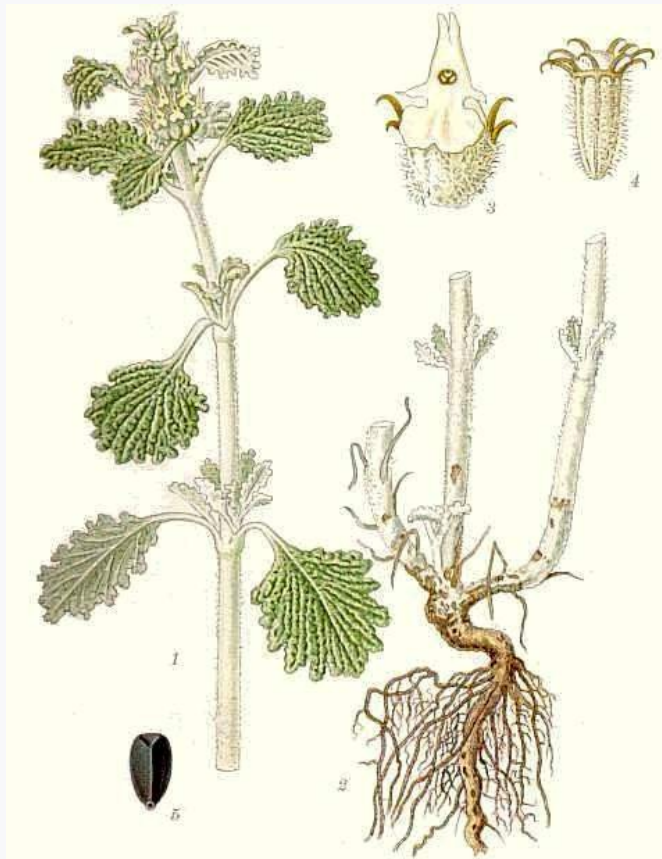


MACROSCOPY



Marrubii herba CzPh 2017

- Mother plant: *Marrubium vulgare*, Lamiaceae (White Horehound or Common Horehound)



Marrubii herba CzPh 2017



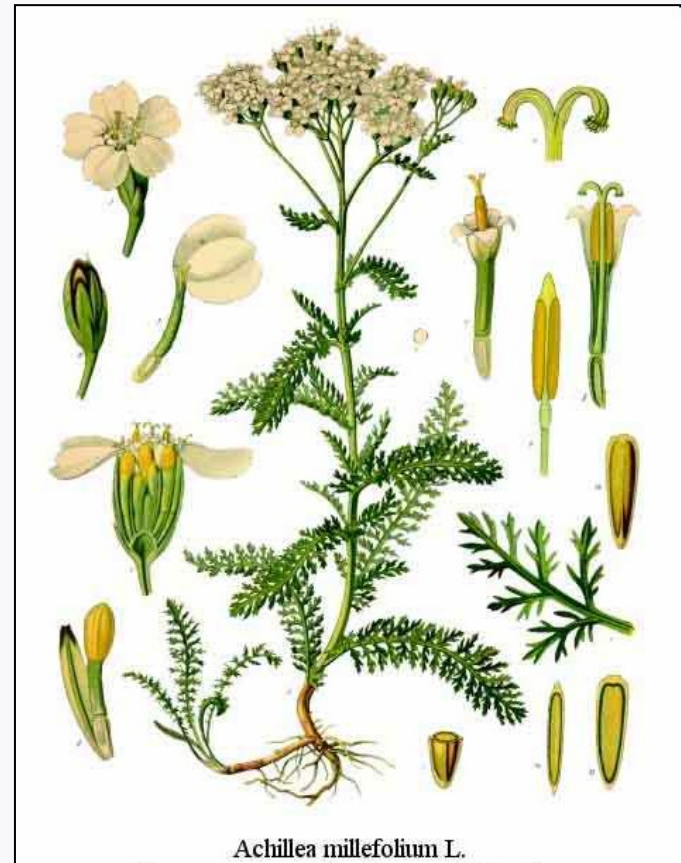
- Macroscopy: 4-edged white felt-like stems, opposite leaves, wrinkled, oval, on the margin serrated, on the face almost bald, on the reversed face hairy, small white flowers in pseudo-verticilles, apple odour, very bitter taste
- Content compounds: **bitter substances** (diterpenic lactone **marrubiin**), essential oils, tannins, saponins
- Usage: amare, choloretic, carminative; secretolytic expectorant, mild anti-inflammatory effect



Millefolii herba CzPh 2017



- Mother plant: *Achillea millefolium*, Asteraceae (Yarrow)



Millefolii herba CzPh 2017



- Macroscopy: whole stems with flower head of yellow-white flowers, leaves narrow cutted, divided to segments, aromatic odour, bitter taste



- Content compounds: **essential oil** (sesquiterpens – proazulens), **bitter substances**, flavonoids, tannins, manganese salts
- Usage: amare, stomachic, spasmolytic, choloretic, expectorant, mild antiseptic, diuretic



Origani herba CzPh 2017

- Mother plant: *Origanum vulgare*, *O. onites*, Lamiaceae, (Oregano, Wild Marjoram)





Origani herba CzPh 2017

- Macroscopy: weakly edged reddish stems, opposite leaves, purple flowers in terminal erect spikes, pleasant aromatic odour, spicy bitter taste
- Content compounds: **essential oil (thymol, carvacrol)**; tannins, bitter substances
- Usage: stomachic - amare, expectorant, spasmolytic, carminative





Polygoni avicularis herba

CzPh 2017

- Mother plant: *Polygonum aviculare*, Polygonaceae (Common Kntogress, Birdweed)



Polygoni avicularis herba

CzPh 2017



- Macroscopy: green stems, leaves almost sessile, elipsoid, *integerrimum*, small flowers in underarm of leaves, without odour, bitter astringent taste
- Content compounds: **flavonoids**, **mucilage**, higher amount of soluble **silica acid**, **tannins**, phenolic glycosides, vitamin C
- Usage: expectorant, diuretic, astringent, antiphlogistic, haemostyptic





Salviae officinalis folium CzPh 2017

Salviae herba CzPh 2017

- Mother plant: *Salvia officinalis*, Lamiaceae (Sage)
- *Salviae tinctura* CzPh 2017
- *Salviae sclareae etheroleum* CzPh 2017
- *Salviae trilobae folium* CzPh 2017
- *Salviae lavandulifoliae etheroleum* CzPh 2017





Salviae officinalis folium CzPh 2017

Salviae herba CzPh 2017

- Macroscopy:

rounded grey felt-like stems, strong leaves, stalked, green-grey, prolonged oval, flowers in poor verticiles with two-labiate corolla, aromatic odour, bitter astringent taste



- Content compounds: **essential oil** (monoterpens – thujon, cineole, camphora, pinen); **bitter substances** (pikrosalvine); **tannins**, saponins, flavonoids

- Usage: antiphlogistic, spasmolytic, antihydrotic;
externally - astringent, dermatologic, antilactagogue



Serpylli herba CzPh 2017

- Mother plant: *Thymus serpyllum*, Lamiaceae (Wild Thyme)





Serpylli herba CzPh 2017

- Macroscopy: rounded stems, oval, *integerrimum* leaves, almost sessile with mild underwinded margin, on the reversed side glandularly pointed, purple-black and white flowers in pseudo-verticiles, aromatic odour, spicy bitter taste
- Content compounds: **essential oil (thymol, carvacrol)**, tannins, bitter compounds, flavonoids, minerals
- Usage: expectorans, bronchospasmolytic, stomachic, antiseptic, antiphlogistic





Urticae herba

Urticae folium CzPh 2017

- Mother plant: *Urtica dioica*, *Urticaceae* (Stinkink Nettle)
- *Urticae radix* CzPh 2017





Urticae herba

- Macroscopy: stem direct 4-edged, stalked leaves, oval, spiked, coarse serrated, flowers in leaves underarms, greenish, drug smells like spinach, bitter and acrid taste



- Content compounds: **chlorophyll**, **flavonoids**, carotenoids, triterpens, sterols, minerals, vitamins K and C
- Usage: metabolic, diuretic, antiseptic, antirheumatic; astringens, hemostyptic



Visci albi herba

Mother plant: *Viscum album*, Santalaceae (Mistletoe)





Visci albi herba

- **Macroscopy:** rounded, furcated branched stems, slightly fragile, prolonged oval leaves with compact margin, tough, leatherlike, uni-seminal fruits, weak odour, bitter taste
- **Content compounds:** **cardiotoxic proteins** **viscotoxins**, **lectins** (=glycoproteins) amines, flavonoids, polysaccharides, lignans
- **Usage:** hypotonic, antisclerotic (flavonoids), cytotoxic (lectins)
Intradermally – treatment of degenerative inflammatory diseases of joints, treatment of cancer

