



COMPOUNDS AFFECTING CENTRAL NERVOUS SYSTEM

SEDATIVES

Calming CNS via suppression of increased irritability
Biogenic drugs of this group possess complex character
Effect is triggered after repeated application



VALERIANAE RADIX – VALERIAN ROOT (ČL 2002)

Valeriana officinalis L. sensu lato – valerian
(Valerianaceae)

- Perennial huge plant home in Europe and Asia
- Polymorphous species divided in to series and types; differ both in number of chromosomes and content compounds
- For pharmaceutical purposes cultivated

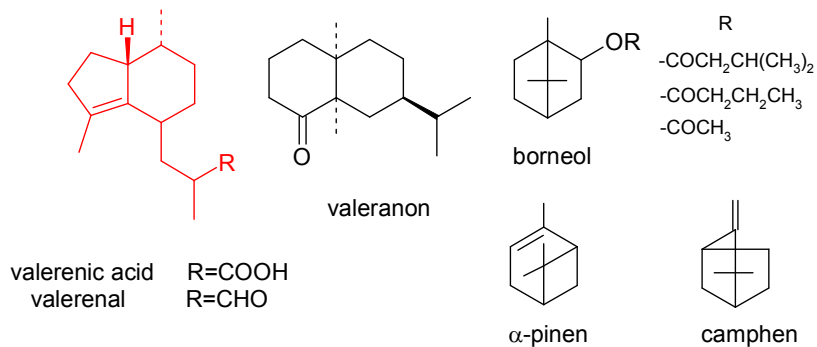


VALERIANAE RADIX

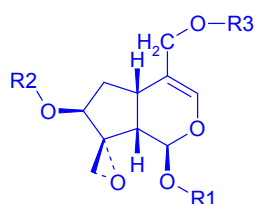
- Drug is formed up to 40 °C dried rhizomes with numerous roots and spits
- Characteristic odor
- Un-cut drug - 5 ml essential oil/kg
- Cut drug - 3 ml essential oil/kg
- Contains at least 0,17 % of sesquiterpenic acids counted as valerenic acid, relative to dried drug



VALERIANAE RADIX
CONTAIN COMPOUNDS – ESSENTIAL OIL

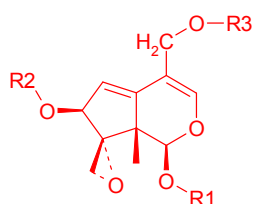


VALERIANAE RADIX
 CONTENT COMPOUNDS – VALEPOTRIATES
 (*Valeriana epoxy triesters*)



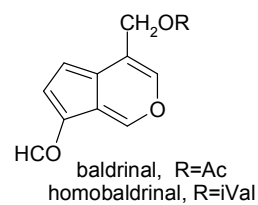
typ monoene
 didrovaltrate

R1 R2 R3
 iVal Ac iVal



typ diene
 valtrate
 isovaltrate
 acevaltrate

R1 R2 R3
 iVal iVal Ac
 iVal Ac (β-O-
 -Ac)iVal



VALERIANAE RADIX
 CONTENT COMPOUNDS

- Flavonoid glycosides derived from quercetine
- Traces of pyridine alkaloids (actinidine)
- Aminoacids glutamine, alanine, asparagine
- γ -aminobutyric acid (8g / kg of extract)



VALERIANAE RADIX

Valerianae tinctura – valerian tincture (ČL 2002 N)

Valerianae extractum fluidum – liquid valerian extract

Effect

- Valepotriates and their fissionable products – sedative, tranquilizers
- Valerenic acid – musculotropic spasmolytic, sedative
- Sesquiterpenes – slowing degradation of GABA

Utilization:

- insomnia, nervousness, feelings of tension
- antispasmodic (gastric)



VALERIANAE RADIX

- Drug is a part of herbal mixture (VALOFYT NEO, NERVOVÁ ČAJOVÁ SMĚS)
- Extract is part of sedative and spasmolytic mixtures
- Valepotriates are part of sedatives and tranquilizers (VALMANE, BALDRISEDON)

Production of valepotriates:

- *Valeriana wallichii* DC.– cultivated in India; contains 2,8-3,5 % of valepotriates
- *Valeriana edulis ssp. procera* – cultivated in Mexico; contains up to 7 % of valepotriates

MELISSAE FOLIUM – LEMON BALM LEAVES (ČL 2002)

Melissa officinalis L. – Lemon balm
(Lamiaceae)

- Perennial plant with branched stem
- White stalked flowers in valleys of leaves
- Cultivated in middle and south Europe

Drug: dried leaves harvested at the beginning of flowering period

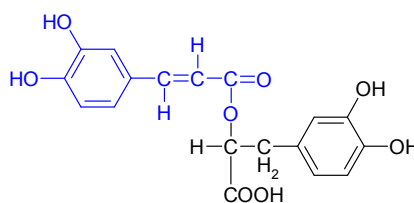
Temperature of drying could not exceed 35 °C

Characteristic lemon odour



MELISSAE FOLIUM CONTENT COMPOUNDS – POLYPHENOLS

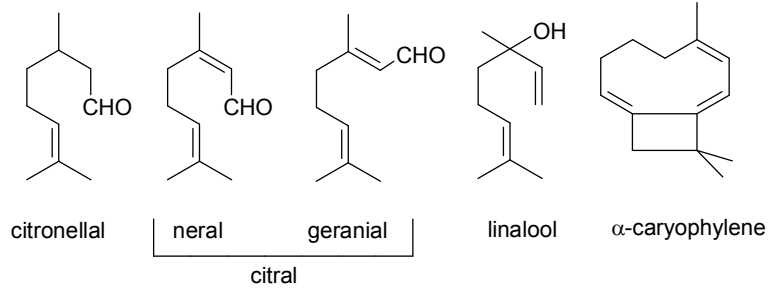
Contains at least 4,0 % of all hydroxycinnamate derivatives, expressed as rosmarinic acid („tannin“ of plants from Lamiaceae)



Rosmarinic acid
(depsid of caffeic acid with 3,4-dihydroxyphenyl lactic acid)



MELISSAE FOLIUM
CONTAIN COMPOUNDS – ESSENTIAL OIL



MELISSAE FOLIUM

FURTHER COMPOUNDS

- sesquiterpenes copaene, cubebene
- Ursolic acid
- flavonoid rhamnesine
- coumarin aesculetine

EFFECT mild

- sedative
- spasmolytic
- antiphlogistic
- antibacterial

UTILIZATION

Mostly often used for herbal tea mixtures

Use at neurovegetative dystonia (cardial, stomachic, intestinal disorders)

Component of carminative mixtures

Water extract externally to affect skin

Cosmetics




MELISSAE FOLIUM

ESSENTIAL OIL IS NOT OBTAINED FROM MELLISAE FOLIUM DUE TO THE RELATIVELY LOW CONTENT

Under naming MELISSAE OLEUM could be:

- Essential oil from indian herb *Cymbopogon* spp. – lemon grass (Poaceae), correct naming is *Oleum citronellae*
- Citrus essential oil obtained from pericarpium *Citrus limonum* – Mediterranean sweet limetta (Rutaceae)
- Through *Melissae herba* hydrodistilled Citrus essential oil – *Oleum melissae citratum*



LUPULI FLOS – HOPS (ČL 2002)

Humulus lupulus L. – common hop (Cannabaceae)

- dioecious, dextrorotary wrapping climbing plant
- Cultivated in Europe and Northern Asia
 - Only female plants are cultivated
 - Vegetative propagation





LUPULI FLOS

Drug: dried, usually whole female inflorescences

Characteristic aromatic odour

Must contain at least 25,0 % of compounds extractible by ethanol 70% (V/V)

Protect against sunlight.

Drug non-pharmacopoeic:
Lupulinum – Lupuline,
Glandulae lupuli – hop glandules, yellow colored powder, bitter taste and aromatic odor

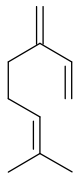
Stored maximally one year

Protect against sunlight.

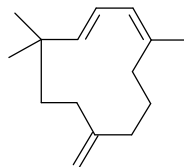


LUPULI FLOS

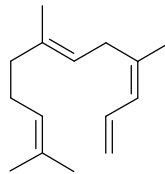
CONTENT COMPOUNDS – ESSENTIAL OIL (0,3 - 1 %)



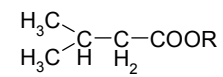
myrcene



humulene



farnesene

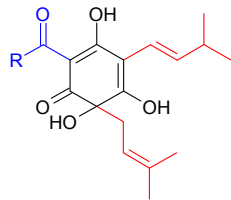


esters isobutyric acid

oxygenated monoterpenes in traces only

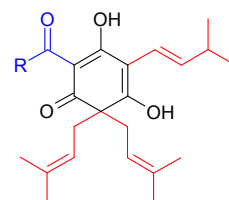


LUPULI FLOS CONTAIN COMPOUNDS – RESINS (15 - 30 %)



α -lupulic bitter acids
monoacylphloroglucinols with 2 prenyl units

humulone, $R=CH_2CH(CH_3)_2$
cohumulone, $R=CH(CH_3)_2$
adhumulone, $R=CH(CH_3)CH_2CH_3$

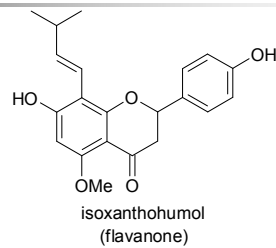
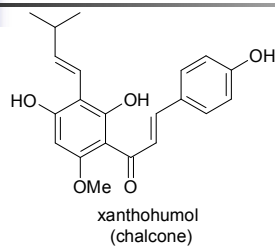


β -lupulic bitter acids
monoacylphloroglucinols with 3 prenyl units

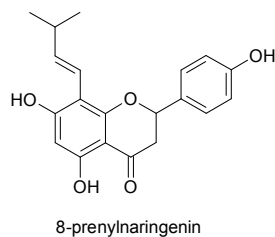
lupulone, $R=CH_2CH(CH_3)_2$
colupulone, $R=CH(CH_3)_2$



LUPULI FLOS CONTENT COMPOUNDS - FLAVONOIDY

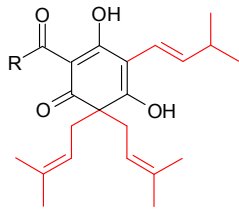


flavonoids:
rutosid
quercitrin
astragalin



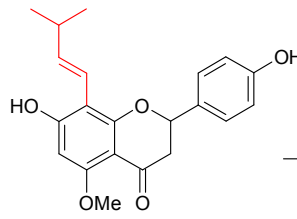


LUPULI FLOS PRODUCTS OF PRENYL DEGRADATION

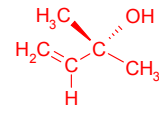


β -lupulinic bitter acids
monoacylphloroglucinols with 3 prenyls

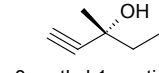
lupulone, $R=CH_2CH(CH_3)_2$
colupulone, $R=CH(CH_3)_2$



isoxanthohumol
(flavanon)



3-methyl-1-butene-3-ol

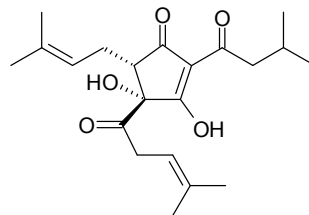


3-methyl-1-pentyn-3-ol
(ALLOTROPAL)



LUPULI FLOS and *LUPULINUM* UTILIZATION

- Sedative
- Anaphrodisiac (antigonadotropic glucoprotein)
- Amare (bitter lupulinic acids)
- Stomachic
- Antidiabetic for beginning stadia (decoction from hops)
- Beer manufacturing



trans-isohumulon

PASSIFLORAE HERBA – PASION FLOWERS HERB (ČL 2002)

Passiflora incarnata L. – passion flowers (Passifloraceae)
Perennial, climbing, evergreen with bright purple flowers
Home in Middle and South America
In Europe planted as ornamental

Drug: cut dried aerial part, may contain also flowers and/or fruits

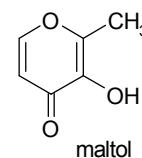
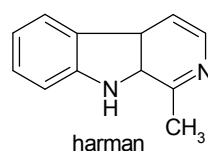
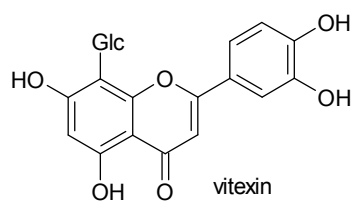
Contain at least 1,5 % of total flavonoids (expressed as vitexin) related to dried drug



PASSIFLORAE HERBA – CONTAIN COMPOUNDS

- Flavonoid C-glycosides: vitexin, isovitexin, orientin, isoorientin, vicenin, lucenin
- Carboline alkaloids: harman, harmol, harmin
- Maltol (2-methyl-3-hydroxy-γ-pyrone)

Utilization: sedative, insomnia



HYPERICI HERBA – St. JOHN'S WORTH HERB
(ČL 2002)

Hypericum perforatum L. – St.

John's worth (Hypericaceae)

- Perennial plant of all continents
- Species naming – bright pointing of leaves – secretion glandules

Drug – whole or cut flowering tips of plant, harvest VII and VIII, drying at 35 °C, storage – protect against sunlight.

Contain at least 0,08 % of all naphthodianthrone, counted as hypericin, related to dried drug



HYPERICI HERBA

Hypericum species – St.
John's worth in Czech:

H. perforatum L. (ČL 2002)

H. maculatum Crantz.

H. montanum L.

H. hirsutum L.

H. pulchrum

H. tetrapterum Fries

H. elegans Steph. ex Wild.

H. humifusum L.



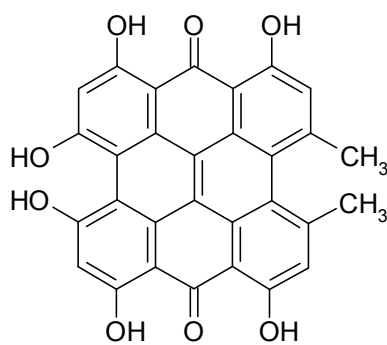


HYPERICI HERBA – CONTENT COMPOUNDS

1. Naphthodianthrons 0,1-0,15 % (hypericine, pseudohypericine, isohypericine, protohypericine, protopseudohypericine)
2. Flavonoids 2-4 % (hyperosid, quercetin, isokvercitrin, rutosid, kempferol, luteolin, myricetin)
3. Biflavonoids (I3,II8-biapigenin, I3',II8-biapigenin = amentoflavon)
4. Phloroglucinol derivatives (hyperforin, adhyperforin)
5. Tannins 5,5-15 % (catechine type), including precursors: catechine, epicatechine, procyanidine and leucoanthocyanidine
6. Essential oil 0,1-1 % (higher alkanes, mono- and sesquiterpenes, mainly α -pinen and caryophylene)
7. Xanthones (1,3,6,7-tetrahydroxyxanthon)
8. Organic acids (caffeic, ferulic, quinic)



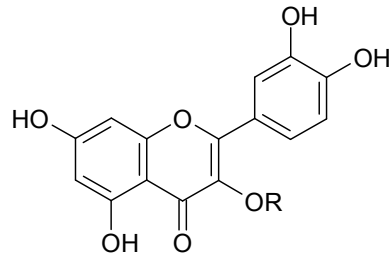
HYPERICI HERBA – NAPHTODIANTHRONES



hypericine



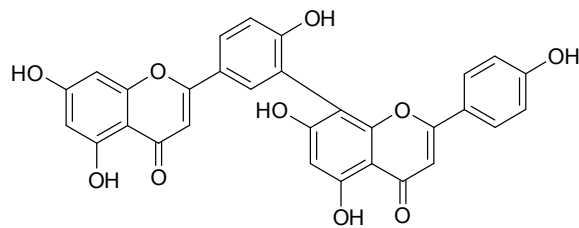
HYPERICI HERBA – FLAVONOIDS




- hyperoside R = β -D-Gal
quercitrine R = α -L-Rha
isoquercitrine R = β -D-Glc
rutoside R = β -D-Glc(6 \rightarrow 1) α -L-Rha



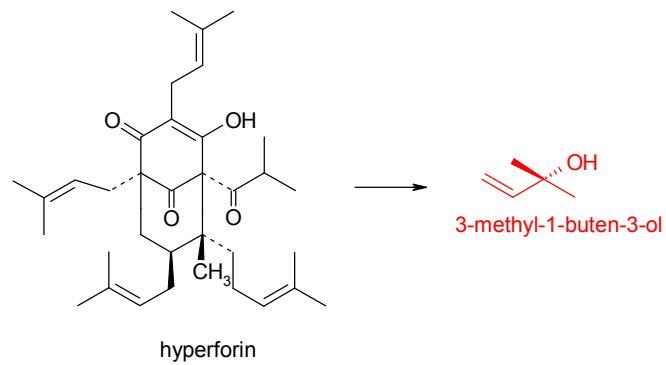
HYPERICI HERBA – BIFLAVONOIDS



13',118-biapigenin (amentoflavone)



HYPERICI HERBA – DERIVATIVES OF PHLOROGLUCINOL



HYPERICI HERBA – USAGE

Sedative (JARSIN, HYPERFORAT, ESBERICUM)

Therapy of depression (inhibition of MAO, increased secretion of serotonin and melatonin ?? **Do not combine with other antidepressives!**)

Antiviral (light exposure is condition) HSV1, HSV2, cytomegalovirus – inhibition of reversed transcriptase, integrase

Bactericide (G+ and G-)

Astringent (tannins)

HYPERICI HERBA – SIDE EFFECTS

Photodynamic effect (hypericismus), albinoids

Mutagenic effect of *Oleum hyperici*

Affects:

- Decrease of theophylline effect (asthmatics)
- Decrease of warfarine and cyclosporine effectiveness
- Together with hormones (ethinylestradiol + desogestrel) – bleeding

LAVANDULAE FLOS – LAVENDER FLOWERS (ČL 2002) LAVANDULAE OLEUM – LAVENDER ESSENTIAL OIL (ČL 2002)

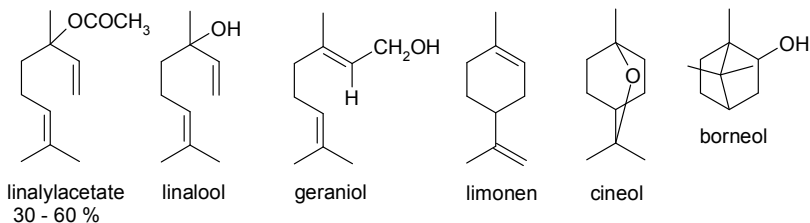
Source: *Lavandula angustifolia* – lavender, Lamiaceae

- Perennial low shrub with integerrime leaves with under winded margin. Small blue slothy flowers
- Must contain at least 13 ml of essential oil / 1 kg of drug
- Essential oil is obtained by hydrodistillation



LAVANDULAE FLOS – LAVENDER FLOWERS (ČL 2002)
LAVANDULAE OLEUM – LAVENDER ESSENTIAL OIL (ČL 2002)
CONTAIN COMPOUNDS

Components of essential oil



Other contain compounds:

tannins
anthocyanins

LAVANDULAE FLOS – LAVENDER FLOWERS (ČL 2002)
LAVANDULAE OLEUM – LAVENDER ESSENTIAL OIL (ČL 2002)

Usage:

- mild sedative
- carminative
- spasmolytic

Externally:

- derivant
- corrigents of odor

Largest consumption: manufacturing of alcohol, perfumeries

KAWA-KAWA

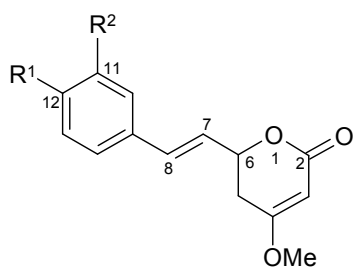
Source: *Piper methysticum* –
pepřovník opojný

- Shrub home and cultivated at islands of Micronesia and Polynesia
- From fresh roots the water extract is prepared. The extract is used for ritual ceremonies

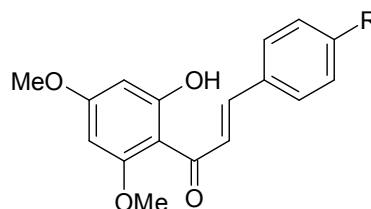
Drug: dried and cut rhizomes
without roots




KAWA-KAWA CONTENT COMPOUNDS



kawaine $R^1 = R^2 = H$
methysticine $R^1 - R^2 = -OCH_2O-$
(derivatives of α -pyrone)



flavokavine A $R = OCH_3$
flavokavine B $R = H$
(chalcones)



KAWA-KAWA

Effect:

- sedative or hypnotic in dependence on dose
- Derivatives of α -pyrone and its 7,8-dihydroderivatives – central suppression, similar to ataractics
- analgesic
- anticonvulsive



GUMMIREŠINA ASA FOETIDA – KLEJOPRYŠKYŘICE ASA FOETIDA

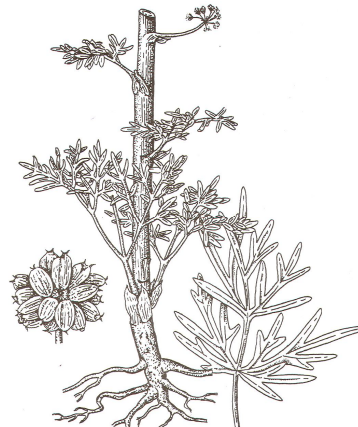
Source:

Ferula asa foetida – asafetida
(Apiaceae)

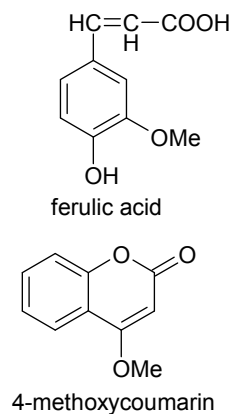
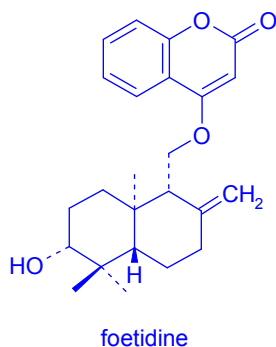
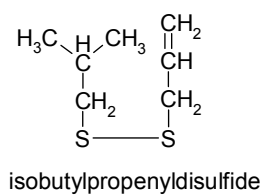
- perennial herb of steppes of Iran and Afghanistan
- flowering from roots after cutting, after desiccation is collected
- disgusting odor

Usage:

- sedative (during hysteria)



GUMMIRESINA ASA FOETIDA
ASAFETIDA GUMMIRESIN
CONTAIN COMPOUNDS



AVENAE FRUCTUS – OAT FRUITS (FLAKES)

Source:
Avena sativa – common oat
(Poaceae)

One-year cultivated plant

Extraordinary rich
heterogeneous mixture of
content compounds

Usage:
component of sedative
mixtures



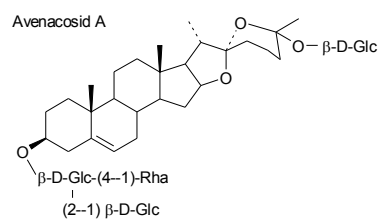


AVENAE FRUCTUS – OAT FRUITS CONTAIN COMPOUNDS

- Saccharides: starch, β -glucans, arabinoxylans, cellulose
- *N*-substances: proteins, lipoproteins, peptids
- Sterols: avenasterols, β -sitosterol, stigmasterol
- Steroid saponins: avenacosid A a B
- Vitamins: B₁, B₂, B₆, pantothenic acid, vitamine E, vitamine K
- Minerals: cca 30 % silicic acid
- Others: gramin, linamarin, pheophytine, avenein = vanililglucoside



AVENAE FRUCTUS – OAT FRUITS CONTAIN COMPOUNDS





VALOFYT-NEO

Valerianae radix	24 g
Lupuli flos	12
Melissae herba	11
Avenae fructus	11
Lavandulae herba	11
Crataegi fructus	17
Salicis cortex	7
Angelicae radix	3,5
Menthae piperitae herba	3,5