

# Ethnobotany. Lecture 31

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# Outline

- 1 Plant remedies for nervous system: others
- 2 Addition to the starch-containing plants

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- 1 Plant remedies for nervous system: others
- 2 Addition to the starch-containing plants

# Sedatives

- Are often calling “hypnotics”, difference is mainly in a dose
- Plant sedatives are much safer than synthetic

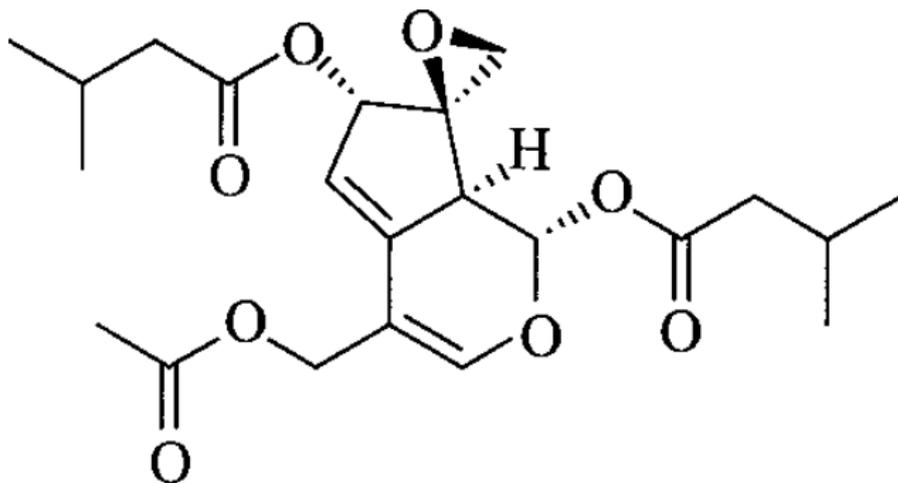
# Valerian, *Valeriana officinalis*, Caprifoliaceae, Eurasia

- *Valerianae radix*
- Active components are valerian oils and iridoids valepotriates
- Interact with GABA receptors

# Valerian



# Valtrate valepotriate



# Hops, *Humulus lupulus*, Cannabaceae, Eurasia

- *Lupuli flos*
- Active components are unusual organic acids humulone and lupulone and their derivatives
- Helps to normalize sleep, also have antibacterial effects

# Hops (female inflorescences)



# Lemon balm, *Melissa officinalis*, Labiatae, Eurasia

- *Melissae folium*
- Active components are multi-component volatile oils including aldehydes
- Improve nervous disorders and also gastrointestinal problems; has antibacterial effects

# Melissa



# Red passion flower, *Passiflora incarnata*, Passifloraceae, South America

- Dried leaves are used pharmaceutically
- Active components suspected to be flavonoids
- As effective as oxazepam (serax) in treating nervous disorders (e.g., hysteria)

# Mandrake, *Mandragora officinarum*, Solanaceae, Central Asia

- Dried root contains atropine, scopolamine, hyoscyamine and podophyllin: all alkaloids
- Poisonous and hallucinogenic in large doses, hypnotic/sedative in small doses

# Mandrake, from Tacuinum Sanitatis (1474)



# Mandrake



# Mandrake roots



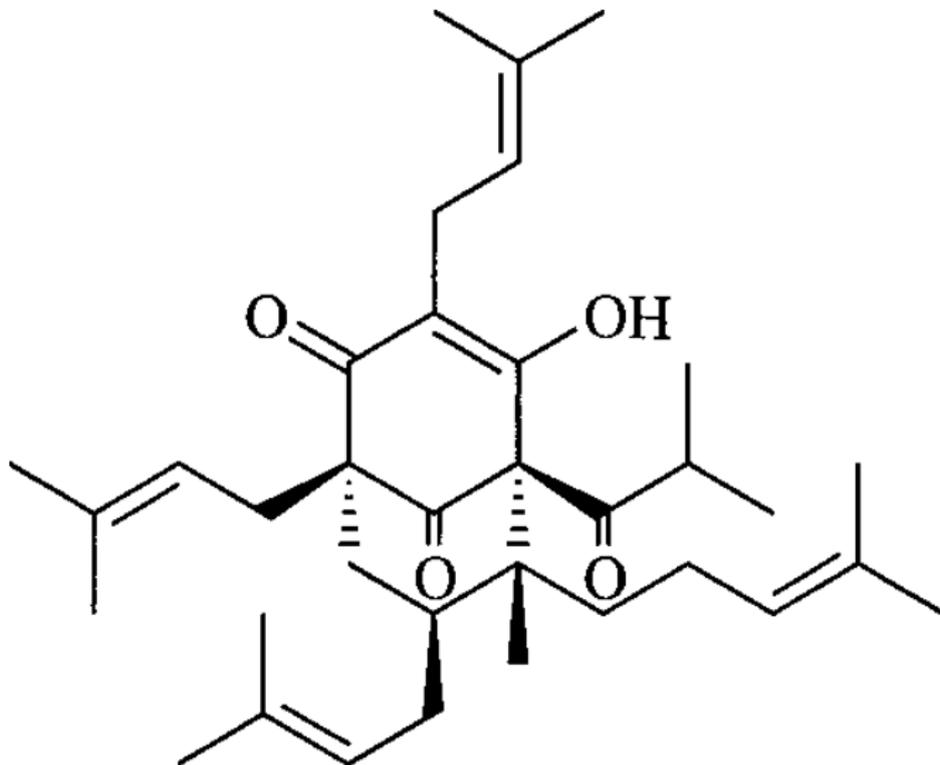
# Antidepressants

- “Nerve tonics”
- Plants with anti-depressant activity are rare

# St. John's wort, *Hypericum perforatum*, Hypericaceae, Eurasia

- *Hyperici herba*
- Hyperforin (derivative of terpenes) is the most active component
- Inhibition of synaptic uptake of several neurotransmitters: serotonin, dopamin, GABA etc.

# Hyperforin



# *Hypericum perforatum*



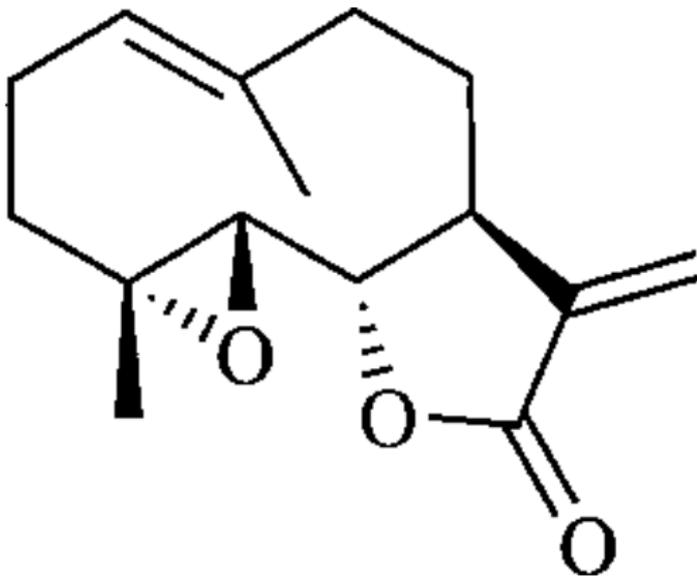
perforatum.jpg

# Analgesics

- Cocaine and morphines are sometimes used as analgesics
- Aspirin-related anti-inflammatory drugs will be covered later



# Parthenolide



# Feverfew



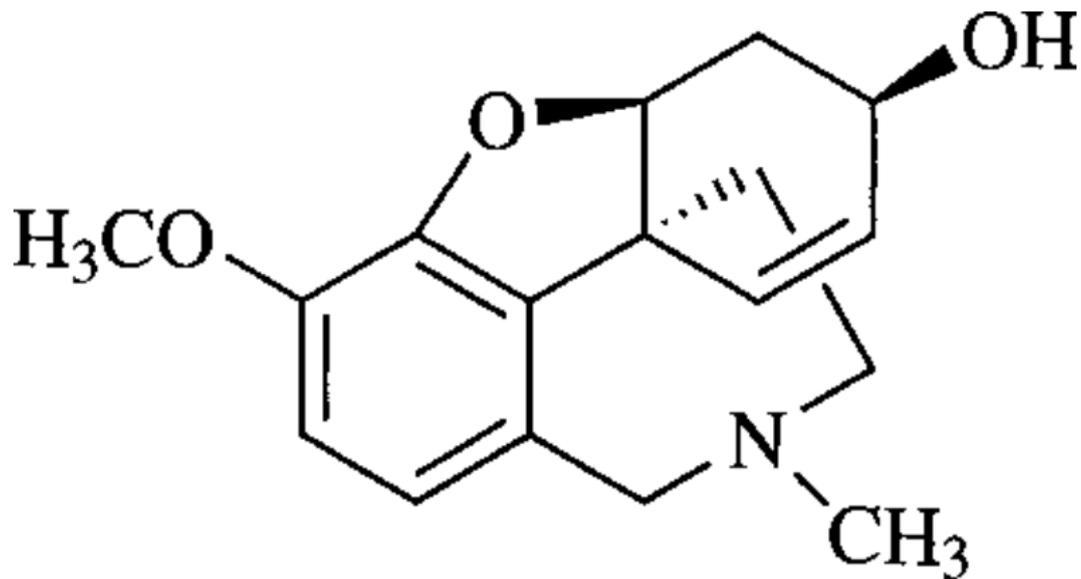
# Memory enhancement

- Especially important in case of Alzheimer's disease (dementia)
- Often are inhibitors of acetylcholinesterase

# Snowdrop, *Galanthus nivalis*, Amaryllidaceae, Mediterranean

- Contains alkaloid galantamine
- Slow down the progression of Alzheimer's disease

# Galanthamine



# Snowdrop



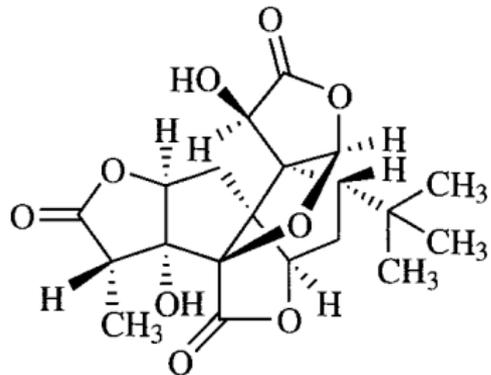
# Ginkgo, *Ginkgo biloba*, Ginkgoaceae, China

- “Living fossil” from China, natural habitats are lost
- Active components are diterpene lactones ginkgolides and glycosides such as ginkgetin
- Improve blood circulation in brain, have antioxidant effects, prevent degradation of synaptic receptors
- Also used to heal varicose veins

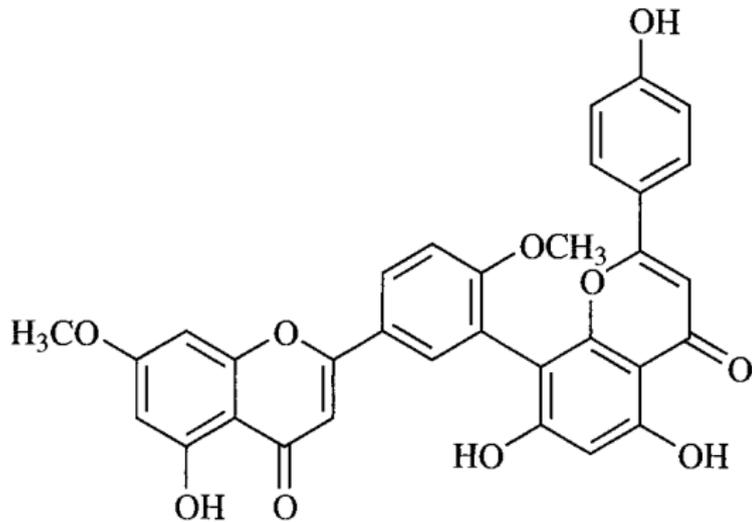
# *Ginkgo biloba*



# Ginkgolides and ginkgetins



**Ginkgolide A**



**Ginkgetin**

# Water chestnut, *Eleocharis dulcis*, Cyperaceae, China

- Rich of dietary fibers, vitamins B, copper and manganese
- Cell walls contain phenolic compounds which are not damaged when boiling

# Water chestnut



## Chufa, *Cyperus esculentus*, Cyperaceae, Africa

- Tubers are rich of potassium, phosphorous and oils (20–36%!)
- Traditional food in Africa, also cultivated in Spain and California

# Chufa



# Summary

- Sedative and hypnotic chemicals are often non-alkaloids
- Mandrake is a real plant!

# For Further Reading



## A. Shipunov.

*Ethnobotany* [Electronic resource]. 2011—onwards.

Mode of access:

[http://ashipunov.info/shipunov/school/biol\\_310](http://ashipunov.info/shipunov/school/biol_310)



## M. Heinrich and others.

*Fundamentals of pharmacognosy amd phytotherapy* (selected chapters). [Electronic resource].

Churchhill Livingstone, 2004.

Mode of access: [http://ashipunov.info/shipunov/school/biol\\_310/heinrich2004\\_fund\\_pharm\\_part.djvu](http://ashipunov.info/shipunov/school/biol_310/heinrich2004_fund_pharm_part.djvu)

## Chapter 16.