

# Ethnobotany. Lecture 28

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# Outline

- 1 Pharmacognosy
  - Plant remedies for cardiovascular system
  - Plant remedies for respiratory system



# Pharmacognosy

## Plant remedies for cardiovascular system



# Heart problems (arrhythmic conditions, failure etc.)

- Plants with cardiac glycosides
- In addition, lily of valley (*Convallaria majalis* with convallatoxin) and motherwort (*Leonurus cardiaca* with specific essential oils)



# Foxglove, *Digitalis purpurea*, Plantaginaceae, Europe

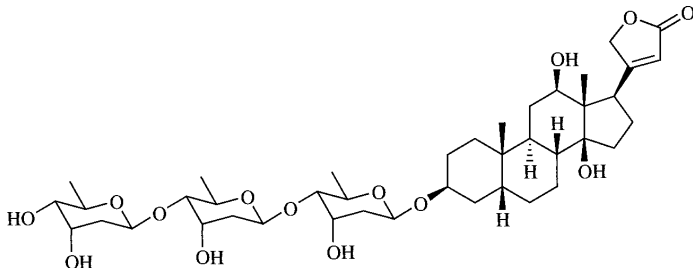
- *Digitalis purpureae folium*
- Contain digoxin and other cardiac glycosides
- Increase the heart muscle contractility and reduces conductivity inside a atrioventricular node



# Foxglove



# Digoxin



# Hawthorn, *Crataegus* spp., Rosaceae, North hemisphere

- *Crataegi folium/flores*
- The mixture of cyanide glycosides and flavonoids
- Blocks repolarizing potassium current in ventricular muscle and prolongs its activity

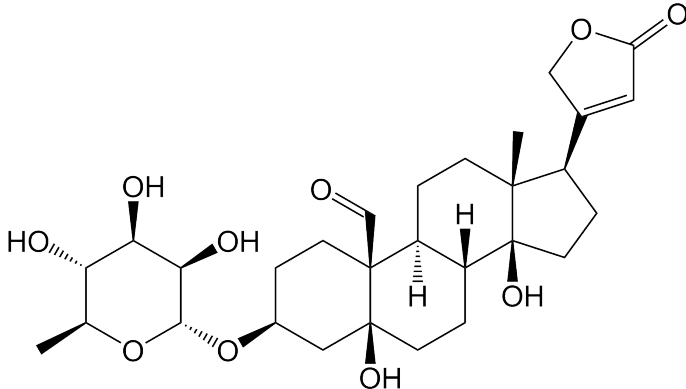




# Lily of valley, *Convallaria majalis*



# Convallatoxin



# Common motherwort, *Leonurus cardiaca*



# Venous insufficiency problems

- Hemorrhoids, varicose veins
- Antioxidants are normally used as remedies



# Bilberry, *Vaccinium myrtillis*, Ericaceae, Eurasia

- *Myrtilli fructus*
- Anthocyanosides have vascular spasmolytic effects



# Bilberry



# Butcher's broom, *Ruscus aculeatus*, Asparagaceae, Eurasia

- *Rusci rhizoma*
- Saponin glycosides, including ruscine have been shown to produce positive effects to lipid profiles



# *Ruscus*





# Horse chestnut, *Aesculus* spp., Sapindaceae, North hemisphere

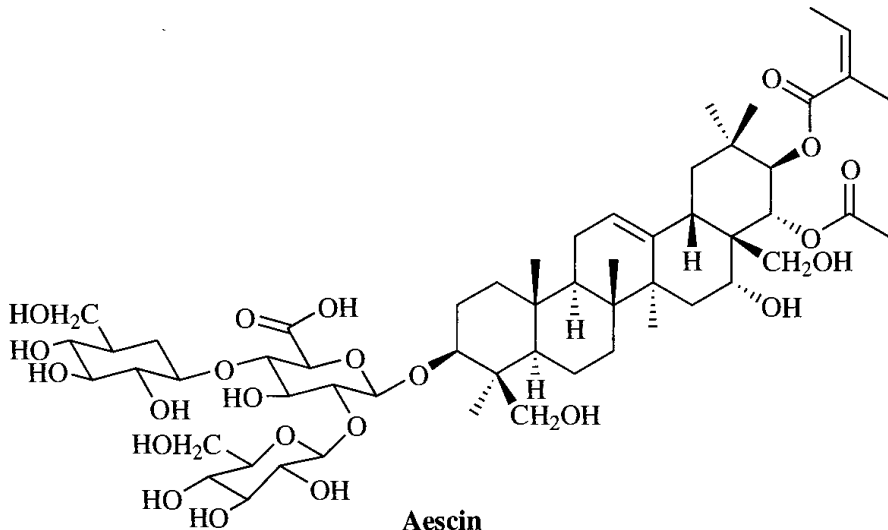
- Seeds contain mixture of saponin flavonoids, e.g., aescin
- Have multiple membrane-related effects: anti-edema, thrombolytic etc.



# Horse chestnut



# Aescin



# Atherosclerosis

- Drugs should decrease platelet formation and risks of thrombosis and atherosclerosis
- Aspirin (modified salicylic acid from willows, *Salix* is the main drug)



# Garlic, *Allium sativum*, Alliaceae, Eurasia

- *Allii sativi bulbi*
- Sulphuric compounds like allicin and ajoene inhibit synthesis of LDL (low density lipoprotein)



# Pharmacognosy

## Plant remedies for respiratory system



# Bronchitis and nasal congestion

- Overproduction of mucus, the effect similar to edema
- Synthetic analogs of adrenalin (oxymetazolin etc.) are normally used



# Ephedra, ma huang, *Ephedra* spp., Ephedraceae, worldwide

- Old component of TCM
- Ephedrine alkaloid has multiple effects (stimulation of CNS, decongestion etc.)
- Theophylline from tea and cocoa may be used for the same purposes

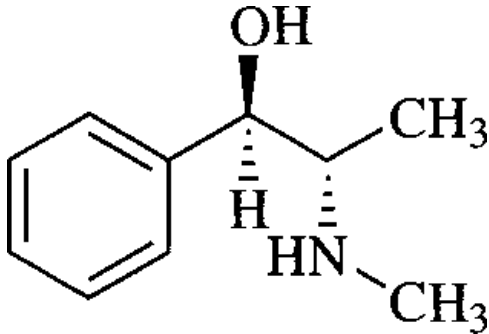




# *Ephedra*



# Ephedrine



# Asthmatic conditions

- Inhalations have a positive, broncholytic effect
- Essential oils and camphor are common component of inhalations



# Eucalyptus, *Eucalyptus*, Myrtaceae, Australia

- *Eucalypti aetheroleum*
- 1,8-cineole is a major component
- Has multiple effects like antiseptic and antispasmodic



# *Eucalyptus*



# Allergy

- Mostly due to the activation of histamin receptors
- Synthetic drugs (like cetirizine etc.) have multiple side effects



# Khella, *Ammi visnaga*, Umbelliferae, Mediterranean

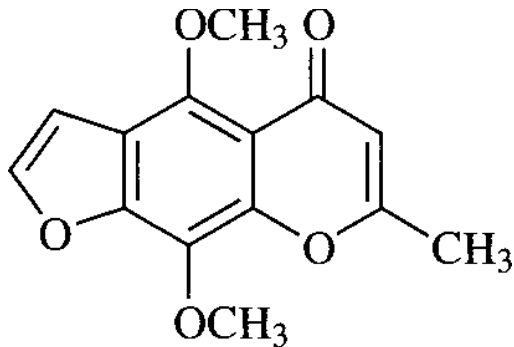
- Active compounds are coumarins like khellin
- Have vasodilating effects, blocks calcium membrane channels



# Khella







**Khellin**



# Butterbur, *Petasites hybridus*, Compositae, Eurasia

- Sesquiterpene lactones (eremophinolides like petasin)
- Traditionally used as anti-asthmatic and against migraine, but has strong anti-histamin effect



# Butterbur



# Mucolytics

- Have a softening effect for cough
- Reduce viscosity of mucus



# Sage, *Salvia officinalis*, Labiatae, Eurasia

- *Salviae folium*
- Contains essential oil thujone
- In addition, has a memory-stimulating and antimicrobial effects



# Senega, *Polygala senega*, Polygalaceae, North America

- *Polygalae radix*
- Triterpenoid saponins: senegin
- Mucolytic and antiseptic effects



# Senega



# Summary

- Heart and vessel system problems are often threatening with glycosides
- Respiratory system remedies are essential oils and alkaloids





# 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 and phytotherapy* (selected chapters). [Electronic resource].

Churchill 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)

**Pages 199–214.**

