

Ethnobotany. Lecture 33

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Outline

- 1 Plants for musculoskeletal system and skin

Arthritis, rheumatism and muscle pain

- Numerous unrelated diseases, from infections to psychological
- As a result, no general treatment available
- Main synthetic non-steroidal anti-inflammatory drug (NSAIDs: aspirin, ibuprofen) are cyclo-oxygenases which inhibit prostaglandin synthase enzymes

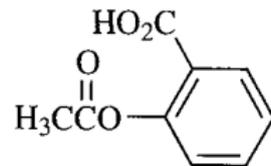
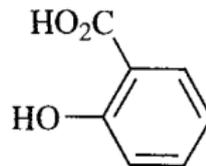
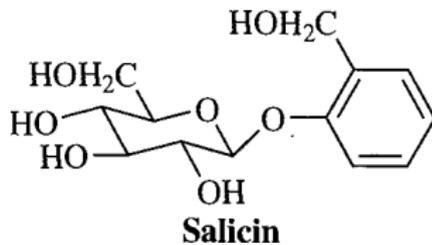
Willows, *Salix* spp., Salicaceae, Northern Hemisphere

- *Salicis cortex*
- Contains salicylic acid
- Work much better with stomach than pure salicylic or acetylsalicylic acids (aspirin)

Willow



Salicylates



Meadowsweet, *Filipendula ulmaria*, Rosaceae, Eurasia

- Perennial herb growing in wet places, leaves and flowers are used
- Contain high amounts of salicylic acid, “aspirin” is a derivative from old name of plant, “spiraea”

Meadowsweet

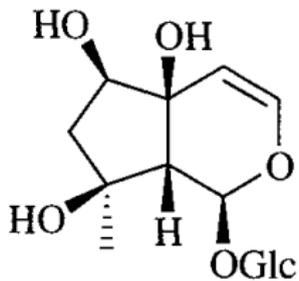
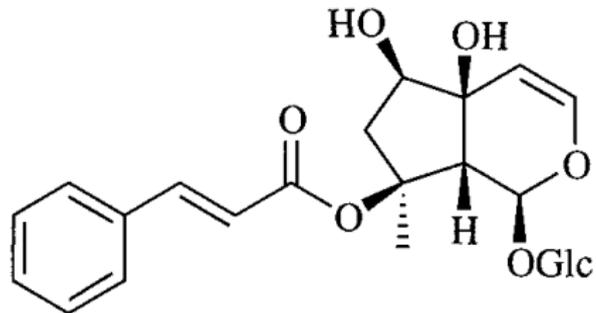


Devil's claw, *Harpagophytum procumbens*, Pedaliaceae, South Africa

- *Harpagophyti radix*
- Plant with extremely spiny fruits; roots are collected
- Contains bitter iridoids harpagide and harpagoside working well in arthritis

Devil's claw



**Harpagide****Harpagoside**

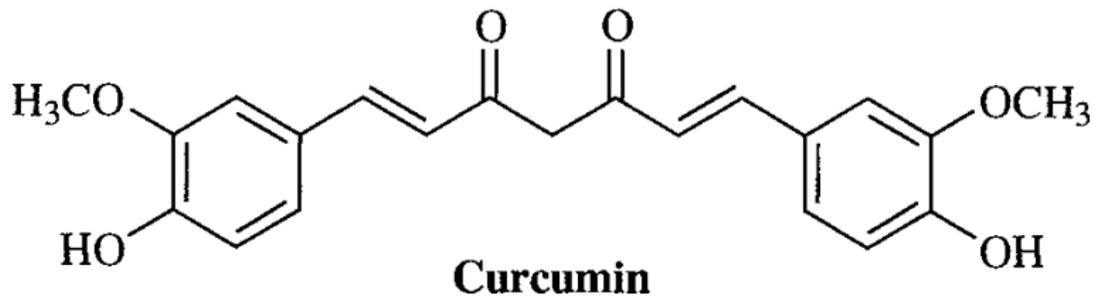
Turmeric, *Curcuma domestica*, Zingiberaceae, South Asia

- *Curcuma domestica* rhizoma
- Herbaceous plant similar to ginger, rhizomes are used
- Plant came from Ayurveda and TCM
- Curcuminoid phenolic compounds are active, antagonist of some inflammatory factors

Turmeric



Cucurmin



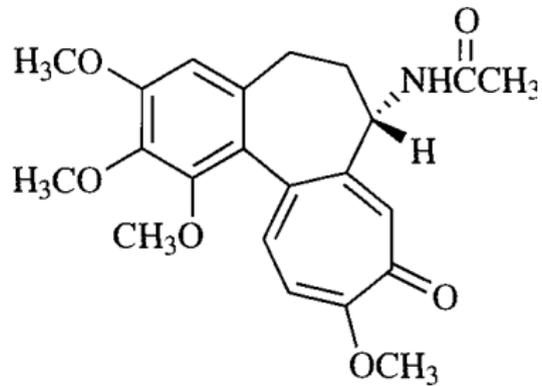
Autumn crocus, *Colchicum autumnale*, Colchicaceae, Eurasia

- Used against gout: severe inflammation of foot joints caused by formation of uric crystals
- Colchicine is an active compound; extremely toxic!

Autumn crocus



Colchicine



Cold and influenza

- Mixture of diseases, anti-inflammatory, antiviral drugs and immunostimulants are used
- Demulcents and emollients used for symptomatic treatment

Linden, *Tilia* spp., Malvaceae, North Hemisphere

- *Tiliae flos*
- Deciduous trees with insect-pollinated, fragrant flowers
- Active components are different essential oils, polysaccharides; some are capable to bind with inhibitory GABA receptors

Linden



Coltsfoot, *Tussilago farfara*, Compositae, Eurasia

- Herb with dimorphic leaves and early flowering (both flowers and leaves are used)
- Main active components are acidic polysaccharides

Coltsfoot



Marshmallow



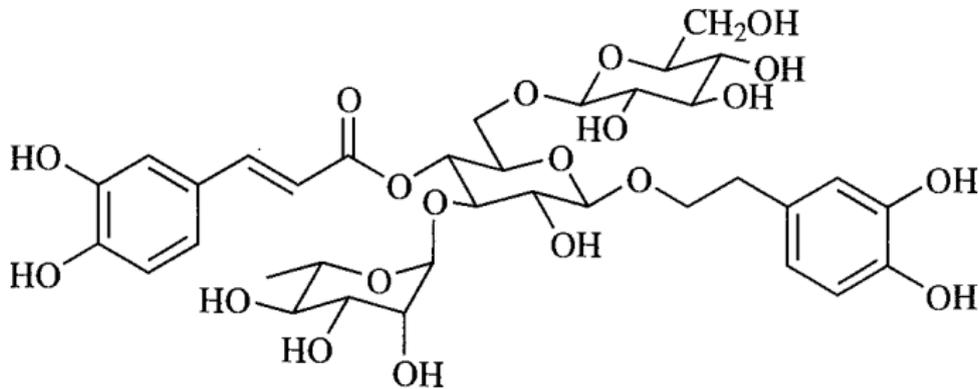
Echinacea, *Echinacea purpurea* and other species, Compositae, North America

- Perennial herb, widely used by native tribes
- Contain numerous glycosides and other compounds, e.g., echinacoside
- Immunostimulant and anti-allergic plant, often combined with garlic

Echinacea



Echinacoside



Wintergreen, *Gaultheria procumbens*, Ericaceae, North America

- Leaves and stems contain oils rich of methyl salicylates
- Often used topically, e.g., for many kinds of muscular pains

Wintergreen



Red pepper, *Capsicum* spp., Solanaceae, Central America

- (Already covered)
- Provides the revulsive effect

Skin diseases

- Eczema, dry skin, infectious diseases, local inflammation etc.
- Anti-inflammatory, antimicrobial and some specific drugs are used

Yarrow, *Achillea millefolium*, Compositae, Eurasia

- Perennial plant with dissected leaves, all parts are used
- Essential oils and tannins are responsible for anti-inflammatory and astringent effects

Yarrow



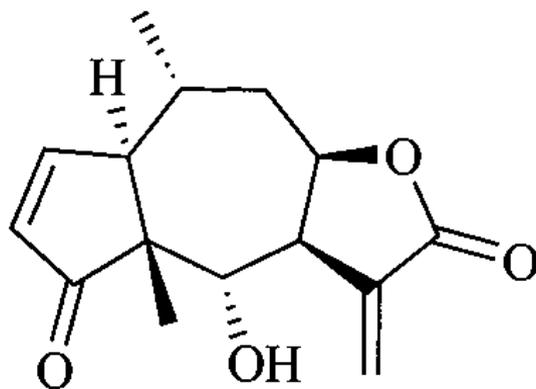
Arnica, *Arnica montana*, Compositae, Eurasia

- Perennial mountainous plant from Alps
- Contain a rich combination of active compounds: proteins, essential oils, sesquiterpene lactons (e.g., helenalin)

Arnica



Helenalin



Aloë vera, Asparagaceae, Africa

- African tree with succulent leaves
- Mixture of different components with antibacterial, anti-inflammatory and other effects

Aloë vera



Calendula, *Calendula officinalis*, Asteraceae, Eurasia

- Herbaceous plant with bright yellow or orange inflorescences
- Oils, polysaccharides, saponins (like calenduladiol), carotenes—with anti-inflammatory and antiseptic effects

Calendula



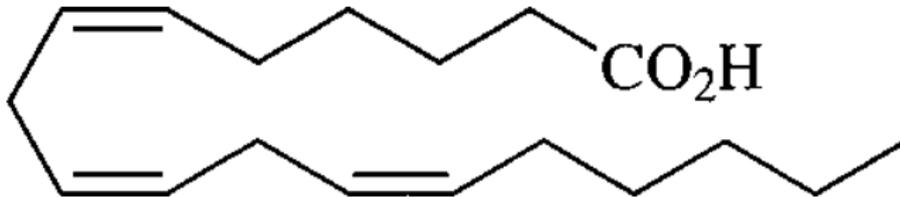
Evening primrose, *Oenothera* spp., Onagraceae, North America

- Used by local tribes
- Active is γ -linolenic acid which has topical anti-inflammatory and anti-eczematic effects

Evening primrose



γ -linolenic acid



Witch hazel, *Hamamelis virginiana*, Hamamelidaceae, North America

- Shrub with hazel-like leaves and extremely early (or late) flowering
- Leaves and bark contain tannins with positive astringent effects to skin

Witch hazel



Summary

- Colds and skin diseases are “mixed”
- Anti-inflammatory, antibacterial and astringent compounds are most important for treating these diseases

For Further Reading



A. Shipunov.

Ethnobotany [Electronic resource]. 2011—onwards.

Mode of access:

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

Chapters 15, 20–21.