



INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

PHYTOPHARMACEUTICALS

academic year 2018/19

LECTURE 13 – Phytopharmaceuticals for external use, dermatologics – PART I

Dr. Ivana Daňková
Dept. of Natural Drugs, Faculty of Pharmacy, VFU Brno

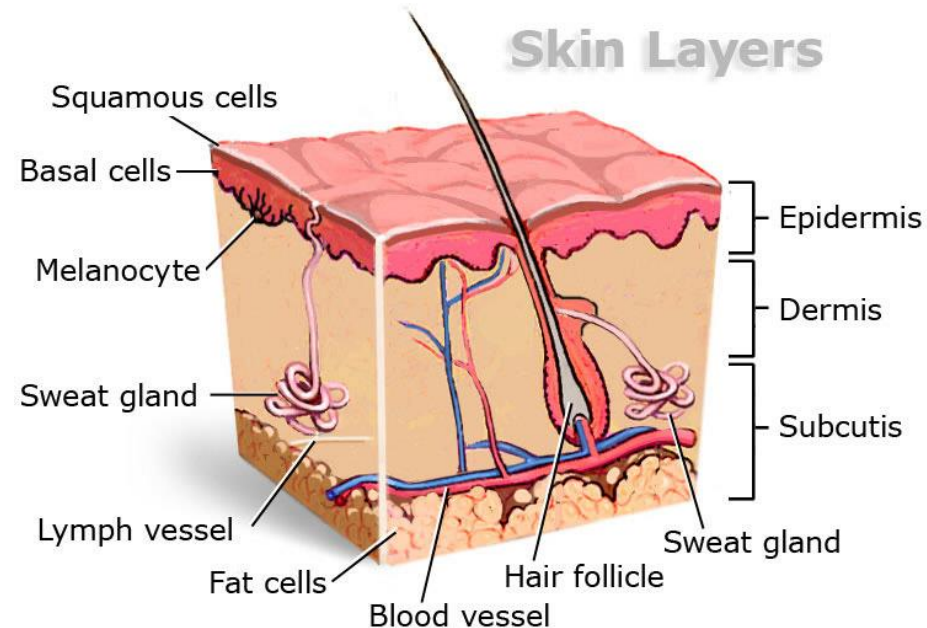
DERMATOLOGICS

- ▶ = preparations used topically
 - ▶ in case of skin diseases
 - ▶ for skin irritation, blood congestion (hyperaemia), induction a feeling of warm
 - ▶ for protection of health skin against external influences
- ▶ Disinfectants, antiseptics, antibacterials, antivirals, antifungals
- ▶ Antipruritics, antiseborrheic agents, antipsoriatics, antiscabietics
- ▶ Astringents, antiphlogistics
- ▶ Keratolytic, emollients
- ▶ Preparations used for repairing wounds (re-epithelisation, re-granulation)
- ▶ Preparations used to treat burns, frostbites,...
- ▶ Preparations used to treat muscular injuries, contusions, external antirheumatics,...

DERMATOLOGICS

SKIN DISEASES

- ▶ are usually divided into two great classes – functional and organic
 - ▶ functional – affections of the skin, hair, sebaceous glands, sweat glands
 - ▶ organic – inflammations, infectious diseases, new formations and tumours, haemorrhages (bleeding),...



DERMATOLOGICS

Topical dermatological formulations:

- ▶ topical medications should be applied on the skin as a thin layer
- ▶ contain an active ingredient and vehicle. Vehicle contains water, oil, fat, alcohol, propylene glycol, ...
 - ▶ solutions
 - ▶ tinctures
 - ▶ lotions (emulsions), suspensions
 - ▶ ointments, creams, pastes
 - ▶ hydrocolloids, hydrogels
 - ▶ (talcum) powders
 - ▶ liquid powders
 - ▶ aerosol foams or sprays
 - ▶ adhesive plasters

PHYTOPHARMACEUTICALS

used for WOUND HEALING

WOUND

- ▶ is defined as a breaking of cellular and anatomical or functional continuity of living tissue
- ▶ there are four phases in the process of wound healing:
 - ▶ **phase 1** – is the vascular response (blood coagulation)
 - ▶ **phase 2** – is the inflammatory response that involves migration of neutrophils at margin of incision
 - ▶ **phase 3** – is the proliferative phase which is characterized by angiogenesis, granulation (newly formed wound matrix, consisting of collagen, matrix proteins and proteoglycans), wound contraction, and epithelisation
 - ▶ **phase 4** – is a remodelling phase involving continuous accumulation of collagen and proliferation of fibroblasts

PHYTOPHARMACEUTICALS used for WOUND HEALING

Agents promoting wound healing:

- ▶ **astringents** – they are able to precipitate proteins – „wound contracting“ ability. Antioxidant activity refers to the possible antibacterial activity.
- ▶ **disinfectants** – act to disrupt significant cellular structures or processes in order to kill or eliminate microorganisms
- ▶ **antiphlogistic (anti-inflammatory) agents** – are able to reduce inflammation
- ▶ preparations **promoting wound healing and repair**, including re-epithelisation, and re-granulation

ASTRINGENTS

TANNINS

- ▶ polyphenolic compounds, they are composed of a very diverse group of oligomers and polymers; subdivided into two groups:
 - ▶ **hydrolyzable tannins** (gallotannins, ellagitannins)
 - ▶ **condensed tannins** (proanthocyanidines, catechins)
- ▶ the main characteristic is that they bind and precipitate proteins = **astrigent effect**
- ▶ the word „tannin“ reflects a traditional technology „tanning“ (waterproofing and preserving) = transforming animal hides into leather
- ▶ Biological effect:
 - ▶ astringent – externally: wounds healing, bleeding stop, treatment of burns, frostbites, oral cavity disorders,...

ASTRINGENTS

GALLA

Quercus infectoria (*Q. lusitanica*),
Fagaceae,
gall oak

- ▶ native to Morocco, Portugal, Spain, Turkey,...
- ▶ „nutgalls“ (*Galla tinctoria*, Turkish gall, ...) are produced by the infection from the insect *Cynips gallae tinctoriae*
- ▶ nutgalls are rich in the **tannin** content



ASTRINGENTS

Plant drugs containing **tannins**

very often from the family **Rosaceae**, e.g.:

- ▶ **Tormentillae rhizoma** – *Potentilla tormentilla* (*P. erecta*), tormentil
- ▶ **Sanguisorbae radix** – *Sanguisorba officinalis*, great burnet
- ▶ **Agrimoniae herba** – *Agrimonia eupatoria*, agrimony
- ▶ **Alchemillae herba** – *Alchemilla vulgaris*, lady's mantle
- ▶ **Rubi idaei folium** – *Rubus idaeus*, raspberry
- ▶ **Rubi fruticosi folium** – *Rubus fruticosus*, blackberry (brambleberry)
- ▶ **Fragariae folium** – *Fragaria vesca*, wild strawberry
- ▶ **Anserinae herba** – *Potentilla anserina*

ASTRINGENTS



Potentilla tormentilla
rhizome



Agrimonia eupatoria
herb



Alchemilla vulgaris
herb



Sanguisorba officinalis
root



Rubus idaeus
leaf



Rubus fruticosus
leaf



Fragaria vesca
leaf

ASTRINGENTS

Other plant drugs containing **tannins**:

- ▶ **Bistortae rhizoma** – *Polygonum bistorta* (*Bistorta major*), Polygonaceae
- ▶ **Quercus cortex** – *Quercus robur*, *Q. petraea*, Fagaceae
- ▶ **Ratanhiae radix** – *Krameria triandra*, Krameriaceae
- ▶ **Juglandis folium** – *Juglans regia*, Juglandaceae
- ▶ **Hamamelidis folium/cortex** – *Hamamelis virginiana*, Hamamelidaceae
- ▶ **Hyperici herba** – *Hypericum perforatum*, Hypericaceae
- ▶ **Myrtilli fructus/folium** – *Vaccinium myrtillus*, Ericaceae
- ▶ plants from the family Lamiaceae, e.g.:
 - ▶ **Salviae officinalis folium** – *Salvia officinalis*, sage

ASTRINGENTS



Bistorta major
rhizome



Quercus robur
Quercus petraea
bark

Krameria triandra
root



Hypericum perforatum
herb



Hamamelis virginiana
leaf/bark

Juglans regia
leaf



PHYTOPHARMACEUTICALS

with ASTRINGENT EFFECT

▶ AGRIMONY Herbal tea

(Megafyt Pharma)

- ▶ POR SPC 1X50GM
- ▶ Agrimoniae herba
Agrimonia eupatoria,
Rosaceae
- ▶ contains: tannins, flavonoids,
small amount of essential oils
- ▶ SUKL code: 0076589
Selected medicinal products
- ▶ ATC: V11

- ▶ it has healing effects
(astringent, anti-inflammatory
properties)
- ▶ production: pour 500 mL of
water over 2 spoons of the
drug, boil briefly for 10 min
and let stay another 15 min
- ▶ decoction is used as a poultice
(warm compress), bath, or for
gargling



PHYTOPHARMACEUTICALS with ASTRINGENT EFFECT

Astringent tincture:

- ▶ Ratanhiae tinctura
Gallarum tinctura
Myrrhae tinctura
- ▶ indication: as an astringent wash for the mucous membrane of the mouth, as a gargle in sore throat



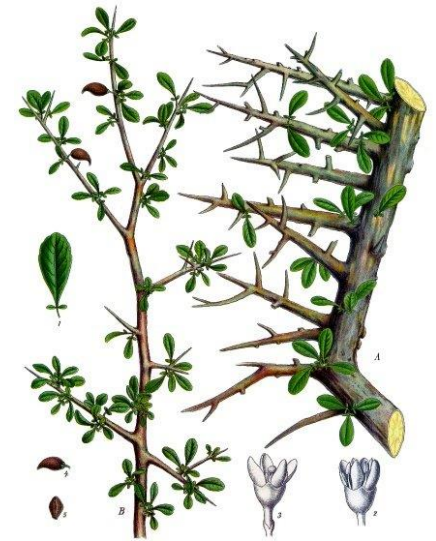
- ▶ Ratanhiae tinctura
 - ▶ production: 1 part of the drug and 5 parts of ethanol 70% (V/V)
 - ▶ tannin content is 1.0 % at least (expressed as pyrogallol)
- ▶ Gallarum tinctura
 - ▶ production: 1 part of the galls and 6 parts of ethanol 60% (V/V), maceration, 3 days
 - ▶ tannin content is 1.5 % at least
- ▶ Myrrhae tinctura
 - ▶ production: 1 part of the myrrh and 5 parts of ethanol 90% (V/V)

PHYTOPHARMACEUTICALS

used for WOUND HEALING

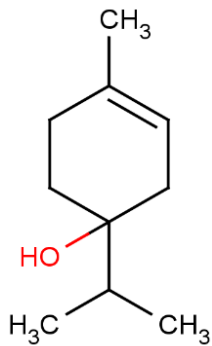
GUMMIRESINA MYRRHA, MYRRH

- ▶ *Commiphora abyssinica*
Commiphora molmol, Burseraceae
- ▶ thorny trees native to Africa
- ▶ contains: about 60 % polysaccharides and proteins, 25-40 % of resin, 3-10 % of essential oil, steroids,...
- ▶ effects: anti-inflammatory, astringent, antibacterial, healing
- ▶ indications: inflammation of the mucous membrane of the mouth (gingivitis, stomatitis), pharyngitis
- ▶ usually as tincture (*Myrrhae tinctura*) or *Myrrhae extractum spirituosum*

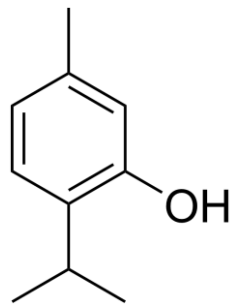


DISINFECTANT DRUGS

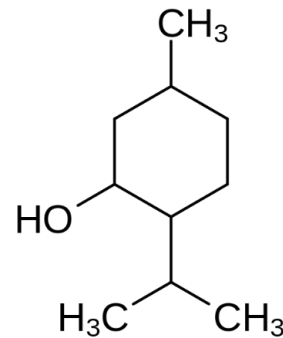
- ▶ disinfectants – act to disrupt significant cellular structures or processes in order to kill or eliminate microorganisms
- ▶ antimicrobial, antiviral, antifungal effect
- ▶ synthetic drugs are predominantly used
- ▶ plant drugs containing:
 - ▶ phenolic compounds
 - ▶ essential oils – usually with the free –OH group, e.g.:



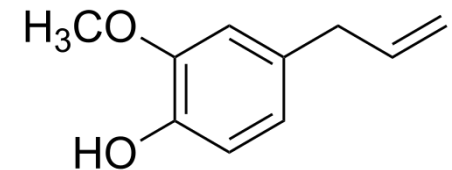
terpinen-4-ol



thymol



menthol



eugenol

DISINFECTANTS

Plants containing **essential oils** with disinfectant and usually also „counterirritant“ effect , e.g.:

- ▶ Thymi herba – *Thymus vulgaris*, Lamiaceae
- ▶ Menthae piperitae folium/herba – *Mentha piperita*, Lamiaceae
- ▶ Salviae off. folium/herba – *Salvia officinalis*, Lamiaceae
- ▶ Rosmarini herba – *Rosmarinus officinalis*, Lamiaceae
- ▶ Juniperi fructus/lignum – *Juniperus communis*, Cupressaceae
- ▶ Caryophylli flos – *Syzygium aromaticum*, Myrtaceae
- ▶ Eucalypti folium – *Eucalyptus globulus*, Myrtaceae
- ▶ Melaleucae folium – *Melaleuca alternifolia*, Myrtaceae (tea tree oil)
- ▶ Pini pumilionis etheroleum – *Pinus mugo* var. *pumilio*, Pinaceae, (essential oil from the branches and needles of the tree)

DISINFECTANTS

CARYOPHYLLI FLOS

Caryophylli etheroleum

- ▶ *Syzygium aromaticum* (*Eugenia caryophyllus*), Myrtaceae
clove, clove oil
- ▶ thorny trees native to Africa
- ▶ contains: essential oil (contains 70-85 % eugenol, 10 % β -caryophyllene), tannins
- ▶ effects: antibacterial, astringent, healing, **anaesthetic**
- ▶ indications: topical preparations for treatment of small injuries and wounds, used usually in mouth infections and inflammation, in dentistry



PHYTOPHARMACEUTICALS with HEALING EFFECT

- ▶ Plant drugs with healing effects:
 - ▶ Matricariae flos – *Matricaria recutia*, Asteraceae
 - ▶ essential oil, containing mainly sesquiterpene compounds (*bisabolol* = *levomenol*, *bisabolol oxides*, *chamazulene*, *guaiazulene*), flavonoids, coumarins, polyacetylenes, mucilage,...
 - ▶ Millefolii herba – *Achillea millefolium*, Asteraceae
 - ▶ similar composition, mainly azulenes



PHYTOPHARMACEUTICALS with HEALING EFFECT

- ▶ **CHAMOMILE Herbal tea**
(Megafyt Pharma)
 - ▶ POR SPC 1X50GM
 - ▶ Matricariae flos
 - ▶ SUKL code: 0076578
Selected medicinal products
 - ▶ ATC: V11
- ▶ **CHAMOMILLA Teva**
SOL 1X25ML
 - ▶ Matricariae extractum fluidum
= liquid extract of Matricariae flos
 - ▶ ammonium solution 10%, water and ethanol 96% (2.5 : 47.5 : 50)
 - ▶ SUKL code: 0162391, OTC
 - ▶ ATC: V11
- ▶ external use: inflammatory diseases of skin and mucous membranes, poorly healing wounds, ulcers, burns...



PHYTOPHARMACEUTICALS with HEALING EFFECT

▶ **DERMAZULEN** (Zentiva) DRM UNG 1X30GM

- ▶ in 30 g:
Guaiazulenum 60 mg
Matricariae etheroleum 30 mg
- ▶ SUKL code: 0000843
OTC medicinal products
- ▶ ATC: D03AX



▶ **OPHTHALMO-AZULEN** (Zentiva) OPH UNG 1X5GM

- ▶ in 5 g:
Guaiazulenum 7.5 mg
- ▶ SUKL code: 0000874
OTC medicinal products
- ▶ ATC: S01XA01

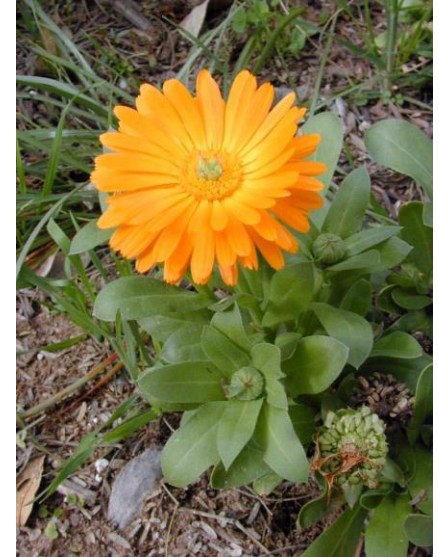


PHYTOPHARMACEUTICALS with HEALING EFFECT

▶ Calendulae flos

Calendula officinalis, Asteraceae, marigold

- ▶ **calendulosides** (glycosides of oleanolic acid), essential oil (mono- and sesquiterpene compounds), flavonoids, triterpene alcohols, polyacetylenes, carotenes and xanthophylls,...
- ▶ external preparations of the drug inhibit inflammation and promote the formation of granulation tissue
- ▶ infusions, tinctures, ointments as a wound-healing remedy for inflammation of the skin and mucous membranes, for poorly healing wounds, bruises, ulcers, rashes...



PHYTOPHARMACEUTICALS with HEALING EFFECT

▶ MARIGOLD Preparations

- ▶ ointments, creams, lotions
- ▶ e. g. of Weleda, Galmed, Dr. Müller, Aromatica, Apotheke,...
- ▶ suitable also for very small children
- ▶ addition of other components:
 - ▶ *Balsamum peruvianum*
 - ▶ Propolis
 - ▶ *Hippophae rhamnoides*



PHYTOPHARMACEUTICALS with HEALING EFFECT

▶ Balsamum peruvianum

Myroxylon balsamum var. pereirae

Fabaceae

- ▶ peru-balsam oleoresin, containing 45-70 % „cinnamein“ = mixture of cinnamic and benzoic acids benzylesters, and 6-8 % resin
- ▶ used as antibacterial, antifungal, and antiparasitic agent in case of wounds, ulcerations, bedsores...; promotes re-epithelisation, and re-granulation of the tissue
- ▶ a component of Balsamum Višněvski (Suspensio Višněvski cum balsamo peruviano)



PHYTOPHARMACEUTICALS with HEALING EFFECT

▶ Suspensio Višněvski cum balsamo peruviano

- ▶ Bismuthi tribromphenolas basicum 5.0 g
- ▶ **Balsamum peruvianum** 20.0 g
- ▶ Ricini oleum virginale ad 100.0 g



▶ Suspensio Višněvski cum pice liquida (HBF, Herbacos Recordati)

- ▶ DRM SUS 1X100GM
- ▶ Bismuthi tribromphenolas basicum 3.0 g
- ▶ **Pix fagi seu Pix lithanthracis** 5.0 g
- ▶ Ricini oleum virginale ad 100.0 g
- ▶ SUKL code: 0054248
- ▶ ATC group: D05AA



PHYTOPHARMACEUTICALS with HEALING EFFECT

CICADERMA

DRM UNG 1X30GM (Boiron)

- ▶ composition in 100 g:
 - ▶ Extractum herbarum vaselinum 97.0 g
 - Ledum palustre*
 - tinctura basica a.u.h. 1.5 g
 - Pulsatilla vulgaris*
 - tinctura basica a.u.h. 1.5 g
 - !!! (homeopathic mother tinctures)
- ▶ SUKL code: 0097947
OTC medicinal product
- ▶ ATC: V11
(Phytopharmaceuticals)
- ▶ be careful of the **St. John's wort** content (photosensibilization)

- ▶ Extractum herbarum vaselinum pro
CICADERMA
 - ▶ Calendulae herba recens 20.0 g
 - Hyperici herba recens 10.0 g
 - Millefolii herba recens 10.0 g
 - Vaselinum album 100.0 g
- ▶ promotes healing of smaller injuries on the skin surface (small cuts, cracks, abrasions), small burns, solar erythema, insect bites



PHYTOPHARMACEUTICALS with HEALING EFFECT

HERBADENT GNG SOL 1X25ML (Herbadent)

- ▶ composition in 25 mL:
 - ▶ **Herbarum extractum fluidum** 22.5 mL
 - Acidum salicylicum 0.25 g
 - Acidum boricum 0.25 g
 - Acidum citricum monohydricum 0.125 g
 - Benzocainum 0.0625 g
 - Menthae pip. etheroleum 0.05 g
 - Caryophylli floris etheroleum 0.05 g
 - Foeniculi amari fr. etheroleum 0.025 g
 - Ethanol 96 % (V/V)
- ▶ SUKL code: 0191186
OTC medicinal product
- ▶ ATC: V11 (Phytopharmaceuticals)

▶ Herbarum extractum fluidum pro Herbadent:

- ▶ Agrimoniae herba 5.0 g
- Matricariae flos 2.0 g
- Salviae off. herba 2.0 g
- Tormentillae rhizoma 1.0 g
- Ethanolum 96 % 77.0 g
- Aqua purificata 18.5 g
- ▶ for treatment of oral cavity disorders. Antiphlogistic, astringent, mild anaesthetic properties.

