

PHYTOTHERAPY

Chapter 6

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Respiratory system

- Infectious diseases of the respiratory tract are the **most common infectious diseases in the western world**.
- The upper (**pharynx, larynx and paranasal sinuses**) and the **lower** respiratory tract (**trachea and bronchi**) may be affected.
- The **pathogens responsible for upper respiratory tract infections** and viruses (rhinoviruses, but excluding influenza viruses) are only very rarely the primary cause.
- Phytotherapy may be useful in relieving the symptoms and antibiotic treatment unnecessary.
- **Herbal remedies are not able to cure bacterial infections**

Respiratory system

«Dry cough»

- A cough is a **result of irritation of the respiratory mucosa**.
- If the mucosa is dry and irritated as a result of an infection, the **receptors of the larynx and pharynx are stimulated**.
- This stimulation may be **inhibited by the use of polysaccharide-containing plants (as a tea)**.
- The **mucilage acts as a protective layer** against irritants on the pharyngeal mucosa.
- Polysaccharides may have a local immunomodulatory effect.

Respiratory system

«*Dry cough*»

- **Mucilaginous herbs are safe** even on prolonged use.
- Their use is not associated with **any known adverse effect**.
- **Polysaccharides may affect the absorption** of concomitantly taken medicines.

Marshmallow

«*Althaea officinalis*»

Used part: leaves and roots

Used type: leaves, roots and extracts

Drog properties: European

Pharmacopoeia approved both the leaves and roots.

It has a swelling index of at least 10



Marshmallow

«*Althaea officinalis*»

Chemical composition and mechanism of action:

Polysaccharides.. «arabinanogalactans, galacturonic rhamnans, arabans and glucans»

neutral mucilage component.. «(1,6)-alpha-D-glucan»

pectins, saccharose, starch

phenolic acids and flavonoids.

Marshmallow

«*Althaea officinalis*»

Chemical composition and mechanism of action:

- The mucilage of marshmallow **forms a layer on the mucosa** and **protects it from irritation**.
- In in vitro studies, **polysaccharides exhibited moderate adhesion to the epithelial tissue**.
- The **antitussive effect** may be related to the **inhibition of the mucociliary activity of the esophageal epithelium**.
- In an animal study, the **antitussive activity** was found to be **inferior to that of codeine**, but **more pronounced than those of the non-narcotic drugs prenoxidazine and dropropizine**.

Marshmallow

«*Althaea officinalis*»

Chemical composition and mechanism of action:

- Various extracts exert an in vitro **antimicrobial effect** (*Pseudomonas aeruginosa*, *Proteus vulgaris* and *Staphylococcus aureus*)
- Following local application, marshmallow extract exhibited **antiphlogistic activity**, whereas **no systemic effect** was observed after oral administration.
- A flavonoid of the plant, hypolaetin 8-glucoside, exerted **anti-inflammatory, analgesic and anti-ulcer activity** in rats.
- In an animal experiment, intraperitoneally applied marshmallow **polysaccharide** resulted in a significant **reduction of the blood glucose level**.

Marshmallow

«*Althaea officinalis*»

Efficacy and indications:

- In a clinical trial involving patients with a dry cough associated with ACE inhibitors, a **liquid marshmallow extract** **significantly decreased the cough frequency** after 4 weeks in comparison with placebo.
- In a post-marketing surveillance study of children (0-12 years) with a dry irritating cough, the efficacy and tolerability of a marshmallow root syrup was examined. **Cough frequency and intensity were reduced significantly after three days of treatment with no no adverse effects.**

Marshmallow

«*Althaea officinalis*»

Side-effects, interactions & contraindications:

- The absorption of concomitantly administered medicines may be decreased.
- **Marshmallow should not be taken less than 1 hour before or after the intake of other medicines.**
- Although the safety during pregnancy and lactation has not been established (and its application is therefore not recommended by the EMA), there are no data concerning the risk of the application of marshmallow roots.

Respiratory system

«*Productive cough*»

- The bronchial mucus resulting from the inflammation of the mucosa, can be transformed into an exudate which triggers a cough as a reflex to remove the irritant.
- In such cases, **expectorants may be useful**, since they **reduce the viscosity of the mucus** and **facilitate its removal by coughing**.

Respiratory system

«*Productive cough*»

- Herbal expectorants can be divided into two major groups:
 - Directly acting expectorants: These are typically **essential oils or essential oil-containing plants**. The **effect is based on the stimulation of the serous glandular cells and the ciliar activity of the epithelium**.
 - Reflex expectorants: These expectorants **contain saponins** that irritate the gastrointestinal mucosa to induce a reflex stimulation of respiratory secretion, resulting in an **increased production of mucus with lower viscosity**.

Ivy

«*Hedera helix*»

Used part: leaves

Used type: leaves and extract

Drog properties: According to the European Pharmacopoeia, *Hederae folium* is the whole or cut, dried leaves of *Hedera helix* L., **collected in spring**, with a **minimum hederacoside content of 3.0%**.



Ivy

«*Hedera helix*»

Chemical composition and mechanism of action:

Triterpene saponins.. aglycones «hederagenin, oleanolic acid and bayogenin»

glycosides «**hederacoside C, alpha-hederin**»

flavonoids,

coumarins

polyacetylenes (e.g. falcarinol).

Ivy

«*Hedera helix*»

Chemical composition and mechanism of action:

- The expectorant effect of ivy is more complex.
- **Apart from the reflex expectorant effect** through irritation of the gastric mucosa, other activities also play a part.
- **Hedera treatment increased the density of beta-adrenoreceptors in vitro and alpha-hederin inhibited the terbutaline-stimulated internalization of the beta2-adrenoreceptors in the alveolar cells.**
- The **bronchodilating activity** of the extract was observed in in vivo studies. Moreover, the **stimulation of beta2-adrenoreceptors leads to increased surfactant production.**

Ivy

«*Hedera helix*»

Chemical composition and mechanism of action:

- Ivy leaf **extracts and their saponins exerted spasmolytic activities** on isolated animal smooth muscles.
- Flavonoids and caffeic acid derivatives with less pronounced activity may also contribute to the effect.
- Extracts of the **plant and its saponins exerted anti-inflammatory effects** in animal experiments and were active against several bacteria and viruses in vitro.

Ivy

«*Hedera helix*»

Efficacy and indications:

- In a controlled study, children (7 months-15 years) suffering from acute inflammatory diseases of the respiratory tract were treated either with ivy dry extract or with ambroxol for 7-14 days. After 7 days of treatment, the velocity parameters of **external respiration were normalized** in nearly all of the children with obstructive diseases, while in the ambroxol group normalization could not be documented; further, **a fast decrease of crepitation only was seen in the group treated with ivy.**

Ivy

«*Hedera helix*»

Efficacy and indications:

- In an open and controlled study, children (2-10 years) with **acute bronchitis** were treated either with ivy **dry extract** or with acetylcysteine for 7-10 days. After 5 days of the treatment, the **improvements of the parameters relating to the upper and middle airway functions** (e.g. FVC and FEV1) were significantly greater in the ivy group.

Ivy

«*Hedera helix*»

Efficacy and indications:

- In a randomized, controlled, double-blind comparative study of adult patients with mild to moderate, simple or obstructive chronic bronchitis, treatment corresponding to 0.25-0.42 g of herbal substance daily was compared with ambroxol. **Improvements in spirometric and auscultation parameters** were observed in both groups, with no significant differences between the groups.
- In a randomized, double-blind, placebo-controlled crossover comparative study children aged 4-12 years, with bronchial asthma were treated for 3 days, with a dry extract from ivy leaves (equivalent to 218 mg of herbal substance) or with placebo. In the active group, a statistically **significant reduction of the airway resistance** was demonstrated in comparison with the placebo therapy.

Ivy

«*Hedera helix*»

Efficacy and indications:

- The available clinical evidence supports the efficacy of certain extracts in well-established therapy
 - as an expectorant in cases of productive cough.

Ivy

«*Hedera helix*»

Efficacy and indications:

The daily doses of these extracts are as follows:

- Dry extract (DER 4-8:1, extraction solvent ethanol 24-30%): adults: 45-105 mg; 6-12 years: 33-70 mg; 2-5 years: 24-36 mg.
- Dry extract (DER 6-7:1, extraction solvent ethanol 40%); adults: 42-54 mg; 6-12 years: 15-40 mg; 2-5 years: 17-27 mg.
- Dry extract (DER 3-6:1, extraction solvent ethanol 60%); adults: 66 mg; 6-12 years: 50 mg; 34 mg.
- Liquid extract (DER 1:1, extraction solvent ethanol 70%); adults 300 mg; 6-12 years: 225 mg.

Ivy

«*Hedera helix*»

Side effects, interactions & contraindications:

- Fresh ivy leaves may cause contact dermatitis, presumably due to their **falcarinol** content.
- Allergic reactions (urticaria, skin rash and dyspnea) and gastrointestinal reactions (nausea, vomiting and diarrhea) have been observed in clinical studies.
- An **overdose can provoke nausea, vomiting, diarrhea and agitation.**
- In **patients with gastritis or gastric ulcer**, the symptoms may be aggravated.

Ivy

«*Hedera helix*»

Side effects, interactions & contraindications:

- Concomitant use with antitussives is not recommended.
- Safety during pregnancy and lactation has not been established.
- It is contraindicated in cases of hypersensitivity to ivy or to plants of the Araliaceae family.
- Use in **children under 2 years of age is contraindicated** because of the risk of the aggravation of respiratory symptoms.

Eucalyptus

«*Eucalyptus globulus*»

Used part: leaves

Used type: leaves and extract

Drog properties: According to the European Pharmacopoeia, whole or cut dried leaves of older branches of *Eucalyptus globulus* should contain at least 20 ml/kg essential oil.



Eucalyptus

«*Eucalyptus globulus*»

Chemical composition and mechanism of action:

Essential oil.. «1,8-cineole (eucalyptol)»

Tannins,

Flavonoids

Phloroglucinol derivatives.

Eucalyptus

«*Eucalyptus globulus*»

Chemical composition and mechanism of action:

- Leaf extracts, essential oil and cineole exert **antiviral** (against influenza virus) and **high inhibitory activity on bacterial** (including Staphylococcus and Streptococcus strains), and **fungal growth** in vitro.
- Oral administration of the oil **augmented the output of respiratory tract fluid** in guinea pigs. Eucalyptus oil **exhibits surfactant-like effects**, which may support its expectorant activity.
- Extracts of leaves inhibited (experimentally induced) **histamine release activity** from rat leukemia cells. Plant extracts, oil and cineole displayed **anti-inflammatory activities** in different experimental models.

Eucalyptus

«*Eucalyptus globulus*»

Efficacy and indications:

- The antitussive effects of Eucalyptus oil as a “chest rub” were studied in healthy subjects with induced cough in a single-blind cross-over study. The Eucalyptus oil formulation resulted in a statistical **decrease in the cough count** as compared with the baseline.
- The effects of 1,8-cineole (600 mg daily for 6 months as concomitant therapy) were assessed with COPD patients. 1,8-Cineole reduced both the exacerbations and the dyspnea, and significantly **improved the lung function** (e.g. forced expiratory volume and vital capacity) in comparison with the placebo.

Eucalyptus

«*Eucalyptus globulus*»

Efficacy and indications:

- The efficacy and safety of cineole were compared with those of placebo in patients with acute rhinosinusitis in a 1-week study. After 7 days, the differences between the two groups regarding the symptoms of the disease were statistically significant.
- In a further study, 150 patients with acute rhinosinusitis were treated with cineole or a herbal combination product (Gentianae radix, Primulae flos, Ramicis herba, Sambuci flos and Verbenae herba). Both treated groups exhibited an improvement in all relevant characteristics for rhinosinusitis within 7 days. The symptom scores (such as headache and nasal obstruction) were **significantly lower** in the case of treatment with cineole than in response to the treatment with the herbal combination product.

Eucalyptus

«*Eucalyptus globulus*»

Efficacy and indications:

- On the basis of its **traditional use**, Eucalypti folium and essential oil may be used as a traditional herbal medicinal product
 - for the **relief of the cough associated with a cold**.
- A **herbal tea** may be prepared from **4.5-12 g of the comminuted leaves daily**. The infusion may also be used for **inhalation**. The **tincture** of the leaves should be used in a **daily dose of 2.5-10 g**.

Eucalyptus

«*Eucalyptus globulus*»

Efficacy and indications:

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 - for the **relief of the cough associated with a cold**.
- A **herbal tea** may be prepared from **4.5-12 g of the comminuted leaves daily**. The infusion may also be used for **inhalation**. The **tincture** of the leaves should be used in a **daily dose of 2.5-10 g**.
- In the event of **oral use**, the daily dose of the oil is **200-1000 mg**.
- For **inhalation**, **3-8 drops** should be used.
- As **bath additive**, **1.5-6 g essential oil/100 l** of water may be applied.
- The essential oil can also be used **cutaneously** as an **ointment containing 10% oil**.

Eucalyptus

«*Eucalyptus globulus*»

Efficacy and indications:

- The essential oil may also be used as a traditional herbal medicinal product
 - for the **symptomatic relief of localized muscle pain**.
- With this indication, the **single doses of liquid dosage forms are a few drops on the affected areas, 2 or 3 times daily**.
- **Semi-solid dosage forms containing 10% Eucalyptus oil** may also be applied.

Eucalyptus

«*Eucalyptus globulus*»

Side-effects, interactions & contraindications:

- In **children under 30 months of age** (due to the risk of laryngospasm), in children with a history of seizures and in cases of hypersensitivity, the use is **contraindicated**.
- Eucalyptus oil **should not be applied on broken or irritated skin**.
- It should be used with caution in inflamed and ulcerated conditions of the gastrointestinal tract.
- In the absence of sufficient data, its use during pregnancy and lactation is not recommended.

Respiratory system

«Plants with immunomodulant or aspecific effect»

- One possibly strategy to prevent or overcome respiratory infections is **stimulation of the immune system**.
- Several herbs have been claimed to have such an effect, but their activity is **quite different from that of vaccines** since **herbal metabolites have no antigenic relationship to pathogens**.
- Their effect is **non-specific and relies on the stimulation of cellular immunity**.

Respiratory system

«Plants with immunomodulant or aspecific effect»

- The term **immunomodulant** is a better expression to characterize the mechanism of action of these plants.
- Since their effect cannot be predicted in special cases (e.g. immunosuppression, autoimmune diseases and certain chronic diseases such as tuberculosis), **these plants must be applied very carefully.**
- Certain plants **relieve several symptoms of common cold.**

Echinacea

«*Echinacea angustifolia*, *E. pallida*, *E. purpurea*»

Used part: flowers, herbs, radix

Used type: flowers, herbs, radix and
extracts

Drog properties: Registered in
European Pharmacopoeia.



Echinacea

«*Echinacea angustifolia*, *E. pallida*, *E. purpurea*»

Chemical composition and mechanism of action:

Alkamides.. «isobutylamides or 2-methylbutylamides of unsaturated fatty acids»

Caffeic acid derivatives.. «echinacosid, caftaric acid and cichoric acid»

Polysaccharides and glycoproteins

Roots... pyrrolizidine-type alkaloids.. «tussilagine and isotussilagine»

Echinacea

«*Echinacea angustifolia*, *E. pallida*, *E. purpurea*»

Chemical composition and mechanism of action:

- Polysaccharides (heteroglycans) were found to **stimulate the activity of mouse macrophages** in vitro and **increase interleukin-1 secretion**.
- Polysaccharides of the herb and root of *E. purpurea* **strongly activated macrophages** in vitro.
- Alkylamides **significantly increased the phagocytic activity of alveolar macrophages**.
- The herbal extracts **significantly increased IFN-alpha production, but inhibited the release of TNF-gamma, IL-1-beta, IL-4 and IL-10**.

Echinacea

«*Echinacea angustifolia*, *E. pallida*, *E. purpurea*»

Chemical composition and mechanism of action:

- Certain alkamides were confirmed to have in vitro **anti-inflammatory activity**.
- Extracts **inhibited 5-lipoxygenase** and **antiphlogistic effect** was confirmed after both local and oral administration.
- Ethanol extracts **significantly inhibited PGE2 production** in LPS-stimulated mouse macrophages.
- Certain alkamides **inhibited COX-2-dependent PGE2 formation** in an animal experiment.

Echinacea

«*Echinacea angustifolia*, *E. pallida*, *E. purpurea*»

Chemical composition and mechanism of action:

- Different extracts and certain pure compounds (eg. echinacoside) exerted **antimicrobial activities** against several bacteria and several viruses, including **rhinoviruses and influenzaviruses**.
- According to recent results, alkamides **act on the cannabinoid (CB) receptors**. The alkylamides dodeca-2E,4E,8Z,10Z-tetraenoic acid isobutylamide and dodeca-2E,4E-dienoic acid isobutylamide bind to the CB2 receptor more strongly than the endogenous cannabinoids.

Echinacea

«*Echinacea angustifolia*, *E. pallida*, *E. purpurea*»

Efficacy and indications:

- There have been several clinical trials with Echinacea products;
 - **increased phagocytosis**
 - **prevention of upper respiratory tract infections**
 - **significant improvements in major symptoms of cold**
 - **significant increase in the number of circulating total white blood cells, monocytes, neutrophils and NK cells**
 - **highly significant reduction in the symptom score in influenza**

Echinacea

«*Echinacea angustifolia*, *E. pallida*, *E. purpurea*»

Efficacy and indications:

- According to the opinion of European Medicines Agency, the above-mentioned Echinacea species roots may be used as traditional herbal medicinal products
 - for the **supportive treatment of the common cold**. The therapy should start at the first signs of the common cold.
- For *E. angustifolia* roots, the **therapeutic daily dose is 3 g** of the comminuted **herbal substance** as a decoction or infusion, **1.5 g of the powdered herbal** substance, or **0.75-6 ml of the liquid extract** or tincture.

Echinacea

«*Echinacea angustifolia*, *E. pallida*, *E. purpurea*»

Side-effects, interactions & contraindications:

- **Hypersensitivity reactions, e.g. skin reactions**, may occur
- There is a **possible risk of anaphylactic reactions in atopic patients.**
- The use of coneflowers **is not recommended** in cases of progressive systemic diseases such as **tuberculosis, diseases of the white blood cells, collagenoses, multiple sclerosis, AIDS, HIV infections and other immune diseases**
- Safety during pregnancy and lactation has not been established

Pelargonium

«*Pelargonium sidoides*, *P. reniforme* »

Used part: radix

Used type: radix and extracts

Drog properties: Registered in
European Pharmacopoeia.



Pelargonium

«*Pelargonium sidoides*, *P. reniforme*»

Chemical composition and mechanism of action:

polyhydroxylated coumarins.. «umckalin and artelin»

phenolic acids

Flavonoids

oligomeric and polymeric proanthocyanidins.

Pelargonium

«*Pelargonium sidoides*, *P. reniforme*»

Chemical composition and mechanism of action:

- An in vitro **antimicrobial analysis** of the effects Pelargonium coumarins on 8 microorganisms responsible for numerous **respiratory tract infections**, including Gram-positive (*Staphylococcus aureus*, *Streptococcus pneumoniae* and beta-hemolytic *Streptococcus*) and Gram-negative bacteria (*Escherichia coli*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Pseudomonas aeruginosa* and *Haemophilus influenzae*) revealed **moderate activity**. Certain **extracts exerted pronounced activities on respiratory pathogens**. The antimicrobial efficacy cannot be confirmed convincingly. **Antiviral activity against herpes simplex virus types 1 and 2 was demonstrated in a cell culture** experiment.

Pelargonium

«*Pelargonium sidoides*, *P. reniforme*»

Chemical composition and mechanism of action:

- The **immunomodulatory effect of the extracts** may be **related to the macrophage activating activity**. In vitro, Pelargonium **extract increased the release of NO and the production of IL-1, IL-12, and TNF-alpha**, thereby reducing the survival rate of intracellular parasites. An **increase of the IFN-beta production** was also observed.

Pelargonium

«*Pelargonium sidoides*, *P. reniforme*»

Efficacy and indications:

- There are many clinical trials with several hundreds of patients with acute bronchitis.
 - the decrease in BSS (Bronchitis Severity Scores) was significantly
 - common cold symptoms significantly decreased
 - effectiveness in rhinosinusitis was also assessed and symptoms are relief

Pelargonium

«*Pelargonium sidoides*, *P. reniforme*»

Efficacy and indications:

- With regard to its its documented **long-standing use**, one **liquid extract** (DER 1:8-10, extraction solvent ethanol 11% (m/m)) and **one dry extract** (DER 4-25:1, **extraction solvent ethanol 11%** (m/m)) can be used as traditional herbal medicinal products
 - for **symptomatic treatment of the common cold**.
- For **adolescents over the age of 12 years and adults**, the daily dose of the **liquid extract** is **1.19-1.25 ml, 3 times daily**, while that of the **dry extract** is **60 mg**.
- For **children between 6 and 12 years**, **0.79-0.83 ml of liquid extract 3 times daily** or **40 mg of dry extract** should be used.

Pelargonium

«*Pelargonium sidoides*, *P. reniforme*»

Side effects, interactions & contraindications:

- Its use in children under 6 years of age has not been established due to the lack of adequate data.
- Hepatotoxicity and hepatitis cases have been reported in association with the administration of some Pelargonium products, though these were not identical with the clinically studied ones.
- Mild gastrointestinal complaints (diarrhoea, epigastric discomfort, nausea or vomiting and dysphagia), mild nasal and gingival bleeding and allergic reactions have been reported during the use of Pelargonium.

Gynecological disorders

- The treatment of different **gynecological disorders** has long been at the **focus of herbal medicine**.
- For centuries, the **prevention of pregnancy and abortion** have been among the main fields of application.
- A further important use was to **promote the menstrual flow**.
- **Phytotherapeutic** agents may be regarded as **first-choice medicines**, since the available modern medicines (usually hormones or synthetics) may have **unfavorable side-effect** profile to be a **safe alternative for long-term treatment**.

Gynecological disorders

«Menopause-related symptoms»

- The menopause is defined as a **12-month menstruation-free period** which marks the end of the menstrual cycles.
- The menopause is a **natural biological process**, and is a result of the **change in hormone production in the organisms of women**.
- Physiologically, it usually **occurs in the 40s or 50s**.
- As the menopause approaches, the **menstrual periods become irregular** and **bleeding occurs more and more rarely**.

Gynecological disorders

«Menopause-related symptoms»

- The root cause of menopause is the **decreased estrogen and progesterone production of the ovaries.**
- In the postmenopausal periods, the main reason for health complaints is the **permanently low estrogen level in the blood plasma.**
- In the period of menopause, the following symptoms occur:
 - Hot flushes
 - Vaginal dryness, sexual problems, and a decreased libido
 - Night sweats and sleeping problems
 - Mood changes and depression
 - Weight gain

Black cohosh

«*Actea racemosa (Cimicifuga racemosa)*»

Used part: root and radix

Used type: root, radix and extracts

Drog properties:-



Black cohosh

«*Actea racemosa (Cimicifuga racemosa)*»

Chemical composition and mechanism of action:

Triterpenes.. «**actein and cimifugosid**»

phenolics,

flavonoids

quinolizidine alkaloids.. «**cytisine**»

Black cohosh

«*Actea racemosa (Cimicifuga racemosa)*»

Chemical composition and mechanism of action:

- A methanolic extract of the plant demonstrated in vitro **binding to estrogen receptors**.
- In low concentration, the extract did not display a proliferative effect on an **estrogen receptor-negative breast cancer** cell line, but in **higher concentration it inhibited its proliferation**.
- A **hydroethanolic extract did not stimulate cell proliferation in the estrogen receptor alpha-positive (ER+) human breast cancer cell line T-47D**, whereas similar extracts exert a proliferative effect on ER+ MCF-7 cells.
- Treatment with an **ethanolic extract did not affect the weight of the uteri** of mice.

Black cohosh

«*Actea racemosa (Cimicifuga racemosa)*»

Chemical composition and mechanism of action:

- According to an animal experiment, Black cohosh **exerted estrogenic effects in the bone and fat tissue.**
- The **extract of the plant did not promote mammary tumor growth or metastatic potential of the primary tumour.**

Black cohosh

«*Actea racemosa (Cimicifuga racemosa)*»

Efficacy and indications:

- The efficacy of *Actea* has been assessed in clinical studies on >6000 patients through use of the **Kupperman Index (KI)** or the **Menopause Rating Scale (MRS)**.
- Results indicated a **significant advantage** of *Actea* in the MRS as regards the **subscores of sexual desire, sexual activity and satisfaction, urination complaints, a feeling of dryness in the vagina and rheumatic-like pains.**

Black cohosh

«*Actea racemosa (Cimicifuga racemosa)*»

Efficacy and indications:

- In a double-blind, randomized, placebo-controlled 3-month study of postmenopausal women, the efficacy of an isopropanolic extract with a daily dose corresponding to **40 mg of plant material daily** was measured as the **decrease in the MRS score**. Three subscores (**hot flushes, atrophy and psyche**) **improved significantly** in the treated group.
- With this extract, several open studies were also conducted, which indicated efficacy of the treatment.

Black cohosh

«*Actea racemosa (Cimicifuga racemosa)*»

Side-effects, interactions & contraindications:

- For safety reasons **it should not be taken for more than 6 months** without medical advice
- **Liver toxicity has been reported** following the use of certain Actea containing products
- Actea preparations **should not be taken together with estrogens** unless advised by a doctor.
- Patients who have been treated or who are undergoing treatment for breastcancer or other **hormone-dependent tumors should not use** preparations without medical advice.