

**Charles University in Prague  
Faculty of Pharmacy in Hradec Kralove  
Department of Pharmacognosy**

**Side effects of selected natural substances**

**Diploma thesis**

**Supervisor of diploma**

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## **Abbreviations:**

GIT: Gastrointestinal tract

CVS: Cardiovascular system

CNS: Central nervous system

NSAIDs: Non-steroidal anti-inflammatory drugs

LDL: Low-density cholesterol

ACE: Angiotensin converting enzyme

MAO: Monoamino oxidase

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## **Statement**

I state that I wrote this diploma thesis by myself under supervision of Doc. PharmDr. Lenka Tumova, CSc.

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## **1. Introduction**

From ancient times until nowadays, natural substances contained in herbs and plants have been used for the treatment of several diseases. Greeks, Egyptians and Chinese used either plant's extracts, fruits or even roots in order to improve the patient's discomfort. Diabetes mellitus, rheumatoid arthritis, skin inflammations, flu, dyspepsia, coagulation of blood are only an example of the conditions that could be improved or healed through topical application or oral consumption of these natural substances. However, the majority of drugs appear to be unsafe for the human organism, especially when they are used in large quantities or in combination with other medications. Cardiovascular, gastrointestinal, endocrine, central nervous and haemopoietic systems are directly affected by the adverse drug reactions caused by the medicinal herbs.

## **2. Aim of thesis**

The aim of the diploma thesis is to prepare and describe a list of medicinal plants, herbs and natural compounds in combination with their side effects on the human body. The study period includes years 2000-2013.

## **3. Theoretical part**

Adverse drug reactions (ADR) are possible unwanted effects of a drug, influencing specific parts of the human organism, after administration. These reactions could take place immediately after the consumption of a drug or they can be observed after a longer period of time. Side effects are divided into several groups; type A are predictable reactions of a remedy, type B are unpredictable complications that may occur, type C are reactions that are presented after a long-term administration of the drug, type D are adverse effects appearing with a delay, for example teratogenicity, type E are effects occurring after cessation of therapy, like withdrawal syndrome and finally, type F are complications leading to an ineffective therapy. (1)

No medication is without a risk for such an adverse reaction, thus there are a number of clinical trials that the drugs should undergo in order to be ready for consumption. Pharmacovigilance is the procedure in which side effects are observed and finally prevented, if possible, from medications. (2)

Various organs could be affected, such as kidneys, liver, intestines, gastrointestinal tract, respiratory organs, heart, skin and others. The severity of the damage affecting these organs and caused by specific remedies depends on the way of administration, the period ( long or short term) of administration and on the individual's response in each drug.

## 4. Practical part

### **Aesculi hippocastani semen**

*Aesculus hippocastanum*  
(Horse-chestnut)



Family: Hippocastanaceae

**Constituents:** coumarins, flavonoids, saponins, tannins.

Uses: Horse-chestnut is very effective for chronic venous insufficiency. (3) It is used to treat edematous states (4), haemorrhoids and arthritis. (5)

#### **Side effects:**

GIT: Nausea, vomiting, (8), stomach pain (3) are reported as side effects. Reflux may also appear due to the saponins contained in the drug. (4)

CNS: Dizziness, headache (4) and depression could, also, take place. (3)

Urinary system: The drug may cause serious problems in the kidneys, especially when large amount of aescin is consumed by the patient. (5)

Allergic reactions: Those who are allergic to latex, should avoid the use of the drug.

Pregnancy and lactation: It should be avoided. (3)



**Contraindications:** It should be avoided by those that have liver diseases because it might exacerbate their problem.

Finally, it must be used with caution, in moderate amounts, by those who suffer from diabetes mellitus type II, since there is increased risk for hypoglycemia. (3)

## **Agni casti fructus**

*Vitex agnus-castus*

(Chaste tree)



Family:Verbenaceae (6)

**Constituents:** alkaloids (viticin), flavonoids, iridoids, terpenoids. (7)

**Uses:** It was used for the treatment of acne, imbalance of hormones and menstrual abnormalities.(8) It is also used for breast pain, because it has the ability to suppress pain. Chaste tree is helpful for the women who are suffering from infertility and it has also anti-inflammatory and sedative effects. (9)

### **Side effects:**

Allergic reactions: It is proven to cause allergies (7), especially inflammation of the skin, for example pruritus, rash or even acne.

GIT: Nausea is a very common adverse reaction (10)

CNS: Chaste tree is likely to cause headache and trouble sleeping. (11) In addition, seizures have been reported as side effect, although it not fully clear if they occurred because of the plant.

Pregnancy and lactation: It should be used only in the early stages of pregnancy with caution (3) and it should be avoided during breastfeeding, since the information about its toxicity are not adequate enough. (7)

Endocrine system: *Vitex agnus-castus* is said to interfere with hormone-sensitive situations, such as breast, ovary or uterus cancer. (11) There is also an increase in the menstrual flow after a long-term application. (7) Finally, endometriosis and uterine fibroids are major adverse reactions of the plant, too. (11)

**Contraindications:** The particular plant should not be consumed by women receiving contraceptive pills, since chaste tree interacts with estrogens and changes hormone levels in the body. (11) It interacts, also, with dopamine receptor antagonists (6) and with antipsychotic drugs. Thus, it should not be consumed by those suffering from Parkinson's disease or psychotic disorders. In conclusion, it interferes with metoclopramide, which affects dopamine, so vitex is likely to decrease the effectiveness of the drug. (11)

## **Allii sativi bulbus**

*Allium sativum*  
(Garlic)



Family: Alliaceae/Liliaceae(12)

**Constituents:** enzymes, volatile oils, proteins, vitamins, amino acids (13)

**Uses:** Garlic is very useful for all cardiovascular diseases and it could be used for prevention of all types of cancer. (14) It is, also, effective against osteoarthritis, bronchitis, haemorrhoids (14), even common cold and flu. (15)

*Allium sativum* has anti-inflammatory, antibacterial and antifungal and properties. (13)

**Side effects:**

Allergic reactions: Dermatitis and skin rashes are relatively common adverse drug reactions. (12)

GIT: Gastrointestinal problems are not very usual, but they might occur. (12) It should be used cautiously by those having stomach irritations. (14)

Haemopoietic system: After a long-term use of garlic, haemorrhage is very likely to take place. (12)

**Contraindications:** Garlic must be avoided concomitantly with antiplatelets and anticoagulants, eg. warfarin,(12) contraceptives and cyclosporine. Finally, isoniazid interacts with garlic, so it is contraindicated for patients following this therapy and also its administration with drugs that are broken down in liver and thus, interfering with cytochrome P450, is contraindicated, too. (14)

**Aloe**

*Aloe vera*  
(Aloe)



Family: Liliaceae

**Constituents:** anthranoids, chromones such as aloesin and aloeresin E, glycosides (aloenin).(16)

**Uses:** Aloe helps in healing of burns, skin irritations, fungal infections, infections of the vagina and of course it is effective against psoriasis and in the treatment of

acne. (17)

**Side effects:**

GIT: Aloe vera may cause irritations in gastrointestinal system, such as abdominal pain. In large doses, though, its use may lead to haemorrhagic gastritis or even diarrhea with blood. (18)

Urinary system: brown colouration of the urine (19)

Pregnancy and lactation: It should not be administered to pregnant women, used with caution during lactation. (19)

Allergic reactions: There is risk for dermatitis.(19)

Other: Risk of cancer after the use of Aloe latex. (20)

**Contraindications**: Stimulating laxatives as Aloe are contraindicated in kidney diseases and for those suffering from haemorrhoids.(16) Not more than 2 weeks administration to those with chronic abdominal pain.(19)

**Angelicae fructus/folium/rhizoma/radix**

*Angelica archangelica*

(Angelica)



Family: Apiaceae

**Constituents**: coumarins, volatile oils, sugars.(21)

**Uses**: It is used for rheumatism, heartburn (22), dyspepsia, psychogenic asthma and for anorexia nervosa(21). Angelica has also diuretic, antispasmodic, expectorant and anti-inflammatory actions. (21)

**Side effects:**

Allergic reactions: It may cause allergic photosensitive reactions, due to coumarins contained in the plant. (21)

GIT: *Angelica koreana*, which is Chinese species, is proven to affect hepatic metabolism.

Pregnancy and lactation: It should be avoided. (21)

Other: There is also risk for skin cancer. (22)

**Apium fructus**

*Apium graveolens*  
(Celery seed)



Family: Apiaceae

**Constituents:** flavonoids, furanocoumarins, volatile oils, fatty acids. (23)

**Uses:** It is used for the treatment of gout, for pain in joints, for urinary inflammations and rheumatoid arthritis. (24) It can, also, treat weight loss due to malnutritive disorders and sleep disturbances. (25)

**Side effects:**

Urinary system: Celery can cause serious inflammation in the kidneys, (25) due to the essential oils which may damage the epithelial cell wall. (26)

CNS: In combination with anesthesia or other drugs before or after surgery, it is likely to influence the central nervous system. (25)

Allergic reactions: It may induce allergies in the skin (25) and photosensitivity

reactions have also been reported, due to furanocoumarins included. (23)

Pregnancy and lactation: There is no proof that it affects the foetus, but it should be used with caution. (26)

**Contraindications**: Celery must not be consumed by those with already existing food or pollen allergies. (23) It should not be administered together with levothyroxine or anticoagulant drugs, such as warfarin, since celery increases the risk of bleeding. (26) In addition, celery should not be given with medication which increases sensitivity to light, for example fluoroquinolones and amitriptyline. Finally, it may interact with lithium salts as it enhances the accumulation of lithium in the body which leads to toxicity and with sedative drugs, such as barbiturates, benzodiazepines or even Z-drugs. (25)

## **Arnicae flos**

*Arnica montana*

(Arnica)



Family: Asteraceae/ Compositae

**Constituents**: alkaloids, coumarins, flavonoids, carbohydrates, terpenoids, oils. (27)

**Uses**: Arnica as gel is used for edematous states in the legs and in patients with pain in joints and muscles.(28) It is also used for alopecia, joint pain, phlebitis and inflammations caused by insects.(27). Finally, it's widely used in homeopathic preparations.(29)

### **Side effects:**

GIT: Arnica, if taken internally, may cause gastroenteritis (27), vomiting, diarrhea and stomach pain (30).

CVS: The particular plant could increase blood pressure and lead to heart damage.

Respiratory system: Shortness of breath. (30)

Allergic reactions: It may irritate the skin and cause dermatitis.

Pregnancy and lactation: Arnica should be avoided. Only for topical use.

**Contraindications**: It should not be applied near the eyes, mouth and in broken skin. Arnicas' use should be immediately stopped if signs of dermatitis appear. (28)

## **Astragali radix**

*Astragalus membranaceus*  
(Astragalus)



Family: Fabaceae

**Constituents**: saponins, flavonoids, free amino acids, polysaccharides. (31)

**Uses**: It is used in the treatment of ischaemic heart disease and cardiac dysrhythmias. (32) and it's equally useful for the flu, allergies, diabetes and kidney diseases. (33) Finally it has anti-inflammatory action. (33)

**Side effects**:

CNS: Astragalus affects the central nervous system and it may lead to multiple sclerosis, rheumatoid arthritis and systemic lupus erythematosus, (34) since it contains immune-stimulating polysaccharides.(33)

Pregnancy and lactation: It should be avoided because it induces teratogenic effects. (32)

**Contraindications**: The drug should not be administered in cases of acute infections, because it may worsen the existing inflammation. Finally, it must not be taken together with anticancer, antiviral or thrombolytic agents. (35)

## **Capsellae bursae-pastoris herba**

*Capsella bursa-pastoris*  
(Shepherd's purse)



Family: Cruciferae

**Constituents**: amines, flavonoids, sterols, saponins. (36)

**Uses**: It is used to treat headache, cardiac problems, diarrhea (37) and bleeding. (38) It has, also, urinary antiseptic actions, so it was used for the treatment of hematuria, diarrhea and hematemesis. (39)

**Side effects**:

CVS: It may cause heart complications.

Urinary system: The drugs' long-term use may lead to kidney stones (nephrolithiasis).

CNS: Shepherd's purse affects the central nervous system, thus it should be avoided before or during surgery. (37)

Respiratory system: It interferes with respiration and it may induce death from respiratory paralysis, but rarely.



Endocrine system: The drug interferes with the thyroid gland and as a result, it might lead to hypothyroidism with enlargement of the thyroid gland. (39)

Pregnancy and lactation: It should be used after professional advice only. (38)

**Contraindications**: It must not be administered concomitantly with the already existing medication for hypotension or hypertension, cardiac complications and thyroid dysfunction. (39). Finally, the drug interacts with CNS depressants, which could induce increased sedation, so they must not be used together. (37)

## **Chamomillae romanae flos**

*Chamaemelum nobile*  
(Roman chamomile)



Family: Asteraceae/Compositae

**Constituents**: coumarins, flavonoids, volatile oils, anthemic acid.

**Uses**: It is anti-emetic and has sedative properties. (40) It is also used for liver, gallbladder and digestive disorders. Roman Chamomile is applied on the infected skin since it has anti-inflammatory properties and it's also effective against sinusitis. (41)

**Side effects**:

GIT: In large doses it may cause vomiting, due to the anthemic acid. (40)

Allergic reactions: It causes anaphylactic reactions.

Pregnancy and lactation: Roman Chamomile is said to interfere with the menstrual cycle (40) and it could lead to miscarriage. (41) Its consumption in large quantities should be avoided.

**Contraindications:** It should not be taken by those who have allergies in any member of the family Asteraceae/Compositae. In addition, it should be avoided by the asthmatics and by teething babies. (40) There is, also, the possibility of interference with sedatives and anticoagulant drugs, eg. warfarin, due to the coumarin content of Roman chamomile. (42)

### **Chelidonii herba/radix**

*Chelidonium majus*  
(Greater celandine)



Family: Papaveraceae

**Constituents:** alkaloids, protoberberines, acids, carotenoids, flavonoids. (43)

**Uses:** It is laxative, anti-inflammatory, diuretic and spasmolytic.(44) Greater celandine has also antiviral, antimicrobial and anticancer effects. (45) It is used for several gastrointestinal complications, some cardiovascular diseases, gout and skin irritations.

**Side effects:**

GIT: The drug may induce hepatitis. It should not be used by those who already have gastrointestinal problems. (46)

Haemopoietic system: In some patients, hemolytic anemia may appear.

Pregnancy and lactation: It should be avoided. (44)

Other: It aggravates the complications for those who already suffer from bile duct obstruction. (46)

**Contraindications**: Greater celandine is contraindicated for patients receiving drugs that affect the central nervous system (44) and for those receiving hepatotoxic drugs, such as paracetamol, amiodarone, methyldopa, methotrexate, benzodiazepines and others. (46)

## **Cinnamomi cortex**

*Cinnamomum cassia*  
(Cassia)



Family: Lauraceae

Constituents: essential oils, oleo gum resin, polmyrecene. (47)

Uses: Mainly, it is used for diabetes mellitus and it could be effective for gastrointestinal complications, as well as, for cold, menstrual complaints, elevated blood pressure and kidney dysfunction. (48) In addition, it could be useful in the treatment of hyperlipidaemia and acne. (49)

### **Side effects:**

Haemopoietic system: The drug lowers blood sugar levels, so there is risk of hypoglycemia, especially for diabetic patients.

GIT: It might induce liver complications or aggravate the existing liver diseases. (48)

Allergic reactions: It could irritate the skin when cinnamomum is contained in preparations that are used topically.

Respiratory system: The drug could induce difficulty in breathing when taken orally. (50)

Pregnancy and lactation: It should be avoided, because there is not enough information about its safety.

**Contraindications**: It should be administered concomitantly with antidiabetic medication nor with hepatotoxic drugs. (48)

## **Commiphorae oleum/resina**

*Commiphora mukul*  
(Myrrh, Guggul)



Family: Burseraceae

**Constituents**: carbohydrates, resins, steroids, terpenoids, volatile oils. (51)

**Uses**: It is antiseptic, antibacterial, expectorant, anti-inflammatory and analgesic. (51) It lowers cholesterol (LDL) in patients with hyperlipidaemia and is also helpful for rheumatism, skin complications and obesity. (52)

### **Side effects:**

GIT: Moderate gastrointestinal irritations may occur, (53) such as diarrhea, nausea, vomiting. (54)

CNS: Tension (51) and headache are common.

Allergic reactions: Skin rashes and itching are possible adverse effects. (55)

Endocrine system: Irregular menstruation cycle is another adverse effect of the drug.

Pregnancy and lactation: It should be avoided, since it may harm the foetus forr the newborn baby .(53)

**Contraindications**: Myrrh should be used cautiously from those hyperthyroidism or hypothyroidism (54) and from those receiving anticoagulant or antiplatelet drugs. (53) It has antihypoglycemic properties, so it could interfere with antidiabetic agents, thus it should be used moderately. (51)

In addition, Commiphora mukul should not be used at all if the patient suffers from hormonal-sensitive conditions, for example breast or ovarian cancer or even endometriosis.

Finally, it may increase the risk of bleeding after surgery and it should not be administered together with estrogens or contraceptive pills in general. (54)

## **Crataegii folium/fructus/flos**

*Crataegus laevigata*

(Hawthorn leaf and flower)



Family: Rosaceae

**Constituents**: flavonoid glycosides (56), phenolic acids, triterpenes, procyanidins. (57)

**Uses**: It is used for heart diseases, for example congestive heart failure, and for diseases related to blood vessels, such as hypertension and atherosclerosis. (58) It is also antiarrhythmic, sedative and diuretic. (59) Finally, it is used for gastrointestinal problems and skin irritations.

### **Side effects:**

GIT: Nausea and stomach problems are possible as side effects.

CNS: Dizziness (60), headache, insomnia and sweat could appear.(58)

CVS: Cardiac abnormalities are likely to happen, such as irregular heartbeat or lower blood pressure.

Respiratory system: Difficulty in breathing or total paralysis of the respiratory system may occur, after large doses and long-term administration of the drug. (60)

Pregnancy and lactation: There is not enough known about the toxicity of the drug, so it is better to avoid it during pregnancy or breastfeeding.

**Contraindications**: It should not be administered together with glycosides, beta-blockers or other drugs for treatment of hypertension. (58) The doses should be adjusted according the patient. Hawthorn, also, should not be taken by those having low blood pressure or used concomitantly with ACE inhibitors. (57)

## **Curcumae rhizoma**

*Curcuma longa*  
(Turmeric)



Family: Zingiberaceae

**Constituents**: carbohydrates, essential oils, (61) sesquiterpene ketones, curcuminoids. (62)

**Uses**: The drug has anti-inflammatory activity and it was used for the treatment of cancer. (63) It has also antiplatelet, hypolipidemic, antimicrobial, antioxidant and carminative action. (62) Additionally, it was used for rheumatoid arthritis, osteoarthritis, hepatitis and dyspepsia. (64) Finally, it was effective against inflammatory bowel disease and Crohn's disease (63) and it was used as a spice

in indian cuisine (indian saffron). (61)

**Side effects:**

GIT: Moderate gastrointestinal complications, such as nausea, diarrhea and stomach pain may occur.

Pregnancy and lactation: It may stimulate uterus or cause menstruation during pregnancy. It should be avoided. (64)

Allergic reactions: Dermatitis could be another side effect of the drug. (62)

Haemopoietic system: It can induce more bleeding, especially during surgery, since it slows the bloods' clotting time. (64)

**Contraindications**: It should not be administered to patients with gallstones without professional advice. (62) Finally, it should not be used together with anticoagulants or antiplatelets, because it enhances the risk of haemorrhage. (64)

## **Echinaceae rhizoma/radix**

*Echinacea angustifolia*  
(Echinaceae)



Family: Asteraceae/Compositae

**Constituents**: polysaccharides, flavonoids, glycosides, vitamins, minerals.(65)

**Uses**: It is used for common cold and flu, because it increases the immune system.(66) It is also effective against vaginal infections. (67)

**Side effects:**

GIT: It may cause digestive disorders and it has unpleasant taste .(68)  
Polysaccharide extract could cause dryness in the mouth, as well as, pain in stomach and numbness of the tongue.

CNS: Insomnia, dizziness and lack of orientation are also adverse reactions that may take place.

Allergic reactions: It causes dermatitis on the skin and rashes. (67)

Respiratory system: Trouble in breathing is a possible side effect. (66)

Haemopoietic system: *Erythema nodosum* and leucopenia are reported. (68)

**Contraindications**: Patients that are administered with immunosuppressant medications, for example after transplantation surgery, should use echinacea only for a small period of time. (68) Its use must be avoided at the same time with large quantities of coffee, tea or chocolate and corticosteroids which also affect the immune system. (66)

## **Eleutherococci radix**

*Eleutherococcus senticosus*  
(Siberian ginseng)



Family: Araliaceae

**Constituents**: eleutherosides, glycans, triterpenoid saponins. (69)

**Uses**: It is mainly tonic and has the ability to modulate the immune system. (70)



It was used for cardiac complications and venous problems, such as atherosclerosis and hypertension. The drug is also effective towards viral infections, rheumatism, common cold, diabetes and kidney diseases. (71) Finally, the drug was used for the treatment of respiratory complications, osteoporosis and hepatic failure. (72)

**Side effects:**

CNS: Insomnia, headache and anxiety are reported. (70) In some cases, mania or schizophrenia have been proven as serious adverse reactions of the drug. (71)

CVS: Tachycardia and hypertension are complications caused by the drug, especially in patients suffering from cardiovascular problems. (73)

Endocrine system: Ginseng might have an estrogens' action, so it should not be used in hormone-sensitive conditions, such as breast or ovarian cancer, endometriosis or uterine fibrosis. (71)

Pregnancy and lactation: There is not enough evidence for its safety, so it should better be avoided. (70)

Other: The drug may worsen the patient's condition when he is suffering from cancer. (73)

**Contraindications:** The drug must not be used by those who have cardiovascular problems (74) and by patients using anticoagulant drugs, digoxin and lithium. In addition, ginseng should not be used together with antidiabetic drugs, CNS depressants, alcohol consumption and with medication that is substrate in cytochrome P450 in the liver. (71) Finally, premenopausal women must not use the particular drug, as well as, (74) individuals that suffer from an acute infection. (70)

**Ephedrae herba**

*Ephedra sinica*

(Ephedra- herbal ecstasy)



Family: Ephedraceae

**Constituents:** alkaloids (ephedrine, pseudoephedrine), acids, tannins. (75)

**Uses:** It has anti-inflammatory properties. Ephedra was also used for treatment of allergic asthma, as well as, it improved arthritis and enuresis during the night. (76) In addition, it was administered in postural hypotension and in common cold, cough. (75)

Finally, it is said to be very effective against rhinitis and sinusitis. (76)

**Side effects:**

CVS: It causes tachycardia, hypertension (77), which may lead even to myocardial infarction, stroke or sudden death. (78) Angina pectoris is also very risky. (77)

CNS: Headache, tremor, insomnia, anxiety (76) and seizures are very common.

GIT: Nausea and vomiting are typical adverse reactions.(78) These problems could increase the risk for hepatotoxicity. (76)

Urinary system: Problems in urination are possible (78) and the formation of kidney stones, too.

Pregnancy and lactation: It should be avoided.

Other: It might stimulate the thyroid gland and exacerbate problems in patients suffering from diabetes mellitus. (77)

**Contraindications:** Its use is strictly contraindicated for patients with diabetes mellitus, coronary thrombosis, heart diseases, anxiety problems, problems with

the thyroid gland, benign prostate hyperplasia and hypertension. (76)  
Ephedra should not be used by those suffering from glaucoma or pheochromocytoma, because it will worsen the disease's symptoms. (77)  
It should not be used together with cardiac glycosides, ergot alkaloid derivatives, CNS stimulating drugs, antihypertensives, serotonin reuptake inhibitors (SSRI),  $\alpha$  and  $\beta$  adrenergic agonists and MAO inhibitors. (78)  
Finally, Ephedra must not be administered together with methylxanthines (caffeine, theophylline), because it could stimulate the whole body and induce tremor, tachycardia, nervousness and more. (77)

## **Euphorbiae herba**

*Euphorbia hirta*  
(Euphorbia)



Family: Euphorbiaceae

**Constituents:** flavonoids, terpenoids, phenolic acids. (79)

**Uses:** It has expectorant action and it was used as spasmolytic and antiasthmatic. (80) It was also used for digestive and intestinal problems (81), as well as, for protozoal infections. (81) Finally, *Euphorbia hirta* could be effective against diabetes mellitus, conjunctivitis and kidney stones. (82)

### **Side effects:**

GIT: Irritation of the gastrointestinal tract and nausea are very typical symptoms. (80) Stomach problems are, also, common. (81)

Allergic reactions: Euphorbia could cause skin irritations, especially between the sides of the fingers (80) and rashes.

Pregnancy and lactation: It could lead to miscarriage, thus it should be avoided. (81)

Other: It is proven that *Euphorbia hirta* has cancerogenic and mutagenic activity. (79)

**Contraindications:** None reported.

## **Filipendulae flos**

*Filipendula ulmaria*  
(Meadowsweet)



Family: Rosaceae

**Constituents:** flavonoids, salicylates, tannins, volatile oils, carbohydrates. (83)

**Uses:** It is used for dyspepsia, because it has antacid properties for diarrhea in children, for gastrointestinal complications, such as ulcers, liver problems and reflux and for pain in joints. (84) It is, also, effective for bronchitis and bladder infections (86), since it has astringent effect. (85)

### **Side effects:**

GIT: Nausea is the most frequent adverse drug reaction, however, vomiting or blood in stools can also be induced after large doses of the drug.

Allergic reactions: Skin rashes are possible symptoms.

Respiratory system: Its use may worsen the already existing asthma or even cause spasms in the lungs.

Urinary system: Kidney problems may occur, but rarely.

Pregnancy and lactation: It must not be consumed, because it may lead to a

miscarriage. (86)

**Contraindications:** The drug is contraindicated for those receiving anticoagulants, since it increases the risk of bleeding and for those allergic to salicylates. (85) Meadowsweet should be used cautiously by the asthmatics.

## **Ginkgo folium**

*Ginkgo biloba*  
(Ginkgo)



Family: Ginkgoaceae

**Constituents:** amino acids, flavonoids, terpenoids, sugars. (87)

**Uses:** Ginkgo was used for degenerative disorders, such as Alzheimer disease, and for cerebral insufficiency. (88) It has also expectorant and anti-asthmatic properties. (87) It has been proven that it alleviates edematous states, since it has anti-inflammatory action, due to the flavonoids. (89) Ginkgo also improves blood flow, dizziness and eye problems. (90)

### **Side effects:**

GIT: Nausea, diarrhea, stomach problems (90) and vomiting are common. (87)

CNS: Headache, seizures (88) and loss of consciousness are more common usually in infants. (87)

Allergic reactions: It may cause rashes and itching on the skin but rarely. (90) Steven-Johnson's syndrome may appear, too. (88)

CVS: Abnormal heartbeat has been reported. (90)

Haemopoietic system: Cerebral or extracerebral haemorrhage appeared in some cases.(88) In addition, acute myoglobinuria is an adverse reaction, but rare.(87)

Respiratory system: Trouble in breathing is one more side effect of the drug.(90)

Other: Vision problems could appear, such as double vision.

Pregnancy and lactation: There is not enough information about its safety, so it should be avoided. (87)

**Contraindications**: The consumption of the seed is more likely to cause the above side effects, so it is better to consume Ginkgo's extract. (87) It should not be taken together with anticoagulant and antiplatelet drugs (88) or with NSAIDs which increase the risk of bleeding. Additionally, it could react with drugs used for epilepsy states, for example carbamazepines and it should be administered with caution to those with liver problems (90) and diabetes, since it affects insulin levels and sugar in the blood. (91) Finally, the drug must be taken by children in small quantities, because it is proven to be toxic in large doses. (92)

## **Ginseng radix**

*Panax ginseng*  
(Asian ginseng)



Family: Araliaceae

**Constituents**: terpenoids, alkaloids, phenols, amino acids, saponins (ginsenosides). (93)

**Uses**: It is used for insomnia, neuralgia, stomachic disorders and neurasthenia. (94) It is very helpful for the treatment of arthritis, muscular pain, hypertension and many infections. (95) It also cures postoperative vomiting and nausea and

has sedative, diuretic and aphrodisiac properties. (94) In the end, it has hypoglycemic properties, thus it is useful in the treatment of diabetes type II. (95)

### **Side effects:**

CNS: Difficulty in sleeping is the most common adverse reaction, headaches (96) and also mania may occur in some cases. (97)

GIT: Stomachic disorders, loss of appetite (179) and diarrhea could appear, but they are not so frequent. (94)

Haemopoietic system: Cerebral arteritis (97) is a serious side effect (inflammation of the blood vessel walls). (98) Vaginal bleeding is also likely. (94)

Allergic reactions: Steven-Johnson's syndrome (97), rashes (98) and skin eruptions have been reported. (94)

CVS: Abnormalities in heartbeat and in blood pressure are very likely to take place after so a professional advice is needed before ginseng's consumption. (100)

Respiratory system: Difficulty in breathing may occur, but not usually. (100)

Other: "Ginseng abuse syndrome" is a condition in which a patient, after a long-term administration of the drug, had appeared symptoms as hypertension, insomnia, skin eruptions, diarrhea and tension. (95)

### **Contraindications:**

It should be used with caution together with NSAIDs, drugs for treatment of diabetes and MAO inhibitors. All groups of patients suffering from the side effects mentioned above, should avoid to use ginseng or use it in moderate amounts. (99) It should not be administered with anticoagulant drugs (97), as well as, not to those with acute bleeding or thrombosis. (94) Patients suffering from insomnia, diabetes, endometriosis and schizophrenia should not consume the particular drug. (100) Finally, ginseng should not be taken at the same time with antipsychotics, stimulants, for example coffee, and hormonal treatment. (94)

## **Gymnema folium**

*Gymnema sylvestris*

(Gymnema)



Family: Asclepiadaceae

**Constituents:** acids, saponins. (101)

**Uses:** It is used firstly in cases of diabetes, metabolic syndrome and malaria. It stimulates digestion and it has laxative and appetite suppressant properties, so it is used for weight loss. (102) Gymnema is also diuretic and helps in blood circulation. (103)

**Side effects:**

CNS: Double vision, anxiety and mental confusion may appear after using gymnema together with hypoglycemic agents. (104)

GIT: Due to the saponin content, the herb may irritate the gastrointestinal system and cause reflux. (101)

Haemopoietic system: The drug lower sugar levels in the blood, so the risk of hypoglycemia, especially in patients with diabetes mellitus who receive medications. (102)

Pregnancy and lactation: It may harm the foetus, so it must be avoided. (101)

**Contraindications:**

It should not be administered together with antidiabetic drugs, especially insulin injection, because it enhances the risk of hypoglycemia. (102)



## Harpagophyti radix

*Harpagophytum procumbens*  
(Devil's claw)



Family: Pedaliaceae

**Constituents:** carbohydrates, iridoids, phenols, flavonoids.

**Uses:** It is mainly anti-inflammatory, diuretic and sedative. (105) It is used for rheumatism, gout (105), migraine, heart burn, atherosclerosis, back pain and kidney diseases. (106)

**Side effects:**

**CNS:** Headache and whistling in the ears are common adverse drug reactions. (107)

**GIT:** Only mild gastrointestinal problems are reported (108), for example nausea and diarrhea. (106) Loss of taste and appetite may appear, too. (107)

**CVS:** It affects both heart rate and blood pressure, so anyone with circulatory problems should use it with caution.

**Pregnancy and lactation:** It has been shown that it may be toxic for the foetus, but is not completely proven if it is safe during lactation. (106)

**Allergic reactions:** Allergies in skin, respiratory pathways and eyes have been proven. (108)

**Other:** Devil's claw enhances bile production, so there is risk of developing gallstones. (106)

**Contraindications:** It should be used with caution by those who suffer from gastric or duodenal ulcers, depression, psychosis or neurological disorders and

kidney diseases. (108) The doses should be adjusted properly for those with cardiac problems. (105) Its administration should,also, be limited to those with allergies in their history. (108) Finally, it should be used cautiously by those receiving warfarin, since it enhances the drugs' effect and it might cause bleeding. (109)

## **Hydrastis rhizoma/radix**

*Hydrastis canadensis*

(Golden seal)



Family: Ranunculaceae

**Constituents:** alkaloids (hydrastine, berberin), carbohydrates, fatty acids, starch, volatile oils. (110)

**Uses:** It is used for respiratory tract complications, gastritis, eye irritations and gastrointestinal complaints. (111) In addition, it is used to mask illegal drugs in urine, such as marijuana, ampetamines and cocaine. (112) Golden seal is proven to have antimuscarinic and antihistaminic properties, due to berberin which is contained in the drug. (113) Finally, it has antibacterial and anti-inflammatory actions. (114)

### **Side effects:**

GIT: Stomach problems are reported, but they are rare.

CNS: Complications in the central nervous system are possible, as well as, depression, which may lead to death if large quantities of the drug are consumed. Because of hydrastine, convulsions and paralysis may occur. (113) Headache and trouble in vision are also possible adverse drug reactions.

CVS: Heart disorders may appear. (115)

Respiratory system: Respiratory failure after overdosage of the drug. (113)

Pregnancy and lactation: It should be strictly avoided, because it is proven to be toxic and cause malformations to the foetus, especially kernicterus. (112)

**Contraindications**: It is contraindicated to hypertensive patients, due to the activity of berberin (114) and to those with lack of vitamin B, because golden seal decreases its absorption. In the end, it should not be given together with anticoagulant drugs, such as warfarin (113) or with cyclosporine. (112)

## **Hyperici herba**

*Hypericum perforatum*  
(St.John's wort)



Family: Hypericaceae

**Constituents**: anthraquinone derivatives, flavonoids, tannins, volatile oils. (116)

**Uses**: It has anti-inflammatory properties, antimicrobial and antiviral effects. In addition, it was used as antidepressant (117), sedative and for the treatment of depression, anxiety, neuralgia and neuralgia. (116)

### **Side effects:**

GIT: Gastrointestinal complaints have been reported, such as stomach pain and diarrhea (118) and dry mouth and throat are likely to appear too. (119)

Allergic reactions: Photosensitivity is the most common adverse effect and erythroderma may also occur. (117)

CNS: It may lead to dementia, Alzheimer disease or psychosis, for example schizophrenia or bipolar disorder. In patients suffering from depression,

*Hypericum perforatum* may aggravate their symptoms. In some cases, it might worsen attention deficit-hyperactivity disorder (ADHD). (118) In addition, the drug could induce headache, dizziness and upsetting. (120)

Pregnancy and lactation: There is not enough evidence for drug, so it is better to be avoided. (118)

**Contraindications:** The drug interacts with alprazolam, so it is contraindicated for those suffering from anxiety and with amitryptiline, so it should not be used by depressives. It interacts also with contraceptive pills, cyclosporine, digoxin and imatinib and photosensitizing drugs. (118) *Hypericum perforatum* also interferes anticoagulants, triptans and selective serotonin reuptake inhibitors. (116)

## **Iridis rhizoma**

*Iris versicolor*  
(Blue flag)



Family: Iridaceae(121)

**Constituents:** acids (stearic, palmitic, salicylic), volatile oils, iridin, tannins. (122)

**Uses:** Blue flag has been used for the treatment of skin diseases, liver dysfunction and constipation, since it has excellent laxative and diuretic properties. (122),(121) Additionally, it is anti-inflammatory, stimulant and anti-emetic in small quantities, whereas it provoques emesis in large ones. (123)

### **Side effects:**

GIT: *Iris versicolor* may cause nausea, vomiting (122) and irritations in the digestive tract and mouth. These adverse effects could lead to ulcerative colitis,

intestinal problems and Crohn's disease.(124) Pain in the abdomen and gastrointestinal complaints are, also, likely to occur after the drugs' consumption. (125)

CNS: High doses of Blue flag also cause headache and inflammation or edema in the eyes, probably due to the volatile oils contained.(122)

Pregnancy and lactation: It is not proven that the drug is harmful for the foetus, however, it should be used cautiously, since it could be toxic in overdose. (123)

Allergic reactions: It could, also, affect negatively the existing skin diseases (121) and cause dermatitis or rashes. (125)

**Contraindications:** Blue flag should not be administered together with digoxin, because its properties as stimulant laxative decrease potassium levels in the body, which afterwards increase the side effects of digoxin. In addition, it should not be given together with warfarin or diuretic drugs.(124) Children must not consume the drug, because it could be toxic. (126)

## **Kava-kava rhizoma**

Piper methysticum

(Kava)



Family: Piperaceae

**Constituents:** kava lactones, alkaloids, esters, glutathione, methysticin. (127)

**Uses:** It is used for the treatment of anxiety, especially in menopausal women. In addition, it is used prophylactically for cancer, and for the treatment of depression, psychosis, colds, headaches, respiratory infections and others. (129) It acts also as anticonvulsant (like benzodiazepines) and sedative and it is used

for treating insomnia. (128)

**Side effects:**

GIT: Gastrointestinal complications are possible after the drug's use. Hepatotoxicity is more rare.

CNS: Headaches and dizziness have been reported (130) and in cases of depression kava's use may worsen the symptoms. It must not be used together with drugs provoking anaesthesia. (129)

CVS: Kava decreases blood pressure and renal blood flow. It interferes with platelet aggregation, too. (131)

Allergic reactions: It may cause skin irritations.

Pregnancy and lactation: Kava should be avoided because it may harm the foetus or the newborn baby. (128)

**Contraindications:** It must not be administered together with CNS depressants, such as benzodiazepines, barbiturates and Z-drugs. (129) Moreover, its use should take place after professional advice when the patient is taking medication for Parkinson's disease, liver diseases or depression. (129)

**Lactucaefolium/latex**

*Lactuca virosa*  
(Wild lettuce)



Family: Asteraceae/Compositae

**Constituents:** acids, alkaloids, coumarins, flavonoids, terpenoids. (132)

**Uses:** Wild lettuce has sedative and antitussive actions (133), so it is used for the treatment of asthma and cough, as well as, for insomnia, atherosclerosis, menstruation disorders and pain in joints. (134) It is effective for the treatment of priapism, nymphomania (132), contractions of the uterus and gastrointestinal disturbances. (135)

**Side effects:**

Allergic reactions: Patients that have shown before allergies in the plants of the family Asteraceae/Compositae, should avoid the drugs' use. (133)

CNS: It affects the central nervous system so it should not be used together with other medication before or during surgery. (134) Dizziness and sedation are the most common. Blurred vision and difficulty in balance may appear, too. (136)

Pregnancy and lactation: There not sufficient evidence, so it is better to be avoided. (133)

Other: Whistling in the ears and vision problems are also likely to occur.

**Contraindications:** The drug should not be administered to those with benign prostatic hyperplasia (BPH) nor to those with glaucoma, because specific substances in the plant may aggravate the symptoms in both situations. (134)

**Larreae folium**

*Larrea tridentata*  
(Chaparral)



Family: Zygophyllaceae

**Constituents:** amino acids, flavonoids, resins, volatile oils. (137)

**Uses:** It has anticancer, antimicrobial, as well as, antioxidant properties. (138) Thus, it is used for the treatment of cancer, tuberculosis, obesity, urinary tract infections (139), bowel cramps and rheumatism.(137 The drug is also effective against premenstrual syndrome, flu, fungal infections and it provokes diuresis. (140)

**Side effects:**

GIT: Chaparral may cause liver disorders, which may lead to liver failure or hepatitis. Vomiting, diarrhea and weight loss are also very common adverse drug reactions.(139)

Haemopoietic system: It may cause autoimmune haemolytic anemia. (138)

Urinary system: Renal failure is very risky after consumption (139), due to the formation of cysts in the kidney.(137) There is ,also, one case of cystic adenocarcinoma reported. (141)

Allergic reactions: Larrea tridentata induces inflammation of the skin, itching and red colouration of the skin(139), as well as, dermatitis.(138)

Pregnancy and lactation: It is very toxic so it is totally unsafe for pregnant or breastfeeding women. (137)

Other: It may stimulate the already existing tumor. (138)



**Contraindications:** Its use should be avoided by those having liver (hepatitis) or kidney problems, (137) and it should never be administered together with hepatotoxic drugs, such as paracetamol, amiodarone, carbamazepine, methotrexate and more others. (139) Finally, it reacts with monoaminoxidase inhibitor (MAOI) because of the amino acids contained. (137)

## **Liquiritiae radix**

*Glycyrrhiza glabra*

(Licorice)



Family: Fabaceae

**Constituents:** coumarins, flavonoids, terpenoids, volatile oils, saponin glycosides. (142)

**Uses:** It is really useful in cases of dyspepsia, nausea and reflux. (143) It has anti-inflammatory properties, it is expectorant and laxative and it was used for the treatment of bronchitis (142), gastritis and peptic ulcer. Finally, it is used as flavoring agent, in dietary supplements and in hand or body lotions. (144)

### **Side effects:**

CVS: Elevated levels of sodium and blood pressure have been reported, in contrast to potassium levels that appear to be lower after its use (hypokalemia). (145) Metabolic alkalosis is also reported. (144) Additionally, it may worsen the symptoms of the patients suffering from congestive heart disease.

Pregnancy and lactation: It is unsafe for pregnant and breastfeeding women, so it must be avoided.

Endocrine system: Licorice may worsen the symptoms of hormone-sensitive

diseases, such as breast and ovarian cancer, endometriosis and uterine fibrosis. (143)

Other: In some cases, muscle weakness and rhabdomyolysis appear as side effects of the drug (144), as well as, edematous states and hypokalemia. (146)

**Contraindications:**

It should not be used by patients with kidney diseases, nor by men with sexual problems, because it could aggravate the erectile dysfunction. Its use should be avoided together with anticoagulant drugs, digoxin, furosemide and estrogens. (143) Last but not least, licorice must be avoided by patients with hypertension, congestive heart disease, anorexia nervosa and liver cirrhosis. (145)

**Lobeliae herba**

*Lobelia inflata*  
(Lobelia)



Family: Lobeliaceae

**Constituents:** alkaloids (lobeline, lobelanine), bitter glycosides, volatile oils, fats, chelidonic acid. (147)

**Uses:** It is mainly used for the cessation of smoking and secondly for asthma and bronchitis. After topical application, it can be used for insect bites, poisoning, muscle pain (148) or rheumatic nodules. Lobelia is useful against dermal problems, nausea and it can act as a muscle relaxant, too. (149)

**Side effects:**

GIT: Nausea, vomiting, diarrhea are usual adverse effects of the drug, when it is used in overdose. (150) These symptoms could lead to more serious

situations, such as ulcers, inflammatory bowel disease, Crohn's disease and stomach discomfort.

CNS: Dizziness and tremor may also occur (148), as well as, convulsions. (150)

Respiratory system: Difficulty in breathing, shortness of breath and cramps are reported. (151)

Pregnancy and lactation: It is an unsafe drug, so it should not be used.

**Contraindications**: Patients using lithium must not consume at the same time lobelia. (148)

## **Matricariae flos**

*Matricaria recutita*

(German chamomile)



Family: Asteraceae

**Constituents**: sesquiterpenes, essential oils (chamazulene, bisabolol oxide), flavonoids, coumarins. (152)

**Uses**: Chamomile can be applied on the skin for skin irritations or inflammations. It could be used as inhalation spray and be effective for respiratory complications. (153) In addition, chamomile is widely used for gastrointestinal problems, such as colitis, dyspepsia and gastritis as well as it can act as muscle relaxant and treat edematous states. (154)

**Side effects:**

Allergic reactions: Rashes or even conjunctivitis when chamomile is used in the eyes can take place, but rarely. (155)

GIT: The drug may cause vomiting, but in very large doses and rarely. (156)

CNS: It might induce dizziness or sedation.

CVS: It can increase blood pressure and in those receiving anticoagulants, it might increase the haemorrhage. (157)

Pregnancy and lactation: It should be avoided, because it is proven to cause teratogenesis in the foetus.

**Contraindications:** Matricaria should not be administered to those allergic to the plants of family Asteraceae nor to those suffering from asthma or hay fever. (158) It should not be taken together with warfarin or benzodiazepines. (156)

**Melissa folium/flos**

*Melissa officinalis*

(Lemon balm)



Family: Lamiaceae

**Constituents:** volatile oils, flavonoids, polyphenols. (159)

**Uses:** It is used for Alzheimer's disease, dyspepsia, gastroesophageal reflux disease (GERD), colic in infants and cold. (160) It has, also, spasmolytic and sedative effect and it was administered to those suffering from headaches, rheumatism and nervousness. (159) Due to the essential oils contained, the drug is effective against bacterial or fungal inflammations and carcinogens. (161)

**Side effects:**

GIT: It may cause abdominal disturbances, vomiting and nausea. (160)

CNS: Sleep disorders, tiredness (159) and dizziness are the most common complications of the drug. It might also induce too much drowsiness when combined with drugs used before or during surgery, so it must be avoided. (160)

Respiratory system: Difficulty in breathing has been reported, although it is rare.

Haemopoietic system: Rarerly, it is proven that the drug might cause venous thrombosis. (162)

Pregnacy and lactation: There is not enough information, so it should be avoided.

**Contraindications:** It should not be administered together with CNS depressants, for example benzodiazepines, barbiturates and Z-drugs, because it may induce sleepiness and drowsiness. (160)

**Menthae piperitae folium/herba**

*Mentha piperita*

(Peppermint)



Family: Lamiaceae (163)

**Constituents:** tannins, monoterpenes, volatile oils (menthol, menthyl acetate, menthone). (164)

**Uses:** It has multiple actions: spasmolytic, antiemetic, sedative, analgesic, antimicrobial, antitussive. (163) Peppermint is very effective against dyspepsia, flatulence, irritation of the bowel and for treatment of headaches. (165) It can be useful in the treatment of nasal congestion and during the recovery after stroke through aromatherapy. (166)

**Side effects:**

GIT: It may cause irritations in the mouth or gastrointestinal tract, due to the tannins contained in the drug, or even heartburn. (163) In addition, enteric-coated peppermint oil should not be consumed by those suffering from achlorhydria, meaning patients that do not produce hydrochloric acid. (165) Finally, the excessive consumption of the drug can lead to liver damage. (167)

Allergic reactions: Flushing is a common adverse reaction,(165) however, skin rashes appear rarely .

CNS: Headaches and tremor have been reported, but they are not that common. (163) Dizziness and blurred vision can occur after consumption in large doses. (167)

CVS: Bradycardia has been also observed but rarely. (163)

Pregnancy and lactation: There is not enough information for the drug, so it is better to avoid its consumption during pregnancy or breastfeeding. (168)

**Contraindications:**

Patients suffering from diarrhea must not use the drug, because there is risk for developing anal burning. (165) Patients with GERD (gastroesophageal reflux disease) should avoid the drug, too and it is strictly contraindicated for those with iron deficiency anemia, malnutrition and constipation. (163) It should not be used by those suffering from gallbladder disease nor by children. (168) Finally peppermint interacts mainly with cyclosporine and drugs that are substrates for cytochrome P450 in the liver. (165)

**Menthae herba**

*Mentha pulegium*  
(Pennyroyal)



Family: Lamiaceae

**Constituents:** volatile oils (169), pugelone, menthone, limonene, acids. (170)

**Uses:** It has spasmolytic and carminative actions. (171) It could be used in pneumonia, stomach disorders, skin irritations or weakness. (172) It is also antiseptic and it could be effective in cases of dyspepsia and common cold (169) and it can act also as stimulant and sedative. (173)

**Side effects:**

GIT: Nausea, vomiting and diarrhea are common (169) and could lead to hepatotoxicity or hepatic necrosis. (171) Abdominal cramps are also reported after oral consumption of the drug. (173)

CNS: It might induce seizures and dizziness and destroy the whole nervous system.

Respiratory system: Overusage of the drug could lead to lung failure. (172)

CVS: The drug might increase blood pressure and cause tachycardia.

Urinary system: Nephrotoxicity is another possible adverse drug reaction. (169)

Pregnancy and lactation: It is highly toxic and there is great chance to harm the foetus, so it should be avoided. (171)

Allergic reactions: Dermatitis has been proven to be a side effect of the drug, but rarely. (174)

Other: Pennyroyal might be involved in vision and hearing complications. (172)

**Contraindications**: In cases of already existing hepatotoxicity or nephrotoxicity, the drug must not be administered at all (169), as well as, in cases of seizures. (173)

## **Millefolii flos/folium**

*Achillea millefolium*

(Yarrow)





Family: Asteraceae/Compositae

**Constituents:** camphor, cineole, volatile oils, sesquiterpene lactones. (175)

**Uses:** It is used for common cold, bleeding, diarrhea and for the treatment of irritable bowel syndrome. (176) It is also hypotensive, spasmolytic and anti-inflammatory. (177)

**Side effects:**

Haemopoietic system: The drug slows the clotting of blood, so it increases the risk of haemorrhage, especially in those receiving anticoagulant and antiplatelet drugs. (178)

Allergic reactions: Patients who have observed allergies in plants of the family Asteraceae/Compositae, should not use yarrow.. It may cause dermatitis or rashes. (179)

Pregnancy and lactation: Its use may lead to a miscarriage, thus it should be avoided without professional advice. (177)

**Contraindications:** Yarrow should not be used by women suffering from menstruation abnormalities, since it interferes with estrogen's activity. In addition, it should be used with caution for the treatment of serious infections of the skin and not in high doses. (180)

## **Myrtilli fructus**

*Vaccinium myrtillus*

(Bilberry fruit)



Family: Ericaceae

**Constituents:** flavonoid glycosides, polyphenols, tannins, pectin. (181)

**Uses:** Bilberry is used in kidney transplantation since it enhances calcium absorption due to the flavonoids contained in the plant.(182) It is also useful for retinopathy, diarrhea and venous insufficiency in the lower limb.(183) The drug is effective for cardiac diseases, diabetes and urinary complications. It has also antioxidant properties. (184)

**Side effects:**

GIT: It may cause gastrointestinal complications especially after a long-term use of the drug. (185)

CNS: Similarly, the CNS is also affected. Dizziness is the most common adverse drug reaction.(186)

Allergic reactions: *Vaccinium myrtillus* is also proven to cause allergic reactions in the skin,such as rashes and itching. (187)

Pregnancy and lactation: It is not clear yet if it significantly toxic. Thus, it should be avoided.(185)

**Contraindications:** The simultaneous use of Bilberry and anticoagulant or antiplatelet drus increases the risk of bleeding, especially when they are

administered in high doses. (184) In general, it should be given with caution to patients with haemorrhagic disorders. (183)

## **Oenotherae oleum**

*Oenothera biennis*  
(Evening primrose)



Family: Oenotheraceae

**Constituents:** fixed oils, fatty acids. (187)

**Uses:** It is used for rheumatoid arthritis, cancer, heart diseases, skin irritations and alcoholism. (188) In addition, it alleviates gastrointestinal problems, it has sedative properties and it is useful in the treatment of asthma. (189) Finally, *Oenothera biennis* is helpful against allergies, hypertension (190) and menopause symptoms, such as flushes. (187)

### **Side effects:**

**GIT:** A slight sense of nausea may appear after its use. (190) After overdosage of the drug, gastrointestinal discomfort may occur, such as diarrhea, but rarely. (189)

**CNS:** Headache is reported as a common adverse reaction of the drug, however, it could, also, induce seizures in patients suffering from schizophrenia (190) or having epileptic events in the past. (192)

Haemopoietic system: Its use increases significantly the risk of bleeding, especially after surgery.

Pregnancy and lactation: It is possibly unsafe, so it is better to avoid its use during pregnancy and breastfeeding. (188)

Allergic reactions: Dermatitis is likely to take place. (191)

**Contraindications:** Primrose should not be administered together with anticoagulant and antiplatelet drugs, such as aspirin, warfarin, clopidogrel, ticlodipine, heparin and others, since it enhances the risk of haemorrhage. (188) In addition, it should not be taken together ceftadizime (antibiotic) or with NSAIDs (non-steroidal anti-inflammatory drugs. (192) Finally, it should be avoided together with phenothiazines or anaesthetics, because epileptic events are more possible to take place. (191)

## **Passiflorae herba**

*Passiflora incarnata*  
(Passion flower)



Family: Passifloraceae

**Constituents:** alkaloids, flavonoids, fatty acids, coumarins. (193)

**Uses:** It has anxiolytic, hypnotic and spasmolytic effects, (194) as a result it was widely used for generalised seizures, spasmodic asthma, insomnia and hysteria. (193) It could, also be used for haemorrhoids, high blood pressure and heart problems (195), as well as, for tremor and nausea in combination with clonidine. (194)

Finally, it is proven to be effective for erectile dysfunction in men and for menstruation complaints in women. (196)

**Side effects:**

CVS: After overdosage, cardiovascular problems occurred in separated situations. (197)

CNS: It affects the central nervous system, so it should not be used before surgery, since it interferes with the effects of the topical anaesthesia. It could also cause dizziness, confusion (185) or sedation. (193)

GIT: Nausea and vomiting were also observed (195), which could lead in some cases to chronic hepatitis, especially for those who had indigestion complaints.

Allergic reactions: It is the most common adverse effect that the drug might induce. (197)

Pregnancy and lactation: It is completely unsafe, because it might induce contractions of the uterus. (193)

**Contraindications:** *Passiflora incarnata* should not be administered together with other sedative drugs. (198)

## **Phytolaccae radix**

Phytolacca decandra  
(Poke root)



Family: Phytolaccaceae

**Constituents:** alkaloids, lectins, saponins. (199)

**Uses:** In general, it is not a safe drug, however, it was used in the past for rheumatism, tonsillitis, skin irritations, mastitis, mumps and syphilis. (200) It enhances the immune system and has, also, anti-inflammatory properties. (201) Finally it is very effective against depression and loss of weight. (202)

### **Side effects:**

GIT: Nausea, stomach pain, vomiting, diarrhea are the most common adverse drug reactions. (200) Due to its content (saponins) the drug can cause gastric mucosal irritation (201) and it also causes the sense of burning in the mouth, especially when swallowing. (202)

CVS: Cardiovascular complaints, such as tachycardia (201) and hypotension are observed. (203)

Haemopoietic system: Both T and B cell lymphocytes are affected and induce haematological changes.

Respiratory system: Cough, sore throat and dyspnoea are also reported as possible side effects of the drug, that could lead to respiratory failure.

CNS: Seizures and spasms which may cause even death are proven, but in some cases only. (199)

Allergic reactions: Irritated skin may occur after a long-term application.(203)

Pregnancy and lactation: It is unsafe, since it may lead to a miscarriage (200) and cause contractions of the uterus. (199) Consume the drug after a professionals' recommendation. (204)

**Contraindications:** Poke root is contraindicated for those who suffer from lymphocytic leukaemia and gastrointestinal complications and it should be used after a professional's advice in cases of cholestasis. (201) It should not be applied to ulcerated skin, it should not be taken orally (190) and patients should avoid contact with the eyes.(201) The drug should not be administered to children. (204)Finally, plants like *Phytolacca dacandra* containing saponins, must be avoided by those who have vitamin deficiency, coeliac disease and fat malabsorption. (201)

## **Piscidia radix**

Piscidia erythrina  
(Jamaica dogwood)



Family: Fabaceae

**Constituents:** acids, isoflavonoids, tannins, sterols, alkaloids.(205)

**Uses:** It is used mainly for anxiety, insomnia and migraines. (206) It is also helpful in alleviating muscle pain, since it is analgesic (207) and in painful menstruation. Finally it has sedative properties. (208)

**Side effects:**

GIT: Jamaica dogwood may cause nausea and vomiting.

CNS: Headache is a common adverse reaction for susceptible patients. (207) It could also slow down the central nervous system when combined with anaesthesia, so it must be avoided before surgery. (206) In cases of overdosage, it could cause excessive sedation. (200) Finally, Dogwood can cause salivation and tremor. (209)

Pregnancy and lactation: It is completely unsafe, since it affects the uterus. (206)

Respiratory system: Dyspnoea is another adverse effect of the drug.

Allergic reactions: Rashes and itching are possible to occur after its use. (210)

Other: In cases of overdosage, it leads to excessive sweating, tremor and salivation. (208)

**Contraindications:** It should not be administered in pregnant or breastfeeding women, as well as, to those suffering from bradycardia and heart-related problems. (207) Jamaica dogwood must not be used together with CNS depressants, such as benzodiazepines, barbiturates or Z-drugs, since it may cause too much drowsiness and sleepiness. (206)



## **Plantaginis folium**

Plantago major  
(Plantain)



Family: Plantaginaceae

**Constituents:** acids, glycosides, carbohydrates, flavonoids, iridoids, mucilages.

**Uses:** It is widely used for haematuria and haemorrhoids with irritation. (211) It is also effective for the symptoms of common cold, bronchitis and skin disorders. (212) Plantain is also antioxidant, antihypertensive, antitumor, anti-inflammatory and analgesic. (213)

### **Side effects:**

GIT: Diarrhea is an adverse reaction of the drug (212), as well as, esophageal complaints and abdominal pain. (214) In general, gastrointestinal complications are common after plantains' consumption. (215)

CVS: It lowers blood pressure, so it should not be used by hypotensive patients. (212)

Allergic reactions: It might cause dermatitis when it is applied directly upon the skin. (211)

Pregnancy and lactation: Pregnant and breastfeeding women should ask a professionals' advice before using the drug. (216)

**Contraindications:** It must not be administered concomitantly with anticoagulant or antiplatelet drugs. (212)

## **Rhamni Purshianae cortex**

Rhamnus Purshiana  
(Cascara Sagrada)



Family: Rhamnaceae

**Constituents:** anthracene glycosides, linoleic acid, lipids, resin.

**Uses:** It is, mainly used for the treatment of constipation. (217) However, it could be used for hemorrhoids and digestive complications, too. (218)

**Side effects:**

GIT: Cascara may cause diarrhea, vomiting, hepatic disorders(219), cramps and colic.

Urinary system: Haematuria and kidney complications are possible to take place after a long-term administration of the drug. (220)

CVS: It may, also, induce heart problems. (221)

Haemopoietic system: Dehydration and electrolyte disturbances are possible, for example, low levels of potassium or sodium in the blood.(221) High blood pressure is also likely to occur. (220)

Allergic reactions: Skin discolouration and rashes are adverse reactions, too. (222)

Pregnancy and lactation: It should be avoided. (217)

**Contraindications:** *Rhamnus Purshiana* should not be taken by those suffering from gastrointestinal disorders, such as ulcerative colitis, stomach pain, Crohn's disease,(221) or bowel disorders. In addition, it should be avoided together with

the administration of antiarrhythmic drugs, for example digoxin, as well as, with diuretics or laxatives. (219) Corticosteroids, eg. dexamethasone, interact with cascara. (221) Children under 12 years old should avoid its use. (217)

## **Rubi idaei folium**

Rubus idaeus  
(Raspberry leaf)



Family: Rosaceae

**Constituents:** acids, polypeptides, tannins, flavonoids (rutin).

**Uses:** It was used on the past for the treatment of diarrhea, stomatitis, tonsillitis and conjunctivitis as an eye solution. (223) It has astringent properties (224), it was also very effective during pregnancy, for the prevention of miscarriage and for the facilitation of labor. Finally, it was directly applied to the skin for the treatment of skin rashes and sore throat (225) and was very effective against kidney stones. (226)

### **Side effects:**

GIT: Tannins which are included in the drug, induce gastrointestinal tract's and mouth's irritations. (224) It can also cause mild diarrhea and sometimes nausea. (227)

Endocrine system: Raspberry might act like estrogen and that is the reason why it should be avoided in cases of breast or ovarian cancer, endometriosis or uterine fibrosis. (225)

Pregnancy and lactation: It has been shown that the drug is safe, however, it should be used after professional advice. (223)

**Contraindications:** *Rubus idaeus*, as well as, every plant containing tannins, is contraindicated for patients with constipation, iron deficiency anaemia and malnutrition. (224)The drug should be used cautiously when administered together with contraceptives. (228)

## **Rumicis radix**

Rumex crispus  
(Yellow dock)



Family: Polygonaceae

**Constituents:** anthraquinones, tannins, volatile oils. (229)

**Uses:** It has laxative properties (230) and it is used for the treatment of constipation, nasal and respiratory inflammations and bacterial infections. (231) The drug could be used in cases of low stomach acidity, too. (232) Finally it is cathartic and has been mainly used for psoriasis and skin diseases (229), as well as, for digestion problems and blood complications. (233)

### **Side effects:**

GIT: Nausea, vomiting and stomach pain are the most frequent adverse drug reactions.

CVS: Heart complications are likely to occur after the drugs' use.

Urinary system: The constituents of the plant bind to calcium and as a result, they form calcium salts which may damage the kidneys. In cases of kidney stones, the drug should be avoided.

Haemopoietic system: Yellow dock increases blood clotting, so the patient should communicate with the doctor before its use (231) In addition, it lowers the levels of potassium and calcium in the blood.

Allergic reactions: Dermatitis may occur after overdosage by oral administration. (229)

Pregnancy and lactation: It should not be used without professional advice. (230)

Other: Cramps are likely to take place after overdosage and potassium reduction if the drug is administered together with furosemide. (234)

**Contraindications:** Yellow dock should not be administered to those suffering from ileus,(230) kidney problems, stomachic ulcers (231) or liver complications. (233) It should not be used together with digoxin, diuretic agents, anticoagulant drugs(231) and laxatives. (233)

## **Salicis cortex**

*Salix purpurea*  
(Willow bark)



Family: Salicaceae

**Constituents:** phenolic glycosides, salicylates, flavonoids, tannins, catechins. (235)

**Uses:** It has anti-inflammatory, antipyretic, antirheumatic and analgesic effects. (236) It was also used against common flu , weight loss, headache and muscle pain .

**Side effects:**

Urinary system: The drug reduced blood flow in the kidneys and as a result, it may lead to kidney failure.

Haemopoietic system: It reduces the bloods' clotting so it increases the risk of bleeding before or during surgery or when it is used concomitantly with anticoagulant drugs. (237)

CNS: Tiredness and dizziness are possible adverse reactions in the central nervous system. (236)

GIT: It may induce nausea, vomiting, pain in the stomach and irritation in the gastrointestinal tract, due to tannins.

Allergic reactions: Rashes are a possible adverse drug reaction. (238)

Pregnancy and lactation: It should be avoided, since the salicylates pass through breast milk and may cause allergies to the foetus. (239)

**Contraindications:** Patients that are allergic to aspirin, may be to willow bark too..Those with diabetes, gout, liver complications and asthma should avoid to use the drug. (237) In addition, plants containing tannins, in general, should be avoided by those suffering from iron deficiency anemia, malnutrition and constipation. (236) Finally, *Salix purpurea* should not be given together with diuretics, anticoagulants, beta-blockers or NSAIDs. (238)

## **Sassafrasi cortex**

Sassafras albidum  
(Sassafras)



Family: Lauraceae

**Constituents:** alkaloids, volatile oils, mucilages, tannins. (240)

**Uses:** It is used for rheumatoid arthritis, gout and skin complications. (241) It has diuretic and carminative actions (240) and it could, also, be used in eye swelling. (242) Its extract is used for pain in stomach and liver and kidney disorders, however, the root bark of the plant is used for the prevention of stroke. Finally, it could be useful for the treatment of depression. (243)

**Side effects:**

GIT: Vomiting and diarrhea are included in the drugs' adverse reactions. (241) Gastrointestinal complications may lead to liver damage or even cancer. (242)

Allergic reactions: Skin rashes are possible complications. (244)

CNS: Depression and hallucinations that could last for several days could appear after a long-term use of the drug. (240) In addition, since it affects the central nervous system, it must not be used before or during surgery. (242)

Pregnancy and lactation: It should be avoided. (245)

Other: It may induce cancer when consumed with food, as sassafras oil. (244)

**Contraindications:** Sassafras must not be used together with CNS depressants, because it might cause excessive sleepiness and sedation. It is finally contraindicated to patients suffering from urinary tract infections, because it will aggravate the symptoms of the disease. (242) It should not be used together with alcohol or in empty stomach. (245)

### **Schizandrae fructus**

Schizandra chinensis  
(Schisandra)



Family: Schisandraceae (246)

**Constituents:** schizandrin, polysaccharides, polyphenols, essential oils. (247)

**Uses:** Schisandra was used to treat inflammations and irritations (248), respiratory problems (246) and hepatitis. (249) It has in general, antioxidant properties (246) and it is effective for diabetes, hypertension, visual problems, concentration problems and others. (249) It also enhances immunity, decreases the sense of fatigue (250) and relieves kidney disorders. Finally, is effective against sweating and improves mental clarity. (251)

**Side effect:**

GIT: Nausea, dyspepsia, pain in stomach and anorexia are some mild complications that may appear after the consumption of the drug. (246) Gastroesophageal reflux (GERD) or peptic ulcer are,also, possible side effects due to the increase of the stomach acid. (249)

CNS: Headache is another adverse reaction (246), as well as, epileptic complications may occur, since the drug is proven to stimulate the central nervous system.

Allergic reactions: Skin rashes and itching are likely, but not that common. (249)

Pregnancy and lactation: It should be avoided, it may cause uterine contractions.(246)

Other: The drug is proven to increase triglyceride and cholesterol levels.(252)

**Contraindications:** The drug is contraindicated for those in the early stages of cough, rash, peptic ulcer, seizures and hypertension. (246) It should not be used by patients with increased intracranial blood pressure, because Schisandra stimulates the central nervous system. Finally, it must be avoided by those who



use concomitantly anticoagulant drugs or drugs that are substrates in cytochrome P450 in the liver. (249)

## **Sennae fructus/folium**

*Cassia senna*

(Senna)



Family: Caesalpiniaceae

**Constituents:** anthraquinone glycosides (sennosides), aloe-emodin, acids, flavonoids, volatile oils. (253)

**Uses:** It was widely used for constipation, since it has laxative action. (254) Its use together with psyllium leads to even faster treatment of constipation. Finally, it might be useful for irritable bowel disease, haemorrhoids and for the preparation of colonoscopy. (255)

### **Side effects:**

GIT: Senna could induce stomach pain and diarrhea with major loss of potassium, which may lead to dehydration or even Crohn's disease or stomach inflammation. (255)

Urinary system: Hematuria is a possible adverse drug reaction.

CVS: Electrolyte disturbances (hypokalemia) could induce heart complications, especially is the patient is taking cardiac glycosides, corticosteroids or diuretics. (256)

Allergic reactions: After a long-term administration of Senna, allergic rhinitis is shown to occur in some cases.

Pregnancy and lactation: It should be avoided. (257)

**Contraindications:** The drug must not be used at the same time with digoxin, because low potassium levels increase the adverse effects of digoxin, with diuretics, because they also decrease potassium levels and anticoagulant medication, because the risk of bleeding is increased. (255) Senna must not be administered to those suffering from diarrhea, colon or bowel diseases or to those receiving antiarrhythmic drugs. (257)

## **Serenoae fructus**

*Serenoa serrulata*  
(Saw palmetto)



Family: Arecaceae/Palmae

**Constituents:** carbohydrates, fixed oils, steroids, flavonoids. (258)

**Uses:** It is used for treating benign prostatic hyperplasia (BPH) and prostate cancer. (259) It has anti-inflammatory and spasmolytic effects, (260) so it is effective against urinary tract symptoms (261). Saw palmetto was used sometimes for the treatment of asthma, sore throat and bronchitis. (259). It is proven to be effective in polycystic ovary syndrome, thyroid complications and in improvement of digestion. (262)

### **Side effects:**

GIT: Moderate complications in the gastrointestinal system have been proven, stomach pain is the most common. (260) Nausea, diarrhea or constipation may also occur. (258) Pancreatitis is reported, but it is rare. (263)

Haemopoietic system: Haemorrhage has been reported, but in some special cases only. (260)

CNS: Headache, vertigo (258) and dizziness can take place after a long-term therapy with the drug.

Pregnancy and lactation: It should be avoided, it is totally unsafe.

**Contraindications:** Saw palmetto should be consumed cautiously together with contraceptive pills or estrogens (259), as well as, with warfarin and other anticoagulants, because it increases the risk of bleeding. (260)

## **Silybi mariani fructus**

*Silybum marianum*  
(St.Mary's thistle)



Family: Asteraceae/Compositae

**Constituents:** flavonoids, silymarine complex, lipids, sterols, acids, sugars. (264)

**Uses:** It is used for allergies, for example allergic rhinitis, (265) it is hepatoprotective and antioxidant. (266) It is also used for dyspepsia, haemorrhoids and stimulation of milk production for breastfeeding women. (264) It is very effective for the treatment of chronic liver diseases or liver cirrhosis. (267)

### **Side effects:**

GIT: Stomach pain, nausea, diarrhea and loss of appetite are usual gastrointestinal problems.

Endocrine system: Extracts from the particular plant may act like estrogen, so its use may worsen the symptoms of the already existing breast or ovarian cancer, endometriosis and uterine fibrosis. (265)

CNS: Headache, sweating and a sense of weakness are possible adverse

reactions of the drug.

Allergic reactions: Anaphylaxis is reported, especially in those who have sensitivity in the plants of the family Asteraceae/Compositae. (268)

Pregnancy and lactation: There is not enough information about the toxicity of the drug, thus it should be avoided. (264)

Contraindications: The drug should be administered with caution together with acetaminophen, butyrophenones, phenothiazines and ethanol, since it increases their toxicity. (269)

## **Tanateci folium**

*Tanatecum parthenium*  
(Feverfew)



Family: Asteraceae/Compositae

**Constituents:** terpenoids (sesquiterpene lactones), volatile oils, flavonoids. (270)

**Uses:** Feverfew is used for skin irritations, allergies, fever, arthritis and nausea. (271) Also, it was used prophylactically for headache and migraine,(270) but it was not proven very effective. (272) It is very helpful in gastrointestinal disorders, for example stomach and intestinal upset. (271) Finally, it has anti-inflammtory, antibacterial and anti-cancer properties. (273)

### **Side effects:**

GIT: Feverfew is very possible to cause mouth ulcerations and generally gastrointestinal adverse reactions. (262) Edema on the lips or mouth are also reported. (274) Pain in the stomach is the most common complication of the drug. (275)

CNS: "Post feverfew syndrome" is reported after the use of the plant and it affects mainly the CNS (262), headache (274) and insomnia are very common. (270)

Haemopoietic system: Feverfew may increase the amount of blood during menstruation.

Respiratory system: Overdosage of the particular drug may lead to respiratory failure. (275)

Allergic reactions: Skin irritations, rashes and dermatitis are very possible to occur. (274)

Pregnancy and lactation: It should not be administered. (273)

**Contraindications**: It should not be taken during or after surgery, because it increases the risk of bleeding. The drug should not be used together with anticoagulant and antiplatelet drugs and with drugs which interfere with cytochrome P450 3A4, since there may be induced liver damage. (271)

## **Trifolii fibrini folium**

*Menyanthes trifoliata*

(Bogbean)



Family: Gentianaceae / Menyanthaceae

**Constituents:** acids, flavonoids, coumarins, iridoids, loganin, sweroside, foliamenthin, mentiafolin. (276)

**Uses:** It is used mainly for rheumatoid arthritis, pain in joints and stomach complications. (277) The drug has also diuretic properties (276), it prevents inflammations and it is useful against anorexia. (278) It is finally, laxative in large doses and suitable for gallbladder diseases. (279)

**Side effects:**

CNS: Dizziness and vision problems are reported as adverse effects of the particular drug.

Respiratory system: Difficulty in breathing may occur. (280)

GIT: Nausea, vomiting and diarrhea are the most common adverse reactions of bogbean. The use of this drug could worsen the already existing colitis or dysentery.

CVS: It affects the bloods' clotting time, so it may increase the risk of bleeding, especially in cases where the patient uses anticoagulant drugs. (277)

Pregnancy and lactation: The drug should be avoided, it is totally unsafe. (276)

Other: Back pain and muscle cramps have been observed. (280)

**Contraindications:** Bogbean must not be used together with anticoagulants or antiplatelet drugs, because it increases the risk of haemorrhage. (277) It should also be avoided by those suffering from diarrhea or gastrointestinal complaints.

(279)

## **Uncariae cortex**

Uncaria tomentosa  
(Cat's claw)



Family: Rubiaceae

**Constituents:** alkaloids, glycosides, triterpenes, steroids. (281)

**Uses:** It has anti-inflammatory properties, it is antioxidant and it increases immunity. (282) It is used for osteoarthritis, rheumatoid arthritis, haemorrhoids, gastrointestinal problems and various viral infections. (283) It is effective against stomach ulcers, colitis and depression. (284) Finally it has also anticancer effects and it may act as contraceptive. (281)

### **Side effects:**

GIT: Diarrhea or constipation and digestive complications may occur after overdosage. (285)

Haemopoietic system: Lymphocytosis or erythrocytosis are possible adverse drug reactions and their symptoms may worsen if the diseases already exist. Circulatory problems are also likely to occur. (286)

CVS: Cat's claw could lower blood pressure, so it should not be used by patients with hypotension. (283)

Urinary system: It might induce kidney complications. (281)

Pregnancy and lactation: It must not be administered, especially without professional advice.

Other: The drug could worsen the symptoms of acne (282), as well as, it may cause or worsen the complications of auto-immune diseases (285), such as multiple sclerosis or lupus erythematosus. (283)

**Contraindications:** It is contraindicated to those who are under immunosuppressive therapy or those who receive anticoagulant or antiplatelet medication. The drug should be administered cautiously to patients undergoing antihypertensive therapy. (281) It interferes with drugs that are substrates for cytochrome P450 in the liver. (283)

## **Urticae folium/radix**

*Urtica dioica*  
(Nettle)



Family: Urticaceae

**Constituents:** acids, amines, flavonoids, minerals, chlorophyl.

**Uses:** It was used for uterine bleeding, skin eruptions and infantile and psychogenic eczema. (287) In addition, it is effective for the treatment of osteoarthritis, anemia, water retention, diarrhea and diabetes. (288) It has antiulcer, antioxidant and antibacterial activities. (289)

### **Side effects:**

GIT: Gastrointestinal complaints have been proven after the root's consumption. (290)

Urinary system: Nettle might induce increased urinary flow and kidney problems may worsen, if they already exist. (288)

CVS: Nettle lowers blood pressure and heart rate, so the drug should be used with caution by those suffering from hypotension and bradycardia. (291)



Urinary system: The drug has diuretic properties, thus it should be used with caution by those having diuretic problems. (292)

Allergic reactions: Allergies, especially the sense of burning in the skin (287), have been reported, so it should be used cautiously by those with a known allergy in plant. (290)

Haemopoietic system: *Urtica dioica* may increase the risk of bleeding, mostly when it is combined with anticoagulant drugs.

Pregnancy and lactation: It should be avoided, because it might lead to a miscarriage. (293)

**Contraindications:** *Urtica dioica* should not be used together with antidiabetic medication and antihypertensive, however, the drug enhances the activity of CNS-depressants. (287) Finally, nettle interacts with lithium salts and with anticoagulant drugs, for example warfarin. (288)

## **Vaccinii fructus**

*Vaccinium macrocarpon*  
(Cranberry)



Family: Ericaceae

**Constituents:** acids, carbohydrates, phenolics.

**Uses:** It is used for prevention and treatment of urinary tract infections (294), since it reduces bacterinuria and it is also effective against *Helicobacter pylori*. (295) It, also, likely that it reduces blood sugar volume, so cranberry juice is a good choice for the treatment of Diabetes type II.

**Side effects:**

GIT: It could cause stomach pain or diarrhea if it is consumed in large quantities. (296)

Urinary system: Because of its high concentration in oxalate content, cranberry could induce the formation of oxalate stones (kidney stones) and uric acid. (294)

Allergic reactions: Cranberry contains a great amount of salicylic acid, so it should not be used by those who are allergic to aspirin. (297)

Pregnancy and lactation: It should be avoided in the form of tinctures, because they may contain a large amount of alcohol. (298)

**Contraindications:** It must be used with caution by patients suffering from benign prostate hyperplasia (BPH) or urinary obstruction, because cranberry increases the elimination of the drugs that are excreted by urine. (294)

Also, it interacts with anticoagulant drugs, for example warfarin, and with digoxin and as a result the fruit enhances the risk of bleeding. (298) It enhances the activity of antibiotics and it may interfere with proton-pump inhibitors (esomeprazole). (299)

Finally, cranberry juice should not be consumed on a daily basis by the diabetics, because it contains additional sugar. (295)

## Visci albi folium/fructus

*Viscum album*  
(Mistletoe)



Family: Loranthaceae

**Constituents:** acids, alkaloids, amines, lectins, flavonoids, terpenoids. (300)

**Uses:** The plant is used for hypertension, atherosclerosis, tachycardia (301) and in hepatic and bladder cancer. It could also be effective for gastrointestinal complications, hepatitis C and seizures. (302) The drug increases immunity and can be useful against fatigue and anxiety, too. (305)

### **Side effects:**

CVS: Hypotension which may lead to coma is a possible adverse drug reaction. (301) It might aggravate they already existing heart problems and induve cardiovascular collapse.

Haemopoietic system: The drug is proven to aggravate leukemia, especially in children, so it is better to avoid its use. (302) In addition, mistletoe interferes with glucose blood levels, so it must be used with caution especially by diabetics.

CNS: Headache and fever are common side effects of the drug.(303) Mistletoe could induce seizures,too.

GIT: Lectins contained in the fruit of the plant are highly toxic, a fact that can cause liver toxicity problems. (301)

Respiratory system: Difficulty in breathing may occur, but rarely. (304)

Allergic reactions: Allergies have been reported, so it should be used cautiously. (305)

Pregnancy and lactation: It should not be used, because it might cause contractions of the uterus and lead to a miscarriage.

Other: It stimulates the immune system, so it could induce auto-immune diseases, such as multiple sclerosis, rheumatoid arthritis and lupus erythematosus. (302) Finally, the drug may induce mydriasis or miosis. (300)

**Contraindications**: It must not be administered together with antihypertensives or immunosuppressants and it should be avoided by those who have undergone an organ transplantation, since it could induce organ rejection. (302)

## **Withaniae radix**

*Withania somnifera*  
(Withania)



Family: Solanaceae

**Constituents**: alkaloids, saponins, steroid lactones (withanolides). (306)

**Uses**: Withania is anti-inflammatory, sedative, antianemic, and modulates the immune system. (307) It has great anticancer effect, especially in combination with radiation (308) and it could be useful in tuberculosis, liver complications, vomiting and infertility.(309) Finally, it was used for the treatment of neurological and sexual complications (310) and it is very effective against cardiac complaints, such as coronary artery disease, ischemia and hypertension. (311)

### **Side effects:**

GIT: The drug causes gastrointestinal irritations, such as vomiting and diarrhea, which can lead to stomach ulcers. Saponin content is responsible for this adverse drug reaction. (307)

CNS: It affects the central nervous system, so it must not be administered before

or during surgery not concomitantly with anaesthesia. (309)

CVS: It could be toxic in high doses and induce cardiac problems.(313)

Pregnancy and lactation: It may lead to a miscarriage, thus it should be avoided by pregnant women. (312)

Other: Since withania modulates immunity, it could induce auto-immune diseases, such as multiple sclerosis, rheumatoid arthritis and lupus erythematosus. (309)

**Contraindications:** The plant should not be taken together with immunosuppressants, benzodiazepines, CNS depressants, (309) anxiolytics and alcohol. (312)

## **Zingiberis rhizoma**

*Zingiber officinale*

(Ginger)



Family: Zingiberaceae

**Constituents:** carbohydrates, lipids, oleo-resin, volatile oils. (314)

**Uses:** It has been widely used for the treatment of common cold, fever, digestive problems and for the inducement of appetite. It is very effective against joint pain, arthritis and abnormal blood clotting. (315) Finally, the drug is administered in cases of dizziness and nausea (316) and has anticancer properties. (314)

**Side effects:**

GIT: Moderate gastrointestinal complaints may appear in some patients(317),

such as diarrhea, dyspepsia and stomach pain .

CVS: It reduces blood pressure and it may worsen heart complications. (317)

CNS: Ginger may lead to sedation, anxiety or even sleepiness. (318)

Allergic reactions: Dermatitis is possible for patients that are allergic to the plants of this family. (314)

Pregnancy and lactation: Ginger can lead to abortion, so it should be avoided by pregnant women and during breastfeeding, since it passes through milk to the newborn. (319)

**Contraindications**: It should not be administered to patients with gallstones (317) and to patients receiving anticoagulants or antiplatelets, because it enhances the risk of bleeding. In addition, patients receiving antidiabetic medication should adjust their dosage when they consume ginger at the same time. Finally, since the drug reduces blood pressure it should be used with caution by those who use calcium channel blockers. (316)

Tab 1. **Side effects of drugs on various organ systems and complications**

| <b>Systems</b>                | <b>Complications</b>  | <b>Plants (plant part)</b>                | <b>References</b>              |
|-------------------------------|-----------------------|---|--------------------------------|
| <b>GIT</b>                    | Abdominal pain        | Aeculus hippocastanum (semen)             | 3                              |
|                               |                       | Aloe vera                                 | 18                             |
|                               |                       | Arnica montana (flos)                     | 30                             |
|                               |                       | Cassia senna (fructus, folium)            | 255                            |
|                               |                       | Crataegus laevigata (folium,fructus,flos) | 60                             |
|                               |                       | Curcuma longa (rhizoma)                   | 64                             |
|                               |                       | Euphorbia hirta (herba)                   | 81                             |
|                               |                       | Ginkgo biloba (folium)                    | 90                             |
|                               |                       | Hydrastis canadensis (rhizoma,radix)      | 113                            |
|                               |                       | Hypericum perforatum (herba)              | 118                            |
|                               |                       | Iris versicolor (rhizoma)                 | 124                            |
|                               |                       | Lobelia inflata (herba)                   | 150                            |
|                               |                       | Oenothera biennis (oleum)                 | 189                            |
|                               |                       | Panax ginseng (radix)                     | 179                            |
|                               |                       | Schizandra chinensis (fructus)            | 246                            |
|                               |                       | Vaccinium macrocarpon (fructus)           | 296                            |
|                               |                       | Zingiber officinale (rhizoma)             | 317                            |
|                               |                       | Nausea<br>Vomiting<br>Diarrhea            | Aesculus hippocastanum (semen) |
|                               | Aloe vera             |   | 18                             |
|                               | Arnica montana (flos) |   | 30                             |
| Cassia senna (fructus,folium) | 255                   |   |                                |

| Systems                          | Complications                  | Plants (plant part)                                   | References |
|----------------------------------|--------------------------------|---|------------|
| GIT                              | Nausea<br>Vomiting<br>Diarrhea | <i>Chamaemelum romanae</i> (flos)                     | 40         |
|                                  |                                | <i>Commiphora mukul</i><br>(oleum, resina)            | 54         |
|                                  |                                | <i>Crataegus laevigata</i><br>(folium, fructus, flos) | 60         |
|                                  |                                | <i>Curcuma longa</i> (rhizoma)                        | 64         |
|                                  |                                | <i>Ephedra sinica</i> (herba)                         | 78         |
|                                  |                                | <i>Euphorbia hirta</i> (herba)                        | 80         |
|                                  |                                | <i>Filipendula ulmaria</i> (flos)                     | 85         |
|                                  |                                | <i>Ginkgo biloba</i> (folium)                         | 89,90      |
|                                  |                                | <i>Harpagophytum procumbens</i><br>(radix)            | 106        |
|                                  |                                | <i>Hypericum perforatum</i> (herba)                   | 118        |
|                                  |                                | <i>Iris versicolor</i> (rhizoma)                      | 122        |
|                                  |                                | <i>Larrea tridentata</i> (folium)                     | 139        |
|                                  |                                | <i>Lobelia inflata</i> (herba)                        | 150        |
|                                  |                                | <i>Matricaria recutita</i> (flos)                     | 156        |
|                                  |                                | <i>Melissa officinalis</i> (folium, flos)             | 160        |
|                                  |                                | <i>Mentha pulegium</i> (herba)                        | 169        |
|                                  |                                | <i>Menyanthes trifoliata</i> (folium)                 | 277        |
|                                  |                                | <i>Oenothera biennis</i> (oleum)                      | 189,190    |
|                                  |                                | <i>Phytolacca decandra</i> (radix)                    | 200        |
|                                  |                                | <i>Piscidia erythrina</i> (radix)                     | 207        |
|                                  |                                | <i>Plantago major</i> (folium)                        | 212        |
| <i>Ramnus purshiana</i> (cortex) | 219                            |   |            |
| <i>Rubus idaeus</i> (folium)     | 227                            |   |            |
| <i>Rumex crispus</i> (radix)     | 231                            |   |            |
| <i>Salix purpurea</i> (cortex)   | 238                            |   |            |



| <b>Systems</b>                | <b>Complications</b>           | <b>Plants (plant part)</b>                 | <b>References</b> |
|-------------------------------|--------------------------------|--|-------------------|
| <b>GIT</b>                    | Nausea<br>Vomiting<br>Diarrhea | Sassafras albidum (cortex)                 | 236               |
|                               |                                | Schizandra chinensis (fructus)             | 241               |
|                               |                                | Serenoa serrulata (fructus)                | 258               |
|                               |                                | Silybum marianum (fructus)                 | 265               |
|                               |                                | Uncaria tomentosa (cortex)                 | 285               |
|                               |                                | Vaccinium macrocarpon (fructus)            | 296               |
|                               |                                | Vitex agnus-castus (fructus)               | 10                |
|                               |                                | Withania somnifera (radix)                 | 307               |
|                               |                                | Zingiber officinale (rhizoma)              | 317               |
|                               | Digestive Disorders            | Echinaceae angustifolia<br>(rhizoma,radix) | 68                |
|                               | GIT irritations<br>Reflux      | Gymnema sylvestre (folium)                 | 101               |
|                               |                                | Hypericum perforatum (herba)               | 119               |
|                               |                                | Iris versicolor (rhizoma)                  | 124               |
|                               |                                | Mentha piperita (folium,herba)             | 165               |
|                               |                                | Phytolacca decandra (radix)                | 201               |
|                               |                                | Piper methysticum (rhizoma)                | 130               |
|                               |                                | Plantago major (folium)                    | 214,215           |
|                               |                                | Rubus idaeus (folium)                      | 224               |
|                               |                                | Salix purpurea (cortex)                    | 238               |
|                               |                                | Schizandra chinensis (fructus)             | 249               |
| Serenoa serrulata (fructus)   |                                | 260  |                   |
| Urtica dioica (folium,radix)  | 290                            |  |                   |
| Vaccinium myrtillus (fructus) | 296                            |  |                   |
| Withania somnifera (radix)    | 307                            |  |                   |

| <b>Systems</b> | <b>Complications</b>                                      | <b>Plants (plant part)</b>                              | <b>References</b> |
|----------------|---|---|-------------------|
| <b>GIT</b>     | Liver complications                                       | Angelica archangelica<br>(fructus,folium,rhizoma,radix) | 21                |
|                |   | Chelidonium majus (herba,radix)                         | 46                |
|                |   | Cinnamomum cassia (cortex)                              | 48                |
|                |   | Ephedra sinica (herba)                                  | 76                |
|                |   | Larrea tridentata (folium)                              | 139               |
|                |   | Mentha piperita (folium,herba)                          | 167               |
|                |   | Mentha pulegium (herba)                                 | 171               |
|                |   | Passiflora incarnata (herba)                            | 197               |
|                |   | Piper methysticum (rhizoma)                             | 130               |
|                |   | Rhamnus purshiana (cortex)                              | 219               |
|                |   | Sassafras albidum (cortex)                              | 242               |
|                |   | Viscum album (folium,fructus)                           | 301               |
| <b>CNS</b>     | Dizziness/headache<br>Loss of consciousness/<br>tiredness | Aesculus hippocastanum<br>(semen)                       | 4                 |
|                |   | Capsella bursa-pastoris (herba)                         | 37                |
|                |   | Commiphora mukul<br>(oleum,resina)                      | 51                |
|                |   | Crataegus laevigata<br>(folium,fructus,flos)            | 58,60             |
|                |   | Echinacea angustifolia<br>(rhizome,radix)               | 67                |
|                |   | Eleutherococcus senticosus<br>(radix)                   | 70                |
|                |   | Ephedra sinica (herba)                                  | 76                |
|                |   | Ginkgo biloba (folium)                                  | 87,88             |
|                |   | Harpagohytum procumbens<br>(radix)                      | 107               |

| Systems                        | Complications   | Plants (plant part)                  | References |
|--------------------------------|---|--------------------------------------|------------|
| <b>CNS</b>                     | Dizziness/headache<br>Loss of consciousness/<br>tiredness | Hydrastis canadensis (rhizoma,radix) | 113        |
|                                |   | Iris versicolor (rhizoma)            | 122        |
|                                |   | Lactuca virosa (folium,latex)        | 134,136    |
|                                |   | Lobelia inflata (herba)              | 148        |
|                                |   | Matricaria recutita (flos)           | 157        |
|                                |   | Melissa officinalis (folium,flos)    | 159,160    |
|                                |   | Mentha piperita (folium,herba)       | 163,167    |
|                                |   | Mentha pulegium (herba)              | 172        |
|                                |   | Menyanthes trifoliata (folium)       | 280        |
|                                |   | Oenothera biennis (oleum)            | 190        |
|                                |   | Panax ginseng (radix)                | 96         |
|                                |   | Passiflora incarnata (herba)         | 185,193    |
|                                |   | Piper methysticum (rhizoma)          | 130        |
|                                |   | Piscidia erythrina (radix)           | 200,207    |
|                                |   | Salix purpurea (cortex)              | 236        |
|                                |   | Serenoa serrulata (fructus)          | 258        |
|                                |   | Silybum marianum (fructus)           | 268        |
|                                |   | Tanacetum parthenium (folium)        | 274        |
|                                |   | Viscum album (folium,fructus)        | 303        |
|                                |   | Vitex agnus-castus (fructus)         | 11         |
| Withania somnifera (radix)     | 309   |                                      |            |
| Zingiber officinalis (rhizoma) | 318   |                                      |            |

| <b>Systems</b> | <b>Complications</b>               | <b>Plants (plant part)</b>      | <b>References</b> |
|----------------|------------------------------------|---------------------------------|-------------------|
| <b>CNS</b>     | Seizures                           | Phytolacca decandra (radix)     | 199               |
|                |                                    | Schizandra chinensis (fructus)  | 249               |
|                | Multiple sclerosis                 | Astragalus membranaceus (radix) | 34                |
|                | Mental confusion/anxiety/psychosis | Gymnema sylvestre (folium)      | 104               |
|                |                                    | Hypericum perforatum (herba)    | 118               |
|                |                                    | Oenothera biennis (oleum)       | 190,192           |
|                |                                    | Sassafras albidum (cortex)      | 240,242           |

| <b>Systems</b>         | <b>Complications</b>       | <b>Plants (plant part)</b>                | <b>References</b> |
|------------------------|----------------------------|---|-------------------|
| <b>CVS</b>             | Increase of blood pressure | Arnica Montana (flos)                     | 30                |
|                        |                            | Eleutherococcus senticosus (radix)        | 73                |
|                        |                            | Ephedra sinica (herba)                    | 77                |
|                        |                            | Glycyrrhiza glabra (radix)                | 145               |
|                        |                            | Harpagophytum procumbens (radix)          | 106               |
|                        |                            | Matricaria recutita (flos)                | 157               |
|                        |                            | Mentha pulegium (herba)                   | 169               |
|                        |                            | Panax ginseng (radix)                     | 100               |
|                        | Decrease of blood pressure | Crataegus laevigata (folium,fructus,flos) | 60                |
|                        |                            | Phytolacca decandra (radix)               | 203               |
|                        |                            | Piper methysticum (rhizoma)               | 131               |
|                        |                            | Plantago major (folium)                   | 212               |
|                        |                            | Uncaria tomentosa (cortex)                | 283               |
|                        |                            | Urtica dioica (folium,radix)              | 291               |
|                        |                            | Viscum album (folium,fructus)             | 301               |
|                        | Hypokalemia                | Zingiber officinalis (rhizoma)            | 317               |
|                        |                            | Cassia senna (fructus,folium)             | 256               |
|                        | Arrhythmias                | Glycyrrhiza glabra (radix)                | 145               |
|                        |                            | Crataegus laevigata (folium,fructus,flos) | 60                |
|                        |                            | Eleutherococcus senticosus (radix)        | 73                |
| Ginkgo biloba (folium) |                            | 90  |                   |
|                        |                            | Harpagophytum procumbens (radix)          | 106               |

| <b>Systems</b>            | <b>Complications</b> | <b>Plants (plant part)</b>                | <b>References</b> |
|---------------------------|----------------------|---|-------------------|
| <b>CVS</b>                | Arrythmias           | Mentha piperita (folium,herba)            | 163               |
|                           |                      | Panax ginseng (radix)                     | 100               |
|                           |                      | Phytolacca decandra (radix)               | 201               |
|                           | Heart complications  | Capsella bursa-pastoris (herba)           | 37                |
|                           |                      | Cassia senna (fructus,folium)             | 256               |
|                           |                      | Hydrastis canadensis (rhizoma,radix)      | 115               |
|                           |                      | Menyanthes trifoliata (folium)            | 277               |
|                           |                      | Passiflora incarnata ((herba)             | 197               |
|                           |                      | Rhamnus purshiana (cortex)                | 221               |
|                           |                      | Rumex crispus (radix)                     | 231               |
|                           |                      | Withania somnifera (radix)                | 313               |
| <b>Respiratory system</b> | Shortness of breath  | Arnica montana (flos)                     | 30                |
|                           |                      | Cinnamomum cassia (cortex)                | 50                |
|                           |                      | Crataegus laevigata (folium,fructus,flos) | 60                |
|                           |                      | Echinaceae angustifolia (rhizoma,radix)   | 66                |
|                           |                      | Filipendula ulmaria (flos)                | 86                |
|                           |                      | Ginkgo biloba (folium)                    | 90                |
|                           |                      | Lobelia inflata (herba)                   | 151               |
|                           |                      | Melissa officinalis (folium,flos)         | 162               |
|                           |                      | Menyanthes trifoliata (folium)            | 280               |
|                           |                      | Panax ginseng (radix)                     | 100               |

| <b>Systems</b>             | <b>Complications</b>            | <b>Plants (plant part)</b>                | <b>References</b> |
|----------------------------|---------------------------------|---|-------------------|
| <b>Respiratory system</b>  | Respiratory paralysis           | Capsella bursa-pastoris (herba)           | 39                |
|                            |                                 | Crataegus laevigata (folium,fructus,flos) | 60                |
|                            |                                 | Hydrastis canadensis (rhizoma,radix)      | 113               |
|                            |                                 | Mentha pulegium (herba)                   | 172               |
|                            |                                 | Tanacetum parthenium (folium)             | 275               |
| <b>Urinary system</b>      | Kidney problems                 | Aesculus hippocastanum (semen)            | 5                 |
|                            |                                 | Apium graveolens (fructus)                | 25                |
|                            |                                 | Capsella bursa-pastoris (herba)           | 37                |
|                            |                                 | Ephedra sinica (herba)                    | 78                |
|                            |                                 | Filipendula ulmaria (flos)                | 86                |
|                            |                                 | Larrea tridentata (folium)                | 137,141           |
|                            |                                 | Mentha pulegium (herba)                   | 169               |
|                            |                                 | Rumex crispus (radix)                     | 231               |
|                            |                                 | Salix purpurea (cortex)                   | 237               |
|                            |                                 | Uncaria tomentosa (cortex)                | 281               |
|                            |                                 | Urtica dioica (folium,radix)              | 288               |
|                            | Vaccinium macrocarpon (fructus) | 294                                       |                   |
|                            | Discolouration of urine         | Aloe vera                                 | 19                |
|                            | Hematuria                       | Cassia senna (fructus,folium)             | 256               |
| Rhamnus purshiana (cortex) |                                 | 220                                       |                   |

| <b>Systems</b>                   | <b>Complications</b>          | <b>Plants (plant part)</b>              | <b>References</b> |
|----------------------------------|-------------------------------|---|-------------------|
| <b>Haemopoietic system</b>       | <b>Haemorrhage</b>            | Achillea millefolium (flos,folium)      | 178               |
|                                  |                               | Allium sativum (bulbus)                 | 12                |
|                                  |                               | Curcuma longa (rhizoma)                 | 64                |
|                                  |                               | Ginkgo biloba (folium)                  | 87                |
|                                  |                               | Oenothera biennis (oleum)               | 188               |
|                                  |                               | Panax ginseng (radix)                   | 94                |
|                                  |                               | Rumex crispus (radix)                   | 231               |
|                                  |                               | Salix purpurea (cortex)                 | 237               |
|                                  |                               | Serenoa serrulata (fructus)             | 260               |
|                                  |                               | Tanatecum parthenium (folium)           | 275               |
|                                  |                               | Urtica dioica (folium,radix)            | 293               |
|                                  | <b>Haemolytic anemia</b>      | Chelidonium majus (herba,radix)         | 44                |
|                                  |                               | Larrea tridentata (folium)              | 138               |
|                                  |                               | Viscum album (folium,fructus)           | 302               |
|                                  | <b>Leukopenia</b>             | Echinaceae angustifolia (rhizoma,radix) | 68                |
|                                  |                               | Phytolacca decandra (radix)             | 199               |
|                                  | <b>Lymphocytosis</b>          | Uncaria tomentosa (cortex)              | 286               |
|                                  | <b>Venous thrombosis</b>      | Melissa officinalis (folium,flos)       | 162               |
|                                  | <b>Hypoglycaemia</b>          | Cinnamomum cassia (cortex)              | 48                |
|                                  |                               | Gymnema sylvestre (folium)              | 102               |
| <b>Electrolyte distrurbances</b> | Cassia senna (fructus,folium) | 256                                     |                   |
|                                  | Glycyrrhiza glabra (radix)    | 145                                     |                   |
|                                  | Rhamnus purshiana (cortex)    | 221                                     |                   |



| <b>Systems</b>                          | <b>Complications</b>      | <b>Plants (plant part)</b>          | <b>References</b>                  |
|---|---------------------------|-------------------------------------|------------------------------------|
| <b>Endocrine system</b>                 | Hypothyroidism            | Capsella bursa-pastoris (herba)     | 39                                 |
|   | Menstrual complications   | Commiphora mukul (oleum,resina)     | 53                                 |
|   |                           | Eleutherococcus senticosus (radix)  | 71                                 |
|   |                           | Glycyrrhiza glabra (radix)          | 143                                |
|   |                           | Rubus idaeus (folium)               | 225                                |
|   |                           | Silybum marianum (fructus)          | 265                                |
|   |                           | Vitex agnus-castus (folium,fructus) | 7,11                               |
|   | <b>Allergic reactions</b> | Rashes/dermatitis                   | Achillea millefolium (flos,folium) |
| Aesculus hippocastanum (semen)          |                           |                                     | 3                                  |
| Allium sativum (bulbus)                 |                           |                                     | 12                                 |
| Aloe vera                               |                           |                                     | 19                                 |
| Arnica montana (flos)                   |                           |                                     | 28                                 |
| Chamaemelum romana (flos)               |                           |                                     | 40                                 |
| Cinnamomum cassia (cortex)              |                           |                                     | 50                                 |
| Commiphora mukul (oleum,resina)         |                           |                                     | 55                                 |
| Curcuma longa (rhizoma)                 |                           |                                     | 62                                 |
| Echinaceae angustifolia (rhizoma,radix) |                           |                                     | 67                                 |
| Euphorbia hirta (herba)                 |                           |                                     | 80                                 |
| Filipendula ulmaria (flos)              |                           |                                     | 86                                 |
| Ginkgo biloba (folium)                  |                           |                                     | 90                                 |
| Harpagophytum procumbens (radix)        |                           |                                     | 108                                |

| <b>Systems</b>                | <b>Complications</b> | <b>Plants (plant part)</b>     | <b>References</b> |
|-------------------------------|----------------------|--------------------------------|-------------------|
| <b>Allergic reactions</b>     | Rashes/dermatitis    | Iris versicolor (rhizoma)      | 121,125           |
|                               |                      | Lactuca virosa (folium,latex)  | 133               |
|                               |                      | Larrea tridentata (folium)     | 138,139           |
|                               |                      | Matricaria recutita (flos)     | 145               |
|                               |                      | Mentha piperita (folium,herba) | 155               |
|                               |                      | Mentha pulegium (herba)        | 174               |
|                               |                      | Oenothera biennis (oleum)      | 191               |
|                               |                      | Panax ginseng (radix)          | 94,98             |
|                               |                      | Passiflora incarnata (herba)   | 197               |
|                               |                      | Phytolacca decandra (radix)    | 203               |
|                               |                      | Piper methysticum (rhizoma)    | 128               |
|                               |                      | Piscidia erythrina (radix)     | 210               |
|                               |                      | Plantago major (folium)        | 211               |
|                               |                      | Rhamnus purshiana (cortex)     | 222               |
|                               |                      | Rumex crispus (radix)          | 229               |
|                               |                      | Salix purpurea (cortex)        | 238               |
|                               |                      | Sassafras albidum (cortex)     | 244               |
|                               |                      | Schizandra chinensis (fructus) | 249               |
|                               |                      | Silybum marianum (fructus)     | 268               |
| Tanacetum parthenium (folium) | 274                  |                                |                   |
| Urtica dioica (folium,radix)  | 287,290              |                                |                   |

| <b>Systems</b>            | <b>Complications</b>      | <b>Plants (plant part)</b>                           | <b>References</b> |
|---------------------------|---------------------------|--|-------------------|
| <b>Allergic reactions</b> | Allergic rhinitis         | Cassia senna (fructus,folium)                        | 257               |
|                           |                           | Harpagophytum procumbens (radix)                     | 108               |
|                           | Photosensitivity          | Angelica archangelica (fructus,folium,rhizoma,radix) | 21                |
|                           |                           | Apium graveolens (fructus)                           | 23                |
|                           |                           | Hypericum perforatum (herba)                         | 117               |
|                           | Steven-Johnson's syndrome | Ginkgo biloba (folium)                               | 88                |
|                           |                           | Panax ginseng (radix)                                | 97                |

## **5. Discussion**

My diploma thesis is about the side effects of the drugs, how they affect vital organs in the body and their functions, the way that they should be administered and the cases in which the drugs must be consumed with caution or must not be consumed at all.

Above, there are presented 60 medicinal herbs, their constituents, therapeutical uses, side effects and contraindications organized according the system which is affected.

It is observed that there are 8 systems that may appear complications after the drugs' consumption. Central nervous, gastrointestinal, respiratory, cardiovascular, endocrine, haemopoietic, urinary systems and allergic reactions.

Many active substances have anti-inflammatory properties, such as essential oils, or antioxidant properties, such as flavonoids. However, it is obvious that almost every drug is not totally safe, due to specific constituents, and it may induce mild or serious adverse reactions. The plants that belong in the family Asteraceae/Compositae cause mainly allergic reactions, such as rashes and dermatic complications, eg. *Achillea millefolium*, *Chamaemelum nobile*. (5), (44) Usually these drugs contain sesquiterpene lactones or furanocoumarins, which are proven to be allergenic or photosensitising respectively. *Angelica archangelica* and *Hypericum perforatum* are the most phototoxic drugs of all. (19), (117)

On the other hand, tannins and saponins cause gastrointestinal irritations and stomach ulcers, so they must not be used by patients suffering from dyspepsia and stomach and intestinal disorders. *Hypericum perforatum*, *Ephedra sinica*, *Filipendula ulmaria* and *Gymnema sylvestris* are some examples of drugs that are most likely to cause these adverse drug reactions. (118), (79), (89), (101). More specifically, tannins are contraindicated for patients with constipation, iron deficiency anemia and malnutrition.

In addition, drugs containing coumarins increase the risk of bleeding and thus, they should be avoided especially by those consuming anticoagulants, in order to prevent further complications. *Apium graveolens*, *Chamaemelum nobile* and *Menyanthes trifoliata* should never be consumed concomitantly with anticoagulants, because there is increased risk of haemorrhage. (24), (45), (166)

Electrolyte disturbances are also serious complications which affect cardiovascular system. *Cassia senna* and *Glycyrrhiza glabra* cause hypokalemia due to laxative or diuretic effect. (41), (99) *Panax ginseng* and *Viscum album* are drugs with the highest risk of inducing

disturbances in arterial blood pressure. (178), (293) Cardiac glycosides are responsible for cardiotoxic events, hypotension and arrhythmias (319) that appear as side effects in some of the drugs examined above. For example, *Crataegus Laevigata* is likely to induce cardiac abnormalities. (60)

Additionally, there are many various drugs affecting urinary system. The most common reaction is related to kidney inflammation or even kidney failure in some cases. For instance, *Rumex crispus*, *Rhamnus purshiana* and *Mentha pulegium* could influence kidney function and cause further complications. (226), (215), (159) Plus, cystic adenocarcinoma could be a serious adverse drug reaction caused by the consumption of *Larrea tridentata*. (132)

Some plant drugs can either stimulate or sedate central nervous system. Some possible side effects could be dizziness, drowsiness, headache, loss of consciousness, mental confusion, anxiety, psychosis or even Parkinson-like symptoms. *Piper methysticum* is the drug with the greatest side effects on central nervous system. (198)

Side effects are present in respiratory system, too. Cough, dyspnoea, shortness of breath, respiratory paralysis are some examples of reactions that may take place. *Phytolacca decandra* is really likely to cause cough or even respiratory failure after a long-term consumption. (189)

Moreover, some drugs could act like estrogens or alter regular menstruation in women, thus affecting endocrine system. Breast or ovarian cancer, endometriosis or uterine fibrosis are possible complications. *Commiphora mukul* is highly risky to cause irregular menstruation (56) and *Rubus idaeus* has a variety of effects on this particular system, since it has estrogen-like activity. (220)

Last but not least, it should be emphasized that the majority of these drugs contain both therapeutical and harmful constituents, so they must be used with caution, after a professional's advice and in moderate amounts. Patients that suffered in the past by any kind of disease, which affected their immunity or the function of their vital organs, should receive medicinal herbs only after their doctor's or pharmacist's suggestio

## **6. Conclusion**

- It is observed that 60% from the drugs listed above, irritate gastrointestinal system causing nausea, vomiting and diarrhea.
- The central nervous system is affected, also, by a large number of drugs 38/60 (63%), which may induce dizziness or other mild complications.
- Additionally, an overwhelming majority of 42/60 (70%) has been proven to cause allergic reactions; 35 out of 42 are responsible for rashes and dermatitis.
- Cardiovascular effects are observed in 30/60 (50%), 16 of them are involved in blood pressure regulation.
- Only 13/60 (22%) drugs provoke respiratory irritations, however, Phytolacca decandra is likely to induce respiratory failure.
- Moreover, in endocrine and haemopoietic systems, less than 20% of the drugs above are toxic, causing menstrual or hormonal complications and haemorrhage or electrolyte disturbances, respectively.
- Finally, 15/60 (25%) drugs are irritant for urinary system, where Rumex crispus is highly toxic and its consumption could lead to kidney failure.

The adverse drug reactions listed above depend on the drug's constituents, the way of administration, for example through oral consumption GIT problems are more usual, and the length of time in which the drug is consumed.

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## **Abstract in English**

This thesis is a review of substances contained in medicinal plants, the side effects and complications that they provoke. The adverse drug reactions are directly related to the constituents contained in each plant. Information for this work was taken from sources published from 1965 until 2013, especially from The Essential Guide To Herbal Safety and from the databases webmd.com and ncbi.nlm.nih.gov. It is discussed how the use of natural medicinal drugs affect vital organs in the human organism and in which cases their consumption is contraindicated. Central nervous, cardiovascular, urinary, gastrointestinal, endocrine, haemopoietic, respiratory, urinary systems are affected and allergic reactions are possible to occur as complications. *Hypericum perforatum* is typical for causing gastrointestinal irritations and *Chamaemelum nobile* and *Achillea millefolium* are found to cause dermatic complications. Finally, *Piper methysticum* may induce extreme sedation, since it has anxiolytic and antiepileptic properties.

Keywords: side effects, contraindications, medicinal plants, uses, constituents.

## **Abstract in Czech**

Tato diplomová práce podává formou rešerše přehled obsahových látek léčivých rostlin způsobujících vedlejší účinky. Údaje a informace pro tuto práci byly získány z literárních zdrojů zahrnující období 1965-2013, včetně a to především z knihy The Essential Guide To Herbal Safety a z internetových databází webmd.com a ncbi.nlm.nih.gov. Vedlejší účinky přírodních látek se projevují zejména v centrálním nervovém systému a dále v kardiovaskulárním, močovém, gastrointestinálním, endokrinním a krevním systému a způsobují i alergické reakce. *Hypericum perforatum* je typickou rostlinou vyvolávající gastrointestinální potíže, *Chamaemelum nobile* a *Achillea millefolium* způsobují dermatologické komplikace. *Piper methysticum* může vyvolat silnou sedaci, poněvadž je užíván jako anxiolytikum a antiepileptikum.

Klíčová slova: Vedlejší účinky, kontraindikace, léčivé rostliny, použití, obsahové látky.