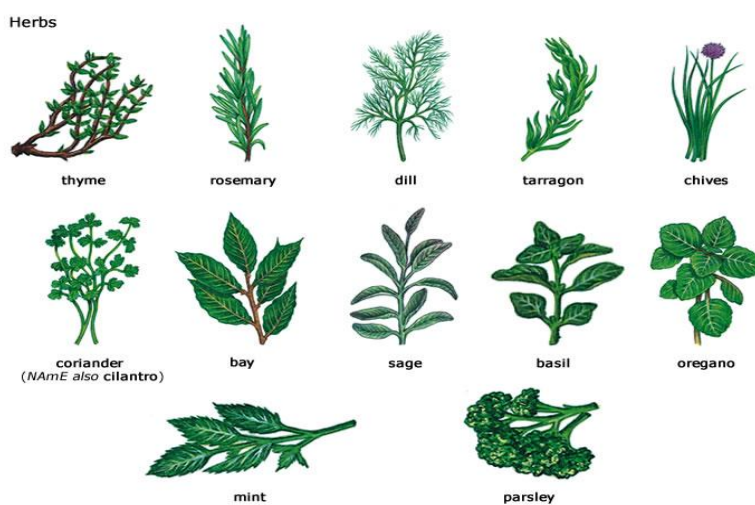


FEATURED GREEK HERB BLENDS FOR HIGH QUALITY BEVERAGES:

Documentation and market research for dried herbs



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A. IDENTITY OF GREEK HERBS FOR THE PRODUCTION OF HERBAL INFUSIONS

By the term 'Greek herbs' we defined two plant groups. Greek herbs are primarily defined as the indigenous plants, some endemic to the natural environment of Greece, plants that grow naturally in the country and have always had their origin in this geographical region (*Greek herbs*). By expanding this definition, we also considered Greek those herbs which have become naturalised, have been successfully cultivated and adapted to local conditions although they are not of Greek origin (*Hellenized herbs*). These plants were also included in our selection of plants, because of the extended use of their products, due to their irreplaceable properties, their optimum adaptation and successful cultivation in the Greek environment.

The herbs proposed by this scientific team for the preparation of herbal infusions and finally selected after preliminary screening tests, in cooperation with the firm ANASSA ORGANICS, are 22 different species, belonging to 10 different plant families. Among these, the majority belong to Labiatae or Umbelliferae families - i.e. the main medicinal plant families in the Greek region. Secondly, the selected herbs belong to the family Rosaceae, a family which includes many fruits of temperate regions. The rest of the selected plants belong to the Composite family, the Fabaceae or Leguminosae family, or the families Cornaceae, Caprifoliaceae, Ericaceae, Tiliaceae, Verbenaceae and Vitaceae.

Information fields selected to accompany the identity (i.e. the scientific name) of each plant are used variously. More specifically:

The field "full scientific name" includes the abbreviation or the surname of the scientist who described it scientifically for the first time ('authority'). In some cases, this field refers to the species of a genus that exists in Greece in order to determine the particular plant of interest.

The field 'Comments' indicates what plants are non-indigenous (indigenous or native of Greece) and gives information about the origin of a plant.

The field "Morphology" provides a brief and simplified description of the key characteristics of each plant.

The field "plant parts for dried herbs" identifies the scientifically accurate material that should be included in a herbal blend for commercial use.

The field "Blooming" marks the time when a plant is blooming, which can determine the period when specific parts of the plant should be collected or harvested.

The field "Distribution" includes information about the area where a plant exists as indigenous and indicates the region where the plant has acclimatized as non-indigenous or non-native species.

Listed below are selected plants for the preparation of infusions (alphabetically by their scientific name) within the two main groups of plants distinguished (Greek herbs and Hellenized herbs). For the selected plants we also list the basic biological information of their identity (full scientific name, morphology, plant part for dried herbal selection, flowering, spreading and comments).

B. PROPERTIES- ACTIONS OF GREEK HERBS

For the selected Greek herbs and Hellenized herbs we present the basic properties and medicinal actions. For those of the selected plants there exist scientific data in monographs (i.e. scientific survey work research data and review-confirmation of traditional uses) the information is organized into several thematic sections. For those of the selected plants there are no monographs issued, information is presented on fewer topics.

GREEK HERBS

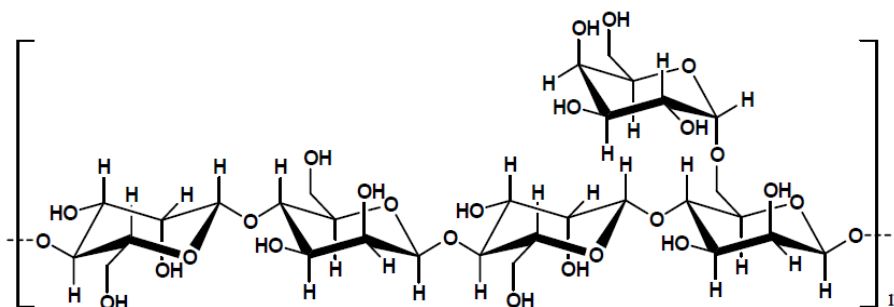
1. Ceratonia siliqua (carob), family Leguminosae (Fabaceae)

The two main carob pod constituents are (by weight): pulp (90 %) and seed (10%).

Fruit Texture: Chemical composition of the carob pod depends on cultivar, origin and harvesting time. Carob pulp is high (48–56%) in total sugar content (48-56%), primarily sucrose (32-38%), glucose (5-6%), fructose (5.7%), and maltose. In addition it contains about 18% cellulose and hemicellulose, as well as potassium, calcium, magnesium, sodium, iron, copper, manganese and zinc. The lipids consist of approximately equal proportions of saturated and unsaturated acids. Amino acids in pod extracts are alanine, glycine, leucine, proline and valine, tyrosine and phenylalanine. Ripe carob pods contain a large amount of condensed tannins (16-20% of dry weight). Constituents of the seed are (by weight): coat (30-33%), endosperm (42-46%) and embryo or germ (23-25%). The seed coat is rich in antioxidants. The endosperm is rich in a polysaccharide molecule composed of mannose and galactose sugar units with a ratio 4:1.

The fibers contain 24 carob polyphenolic compounds yield 3,94 g / kg dry weight, with the main free gallic acid (42% by weight of polyphenols), the gallotannines (29%), and the French methyl (1%), while simple phenols main representative cinnamic acid are approximately 2% of the total.

A total of 24 polyphenol compounds were identified in carob fibers with a yield of 3.94 g/kg of dry weight, dominated by free gallic acid (42% of polyphenols by weight), gallotannins (29%), and methyl gallate (1%), while simple phenols, mainly cinnamic acid, made up about 2% of the total. Flavonoids represent 26% of the polyphenols, whereas glycosides myricetin- and quercetin-3-O-alpha-L-rhamnoside represent ca. 9% and 10%, respectively.



Carob contains 448 mg / kg of extractable polyphenols, mainly gallic acid, hydrolysable and condensed tannins, glycosides, flavonoids and traces of isoflavones.

Fruit action: Experiments in vitro and in vivo studies reveal that carob extracts exhibit antioxidant, antidiabetic, antiviral, anticancer, anti-diarrheal, hypolipidemic actions.

Clinical studies: Clinical studies have shown that carob has an effect on weight loss, and is also suitable for infant colic pain.

Carob may substitute chocolate and cocoa in pastry and bakery. Carob pods boiled in water produce carob syrup, which has a chocolate like flavor, but excels chocolate in nutrients because it contains 52 times less fat and does not contain allergens or caffeine, its sweetness being a result of a naturally high content of sugar.

(Rockrose) Family Cistaceae
(*Cistus creticus*)

An aromatic, medicinal and apiarian shrub known since antiquity. It is mentioned in the works of Theophrastus and Dioscorides. In Crete, popular tradition considers its wood an insurance against the evil eye and the best wood for baking rusks in a traditional wood-burning oven.

Texture of stems-leaves: The stem and leaves contain a balmy fragrant resin, labdanum, rich in terpene compounds of the class of labdane diterpenes. These substances exhibit strong antimicrobial and cytostatic effects. Labdanum is of a dark brown colour and bitter in taste. The resin yields an essential oil with a penetrating fragrance. Since early antiquity and until the late 18th century, labdanum was used as a medicinal aid and remedy against cholera, it was burned as incense, but also as a means for embalming the dead.

Action of stems-leaves: It is used to treat insomnia, diarrhea, toothache and tetanus. It is not prescribed for internal use except under medical supervision. The resin dissolved in olive oil is used for chest rubbing in colds and bronchitis. It is also used for the preparation of ointments in order to treat boils.

Moreover, the plants of the genus *Cistus* are rich in phenolic substances (mainly flavonoids). Studies confirm the presence of polyphenols in teas and infusions prepared from the above-ground parts of various species of the genus, and their powerful antioxidant and anti-inflammatory action. Due to the presence of polyphenolic compounds in high concentrations in rockrose infusions, the plant has become very popular both in Greece and abroad. It presents strong antioxidant, anti-inflammatory and antimicrobial activity and can safely be relied upon to strengthen the immune system. It prevents infections in the oral cavity by reducing the number of bacteria.

***Foeniculum vulgare* (fennel), Family Apiaceae (Umbelliferae).** An aromatic, medicinal and apiarian plant, known since antiquity. The Chinese and the Indians used fennel as an antidote to snake and scorpion bites. Ancient Greeks called it "marathon" and considered it a symbol of success. Its name is connected with the great battle in the Marathon field, i.e a field of fennel. Pliny mentions the medicinal properties of fennel in more than 20 entries, and believed that snakes ate fennel in order to shed their skins.

Fennel is widely used nowadays as an aromatic culinary herb, and as a green to flavour traditional vegetable and seafood dishes, savory pies and raw salads. It is also used to spice olives, pickles and home made vinegars; fennel seeds are also added to bread, and in garnishing dishes.

Actions: Pharmaceutical uses of fennel include cystitis, arthritis and its use as a remedy to soothe sore eyes, to prevent hair loss, to fight wrinkles and as a refreshing mouth freshener. It helps reducing the symptoms of the flu, coughs, whooping cough, asthma, stomach disorders, nausea. It is thought to improve the milk supply in breastfeeding mothers.

The essential oil of the seeds, which contains 6% anethole and maratholis essential oils is used in perfumery, distilleries (particularly in liquors such as Absinthe from the Alps), and in the cosmetics industry.

Anethole

A traditional herbal medicinal product for:

- (a) symptomatic treatment of mild, spasmodic gastro-intestinal complaints including bloating and flatulence
- (b) symptomatic treatment of mild cramps associated with menstruation
- (c) as an expectorant in cough associated with colds.

Contraindications: Hypersensitivity to the active substance, in preparations of the substance or hypersensitivity in the plants of the family Apiaceae (Umbelliferae) (anise, caraway, celery, coriander and dill) or to anethole.

Warnings : The use in children under 4 years is not recommended because of the lack of sufficient information; a pediatrician should be consulted.

Precautions: There are no clinical data regarding the use of fennel in pregnancy. It is unknown if fennel constituents are excreted in human breast milk. In the absence of sufficient data, the use during pregnancy and lactation is not recommended.

Other Precautions: There are no reported interactions with other medicinal products.

Undesirable effects: Allergic reactions to fennel, affecting the skin and respiratory system may occur. The frequency is not known.

Dosage (Internal use)

Adults and adolescents over 12 years of age: For the symptomatic treatment of mild, spasmodic gastro-intestinal complaints (including bloating and flatulence), a single dose: 1,5 - 2,5 g of fennel seeds with 0,25 l of boiling water (leave for 15 minutes) t.i.d is recommended.

Children : For the symptomatic treatment of mild, spasmodic gastro-intestinal complaints (including bloating and flatulence) in children between 4 and 12 years, an average daily dose of 3-5 g, in three divided doses, for short term use in mild symptoms only (less than one week) is recommended. The use is not recommended in children under 4 years of age.

Duration of use

For the symptomatic treatment of mild, spasmodic gastro-intestinal complaints (including bloating and flatulence) in adults and adolescents over 12 years of age, fennel should not be taken for more than 2 weeks. For children between 4 and 12 years of age, a short-term use in mild symptoms (less than one week) is recommended.

V.1.6. Melissa officinalis (lemon balm) Family Labiatae

An aromatic, medicinal and apiarian plant. It was known in ancient Greece and also in South American countries. In Chile it is quite popular as a drink that "helps" weight loss.

As a folk medicine, melissa is used as a tonic, antispasmodic, antirheumatic, appetizer and antiasthmatic remedy.

Recommended to address pain and spasms of the stomach, colic, indigestion, vomiting during pregnancy, nervous crises, tooth aches, etc.

In cooking it is used in mayonnaise, in recipes with fresh cheese or cream, in gravies, sauces and salads, and even in some fruit desserts. It is also used in perfumery and in liqueur production.

Leaf texture: The leaves have a low content of essential oil, the main components being citral, citronellal, linalool and geraniol. Known non-volatile components include simple phenolic acids, mainly rosmarinic acid, caffeic acid, chlorogenic acid, flavonoids such as luteolin, apigenin and its derivatives, monoterpene glycosides, triterpenes such as ursolic and oleanolic acids and tannins. Different components contribute to the various pharmacological effects of the plant.

Actions: Recently, there has been a resurgence of interest in melissa, due to findings regarding its antioxidant, anti-inflammatory, antimicrobial, antiviral, sedatives, thyroid and regulatory properties. It is used for a wide range of problems, including fever, wounds, bites, insomnia, dysmenorrhea, toothache, headaches, intestinal cramps, and asthma. Ointments containing extract of the plant for the treatment of herpes simplex virus are also available.

It is a traditional herbal medicinal product for the relief of mild symptoms of mental stress, a sleep-inducing one. It is also used for the symptomatic treatment of mild gastrointestinal disorders (including bloating and flatulence).

Contraindications: Hypersensitivity to the active substance.

Warnings : The use in children under 12 years of age is not recommended due to lack of sufficient data. Seek professional medical advice.

Cautions: Its safety for use during pregnancy and lactation has not been established. In the absence of sufficient data, the use during pregnancy and lactation is not recommended.

Other Precautions: There are no reported interactions with other medicinal products.

Adverse effects: None known.

Dosage (Herbal Infusion)

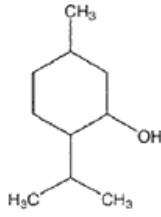
Adults : 1,5 - 4,5 g immersed in 150 ml of boiling water and left to infuse for 5 to 15 minutes. May be taken 1 to 3 times daily.

Children : Use in children under 12 years of age is not recommended.

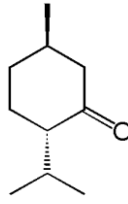
B.1.7. Mentha X piperita (peppermint), family Labiatae

Plants of the genus, all with rich content in essential oils, are used in folk healing because of their spasmolytic, anti-inflammatory, tonic, antibacterial and astringent properties.

Leaf texture: The constituents of the leaves of *Mentha x piperita* vary depending on plant maturity, the variety grown, the geographical location and processing conditions. The main active component is the essential oil. The leaves contain 1.2 to 3.9% (w / w) essential oil, with the main constituents being menthol (30-55%) and menthone (14-32%). Other monoterpenes present in the essential oil is limonene (5.1%), cineole (3, 5 to 14%), menthofuran (1-9%), isomenthoni (1.5-10%), ethyl menthyl (2 ,8-10%), pulegone (up to 4%) carvone (up to 1%).



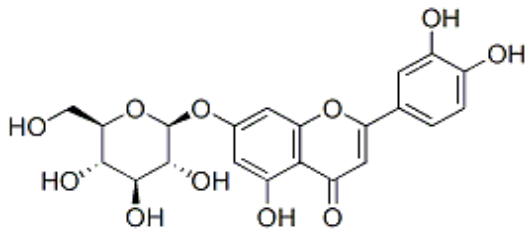
Menthol



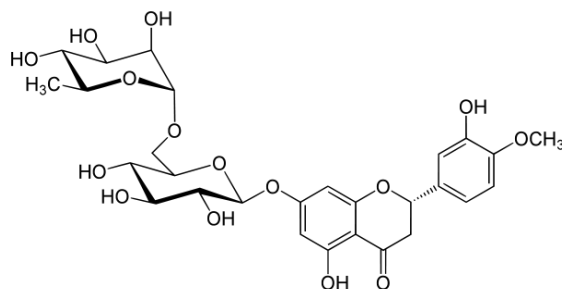
Menthonic

Actions: The essential oil has many healing properties and is widely used in the perfume industry. Both as an infusion and as essential oil it is analgesic, anti-insomniac and helpful in headaches. The essential oil of peppermint has been shown to present antimicrobial activity. As an aromatic substance, mint is used in toothpastes, in oral hygiene products as well as chewing gum.

Mint leaves are a traditional herbal medicinal product for the symptomatic relief in digestive disorders such as dyspepsia and flatulence. Aqueous extracts of peppermint are rich in phenolic compounds (luteolin 7-glucoside, rutin, hesperidin, eriositrin and flavones, hesperidin and rosmarinic acid).



Luteolin 7-glucoside



Hesperidin

Contraindications: Hypersensitivity to peppermint oil or menthol.

Warnings: People who suffer from gastro-esophageal reflux disease (heartburn) should avoid mint leaf preparations, because heartburn may increase. Patients with gallstones and any other biliary tract diseases should be careful with the use of mint leaf preparations. The use in children under 4 years of age is not recommended as there is no evidence.

Cautions: Safety use during pregnancy and lactation has not been established. In the absence of sufficient data, the use during pregnancy and lactation is not recommended.

Other Precautions: There are no reported interactions with other medicinal products.

Undesirable effects: Mint may actually worsen the symptoms of gastro-oesophageal reflux and heartburn.

Dosage (Herbal Infusion)

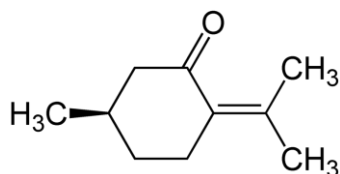
Adults - Daily dose : 4,5 - 9 g, divided in three single doses.

Children aged 4-12 years or adolescents 12 to 16 years - Daily dose (to be divided in three single doses) : 3 to 5 g and 3-6 g, respectively. The use in children under 4 years is not recommended.

B.1.8. *Mentha pulegium* (pennyroyal) Family Labiatae

Mentha pulegium is widely used as a culinary herb, in perfumery and the pharmaceutical industry and also as an insect repellent. In traditional medicine, the essential oil is used against digestive, liver and gall bladder disorders, to fight gouty arthritis and colds; it is also used externally to treat skin inflammations and irritations. Infusions and decoctions of the leaves and flowers are reported to present antispasmodic, diuretic, antiseptic, digestive, emmenagogue, and stimulant properties. Pennyroyal is a medicinal plant with interesting antioxidant properties.

Texture: The main component of the essential oil is pulegone, while the aqueous extracts are rich in polyphenolic compounds (flavonoids, Rosmarinic acid, etc.).



Pulegone

Dosage: Prepared as an infusion. Pour a spoonful in a cup of boiling water and leave it covered for 10-15 minutes. Strain and drink 2-3 times a day, after meals.

Precautions: Use during pregnancy and lactation is not recommended.

B.1.9. *Origanum dictamnus* (Dittany of Crete) Family Labiatae

Useful parts of the plant for medicinal purposes are all the above-ground parts (flowering tops of stems and leaves).

Leaf texture: Dictamnus contains a variety of chemical components: the main components in the essential oil are thymol, carvacrol and camphor (substances that provide the plant with therapeutic properties), and also pulegone. Proved to be a rich source of phenolic compounds, the main category being depsides (a chemical group containing caffeic acid subunits linked together through an ester or ether bond).

Actions: Dittany displays healing and astringent properties and soothes stomach and intestines pains. It fights bad breath and helps in treating gingivitis. The decoction is diuretic. As an emmenagogue it is reputed to help in cases of amenorrhea resulting from fatigue. Recommended in headaches, neurological disorders, and other diseases

of the nervous system, because of its sedative properties. It is often used because of its anthelmintic, antibacterial and antispasmodic activity.

Infusion : 20-30g of the herb in 0,5-1 L hot water.

Uses : tonic, antispasmodic, diuretic, digestive, antispasmodic, helps in kidney problems and also as a treatment against tonsillitis, colds, cough and sore throat. It has also been recommended as an alternative aid against liver diseases, and in cases of obesity and diabetes.

Decoction : 1,5-5 g of the herb in 250 ml (approximately one glass) of boiling water. It should not remain in the boiling water for too long because its precious ingredients may be destroyed. The decoction called 'vrastari' in Crete should be used within 24 hours, otherwise it is believed to be useless.

Dosage: 2 cups a day.

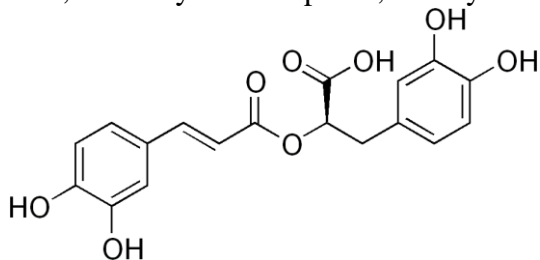
Uses : in headaches, neuralgia, gingivitis and toothaches, tonsillitis, common cold and cough. The decoction is used as a digestive, diuretic aid in kidney diseases and in cases of arthritis. It is considered to act as an emmenagogue.

B.1.11. Rosmarinus officinalis (rosemary), family Labiatae

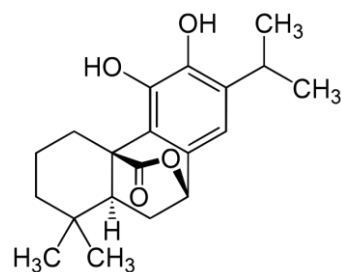
The botanical name *Rosmarinus* derives from old Latin and it means 'dew of the sea' because of the pale blue colour of the flowers and the fact that it often grows near the sea. Rosemary flowers attract bees and thus contribute in honey production.

Rosemary is used as a culinary herb and as an alternative to synthetic antioxidants, its essential oil and extracts being used as a natural food preservative.

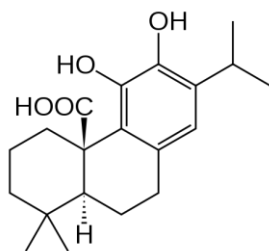
Texture of leaves and flowers: The leaves of the plant contain essential oil the main constituents being cineole, bornyl acetate, camphene, etc. It also contains phenolic compounds, including flavonoids and phenolic acids, mainly rosmarinic acid, and tricyclic diterpenes, mainly carnosol and carnosic acid.



Rosmarinic acid



carnosol



Carnosic acid

Actions: Rosemary flowers added to wine are thought to strengthen the heart and enhance vision. It is used for insomnia, fainting and dizziness. It is thought to be an excellent blood purifier, beneficial in breathing problems and asthma. It is also tonic, antiseptic and anti-rheumatic. It is beneficial to the skin, helps in hair growth and fights diabetes. The infusion is used to wash infected wounds. It is also used as a condiment, but rarely in order to increase the appetite.

The leaves of rosemary is a traditional herbal medicinal product for the symptomatic relief of indigestion and mild disorders of the gastrointestinal tract. It is used as a cholagogue, diaphoretic, diuretic, emmenagogue, laxative and tonic aid. Moreover, it is also used to treat headaches, menstrual disorders, memory problems, and is thought to benefit the healing process in sprains and bruises.

Contraindications: Hypersensitivity to the active substance. Blockage of the bile duct, cholangitis, liver disease, gallstones and other disorders of the bile ducts that require medical supervision and advice.

Warnings : The use in children under 12 years of age is not recommended due to lack of sufficient data and medical advice should be sought.

Cautions: Safety during pregnancy and lactation has not been established. In the absence of sufficient data, the use during pregnancy and lactation is not recommended.

Other Precautions: There are no reported interactions with other medicinal products.

Undesirable effects: Hypersensitivity, e.g. allergic contact dermatitis, has been reported. The frequency is not known.

Posology (Internal use)

Adults : Daily dose: 2-6 g. Single dose: 1-2 g in 150-250 ml of boiling water. May be taken 2-3 times daily.

Children : Use in children under 12 years is not recommended.

B.1.12. Rosa canina (Wild Rose), family Rosaceae

The distillation of roses began in Persia in 810 or 817 AD.

Texture: The fruits of the plant, rosehips, kynoroda in Greek, are rich in vitamins C, A, riboflavin, nicotinic acid, citric acid, sugars, carotenoids and flavonoids. They are collected when they begin to mature, when they are still tight; then the flesh is removed dried in the shade and stored properly.

Rose hip extracts have antibacterial, antifungal and anti-inflammatory properties and antioxidant activity has also been shown. They contain large amounts of pharmacologically active compounds such as ascorbic acid, flavonoids, carotenoids and tannins.

In recent research, *Rosa canina*, showed an average content of vitamin C to be 0.51 g/100 g of dry matter and flavonoids 41 mg/100 g of dry matter. Flavonoids isolated from *Rosa canina* seeds are flavonols trans – and cis tiliroside 1 and 2)) and have been concluded to present an antibacterial effect.

It is worth mentioning that a substance contained in rosehips, GOPO ®, a galactolipid (2S) -1,2-di-O-[(9Z, 12Z, 15Z)-octadeca-9,12,15-trienoyl] -3-O-BD-galactopyranosyl glycerol, presents anti-inflammatory and antioxidant activity. It is an active ingredient of Litozin, a drug achieving remarkable success as a treatment for osteoarthritis. It reduces joint pain and stiffness, improves flexibility and mobility presenting no undesirable effects whatsoever.

Actions: used as an astringent, anti-diarrheal, for the prevention and treatment of colds, bronchitis, hemoptysis, as a source of vitamin C; also used externally as an eye wash.

B.1. Salvia spp. (Sage), family Labiatae

The genus name *Salvia* comes from the Latin verb *salvare* (= save lives), although it was known and used at earlier times. It was used as a panacea, a cure all mentioned by Dioscorides, Aetius, Hippocrates and Galen.

It is used as a spice in various dishes and soups; blooming stems of the plant are used to herb-flavor vinegars. Moreover, sage is considered as an excellent apiarian plant, providing high-quality honey.

Texture: It is an important source of rosmarinic acid, which presents a number of interesting activities, eg. antiviral, antibacterial, anti-inflammatory and antioxidant. The content of essential oil of *Salvia fruticosa* ranges from 1.1 to 5.1%. The main constituents of the essential oil (1,8-cineole, alpha-thougioni, beta thougioni, camphor, etc.) vary depending on the region of origin.

Actions: Recent experiments confirmed that sage enhances memory. It is believed that it increases the levels of the acetylcholine neurotransmitter, aiding in the smooth transmission of messages in the brain. The levels of acetylcholine are reduced in patients with Alzheimer's disease, and therefore, sage, may be effective in treating the symptoms of the disease.

In the past people used to chew the leaves in order to cleanse their teeth. The infusion is used in the treatment of oral cavity and gum diseases, i.e. stomatitis, pharyngitis, gingivitis and also skin diseases; the essential oil against toothache.

Sage also inhibits secretion of the mammary glands and, to a small extent, boosts insulin activity in diabetic patients. The leaves present tonic, antiseptic, spasmolytic, expectorant and antiperspirant properties. In small doses it is used as antispasmodic, preventing gas formation in the intestines, and as an emmenagogue.

Sage is a traditional herbal medicinal product for:

- (A) the symptomatic treatment of mild indigestion such as heartburn and flatulence,
- (B) the relief of excessive sweating,
- (C) the symptomatic treatment of inflammations in the mouth or throat,
- (D) the relief of inflammatory skin conditions in children.

Contraindications: Hypersensitivity to the active ingredients. Rare cases of poisoning have been reported, stated to be due to thujone and caused by misuse in excessive quantities. Sage should be avoided by people with epilepsy, because thujone can trigger epileptic seizures. Sage should not be used by pregnant or nursing women. Characteristic symptoms of sage poisoning are skin irritations, intense and prolonged spasms, rigidity in the upper limbs, liver and kidney decay etc. Small amounts used in cooking are harmless and safe.

Warnings : Not recommended for use in children and adolescents under 18 years of age.

Cautions: Safety during pregnancy and lactation has not been established. In the absence of adequate data, the use during pregnancy and lactation is not recommended.

Other Precautions: There are no reported interactions with other medicinal products. The intake of sage products could affect the result of drugs acting through the GABA receptor (eg. barbiturates, benzodiazepines), even though it has not been observed clinically. Therefore, the concomitant use with such medicinal products is not recommended.

Adverse effects: None known.

Dosage

Adults : For the symptomatic treatment of mild indigestion (such as heartburn and bloating): 1-2 g leaves in boiling water t.i.d.

For the relief of excessive sweating: 2 g leaves in 160 ml of boiling water.

Thujone intake should not exceed 5 mg /day.

Children and adolescents: The use in children and adolescents under 18 years of age is not recommended.

Duration of use: Do not take for more than 2 weeks.

Overdose : Overdose has been reported after intake of more than 15 g of sage leaves with a sense of heat, tachycardia, vertigo and epileptic form convulsions (seizures).

B .1.15. Sideritis spp. (Mountain tea), family Labiatae

Sideritis syriaca L. subsp. syriaca , Malotira, Sideritis scardica Griseb., Olympus Tea, Sideritis raeseri Bois s. & Heldr. subsp. raeseri , Parnassus Tea or Tea Velouchi

In ancient times, the name 'sideritis', from Greek 'sideron', i.e. 'iron', was used to refer to various plants, believed to present the capacity to heal major wounds from iron objects such as arrows, swords etc. Sideritis, mentioned in Dioscorides, was named after the teeth of the calyx of the flower, resembling a spearhead. Dioscorides mentions the herb as a healing aid for wounds.

Species of the genus *Sideritis*, have been used since ancient times, in folk healing within the Mediterranean area, because of their anti-inflammatory, antirheumatic and antimicrobial properties.

Their infusions are used as an anti-ulcer, anti-rheumatic, anti-inflammatory agent, a heating, tonic, diuretic, detoxifying, antispasmodic, anti-diarrheal aid and one fighting colds. It is thought to be beneficial for the heart blood vessels and having an antihypertensive effect. The infusion of the above ground parts of the herb is used against colds and disorders of the respiratory tract, and also for urinary track infections due to its diuretic properties. Mountain tea with cinnamon bark and honey is considered to be soothing and antiseptic for cough.

In Spain, several wild species are used in folk medicine, especially for long-term treatment of inflammatory conditions, but also served as popular teas and digestive liqueurs.

Texture: Biological effects are due to the presence of flavonoids, phenyl ethanoate glycosides and terpenoids.

Various types of *Sideritis* contain several minerals and trace elements, especially Al, Ca, Fe, K, Mg, Na, P and Zn. They also contain small amounts of B, Ba, Cd, Co, Cr, Cu, Li, Mn, Ni, Pb, Sr, Tl and V.

An infusion of *Sideritis* spp. with preparation time 10 min, is rich in minerals especially Cu and K. Heavy metals appear at very low levels in the dried herb and the infusion, which is particularly positive for the consumption of herbal infusions. The essential oil content is generally low, ranging from 0.05 to 1%. The main components of essential oil vary depending on the variety and the environment where the original plant was grown. The predominant groups are monoterpene hydrocarbons and / or phenolic compounds and diterpenes.

Actions: Various species of the genus *Sideritis*, were found to exhibit anti-HIV activity, deriving from diterpenoid linearol. The plants of the genus *Sideritis* exhibit antibacterial and antifungal activity. Fungicidal and bactericidal activity of the essential oil of the species has also been reported.

Infusions, aqueous extracts and essential oils from leaves and flowers of the *Sideritis* genus plants exhibit antioxidant properties.

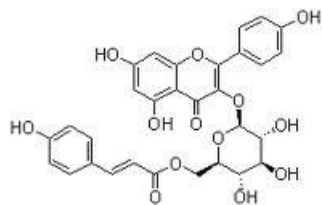
A phytotherapeutic formulation, 'Melofer', prepared from extracts of the species *Sideritis scardica*, containing iron, is used as a preventive treatment in cases of iron deficiency anemia.

B.1.16. Tilia tomentosa (linden) Family Tiliaceae

Also known by the names Lime tree, Linden, Silver lime, Silver linden, Basswood. It is known since antiquity (quoted by Theophrastus). The plant is aromatic, medicinal and melliferous. The tea is considered to exhibit antispasmodic, anti-diarrheal, diuretic, diaphoretic, expectorant and calming properties.

Principles *Tilia tomentosa* : Acids (Caffeic acid, chlorogenic acid and *P*-coumaric acid), amino acids, carbohydrates - polysaccharides (3%), flavonoids (kaempferol, quercetin, myricetin, and their glycosides such kaempferol-3-O-β-D-(6"-E-p-coumaroyl)-glucopyranoside - tiliroside, hyperoside), essential oil (0.02 to 0.1%), alkanes, phenolic alcohols and esters, and terpenes (citral, citronellal, citronellol, eugenol, limonene, nerol, alpha-pinene, terpineol, farnesol), and saponin, tannin and tocopherol (phytosterol).

Principles of *Tilia cordata* : Acids (Caffeic acid, chlorogenic acid and *P*-coumaric acid), amino acids (alanine, cysteine, cystine, isoleucine, leucine, phenylalanine and serine), carbohydrates - polysaccharides (3%), flavonoids (kaempferol, quercetin, myricetin, and their glycosides such as kaempferol-3-O-β-D-(6"-E-p-coumaroyl)-glucopyranoside - tiliroside, hyperoside), essential oil (0.02 to 0.1%), alkanes, phenolic alcohols and esters and terpenes (citral, citronellal, citronellol, eugenol, limonene, nerol, alpha-pinene, terpineol, farnesol), and saponin, tannin and tocopherol (phytosterol).



Tiliroside

The flowers of *Tilia cordata* is a traditional herbal medicinal product for:

- (a) alleviate the symptoms of the common cold and
- (b) the relief of mild symptoms of mental stress.

Contraindications: Hypersensitivity to the active ingredients.

Warnings: Use is not recommended in children under the age of 4 years for the relief of symptoms of the common cold and less than 12 years for the relief of mild symptoms of mental stress due to lack of adequate data. If experiencing shortness of breath, fever or purulent sputum during the use of the medicinal product a doctor or other qualified professional should be consulted.

Cautions: Safety during pregnancy and lactation has not been established. In the absence of sufficient data, the use during pregnancy and lactation is not recommended.

Other Precautions: There are no reported interactions with other medicinal products.

Adverse effects: None known.

Dosage (Infusion)

Adults : Single dose: 1,5 g dry herb in 150 ml of boiling water 2-4 times daily. Daily dose: 3-6 g

Children: For the relief of symptoms of common colds in children between 4 and 12 years: Single dose 1 g dry herb in 150 ml of boiling water as an infusion, 2-4 times daily. Daily dose: 2-4 g. The use in children under 4 years is not recommended. For the relief of mild symptoms of mental stress: The use in children under 12 years is not recommended.

Duration of use

For the relief of symptoms of the common cold: Treatment should start at first signs of a cold. If symptoms persist for more than one week during the use of the medicinal product, you should consult a doctor or other qualified professional.

For the relief of mild symptoms of mental stress: If symptoms persist during the use of the medicinal product, a doctor or other qualified professional should be consulted.

B.2. HELLENISED HERBS

B.2.1. *Aloysia citriodora* (lemon verbena) Family Verbenaceae

Properties: The Lemon verbena essential oil has a citrus-like, fresh aroma and is pale green in colour. The main components of the essential oil are citral, 1,8-cineole, limonene, geraniol, neral, 1-octen-3-ol and alpha-curcumene, the proportions of which vary according to region of origin of the plants. Lemon Verbena leaves are rich in flavonoids (salvigenini, efpatorin, luteolin and diosmetin); tannins and triterpenes are among the other constituents.

Uses : Besides being used as a spice, lemon verbena is also used in traditional medicine in order to treat headaches, indigestion, neuralgic pains, flatulence, vertigo, colds, etc. The essential oil extracted from leaves finds a wide application in the perfume industry. Insecticidal and antibacterial properties have also been reported.

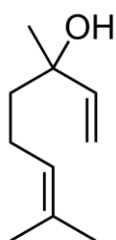
Precautions: Patients with hypotension are advised to avoid verbena because it is diuretic and lowers blood pressure. Not to be used during pregnancy and nursing.

Dosage (infusion): 1.5 g dry herb in 150 ml of boiling water for 4-5 minutes, up to 2 times daily for a period of about one month.

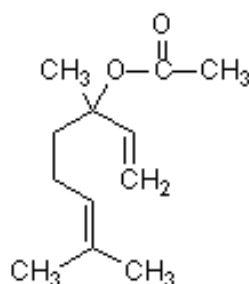
B.2.2. *Lavandula angustifolia* (lavender), family Labiatae

Lavender is an aromatic, medicinal, melliferous and ornamental herb known since antiquity. Extremely diverse in terms of its uses, Lavender is used as a herbal tea; the popular essential oil is used in perfumery, aromatherapy, as a fragrance ingredient in soaps, as an ingredient in varnishes and porcelain painting; dried flowers are placed in closets to keep linens fresh and free of moths. Lavender is also used as a flavor component.

Texture of flowers: The flowers contain essential oil, coumarin derivatives (umbelliferone, cherniarin), flavonoids, sterols, triterpenes traces, tannins and phenolic acids (rosmarinic acid, ferulic acid, ursolic acid, coumaric acid, caffeic acid, sinapic acid, etc.); the main compounds include monoterpene alcohols (60-65%) such as linalool (20-50%) and linalyl acetate (25-46%).



Linalool



Linalyl acetate

Actions: Lavender exhibits antiseptic and healing properties. It is believed to help against coughs, asthma, whooping cough, influenza and laryngitis. Lavender soothes stomach problems and calms the nervous system, promoting relaxation. It is ideal for insomnia and stress, helps migraines and headaches. Is a traditional herbal medicinal product for the relief of mild symptoms of anxiety and mental exhaustion and is considered sleep-inducing.

Contraindications: Hypersensitivity to the active substance.

Warnings : The use in children under 12 years is not recommended due to the lack of adequate data.

Precautions: In the absence of sufficient data, the use during pregnancy and lactation is not recommended. May impair the ability to drive and use machines.

Other Precautions: There are no reported interactions with other medicinal products.

Adverse effects: None known.

Dosage (infusion)

Adults : 1 - 2 g immersed in 150 ml of boiling water and left for 5 to 15 minutes. May be taken 1 to 3 times daily.

Children : Use in children under 12 years are not recommended.

Duration of use: Do not use over prolonged periods.

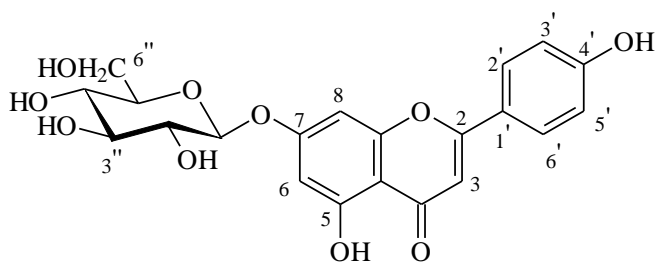
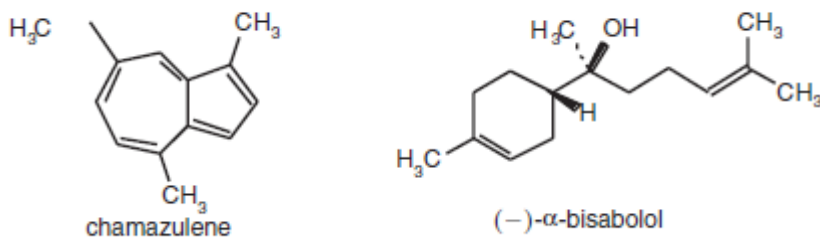
B.2.3 . Matricaria chamomilla (chamomile), family Compositae

Known since antiquity, chamomile derives its name from the Greek words *xamai* and *melon*, (apple of the ground), referring to its fresh apple scent and its low-growing habit. Hippocrates recommended it as an emmenagogue and used it to treat hysteria, whereas Dioscorides administered chamomile for its antipyretic and analgesic properties.

Texture of inflorescences : The plant is officially listed in the European Pharmacopoeia. Chamomille inflorescences contain an essential oil (0.4–1.5%), of an intense blue colour due to its chamazulene content (1–15%). Other major constituents include a-bisabolol and related sesquiterpenes (up to 50% of the oil). Apigenin and related flavonoid glycosides constitute up to 8% (dry weight) of the herb; phenolic acids and coumarin-related compounds are also detected.

Actions: It is an aromatic and medicinal plant. Varieties of chamomile are cultivated because the infusion has presented soothing, healing and anti-inflammatory properties. Chamomile has been used for centuries as a mild, soothing, anti-inflammatory, sleep-inducing aid against colds and stomach disorders, to name only a few therapeutic uses. Extensive, recent and on-going scientific research has confirmed many of the traditional uses of the herb and has established the pharmacological mechanisms for the plant's therapeutic activity including anticonvulsive, antipyretic, antibacterial, antifungal, and anti-allergic action. Apart from its medicinal use, chamomile is widely used, especially in Europe, Latin America and the U.S., as a refreshing herbal tea and as an ingredient in numerous cosmetic formulations. It is estimated that over one million cups of chamomile tea are ingested worldwide each day.

The components of the essential oil are known for their soothing, antiseptic and anti-irritant activity. They stimulate the regeneration of damaged skin. The flavonoids have positive effects on the peripheral microcirculation and studies have shown that these substances help to trap free radicals, so they present a particular interest in inflammatory reactions.



Apigenin -7-O- β -D- glucoside

The herb is used to lighten hair colour naturally. Due to its anti-inflammatory activity, it is also used for rashes, wounds, burns and boils. Chamomile contains sesquiterpene lactones, which can cause allergic reactions; therefore, their presence in the final product is undesirable.

Contraindications : Chamomile is contraindicated in patients with a known sensitivity or allergy to plants of the family Asteraceae (Compositae) such as chrysanthemums.

Warnings: No information available.

Precautions : (Carcinogenesis, mutagenesis, impairment of fertility): Mutagenic effects or adverse reactions were not observed in vivo.

Other precautions : No information available on general precautions, drug interactions , non- teratogenic effects in pregnancy, nursing mothers, or pediatric use.

Undesirable effects : The presence of lactones in preparations of chamomile flowers may cause allergic reactions in sensitive individuals. Contact dermatitis due to preparations containing chamomile have been reported. It should be noted, that, the very few cases of allergic reactions reported were attributed to German chamomile. A few cases of anaphylactoid reactions have also been reported.

Posology (Internal use)

Adults : average daily dose of inflorescences : 2-8 g, 3 t.i.d.

Children : 2 g, 3 t.i.d.

B.2.4 . *Origanum majorana* (*marjoram* , *antoanida*) Family Labiatae

Marjoram presents many medicinal and therapeutic properties. The useful parts of the herb are the leaves, which provide an infusion with sedative, anticonvulsive and diaphoretic properties.

Texture - Actions: Contains essential oil (0.8 to 2.2 %), which is used in perfumery. Several studies suggest that it has antimicrobial, antifungal, antioxidant, insecticidal and phytotoxic action. It also has a high content in polyphenolic components, mainly

rosmarinic acid. Flavonoids largely occur as apigenin and luteolin -7 - rutinolide.

Uses: Marjoram is appropriate for therapy of minor disorders of the nervous system. It is also used as an antispasmodic aid. It increases the appetite, relieves flatulence and stomach aches. It is beneficial against headaches and insomnia. It has expectorant, disinfectant, tonic, antispasmodic, analgesic, sedative and anticonvulsant action. Poultice of the leaves and essential oil are applied to relieve rheumatic and arthritic pains, whereas marjoram's pure fragrance is mood uplifting and counters depression and stress. It is also very effective against respiratory diseases, such as asthma and bronchitis, against dysmenorrhoea, constipation, cerebrovascular diseases, colic, vertigo, epilepsy, cold and oral ulcers.

In aromatherapy, marjoram essential oil promotes relaxation.

C. MARKET RESEARCH: AVAILABILITY OF HERB DRY MATTER GREEK AROMATIC AND MEDICINAL PLANTS & HERBAL TEAS

C.1. INTRODUCTION

Herbal teas require dry herbs of excellent quality, since, from a consumer point of view, the first visual contact with the product, the appearance and then the tasty result (most probably, more important than efficiency) are the first selection criteria. The Greek origin of the raw herbal materials sourced from organic farming are product characteristics of ANASSA ORGANICS.

Our research on the availability of genuine raw material for herbal blends was made with reference to:

- Conventional Cultivation growers of aromatic /medicinal plants
- Organic farming growers of herbs
- Suppliers & Traders of dry herbs

In order to evaluate the outcome and the difficulty of the task, insight into the current Greek reality regarding the cultivation of aromatic and medicinal plants and the development of organic agriculture in Greece is required. Here, we present details on both. Information is available, due to the fact that our team was previously involved in the area of herbal reproductive material, which allows for the formation of opinion for cultivating aromatic and medicinal plants in recent years, and also for the future availability of the herbs in question.

Areas cultivating aromatic and medicinal plants are very difficult to detect at global, European and national levels, since there exist many herbal species, all found scattered. Accurate recordings of cultivated herbs in Greece are unavailable and the ones referred to, derive from statements made by farmers in ELGA and the data of the Ministry of Rural Development and Food (2000 - 2006), which actually move far from reality. This is why, in order to come to conclusions, data of an earlier period, combined with personal assessments, were analysed.

Growing and Cultivating Aromatic Herbs in Greece

The total area of aromatic and medicinal plants under cultivation in Greece, ranges

from 16,000 to 20,000 hectares and the annual production from 1,500 to 1,800 tons. These values place Greece in the 11th place in all 16 European countries. The area under cultivation of herbs shows an increasing trend. More than 112 plant species are cultivated in Greece, 68 of which are classified as melliferous. Saffron ranks first in terms of cultivated area, followed by plants such as dittany, fennel, mint, oregano, sage, mountain tea, basil, anise, rosemary, thyme, coriander, cumin, lavender, marjoram, melissa, clary sage, hyssop, chamomile, rose geranium, mastic. Growing regions of Greece hosting aromatic and medicinal crops are Macedonia, Thrace, Boeotia, Euboea, Thessaly, Lesbos, Crete. They are mainly located in mountainous LFAs.

Organic farming in Greece

In recent years, there has occurred a remarkable shift in organic farming practices on a European scale. Greece, compared to other European countries, has one of the lowest rates of organic cultivated area. Figures for the year 1999 amounted to 0.6 % of the total cultivated land, and in 2005 stood at approximately 3%. The main factors affecting the demand for organic products include consumers' concerns over their health and increasing food safety concerns, partly driven by the threat of food scandals revealed.

In the majority of cases, the sector of organic products in Greece involves small-scale organic brands and family businesses. Their sales remain at relatively low levels, with the main legal forms being sole proprietorships and general partnerships. According to data from inspection and certification bodies, the total number of firms in the industry (producers, processors and importers) amounted to 15.556 in 2005 versus 9.985 in 2004.

Until a few years ago, the number of retail outlets for organic products in the Greek market was relatively limited. This began to change with the rise of supermarkets chains as major retail outlets of organic products. A further positive development is indicated by channels of organic specialized stores, offering only organic products, and the operation of regular open markets of organic products.

The total value of domestic organic food market (at retail prices) showed an increase of 30% in 2006 compared to 2005, whereas for imported organic foods, these are estimated to represent approximately 65% of the total value for 2006. Regarding three of the main organic products, domestic consumption of organic olive oil showed an increase of 22% in 2006/05, the bulk of the Greek production (about 70 % in 2006) being exported. Buying wine from organic grapes rose by 4% in 2006 compared with the previous year, while the bulk of the Greek production (about 80 % in 2006) mainly addresses the domestic market.

The impact of the recent financial crisis has significantly altered the above figures. Over the last two years, the consumption of organic products has declined significantly, due to higher prices. However, there is a significant number of consumers who still respond, by consciously adopting healthy lifestyle choices.

Cultivation of organic aromatic herbs in Greece

Based on the above data, it is clear that organic farming of Greek aromatic herbs is extremely limited. According to official figures, certified organic crop acreages with medicinal aromatic herbs are approximately 2,500 acres of the total, centered mainly

on saffron, mastic and oregano.

However, cultivation in both sectors is increasing. The economic crisis being well on its way and recent press reports have prompted many to cultivate aromatic herbs, mainly in organic production. An increase in plantings of almost 150% / year has been reported. Many of the areas planted have not entered the final production phase yet, being on a transition period; others are farmed using organic methods but have not been certified organic, since at least three years are required until certification requirements have been met.

The species planted vary depending on the region and the intended market to be addressed, but the majority of herbs belong to indigenous Greek flora, since, a conscious definition of the specific nature of the country presenting a comparative advantage has begun to take shape. The cultivation of herbs is already organic, a prerequisite for farmers hoping to reach the niche market with high quality herbs. To conclude: In the coming years, the offer of genuine raw material for ANASSA ORGANICS will increase, and the quality of the offered dry matter will improve as cultivated areas increase and farming experience is gained.

D. PROPOSED HERBAL BLENDS PERCENTAGES & RATIOS

Blend 1: Supporting a slimming diet -- Pure symmetry

1. Mentha X piperita (Peppermint)
- 2 . Salvia spp. (Sage)
- 3 . Ceratonia siliqua (Carob)
4. Melissa officinalis (Melissa)

Blend 2: Supporting rest, relaxation and insomnia -- Pure Peace

1. Melissa officinalis (Melissa)
2. Lavandula angustifolia (Lavender)
- 3 . Tilia tomentosa (Linden)
4. Matricaria chamomilla (Chamomile)
5. Origanum majorana (Marjoram)

Blend 4: Supporting colds and strengthening the immune system-Pure Defence

1. Rosa canina (Wild Rose, fruits)
- 2 . Foeniculum vulgare (Fennel seed)
- 3 . Origanum dictamnus (Dittany)
4. Sideritis spp. (Mountain Tea)
5. Mentha pulegium (Pennyroyal)

Blend 5: Supporting overall health -- Wellbeing

1. Sideritis spp. (Mountain Tea)
- 2 . Mentha spp. (Mint)
- 3 . Salvia spp. (Sage)
4. Melissa officinalis (Melissa)

Blend 7: Supporting overall health, with strong antioxidant properties --Pure Youth

1. *Cistus* spp. (*Ladania*)
- 2 . *Rosa canina* (Wild Rose, fruits)
- 3 . *Sideritis* spp. (Mountain Tea)
4. *Rosmarinus officinalis* (Rosemary)

The blends were formed based on the ingredients and properties of the herbs included so as to ensure safe and effective use.

Regarding herbs listed in the European Pharmacopoeia (published monographs or monographs to be issued), under the subheading 'Other precautions' [*Foeniculum vulgare* (fennel seed), *Lavandula angustifolia* (lavender), *Matricaria chamomilla* (chamomile) *, *Melissa officinalis* (Melissa), *Mentha X piperita* (Peppermint), *Salvia* spp. (Sage), *Sambucus nigra* (elder), *Tilia tomentosa* (linden), *Rosmarinus officinalis* (Rosemary)], interactions with other medicinal products have not been reported. The overall effect of each mixture is the result of specific actions of the individual herbs (actions of individual plants are cumulative in the proposed blend).

Furthermore, deriving information from traditional folk medicine, we may conclude that herbal blends increase the pharmaceutical properties of individual species and / or improve the taste of certain species when taken orally. Blends in traditional medicinal and folk medicinal practice have been used based on the empirical similarity of therapeutic effects, and in the accumulation of beneficial properties.

As already mentioned, our blends are formed according to the components and properties of the herbs included. Research investigating the overall effect of the proposed blends does not exist in literature; this is a new field of research. References to the contents and action of infusions and decoctions are few, and those existing involve different herbal combinations. In all cases, the result is the sum of beneficial actions of individual components.

Analysis of the ingredients and properties of each herb justifies the presence in the relevant blend. Due to several different activities of the chemical compounds of the herbs, some are included in several blends. Ongoing research studies reveal that herbs contain many different active ingredients which may exhibit several different actions. Therefore, in some cases, analysis of the aromatic herbs properties reveals two properties that seem to contradict each other (eg melissa : tonic / insomnia). These two properties are not necessarily opposing. Some substances that act as stimulants also exert beneficial effects in disorders of sleep, relieve the body from a state of general weakness or stimulate specific organs. Herbs increase the ability to adapt to environmental factors and to avoid damage caused by such factors.

Specifically:

- The herbs in blend 1 (Support for slimming diet) have a diuretic effect, stimulate the body and relieve digestive disorders. Carob helps in weight loss due to the sugars present
- The herbs in blend 2 (Calming night drink) help in relaxation and relieve mild gastrointestinal disturbances, and mild symptoms of stress
- · The herbs in blend 3 (Supporting overall health with aphrodisiac properties) are rich in phenolic compounds, stimulate the body and enhance memory
- The herbs in blend 4 (Supporting cold symptoms and enhancing the immune system) exhibit fungicidal and bactericidal action resulting in relieving the symptoms

of the common cold. Rose hips have a high concentration of vitamin C; in combination with the phenolic compounds it strengthens the immune system.

-- · The herbs in blend 5 (Supporting overall health , wellbeing) are rich in phenolic compounds, contribute to wellness, and stimulate the body to obtain the desired wellness.

·-- The herbs in blend 6 (Supporting energy and stimulation) contains edible fruits rich in phenolic compounds (mainly anthocyanins and flavonoids) and help to obtain energy, toning and wellness.

·-- The herbs in blend 7 (Supporting overall health, with strong antioxidant properties) is rich in phenolic compounds which exhibit strong antioxidant and anti-inflammatory action.

E. HERBAL TEA PREPARATION

E.1 . GENERAL INSTRUCTIONS

§ We recommend the use of porcelain or cast iron teapots.

§ Adding honey or lemon influences the antioxidant activity of the proposed mixtures in a positive way.

§ Adding sugar or milk may present indifferent results regarding the antioxidant activity of the mixtures.

§ We recommend the use of bottled soft water (low in minerals) for the preparation of herbal teas, infusions and tisanes.

§ We recommend storing herbs in a dark dry place, as light and humidity may affect both the antioxidants and the taste of blends.

§ As a general instruction, for a single dose, we recommend 3 grams of mixture (1 teaspoon) per cup of 150 ml; we steep the the herbs in hot water for 5 to 30 minutes, depending on the herb or blend. Each proposed drink can be taken up to three times a day; the period of continuous use should not exceed two weeks, with the exception of those components of the blends indicating a period of less than two weeks.

§ All drinks may be consumed cold, as long as they are placed in the refrigerator after preparation. This time should not exceed 24 hours. To the question arising however, whether and how the beneficial components are maintained over time, precise answers may only be given after scientific research. Our aim is to deal with this research field in the future.

Regarding herbs maintenance, recent research involving the study of antioxidant herbal infusions and tisanes prepared from the aboveground parts and leaves of *Aloysia citrodora*, aboveground parts of *Foeniculum vulgare*, of *Mentha pulegium* and *Mentha spicata*, of different storage periods (0, 30, 60 and 120 days), revealed slight decrease in antioxidant capacity, as time takes its toll. However, with proper and efficient packaging and storage (airtight containers, away from heat, moisture and direct sunlight), herbs may be kept in a very good condition for a period of two years and fruits for over a year.