



## LUNA MEDITERRANEA

### Cistus incanus or Pink rock rose

**Family:** Cistaceae

**Synonyms:** *Cistus creticus*, *Cistus garganicus* Ten., *Cistus villosus* Auct. an L. and *Cistus eriocephalus* Viv ..

This entity which was described by Linnaeus as *Cistus incanus* in fact, following recent studies, has been shown to be a natural hybrid between *Cistus albidus* and *Cistus crispus*.

**Common name:** villous rock rose, red rock rose, pink rock rose

**Etymology:** the term *Cistus* comes from the Greek κίστη *kíste* small box (in Dioscorides): it describes the characteristic of the ripe fruit, a capsule which, when opened, expels the seeds. The specific epithet *incanus* derives from: which becomes white, due to the presence of thick white hairs.

**Habit:** woolly-tomentose (covered by dense down with simple and / or glandular hairs) with bushy, densely branched, modest size that does not reach one meter in height. It has leaves with a rough surface, oval and covered with a thick tomentosity, with a 2 to 4 cm long lamina.

**Leaves:** wrinkled, oval, opposite, persistent hairy, whole, with more or less elongated petiole, lamina 2 to 4 cm long.

**Flowers:** large (4-6 cm of diameter), sometimes with only the yellow or orange nail becoming yellowish, white, pink or red-purple with five-three sepals, solitary, in tops or in racemes, with radiated symmetry. The calyx is a petal of five hairy sepals with a corolla of five petals and numerous stamens. It is a melliferous plant, not of great quantity, but of excellent honey quality.

**Fruit:** it is a 5-valve capsule containing several seeds. Size 7-10 mm, ovate, covered with simple hair, dehiscent. The seeds are 1-1.2 mm, polyhedral, straw-brown in color.

Typical plant of the eastern Mediterranean: in Italy it is present in the southern regions and in Sicily, while in Sardinia it has been reported in the central-eastern coastal limestone areas. It prefers sunny exposures, typical of Mediterranean environments and sheltered from the winds, preferring warm and sunny areas in southern Europe. It is also called "lover of the sun", due to its development aimed at avoiding shaded areas.

There is a close correlation between fire and the presence of *cistus*. In natural conditions they occupy open environments, rocks, coastal areas and land exposed to wind erosion. In the burned spots the *cistus*, all very heliophilic, with the vegetative restart and the regrowth of the suckers of the evergreen sclerophylls lose vitality and become rarefied. However, there is still a considerable seed bank in the ground, which allows the cycle to be resumed. The leathery capsule of the seeds remains intact when the fire passes, protecting them. The seeds are also associated

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with good thermo-resistance, which allows them to germinate abundantly already at the first rains, covering the soil in a short time and thus helping to provide effective protection to the soil from water erosion. The role of these plants in the ecosystem is very important, because in degraded soils in a short time they reconstitute a vegetation cover, exercising a protection that also favors the recovery of more demanding species.

### Traditional uses

The most common use is probably the Cistus tea. The flavor of Red Cistus Tea is spicy, pleasant. It can be flavored with small pieces of orange peel or infused mint leaves. Tincture of Cistus, Hydro-alcoholic Extract of Cistus, Essential Oil, Resin (laudanum)

On the peninsula of Chalcidica in Greece it is said that one day the gods of Olympus met to establish the properties of each plant. Because of the down and the resin that oozes from the leaves, the Cistus was chosen by the gods to heal the wounds of the warriors after the battles. A plant with such strong leaves must have served to strengthen the skin. The goddesses protested. They wanted the cistus with such a beautiful and delicate flower to be named as a plant for the beauty of skin and hair. Gods and Goddesses were unable to agree and finally decided that Cistus would be the only plant with two applications: the care of wounded skin and the care of its beauty.

In the past, the cistus was confused with ivy by the expert Pliny the Elder: most likely he confused the names present in the Greek texts, since the cistus (kisthos) and the ivy (kissos) had very similar Greek names.

Also in Genesis this Mediterranean plant is referred to as a kind of panacea. A tradition that has been maintained over time, if it is true that even today it is used in the Greek islands to serve Cistus tea for breakfast as an energizing drink. It has also been highly appreciated as a tea in the countries of North Africa, as well as in the Mediterranean countries. Laudanum obtained from the resin is known for its antiseptic effect capable of counteracting bacterial infections, and is used in cosmetics for impure or inflamed skin while for internal use it was already used in ancient times in situations of phlegm and diarrhea.

In the past, the rubbery resin of the cistus has always been used in folk medicine as a flavoring in the cosmetic environment.

In the Mediterranean areas, in the Middle East and in North Africa, the cistus would in fact also be used as a natural remedy against episodes of diarrhea, fever, ulcer and as an anti-inflammatory. The properties of Cistus incanus make it an excellent ingredient for making anti-aging formulations and preparations for impure or inflamed skin.

### Scientific literature

Chemical composition over 29 polyphenols, including ellagitannins, flavanols and glycosylated flavonols. In particular, epicatechin, epigallocatechin gallate (EGCG) and myricitrin (responsible for the antioxidant potential), Zeaxanthin (peculiar antioxidant for the eyes) are highlighted. There are also more ubiquitous polyphenols such as mycetin, quercetin, kaempferol.

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### Uses

- **Antimicrobial:** *Borrelia burgdorferi* is the infectious agent that causes Lyme disease. Disease that can affect joints, heart and nervous system with a long course. Symptoms can also occur after receiving antibiotic treatment. The *Cistus Incanus* extract is very active against *Borrelia*, thanks to its content of carvacrol and epi-manoiloxide.

- **Antiviral:** *Cistus* extract has proved useful in the treatment of upper respiratory tract infections. The polyphenols contained in the extract have shown interesting antiviral and antimicrobial properties in animal and in vitro studies. In particular, against the flu and cold viruses, with a reduction of the C reactive protein (inflammation marker). The activity against a highly pathogenic avian influenza A (H7N7) virus was studied in cell culture and in a mouse infection model. A 90% reduction in infected cells was achieved. In vivo, the treated animals did not develop the disease, showed no differences in their body temperature or differences in their gross motor activity, and showed no histological changes in the bronchiole epithelial cells. The study also extended to viruses of the H5N1 subtype (influenza A). The antiviral effect, in vitro, did not alter the vitality of the cells in culture. Viruses developed no resistance to CYSTUS052 compared to amantadine, which resulted in the generation of resistant variants after only a few passes. On a molecular basis, the protective effect of *C.* appears to be mainly due to the binding of the polyphenolic polymeric components of the extract to the surface of the virus, thus inhibiting the binding of hemagglutinin to cell receptors. Therefore, local application of *C.* to viral entry routes may be a promising approach that can help protect against influenza virus infections. It has also been studied as a complementary treatment for HIV (in vitro). The *cistus* extract inhibited HIV-1 and HIV-2 and, importantly, also in the case of viral strains resistant to common drugs. Antiviral activity was highly selective for viral particles, preventing primary attachment of the virus to the cell surface. The fractionation of the extract indicated that the *Ci* extract contains numerous antiviral compounds and therefore has a favorably low propensity to induce resistance to viruses. The *Cistus* extracts also inhibited infection by pseudotyped viral particles with envelope proteins of the Ebola and Marburg virus, indicating that the antiviral activity of the *Ci* extract extends to emerging viral pathogens.

- **Antioxidant:** the high content of polyphenols makes it an interesting plant as an antioxidant power. The highest polyphenol content is obtained by extraction in 30% alcohol with an infusion of 390 minutes. In the leaves of the plant, the polyphenol content is particularly high when harvested in the summer, but the winter leaves, seeds, shoots and stems also have a comparable content. In in vitro studies the ROS (free radicals) content was reduced by 30- 40%. It also contains interesting amounts of Epigallocatechingallate (the "typical" antioxidant of green tea) useful for counteracting some mechanisms that lead to tumor degeneration. These extracts showed a protective effect on DNA cleavage and a dose-dependent ability to eliminate free radicals. Experimental evidence suggests that due to their antioxidant activity these extracts may offer excellent photoprotection for the skin and may be useful in the treatment of human diseases where oxidative stress plays a key role.

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- **Antibacterial:** an infusion of *C. incanus* reduces the initial bacterial adhesion in the oral cavity due to polyphenols: *C. incanus* could therefore reduce the risk of caries. It was studied in vitro against *Streptococcus mutans*, one of the primary cariogenic bacterial species, with excellent results, even the rinses with the plant extract reduced the initial bacterial colonization of the enamel samples exposed to oral fluids for over eight hours. Furthermore, it has been demonstrated by transmission electron microscopy that the application of an infusion of *C. incanus* changes the ultrastructure of the acquired enamel film, producing a more electron-dense morphology.

- **Cardiopreventive:** the high content of polyphenols, in addition to antioxidant effects, also has control effects on the levels of lipids in the blood. This contributes to having a preventive effect in heart disease. 12 weeks of administration of the herbal tea reduced the risk of cardiovascular events and by improving the lipid profile (HDL increase and TG reduction), it also reduced the concentration of malondialdehyde (product of lipid peroxidation). These results suggest a possible daily use to prevent atherosclerotic pathologies.

- **Cooking:** adding 3% dried *C. incanus* to the flour used to prepare the pasta, the total content of phenols and antioxidant activity are increased. Higher concentrations, while providing more nourishment, have created a harder, less cooked and less luminous pasta, altering the organoleptic characteristics too much to be able to recommend higher%. In the case of bread, the recommended concentration always remains 3%, as the result is a smaller, too moist bread; however, already at these concentrations, the antioxidant effect was much higher with a pleasant taste.

- **Muscle relaxant:** in vivo studies have shown a muscle relaxing effect at the smooth muscle level (involuntary: aorta, intestine) of the *Cistus* infusion. The myorelaxant effect on visceral muscles is functional, therefore it does not depend on the interaction with particular receptors.

- **Cosmetics:** the high content of polyphenols makes *C. incanus* interesting for the reduction of oxidative or photo-oxidative skin stress, with the reduction of aesthetic problems. In addition to being an antioxidant, it protects from UV rays (SPF 3.5 100mcg / mL), from hyperpigmentation. In fact, as a Mediterranean plant, it had to develop mechanisms to protect itself from excessive solar radiation. It can also protect against melanogenic degeneration: the extract is also cytotoxic to human melanoma cells. The extracts did not significantly alter the growth of non-cancerous human keratinocytes. *Cistus* extract also has a remarkable antimicrobial action, especially against yeast-induced skin infections, such as *Candida albicans*. The mechanism of action is a non-specific inhibition.

- **Prostatitis:** in vitro studies have seen a reduction in the proliferation of human prostate cells and a decrease in cell viability, which lead to hope for a possible reduction in the symptoms of benign prostatic hypertrophy.

- **Immunomodulators:** aqueous extracts dose-dependently inhibits the enzymatic activities of both alanyl aminopeptidase (leukocyte activity marker) and dipeptidylpeptidase IV (pro-inflammatory mediator). This inhibition

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is not reversible and most likely results from a covalent binding of reactive compounds to enzymes. Furthermore, we demonstrate that aqueous extracts of CIT reduce the DNA synthesis of human T cells and mononuclear cells and inhibit the proliferation rate of the human T cell line in a dose-dependent manner. This also generates anti-inflammatory effects.

- **Gastroprotector:** The anti-ulcer activity of a short boiling aqueous extract from aerial parts of *Cistus incanus* has been studied in vivo against gastric lesions induced by necrotizing agents (ethanol, anti-inflammatories, etc.). The effects are dose dependent and are secondary to an efficient microvascular supply of the gastric mucosa generated by the extract.

### Side effects

It has no particular contraindications, but it should not be abused for the use of infusions and herbal teas. It could cause nausea and possible allergies. Its use for pregnant women should be evaluated by a doctor.



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### Aloysia citrodora or Lemon Verbena

**Family:** Verbenaceae

**Habitat:** Perennial shrub plant that can reach 2.5 meters in height with a ranging expansion from 1.5 to 2.2 meters. It takes an average of 5-10 years to grow and reach its maximum development.

**Leaves:** sessile, gathered in whorls of 3-4; these are green, deciduous, rough on the top, lanceolate, which have an intense lemon scent and flavor, 5-7 cm long.

**Flowers:** small, white or pale lilac, are grouped in loose spike inflorescences.

**Origins:** South America, Ecuador, Peru, Chile and Argentina

**Synonyms:** Aloysia citrodora, Lippia citrodora. Lippia citrodora Kunth, Aloysia triphylla (L'Hér.) Britton, not Royle, Lippia triphylla (L'Hér.) Kuntze, Verbena citrodora (Paláu) Cav., Verbena triphylla L'Hér. Aloysia citrodora P. Palau

**Common names:** lemon verbena, lemon verbena, limoncina, lemongrass, Luigia grass, Luisa grass, Maria Luigia grass, perseghina grass, limonetto, lippia, Aloisio and piscella grass.

**Etymology:** Aloysia is a tribute to Maria Luisa of Parma (1751-1819), queen and wife of Charles IV of Spain. Citrodora comes from Latin and means from the scent of lemon.

**Drug:** leaves and flowering tops

#### Traditional uses

Lemon verbena is used for digestive disorders such as gas or diarrhea, muscle damage caused by physical exercise, multiple sclerosis (MS) and other conditions, has a long history of traditional use for sedation and the treatment of insomnia in different societies. This study was conducted to evaluate the efficacy of A.citrodora in patients with insomnia. In the areas of origin it is also used to treat diarrhea, insomnia and rheumatism.

With a pleasant flavor, it has always been included as a flavoring in the composition of herbal teas. Sometimes it comes used as a substitute for coffee or tea. In the herbal sector it is used for the preparation of herbal teas, infusions and compresses. It is used in the kitchen for making liqueurs, jams, fruit salads and as a spice. Prolonged use, however, can cause problems with the stomach, including gastritis. It is traditionally used for the treatment of



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menstrual colic (primary dysmenorrhea) in Mexico. The infusion is used as a digestive, carminative and antispasmodic, in case of stomach pain or indigestion. It is also consumed as a mild sedative. The plant has therapeutic properties: anti-neuralgic, neurotonic, stimulating.

### **BELFRIT List**

Folium

Digestive function.

Regulate gastrointestinal motility and gas elimination.

Relaxation and well-being mental.

Antioxidant.

### **Scientific literature**

Biological activities such as antioxidant, anxiolytic, neuroprotective, anticancer, anesthetic effects, antimicrobials and sedatives have been demonstrated in cell culture and animal studies.

### **Components**

The main class of compounds of these plants were phenylpropanoids (16 to 120 mg / g of dry extract), verbascoside being the most abundant in all preparations up to 97% of total phenylpropanoids. Iridoids, hastatoside and verbenalin were also found along with flavonoids, mono- and di-glucuronide derivatives of luteolin and apigenin. polyphenols such as flavone diglucuronides and phenylpropanoid glycosides (mainly verbascoside) verbascoside or acteoside showed broad biological activity, being the most representative what eliminates free radicals. In addition, antitumor, antimicrobial, anti-inflammatory, antithrombotic and cicatrizants.

The main chemical components found in the EO of *A. citrodora*, derived from dried and fresh leaves, included limonene, geranium, neral, 1, 8-cineole, curcumene, spathulenol, and caryophyllene oxide.

Neral and geranium are the main ingredients of the essential oil; while verbascoside is the component more significant than the extract.

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### Uses

- **Insomnia:** a syrup prepared from the essential oil and infusion of *Aloysia citriodora* (*A.citriodora*) was used at a dose of 10ml 1 hour before bedtime for 4 weeks. He reduced the sleep latency, its efficiency, daytime dysfunction and subjective sleep quality. The aqueous extract of the plant was used in comparison with diazepam (benzodiazepine, anxiolytic) in in vivo studies by increasing the duration of sleep and activity in the treated group. The effect it is therefore both hypnoiductive, anxiolytic and relaxing. It appears to affect GABA receptors.

- **Antioxidant:** Aqueous extracts (infusions) of *Aloysia citriodora* have shown enhanced total antioxidant capacity when used as a decoction, protecting from protein carbonylation and lipid peroxidation. (In vitro study) It increases the activity of glutathione peroxidase, of SOD and reducing lipid peroxidation. (decoction: infusion of the plant in cold water kept in infusion for up to 10 minutes after boiling) Structure-antioxidant activity ratios revealed glycosylated phenylpropanoids as crucial in antioxidant activity. The development of extracts enriched in these compounds could lead to greater and better antioxidant effects functional ingredients to prevent chronic diseases. The antioxidant and free radical scavenger effect of a verbena infusion can be compared to that of green tea, with its antioxidant constituents that are resistant to degradation to infusion temperatures. Luteolin-7-diglucuronide, another component of the extract, has cardioprotective effects, it can also reduce the progression of degenerative retinal diseases such as macular degeneration. In particular reduces the damage caused by bright light.

- **Functional recovery:** using an infusion of verbena leaves, post-activity recovery was acted upon intense physics. Intense exercise causes muscle damage accompanied by oxidative stress e inflammation leading to muscle fatigue and muscle soreness. Using 400mg of *A. citriodora* leaf extract, less muscle damage and recovery were observed faster and more complete. In addition, the exercise-related loss of muscle strength was significantly less, as well as less pain induced by movement.

The infusion can reduce the production of free radicals due to exercise and pro-inflammatory molecules. It also reduces the effect of serum transaminases, indicating a protection of the muscle tissue.

- **Irritable colon:** in vivo studies demonstrate the efficacy of the verbena infusion to treat the symptoms of inflammation of the colon (spasms, pain, alternation of hives). The effects in the treated group were evident already after 14 days of treatment. However, this does not alter the absorption of the polyphenols contained in the product.

- **Spasmolytic:** The anti-inflammatory effects of the extract of *Aloysia citriodora* have permesos of reduce uterine contractions that generate menstrual pain without side effects at the level gastric. Aqueous extract of *Aloysia citriodora* significantly reduced induced spasms in animals intestinal induced in laboratory animals, the traditional use of the plant in America confirmed Latin. Two flavonoids appear to be responsible for this activity: vitexin and isovitexin. It is active in digestive hypotonia, meteorism and anorexia. Also in gastric spasms and palpitations from anxious states.

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- **Anti-inflammatory:** Verbena supplementation reduced serum levels of cytokines and protein C reactive (marker of inflammation) after 28 days of intake.

- **Obesity:** plant-based polyphenols have shown the potential to alleviate pathologies linked to obesity through a multi-targeted mechanism in animal models and intervention studies on man. A food supplement based on a combination of Lippia polyphenolic extracts citriodora (LC) and Hibiscus sabdariffa (HS) reduced blood pressure, body weight, waist circumference and thickness of the abdominal fold in 60 days. Vegetable polyphenols increased anorexigenic hormones (glucagon-like peptide-1) and decreased hormone hormones (ghrelin). It therefore seems unable to manage the sense of satiety, using energy consumption lipids: this can help avoid unwanted weight gain typical of low-calorie diets. There was also a reduction in total cholesterol, LDL, triglycerides, bilirubin and transaminases (the latter indicators of liver damage) in experimental animals whose food was added with verbena extract.

In vitro studies have seen a reduction in the accumulation of triglycerides in lipocytes, with a reduction in lipogenesis and activation of the use of energy stored in the form of lipids.

- **Immune defense:** lemon verbena extract protects neutrophils from oxidative damage following too intense physical exercise.

- **Antimicrobial / healing:** Treating wounds in vivo with a cream prepared with extract Verbena ethanolic, a reduction in Staphylococcus aureus skin infections was observed (bacterium resistant to many antibiotics) and improved scarring. The antimicrobial effect can also manifest itself against candida, where the action is comparable to that of nystatite and fluconazole (two synthetic antifungals). In addition, the oil essential may also be effective against those species resistant to common drugs.

- **Neurodegenerative diseases:** components of the essential oil of A.citrodora increases elimination of radicals, antioxidant activity, iron chelation and is neuroprotective.

-**Cosmetic:** Antiaging, anti-inflammatory, antioxidant, fragrance. Also can in the drainage formulations for those people who have skin problems as it improves it overall health of the skin.

### Contraindications - side effects

When taken orally verbena is LIKELY SAFE for most people when consumed in quantities found in drinks. Otherwise, excessive doses can cause heartburn. May cause skin irritation (dermatitis) in some people.

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## LUNA MEDITERRANEA

# Origanum dictamnus or Dittany of Crete

**Family :** Origanum dictamnus Lamiacea

Common on the Greek islands, especially Crete, in arid and rocky environments

Common names: Dittany of Crete, Hop Maryoram, Erontas "love", "grass for the stomach", "woolly grass", "coagulating grass".

**Etymology:** the word Oregano derives from the Greek ὄρος (mountain) and γάνος (luminous), which can be translated as "the delight of the mountain".

**Portamneto:** Shrub or small perennial fruit tree 20–30 cm high in rocky areas at a height of 300 to 1500 m s.l.m. With very sunny exposure, but can resist up to -10 ° C.

**Leaves:** gray-green are opposite, rounded oval and covered with a white down that gives it a velvety, aromatic texture.

**Flowers:** hermaphrodite, pale pink tending to purple, with spikes hanging down and elongated and bloom in the summer months. The flowers are surrounded by greenish bracts that mature to a conspicuous purplish red as the seeds begin to form. Leaves and inflorescences are used, with harvesting in the months of July, September.

### Traditional uses

Traditionally it is referred to as the "Herbal tea for irregular menstruation".

Find popular uses for the treatment of dysmenorrhea and oligomenorrhea, amenorrhea and hypomenorrhea; also as an antiseptic, mucolytic, expectorant, as a febrifuge and in case of allergies. It is also used as a fibrinolytic anticoagulant, cholagogue, and in case of liver poisoning.

The Cretic Dittamo is used in divination and for contact with spirits (materialized in smoke) when used as incense. Furthermore, popular tradition has it that small doses of Dittamo strengthen the ability to perform astral projection and the separation of consciousness from the physical.

The Crete Dittamo with its beautiful flowers was in ancient times a symbol of love and passion. Young people climbed the steep cliffs and gorges of Crete to collect it and give it to the girls they love.

Today, the wild and nature-grown Cretan Dictamnus is classified as "rare" and is protected by European law. Cultivation

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now focuses on Embaros and surrounding villages, south of Heraklion, Crete, and is used for making herbal teas and for use in natural beauty products. The first depictions of the dittamus date back to 1500 BC. And they are found in a fresco located on the wall of a Minoan palace. It has been used for about 26 centuries in traditional medicine.

The first antiseptic for external use mentioned in the Linear B tablets dating back to 1300 BC, the dittamus is known to the ancient peoples of Greece and Egypt (where it was exported) for its medicinal victories.

In On the nature of the women of Hippocrates it is recommended to "drink a penny of a Cretan dittamus in water to cause the departure of the còrio and the rules".

Ancient medical literature prescribes the infusion dittamus for stomach pains, intestinal problems, high-risk pregnancies and painful menstruation. In external use it acts as an antiseptic and coagulant.

Aristotle in his History of animals in chapter VII writes «It is believed that the wild goats of Crete, when they are hit by an arrow, they start looking for the dittamus who seems to have the property of getting the iron out of the wound ». In the twelfth book of the Aeneid Virgil describes the extraction of an arrow and the use of the dittamus as an antiseptic.

The Greek goddess Aphrodite heals the wounds of her son Aeneas with her dittamus. She herself heals with the dittamus to facilitate her own pregnancy when she is pregnant with Hermaphroditus on Mount Ida of Troas.

Zeus, king of the Olympians, was saved from certain death by his mother, Rhea. She gave birth in Crete in a cave of Monte Ditte, protected by the Curetes, where she hid her son. In thanksgiving Zeus offered the Cretan dictatorship.

In ancient times the dittamus was called "artemidion" in honor of the goddess Artemis (Diana for the Romans), who if she wanted she could heal the wounds inflicted by her arrows.

The Cretan goddess of childbirth, Eilytheia, (Ειλυθεία) wore a dittamus crown, a direct link between the plant and childbirth. Dittamus, like its cousin oregano, has antiseptic properties. It is used in Greece in the form of an infusion to treat colds, infections of the mouth and teeth, digestive problems, menorrhoea, diabetes, obesity, kidney and liver problems. Also applied as a poultice for head pain, rheumatism and sores.

The leaves are used both fresh and dried in the kitchen to dress salads or to flavor fish; with the flowers a very fragrant tea is prepared.

Dittamo essential oil is used in the making of dry Martini, Vermouth and in cosmetics.

### Scientific literature

#### Composition:

Essential oil: (carvacrol (52.2%),  $\gamma$ -terpinene (8.4%), p-cymene (6.1%), linalool (1.4%) and caryophyllene(1.3%), Camphor (stimulant, decongestant, antiseptic, antispasmodic), Carvacrol (analgesic, anti-inflammatory, antiseptic, bactericidal, expectorant, fungicide, vermifuge), Cedrolo, linanol, p- cimolo, pinène (bactericide, expectorant, fungicide), Tannin , anti-ulcer, anti-tumor), thymol (antioxidant), Paracymene (analgesic, bactericide, vermifuge),  $\Gamma$ -terpinène (insect repellent) The phytochemical study of the polar extracts of the aerial parts of *Origanum dictamnus* provided 15 secondary metabolites: salvianolic acid P, rosmarinic acid, thymoquinone and thymoquinol 2-O-beta-

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glucopyranoside; oresbiusin A, E-caffeic acid, apigenin, kaempferol, quercetin, eriodictyol, taxifolin, naringenin, 12-hydroxygasmonic acid, 12-O-beta-d-glucoside.

### Uses

- **Cosmetic:** The accumulation of advanced glycation end products (AGE) in vivo is associated with many chronic disorders such as diabetes, renal failure, aging and Alzheimer's disease. Infusion showed the highest inhibitory effect on the formation of dicarbonyl compounds and AGEs (activity values ranged from 72-100%). This activity is partially correlated with the antioxidant / antiradical activity, as demonstrated by the scavenger capacity. The high anti- AGE capacity recorded could probably be attributed to the polyphenolic composition.

- **Antimicrobial:** *O. Dictamnus* essential oil and its main components have been found to be effective against *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Escherichia coli*, *Listeria monocytogenes*, *Salmonella Enteritidis*, *Salmonella typhimurium*, *Saccharomyces cerevisiae* and *Aspergillus niger*. The antioxidant scavenger effect is mainly attributable to carvacrol. Furthermore, it has been shown to be active against the Gram-negative clinical strains *Acinetobacter hemolyticus*, *Empedobacter brevis*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae*. Essential oils have been studied for their antimicrobial activity against *STAPHYLOCOCCUS AUREUS*, *STAPHYLOCOCCUS EPIDERMIDIS*, *STAPHYLOCOCCUS HOMINIS*, *ESCHEIRICHIA COLI* and *PSEUDOMONOS AERUGINOSA*.

- **Chemopreventive,** carvacrol is the most bioactive compound in *dictamnus* extract and represented antiproliferative activity against liver tumor cells. The plant has also been successfully tested against murine leukemia and a form of lung cancer but only on cell lines. In vivo confirmations are lacking.

- **Antioxidant:** Antioxidant activity has been determined with respect to that of common commercial antioxidants butylated hydroxytoluene (BHT) and alpha-tocopherol (vitamin E). All the extracts of the plant showed antioxidant activities: their action proved superior to alpha-tocopherol. The organically grown methanolic extract of *O. Dictamnus* (240 ppm) showed greater activity than butylated hydroxytoluene. The activity is greater the greater the polyphenol content in the extract used.

### SIDE EFFECTS

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## LUNA MEDITERRANEA

### Sideritis syriaca or Malotira or Mountain tea

**Family:** Lamiaceae

Perennial suffructive, shrubby habit, with woody stem at the base, with erect, simple branches. It reaches a height of about 40cm and grows between 1500m and 1900m, in garrigue or Mediterranean prairie environments.

Leaves are oblanceolate-spatulate, 8-12 X 40-50 mm, whole or crenulate, spaced apart

Hermaphrodite flowers, with yellow corolla, progressively close together in cylindrical spike of 6-12 flowers. Heart-shaped bracts (9-12 X 7-10 mm) with 2-3 mm acute appendage, whole on the edge; woolly calyx with 6-7 mm tube and 2 mm teeth; yellow corolla 9-12 mm. Flowering between May and July.

Native to the Eastern Mediterranean countries, such as: Albania, Syria, Turkey, Greece (Crete), Italy (central-southern regions).

The name of the genus "Stachys", as a synonym from the Greek στάχυς stáchys spiga: due to the arrangement of the flowers along the stem.

#### Traditional uses

In Greece it is used to prepare a herbal tea called "tsai vounisio", mountain tea, as well as in Albania, in Macedonia and in Bulgaria (čaj mali mountain tea). In English it is also known as shepherd's tea.

This plant is melliferous and is foraged by bees from which honey can be obtained, sometimes it is unifloral but very rarely due to the narrowness of the plant's habitat.

In the areas of origin, it is used as a decongestant and to relieve sinusitis, colds, coughs.

Popularly recognized activities are anti-inflammatory, antispasmodic, carminative, analgesic, nervous system stimulant, sedative, antitussive, stomachic, anticonvulsant and antimicrobial.

#### Scientific literature

Components: The flavones identified and specific to the plant are 5,8,3'-trihydroxy-4'-methoxyflavone 7- (6"-O-acetylsophoroside), while apigenin 7- (6"-p-coumaroylglucoside is also found) and apigenin 7- (4"-p-coumaroylglucoside). 3 derivatives of hydroxycinnamic acids, caffeoilfolioside, lavendulifolioside, verbascoside, apigenin 7- (4"-p-coumaroylglucoside), 4'-O-methylisoscuteellar were highlighted in 7-O- [6"-'-O-acetyl] - allosyl (1 -> 2) glucoside, and to a lesser extent isoverbascoside, apigenin 7-O-allosyl (1 -> 2) glucoside, isoscuteellarin 7-O-

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allosyl - (1 → 2) - [6"-O-acetyl] -glucoside, hypolaetin 7-O-allosyl- (1 → 2) - [6"-O-acetyl] -glucoside and 4'-O - methylhypolaetin 7-O- [6"-O-acetyl] -allosyl- (1 → 2) - [6"-O-acetyl] -glucoside. The glycosides phenylethanoids and acetylglycoside constitute 90% of all phenolic compounds. Essential oil composed of 51 components of the essential oil, 43 are found in the oil obtained from the flowers, 29 in that of the leaves. The constituent may be Kaur-15-ene (20.0%) (in flowers), with beta-cubebene (12.1%), beta-pinene (8.5%), (Z)-nuciferol (6.5%), tricyclene (4.5%) and alpha-bisabolol (4.0%).

### Uses

- **Anti-inflammatory / analgesic:** The plant is studied for its anti-inflammatory and analgesic effect. In vitro study on edema in rats. The hexane extract has proved useful compared to the dry plant, in powder and extracted with methanol. The analgesic activity was both peripheral and central and is common to ALL extracts. There were no cases of ulcer or hyperemia in treated rats. Analgesic activity present, while anti-inflammatory only in the apolar fraction. This activity seems to be attributable to hydroxycinnamic acids, originating from the Mavolanate-Shikimate pathway, including cinnamic, p-coumaric, ferulic, caffeic and chlorogenic, rosmarinic, all with antioxidant and anti-inflammatory properties.

- **Obesity:** The hydroxycinnamic component seems to exert interesting experimental data in the treatment of diabetes and hyperlipidemia. In obesity they reduce macrophage infiltration and activation of the nuclear factor  $\kappa$ B (NF- $\kappa$ B). They reduce the expression of pro-inflammatory factors and increase the production of anti-inflammatories. They also prevent adipocyte differentiation and lower the level of lipids in the blood.

- **Antimicrobial:** the essential oil of *Sideritis italica* has been tested against 9 ATCC and G+ and G- bacteria, as well as against *H. pylori*. Against this it was found effective at a dose of 5 and 25 mcg / ml. At a dosage between 3.9 and 250 microg / ml, the essential oil has shown the most effective activity against G+ and G-. In particular against *Pseudomonas aeruginosa* (MIC = 3.9 microg / ml and 7.8 for flowerheads and leaves, respectively), *Proteus mirabilis* (MIC = 15.6 and 7.8 microg / ml), *Salmonella typhi* (MIC = 7.8 microg / ml) and *Proteus vulgaris* (MIC = 15.6 microg / ml) the most inhibited bacteria are found. (multi drug resistance) The essential oils are more active against bacteria than against fungi. Bacteria: *Pseudomonas aeruginosa* (ATCC 27853), *Escherichia coli* (ATCC 35210), *Bacillus subtilis* (ATCC 10907), *Bacillus cereus* (clinical isolates), *Micrococcus flavus* (ATCC 10240), *Staphylococcus epidermidis* (ATCC 2228). Fungi: *Aspergillus niger* (ATCC 6275), *Penicillium ochrochloron* (ATCC 9112), *Epidermophyton floccosum* (clinical isolates), *Candida albicans* (clinical isolates) and *Trichophyton mentagrophytes* (clinical isolates).

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**- Cosmetic:** Apigenin is a natural flavonoid with anti-inflammatory, antioxidant, antiangiogenic, antiallergic, antigototoxic and anticancer properties. It is present in the phytochemical complex of the plant and has a marked spasmolytic activity. Apigenin improves the vascular walls by inhibiting collagenase; increases the ability to dispose of bilirubin through the induction of UTIA1; inhibits lipid peroxidation, blocking lipoxygenase and thus avoiding vasodilation, a source of pigmentation. These elements show that apigenin is an excellent active ingredient for the treatment of dark circles with vascular coloring. Vascular staining dark circles are directly related to the state of the blood network. The reduction in blood microcirculation is manifested through darker, more marked and visible capillaries. The vascular walls are therefore less elastic and less impermeable, locally creating dilation and blood stasis. This blood stagnation determines a capillary permeability and the passage of blood from the capillaries to the interstitial medium. Hemoglobin then accumulates in the infra-orbital part and degrades by oxidation into biliverdin, bilirubin or iron. Biliverdin is a dark green-purple pigment, while bilirubin is a dark orange or red-brown pigment. Accumulating in the epidermis and dermis, they are at the origin of the characteristic color of tiredness under the eyes. The release of iron contributes to the increase of the blue color of the dark circles, at the origin of the purple skin pigmentation. The pro-oxidant character of iron on lipid peroxidation, which also generates an aggravating pro-inflammatory situation, as it is a vasodilator, is an additional cause of activation of blood losses and of pigmentation progressively tending to brown. Vitexianes isovitexina are glucosides of different sugars of apigenin. The essential oil obtained from the leaves can be used as a bactericide, possibly implemented in creams for impure skin or with pimples. They can be used as antioxidants in skin conditioning, hair conditioning, and as tonics or antimicrobials. Illuminating and anti-aging effect.

### Side effects

Some cinnamic acids have allergenic or photoallergic potential with restrictions on the maximum amount that can be used, but also protect against UV rays, (ethylhexyl methoxycinnamate (octinoxate), isoamyl p-methoxycinnamate (amiloxiate), octocrylene and cinoxate).