Master data ingredient / monograph

Ingredient/plant: Sage (Salvia officinalis)

Scientific name:	Salvia officinalis
Order:	Lamiales (Lippenblütlerartige)
Family:	Lamiaceae (Lippenblütengewächse)
Subfamily:	Nepetoideae
Genus:	Salvia
Species:	Salvia officinalis

Description:

Common sage (*Salvia officinalis*) is a small evergreen subshrub (a woody perennial plant), with woody stems, grayish leaves, and blue to purplish flowers native to southern Europe and the Mediterranean region.
It is much cultivated as a kitchen and medicinal herb, and is also called Garden sage, Kitchen sage, and Dalmatian sage. In southern Europe related species are sometimes cultivated for the same purpose, and may be confused with the common sage. Although this plant was the one originally called by this name *sage*, a number of related species are now also called by it.
The uses and benefits ascribed to it are many and varied, and are often shared with related species. Uses of common sage include:

- teas and infusions, which are considered to have a calming effect, to soothe a sore throat and as a digestive agent
- preservative flavourings, for instance of cheese
- as a cooking flavouring, such as in sage and onion stuffing

Common sage is also grown in parts of Europe, especially the Balkans for distillation of the essential oil, though other species, such as *Salvia triloba* may also be harvested and distilled with it.

Properties:

The Latin name for sage: salvia, means “to heal”. Although its effectiveness is often open to debate, sage has been recommended at one time or another for virtually every ailment. Modern evidence supports its effects as an

antihydrotic (antiperspiration),

antibiotic,

antifungal,

astringent (An **astringent** substance is a chemical substance that tends to shrink or constrict body tissues, usually locally after topical medicinal application. The word "astringent" derives from Latin *astringere*, meaning "to bind fast".)

antispasmodic,

estrogenic,

hypoglycemic, and

tonic.

Active ingredients

The strongest active constituents of Sage are within its essential oil, which contains cineole, borneol, and thujone. Sage leaf contains tannic acid, oleic acid, ursonic acid, ursolic acid, cornsole, cornsolic acid, fumaric acid, chlorogenic acid, caffeic acid, niacin, nicotinamide, flavones, flavone glycosides, and estrogenic substances.

Active principles of Sage

The chief therapeutic, biologically active component of sage is its essential oil (1-2.5%), which contains mainly cineol, borneol, and alpha- and beta-thujone. Sage leaf contains appreciable amounts of tannic acid (3-8%), resins (5-6%) with oleic, ursonic, and ursolic acids, as well as bitter substances (1.3-1.8%) with cornsole and cornsolic acid. Fumaric, chlorogenic, caffeic and nicotinic acids, nicotinamide, flavones, flavone glycosides, and estrogenic substances are also present.

It has antioxidative properties.

Pharmacological properties:

a) topical effects

Essential oil of sage is reported to have astringent, anti-inflammatory, bacteriostatic, and antiperspiration action. In addition to the essential oil, still-unidentified components have marked antimicrobial action. In vitro experiments indicate aqueous extracts from sage leaves strongly inhibit the development of dysenteric bacteria, E. coli, B. paracoli, Enterobacter aerogenes, and Enterococcus, while moderately inhibiting the development of Staph. aureus, alpha-hemolytic streptococci, and some other pathogenic microorganisms. Bitter substances isolated from sage leaf have bacteriostatic action against S. aureus, E. coli, and Epidermophyton, at dilutions as great as 1:10000.

Sage contains the same condensed tannin (consisting of trimers of caffeic acid) as found in lemon balm and peppermint. This tannin has potent inhibitory action against Newcastle Disease virus and herpes simplex virus. Incubated at 37 degrees C. for seven days with the H37Rv strain of mycobacterium tuberculosis, sage leaf extract produced inhibition at concentrations lower than 1:80 but higher than 1:40. This makes it one of the weakest among those plants having such activity, but demonstrates the presence of the property nonetheless.

b) antiperspiring properties

The rare ability of sage tea to partially or totally inhibit perspiration in humans has been known for several hundred years. There is little responsible disagreement about this effect. Most herbalists have witnessed it first hand, and research has confirmed sage's ability to eliminate the perspiring response. Sage infusions have a strong therapeutic effect on nocturnal perspiration (night sweats) in cases of neuroses and tuberculosis. The effect seems to reach its peak 2-3 hours after ingesting the tea or tincture, and then gradually subsides. The response is attributed to some component of the volatile oil, but the exact active principle is unknown. Experimental pylocarpine-induced hyperhydrosis is almost completely suppressed by sage.

c) estrogenic properties

The estrogenic activity of sage has been demonstrated experimentally, and a team of investigators has shown the herb has strong effects in cases of oligomenorrhea and amenorrhea. The herb's estrogenic substance is thought to constitute 1-2% of the dried plant, but it is doubtful this effect has anything to do with the common practice of using sage to dry up the milk of nursing mothers.

d) hypoglycemic properties

Sage's hypoglycemic property has been investigated sporadically; tests show it has strong activity in humans suffering from diabetes, especially if taken on an empty stomach. The herb has achieved drug status in some eastern European countries as a hypoglycemic agent of merit.

e) spasmolytic effects on smooth muscle

The essential oil of sage has spasmolytic action against acetylcholine-induced contractions of isolated rat intestine, which are immediately suppressed by sage tincture and emulgated oil. However, water extracts, and especially infusions, manifest very slight effect. In a series of experiments carried out on segments of isolated guinea ileum, sage extract inhibited the spasmodic effects of acetylcholine, histamine, serotonin, and barium chloride by 70-85%. This spasmolytic effect was of long duration. The total flavonoid fraction has demonstrated a spasmolytic effect, though weaker than the total extract. In yet another study, the spasmolytic property of sage was established against many convulsant drugs, including acetylcholine, histamine, serotonin, anaphylatoxin. Preparations used included isolated cuts of rabbit and guinea-pig intestine, isolated guinea pig lungs, cat lungs "in situ," and whole animals under conditions of anaphylactic shock. The smooth muscle spasmolytic effect is myotropic, resembling that of papaverine.

f) effects on Blood Pressure

Sage extracts applied in the femoral vein of male cats in a dose of 0.2 mg/kg, or intraduodenally through chronically implanted canuli at a dose of 0.5 ml/kg, produced moderate but prolonged hypotension (30 and 15% respectively, after three hours, as compared to controls).

Possible interactions:

Sage should be used with caution in conjunction with CNS-depressants or stimulants.

The hypotensive effect of this herb may be potentiated by anorectic drugs, such as fenfluramine, whose effects are mediated by brainstem 5HT. Additive effects may occur between the hypotensive property of sage and that of dopamine receptor agonists, such as bromocriptine mesylate. The antituberculous activity of the herb may also potentiate the adverse effects of other antituberculous drugs, especially ethionamide.

The tannin in sage may potentiate the antibiotic activity of echinacea. The tannin in sage tea may be inactivated by the addition of milk or cream.

The presence of estrogen-like substances in sage may increase the production of procoagulant factors which, in turn, may inhibit the anticoagulant action of heparin or coumarin. The estrogenic constituents of this plant may also potentiate oral anti-diabetics, folic acid antagonists, and some corticosteroids.

Conversely, the presence of estrogen in the herb can inhibit antihypercholester-olemics by inducing hyperlipemia. It can also inhibit the activity of most parenteral medications by reducing the rate of spreading. However, the estrogenic activity of sage may be inhibited by meprobamate and phenobarbital.

Due to the presence of estrogenic substance, oxytocin may augment the neural conductivity and contractility of uterine smooth muscle. The estrogen in sage may also raise blood glucose levels enough to alter insulin requirements in diabetics.

Topical application of sage, in conjunction with the acne product tretinoin (retinoic acid, vitamin A acid), may adversely affect the skin.

Comments

The hypotensive property of this herb may be additive with the CNS depressant activity of the analgesic nalbuphine HCl. The same is true of the analgesic propoxyphene HCl.

To minimize central nervous system depression and possible synergism, it would be wise to avoid using this herb with procarbazine antineoplastic drugs.

In the absence of other hard data, it may still be assumed observable interactions may occur between the many central nervous system drugs and the psychoactive principles in sage.

There is evidence to show combined use of bactericidal and bacteriostatic agents will lower the effectiveness of the bacteriostatic agent. However, how this finding applies to herbal antibiotics is not known.

Use:

Sage is a popular home remedy. The herb has been recommended for almost every illness or problem by one herbalist or another. Perhaps the most frequently cited effects of sage are its antihydrotic (antiperspiration), antibiotic, astringent, antispasmodic, and hypoglycemic properties. Each of these effects has received some experimental support. The antihydrotic action is often used to stop night sweats experienced during tuberculosis. Sage's spasmolytic quality is useful to quiet nervousness, remedy digestive disturbances, and treat respiratory problems.

Sage is commonly used to remedy leukorrhea, amenorrhea, and dysmenorrhea. While these effects have been observed experimentally, and estrogenic properties have been discovered, it is unclear if there is a direct connection between them; the herb's mechanism of action requires more investigation.

Sage has moderate but extensive bacteriostatic, antifungal, and antiviral properties. Often used as a mouthwash or gargle to treat inflammations and irritations of the mouth and throat. This effect is due to the herb's high content of volatile oils and tannins. Its hypotensive property may also contribute to this action. Sage is often used to dry up the milk of nursing mothers, but this action has not been verified experimentally.

Sage leaf is an approved herb by the German Commisssion E for internal and external use.

Externally it is applied to the inflamed mucous membranes of the nose and throat, for insect bites, throat, mouth, gum, skin infections, vaginal discharge.

Internally for dyspepsia, indigestion, gas, liver complaints, excessive lactation, excessive perspiration (sweating), excessive salivation, anxiety, depression, female sterility, menopausal problems.

Limits of administration:

None.

Assessment / safety factors and toxicity

Although sage contains more thujones that the leading thujone intoxicator, wormwood, sage is considered nontoxic.
One study demonstrated toxicity in sage, and attributed it to the herb's thujone content. However, the same study failed to find any of the effects of sage documented by other investigators. Were that the only study finding negative properties in sage, it could easily be written off as mistake; however, another com-

prehensive screening test also failed to find many of its otherwise well-substantiated properties, including antibiotic, hypoglycemic, and antispasmodic effects.
These studies may have been cases of misidentification, since the several varieties of sage demonstrate differing levels of potency; if such is not the case, however, a very confusing picture of sage activity emerges.
Sage leaf has approval status by the German Commission E.

Further remarks and characteristics:

None.

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