

Salviae folium (DAB 10), Red sage

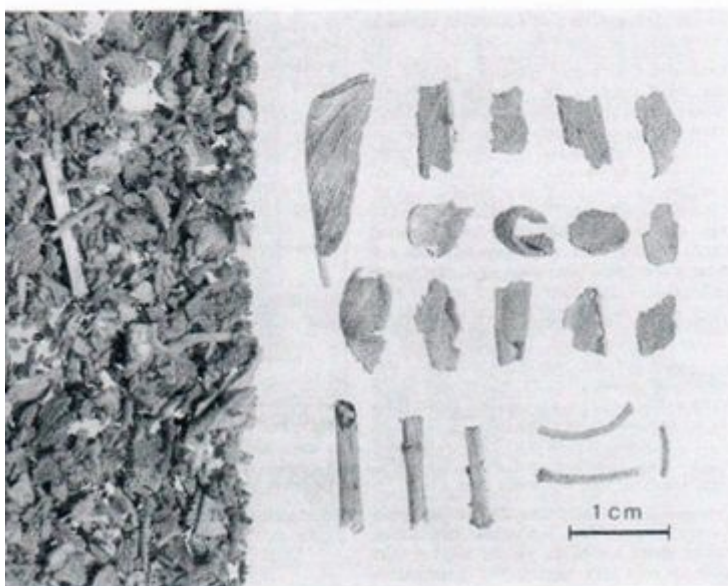


Fig. 1: Red sage

Description: The long-petiole, 3-10 cm long and 1 to 3 cm wide, oval, oblong-ovate, to lanceolate leaves are densely pubescent on both surfaces; they have distinctly crenulate margin and deeply depressed venation which is very prominent on the lower surface, an a lamina which is rounded and sometimes singly or doubly auriculate at the base.

The cut drug consists of small leaf fragments, which because of the dense tomentum, cling together; its fine pubescence on both surfaces and the reticulate venation on the lower surface are easily recognized.

Odour: Intensely spicy and aromatic.

Taste: Spicy, bitter, and astringent.



Fig. 2: *Salvia officinalis* L.

A ca. 70 cm tall subshrub, becoming woody at the base and with characteristically smelling, oblong leaves; lamina, because of the velvety tomentum, greyish green, especially on the lower surface, and often auriculate at the base. Ca. 2 cm long flowers, mostly with a bluish violet corolla, arranged in whorls forming a loose spike.

DAB 10: Salbeiblätter
ÖAB: Folium Salviae
Ph. Heb. VII: Salviae folium
St. Zol. 1229.99.99

Plant source: *Salvia officinalis* L., garden or red sage (Lamiaceae). The pharmacopoeial specification corresponds only with subsp. *minor* (GMELIN) GAMS and subsp. *major* (GARSALT) GAMS, but not with subsp. *lavandulifolia* (VAHL) GAMS (which according to the Flora Europaea is a separate species). Recent morphological/anatomical studies support the view that the subspecies of *S. officinalis* should be treated as independent species: subsp. *minor* = *S. officinalis* s.s., subsp. *major* = *S. tomentosa* MILLER, and subsp. *lavandulifolia* = *S. lavandulifolia* VAHL [4].

Synonyms: Garden or Broad-leaved sage, Sawge (Engl.), Salbeiblätter, Edelsalbei, Gartensalbei (Ger.), Feuilles de sauge officinale, Feuilles de sauge commune (Fr.).

Extract from the German Commission
E monograph
(BAnz no. 90, dated 15. 05. 1985)

Uses

Externally: inflammation of the mucous membranes of the mouth and throat.
Internally: dyspeptic complaints, excessive secretion of sweat.

Contraindications

The pure essential oil and alcoholic extracts should not be taken during pregnancy.

Side effects

On prolonged use of alcoholic extracts and the pure essential oil, epileptiform convulsions may occur.

Interactions

None known.

Dosage

Unless otherwise prescribed:
Internally: daily dose 4-6 g drug, 0.1-0.3 g essential oil, 2.5-7.5 g tincture (as in Erg. B. 6), 1.5-3 g fluid extract (as in Erg. B. 6).

As a gargle and rinse: 2.5 g drug as infusion or 2-3 drops of the essential oil to 100 ml water or 5 g alcoholic extract to a glass of water.
As a paint: undiluted alcoholic extract.

Mode of administration

Chopped drug for infusions, alcoholic extracts, and distillates for gargling, rinsing, and painting, and for external use and the fresh press juice of the plant.

Effects

Antibacterial, fungistatic, virostatic, astringent, secretion-promoting, sweat-inhibiting.

Note

A separate monograph has been prepared for *Salvia triloba*.

Origin: Native in the Mediterranean region, especially in the Adriatic; cultivated to some extent in various European countries. Imports of the drug come from Albania and former Yugoslavia.

Constituents: 1-2.5% essential oil, consisting of thujone (up to ca. 35-60%) and other monoterpenes (particularly cineole) and small amounts of sesquiterpenes; 3-7% tannins, including rosmarinic acid; diterpenoid bitter substances, e.g. carnosol (= picrosalvin), carnosic acid 12-methyl ether γ -lactone, rosmanol and its 7-methyl ether, manool, etc.; triterpenes, e.g. oleanolic acid and derivatives [1, 5]. Extraction of an ethanol extract with supercritical carbon dioxide yields a product with greater antioxidant activity than butylated hydroxytoluene [5].

Indications: As an antiphlogistic for inflammation of the mouth and throat, for gingivitis and stomatitis, mainly in the form of a gargle, but also as a tea for digestive complaints, flatulence, inflammation of the intestinal mucosa, in diarrhoea.

As an antisudorific (antihydrotic), e.g. against night sweats in tuberculosis patients, but also against excessive sweat formation of psychosomatic origin.

Use of the drug in the two areas indicated is purely empirical. Pharmacological experiments with isolated constituents are still lacking; however, the antisudorific action has been demonstrated in animal experiments and clinically in man, e.g. pilocarpine-induced sweating is rapidly curtailed.

In folk medicine, because of an inhibiting effect on the secretion of milk, garden sage is also used to aid the cessation of lactation; it is also said (but not proved) to have mild hypotensive and emmenagogic effects. Although not a cholagogue, the drug is sometimes used in this way in mixtures with other drugs (action of bitter substances?).

Side effects: Only likely with overdoses (more than 15 g sage leaves/dose) or on prolonged use. The toxic constituent of the essential oil, thujone, causes symptoms such as tachycardia, hot flushes, convulsions, and dizziness.

Making the tea: Depending on the indication; as a gargle, boiling water is poured over 3 g of the chopped drug and strained after 10 min.; against night sweats, the infusion prepared like the previous one, but the drink is allowed to cool; for gastrointestinal complaints, boiling water is poured over 1.5-2.0 g of the finely chopped drug and strained after 5 min.

1 Teaspoon = ca. 1.5 g.

Herbal preparations: The chopped drug is also available in tea bags (1.0 or 1.6 g).

Phytomedicines: The drug, extracts made from it (tincture, fluid extract), or the essential oil are components of some prepared mouth and throat remedies, e.g. Salus® Salbei-Tropfen (drops), Salviathymol®, etc., Gastrointestinal Remedies, e.g. Enterosanol® (dragees, juice, capsules), etc., and cholagogues and some other remedies. Products available in the UK include Seven Seas Catarrh Tablets, Arkopharma Phytomenopause, etc.

Regulatory status (UK): General Sales - List Schedule 1, Table A.

Authentication: Macro- (see: Description) and microscopically, following the DAB 10. See also [4, 6] and the BHP 1983. It should be noted that the covering trichomes on the upper and lower surfaces of the leaf are the same (distinction from *Salvia triloba* folium - Greek sage): ca. 200-600 μ m long, not more than 20 μ m wide at the base, and with a short, strongly thickened basal cell (Fig. 4). The DAB 10 TLC procedure examines the composition of the essential oil:

Test solution: 0.30 g freshly powdered drug shaken for 2-3 min. with 5 ml dichloromethane and filtered over ca. 2 g anhydrous sodium sulphate.

Reference solution: 3.0 mg borneol, 5 μ l bornyl acetate, and 10 μ l cineole dissolved in 10 ml toluene.

Loadings: 30 μ l test solution and 10 μ l reference solution, as 2-cm bands on silica gel G.

Solvent system: acetone+ethyl acetate+di-chloromethane (2+3+95), 10 cm run.

Detection: sprayed with anisaldehyde reagent, followed by heating at 100-105 °C for 5-10 min. while under observation.

Evaluation: in daylight. Reference solution: the lowest zone, the brownish grey borneol zone; slightly above, the greyish violet to blue cineole zone; and above that, the brownish grey bornyl acetate zone. Test solution: these three zones, approximately equal in intensity; directly below the bornyl acetate zone, the weakly coloured reddish violet thujone zone; and somewhat below that, the weakly coloured pinkish red caryophyllene epoxide zone, followed by an intense violet zone; just below the cineole zone, another violet zone of similar intensity (viridiflorol); in the lowest part of the chromatogram, other violet or greenish yellow zones, some of them very prominent; in the upper part of the chromatogram, two intense violet to blue zones (terpene and sesquiterpene hydrocarbons).

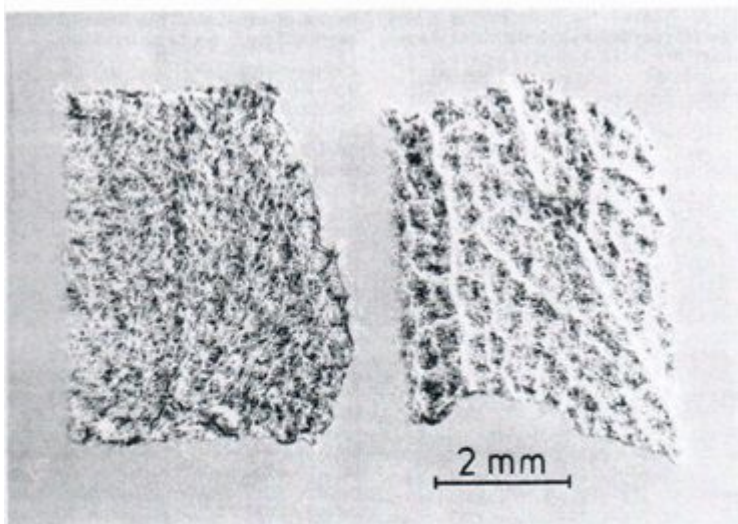


Fig. 3: Upper surface (left) and lower surface (right) of sage leaf

In UV 365 nm light. Test solution: thujone, directly below the bornyl acetate zone, as an intense sealing-wax red fluorescent zone; cineole, a bluish green fluorescent zone; borneol and bornyl acetate zones, almost no fluorescence.

TLC study of the flavonoids is also useful in aiding the identification (see: Adulteration).

Wording of the package insert, from the German Standard Licence:

6.1 Uses

Inflammation of the gums and the mucous membranes of the mouth and throat; pressure spots caused by prostheses; in supportive treatment of gastrointestinal catarrh.

6.2 Dosage and Mode of administration

For treating gastrointestinal complaints, boiling water is poured over half a teaspoonful (1-3 g), and for inflammation in the mouth, over one teaspoonful (ca. 3 g), of **Red sage** and after 10 min. passed through a tea strainer.

Unless otherwise prescribed, for gastrointestinal complaints a cup of the warm tea is drunk several times a day half-an-hour before meals.

For inflammation of the mucous membranes of the mouth and throat, the still warm infusion is used as a rinse or gargle several times a day.

6.3 Duration of use

Infusions of red sage should not be taken over a long period of time.

6.4 Note

Store protected from light and moisture.

Quantitative standards: DAB 10: *Thujone-rich volatile oil*, not less than 1.5%. *Foreign matter*, not more than 3% stem fragments and not more than 2% other foreign matter. *Loss on drying*, not more than 10.0%. *Ash*, not more than 10.0%.

ÖAB: *Volatile oil*, not less than 1.5%. *Foreign matter*, not more than 3% stem fragments. *Ash*, not more than 8.0%.

Ph. Helv. VII: *Volatile oil*, not less than 1.5%. *Foreign matter*, not more than 3% stems; leaves of *S. triloba* absent. *Sulphated ash*, not more than 12.0%.

BHP 1983: *Foreign organic matter*, not more than 3%. *Total ash*, not more than 8%.

Adulteration: Occasionally with the leaves of other *Salvia* species, principally those of *S. triloba* L.f., Greek sage; these have a white, velvety tomentum on both surfaces, which is denser than that of *S. officinalis* (compare Fig. 3 and *Salviae trilobae folium*: Fig. 3). The trichomes on the upper surface are not tortuous and whip-like, but are straight and stiff, and mostly 30-40 µm wide at the base (*Salviae trilobae folium*: Fig. 4).

In the DAB 10 TLC examination set out above, adulteration can be recognized by the divergent composition (a higher cineole and lower thujone content). Differentiation is also possible on the basis of the flavonoid profile; the TLC procedure is as follows:

Test solution: 1 g powdered drug refluxed for 10 min. with 10 ml methanol, filtered, the filtrate taken to dryness, and the residue dissolved in 4.0 ml methanol.



Fig. 4: Long, multicellular, tortuous covering trichomes, from the upper leaf surface

Reference solution: 10 mg rutin and 5 mg hyperoside dissolved in 10 ml methanol.

Loadings: 2 µl test solution and 2 µl reference solution, as bands on silica gel.

Mobile phase: ethyl acetate + anhydrous formic acid + water (88 + 6 + 6), 5 cm run.

Detection: after drying in a current of hot air, sprayed with 1% methanolic diphenylboryloxyethylamine, followed by 5% ethanolic polyethylene glycol 400.

Evaluation: in UV 366 nm light. Reference solution: orange-yellow fluorescent zones, rutin at Rf ca. 0.2 and hyperoside at Rf ca.

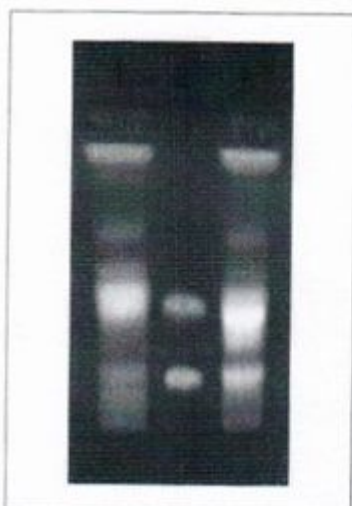


Fig. 5: TLC on 4x8 cm foil

1: Red sage
2: Rutin and hyperoside (reference compounds)
3: Greek sage
For details, see the text

0.45; Test solution (*S. officinalis*): several yellowish orange and bluish fluorescent zones between R_f 0.2 and 0.9, especially just above the level of the hyperoside zone. Test solution (*S. triloba*): similar zones, but the main ones are below the level of the hyperoside zone (Fig. 5).

The solvent system: toluene + ethyl acetate (95 + 5) with silica gel F 60₂₅₄ and detection

with anisaldehyde reagent also allows red sage and Greek sage to be distinguished by: (a) the greater intensity of the violet-red double (α - and β -) thujone zone in the red sage (*S. officinalis*) chromatogram and (b) the very intense cinole zone in the Greek sage (*S. triloba*) chromatogram [7].

Storage: Protected from light, in well-closed (but not plastic) containers. Stability on storage [2, 3]; this depends on the degree of comminution (the coarsely powdered drug keeps better than the finely powdered one) and on the packaging (vacuum packs are better than double-thickness paper bags).

Literature:

- [1] Kommentar DAB 10.
- [2] D. Fehr, Pharm. Ztg. **127**, 111 (1982).
- [3] L. Kreutzig, Pharm. Ztg. **127**, 893 (1982).
- [4] R. Länger, Th. Ruckensauer, J. Juretsch, and W. Kubelka, Sci. Pharm. **59**, 321 (1991).
- [5] Z. Djarmati et al., Phytochemistry **31**, 1307 (1992).
- [6] B.P. Jackson and D.W. Snowden, Atlas of microscopy of medicinal plants, culinary herbs and spices, Belhaven Press, London, 1990, p. 204.
- [7] P. Pachaly, Dtsch. Apoth. Ztg. **130**, 169 (1990).