

BOTANICAL SOURCES USED IN FOOD AS FLAVOURINGS

LAVANDULA ANGUSTIFOLIA MILL. SSP. ANGUSTIFOLIA



Lavandula angustifolia Mill.ssp.angustifolia

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SYS NAME:	Lavandula angustifolia Mill.ssp.angustifolia
CE No:	257
STEINMETZ No:	637
FEMA No:	/
ORDER:	Tubiflorae
FAMILY:	Labiatae
NAME:	E: Lavender F: Lavande D: Echter Lavendel I: Steca, Stigadosso
SYNONYMS:	L. officinalis Chaich, L. spica Lois, L. vera DC
PARTS USED:	flowers, flower tips, herb.
IMPORTANT CONSTITUENTS:	herb and flower tips, essential oil: a-thujene (tr), a-pinene (0.14%), camphene (0.13%), sabinene (0.05%), b-pinene (0.25%), hept-5-en-3-one,6-methyl (0.25%), butyric acid,iso:butyl ester (0.18%), thujone , myrcene (1.08%), hexyl acetate (1.96%), car-3-ene (tr), p-cymene (0.33%), 1,8-cineole (3.32%-30%), limonene (0.59%), b-ocimene-cis (0.88%), b-ocimene-trans (1.15%), c-terpinene (0.07%), trans-sabinene-hydrate (0.11%), cis-linalool:oxide (furanoid) (2.44%), p-cymene (tr), trans-linalool: oxide (furanoid) (1.98%), terpinolene (0.29%), linalyl acetate (30%) linalool (20.98%), oct-1-en-3-ol- acetate (1.34%), cis-pinene: Hydrate (0.07%), oct-3-en-1-ol acetate (0.09%), camphor (0.59%), trans-pinocarveol (0.16%), butyric acid,iso: hexyl ester (0.06%), pinocarvone (0.06%), borneol (1.38%), linalool oxide (pyranoid) (1.38%), terpinen-4-ol (1.52%), a-terpineol (4.34%), butyric acid hexyl ester (0.25%), octyl acetate (0.12%), nerol (0.34%), citronellol (0.34%),

carvone (0.34%), thymol methyl ether (tr), geraniol (tr), linalool acetate (26.54%), borneol acetate (0.06%), thymol (tr), lavandulol acetate (5.49%), linalool propionate (0.12%), d-elemene (tr), citronellol acetate (0.22%), nerol acetate (1.02%), geraniol acetate (1.95%), a-copaene (tr), N-tetradecane (tr), a-cedrene (0.05%),

b-caryophyllene (1.08%), a-bergamotene: trans (tr), b-farnesene: cis (0.97%), D-germacrene (0.14%), c-cadinene (0.56%), cis-nerolidol (tr), trans-nerolidol (0.08%), caryophyllene oxide (3.74%), N-hexadecane (0.10%), T-cadinol (0.99%); farnesol,cis-2-trans-6 (tr); n-octadecane (tr), cadalene (tr). **Fresh flower essential oil:** propan-2-one (0.22%), hexan-1-ol (0.51%),

a-thujene (0.11%), a-pinene (0.42%), camphene (0.35%), oct-1-en-3-ol (1.18%), b-pinene (0.18%), b-terpinene (0.23%), acetic acid hexyl ester (0.24%); benzene,1-methyl-2-methyl-ethyl (0.63%), **1,8-cineole** (5.81%), cis-sabinene: Hydrate (0.39%), linalool oxide (1.67%), furfuryl-2-alcohol,tetrahydro (1.38%), linalool (45.09%), **camphor** (13.32%), butanoic acid hexyl ester (0.57%), borneol (5.22%), lavandulol (0.83%), **terpinen-4-ol** (8.82%), a-terpineol (0.55%), linalool acetate (3.08%), nerol acetate (0.53%), hexanoic acid hexyl ester (0.54%), caryophyllene (0.13%), a-santalene (0.13%), b-bisabolene (1.38%) (1-4).

ACTIVE PRINCIPLES: 1,8-cineole (III), camphor (III), thujone (III), terpinen-4-ol (under evaluation)

OTHER CONSTITUENTS OF

TOXICOLOGICAL CONCERN: pinocamphone

PRODUCTS IN WHICH USED: in perfumes, soaps, aromatic vinegars, herbal, tobaccos and scented sachets. Fresh flowers and stalks used as flavouring in beverages and jallies.

LEVEL OF USE: **lavander absolute (FEMA No 2620):** non-alcoholic beverages 0.2-7.5 ppm, ice cream, ices 0.4 ppm, candy 2-14 ppm, baked goods 2-6.3 ppm. **Lavander concrete (FEMA No 2621):** non-alcoholic beve-



rages 0.01-0.2 ppm, ice cream, ices 0.08 ppm, candy 0.03-0.25 ppm, baked goods 0.25 ppm. **Lavander oil (FEMA No 2622):** non-alcoholic beverages 2.9 ppm, ice cream, ices 7.8 ppm, candy 5.5 ppm, baked goods 8.3 ppm, chewing gum 220 ppm.

PREPARATION: essential oil, concrete and absolute

MAIN TOXICOLOGICAL DATA: **camphor:** TDI 100 µg/Kg b.w. based on the minimum lethal dose of 50 mg/Kg, with a safety factor of 500 (7); **thujone:** TDI 10 µg/Kg/day; **linalyl acetate and linalool:** group ADI 0.5 mg/kg b.w. (JECFA 23 rd, 1979); **limonene:** ADI not specified (JECFA 1993); **1,8-cineole:** provisional TDI 0.2 mg/kg. In large doses lavender oil is a narcotic poison that can cause death by convulsion. The oil cause dermatitis. (2) **Borneol:** Ames test negative (5) but positive with *Bacillus subtilis* rec-assay at 10 mg per dish (6) **terpinen-4-ol:** kidney irritation by commercially available *Juniper* oil depend on the content of terpinen-1-ol-4 (8). In another study two slightly different *Juniper* oil batches were tested in male Sprague-Dawley rats. Animals were dosed orally for 28 days with 100-333 and 1000 mg/kg bw/d (1st batch) and 100-300 and 900 mg/kg bw/d (2nd batch). Additionally, terpinene-4-ol, a known component of *Juniper* oil (10 mg%), was tested with the same experimental design at 400 mg/kg. Neither of the tested substances induced changes in function or morphology of the kidney at the tested doses (9).

DATA NEEDED: herb and flower tips: quantitative information on thujone.

MAIN REFERENCES: 1. Flav. Fragrance J., 1, 121, 1986; 2. Handbook of Medicinal Herbs, J. A. Duke, CRC Press, Inc. Florida, USA, 1987; 3. J. Essent. Oil Res., 9, 107, 1997; 4. Chim. Acta Turcica, 23, 37, 1995; 5. Arch. Environ. Contam. Toxicol., 28, 248, 1995; 6. J. Osaka City Med. Cent. 34, 267, 1986; 7. Toxicol. Lett. 19,207, 1983; 8. Pharmaz. Zeit. Wissensch, 138,85,1993; 9. Arzneimittel-Forschng, 47,855,1997.

CLASSIFICATION AND LIMITS: herb and flower tips: **cat 5** (with limit on 1,8-cineole, thuyone, camphor and terpinen-4-ol)
Category 5: plants, animals and other organisms, and parts of these or products thereof, and preparations derived therefrom, for which additional toxicological and/or chemical information is required. These could temporarily be acceptable provided that any limits set for the "active principles" or the "other chemical components" are not exceeded.

flower: **cat 4** (with limit on 1,8-cineole, camphor and terpinen-4-ol)

Category 4: Plants, animals and other organisms, and parts of these of products thereof, and preparations derived therefrom, not normally consumed as food items, herbs or spices in Europe, which contain defined "active principles" or "other constituents of toxicological concern" requiring limits on use levels.

These source materials and preparations are not considered to constitute a risk to health in the quantities used provided that the limits set for the "active principles" or "other chemical components" are not exceeded.

DATA BASES USED: NAPRALERT (1988-2001), CHEMABS (1967-2001), BIOSIS (1973-2001), FSTA (1969-2001), TOXLINE (1969-2001), MEDLINE (1966-2001).

Key words: *lavandula angustifolia* Mill. *ssp. angustifolia*, *Lavender*, *chemical composition*, *toxicity data*.