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Review article

# *Lavandula Stoechas* (Ustukhuddus): A miracle plant

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## Abstract

There are various sources of drugs like plants, animals, marine etc. Among all these, plants are the main source of drugs. In pharmaceutical world herbal medicine has a special place. Among medicinal plants *Lavandula stoechas* of Lamiaceae/Labiatae family is therapeutically very important. The various studies tell that it contains organic, inorganic substances and essential oil. Research is going on its new chemical constituents. Various pharmacological actions of *Lavandula stoechas* have been described in Unani literature like antiseptic, deobstruent, demulcent, phlegmagogue, nervine tonic, antianxiety, anticonvulsant, in numbness, trembling, mania, amnesia etc. In all traditionally uses of *Lavandula stoechas* few actions get scientific status like antibacterial, blood purifying, adaptogenic, hypotensive effect, cytotoxic and genotoxic effect, anticonvulsant, sedative, antispasmodic, hypoglycaemic activity, antianxiety etc. but many actions are remain to evaluate. This study covers the phytochemistry, pharmacognostic character and pharmacological activities of *Lavandula stoechas*.

**Key words:** Herbal medicine*, Lavandula stoechas,* Chemical constituents, Pharmacological actions, scientific status

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## 1. Introduction

*Lavandula stoechas* is a plant of the Lamiaceae/Labiatae family. *Lavandula* is from the Latin words for 'violet' and 'to wash' and refers to the flower colour and *Stoechas* from its growing on the Stoechades, a group of islands on the south coast of Gaul near Massila and it is much used by Muslim physicians. *Lavandula stoechas* known as "Ustukhuddus" at subcontinent. In Western India, it is wrongly named "Alfazema". In Spain it is known as "Romero Santo" meaning sacred rosemary. In the unani system it is described as "Jaroobe dimagh" which means "broom of brain" because of its removing the black bile from the brain, give strengthens and improves the intellect. It was first described by Galen (First Pharmacist) so it is called "Galeenial herb". Dioscorides described it in the book "Kitabul Hashaiash". Avicena (The Prince of Physicians) described it in his famous book "The Canon of Medicine". The oil content of *Lavandula stoechas* varies from 0.77-1.2%. The taste of plant is bitter. Grey coloured and slightly bitter in taste

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with pungency is rated best quality plant. Flowers are in cluster having a smell like Camphor [1-11].

**Vernacular names** [12]

| | | |
|---|---|---|
| Arabic | : | Anisul arwah, Mumsikul arwah |
| English | : | Arabian or French Lavander |
| Hindi | : | Dharu, Alphagandharu, Ustukhuddusa |
| Unani | : | Hafizul arwah |
| Urdu | : | Ustukhuddus |
| Bengali | : | Tantana Stoechadas |
| Guajarati | : | Lavandarana phula |
| Marathi | : | Alphajan |
| Persian | : | Shahsafram |

**Taxonomical classification** [13]

| | | |
|---|---|---|
| Kingdom | : | Plantae |
| Division | : | Magnoliophyta |
| Class | : | Magnoliopsida |
| Order | : | Lamiales |
| Family | : | Lamiaceae/ Labiatae |
| Genus | : | *Lavandula* |

Botanical name: *Lavandula stoechas* Linn.

**Subspecies** [14]

a) ***Lavandula stoechas* pedunculata**: The common type specific plant, taxonomically considered L. *pedunculata*. There is considerable variation in this subspecies, and it may be split into a number of distinct forms. It is native to many coastal regions of the Mediterranean, with some populations on the Atlantic coasts of Morocco and Spain.

b) ***Lavandula stoechas* luisieri**: Which has petals much less interconnected. It is found mainly in Portugal and adjacent regions of Spain.



**Figure 1: Flowers of *Lavandula stoechas***

## 2. Characteristics of *Lavandula stoechas* [14]

### Habitat

It is native to the Old World and is found from Cape Verde and the Canary Islands, southern Europe across to northern and eastern Africa, the Mediterranean, southwest Asia to southeast India. Many members of the genus are cultivated extensively in temperate climates as ornamental plants for garden and landscape. This herb is found in forests and mountains having wet soils in Rabi season. In India, it is found in Bihar and Bengal but the quality is not good. It also found in Canaries, Portugal, and eastwards throughout the Mediterranean region to Constantinople and Asia Minor. The plant cultivated in Peshawar and Afghanistan is of the best quality. Qualities of *Lavandula, which* cultivated in the region of Hejaz and Rome is more persuasive in medicinal value.

### Stems

Number-many, length -300 to 600 mm, colour - greyish, branched, square when young, often grow along the ground, then bend upwards, densely hairy with star type hairs, lower parts woody and rough, coppice when cut.

**Leaves**
Leaves like the leaves of Satar (*Zataria multiflora*) but thinner and longer than that. Opposite and paired or clustered at the nodes, fragrant when crushed, Stipules – None, Petiole – None, Blade - Grey-green, parallel sided to oblong, 8-30 mm long by 1.5-10 mm wide, dense short hairs (star type) Edges turned down but with no teeth or lobes.

**Roots**
Woody, shallow.

**Flowers**
Bracts: Floral bracts broadly egg shaped, up to 6 mm long by 7 mm wide with 3 shallow lobes, obvious veins, hairy. Bracteoles are egg shaped, 0.5 - 2 mm long, hairy.
Ovary: Superior, Styles with 2 short lobes
Calyx: 4-6 mm long, tubular, 13 ribbed, dense star hairs, 5 lobed and the back lobe is broader and has a notched appendage near the top.
Corolla: Dark purple, rarely white or pink, tubular, 6-8 mm long. 2 lipped, upper lip has 2 lobes and a lower lip has 3 circular lobes.
Stamens: 4 inside corolla tube, front pair is longer.
Anthers: Yellow, kidney shaped, small, one celled.

**Fruit**
Pale brown with many dark spots, shiny, triangular nutlet about 2 mm diameter, hairless.

**Life cycle**
Seed germinates at any time of the year and grow slowly. They are semi dormant, but evergreen in summer and autumn and grow in the winter and spring. Flowering occurs from July to November with seeds produced in spring and summer**.**

**Reproduction**
By seed.
**Flowering times**
Flowering occurs in June to July.
**Seed Biology and Germination**
The seed has a long dormancy in soil.
**Vegetative Propagules**
Crowns and root fragments.
**Population Dynamics and Dispersal**
The main spread is from intentional planting in gardens and consequent escape. Water, wind and birds spread seed. Perennial roots and crowns are moved by cultivation equipment and in gravel for road making. Coppice when stems are cut. In suitable areas, the infestation increases in density until a few other plants remain.

## 3. Phytochemical constituents of *Lavandula stoechas* [15-17]

**Table 1. Phytochemical constituents of *Lavandula stoechas* on the basis of Chemical nature**

| Sr. No. | Substances | Example |
|---|---|---|
| 1 | Organic substances | Carbohydrates, Glycosides, Phenols, Steroids, Terpines, and Resins |
| 2 | Inorganic substances | Aluminium, Calcium, Iron, Magnesium, Potassium and Strontium |
| 3 | Essential oil | Fenchone, Pinocarvyl acetate, Camphor, Eucalyptol, Myrthenol |
| 4 | Triterpenic acid | β-sitosterol, Ursolic acid, Apigenin, Luteolin, Rosmarinic acid |

**4. Marketed preparations [18]**

Ustukhuddus Quath, Sharbat Ustukhuddus, Ustukhuddus Majoon, Ustukhuddus Murabba, Ark Ustukhuddus, Ustukhuddus Arishta, Itriphal Ustukhuddus, Itrifal Mulayyin, Majun Khadar, Majun Maurawweh ul-Arwah, Majun Najah, Majun Zabib, Qurs Mulayyin, Sherbet Ahmad Shah, Sherbet Gaozaban, Sherbet Mushil, Sherbet Ustukhuddus, Itriphal Sanai, Itriphal Ghudadi, Itriphal Muqawwi Dimagh.

**Dosage [19]**

According to Rhazes its dose is 7-10 gm.

**Drug interaction [20]**

Due to diuretic action, it potentiates the action of other diuretics and cause hypokalemia. It has antihypertensive action, so it may increase the hypotensive effect of anaesthetics.

**Uses [21-26]**

Anticonvulsant hypnotic, sedative antispasmodic, Mania, Amnesia, Numbness, Trembling, colic and chest affections, in headache, for cleansing wounds, provides strength to head, brain, liver, spleen, stomach and intestines, expel the crudities from the brain and clarify the intellect.

**Part of the plant used [27]**

Whole plant (mainly flower and leaves).

**5. Action scientifically evaluated**

- Lavender oil (100, 200, and 400 mg/kg ip) injected at the onset of ischemia. Infarct size, cerebral edema, functional outcome, and oxidative stress biomarkers were evaluated using standard methods. Treatment with lavender oil at doses of 200 and 400 mg/kg significantly diminished infarct size, brain edema, and improved functional outcome after cerebral ischaemia ($P<0.001$). The results indicated that lavender oil has neuroprotective activity against cerebral ischemia and alleviated neurological function in rats, and the mechanism may be related to augmentation in endogenous antioxidant defence, inhibiting oxidative stress, and increasing VEGF expression in the rat brain [28].
- The antioxidant power of the ethanolic extract of *Lavandula stoechas* was evaluated by using, 2, 2-diphenyl-1-picryl hydrazyl (DPPH) and phosphomolybdenum assay *in vitro* methods. In the DPPH scavenging assay the IC50 value of the extract was found to be 1.2µg/ml. The antioxidant capacity of L*. stoechas* extract showed 255,5 µg/ml of equivalent to ascorbic acid in comparison with gallic acid, which is 155 µg/ml equivalent to ascorbic acid, it also demonstrated that antioxidant power increase in a dose dependent manner. This study suggests that *Lavandula stoechas* may act as a chemopreventive agent, providing antioxidant properties, and offering effective protection from free radicals [29].
- The anti-inflammatory activity evaluated by Carrageenan-Induced Rat Paw Edema method. The ethanolic extracts of *Lavandula stoechas* (1000 and 2000 mg/kg, body weight "b.w") inhibited the inflammation induced by carrageenan in rats in a dose dependent manner. At dose of 2000 mg/kg, b.w. *Lavandula stoechas* produced a significant inhibition of inflammation at 74 % compared to 69 % for Diclofenac at 1 %. This study suggests that *Lavandula stoechas* may act as a chemopreventive agent,

providing antioxidant properties, and offering effective protection from free radicals, and confirm the Moroccan traditional use of this plant for the treatment of inflammatory diseases [29].

- The *Lavandula stoechas* oils significantly protected against the increase of blood glucose as well as the decrease of antioxidant enzyme activities Alloxan induced in rats [30].
- The aqueous methanolic extract of *Lavandula stoechas* flowers at the dose of 600 mg/kg significantly reduced the severity and increased the latency of convulsions induced by Pentylenetetrazole (PTZ). *Lavandula stoechas* likewise reduced PTZ's lethality. It up to a dose of 600 mg/kg was found devoid of any hypnotic effect in mice, however, the animals were found to be dull, calm and relaxed. The sedative effect of the plant extract was confirmed, as it prolonged the pentobarbital sleeping time in mice similar to that of diazepam [31].
- *Lavandula Stoechas* caused a dose-dependent (0.1–1.0 mg/ ml) relaxation of spontaneous contractions in isolated rabbit jejunum preparations. *Lavandula Stoechas* also inhibited K-induced contractions in a similar dose range, thereby suggesting calcium channel blockade. This effect was confirmed when pretreatment of the jejunum preparation with LS produced a dose-dependent shift of the Ca dose-response curve to the right, similar to the effect of Verapamil, a standard calcium channel blocker [31].
- The cytotoxic and genotoxic effects of aqueous extract (40, 80 and 120 g/L) of L*. stoechas* flowers on *Allium cepa* and found that reduced mitotic index, but induced chromosome aberrations and mitotic aberrations [32].
- *Lavandula stoechas* extract (10%) has more effective healing properties on full thickness open skin wounds compared to zinc oxide topical ointment. The greatest degree of wound contraction was considered in *Lavandula stoechas* extract (10%) treated rats while this change was slighter in the control group. On microscopic examination, the overall healing process of *Lavandula stoechas* extract (10%) treated rats were significantly better than the other experimental groups ($p<0.05$) [33].
- The toxic impact of essential oils from flowers and leaves of *Lavandula stoechas* against *Lasioderma serricorne* F. through contact and fumigation methods. In the contact toxicity, *Lavandula stoechas* (LC50=0.379 µl/cm2) was susceptible. In fumigation, *Lavandula stoechas* with LC50 3.835 µl/l air was susceptible at the 24 h time of exposure [34].

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