



AN INSIGHT ON THE MIRACLE PLANT OF UNANI MEDICINE: USTUKHUDDUS (*Lavandula Stoechas* L.)

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ABSTRACT

Lavandula stoechas, also known as Ustukhuddus or *Jarob-i-dimag* in Unani medicine, is a plant from the Lamiaceae (Labiatae) family with significant therapeutic value. Extensive research has been conducted on its chemical composition, pharmacognostic characteristics, and pharmacological properties. The analysis from classical Unani books and online data of *Lavandula stoechas* has revealed the presence of various organic and inorganic substances, as well as essential oils. Ongoing studies are focused on discovering new chemical constituents within the plant. In Unani literature, *Lavandula stoechas* is described as having multiple pharmacological effects, such as antiseptic, deobstruent, demulcent, phlegmagogue, nervine tonic, antianxiety, anticonvulsant properties, and being beneficial in conditions like numbness, trembling, mania, and amnesia. While some of these traditional uses have been scientifically supported, others require further investigation. Scientific research has confirmed several actions attributed to *Lavandula stoechas* in Unani medicine. These include antibacterial properties, blood purifying effects, adaptogenic properties, hypotensive effects, cytotoxic and genotoxic effects, anticonvulsant activity, sedative properties, antispasmodic effects, hypoglycemic activity, and antianxiety properties. However, more research is needed to evaluate the remaining actions.

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1. INTRODUCTION

Lavandula stoechas is a plant belonging to the Lamiaceae/Labiatae family. The name *Lavandula* is derived from Latin words meaning 'violet' and 'to wash,' referring to the flower color, while *Stoechas* indicates its growth on the Stoechades, a group of islands off the south coast of Gaul near Massila. It has been extensively used by Arab physicians. In the subcontinent, it is known as "Ustukhuddus," although in Western India, it is mistakenly called "Alfazema." In Spain, it is referred to as "Romero Santo," meaning sacred rosemary.

In the Unani system of medicine, *Lavandula stoechas* is described as "Jarobe dimagh," which translates to "broom of the brain." This name stems from its

purported ability to remove black bile from the brain, thereby strengthening and improving intellectual function. The plant has also been associated with Galen, considered the first pharmacist, leading to its nickname as the "Galeenial herb." It was mentioned by Dioscorides in his book "Kitabul Hashaiash," and Avicenna, known as the Prince of Physicians, described it in his renowned work "The Canon of Medicine." *Lavandula stoechas* typically contains an oil content ranging from 0.77% to 1.2%. The plant has a bitter taste, with the highest quality specimens being gray in color and slightly bitter with a hint of pungency. The flowers are clustered together and emit a fragrance resembling that of camphor.^[1-9]

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1.1. Vernacular names^[10]**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**1.2 Taxonomical classification**^[11]**Kingdom** : Plantae**Division** : Magnoliophyta**Class** : Magnoliopsida**Order** : Lamiales**Family** : Lamiaceae/Labiatae**Genus** : Lavandula**Botanical name**: *Lavandula stoechas* L.**1.3 Habitat and Description**

Lavandula stoechas is native to the old World and can be found across various regions. Its natural habitat extends from Cape Verde and the Canary Islands, southern Europe, and northern and eastern Africa, to the Mediterranean region and southwest Asia, reaching as far as southeast India. Many species within the Lavandula genus are widely cultivated in temperate climates as ornamental plants for gardens and landscapes. In its native range, Lavandula stoechas is typically found in forests and mountainous areas with moist soils during the Rabi season. In India, it can be found in Bihar and Bengal, although the quality of the plant in these regions is not considered to be good. Lavandula stoechas is also present in the Canaries, Portugal, and extends eastwards throughout the Mediterranean region up to Constantinople and Asia Minor. Notably, the cultivated Lavandula stoechas grown in Peshawar and Afghanistan is considered to be of the highest quality. Lavandula cultivated in the regions of Hejaz and Rome is also renowned for its potent medicinal properties.^[2,12,13]

The stems of Lavandula stoechas are numerous and can reach lengths of 300 to 600 mm. They have a greyish color and are branched. When young, the stems are square in shape and often grow along the ground before bending upwards. They are densely covered with hairs that have a star-like appearance. The lower parts of the stems become woody and rough over time. Additionally, when the plant is cut, it has the ability to coppice, meaning it can regenerate and produce new shoots from the base.^[12]

The leaves of Lavandula stoechas resemble those of Satar (*Zataria multiflora*) but are thinner and longer.

They are arranged opposite each other or in pairs or clusters at the nodes. When crushed, the leaves emit a fragrant aroma. They lack stipules and petioles. The blade of the leaf is grey-green, parallel-sided to oblong, measuring 8-30 mm in length and 1.5-10 mm in width. The leaves are covered with dense short hairs, resembling star-shaped structures. The edges of the leaves are turned downward, but they do not have teeth or lobes.^[12]

The roots of Lavandula stoechas are woody and shallow.^[12]

Fruits^[12]

- **Bracts**: The floral bracts are broadly egg-shaped, approximately 6 mm long and 7 mm wide, with three shallow lobes. They have distinct veins and are hairy. The bracteoles, which are smaller egg-shaped structures, measure 0.5-2 mm in length and are also hairy.
- **Ovary**: The plant has a superior ovary, and the styles have two short lobes.
- **Calyx**: The calyx is tubular, measuring 4-6 mm in length, with 13 ribs and dense star-shaped hairs. It has five lobes, with the back lobe being broader and having a notched appendage near the top.
- **Corolla**: The corolla of Lavandula stoechas is dark purple, although it can occasionally be white or pink. It is tubular, 6-8 mm long, and two-lipped. The upper lip has two lobes, while the lower lip has three circular lobes.
- **Stamens**: There are four stamens positioned inside the corolla tube, with the front pair being longer than the others.
- **Anthers**: The anthers are yellow, kidney-shaped, small, and have a single cell.

The fruit of Lavandula stoechas is pale brown with many dark spots, appearing shiny. It consists of triangular nutlets measuring approximately 2 mm in diameter, and they are hairless.

1.4 Parts usedWhole plant, flower, essential oil^[14,15]**1.5 Mizaj (Temperament)**Hot 1° and Dry 2°^[2]**1.6 Afaal (Pharmacological Actions)**^[16,17,18]

Muhallil (resolvent)

Mulattif (demulscent)
 Mufatteh sudad (deobstruent)
 Jali (detergent)
 Muqawwi (Tonic)
 Munaqqi (purifier)
 Muqawwi-e-Asab (Nervine tonic)
 Habis (styptic)
 Dafe taffun (antiseptic)
 Mushil-e balgham (phlegmagogue)

1.7 Therapeutic uses:^[14]

Lavandula stoechas has various therapeutic uses according to traditional sources:

Malikholia (Melancholia): It is believed to be beneficial in treating melancholia, a condition characterized by extreme sadness or depression.

Junoon (Mania): *Lavandula stoechas* is used to alleviate symptoms of mania, a mental disorder associated with excessive excitement or agitation.

Nisyan (Amnesia): It is recommended for the management of amnesia, a condition characterized by memory loss or forgetfulness.

Sara (Epilepsy): *Lavandula stoechas* is used in the treatment of epilepsy, a neurological disorder characterized by recurrent seizures.

Waswas saudawi (Anxiety): It is employed to alleviate anxiety, providing a calming effect on the mind and promoting relaxation.

Istirkha (Atony): *Lavandula stoechas* is used to address conditions of atony, which refers to a lack of muscle tone or weakness.

Tashannuj-e-imtelayi (Congestive Convulsion): It is utilized in the management of congestive convulsions, which involve muscle contractions due to congestion or obstruction.

Khidre (Numbness): *Lavandula stoechas* is employed to address numbness, a loss of sensation or feeling in a part of the body.

According to Ibn Sina, *Lavandula stoechas* is mentioned in his treatise 'Advia Qalbia' for its ability to remove sauda (black bile) from the head and brain. It is considered to have a therapeutic effect in addressing saudawi (black bile) and balghami (phlegmatic) morbid matters in the brain, earning it

the name 'broom of the brain' (Jaroobe Dimagh). Muslim physicians view *Lavandula stoechas* as a cephalic (tonic), resolvent, deobstruent, and carminative herb. It is prescribed for chest affections and to help expel bilious and phlegmatic humors. The herb is credited with cephalic properties, sweeping away phlegmatic impurities, removing obstructions, and enhancing the intellect. It is important to note that these therapeutic uses are based on traditional knowledge and may require further scientific research for validation.^[19]

1.8 Mazarrat (Toxicity)^[8,18]

Harmful for hot and safrawi temperament people.

1.9 Musleh (correctives)

Sikanjbeen,^[8,18] Kateera (*Astragalus gummifer*, Labill)^[2]

1.10 Badal (Substitutes)

Akasbel (*Aftimoon*, *Cuscuta reflexa*)^[2,16]

1.11 Therapeutic Dose

According to Rhazes its dose is 7-10 gm and advised better to use with *sikanjbeen*^[14,15]

2. MATERIAL AND METHODS

The review of the exceptional plant, *Lavandula stoechas* L., featured insights from classical Unani literature including Al qanoon fi al Tibb by Ibne Sina, Kitab Al Hawi Fit Tibb by Razi, and Al Jamae ul Mufradat lil Advia wal Aghziya by Ibn Baitar, to name a few. The electronic search comprised Google Scholar, Science Direct, Pub Med, and Wiley Online Library databases.

3. RESULTS AND DISCUSSION

Lavandula stoechas L., also known as Ustukhuddus, is a significant plant that is widely utilised in Unani medicine to treat a range of ailments. An extensive list of chemical constituents, including alkaloids, flavonoids, glycosides, terpenes, carbohydrates, proteins, calcium, magnesium, iron, and others, were identified through phytochemical study. Additionally, it has exhibited a number of biological functions, such as anti-inflammatory, neuroprotective, hypoglycemic, antioxidant, antidepressant, antiseptic, and insecticidal actions.

3.1 Phytochemical constituents of *Lavandula stoechas*^[20,21,22]

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

S. No.	Substances	Bioactive molecules
1.	Organic substance	Carbohydrates, Glycosides, Phenols, Steroids, Terpinenes, 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

3.2 Pharmacological studies

- Neuroprotective effects** of lavender oil against ischemia/reperfusion (IR) injury in mice. Lavender oil was tested as a potential therapy for neuro-dysfunction, specifically in the context of stroke. Focal cerebral ischemia was induced in mice using the intraluminal occlusion method with a nylon string to assess the neuro-dysfunction, neurological deficits. Reactive oxygen species (ROS) generated by mitochondria, malondialdehyde (MDA), and carbonyl levels were measured as markers of oxidative stress. The ratio of reduced glutathione (GSH) to glutathione disulfide (GSSG), as well as the activities of antioxidant enzymes superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GSH-Px), were assessed. After 22 hours of reperfusion, the researchers evaluated neurological deficits, infarct size, histopathological changes, and oxidative stress markers. The findings indicated that treatment with lavender oil significantly reduced neurological deficit scores and infarct size compared to the model group (group without treatment). Lavender oil also decreased the levels of MDA, carbonyl, and ROS, indicating a reduction in oxidative stress. Furthermore, lavender oil attenuated neuronal damage, upregulated the activities of SOD, CAT, and GSH-Px, and increased the GSH/GSSG ratio, suggesting antioxidant effects. Overall, the study suggested that lavender oil exhibited neuroprotective effects against cerebral ischemia/reperfusion injury, likely due to its antioxidant properties.^[23]
- Neuroprotective activity** of lavender oil against cerebral ischemia in rats: The rats were subjected to ischemia, and lavender oil was administered intraperitoneally (at doses of 100, 200, and 400 mg/kg) at the onset of ischemia. The researchers evaluated various parameters including infarct size, cerebral edema, functional outcome, and

oxidative stress biomarkers using standard methods. The results of the study showed that treatment with lavender oil at doses of 200 and 400 mg/kg significantly reduced the infarct size and brain edema, indicating a protective effect against cerebral ischemia. Additionally, the functional outcome of the rats improved after lavender oil treatment. The observed effects were statistically significant ($P < 0.001$), suggesting a strong correlation between lavender oil administration and these positive outcomes. The researchers also suggested that the neuro-protective mechanism of lavender oil may be associated with its ability to enhance the endogenous antioxidant defence system, inhibit oxidative stress, and increase the expression of VEGF (vascular endothelial growth factor) in the rat brain.^[24]

- Antioxidant activity:** The ethanolic extract of *Lavandula stoechas* (*L. stoechas*) has been evaluated for its antioxidant power using the 2,2-diphenyl-1-picryl hydrazyl (DPPH) scavenging assay and phosphomolybdenum assay in vitro methods. In the DPPH scavenging assay, the extract exhibited an IC₅₀ value of 1.2 μ g/ml, indicating its ability to scavenge DPPH radicals effectively. This suggests strong antioxidant activity. The antioxidant capacity of the *L. stoechas* extract was also compared to ascorbic acid (vitamin C) and gallic acid, which are well-known antioxidants. The extract showed an equivalent antioxidant capacity of 255.5 μ g/ml compared to ascorbic acid, while gallic acid had an equivalent capacity of 155 μ g/ml compared to ascorbic acid. These results indicate that *L. stoechas* extract has a higher antioxidant power than gallic acid and can be comparable to ascorbic acid. Furthermore, the study found that the antioxidant power of *L. stoechas* extract increased in a dose-dependent manner, implying that higher concentrations of the extract may result in even stronger antioxidant effects.^[25]
- Anti-inflammatory activity:** *Lavandula stoechas*

(*L. stoechas*) has been evaluated for anti-inflammatory activity using the Carrageenan-Induced Rat Paw Edema method. In this study, ethanolic extracts of *L. stoechas* were administered to rats at doses of 1000 and 2000 mg/kg of body weight. The results showed that *L. stoechas* extract inhibited carrageenan-induced inflammation in a dose-dependent manner. At a dose of 2000 mg/kg, *L. stoechas* extract demonstrated a significant inhibition of inflammation, reaching 74% compared to 69% for Diclofenac at 1% concentration. This indicates that *L. stoechas* extract was even more effective than Diclofenac, a commonly used nonsteroidal anti-inflammatory drug, in reducing inflammation in this experimental model.^[25]

- **Hypoglycaemic activity:** Effect of *Lavandula stoechas* oils on blood glucose levels and antioxidant enzyme activities in rats with alloxan-induced diabetes. The results of the study showed that the *Lavandula stoechas* oils significantly protected against the increase in blood glucose levels induced by alloxan in rats. Additionally, the oils were found to prevent the decrease in antioxidant enzyme activities caused by alloxan-induced diabetes. These findings suggest that *Lavandula stoechas* oils have potential therapeutic benefits in the management of diabetes by reducing blood glucose levels and preserving antioxidant enzyme activities.^[26]
- **Sedative activity:** Effects of the aqueous methanolic extract of *Lavandula stoechas* flowers on convulsions induced by Pentylentetrazole (PTZ) in mice. The results of the study showed that the extract, administered at a dose of 600 mg/kg, significantly reduced the severity and increased the latency of PTZ-induced convulsions. Additionally, the extract was found to reduce the lethality associated with PTZ administration. The study also assessed the sedative effects of the extract. It was found that up to a dose of 600 mg/kg, the extract did not have a hypnotic effect in mice. However, the animals exhibited characteristics of being dull, calm, and relaxed, suggesting a mild sedative effect. Furthermore, the extract prolonged the sleeping time induced by pentobarbital in mice, similar to the effects of diazepam.^[27]
- **Antispasmodic activity:** Effects of *Lavandula stoechas* on isolated rabbit jejunum preparations. The results showed that *Lavandula stoechas* caused relaxation of spontaneous contractions in a dose-dependent manner, with concentrations ranging from 0.1 to 1.0 mg/ml. This indicates that *Lavandula stoechas* has a muscle relaxant effect on the jejunum. Furthermore, *Lavandula stoechas* inhibited contractions induced by potassium (K⁺), suggesting a blockade of calcium channels. This suggests that *Lavandula stoechas* may interfere with the entry of calcium ions into the smooth muscle cells of the jejunum, which is necessary for muscle contraction. The calcium channel-blocking effect of *Lavandula stoechas* was further confirmed when the jejunum preparations were pretreated with *Lavandula stoechas*, resulting in a dose-dependent shift of the calcium dose-response curve to the right. This shift is similar to the effect observed with verapamil.^[27]
- **Cytotoxic activity:** The cytotoxic and genotoxic effects of the aqueous extract of *L. stoechas* flowers on *Allium cepa* (commonly known as onion) were investigated. Different concentrations of the extract, specifically 40 g/L, 80 g/L, and 120 g/L, were used in the study. The results of the study showed that the aqueous extract of *L. stoechas* flowers had cytotoxic effects on *Allium cepa*. A reduced mitotic index was observed, indicating a decrease in the number of cells undergoing mitosis. Furthermore, the extract induced chromosome aberrations and mitotic aberrations in *Allium cepa*.^[28]
- **Wound healing activity:** According to the study, the application of *Lavandula stoechas* extract (10%) showed more effective healing properties on full thickness open skin wounds compared to zinc oxide topical ointment. The results of the study indicated that the rats treated with *Lavandula stoechas* extract (10%) exhibited the greatest degree of wound contraction. This suggests that the extract promoted a more efficient healing process, resulting in a greater degree of wound closure compared to the control group. Microscopic examination of the wounds further supported the findings. The overall healing process of the wounds treated with *Lavandula stoechas* extract (10%) was significantly better compared to the other experimental groups. The statistical analysis conducted on the data showed that the differences observed between the *Lavandula stoechas* extract (10%) treated group and the other groups were statistically significant ($p < 0.05$).^[29]



- **Insecticidal activity:** The study investigated the toxic impact of essential oils derived from the flowers and leaves of *Lavandula stoechas* on *Lasioderma serricorne* (a common insect pest) using both contact and fumigation methods. In the contact toxicity test, it was found that *Lavandula stoechas* exhibited susceptibility against *Lasioderma serricorne*. The LC50 value, which represents the concentration at which 50% of the test organisms are killed, was determined to be 0.379 $\mu\text{l}/\text{cm}^2$. This indicates that a relatively low concentration of *Lavandula stoechas* essential oil was effective in causing mortality in *Lasioderma serricorne* upon direct contact. In the fumigation test, where the essential oil was present in the air, *Lavandula stoechas* also showed susceptibility against *Lasioderma serricorne*. The LC50 value for fumigation was determined to be 3.835 $\mu\text{l}/\text{l}$ of air after a 24-hour exposure period. This suggests that when *Lasioderma serricorne* was exposed to the fumes of *Lavandula stoechas* essential oil in the air, a relatively low concentration of the oil was sufficient to cause mortality.^[30]

4. CONCLUSION

In conclusion, the study on *Lavandula stoechas* provided valuable insights into its properties and effects. It has been widely studied for its phytochemical composition and pharmacological activities. Traditional uses of *Lavandula stoechas*, as described in Unani literature, include its role as an antiseptic, deobstruent, demulcent, phlegmagogue, nervine tonic, antianxiety, and anticonvulsant agent. Scientific research has supported some of these traditional uses, demonstrating antibacterial, blood-purifying, adaptogenic, hypotensive, cytotoxic, genotoxic, sedative, antispasmodic, and hypoglycemic activities. While *Lavandula stoechas* has shown promising pharmacological activities and is highly regarded in traditional medicine, further research is needed to fully explore its potential therapeutic uses and understand its mechanisms of action. The plant's rich historical and cultural significance adds to its value and warrants continued investigation into its phytochemistry, pharmacognostic characteristics, and pharmacological properties.

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