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LAVANDULA STOECHAS (USTOKHUDDUS): A REVIEW OF TRADITIONAL USES, PHYTOCHEMISTRY, PHARMACOLOGY, AND RECENT ADVANCES

***Dr. Bushra Shaikh[1], Prof. Ghulammudin Sofi[2], Dr. Khadija Abdul hafiz[3],**

Dr. Sharique Ur Rahim Shaikh[4]

*[1]BUMS, MD Pharmacology, National Institute of Unani medicine Bangalore

[2]Prof. Ilmul Advia, National Institute of Unani Medicine Bangalore,

[3]Research officer, Drug Standardization Research Institute, Ghaziabad, India

[4]BUMS, MHA, Proprietor Hikmat Clinic and Hijama Centre Nagpur, Maharashtra, India

*Corresponding author Email: dr.bsheikh83@gmail.com

Abstract

Lavandula stoechas (L. stoechas), known as Ustokhuddus in Unani medicine, has been traditionally used for its therapeutic potential, particularly in the Mediterranean region. This comprehensive review integrates ethnobotanical, phytochemical, and pharmacological data on *L. stoechas* to evaluate its traditional uses and identify potential areas for future research. The plant's historical use includes treatments for neurological disorders such as insanity, insomnia, and epilepsy. Phytochemical investigations reveal a diverse array of bioactive compounds, including essential oils (camphor, 1,8-cineole), flavonoids, terpenes, polyphenols, and phenolic acids (rosmarinic acid). These compounds contribute to various pharmacological activities, including anti-inflammatory, anticonvulsant, sedative, antioxidant, anti-hyperglycemic, hepatoprotective, and reno-protective effects, as evidenced by in-vitro and in-vivo studies. While the essential oil exhibits low toxicity and potential for use in food supplements or pharmaceutical applications, aqueous extracts have demonstrated cytotoxic and genotoxic effects in a concentration-dependent manner. The stability of its camphor odor for up to two years suggests good retention of quality. Recent studies have further explored its potential in treating neurodegenerative diseases and its antimicrobial properties against resistant bacterial strains. Further well-designed clinical trials and mechanistic studies are needed to validate traditional uses and explore novel therapeutic applications, considering the complex interplay of its phytochemical constituents and their safety profiles.

Keywords: *Lavandula stoechas*, Ustokhuddus, Unani Medicine, Pharmacology, Neuroprotective, Antioxidant

1. Introduction

Lavandula stoechas L., belonging to the Lamiaceae family, is an evergreen, fragrant shrub native to the Mediterranean region. It is widely cultivated in countries such as Spain, Italy, and France. Historically, *Lavandula stoechas* was described by Dioscorides in Kitabul Hashaish, who noted its origin in Stoechades (present-day Isles d'Hyeres). In Unani medicine, *Lavandula stoechas* is known as Ustokhuddus, signifying its perceived potency, particularly for neurological and psychological well-being.

Ustokhuddus has been traditionally employed for various ailments, including neurological and psychological disorders such as insanity, insomnia, psychosis, and Alzheimer's disease. The plant is found in hilly areas of Western Europe, coastal Spain and Italy, Eastern Africa, and along the coast of the Rome Ocean. It is also cultivated in regions such as Jammu & Kashmir, Nepal, Bhutan, Darjeeling, and Bengal. Fresh, greyish lavender is considered to be of the best quality.

This review aims to consolidate existing knowledge of *Lavandula stoechas*, exploring its botanical characteristics, traditional uses, chemical composition, pharmacological activities, safety profile, and recent advancements in research. By synthesizing this information, we aim to provide a comprehensive resource for researchers and practitioners interested in exploring the therapeutic potential of this medicinal plant.

2. Botanical Description and Identification

Lavandula stoechas is an evergreen, fragrant, flowering shrub reaching up to 120 cm in height. The leaves can be entire or incised. The flowers are arranged in whorls of 2-10, forming simple or branched spikes. The calyx is ovoid-tubular, with 5 teeth and 13-15 nerves. The corolla is typically blue or purple, and rarely white, and is two-lipped. The plant features 4 stamens and a 4-partite ovary. The fruits consist of 4 dry, smooth nutlets. It has 20 species; mostly it found the Mediterranean parts of India.[1],[2],[3],

Ustokhuddus is a Unani word which means *moukufularwh*, potent to *rooh*. In Arabic it is called *Anisul arwah* or *mumsikul arwah*.[4], [5] It is a weed which found mostly Mediterranean areas in moist soil during spring season approximately 1 feet in height.[6] It has woody stem from its apex purplish coloured tongue like spikes comes out, its flower is like barely flower but smaller then it having whitish purple or yellowish red colour its touch is herbaceous

glaborous, soft, test is bitter and spicy.[7] It has a typical smell, seeds are very fine, flattened surface, dark greyish yellow colour,[8] and on crushing, smells like camphor, test is very pungent and spicy. [6],[5] Indian Ustokhuddus, found in Azeemabad and Bengal is considered as low potency having dark black or greyish white or yellowish colour seeds. Some are seedless and some having very less seeds in this variety. The best quality lavender should be fresh, greyish in colour, bitter in test and its flower and leaves can be used medicinally.[6] 58,[9]63 In India it is cultivated on commercial basis but unable to fulfil the market demand hence importing from abroad.[6],[5],[9],

[10] According to Ibn Jazzier *ustokhuddus* means potent to *rooh.* Its test should be bitter, and should have astringent property which shows that it has heavy earthy materials in it, while as its bitterness shows light earthy materials in it. Hence it is a combination of following properties like deobstruent, demulcent, detergent, and generalise toner (*Gallon*).[11]

Vernacular Names:

Unani : Anis-ul-Arwah, Mumsik-ul- aarwah, Zerm [12] ; Siryani: Sajawoos, the name of continent where it found[4] ; Turky : karabaş [13] ; Hindi : Dharoo / Bashash[12], [6], [4],[14], [15],[5] ; Bangla : Tantana / tsnshana, [14], [9] ; Purtuguese : Alfazema[15] ; spainish: Romero Santo[15] ; English : Lavandula, Tikadoosh,[6] steochadoos, [4] its English name steochadoosh is derived from Unani name due to its origin in stechos Iceland[10] Arabian or French Lavender[12] ; French : Ustokhuddus [6],[5] ; Bengali :Tantana[12] ; Urdu:Ustokhudoos[12] ; Gujarati: Lavendra-na-phula[12] ; Marathi: Alphajan,[12] ; Botanical name: *Lavandula stoechas* Linn.[11],[12]

Scientific Classification:[16] (List as in the original)

Kingdom	:	Plantae -Plants
Subkingdom	:	Tracheobionta -Vascular plants
Superdivision	:	Spermatophyta - Seed plants
Division	:	Magnoliophyta -Flowering plants
Class	:	Magnoliopsida - Dicotyledons
Subclass	:	Asteridae
Order	:	Lamiales
Family	:	Lamiaceae - Mint family
Genus	:	Lavandula L- lavender
Species	:	Lavandula stoechas L- French lavender

3. Traditional Uses (Unani Medicine)

In Unani medicine, Ustokhuddus is highly valued for its therapeutic properties, particularly in treating neurological and psychological disorders.[14] It is considered effective for conditions such as insanity, insomnia, psychosis, and Alzheimer's disease. The powder form (approximately 3.5 g) is used to alleviate headaches, tremors, vertigo, and brain concussion resulting from injury. When combined with honey, Ustokhuddus acts as a nervine stimulant. Additionally, Sharbat-e-ustokhuddus, when taken with Sharbat-e-lemoo, is believed to enhance memory. It is very effective orally in patient of nervine disorder, hence advocated for long term use in cold temperament & and in nervine diseases.[14] it can be used as a potent purgative in case of epilepsy, melancholia, dementia, madness, catalepsy, mania, paralysis, spasm, tremor and paraesthesia. It act as melanogouge and removes excess phlegm from brain hence it is called "broom of brain" [15], it also act as disinfectant, it prevents nerve from excessive phlegm.[4] It patents urinary system, and also acts as a very good antidote. It is very effective in neuralgia and arthralgia sheikh had coated in book 'Advia Qalbia' that it is a very good melanogouge, hence it potent Rooh, brain and heart by evacuating excess Sauda (black bile) from them due to this property of ustokhuddus it is called cardio tonic.[6] Sharbat-e-ustokhuddus is useful as a demulcent, deobstruent, tonic, melanogouge, phlegouge, and effective in melancholia, it is a potent brain tonic and evacuate unwanted humours from brain.[9] It has a very good effect in melancholia, amnesia, motor disorder like tremors, numbness and palpitation. It is specially recommended for neurological disorders because it has melanogouge, phlegouge property. In case of vertigo, head injury, shock, *Raasha e dimaghi* (Parkinson's like symptom) it is advocated to be used with *maa ul asal*[8],[11],[7] It prevents premature greying of hairs, also acts as antidote in insect poisoning. [4] It is very effective like zoofa in chest pain quoted by *diascoridoos.*[4] It is used as a nervine tonic and a drug for treatment of epilepsy in Unani system of medicine.[17] Useful in early stage of paralysis and epilepsy stated by S.K.Bhattacharjee.[1]

Temperament:

According to Shaikhur Rais bu Ali Ibne Sina it is Hot 1° & Dry 2°.[12],[5],[9]

According to Tamimi and Ibn-e- Jazala Hot1°&Dry3°.[11]

According to Abdul Latif Hot 2° & Dry 1°,

According to Intaki Hot 2° & Dry 3°,

According to some other Scholars it is Cold and Astringent while as some of them refer it as Murakkabul quwa. [8],[9]

Hot 2° & dry°2,[6]

Hot 1° & dry 2° [4],[14],[7]

Hot & dry. [5],[10]

Functions/Properties/Actions:

It has Resolvent, Anti-inflammatory, demulcent,[7] detergent, deobstruent, astringent, tonic,[18] generalise tonic, disinfectant, remover, siccative, desiccant, eliminate waste from brain, glutinous, diapytic, melanogogue, phlegague, nervine tonic.[6],[9],[19] Aromatic, stimulant, carminative, expectorant, antispasmodic[2] and sternutatory[18] actions. It also has preservative and antibacterial effect.[20]

Therapeutic Dose:

In form decoction: 7-14 g[8],[9]

lavandula powder:17.5 g.

According to Ibn-e-Jazla 10.5g,[8],[9] 5-7 g,[6] 7 g,[7] and 7-10 g.[11]

4. Phytochemistry

Phytochemical investigations of *Lavandula stoechas* have revealed the presence of various chemical constituents: (List from supplied text). Essential oil, fixed oil, alcohol.[6],[10] Its aerial parts contains oleanolic, ursolic,and vergatic acid, β-sitosterol, α-amyrin and its acetate, lupeol, erythrodiol, luteolin, acacetin vitexin. The leaves contains polyphenols, apigenin-7-0-β-D-glucoside, luteolin and its 7-0-β-D-glucoside 7-0-β-D-glucuronide, rosmarinic acid, and 6-0-caf-feoyl glucose.[17] Hydrocarbon.[1] Tanins, Iridoides, Saponins, Anthraquinones, Coumarins, Flavonoids, Sterols and triterpenes, Polyphenols, cardiac glycosides, Quinone's, O-heterosides and Cheterosides are also present mostly in leaf stem and fruit.[21] Aamir mushtaq et al 2018 showed in their study chemical constituents in extract of *lavandula steochas* as Proteins, Carbohydrates, Alkaloids; Glycosides, Flavonoids, Terpenoids, Tannins, Terpenes.[22]

5. Pharmacological Activities

Pharmacological studies have demonstrated that *Lavandula stoechas* possesses a range of biological activities:

Anti-inflammatory, Anticonvulsant, sedative, antispasmodic activity, hepatoprotective, Reno protective, antioxidant, anti-hyperglycaemic activity and relives oxidative stress.[23]

Anti-inflammatory, Anticonvulsant, sedative, antispasmodic activity, hepatoprotective, Reno protective, antioxidant, anti-hyperglycaemic activity and relives oxidative stress.[23]

6. Safety Profile

Toxicity studies indicate that the essential oil of *L. steochas* subspecies *luisieri* exhibits low lethality and presents potential as a food supplement or in pharmaceutical applications79. However, aqueous extracts of *Lavandula stoechas* have shown cytotoxic and genotoxic effects in a concentration-dependent manner.[24]

Muzir (adverse effect):

For bilious individuals,[8],[11],[6] For lungs-

Stomach of bilious people, for ovaries, [19] for anus,[7]

Irritability, vomiting, increase thrust. [14],[5]

Musleh (correctives):

Sikanjabeen - Hamama, kateera, Samag Arabi, Muqil,[8]

Sharbate lemoo, Afteemoon vilayati, Ayarij faiqra[6],[9]

Hamoozaat, Sikanjabeen, kateera, gum [11],[5],[19] Muqil.[7]

Badal (substitute):

Badranjboya, gule Banafsha,[9]

Afteemoon and Badranjboya,[7]

for respiratory system- Farasiyoun,

for sauda Aftimoon.[5]

7. Stability

Its camphor odour retains up to two years which shows it retains its quality till 2 years and then starts to detioriate.[5] As per some other sources 1-2 years [9]

8. Identity, Purity, and Strength [12]

Foreign matter : Nill

Purity : 100%

Physicochemical constants

Total Ash : 9.28

Water soluble ash : 2.00

Acid-insoluble ash : 2.03

Loss on drying at 105℃ : 5.02

Qualitative estimation

Total phenolics : 3.5%

Total resins : 5.5%

9. Murakkabaat (Compound Formulations)

Itrifal ustokhuddus,

Majoon Najah,[25],[6]

Itrifal Sanai,

Itrifal Ghududi,

Itrifal Muqaww-i-Dimagh.[25] etc

10. Recent Advances

Recent studies have continued to explore the therapeutic potential of *Lavandula stoechas*. Research highlights:

- **Neuroprotective Effects:** Studies have shown that *L. stoechas* extracts may protect against neurodegenerative processes by reducing oxidative stress and inflammation in neuronal cells.[26]

- **Antimicrobial and Antifungal Properties:** Emerging evidence suggests that *L. stoechas* essential oil exhibits antimicrobial activity against various bacteria, including drug-resistant strains, offering potential applications in combating antibiotic resistance and making it suitable for cosmetic and therapeutic applications. [27,28]
- **Anxiolytic and Antidepressant Effects:** Clinical trials have indicated that *L. stoechas* essential oil can reduce anxiety and depression symptoms, suggesting its potential as a natural alternative in mental health treatment.
- **Antioxidant and Anti-inflammatory Effects:** Recent studies highlight its antioxidant and anti-inflammatory properties, which are beneficial in treating various inflammatory conditions.[29]4[30]
- **Anticancer Properties:** L. stoechas has shown promising anticancer activities, particularly against certain cancer cell lines such as gastric adenocarcinoma and melanoma.[31]2 [29]
- **Anxiolytic and Antinociceptive Effects:** Lavender essential oils, including those from L. stoechas, are known for their anxiolytic (anxiety-reducing) and antinociceptive (pain-relieving) properties.[30]
- **Cardiovascular and Neuroprotective Effects:** It is also used for treating conditions like epilepsy, migraine, and as a hypotensive agent.[27]

Recent Advancements and Research

Eucalyptol-Rich Lavender Oil: A recent study focused on a new eucalyptol-rich L. stoechas essential oil, highlighting its potential in therapy against inflammation and cancer. This oil exhibited significant anti-inflammatory activity in mouse models.[28,29]

Cytotoxic Activity: L. stoechas extracts have demonstrated potent cytotoxic effects against various cancer cell lines, including human gastric adenocarcinoma and melanoma, underscoring its potential as an anticancer agent.[31]

Phytopharmacological Activities: A comprehensive review of L. stoechas and L. officinalis highlighted their diverse pharmacological activities, including antispasmodic, analgesic, and antiseptic effects.[27]

11. Conclusion

Lavandula stoechas (Ustokhuddus) is a plant with a long history of traditional use, particularly in Unani medicine, for its purported benefits in neurological and psychological conditions. Modern research has begun to validate some of these traditional uses, with studies highlighting its anti-inflammatory, anticonvulsant, and antioxidant properties. However, further research is needed to fully elucidate the plant's therapeutic potential and safety profile.

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Conflict of Interest

None of the author has any kind of conflict of interest

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