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Review Article

Traditonal Uses and Phytopharmacological Analysis of Ancient and Lucrative Traditional Plants *Lavandula stoechas* L. and *Lavandula officinalis* Chaix

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ABSTRACT

Traditional medicines are still widely used because they contain notably unique therapeutically active metabolites in their native condition. This elevated the illustrious tradition of indigenous cultures and folklore claims to trace back the development of new therapeutic platforms and active leads that could meet the current needs with the minimum unforeseen health risks. *Lavandula stoechas* L. has the exclusive property to tutelage the brain, heart, and vital organs with unique pharmacodynamic action by expelling out brain impurity and purifying black bile. It is immensely used in insanity as a memory enhancer and nervine tonic, as per the classical Unani literature, and is termed a broom of the brain, but less erudition, improper documentation, and negligence emaciated its appreciation and recognition. While *Lavandula officinalis* Chaix is popularly used in modern practices in aromatherapy, mental rejuvenation, the cosmetic industry, and economic generation throughout the world due to more scientific unveiling. To corroborate the ancestral heritage and ancient therapeutic arguments with antiquated scriptures, these plants have been reviewed for their traditional uses and phytopharmacological activities.

Keywords: Traditional plant, Folkloric application, Phytochemistry, Pharmacology, Ancient medicine.

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INTRODUCTION

Traditional medicines are used to mitigate health discomfort as well as improve or treat physical and mental illnesses.[1] These sources of medicine have been around since ancient times and are an important component of the health care system in developing nations. Most healers and practitioners of the traditional systems of medicine prepare formulations according to their own recipes and dispense them to patients. In India, around 25,000 effective plant-based formulations are used in traditional and folk medicine. More than 1500 herbs are sold as dietary supplements or ethnic traditional medicines.[2,3] Our immediate concern is to preserve knowledge and culture; traditional scriptures, whatever existed and were mostly confined to older generations, must be well scientifically documented. In this context, key information from classical books of traditional Unani physicians, phyto-pharmacological data from concerned scientific literature, and an ethno-botanical survey of these plants have been compiled for further scientific attention and the development of traditional knowledge. This study will dwell on evidence-based acquaintance and protect the legacy of traditional knowledge for linking to future applications, the development of new leads, and the opportunity for traditional healers to galvanize upcoming scientific credentials. In this article, detailed information from classical Unani scriptures, pharmacological and phytochemical disquisitions through scientific databases and ethnic claims to validate its ancient services have been discussed.

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Lavandula stoechas Linn.

Lavandula stoechas L. sp. stoechas (Lamiaceae), locally known as karabasotu in Turkish,[4] has strong camphoraceous scented shrubs of 1m height with showy bracts at the tops of their flowering heads, also called Spanish, Italian, or fringed and

tenderous lavenders that do not grow as tall as the hardy lavenders like *L. angustifolia* and flowered only once a year. They have narrow, gray leaves that vary in size on different parts of the plant. It is extensively cultivated all over the world, particularly in France, Bulgaria, Russia, Italy, Spain, England, the United States, and Australia.[5] It has congruence and morphological analogy with wild basil and grows in winter. Flowers also have small hairs, which appear soft when touched. It has a strong smell and causes sneezing, while the taste is slightly bitter. Seeds are small, slightly compressed, and blackish brown in color. Plants found in the Bengal region are inferior in quality.[6] Flower and leaf fragrances don't always have the same intensity or pleasant aroma.[7] *L. stoechas* possesses a somewhat harsh odor suggestive of spike used in perfumes, medicated pillows or cushions, herb sachets, and fumigating powders.[8] and because Galen (Jalinoos) originally described its medical value, the herb is known as a Galenical herb.[9] Different traditional practitioners recognized it by different synonyms like Zaram and Zaharul Zaram by Mecca people, Shah Safaram Roomi' by Syrians, and Tantna by Bengali practitioners. Plants cultivated in Arab, Roman, and Western countries have strong seeds, a higher aroma, and a higher bitterness as compared to those cultivated in India. It was enumerated as a hot and dry disposition by the consensus of a large number of Unani physicians.[10] The aroma of flowers is traditionally used in Europe to strengthen a stupid and dizzy brain.[11] It is traditionally used in Anatolia as a memory enhancer.[12]

Lavandula officinalis Chaix

L. officinalis Chaix also has the same kind of taxonomical classification with straight and woody branches along with nuanced anatomy. It is similar to *L. stoechas* in most applications for various therapeutic purposes in the Unani system[13,14] in the Canon of Medicine of Avicenna.[15] It has been widely used as a Traditional Uighur Medicine (TUM) with sedative, hypnotic, spasmolytic, antibacterial, neuroprotective, and lipid-decreasing properties.[16]

Phytoconstituents of *L. stoechas* Linn.

It has a diagnostic and unique compound necrodane derivative characterized by its essential oils, which seem to be absent in the remaining Lavandula sp. The crude extracts of *L. stoechas* have pure ursolic acid, oleanolic acid, vergatic acid, -sitosterol, α amyrin, α amyrin acetate, lupeol, erythrodiol, flavonoids, luteolin, acacetin, and vitexin, longipin-2-ene, 7, 9-diol-1-one-monoacetate 7-methoxy coumarin and lavanol, rosmarinic acid and chlorogenic acid, apigenin-7-glucoside, and luteolin-7-O—glucoside.[17-22]

Essential oil of *L. stoechas*

L. stoechas shows the presence of various unique phytoconstituents, and a few are depicted in Figure 1. These metabolites are pinocarvyl acetate, myrthenol, fenchone, α-Campholene aldehyde, myrtenyl acetate, eucalyptol, α-thujene, α-pinene, camphene, sabinene, β-pinene, α-terpinene, p-cymene, D-limonene, β-phellandrene, 3-carene, γ-terpinene, isolimonene, isoterpinolene, β-terpineol, cis-verbenol, trans-p-2,8-menthadien-1-ol, trans-dihydrocarvone, menthone, isopulegol, menthol, borneol, 2,6,6-trimethyl-1-cyclohexene-1-carboxaldehyde, α-terpineol, cis-carveol, piperitenone, piperitone, α-citral, thymol, bornyl acetate, carvacrol, p-mentha-1(7), 8(10)-dien-9-ol, -caryophyllene, nerolidol, spathulenol, caryophylleneoxide, -cadinene, tricyclene, campene, benzaldhyde, myrcene, -phellandrene, terpinen-4-ol.[23-28]

Phytoconstituents of *L. officinalis*

Plant parts possess various crucial phytoconstituents like lavandunat, lavandufurandiol, lavandufluoren, lavandupyrones A, lavandupyrones B, lavandudiphenyls A, lavandudiphenyls B, 4-(1-hydroxy-1-methylethyl) benzoic acid, methyl 3-(3,4-dihydroxyphenyl) propanoate, 3,4,-trihydroxyl phenylpropionate, rosmarinic acid, isosalvianolic acid C,[29] anthocyanins, phytosterols, sugars, minerals, coumaric acid, glycolic acid, valeric acid, ursolic acid, herniarin, coumarin and tannins, isofurans, lavandulactones.[30,31]

Essential oil of *L. officinalis*

The essential oil of both plants is colourless to pale yellow or yellowish green, with a fragrance and a pungent, somewhat bitter taste. The principal constituents of oil vary with ecological and geographical variations; the proportion of cineole imparts a characteristic pungency to the oil.[8] It shows the presence of diverse constituents viz. α-phellandrene, α-pinene, β-pinene, 4-carene, D-limolene, Eucalyptol, 3-carene, β-cis-terpineol, linalyl acetate, octen-1-ol acetate, borneol, α-terpinol, cyclohexanol, camphene, linalool, α-bourbonene, α-bisabolene, α-cedreno, caryophyllene, α-caryophyllene, naphthalene, cis-α-bisabolene, α-bisabolol, thujene, sabinene, myrcene, p- cymene, 1,8 - cineole, (Z)- and (E) ocimene, terpinene, camphor, terpinene-4-ol, lavandulol, lavandulylacetate, (Z) - and (E) farnesene, epi-α-cadinol, cryptone, and caryophyllene oxide, (Z)-β-ocimene, (E)-β-ocimene, hotrienol, hexyl butyrate, T-cadinol, epi-α-muurolol, precocene. High-quality oil used in perfumery generally contains high percentages of linalool and linalool acetate, while the oil's fragrance deteriorates with increasing camphor ratio,[32-37] Borneol, epi--muurolol, -bisabolol, precocene I, and eucalyptol.[32] Some of the important metabolites found in *L. officinalis* are mentioned in Figure 2.

Traditional uses of *L. stoechas* and *L. officinalis*

Plants and their leaves are bitter in taste and useful in chest pain, joint pain, anti-epileptic, antidote for poison and insect bites, demulcent, and cardiotonic,[38] tutelage to the brain and heart since the ancient period in the Unani system of medicine,[39] resolvent, deobstruent, detergent,[40-43] brain purifier and

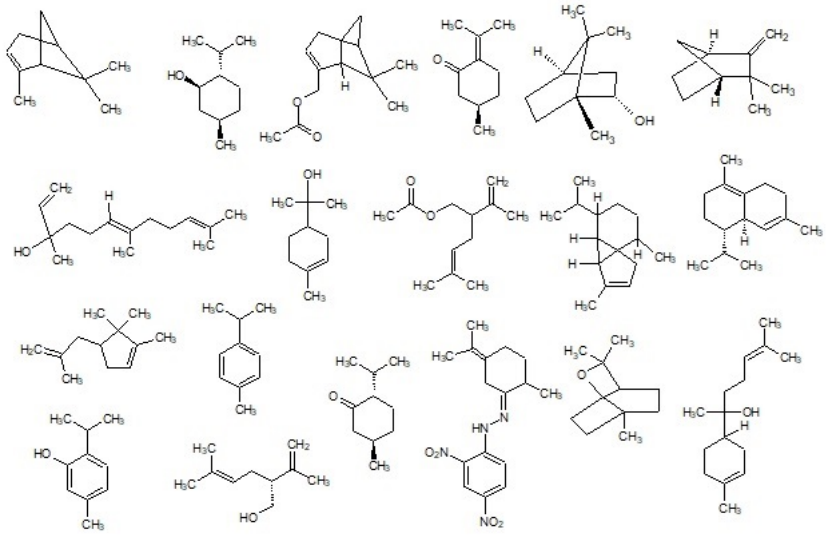

Figure 1: Structure of few metabolites found in *L. stoechas.*

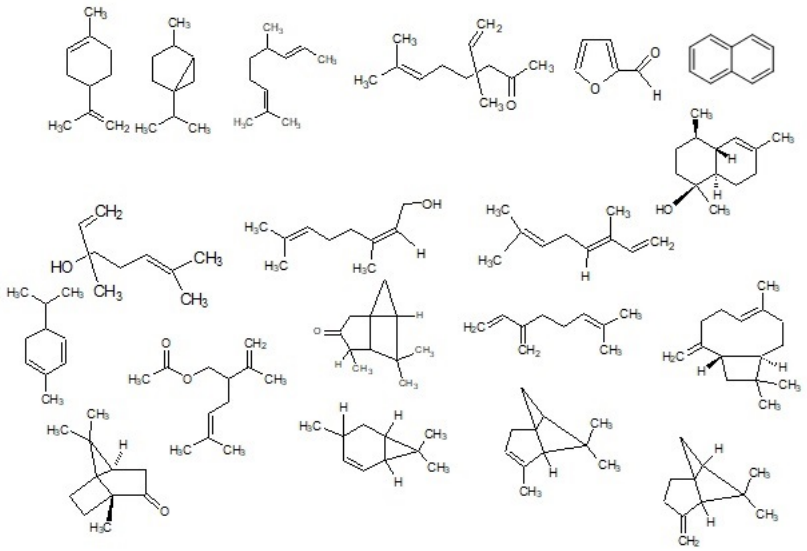

Figure 2: Structure of few metabolites found in *L. officinalis.*

stomachic, phlegmagogue and melanogogue, hemiplegia, facial palsy,[40] body tonic, disinfectant, desiccant, purifying black bile, agglutinant, cholagogue. It is very useful in insanity, as a memory enhancer, and to potentiate the nervous system. A powdered drug with honey or sugar is utilized for several brain complications when taken in the evening.[41] *L. officinalis* also has a long-standing history as a medical remedy and is prescribed to treat several complications like infertility, infection, fever, anti-spasmodics, anti-flatulents, anti-emetic, and diuretics. In recent years, its essential oils have gained a strong reputation in aromatherapy and as a holistic relaxant to treat stress, anxiety, depression, fatigue, or insomnia.[44] Since ancient times, *L. stoechas* has been used for spiritual and medicinal functions, including the treatment of anxiety, insomnia, toilet preparations, and food additives.[45]

Pharmacological activities of *L. stoechas* and *L. officinalis*

These traditional plants have great pharmacological applications through different channels and mechanisms. They also have a

Table 1: Pharmacological activities of the *L. stoechas* Linn. and *L. officinalis* Chaix.

Sl. No.	Pharmacological action	*Lavandula stoechas* Linn.	*Lavandula officinalis* Chaix.
1.	Headaches, depression and diabetes.	[71,72]	
2.	Essential oil used as antimicrobial, antifungal, carminative and cosmetic purposes.	[72-74]	
3.	Leaf decoction used for rheumatism, chill and digestive disorders.	[75]	
4.	Epilepsy and migraine.	[76]	
5.	Antispasmodic in colic pain, analgesic, tranquillizer and antiseptic effects.	[71,77,78]	[79-82]
6.	Urinary tract infections, cardiac diseases and eczema.	[4]	
7.	Reduces blood sugar.	[71,83]	
8.	Nocturnal sedative and Air freshener.	[84-87]	
9.	Anti-cancer	[88]	
10.	Anti-stress	[89]	
11.	Anti-convulsive.	[56,71]	
12.	Hypotensive.	[17]	
13.	Disguise objectionable odours.		[44]
14.	Aroma prevents deterioration of work performance.		[90]
15.	Antioxidant potential.	[91]	[91-95]
16.	Sedative effect.		[96]
17.	Anti-fungal activity.		[97]
18.	Analgesic, anti-anxiety, anti-depressant, and anti-convulsant effects.		[54-56]
19.	Anti-tumor, Anti-inflammatory, anti-histaminic, anti-diabetic, anti-microbial property and modulating the central nervous system.	[98-102]	[102]
20.	Anti-convulsive, anti-depressive effects and insomnia.	[103,104]	[105,106]
21.	Enhancing cognitive performance, dyspepsia and bloating.		[107]
22.	Anti-nociceptive and Anti-hyperalgesic effects.		[108,55]
23.	Anti-inflammatory.		[63]
24.	Sympatholytic (sympathoplegic) action.		[61,62]
25.	Adjunctive therapy in carpal tunnel syndrome.	[109]	
26.	Anti-microbial, antioxidant and anti-mutagenic activity.	[110]	
27.	Hepatoprotective and Nephroprotective activity.	[111]	
28.	Memory stabilizer in dementia.	[112]	[113]
29.	Attenuates renal ischemia.		[114]
30.	Antischistosomal effects, and the cytotoxicity.		[32]

Sl. No.	Pharmacological action	*Lavandula stoechas* Linn.	*Lavandula officinalis* Chaix.
31.	Neuroprotective activity against cerebral ischemia.		[115]
32.	Spasmogenic and spasmolytic Activities and Calcium Channel Blockage.	[116]	
33.	Insecticidal and repulsive activity, Larvicidal Activity.	[117,118]	
34.	Natural antimicrobial agents against food pathogens, can reduce the risk of food poisoning.	[110,119]	[120]
35.	*In vitro* anticancer activity of *L. stoechas* essential oil against different cancer cell lines.	[121]	
36.	Larvicidal Activity.		[122]

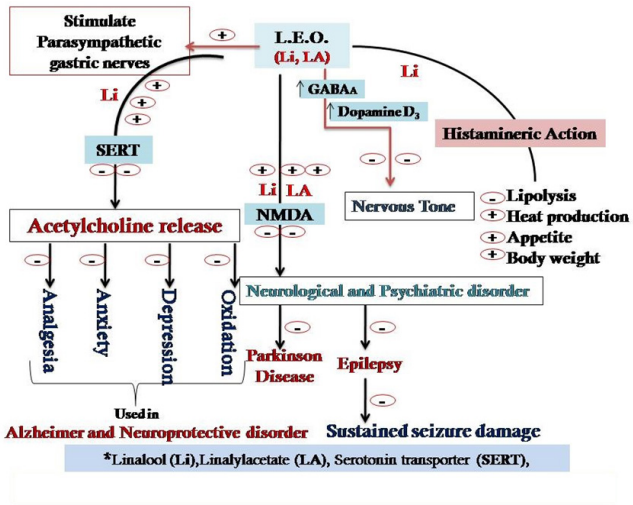

Figure 3: Layout of pharmacological action of (L.E.O) for mental health.

considerable magnitude of application in various forms, including food, fodder, and medicine.[46] Linalool (Li) and Linalylacetate (LA) are key components of Lavender Essential Oil (LEO). The odour of lavender oil is due to linalool, and it generates linalool acetate, which has more efficiency on NMDA receptors, while Linalool has more affinity for histaminergic action and Serotonin Transporter (SERT). The layout of pharmacological mechanisms is illustrated graphically in Figure 3 for a better understanding of their role.[47-64] Lavender oil and its components like linalool and linalyl acetate are swiftly absorbed and detected in plasma, and it is contraindicated during pregnancy and lactation.[65] Their major side effects are drowsiness, gastrointestinal disturbance, skin irritation, nausea, and dyspepsia.[66] It also interacts with pharmaceutical sedatives, antidepressants,[67] gynecomastia, estrogenic, and antiandrogenic activities,[68] and is cautiously used in patients with known allergies.[69-70] Some pharmacological properties are also enumerated in Table 1.

CONCLUSION

This information will be valuable in amplifying ancient knowledge of lavender and its pharmacological properties. It will facilitate the development of future experimental and clinical research plans. A large number of Greco-Persian recipes and AYUSH formulations are obtainable in global markets for a number of chronic diseases as they have vanquished the faith of major populations and evidence-based application. Still more comprehensive data are required to encapsulate all methodological inadequacies and molecular mechanisms to unfold more acceptance and fruitification. The myriad pieces of therapeutic evidence are admirable, and more elaborate studies will emerge with long-term follow-up data and conclusive molecular mechanisms to establish pharmacodynamics for more therapeutic benefits. It is crucial to get excellent tolerability and safety data for the application and management of neurological turmoil and neuroprotection in the future.

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CONFLICT OF INTEREST

The authors declare there is no any conflict of interest.

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