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Tukhme Alsi (*Linum Usitatissimum*) Linn: An Important Drug of Unani Medicine

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ABSTRACT

Due to its cultural acceptance, superior compatibility with the human body, and less side effects, traditional medicine serves as the source of primary healthcare. *Tukhme Alsi* is an important medicinal plant in the Unani system of medicine (USM) due to its multiple therapeutic properties. In Unani system of medicine, it is either used as a single drug or as an ingredient in many Unani formulations which are used in the treatment of various ailments of the body. The review has been reviewed, compiled, and analyzed using references from major databases like classical text and indexed journals. The plant is known to treat different systemic ailments due to the presence of 30-40% of fixed oil, 6% of Mucilage 25% of protein and small quantities of the cyanogenetic glucosides linaamarin and lotaustralin. In USM, the pharmacological actions of *Tukhme Alsi* are *Habis-i-Dam* (Hemostyptic), *Mudirr-i-Bawl* (Diuretic), *Mudirr-i-Laban* (Galactogogue), *Mudirr-i-Hayd* (Emmenogogue), *Mu'arriq* (Diaphoretic), *Maqawwi-e-Bah* (Aphrodisiac), *Mufattit-i-Hasah* (Lithotropic)[12,14] *Musakkin-i-Alam* (Analgesic) etc. Many pharmacological activities mentioned in Unani medicine are validated and many activities need further exploration due to the immense therapeutic scope in this drug

Keywords: Unani System of Medicine, *Tukhme Alsi*, Formulations, Medicinal Plant

1.INTRODUCTION

Dried ripe seeds of *Linum usitatissimum* L. (Linaceae) is the Linseed, an annual herb about 0.7 m tall with blue flowers and a globular capsule. The linseed has long been grown for its pericyclic fibers and seeds. Supplies of the latter originate in South America, Asia, the USA and Canada. Large quantities of oil are expressed in England, especially in Hull and the Continent.[1]

2. METHODOLOGY

The review has been compiled using references from major databases like classical text; indexed journals and authentic websites have been reviewed and analyzed

3. Historical Background

Linseed is a very ancient plant and drawings of weaving from flax fibres obtained from the stem are seen in Egyptian mummies (200 B.C.). Seeds and flax fibres are found in Swiss lake dwellings. The Latin terms *Linum* means fibres and *usitatissimum* means very useful, suggest that the plant is very useful and of considerable economic importance. Seeds are used as an article of food and in medicine. Linseed oil expressed from the seed is used in paints, varnishes etc. Oil cake is used as cattle feed. In the stem, phloem fibres are present which are called flax fibres and they are used in surgical dressings and for articles of cloth. Straw of the stem is used in paper pulp industry.[2]

4. Scientific/Taxonomical classification:[3]

Kingdom: Plantae

Subkingdom:	Tracheobionta
Superdivision:	Spermatophyta
Division:	Mangoliophyta
Class:	Magnoliopsida
Sub Class:	Rosidae
Order:	Linales
Family:	Linaceae
Genus:	*Linum* L
Species:	*Linum Usitatissimum* Linn
Botanical Name:	*Linum Usitatissimum*[4]
Synonym:	*Linum humile* Mill

5. Vernacular names

Arabic: Bazr-ul-Katan[5] **Assamese:** Tisi, Tusi[5] **America:** Gueeche becueze xtilla[6] **Brazil:** Linho[7] **Bombay:** Alasi, Javas, Javasa[7] **Bengali:** Masina, Mosina[5,8,9] **Canarese:** Alashi, Alsi[7] **China:** Chih ma[6] **Dutch:** Vlas[7] **English:** Linseed, Flax Plant,[5] **French:** Lin, Lin chaud, Lin commun, Lin cultive[7] **German:** Flachs[7] **Gujrati:** Alsi, Arasi[5,8] **Hindi:** Alsi, Tisi[5,8,9] **Italian:** Lino[7] **Japan:** Ama[6] **Kannada:** Agasi, Agasebeeja, Semeegara[5,8] **Kashmiri:** Alsi Alish, Kenu,[5] **Malyalam:** Agastha, Cheruchanan-Vittinteuilta[5] **Marathi:** Javas, Alashi[8,9] **Oriya:** Atushi, Peso[5] **Portugese:** Linhaca**, Linho,**[7] **Punjabi:** Ali, Alish, Alsi, Tisi, **Oriya:** Atushi, Peso[5] **Persian:** Tukhm-e-Katan[5] **Sanskrit:** Atasi, Chanaka, Madagandha[8] **Oriya:** Atushi, Peso[5] **Spanish:** Lino[7] **Turki:** Ziggar[7] **Turkish:** Keten**,**[7] **Tamil:** Ali-virai, Alishi-virai[8,9] **Telgu:** Avisi, Atasi[8,9] **Oriya:** Atushi, Peso[5]

6. Habit and Habitat

L. Usitatissimum is unknown in a wild state and has an unclear origin; some are thought to be closely related to, or derived from, *L. Bienne* Mill, Syn. *L. Angustifolium* Huds, which occurs wild in the Mediterranean region; some find it endemic to localities between the Persian Gulf and the Caspian and Black Seas, while others trace its origin to India. However, two major geographical classes corresponding to the oldest areas of cultivation and the centres of diversity may be identified. Linseed has been cultivated since ancient times in the Mediterranean coastal regions, Asia Minor, Egypt, Algeria, Tunis, Spain, Italy and Greece, and in all these areas only fiber linseeds have been cultivated. The second group consists of South-West Asia, including Turkestan, Afghanistan and India; only types of oil are grown in these regions. In Asia Minor and South Russia, both fiber and oil are cultivated in transitional forms. Linseed is grown all over the world with the exception of Kerala, Madras, Delhi, Manipur and Tripura and the Andaman and Nicobar Islands. Uttar Pradesh and Madhya Pradesh together account for almost two thirds of total production. Uttar Pradesh is the largest producer accounting for more than 35% of total production, the main areas being Manipuri, Amirpur and Allahabad districts. Madhya Pradesh accounts for just over 29% of production, the main areas being Drugs, Raipur, Bilaspur, Rewa and Balaghat districts. Other important linseed producing states in order of importance are Bombay, Rajasthan and Bihar.[8]

Figure 1: ***Tukhme Alsi*** (*Linum usitatissimum*)

7. Botanical Description: The capsule, which is globose, is divided into five carpels, each containing 2 seeds separated by a partition. The seeds have a rounded, elongated ovoid shape with an angled edge and a slightly oblique, blunt tip at one end. These have a dark, smooth, polished surface, which tends to be lined with extremely fine pits under the lens.[9]

7.1 Flower and Fruit

The flowers are panicle-like loose cymes on long peduncles in the leaf axils of the upper part of the stem. They have 5 ovate, acuminate, finely ciliate sepals and 5 obovate petals, which are sky blue and longer than the sepals. There are 5 stamens fused at the base and 1 ovary. The fruit is an almost globular, 6 to 8 mm long capsule on an erect or slightly bent stem. The seeds are flat, brown and glossy.[10]

7.2 Leaves, Stem and Root

The plant is an annual and grow> from 20 to 150 cm high. The root is short, fusiform and light yellow. The stem is unbranched, erect or ascending in shon curves. The leaves are smooth edged, gray-green, sessile and almost awn-like acuminate.[10]

7.3 Microscopic

Transverse section of seed shows testa comprises of isodiametric cells with mucilaginous outer walls, collenchymatous cells of middle layer of seed coat cylindrical; single layered, yellowish brown, longitudinally elongated, about 120-190 long and 14-47 wide, thick, lignified and with pitted walls; single layer of flattened polygonal pigment cells with reddishbrown contents; aleurone grains in the cotyledons, upto 20 in dimeter, each with globoid and crystalloid; abundant globule of fixed oil and occasional starch grains present.[5]

8. Description in Unani

Flaxseed plants are upto one yard tall. Its stem has fine branches and leaves.[11] The bark of this plant produces clothes in Iran and that cloth called *Katan*.[12] The importance of this plant is due to the seeds obtained from it which is very important in the products to be exported. These seeds are oily, shiny and dark brown in colour and smell is unpleasant. From these seeds extracted *Roghan* are used as a medicine. Linseed oil is very transparent and colorless and is produced without heat but the oil found in the market is dark yellowish brown because there are other seeds and oils along with Linseed. These seeds belong to the plants that are usually grown along with the linseed plants.[13]

8.1 Hisssa mustamela (Part used): Seed[11,14]

8.2 Mizaj (Temperament): *Har* (Hot) 1^0 *Yabis* (Dry) 1^0 [11,12,14]

8.3 Shelf life: 2 years[15]

9. Afa'al (Pharmacological action in Unani Medicine): *Habis-i-Dam* (Hemostyptic), *Mudirr-i-Bawl* (Diuretic), *Mudirr-i-Laban* (Galactogogue), *Mudirr-i-Hayd* (Emmenogogue), *Mu'arriq* (Diaphoretic), *Maqawwi-e-Bah* (Aphrodisiac), *Mufattit-i-Hasah* (Lithotropic)[12,14] *Musakkin-i-Alam* (Analgesic), *Mughalliz-i-Mani* (Increase the viscosity of Semen), *Mufajjir-i-Awram* (Ruptures mature swelling)[12] *Mufarrih* (Exhilarant)[14]

10. Istemal (Uses): *Buthur Labaniyya* (Acne vulgaris), *Quba* (Ring worm), *Sa'fa* (Baldness), *Sozish-i-Halaq* (Burning in the throat), *Waram al-Kabid* (Hepatitis), *Waja' al-Mafasil* (Polyarthritis)[12] *Sozak* (Gonorrhoea), *Quruh al-Rahim* (Uterine ulceration), *Munaffith-i-Balgham* (Expectorant), *Diq al-Nafas* (Bronchial asthma), *Namla* (Herpes), *Warm-e-Baritun* (Peritonitis), *Dhat al-Janb* (Pleurisy), *Dhat al-Ri'a* (Pneumonia)[11]

11. Miqdare khoorak (Dose): 5-12 gm,[11] 10.5 gm[12] 6-12 gm[14]

12. Muzir (Adverse effect): *Mujif-e-Hadm* (Delayed digestion)[11,12,14]

13. Musleh (Corrective): *Kishneez, Shikanjabeen*[11,12,14]

14. Badal (Substitute): Seeds of *Methi*[11,12,14]

15. Murakkabat (Compound formulation): Laooq-e-Katan, Qairooti[5,11] Bazr-e-Katan[11] Qairroti-e-Mohallil, Zamad-e-Khanazeer, Marham-e-Dakhilyun,[5]

16. Ethanobotanical Literature: abscess, acid stoamch, acne, adenopathy, aposteme, ascarides, backache, boil, cancer (abdomen, anus, breast, colon, cervix), bronchosis, cardiopathy, cholecystosis, cervicosis, cold, colic, constipation, corn, cough, condyloma, cystosis, dermatosis, diabetes, diarrhoea, dysentry, dysuria, eczema, fever, enterosis, hemorrhoid, gastrosis, hyperactivity, pneumonia, tumour, urogenitosis, water retention, splenosis[16]

17. Chemical constituents: The seed contains about 30-40% of fixed oil, 6% of Mucilage 25% of protein and small quantities of the cyanogenetic glucosides linaamarin and lotaustralin.[17]

17.1 Cyanogenic glycosides: Linustain and neolinustatin – isolated and characterised as 2-[(6-O-β-D-glucopyranosyl-β-D-glucopyranosyl)oxy]-2-methylpropanenitrile and (2R)[(6-O-β-D-glucopyranosyl-β-D-glucopyranosyl)oxy]-2-methylbutanenitrile respectively.[18]

17.2 Phenylpropanoid glucoside: Linustitamarin – isolated from defatted seeds and its structure elucidated.[19]
Cholesterol (2), campesterol (26), sigmasterol (7), sitosterol (41), 5-dehydro-avenasterol (13), cycloarteol (9) and 24-methylenecycloartanol (2%) in seeds characterised by GC-MS.[20] Plant contained HCN (0.0486%); isolation of oleic, linoleic and linoleic acids and isofucosterol from seeds;[19]

18. Reported Pharmacological actions

18.1 Antibacterial and Antifungal Activity
Narender B *et al* studied antibacterial and Antifungal activities of *Linum Usitatissimum* (Flax seeds).) Antibacterial activity and antifungal activity of Flax seeds extracts with unique composition of different phenylopropanoid compounds. Study suggest that extracts derived from Flax seeds might be the effective source of antibacterial compounds and the promising alternative to antibiotic therapy.[21]

18.2 Wound healing activity
Study was conducted to evaluate wound healing activity of flaxseed oil on experimentally induced incision wound. Flaxseed oil significantly accelerates wound healing process and suggested flaxseed as an effective herbal drug for wound in skin.[22]

18.3 Antioxidant activity
Han H *et al* displayed antioxidant Activity of Flaxseed (*Linum Usitatissimum* L.) shell and Analysis of Its Polyphenol Contents by LC-MS/MS. The results clearly AEF and EEF demonstrated effective antioxidant activity. The quantity of p-hydroxybenzoic, vanillin, p-coumaric acid, ascorbic acid, ferulic acid, and ellagic acid were investigated by LC-MS/MS.[23]

18.4 Analgesic and Anti-inflammatory Activity
Rafieian-Kopaei M *et al* studied the analgesic and anti-inflammatory activity of *Linum Usitatissimum* in Balb/c Mice. *Linum usitatissimum* L has analgesic activity partially like morphine. Regarding the safety and possessing antioxidant and various effects of plants with antioxidant activities,31-35 *L. usitatissimum* might be used as analgesic and anti-inflammatory agent, as well as treatment of for other diseases.[24]

18.5 Antidepressant activity
Pradhan D studied antidepressant activity of *Linum Usitatissimum* extract. Study shows *Linum Usitatissimum* extract in animal

models of depression has been reported. Antidepressant activity *Linum usitatissimum* seeds extract may be due to presence of omega-3-fatty acid.[25]

18.6 Antidiabetic activity

Study was to evaluate antidiabetic activity of aqueous extract of *Linum Usitatissimum* seeds in streptozotocin (STZ) induced diabetic rats. Our results suggest that the aqueous extract of *Linum Usitatissimum* seeds clearly demonstrated the antidiabetic activity in an experimental model of rats.[26]

18.7 Anti Hyperglycemic and Anti Hyperlipidemic activity

Present experimental study was to assess the antihyperglycemic activity of ethanolic extract of *Linum Usitatissimum* seeds and *Glycyrrhiza glabra* roots with standard drugs metformin and glimepiride in streptozotocin-induced diabetic rats model. This study indicates that the combination of both *L. usitatissimum* and *G. glabra* extracts have antihyperglycemic and anti hyperlipidemic effects in diabetic rats which might be useful for the search of dietary supplements inefficient management of Type-2 diabetes mellitus.[27]

19. DISCUSSION AND CONCLUSION

The review explores *Linum Usitatissimum* Linn pharmacological, phytochemical, and therapeutic properties. The review clearly revealed immense beneficial pharmacological activities in the drug. The scientific studies have proved most of the claims of traditional medicines. Though, further, detailed clinical research appears worthwhile to search the full therapeutic potential of this plant in order to establish it as a standard drug.

Declaration by Authors

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