IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
HUMAN

Human Journals
Review Article
April 2024 Vol.:30, Issue:4

Tukhm-i-Katān (*Linum usitatissimum* Linn.): An Important Medicinal Plant and its Uses in Unani System of Medicine

IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
HUMAN

Mohd Afsahul Kalam[1]*, Abdul Habib[2], Chand Babu[2], Riyaz Ahmad[2], Nasir Nazir Wani[2], Ajaz Ahmad Bhat[2]

[1]Research Officer Unani SL-2, Regional Research Institute of Unani Medicine, University of Kashmir, Srinagar, J&K 190006 India.

[2] PG Scholar, Department of Ilmul Advia, Regional Research Institute of Unani Medicine, Srinagar, University of Kashmir, Srinagar, J&K 190006 India.

Submitted: 20 March 2024
Accepted: 27 March 2024
Published: 30 April 2024

Keywords: *Linum usitatissimum* L., *Alsī*, linseed, *Katān*, omega-3 acid, α-linolenic acid

ABSTRACT

Tukhm-i-Katān is a seed obtained from an annual herb *Linum usitatissimum* Linn. of *Linaceae* family. It is also known as Flaxseeds which are smooth, lustrous, and dark brown in colour. It has a mucilaginous, oily, and mildly bitter flavour. In USM it is used for various medicinal properties like anti-inflammatory, spermatogenic, vesicant, phlegm expectorant, aphrodisiac, lithotriptic and calculus removal, general tonic, galactagogue, and emmenagogue. So, it is used in pneumonia, arthritis, dyspnoea, pleuritis, peritonitis. The aim of this review paper is to collect the data on the phytochemicals, traditional applications, and therapeutic uses. Various pharmacological activities have been carried out on linseed like Antifungal, Antibacterial, Analgesic, Anti-inflammatory and Wound healing.

HUMAN JOURNALS
ijppr.humanjournals.com

INTRODUCTION

Linum usitatissimum L. (Linaceae) is an annual herbaceous plant with 60-120 cm height. Historically it is one of the earliest crop plants used to produce oil and fiber. Flax, or flaxseed, is often called linseed. It is often grouped into one of several categories: "functional food" "bioactive food" and an "endocrine active food". Linnaeus assigned the botanical name *Linum usitatissimum* in his book "*Species Plantarum*". The name, *Linum usitatissimum,* means "very useful". The primary purpose of the introduction of flax to the United States by colonists was to generate fiber for clothes. All parts of the flaxseed plant are used for commercial purposes, either unprocessed or processed. High quality fibers with exceptional strength and durability are produced by the stem. Prior to the 1990s, flax was mostly used to make paper and linen, but flaxseed oil and its byproducts are also used to formulate animal feed [1,2,3]. This plant, which is found in the Mediterranean and temperate zones, yields two important products: fibers from the stem and flax oil from the seeds. The leftovers of the flax seeds after the oil has been extracted, known as seedcakes, are likewise connected to it. Flaxseed oil is sometimes called linseed oil. It is a primordial oil with antifungal qualities that is used in paints, varnishes, astringents, bio-insecticides, herbicides, and medical purposes [4,5]. The functions and properties of the linseed plant and its seeds are almost the same. Ibn Sina says that its actions are similar to *Ḥulba* (*Trigonella foenum-graecum* L.). It has several medical properties in USM, including lithotriptic, aphrodisiac, and calculus removal, expectorant, vesicant, galactagogue, anti-inflammatory and emmenagogue effects. So, it is used in *Su'āl* (cough), *Ḍīq al-Nafas* (dyspnoea), *Dhāt al-Ri'a* (pneumonia), *Dhāt al-Janb* (pleuritis), *Waja'al-Mafāṣil* (arthritis/arthralgia), *Mughalliz-i-Manī* (semen inspissant), *Mufattit-i-Ḥaṣāt-i-Kulya* (renal lithotriptic)[6,7]. Flaxseed oil contains saturated fatty acids (palmitic and stearic), monounsaturated fatty acids (mostly oleic acid), and over α-linolenic acid. It also contains protein and fiber [8]. Flaxseed oil is known for its health advantages due to its unique chemical composition, which contains a high concentration of polyunsaturated omega-3 fatty acids, and linoleic and α-linolenic fatty acids as its main constituents [9]. The α-linolenic acid is an effective anti-inflammatory drug that reduces the synthesis of inflammatory cytokines, lipids, and lipoproteins [10]. Linolenic acid has antibacterial properties via inhibiting bacterial enoyl-acyl carrier protein reductase [11]. According to various studies, Flaxseed oil has been found various health benefits such as reducing the risk of cancer, cardiovascular disease, and cholesterol levels. Flaxseed oil contains several antioxidants, including tocopherols, beta-carotene, phytosterols, polyphenols, and

flavonoids[12,13,14]. Tocopherols are lipid-soluble phytocompounds with four isomers: α, β, γ-, and δ, they have several physiological effects, including antioxidant and anticancer properties [15]. Omega-3 fatty acids have been shown to reduce the incidence of cardiac arrhythmias and sudden death in patients with coronary heart disease. Omega-3 fatty acids are effective in treating hyperlipidemia and hypertension [16].

MATERIALS AND METHODS

This review is prepared using all written, electronic, and web resources available. Both contemporary and Unani texts were examined for information on its description, identity, temperament, pharmacological researches, actions, therapeutic uses, etc. Publications and research papers were sought through PubMed, Google Scholar, Science Direct, Scopus, and other databases. The terms *Alsī*, linseed, flaxseed, flax, *Tukhm-i-Katān*, *Katān* and *Bazr al-Katān* were used to look for more information about the material. For this review, 16 Unani and other books, 26 research and review papers were consulted. The Standard Unani Medical Terminology, which was released by the Central Council for Research in Unani System of Medicine in association with the World Health Organisation and WHO international standard terminologies on Unani medicine, provided the appropriate Unani terminologies.

Distributed

Its cultivation most likely started between 8,000 and 10,000 years ago in the fertile valleys of Mesopotamia's so-called Fertile Crescent. In antiquity and the early modern era, flax was highly valued for its food and medicinal properties. Since ancient times, it has been grown, mostly for its oil and fibres. Although it originated in Egypt, linseed was also cultivated in Holland, Russia, Afghanistan, Egypt, Holland, Turkey, South Russia, Pakistan, Britain, and widely grown in India, primarily in the states of Madhya Pradesh, Uttar Pradesh, Maharashtra, Bihar, Rajasthan, and the United Provinces. It was also occasionally found growing wild [1,17,18,19].

Cultivation and collection:

It flourishes in clay soils with fine textures and high fertility. It is seeded in September-October and harvested in March April in India. The herb is dried and the harvested seeds are then utilized [1].

Botanical descriptions

Katān/Alsī (flax) *Linum usitatissimum* is a perennial plant in the genus Linum. The plant has a willowy stem that grows to 0.6-1.5m in length stem solitary or few corymbosely branched with grayish green leaves that are narrow, oval-shaped, and tapering towards the end. The leaves are around 30-40 mm long and 3-5mm broad. It produces blue flowers that measure 15-20mm in diameter and 5 sepals, 2 outer elliptic acuminate with entire membranous margins and 3 broader acuminate with ciliate margins. The fruits of *Katān* are spherical, dry, and capsular. The *Katān* seeds are about 4-7 mm long and the seeds surface is smooth shining dark brown in colour. They are slightly flattened laterally and have one edge more acute than the other. The straight embryo, which has two big plano convex cotyledons with the radicle pointing toward the hilar end, is surrounded by albuminous seeds. These seeds have a very mucilaginous flavor, yet they have no smell at all [4,19,20].

Microscopic:

The linseed coat, endosperm, and cotyledon are the three separate components that may be seen in a cross-section of the seed. The testa outermost layer, or epidermis, is composed of stratified polygonal cells that are packed with mucilage. The outside of the cells has a thin layer of cuticle. Two layers of flattened parenchymatous cells often lie under the epidermis; these cells are known as round cells, due to their distinctive shape in surface view. Next to it is a single layer that runs parallel to the length of the seed and is made of lignified, thick-walled, pitted fibers. Many layers of thin-walled, relatively collapsed cells, extended at a right angle to the length of the fibers, lie beneath the fibers and are referred to as cross cells. The testa is internally restricted by a single layer of cells, each of which lumen is entirely composed of the dark pigment known as tannin. Parenchymatous tissue, with cell layers ranging in thickness from two to six, makes up the endosperm. Oil droplets and somewhat asymmetrical aleurone grains with crystalloids and globoids make up the contents of the cell. The contents of the cotyledon, which is made of regular parenchyma tissue, resemble those of endosperm cells [20].

Taxonomical classification [21]

Kingdom	:	Plantae
Division	:	Angiosperm
Class	:	Eudicots
Subclass	:	Rosids
Order	:	Malpighiales
Family	:	*Linaceae*
Genus	:	*Linum*
Species	:	*Usitatissimum*

Description of *Alsī* (linseed) plant in Unani Medicine

The linseed plant has thin leaves and branches, shapeless blooms, and a fruit that is nearly the size of a gram. The seeds are small, wide, slightly elongated, yellow, and blackish smooth, with some being reddish; one type is black, and one is white. New, plump, and fatty seeds are best [6,7,17,22,23]. These seeds and the oil extracted from them are used medicinally [17,23]. Their smell is unpleasant. Linseed oil is highly transparent and colorless. It is prepared without the use of heat. But the oil that is accessible on the market. It's a dark yellowish-brown colour. Because it also contains oil from other seeds. These are the seeds of plants that are typically generated alongside their plants. Salivary substances are abundant in its seeds, which become sticky when soaked in cold water [23].

Fig. showing *Tukhm-i-Katān* (*Linum Usitatissimum*)

Mutarādifāt **(Vernacular names)**

Arabic	:	Bazr al-Katān [6,17,19,22,24,25] Katān [25,26]
Ayurveda	:	Atasī, Umā, Masrnā, Nilapushpī, Kshumā [17]
Bengali	:	Tīsī [17,19,20,25]
English	:	Linseed [6,17,18,19,26] Flax [18,19,25], Common flax [25]
Gujarati	:	Alshī [17,20,25]
Hindi	:	Alsī, Tīsī [6,20,17,22,25,26]
Kannada	:	Alashī [20]
Kashmiri	:	Alsi Alish, Kenu
Malayalam	:	Atasī Masina [20]
Marathi	:	Ātish [17] Alashī, Javasa [25]
Oriya	:	Atushi, Peso
Persian	:	Tukhm-i-Katān [6,17,22]
Punjabi	:	Alish, Alsi, Tisi [25]
Sanskrit	:	Badgandhā [17] Atasī, Chanaka, Madagandha, Nilpushpika [25]
Shīrazi	:	Bazarug [6,25,26]
Suryani	:	Bāri A‘lā [6,26]
Tamil	:	Alshī [20,25] Virai, Sirrali [18]
Telugu	:	Alasī [20] Atasī [25]
Turki	:	Ziggar [25]
Urdu	:	Alsī [19,20,24,25]Tīsī [19]
Unani	:	Līsfarmūn [6,26] Katān [18,20], Bazarul Katān [20]

Ajzā’ Musta’mala **(Parts used)**

- Seeds [19,20,24],
- Oil [19,24],
- Flowers [19]

Mizāj **(temperament):**

Hār Yābis (hot & dry) [17,20,23,27]

The seeds of all types are hot and dry in the first stage. According to Sheikh, its seeds are hot, moderately moist and dry in the first grade. One perspective is that it is moderately hot and

cold and dry in the first degree, while another believes that it is hot and dry, but hotter than dryness [6,7].

***Nafa 'Khās* (main action)**

The main action is Mukhrij-i-Balgham (expectorant).

***Af'al* (pharmacological action):**

Muḥallil (resolvent), Mulayyin (laxative/softener), *Mulaṭṭif* (attenuant), Jālī (detergent), *Munḍij* (concoctive), *Musakkin-i-Waja'*(analgesic), *Mudirr-i-bawl* (diuretic), *Mukhrij-i-Balgham* (expectorant), *Muqawwī-i-Bāh* (aphrodisiac), *Muqawwī-i-Chashm* (eye tonic), *Mufattit-i-Ḥasāh* (lithotriptic) [6,7,17,19,20,23,27,28].

***Iste'mālāt* (therapeutic uses):**

Su'āl (cough), *Ḍīq al-Nafas* (dyspnoea), *Dhāt al-Ri'a* (pneumonia), *Dhāt al-Janb* (pleuritis), *Waja' al-Mafāṣil* (arthritis/arthralgia), *Mughalliz-i-Manī* (semen inspissant), *Mufattit-i-Ḥasāh-i-Kulya* (renal lithotriptic), *Waram-i-Jigar* (inflammation of liver), *Waram al-Ṣifāq* (peritonitis), *Mufattit-i-Ḥasāh-i-Mathāna* (vesical lithotriptic), *Qūbā* (tinea/ringworm), *Buthūr Labaniyya* (acne) [6,7,17,19,20,23,27,28].

***Tarkīb-i-Iste'māl* (Method of use):**

***Amrāḍ-i-Udhun* (diseases of the ear):**

- Decoction of Linseed in onion juice is used to pour into the ear. It gives relief ear inflammation [6,7].

***Amrāḍ-i-'Ayn* (diseases of the eye):**

- Cold water extracts the mucilaginous substance from the seeds, resulting in a jelly-like material. The mucilage is used to drop into the eye in cases of conjunctival irritation [19].

***Amrāḍ-i-Tanaffus* (diseases of the respiratory system):**

- Its *Bakhūr/Dhūnī* (incense), relieves nasal congestion and is useful in case of acute coryza.
- Cough can be relieved by licking the roasted seeds along with honey [6,7].
- Roasted flaxseed can help in haemoptysis and productive cough [6,7].

Amrāḍ-i-Mi'da wa Am'ā **(diseases of the stomach and intestine):**

- Roasted flaxseed can help in constipation [6,7].
- 105 ml decoction of coarsely powdered well-ripened flaxseeds as well as its leaves is used to induce vomiting [6,7]. It is helpful for the detoxification of morbid matter from the stomach.
- Consuming 10.5 to 14 g of roasted flaxseeds induces constipation [6,7].
- It is helpful for Qūlanj (colic pain), when taken as 2 g daily [6,7].
- The poultice made with honey is effective as laxative [6,7].

Amrāḍ-i-Ṭiḥāl **(diseases of spleen):**

- The poultice made with honey is effective in treating splenitis [6,7].

Amrāḍ-i-Kulya wa Mathāna **(diseases of kidney and bladder):**

- It is helpful for kidney and bladder ulcers when taken as 2 g daily [6,7].
- After boiling 12 g of flaxseeds in water, a mucus like solution form. Consumption of this solution orally is an effect remedy for removing kidney stones [6,7].
- A decoction of flaxseed prepared with Rogan Gul used as *Ḥuqna* (enema) is good for treating kidney and bladder ulcers [6,7].

Amrāḍ-i-Nizām-i-Tanāsul **(diseases of reproductive system):**

- According to Vedas, gonorrhoea can be cured by administering five drops of warm linseed oil to the orifice of the genital organ and by pouring the oil into the ear to reduce ear pain [6,7].
- Drinking the decoction with Rogan Gul and douching is good for treating uterine ulcers [6,7].

Amrāḍ-i-'Iẓām-o-Mafāṣil **(diseases of bones and joints):**

- Pain can be relieved by heating some fennel powder mixed with linseed oil and applying it to the back [6,7].
- The linseed decoction prepared with *Rogan-i-Gul* along with *Aspghol* (*Plantago ovata*), a poultice is useful for joint pain, arthritis and gout [6,7].
- Along with *Aspghol* (*Plantago ovata*), poultice is useful for joint pain, arthritis, and gout [6,7].

***Amrāḍ-i-Jild* (diseases of skin):**

- Its poultice, when combined with vinegar, particularly with natron and figs, is extremely effective against *Kalaf* (melasma), *Qūbā* (tinea/ringworm) and *Buthūr Labaniyya* (acne) [6,7].
- Wearing a linseed cloth helps relieve itching and swelling, eliminates heat, reduces perspiration, and kills lice [7,26].
- When equal parts flaxseed and honey are mixed and put to the vitiligo or liniment with vinegar, the colour changes [6,7].
- The poultice of Ḥurf (*Lepidium sativum*) and flaxseed, along with honey, is helpful for the condition in which dryness and scaling of the nails occur. [6,7].

Miscellaneous

- Linseed oil and lime-water are combined in equal proportions to create the well-known remedy for burn and scald known as "carron oil" [19].
- Using poultice along with honey and *Roghan-i-Zaitun* or *Roghan-i-Banafsha* is extremely beneficial for internal and external inflammation [6,7].

***Maḍarrat* (adverse effect):**

Late to digest and so produces stomach problems and indigestion [6,7,17,28]. Blurry vision, a decrease of blood production, and testis. [6]

***Musleh* (corrective):**

Kishnīz (*Coriandrum sativum* L) [7,17,20,28] & *Bīhī* (*Cydonia oblonga*) and *Anār* (*Punica granatum*) [6,7] are used as correctives.

***Badal* (substitute)**

Ḥulba (*Trigonella foenum-graeceum*) [6,7,17,20,28] is used as substitute of Alsī.

***Miqdār Khūrāk* (dosage):**

The therapeutic dose of *Alsī* is mentioned as 5-14g. [6,7,28, 17,27]

***Murakkabāt* (compound formulations):**

S.N.	Name of Compound Drugs	Dose and Administration	Action and uses
1.	*Qurs-i-Dhāt al-Janb*	5-10 g [29]	Anti-inflammatory and helps in Pleuritis.
2.	*Qayrūti-i-Arad-i-Bāqla*	For local applications [29]	Anti-inflammatory and helps in Pleuritis.
3.	*Ḍimād-i-Dāf-i-Waram-i-Bawāsīr Qawī*	For local applications [29]	Analgesic and anti-inflammatory, it helps in hemorrhoids.
4.	*Ḍimād-i-Waram-i-Kulya Qawī*	For local applications [29]	Anti-inflammatory and helps in acute nephritis.
5.	*La'ūq Katān*	10 g thrice a day [30]	Expectorant and helps in dyspnoea.
6.	*Ḥabb-i-Maghz Bādām*	Two pills to be taken twice daily [30]	Expectorant and helps in chronic cough and hoarseness of voice
7.	*La'ūq-i-Sapistān Khyār Shambarī*	10 g twice a day [30]	Broncho-relaxant and helps in cold, coryza and cough.
8.	*La'ūq-i-Dīqun Nafas*	10 g thrice a day [30]	Expectorant and helps in dyspnoea.
9.	*Marham Dakhilyūn*	Cream 5 g mixed with 5 ml of 'Arq Mako used as a vaginal suppository [30]	Anti-inflammatory and helps in metritis.
10.	*Kundri*	Adult- 6 g twice a day, Children- 3 g twice a day [31]	Tonic for the bladder and kidneys helps in urinary incontinence and polyuria.
11.	*Ma'jūn Pamba Dāna*	6 g twice a day [31]	Aphrodisiac and spermatogenic, helps in spermatorrhoea and decreased viscosity of semen.
12.	*Marham-i-Dakhilyūn Murakkab*	15 g Marham mixed with Roghan-i-Gul 25 ml and Safedi Bayza Murgh properly and used as a vaginal suppository [31]	Anti-inflammatory and uterine tonic, helps in metritis and uterine debility.

Nutritional composition and Bioactive compounds of flaxseed [21,32,33, 34]

Table 1: Nutritional composition and bioactive compounds of flaxseed

S. N	Group of compounds	Specific compounds
A	**Nutritional composition**	
1	Vitamins	Vitamin A; Vitamin B-Thiamine (B1), Riboflavin (B2), Niacin, Pyridoxine, Pantothenic acid, Biotin, Folic acid
2	Minerals	Potassium, Calcium, Phosphorous, Iron, phytic acid
3	Protein	Cyclic peptides
4	Fatty acids	Linolenic acid, Omega 3 fatty acids, particularly α-linolenic acid, linolenic acid, oleic acid, stearic acid.
5	Dietary fiber	Soluble and insoluble fiber
6	Carbohydrates	Present
B	**Bioactive compounds:**	Alkaloids, phenolic compounds (lgnans, p-coumaric, vaniline), ppolysaccharides, cyanogenic glycosides (linustatin, neolinustatin), phenolics (lignans), trypsin inhibitor

Pharmacological studies

Antidepressant activity: Rath BP et al. (2012) studied the antidepressant potential of *Linum usitatissimum* extract in Wistar rats. Antidepressant activity was measured using the tail suspension test, forced swimming test, and locomotor activity. Compared to the common medication imipramine, fluoxetine, and chlorpromazine, *L. usitatissimum* extract reported less substantial antidepressant activity [35].

Anti-hyperglycaemic activity: An investigation was conducted on the impact of ethanolic extract of *Linum usitatissimum* seeds on the production of oxygen reactive species associated with hyperglycemia in peripheral blood mononuclear cells and pancreatic cells, as well as pancreatic antioxidant enzymes in diabetic rats induced with alloxan. The outcome demonstrated that in both the acute and subacute studies, treatment with the EELU (200 mg and 400 mg/kg) considerably lowered the serum glucose level [36].

Anti-oxidant activity: Zanwar et al. (2010) assessed the anti-oxidant activity of an ethanolic extract of *Linum usitatissimum* (EE-LU) (100, 200, 300, 400, and 500 µg/ml) in an in-vitro model. The outcomes showed that EE-LU and α-tocopherol significantly inhibited the DPPH

radical, reduced power, hydroxyl and superoxide anion radical scavenging, metal chelating, and hydrogen peroxide scavenging [37].

Anti-peptic ulcer activity: In a recent study, Mahdi and Fariba (2013) assessed the aqueous extract of the entire *Linum usitatissimum* Linn seed's ability to prevent peptic ulcers. According to their report, the extract exhibited significant spasmolytic activity and demonstrated a protective effect against the development of experimental ulcers [38].

Type II diabetic activity: The effects of flaxseed gum use on blood glucose and cholesterol, namely low-density lipoprotein cholesterol, in type 2 diabetes were investigated. Flaxseed gum was added to wheat flour chapattis. Sixty patients with type 2 diabetes were fed a daily meal for three months, along with six wheat flour chapattis containing flaxseed gum (5 g), as recommended by the American Diabetic Association. The control group (60 people) ate the same food, except the chapattis lacked gum. The experimental group's fasting blood sugar fell from 154 ± 8 mg/dl to 136 ± 7 mg/dl (P=0.03), while total cholesterol decreased from 182 ± 11 mg/dl to 163 ± 9 mg/dl (P=0.03). Low-density lipoprotein cholesterol decreased from 110 ± 8 mg/dl to 92 ± 9 mg/dl (P = 0.02). The study found that flax gum can improve the blood biochemistry profiles of people with type 2 diabetes [39].

Antifungal and Antibacterial Activity: The antibacterial and antifungal properties of *Linum usitatissimum* (flax seeds) were investigated by Narender et al. (2016) Flax seed extracts have antibacterial and antifungal properties due to their special blend of several phenylpropanoid components. Research indicates that extracts from flax seeds may be a viable replacement for antibiotic therapy and an efficient supply of antibacterial chemicals [40].

Wound healing activity: An experiment was done to assess the ability of flaxseed oil to heal wounds caused by incisions. The application of flaxseed oil greatly accelerates the healing process of wounds and suggests flaxseed as a potent herbal remedy for skin wounds [41].

Analgesic and anti-inflammatory activity: The analgesic and anti-inflammatory properties of Alsī were assessed by Rafieian-Kopaei et al. (2017). In each set, the analgesic actions were assessed after 5, 15, 30, and 60 minutes, respectively. While there was analgesic activity at both doses, the effects of the 200 mg/kg were greater (P <.05). A portion of its action was mitigated by naloxone (P <.001). The extract exhibited anti-inflammatory effect at a dose of 170 mg/kg (P <.05. There were antioxidant-active phenolic, flavonoid, and flavanol components in the extract. *Linum usitatissimum* L, which may be employed as an analgesic

and anti-inflammatory drug, exhibited dose-dependent analgesic effect that was somewhat similar to morphine [42].

CONCLUSION:

Flaxseeds are well known Unani drug used for various ailments since long time. The nutritional composition present in the flaxseed makes it more useful. Information from flaxseeds clearly shows that they are the highest source of lignans and α-linolenic acid. Antioxidants, soluble fibre, and premium protein can also be obtained from it in significant amounts. The role of flaxseed lignans and ω-3 fatty acid in reducing the risks associated with cardiac and coronary disease. Because flaxseed has such a vast potential for preventing and/or treating lowering the risk of several serious illnesses, such as type II diabetes, depression, obesity, hypertension, constipation, peptic ulcers, and other illnesses. Thus, the claims made by the conventional medical system have been validated by scientific research. This makes it seem worthwhile to conduct more thorough clinical research to fully investigate the therapeutic potential of this medication in order to establish it as a standard treatment. This review provides extensive information on the medicinal or therapeutic uses of *Alsī* (Flaxseed) and supports the potential of *Alsī* as a multifaceted Unani drug that needs further research.

Acknowledgement

The authors are very thankful to Deputy director RRIUM Srinagar for providing necessary facilities at the institute. We are also thankful to the librarian for providing best possible facilities to carry out present review work in RRIUM Srinagar, University of Kashmir.

Conflict of interest

The authors declare no any conflict of interest.

REFERENCES:

1. Jabeen A, Khan AA, Alam T, Maaz M, Sheikh HM. Flaxseed/Tukhm-E-Katan (Linum Usitatissimum Linn.): A Review. Journal of Pharmaceutical and Scientific Innovation. 2014; 3(5): 401-409. https://doi.org/10.7897/2277-4572.035183
2. Amit J. Jhala and Linda M. Hall. Flax (Linum usitatissimum L.): Current Uses and Future Applications. Australian Journal of basic and Applied Sciences. 2010; 4(9): 4304-4312.
3. Rashid N, Dar PA, Ahmad HN, Rather SA. Alsi (Linum usitatissimum (Linn.): A potential multifaceted Unani drug. Journal of Pharmacognosy and Phytochemistry. 2018; 7(5): 3294-3300.
4. Banerjee K and Thiagarajan P. Linum usitatissimum L. (Flax) plant and its seed oil a review. Journal of Chemical and Pharmaceutical Sciences. 2015; 8(4): 623-628.

5. Basch E, Bent S, Collins J, Dacey C, Hammerness P, Harrison M, et al. Flax and flaxseed oil (Linum usitatissimum): A review by the natural standard research collaboration. Journal of the Society for Integrative Oncology. 2007; 05(03): 92-105. https://doi.org/10.2310/7200.2007.005
6. Azam Khan M. Muḥīt-i-A'zam. Vol-IV. New Delhi: Central Council for Research in Unani Medicine (CCRUM), Department of AYUSH. 2018; 82-84.
7. Ghanī MN. Khazā'in al-Adwiya. Vol-II. New Delhi: Central Council for Research in Unani Medicine, Department of AYUSH. 2010: 138-141.
8. Martinchik AN, Baturin AK, Zubtsov VV, Molofeev VL. Nutritional value and functional properties of flaxseed. Voprosy paranoia. 2012;81(3):4–10.
9. Przybylski R. Flax oil and high linolenic oils. In Bailey's Industrial Oil and Fat Products. Wiley. 2005; https://doi.org/10.1002/047167849x.bio010
10. Purushothaman D, Brown WY, Vanselow BA, Quinn K, Wu SB. Flaxseed oil supplementation alters the expression of inflammatory-related genes in dogs. Genetics and Molecular Research: GMR. 2014; 13(3): 5322–5332. https://doi.org/10.4238/2014.july.24.11
11. Kaithwas G, Mukerjee A, Kumar P, Majumdar DK. Linum usitatissimum (linseed/flaxseed) fixed oil: antimicrobial activity and efficacy in bovine mastitis. Inflammopharmacology. 2011; 19(1): 45–52. https://doi.org/10.1007/s10787-010-0047-3
12. Mueed A, Shibli S, Jahangir M, Jabbar S, Deng Z. A comprehensive review of flaxseed (Linum usitatissimum L.): health-affecting compounds, mechanism of toxicity, detoxification, anticancer and potential risk. Critical Reviews in Food Science and Nutrition. 2023; 63(32): 11081–11104. https://doi.org/10.1080/10408398.2022.2092718
13. Goyal A, Sharma V, Upadhyay N, Gill S, Sihag M. Flax and flaxseed oil: an ancient medicine & modern functional food. Journal of Food Science and Technology. 2014 51(9): 1633–1653. https://doi.org/10.1007/s13197-013-1247-9
14. Zhang Y, Zhou Y, Song Z, Jin J, Tang J, Wang X, et al. A chemometrics approach comparing characteristics and free radical scavenging capacity of flax (Linum usitatissimum L.) oils obtained from seeds and cakes with different extraction methods. Journal of the Science of Food and Agriculture. 2021; 101(13): 5359–5367. https://doi.org/10.1002/jsfa.11184
15. Kasote DM. Flaxseed phenolics as natural antioxidants. International Food Research Journal. 2013; 20(1): 27-34.
16. Mozaffarian D and Wu JHY. Omega-3 fatty acids and cardiovascular disease. Journal of the American College of Cardiology. 2011; 58(20): 2047–2067. https://doi.org/10.1016/j.jacc.2011.06.063
17. Kabiruddin M. Makhzan al-Mufridat (Kitāb al-Advia). 3rd ed. New Delhi: Idara Kitab-ul-Shifa. 2014; 76, 77.
18. Khare CP. Indian Medicinal Plants: An Illustrated Dictionary, 1st edition. New Delhi; Springer Science + Business Media, Pvt. Ltd. 2007; 376, 377.
19. Said HM. Hamdard Pharmacopoeia of Eastern Medicine. New Delhi: Sri Satguru Publications, A Division of Indian Books Centre. 1997; 397, 398.
20. Anonymous. Standardization of Single Drugs of Unani Medicine. P-II. New Delhi: Central Council for Research in Unani Medicine, Department of AYUSH. 1992; 276-280.
21. Bhavana KB, Babu AN, Lakshmi JN, Deepthi B, Kavya G. A review on pharmacological properties and laboratory outcomes of flaxseed diet (Linum usitatissimum). International Journal of Pharmaceutical Sciences Review and Research. 2021; 70(1): 100-105. https://doi.org/10.47583/ijpsrr.2021.v70i01.013
22. Kabiruddin M. Bayāz-i-Kabīr. Vol-II. New Delhi: Central Council for Research in Unani Medicine, Department of AYUSH. 2008; 236, 237.
23. Safiuddin Ali S. Unani Adviya Mufrada. 7th ed. New Delhi: National Council for Promotion of Urdu Language. 2013; 42, 43.
24. Anonymous. Qarābādīn-i-Sarkārī. 3rd ed. New Delhi: Central Council for Research in Unani Medicine, Department of AYUSH. 2006; 43.
25. Kirtikar KR & Basu BD. Indian Medicinal Plants. 2nd Edition. Vol. IV. New Delhi; Periodical Experts Book Agency. 2012; 408-410.

26. Al-Bytar I. Al-Jami Li-Mufradat al-Advia wa al-Aghziya, Vol. IV. (Urdu Translation). New Delhi: Central Council for Research in Unani Medicine, Department of AYUSH. 2003; 133, 134.
27. Kabiruddin M. Ilmul Adwiya Nafīsī (translate nafīsī). New Delhi: Aijaz Publishing House. 2007; 239, 240.
28. Nabi MG. Makhzan al-Mufridat wa al-Murakkabat. 3rd ed. New Delhi: Central Council for Research in Unani Medicine; 2007: 44.
29. Anonymous. National Formulary of Unani Medicine. P-II, Vol-I. New Delhi: Central Council for Research in Unani Medicine Department of AYUSH. 2007; 35, 136, 138, 139.
30. Anonymous. National Formulary of Unani Medicine. P-V. New Delhi: Central Council for Research in Unani Medicine Department of AYUSH. 2008; 12, 84, 85, 116.
31. Anonymous. National Formulary of Unani Medicine. P-VI, Vol-I. New Delhi: Central Council for Research in Unani Medicine Department of AYUSH. 2011; 62, 65, 77.
32. Akbar S, Baig MN, and Amruta D. Flaxseeds: A Review. International Journal of Innovative Research in Technology. 2021; 8(3): 2349-6002.
33. Thompson LU, Cunnane SC. Flaxseed in human nutrition. Journal of the Science of Food and Agriculture. 2005; 85(10): 1784. https://doi.org/10.1002/jsfa.2233
34. Herchi W, Arrae-Roman D, Boukhchina S, Kallel H. Segura-Carretero A, Fernandez-Gutierrez A. A review of the methods used in the determination of flaxseed components. African Journal of biotechnology. 2012; 11(4): Pp 724-731
35. Rath BP and Pradhan D. Antidepressant Activity of Linum usitatissimum Extract. International Journal of Pharmacognostic and Phytochemical Research. 2012; 1(2): 29-32.
36. Ghule AE, Jadhav SS and Bodhankar SL. Effect of ethanolic extract of seeds of Linum usitatissimum (Linn.) in hyperglycemia associated ROS production in PBMNCs and pancreatic tissue of alloxan induced diabetic rats. Asian Pacific Journal of Tropical Disease. 2012; 2(5): 405–410. https://doi.org/10.1016/s2222-1808(12)60088-7
37. Zanwar AA, Hegde MV and Bodhankar SL. In vitro antioxidant activity of Ethanolic extract of Linum usitatissimum. Pharmacologyonline 2010; 1: 683-696
38. Madhi E and Fariba K. Evaluate the possible anti-peptic ulcer action of the water of Linum usitatissimum. Life Science Journal 2013; 10(3): 509-511.
39. Thakur G, Mitra A, Pal K, Rousseau D. Effect of flaxseed gum on reduction of blood glucose and cholesterol in type 2 diabetic patients. International Journal of Food Sciences and Nutrition. 2009; 60(6): 126-36. https://doi.org/10.1080/09637480903022735
40. Farahpour MR, Taghikhani H, Habibi M. Wound healing activity of flaxseed Linum Usitatissimum L. in rats. African Journal of Pharmacy and Pharmacology. 2011; 5(21): 2386-2389.
41. Narender BR, Tejaswini S, Sarika M, Karuna N, Shirisha R, Priyanka S. Antibacterial and Antifungal activities of Linum Usitatissimum (Flax seeds). International Journal of Pharmacy Education and Research. 2016; 3(2): 4-8.
42. Rafieian Kopaei M, Shakiba A, Sedighi M, Bahmani M. The analgesic and anti-inflammatory activity of Linum usitatissimum in Balb/c mice. Journal of Evidence-Based Complementary & Alternative Medicine. 2017; 22(4): 892–896. https://doi.org/10.1177/2156587217717416.