



Review Article

Flaxseed : A Magical seed

Shivani S. Jadhav, Anil B. Jadhav, Shruti S. Jadhav, Shital R. Jadhav, Shital K. Shinde

Nandkumar Shinde College of Pharmacy, Aghur, Vaijapur 423701 Dist. - Aurangabad, Maharashtra

ARTICLE INFO

Received: 14 Nov 2023

Accepted: 16 Nov 2023

Published: 23 Nov 2023

Keywords:

Health benefits, Liganans, omeg-3 fatty acid, Linum usitatissimum, linseed, flax

DOI:

10.5281/zenodo.10200767

ABSTRACT

Currently there is great interest in phytochemicals as bioactive molecules found in food. Worldwide, flaxseed is grown for its oil, fiber, and nutritional value in addition to its medical uses. In this review flaxseed with their essential component and their health benefits is overview. One of the key benefits of flaxseeds is their high fiber content. Just a tablespoon of flaxseeds contains about 3 grams of fiber, which is great for promoting digestive health and keeping things moving smoothly. Flaxseeds are also an excellent source of omega-3 fatty acids, particularly alpha-linolenic acid (ALA). Omega-3s are essential fats that play a vital role in heart health, brain function, and reducing inflammation in the body. Including flaxseeds in your diet can help support a healthy heart and brain. In addition to fiber and omega-3s, flaxseeds are rich in antioxidants called lignans. These lignans have been linked to a reduced risk of certain cancers, such as breast and prostate cancer. They also have anti-inflammatory properties, which can help protect against chronic diseases.

INTRODUCTION

Flax is regarded as a functional food or source of functional ingredients due to the presence of lignans, polysaccharides (aside from starch), and alpha linolenic acid (Bozan and Temelli, 2008), all of which are beneficial for the prevention of disease. Many people are still ignorant of the advantages offered by flaxseed and its potential uses in the manufacturing of food products, despite the fact that scientific evidence supports its consumption. An upright annual plant, flax grows

to a height of one to two meters and produces lovely, light-blue blooms. One of the most easily grown crops, it thrives in both tropical and subtropical climates, producing more on larger area when grown as a field crop in some lush river valleys. Depending on the cultivar type, the flax fruit pod is a spherical, dry capsule with a diameter of 6 to 9 mm that contains many brown or golden-yellow seeds. Its seeds are quite large, measuring between 4 and 6 mm in length, and have a smooth, glossy, flat surface that resembles sesame seeds in

*Corresponding Author: Shivani S. Jadhav

Address: Nandkumar Shinde College of Pharmacy, Aghur, Vaijapur 423701 Dist. - Aurangabad, Maharashtra

Email ✉: shivanijsadhav17@gmail.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



several ways. Flaxseed (*Linum usitatissimum*), a blue blooming crop that yields small, flat seeds with colors ranging from golden yellow to reddish brown, is a member of the Lineaceae family and is also referred to as *Alsi*, *Jawas*, and *Aksebjija* in Indian languages. It is five chambers of the spherical fruit capsules hold two seeds apiece. Key nations that grow flaxseed are Ethiopia, China, India, and the United State. In india Flaxseed in widely cultivated in Madhya pradesh, chattisgadh as well as Bihar. growing availability. Morphology of plant : This plant can reach a height of 60 cm and has lanceolate, slender, highly fibrous stems. leaves up to 4 cm long with three veins and 4 mm in width, with a vivid blue color Flowers have a diameter of up to 3 cm. There is a seed in fruit called flaxseed Or linseed.

COMPONENTS OF FLAXSEEDS AND THEIR USE:

Flaxseed are tiny seeds that are packed with variety of beneficial components

1.lignans

Two linked phenylpropanoid molecules make up the fundamental structure of plant lignans, which are phenolic secondary metabolites There are two main types of lignans: dibenzylbutane lignans and furanofuran lignans. Two examples of each class are flaxseed's secoisolariciresinol diglucoside (SDG) and sesame seed's sesamin. Lignans are phytoestrogens that have antioxidant properties. They can help reduce the risk of certain hormone-related cancers, such as breast and prostate cancer. Lignans also have anti-inflammatory effects and may contribute to improved cardiovascular health. Lignans are chemicals that are extensively distributed throughout the kingdom of plants, while many plants produce more of them in their roots and seeds than in other sections of their bodies. Fruits, vegetables, and cereals have modest lignan contents; on the other hand, lignans are more concentrated in flax and sesame seeds, particularly flax seeds. The amount of lignans

found in flaxseed is thought to be 75–800 times greater than that found in grains, legumes, fruits, and vegetables .Because of their nutritional value and advantageous characteristics as antioxidants, anti-inflammatory agents, and anticancer agents, lignans have a wide range of applications. In the food business, they are utilized as food supplements or as components of functional meals and drinks. They are found as ingredients in toiletries and cosmetics for skin and hair care .

2.omega-3 fatty acid

Flaxseed also rich with Omega 3 fatty acid. It shows good health effect of heart. Each tablespoon ground flaxseed contains 1.8 grams of plant omega 3s. It also have anti- inflammatory propertie as well as support human health. Oil contain 50 to 60% Omega 3 fatty acid and it is form in the alpha leolenic acid. Flaxseed is a excellent source of alpha leolenic acid. Researchers are examining the potential protective effects of flaxseed's omega-3 fatty acids against specific infections as well as potential treatments for conditions such as ulcers, migraine headaches, eating disorders, preterm labor, emphysema, psoriasis, glaucoma, Lyme disease, lupus, and panic attacks. In 2008, Dugani and colleagues assessed the anti-ulcer properties of flaxseed oil and mucilage using a rat model of ethanol-induced stomach ulcer. The pre-treatment of rats with flaxseed oil and mucilage was found to dramatically minimize the frequency and duration of stomach ulcers caused by ethanol, according to the results. Both flaxseed oil and mucilage were shown to have a cytoprotective impact against ethanol-induced stomach ulcers in rats, even though flaxseed oil was reported to have a greater capacity to reduce the number of ulcers

3. Dietary fibers

Flaxseeds are also an excellent source of dietary fiber. Fiber is important for maintaining a healthy digestive system and regulating blood sugar levels. The soluble fiber in flaxseeds can help lower cholesterol levels and promote a feeling of



fullness, which can aid in weight management. Flaxseed protein demonstrated the reduction of the fat absorption by fecal excretion in animal and human. Mette et al. 2012 found that addition of a flax dietary fiber extract rich in viscous dietary fibers significantly increased fat excretion and lowered total and LDL-cholesterol, with no effect.

4. Vitamins and minerals

flax seed has vitamin E. It has seed maturity, growing capacity growth condition and extraction process. It also contain vitamin K in the form of phyloquinone. which is responsible for the blood clotting mechansim.

Health benefits of flaxseed:

Flaxseed is rich in lignins, dietary fibers, and omega-3 linolenic acid, which contribute to its health benefits in addition to its nutritional value. According to Gogus and Smith (2010) and Simopoulos (2000), fatty acids (ALA, DHA, and EPA) may be protective against a number of diseases, including neurological disorders, atherosclerosis, cardiovascular disease, cancer, osteoporosis, immunology, arthritis, diabetes, and hypertension.

1. Reduce cancer risk:

Numerous animal studies have already employed flaxseed to cure a range of malignancies. When it comes to the effects of dietary flaxseed, breast cancer is arguably the most researched cancer. Research on experimental animals and human subjects has demonstrated the substantial preventive benefits of eating flaxseed against breast cancer. According to the results of a systematic assessment of ten human trials, flaxseed slowed the growth of tumours in breast cancer patients. Additionally, they discovered evidence linking flax to protection against primary breast cancer and a lower mortality risk for breast cancer patients. Milled flaxseed doses of 25 g showed positive result. Sensitivity to dietary flaxseed or its constituents has been observed in cancers other than breast cancer. Flaxseed has

demonstrated anti-cancer properties against prostate, lung, colon, ovarian, endometrial, hepatocellular, and cervical cancer.

2. Treatment of diabetes:

Flaxseed also affects diabetes, a serious illness whose prevalence is rising globally. Supplementing with flaxseed lowered blood glucose levels in individuals with prediabetes and type 2 diabetes. In participants with Type 2 diabetes, lignan supplement and gum made from flaxseed also reduced blood glucose levels. Animals with Type I diabetes have shown the flaxseed lignan SDG to have anti-hyperglycemic properties in preclinical investigations. It is uncertain at this time if supplementing with SDG or flaxseed improves glycemic control in humans with Type 1 diabetes; this may be a subject of future research.

3. Lower the chance of osteoporosis:

According to Ragheb et al. (2019), flaxseed helps to maintain bone strength and density while preventing bone loss. Consuming flaxseed oil lowers osteoporosis-causing variables and boosts bone mineral density (El-Saeed et al. Citation 2018). It has been proposed that eating foods containing flaxseed oil can lower the risk of osteoporosis in women with diabetes.

4. Cardiovascular effects:

Consuming flaxseed lowers the risk of atherosclerosis developing (Bassett et al., 2011; Dupasquier et al., 2006, 2007). This is most likely caused by ALA, an anti-inflammatory compound found in flaxseed. Consuming flaxseed lowers cholesterol in some animals but has no effect in others (Parikh et al., 2019). In addition, Trans fat levels in the blood are lowered by flaxseed (Bassett et al., 2011).

RISK:

Not everyone will benefit from flaxseed's nutrients. Flaxseed products should be avoided, or people should see a doctor first if they:



1. use aspirin or warfarin (Coumadin), or other blood thinners
2. use nonsteroidal anti-inflammatory medications
3. are on cholesterol-lowering medication
4. possess uterine or breast cancer that is hormone-sensitive
5. are expecting or nursing a child
6. Have a flaxseed allergy.

HAIR BENEFITS :

Along with health benefits flaxseed and its constituents also shows hair benefits

The following components may provide particular advantages for your hair: Omega-3 fatty acids:

The hair and scalp receive vitamins, proteins, and nutrients from omega-3 fatty acids. In addition to helping to prevent hair follicle inflammation, omega 3 fatty acids also lessen hair loss. It encourages scalp circulation, which may aid in hair growth.

Lignans

which are produced by flaxseed, are an antioxidant. Bacterial growth may be suppressed or inhibited by lignans. Lignans may lessen hair loss and aid in hair regeneration.

B vitamins:

A reliable source of vitamin B is flaxseed. A class of nutrients known as vitamins B is known to strengthen and improve hair healthier more quickly. Fiber: The most important component for healthy hair is fiber. Keratin is a prominent protein that is used to make fiber. In order to reduce hair damage, many hair products on the market are enhanced with additional fiber. Fibers are a very good way to hide hair loss.

Vitamin E:

An important antioxidant for hair growth, vitamin E is easily found in flaxseed. Vitamin E stops the scalp tissues from eroding and stops hair loss. The most famous vitamin is vitamin E.

REFERENCES

1. Bioactive Components of Flaxseed and its Health Benefits Krishna. B. Gutte¹, A. K. Sahoo¹, Rahul C. Ranveer
2. Mihir Parikh,^{1,2,3} Thane G. Maddaford,^{1,2,3} J. Alejandro Austria,^{1,2,3} Michel Aliani,^{2,4} Thomas Netticadan,^{1,2,5} and Grant N. Pierce^{1,2,3} 2019 May; 11(5): 1171. Published online 2019 May 25.
3. Priyanka Kajla, Alka Sharma, corresponding author and Dev Raj Sood *J Food Sci Technol.* 2015 Apr; 52(4): 1857–1871. Published online 2014 Feb 28. doi: 10.1007/s13197-014-1293-y PMID: PMC4375225 PMID: 25829567
4. M. Rubilar^{1,2*}, C. Gutiérrez^{1,2}, M. Verdugo¹, C. Shene^{1,2}, J. Sineiro³ *Nutr. v.10 n.3 Temuco jul. 2010* <http://dx.doi.org/10.4067/S0718-95162010000100010> *J. Soil Sci. Plant Nutr.* 10 (3): 373 - 377 (2010)
5. Rajju Priya Soni*, Mittu Katoch, Ashish Kumar and Pramod Verma³ 310-316 (2016)
6. Jhilaam Pramanik, Akash Kumar, Bhupendra Prajapati First published: 07 September 2023 <https://doi.org/10.1002/efd2.114>
7. van Trijp HC, Luning P. Functional foods: health claim-food product compatibility and the impact of health claim framing on consumer evaluation. See comment in *PubMed Commons* below *Appetite.* 2005; 44: 299-308.
8. Kalra EK. Nutraceutical--definition and introduction. See comment in *PubMed Commons* below *AAPS PharmSci.* 2003; 5: E25.
9. Doyon M, Labrecque J. Functional foods: a conceptual definition. *British Food Journal.* 2008; 110: 1133- 1149.
10. Daun JK, Barthet VJ, Chornick TL, Duguid S. Structure, composition, and variety development of flaxseed. *Flaxseed in human nutrition* Thompson LU, Cunnane SC. 2003; 1-40.

11. Oomah DB. Flaxseed as a functional food source. *J Sci Food Agr.* 2001; 81: 889-894.
12. Bhatta RS. Nutritional composition of whole flaxseed and flaxseed meal. *Flaxseed in Human Nutrition.* Cunnane SC, Thompson LH, editors. AOCS Press, Champaign IL. 1995; 22-45.
13. Mr. Shaikh Akbar¹, Mr. Mirza Nazish Baig², Miss. Desahmane Amruta³ Assistant Professor, G.M.C College of Pharmacy, Aurangabad (M.S.)^{2,3}Lecturer, R.B.T College of D. Pharmacy, Aurangabad (M.S.)
14. The Role of Flaxseed in Improving Human Health by Wioletta Nowak and Małgorzata Jeziorek **Healthcare* 2023, 11(3), 395;
15. Ankit Goyal, corresponding author Vivek Sharma, Neelam Upadhyay, Sandeep Gill, and Manvesh Sihag Published online 2014 Jan 10. doi: 10.1007/s13197-013-1247-9
16. Flaxseed Gel in hair Growth, Nourishment and Anti-dandruff activity Ashiya Chaugule, Suyash Zinjad, Rahul Lokhande
17. Flaxseed and Cardiovascular Ris LeAnne T. Bloedon, M.S., R.D., and Philippe O. Szapary, M.D. January 2004.

HOW TO CITE: Shivani S. Jadhav, Anil B. Jadhav, Shruti S. Jadhav, Shital R. Jadhav, Shital K. Shinde, Flaxseed : A Magical seed, *Int. J. in Pharm. Sci.*, 2023, Vol 1, Issue 11, 425-429. <https://doi.org/10.5281/zenodo.10200767>

