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REVIEW ARTICLE

A Pharmacological and Therapeutic Study of Chandrashoor Seed

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ABSTRACT
Chandrashoor (Lepidium sativum) is an important herb that belongs to Brassicaceae family. The plant is well-known in Ayurveda for its beneficial properties it holds. Lepidium stivum is a medicinal plant and can be used as an essential drug to improve mother and child health as an abundant source of calcium and phosphorus. Lepidium sativum seeds are commonly used to heal fractures and to increase milk secretion during lactation. Their seeds are highly nutritious and are excellent source of iron. It is mainly containing alkaloids, carbohydrates, proteins, amino acids, flavonoids as chief phytochemical constituents. This article shows various pharmacological activities of Lepidium sativum as an anti-diabetic, laxative, hypocholesterolemic, fracture healing, analgesic, Anti-inflammatory, antipyretic and analgesic, laxative, diuretic, hepatoprotective, antiashthamatic, antidiarrheal, antispasmodic and anticancer activities of garden cress seeds (Lepidium sativum).
***KEYWORDS**: Chandrashoor, nutritional, pharmacological.*

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INTRODUCTION

Chandrashoor seed belongs to Brassicaceae family and its scientific name is *Lepidium sativum* . Common names of Garden cress (*Lepidium sativum*) seeds are Common Cress (English), Halim (Bengali), Aseliyo (Gujrati), Chansur (Hindi), Allibija, Kapila (Kannada), Alian (Kashmiri) Asali (Malayalam), Ahaliva, Haliv (Marathi), Allivirai (Tamil) and Adityalu, Aadalu (Telugu) [1]. The synonym of chandrashoor is Chandrika, charma hantri, pashu mehankarika, nandini, karavi, bhadra, vasapushpa and suvasara. It is highly useful for the patients suffering from hiccough, vata & kapha diseases, diarrhaea and vatarakta. It is strength giving and anabolic [2].

The seeds are the major part of the crop, commonly used. They are small, brownish red in color, oval in shape, triangular and pointed at one end and smooth in texture. It is included in Chaturbija. Methika, Chandrashoor, Kalajaji and yavanika grouped together are referred as Chaturbija. The powder of chaturbija if consumed daily cures Vata diseases, indigestion, distended lower abdomen, pain the sides of thorax and pelvic parts [3].

According to scientific analysis, seed have 80–85% endosperm, 12–17% seed coat and 2–3% embryo. Seed contain 25% protein, 14-24% lipids, 33-54% carbohydrates and 8% crude fiber.4,5 It shows many type of pharmacological activities. In traditional medicinal system, Garden cress seed (*Lepidium sativum*) have been widely used in treating number of diseases in India, Such as hypertension, diabetes, osteoarthritis diseases, in fracture healing [6] and in prevention of cancer. Essential fatty acids of seed used as memory boosters13. The galactogogue properties of *Lepidium sativum* seeds are well known and traditional preparations including kheer is prepared for lactating mother to increase milk production [7].

MORPHOLOGY

Garden cress (*Lepidium sativum*) seeds are smooth, small and reddish brown in color. Shape is oval with point and triangular at one end. Seed length is about 3-4 mm and wideness is 1 -2 mm. When seed is soaked in water seed coat swells and gets covered with transparent, colorless, mucilage and give mucilaginous taste [8,9].

MICROSCOPIC CHARACTERS

The microscopic characterstics of Garden cress (*Lepidium sativum*) seeds shows endosperm of seed is composed of thick walled polygonal cells and embryo is covered by endosperm cells. The cells of embryo are polygonal in shape and minute in size. Seed powder is creamish yellow in colour, show uniform thick walls, few reddish-brown fragments of seed coats with oily endosperm and reddish coloring matter [10]10

CHEMICAL ANALYSIS

Analysis of garden cress seeds gave the following values: moisture 5.69, protein 23.5, fat, ash, phosphorous, calcium, sulphar. The seeds contain an alkaloid (0.19%), glucotropaeolin, sinapin (choline ester of sinaptic acid), sniapic acid, mucilaginous matter and uric acid; on steam distillation they yield a volatile oil similar to that from the whole herb. Five new dimeric imidazole alkaloids lepidine B, C, D, E and F in addition to the known imidazole alkaloid lepidine and two new monomeric imidazole alkaloids semiledinoside A and B were isolated and structure elucidated on the basis of spectroscopic evidence [11-13].

MEDICINAL PROPERTIES OF CHANDRASHOORA SEED

Fracture healing property - Traditionally Garden cress seed are used in healing fracture or in accidental injuries. In some of the areas of India seed as such or its powder is mixed with water and applied on affected areas or consumed with water or warm milk to heal the fracture and internal injuries. To prove this effect a study was conducted on 6 adult New Zealand White rabbits. All are induced with fractures in the mid shaft of the left femur and divided into two groups. Garden cress seed mixed with normal diet and fed to the test group of rabbits while control group was given normal diet only. To assess the fracture healing, X-rays of the induced fractures were taken 6 and 12 weeks postoperatively. Results revealed that the test group had a statistically significant increase in healing of fractures compared to that of the control group. On the basis of results, it can be said that Garden cress seed possess fracture healing property [14].

Antidiarrheal activity - A study carried out by manohar co-workers reported antidiarrheal effect of alcoholic and aqueous extract of *Lepidium sativum* seeds in three animal models (Castor oil induced diarrhea in rats, Prostaglandin induced enteropooling in rats and charcoal meal test in mice) of diarrhea; Furthermore, the aqueous extract was found to be more potent than alcoholic extract [15].

Galactagogue Property - Galactagogue properties of Garden cress (*Lepidium sativum*) seeds were studied on adult female virgin Norway rats. Each experimental rat was administered 1.6 mg seeds powder /gm body weight /day for fourteen days. Different parameters (gross assessment, histological examination, enzymatic histochemical study, and hormonal assay of follicle-stimulating hormone, luteinizing hormone, prolactin, estrogen and progesterone) were assessed to study the effect of Garden cress (*Lepidium sativum*) seeds on the mammary gland of young adult virgin rats. All the parameters significantly exhibited a strong mammotrophic and lactogenic effects of Garden cress (*Lepidium sativum*) seeds on the non-primed mammary gland of adult virgin rats. Authors concluded that Garden cress (*Lepidium sativum*) seeds are most probably a real galactagogue and might be useful in induction of lactation [16].

Effect on respiratory function in bronchial asthma - A study conducted on 30 patients (male and female both) suffering from mild to moderate brochial asthma whose age was 15 years to 80 years excluding pregnant women. One gram of finely ground seed powder was given orally to the patients for thrice a day for 4 weeks without providing medicine. Respiratory functions were assessed with Spirometer before and after the experimental period, and it was observed that there were significant improvements in different pulmonary functions. No any adverse effect was observed in any patients [17].

In the treatment of Osteoarthritis - Lepidium seed powder was studied in 98 patients of osteoarthritis. In this study 30% patients got complete remission, 37.5% patients got marked improvement, 25% patients were moderately improved and 7.5% patients were not improved [18].

Cytotoxic effect on breast cancer - Aqueous extract of garden seed extract possess ability to inhibit growth of breast cancer cells MCF-7. [19]

Effects of garden cress seed on fertility - Oral supplementation of tocopherol extracted from seed can improve histoarchitecture of rabbit testis and could be used to improve the fertility of rabbits. [20]

Antihypercholesterolemic effect - Protective effect of *Lepidium sativum* L. seeds powder and extract was studied for its hypercholesterolemic effect on rats.[21]

Anti-hypothyroidism activity - The anti-hypothyroidism activity was tested using thirty male Wistar rats. The results show that the L. sativum extract was found to increase the T3 and T4 in the

propylthiouracil induced rats. So that *L. sativum* can be stimulatory to thyroid function and possess significant anti-hypothyroidism effect. [22]

Anti-diabetic property - The blood glucose levels were normalized in 2 weeks after daily repeated oral administration of aqueous *Lepidium sativum* extract (20mg/kg) Blood glucose levels were significantly reduced in normal rats after both acute and chronic treatment. No changes were observed in basal plasma insulin concentrations after treatment either in normal or STZ diabetic rats indicating that the underlying mechanism of this pharmacological activity seems to be independent of insulin secretion. [23]

Diuretic activity - The diuretic effect of aqueous and methanolic extracts of the Garden cress (*Lepidium sativum*) seeds in adult male Wistar rats Extracts were administered orally to experimental rats at doses of 50 and 100mg/kg body weight. Both the extracts of Garden cress (*Lepidium sativum*) seeds showed a dose-dependent increase in urine excretion. The excretion of sodium was increased by both the extracts and potassium excretion was increased only by the aqueous extract at a dose of 100 mg/kg. The methanolic extract had the additional advantage of a potassium-conserving effect. Aqueous and methanolic extracts of seeds showed notable diuretic effect which is comparable to that produced by the reference diuretic hydrochlorothiazide. [24]

Effect on Sperm Parameter - In study conducted by NS Naji (2013) the effect of phenol extract of Garden cress (*Lepidium sativum*) seeds on sperm parameters of adult male rabbits. Their result shows that Medium Effect Dose (MED50) of phenols was obtained by Dose-Response Curve. MED50 of Garden cress (*Lepidium sativum*) seeds seed phenols was 36.1 mg/kg body weight. There was a significant increase in testicular sperm concentration, epididymus sperm concentration and in the sperm count per gm of the testis, sperm motility percent, grade activity, sperm viability percent, and abnormal sperm morphology percent of epididymis caudal at MED50 of Garden cress (*Lepidium sativum*) seed phenol. Authors reported that supplementation with low doses of *Lepidium sativum* seed phenols could enhance rabbit fertility. Researcher concluded that phenol extract of *Lepidium sativum* seeds improves some parameters of sperm [25].

Hepatoprotective effect - Researcher examined hepatoprotective effect of Garden cress (*Lepidium sativum*) seed methanolic extract for the prevention of carbon tetrachloride (CCl4) induced liver damage. Garden cress (*Lepidium sativum*) seed methanolic extract (200 and 400 mg/kg body weight) was administered to rats having induced liver injury. Serum activity of alkaline phosphatase (ALP), aspartate aminotransferase (AST), alanine aminotransferase (ALT) and bilirubin concentration were increased significantly in the group of rats received only CCl4. There was a significant reduction in these parameters in groups administered with Garden cress (*Lepidium sativum*) seed extract, the severe fatty changes in the livers of rats caused by CCl4 were also decreased. The researcher results shows that the methanolic extract of Garden cress (*Lepidium sativum*) seeds seems to possess hepatoprotective activity in rats. [26,27]

Antimicrobial Activity - Petroleum ether extract of seed in concentrations of 2.5%, 5% and 10% had active antimicrobial effect against six different pathogens together with powerful antifungal activity at the concentration of 2.5 and 10% 35. Ethanolic extract of seed was found very effective against fungal growth (Fusarium equiseta, Aspergillus flavus and Alternaria alternat) at 2-8% of seed extracts. [28,29]

SAFE LEVEL OF GARDEN CRESS SEED AS FOOD

Although Garden cress seed used widely, there are very few reports available in the literature regarding safe consumption level of Garden cress seed for use as food. Datta PK et al. conducted a study on adult rats to assess the safety of Garden cress seed. For the acute toxicity study, rats were fed seed powder 0.5 – 5.0 g/kg body weight mixed with standard diet and symptoms of toxicity and mortality were monitored for 72 hours. No toxicity and mortality symptoms were found in rats. To observe the subchronic toxicity effect of seed, rats were fed 1.0 – 10.0% seed powder mixed with standard diet for 14 weeks. No any adverse effect was found in any rats, after completing the experimental period. However, there were significant increase in the serum alpha linolenic acid (ALP) and serum glutamyl oxaloacetic transaminase (SGOT) in male rats receiving 5.0 and 10% of Garden cress seed. It was shown that acute and subchronic feeding of seed for 14 weeks do not produce any kind of toxic effects in both male and female rats [30].

CONCLUSION

Lepidium sativum (commonly known as Chandrashoor, garden cress, or halim) is a highly valuable plant from the Brassicaceae family, recognized for its nutritional and therapeutic properties. The seeds of *Lepidium sativum* are particularly rich in essential nutrients, including proteins, dietary fiber, minerals (such as calcium, iron, and magnesium), and a broad spectrum of essential amino acids. Notably, the high

iron content makes it a significant dietary supplement, particularly for individuals at risk of iron deficiency anemia.

In terms of safety, extensive toxicological studies have demonstrated that *Lepidium sativum* seeds are non-toxic and generally regarded as safe for human consumption. This adds to their appeal as a functional food with health-promoting benefits. The pharmacological activities of these seeds are extensive, supporting their use in traditional medicine systems. Seeds shows many medicinal properties such as antidiabetic, hypocholesterolemic, antihypertensive, antidiarrheal, antispasmodic, Antinflammatory, antipyretic and analgesic activities and laxative activities. It also has hepatoprotective, fracture healing, diuretic, nephrocurative, nephroprtective, galactogogue and used in breast cancer.

Given the extensive array of medicinal properties demonstrated by *Lepidium sativum* , these seeds represent a highly promising natural resource for the prevention and management of a variety of health conditions. While the traditional use of *Lepidium sativum* has been well-documented, further clinical and preclinical research is needed to elucidate the exact mechanisms underlying these therapeutic effects, optimize dosage forms, and evaluate long-term safety and efficacy. Additionally, the combination of nutritional benefits and therapeutic effects makes *Lepidium sativum* a potential functional food that could be incorporated into modern dietary recommendations to promote overall health.

The increasing interest in plant-based remedies, coupled with the promising pharmacological profile of *Lepidium sativum* , supports its potential as a valuable component in integrative medicine, offering a natural alternative or adjunct to conventional treatments. Continued research into this plant could lead to the development of novel therapeutic agents for the management of chronic conditions, such as diabetes, hypertension, and inflammatory diseases, as well as enhancing the health benefits of a balanced diet.

REFERENCES

1. Kumar AD. Ayurvedic Drug Plants, Publisher: Daya Books, 2006: 97
2. Dr Bulusu sitaram, Bhavaprakasa, Publisher Chaukhamba Orientalia, 149-150
3. Arkroyd WR, Gopalan C, Balasubramanian SC. (1960). Nutritive value of Indian Foods and the planning of satisfactory diets. Indian Council of Medical Research, New Delhi: 64.
4. Mathews S, Singhal RS, Kulkarni PR. (1993). Some physicochemical properties of *Lepidium sativum* (Haliv) seed. Die Nahrung. 37: 69-71
5. Kirtkar KM, Basu BD. (2005). Indian medicinal Plants. I: 174.
6. Singh R et al. (2007). Acceptability evaluation of iron rich product developed from *Lepidium sativum* . International Journal of Recent Advances in Multidisciplinary Research. 04 (06): 2629- 2631.
7. Anonymous. (2001). Ayurvedic Pharmacopoeia of India, Part- 1,1st ed, The drug controller of India, Government of India, Ministry of health and family welfare development of Indian system of medicine and homeopathy, New Delhi civil lines, Delhi. 1:26
8. Bigoniya P, Singh CS, Shukla A. (2011). Pharmacognostical and physicochemical standardization of ethnopharmacologically important seeds of *Lepidium sativum* Linn. and Wrightia tinctoria R. Br. Indian Journal of Natural Products and Resources. 2(4):464-471
9. Zia-Ul-Haq M. et al. (2012). Compositional Study and Antioxidant Potential of Ipomoea hederacea Jacq. And *Lepidium sativum* L. Seed. Molecules.17:10306-10321
10. Ali M, Rumman A.(2018). Gas Chromatography-Mass Spectrometry (GCMS) Analysis of Extracted Oil from Whole Garden (Rashaad) Seeds. American journal of engineering research. 7(4): 01 -08.
11. Dr Prakasha Hegde, A Text Book of Dravyaguna Vijnana, 121
12. Dr. K. C. Chunekar, Bhavaprakash Nighantu, Haritakyadi Varga (2000). Chaukhamba Bharati academy, Varanasi, 39.
13. Abdullah H, Abdullah J. (2007). The effects of *Lepidium sativum* seed on Fracture – Induced Healing in Rabbits. Med Gen Med. 2007; 9(2):23-29.
14. Manohar D, Shylaja H, Viswanatha GL, Rajesh S. (2009). Antidiarrheal activity of methanolic extracts of *Lepidium sativum* in rodent. J Nat Remidies. 9 (2): 197-201
15. Al-Yawer MA, Al-Khateeb HM. Garden Cress Seed Could be A Factual Galactagogue. The Iraqi Postgraduate Medical Journal, 2006; 5(1):62-67
16. Paranjape AN, Mehta AA. (2006). A Study on Clinical Efficacy of *Lepidium sativum* Seeds in Treatment of Bronchial Asthma. Iranian Journal of Pharmacology & Therapeutics. 5(1):55- 59.
17. Raval ND, Pandya TN. (2009). Clinical trial of *Lepidium sativum* Linn (Chandrashura) in the management of Sandhivata(Osteoarthritis) I.P.G.T. & R.A, Gujarat Ayurved University, Jamnagar. Ayu. 30(2): 153-157.
18. Mahassni SH, Al-Reemi RM. (2013). Cytotoxic effect of an aqueous extract of *Lepidium sativum* L. Seed on human breast cancer cells. Indian Journal of Traditional Knowledge. 12(4):605-614.
19. Naji NS. (2013). Changes in sperm parameters of adult male rabbits by phenol extract of *Lepidium sativum* seeds. Journal of Natural Sciences Research. 3(8): 17-22.
20. Wafeka A, Al H. (2010). Protective Effect of *Lepidium sativum* L. Seeds Powder and Extract on Hypercholesterolemic Rats. J American Sci. 6(11): 873-879.

21. Reham Sharfeldeen Osman and Ikram Mohamed Eltayeb, (2018). Anti-hypothyroidism activity of *Lepidium sativum* ethanolic extract, 6th Edition of International Conference on Pharmacognosy and Medicinal Plants, Amsterdam, Netherlands April 16-17.
22. Eddoaks M, Maghrani M, Zeggwagh NA, Michel JB. (2005). Study of the hypoglycemic activity of *Lepidium sativum* L. aqueous extract in normal and diabetic rats. J Ethnopharmacol ; 97: 391-395.
23. Patel U, Kulkarni M, Undale V and Bhosale A. (2009). Evaluation of Diuretic Activity of Aqueous and Methanol Extracts of *Lepidium sativum* Garden Cress (Cruciferae) in Rats. Tropical Journal of Pharmaceutical Research, 8 (3): 215-219.
24. Naji NS. (2013). Changes in sperm parameters of adult male rabbits by phenol extract of *Lepidium sativum* seeds. Journal of Natural Sciences Research. 3(8): 17-22
25. Abuelgasim A, Nuha HS, Mohammed AH.(2008). Hepatoprotective effect of *Lepidium sativum* against carbon tetrachloride induced damage in rats. Research Journal of Animal and Veterinary Sciences ; 3: 20-23
26. Alok Sharma, (2020). A Comprehensive Review on Pharmacological Properties of Garden cress (*Lepidium sativum*) Seeds, Current Research in Pharmaceutical Sciences; 10 (02): 13-18
27. Adam, SIY, Salih SAM, Abdelgadir WS. (2011). *In vitro* Antimicrobial Assessment of *Lepidium sativum* L. Seeds Extracts. Asian Journal of Medical Sciences. 2011; 3(6):261-266
28. Sharma RK, Vyas K, Manda H.(2012). Evaluation of antifungal effect on ethanolic extract of *Lepidium sativum* L. Seed. International Journal of Phytopharmacology. 3(2):117-120
29. Datta PK, Diwakar BT, Viswanatha S, Murthy KN, Naidu KA. (2011). Safety evaluation studies on Garden cress (*Lepidium sativum* L.) seed in Wistar rats. International Journal of Applied Research in Natural Products. 4(1):37-43