



CODEN [USA]: IAJPBB

ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

<http://doi.org/10.5281/zenodo.839541>

Available online at: <http://www.iajps.com>

Review Article

A REVIEW ON *LEPIDIUM SATIVUM*

Asra Jabeen*¹, Dr. S. Rani², Dr. Mohammed Ibrahim³, Abdul Saleem Mohammad⁴,

¹Associate Professor, Department of Pharmacognosy, Nizam Institute of Pharmacy, Deshmukhi (V), Pochampally (M), Behind Mount Opera, Yadadri Bhuvanagiri (Dist)-508284, Telangana, India.

²Assistant Professor, Annamalai University, Sadagopan Nagar, Annamalai Nagar, Chidambaram, Tamil Nadu 608002, India.

³Professor and Principal, Prathap Narender Reddy College of Pharmacy, Peddashapur, 509325, Shamshabad, Telangana, India.

⁴Assistant Professor, Department of Pharmaceutical Analysis and Quality Assurance, Nizam Institute of Pharmacy, Deshmukhi (V), Pochampally (M), Behind Mount Opera, Yadadri Bhuvanagiri (Dist)-508284, Telangana, India.

Abstract:

Lepidium sativum plant and seeds are considered one of the popular medicinal herbs used in the community of Saudi Arabia, Sudan and some other Arabic countries as a good mediator for bone fracture healing in the human skeleton. A number of recent studies pointed out the traditional uses of *Lepidium sativum* seeds extract in controlling many clinical problems. They were used as anti-asthmatic antiscorbutic, aperient, diuretic, galactagogue, poultice and stimulant. The traditional plants may represent new sources of drugs with stable, biologically active components that can establish a scientific base for the use of plants in modern medicine. These local ethnomedical preparations and prescriptions of plant sources should be scientifically evaluated and then disseminated properly.

Key Words: Seeds, garden cress, hydroponic, phytochemicals, nutritional.

Corresponding Author:

Asra Jabeen,

Associate Professor,

Department of Pharmacognosy,

Nizam Institute of Pharmacy, Deshmukhi (V), Pochampally (M),

Behind Mount Opera, Yadadri Bhuvanagiri (Dist)-508284,

Telangana, India.

Phone number: - 9700889601

E-mail address: - asra_pharma@yahoo.com



Please cite this article in press as Asra Jabeen et al, A Review on *Lepidium Sativum*, Indo Am. J. P. Sci, 2017; 4(8).

INTRODUCTION:[1-9]

Cress (*Lepidium sativum*), sometimes referred to as garden cress to distinguish it from similar plants also referred to as cress (from old Germanic *cresso* which means sharp, spicy), is a rather fast-growing, edible herb. Garden cress is genetically related to watercress and mustard, sharing their peppery, tangy flavor and aroma. In some regions, garden cress is known as mustard and cress, garden pepper cress, pepperwort, pepper grass, or poor man's pepper. This annual plant can reach a height of 60 cm (~24 inches), with many branches on the upper part. The white to pinkish flowers are only 2 mm (1/12 of an inch) across, clustered in branched racemes. When consumed raw, cress is a high-nutrient food containing substantial content of vitamins A, C and K and several dietary minerals.



Fig1: Garden cress is commercially grown in England, France, the Netherlands and Scandinavia. Cultivation of garden cress is practical both on mass scales and on the individual scale. Garden cress is suitable for hydroponic cultivation and thrives in slightly alkaline water. In many local markets, the demand for hydroponically grown cress can exceed available supply, partially because cress leaves are not suitable for distribution in dried form, so they can only be partially preserved. Consumers commonly acquire cress as seeds or (in Europe) from markets as boxes of young live shoots.



Fig 2: Seeds of *Lepidium sativum*

Edible shoots are typically harvested in one to two weeks after planting, when they are 5–13 cm (2–5 in) tall. Garden cress is added to soups, sandwiches and salads for its tangy flavor. It is also eaten as sprouts, and the fresh or dried seed pods can be used as a peppery seasoning (*haloon*). In the United Kingdom, cut cress shoots are commonly used in sandwiches with boiled eggs, mayonnaise and salt. Raw cress is 89% water, 6% carbohydrates (including 1% dietary fiber), 3% protein and less than 1% fat (table). In a 100 gram amount, raw cress supplies 32 calories and numerous nutrients in significant content, including vitamin K (516% of the Daily Value, DV), vitamin C (83% DV) and vitamin A (43% DV). Among dietary minerals, manganese levels are high (26% DV) while several others, including potassium and magnesium, are in moderate content. Garden cress, known as *chandrashoor*, and the seeds, known as *aleev* in Marathi, or *halloo* in India, are commonly used in the system of Ayurveda.

Garden cress is ideally grown hydroponically whereby the cress is cultivated without soil using mineral nutrient solutions in water. Garden cress is usually harvested within two weeks of cultivation and can be preserved by placing the stems in a water container and then refrigerating them for at least one week

History [10-12]

It is considered to have originated from Persia and later spread to the gardens of India, Syria, Greece and Egypt. Garden cress is still popular and frequently consumed type of leafy vegetables in Europe, especially in Scandinavia, Netherlands, England and France (centers of the garden cress cultivation) where it is grown commercially. Due to its delightful and peppery taste it is grown all over the world and is used as healthy addition to salads and sandwiches.

Scientific classification:

Kingdom:	Plantae (Plants)
Subkingdom:	Tracheobionta (Vascular plants)
Superdivision:	Spermatophyta (Seed plants)
Division:	Magnoliophyta (Flowering plants)
Class:	Magnoliopsida (Dicotyledons)
Subclass:	Dilleniidae
Order:	Capparales
Family:	Brassicaceae/Cruciferae (Mustard family)
Genus:	<i>Lepidium</i> L. (Pepperweed)
Species:	<i>Lepidium sativum</i> L. (Gardencress pepperweed)

Chemical Constituents [13-15]

The seeds shows the presence of carbohydrates, phenolic compounds, flavonoids, alkaloids, proteins, saponins and lipids. Thirty four percent of the total

fatty acids are alpha linolenic acid; and the oil has alpha linoleic acid which could give it nutritional advantages (Diwakara et al., 2008). The primary fatty acids in *Lepidium sativum* oil were oleic and linolenic acids and was found to contain high concentrations of tocopherols. It contains good amount of lignans and antioxidants, which can stabilize the n-3 polyunsaturated fatty acids in its seed oil. The primary phytosterols in *Lepidium sativum* were sitosterol and campesterol, with avenasterol. The plant is known to contain imidazole, lepidine, semilepidinoside A and B, β -carotenes, ascorbic acid, linoleic acid, oleic acid, palmitic acid, stearic acid, sinapic acid and sinapin.

Benefits of Garden Cress [16-21]

1. Medicinal Properties

Both the leaves, stems and seeds of garden cress are used in preparing traditional medicine for example; the seed are used as remedy for minimizing asthma symptoms as well as improves lung function in people suffering from asthma. Also garden cress can be used for treating patients suffering from bleeding piles.

2. Menstrual Cycle Regulation

The garden cress seeds contain phytochemicals that are similar to estrogen therefore consuming them helps to make irregular menstruation become more regular.

3. Indigestion

Garden cress seeds can be eaten to relieve the symptoms of constipation and indigestion.

4. Respiratory Infection Treatment

Garden cress seeds can be chewed or blended and mixed with honey, which is taken as an expectorant for treating cold, headache, asthma, sore throat and cough.

5. Iron Deficiency Treatment

Garden cress seeds are used for treating patients suffering from iron deficiency anemia. Consumption of these seeds help to boost the haemoglobin level over time.

6. Culinary Purposes

Garden cress is characterised by peppery, aromatic and tangy flavour. It can be eaten raw in salads and sandwiches or used as herbs for food seasoning. The seeds can also be roasted with salt before eating.

7. Dermatological Treatment

Garden cress seeds can be blended with water and honey to form a thick paste that can be applied on the skin to treat sunburn, irritated skins, dry skin and broken lips.

8. Hair Loss Treatment

Garden cress is an excellent source of protein and iron thus can be used for treating people suffering from hair loss.

9. Immunity Boost

Consumption of both garden cress stems, leaves and seeds help to boost the immune system.

10. Milk Production

Consuming garden cress helps to stimulate the mammary glands to start producing milk in lactating mothers. Due to this powerful property of garden cress, new mothers are encouraged to eat food containing garden cress to facilitate milk production. Moreover, due to the high protein and iron contents of garden cress, it is ideally given post-partum to breastfeeding mothers.

11. Aphrodisiac

Consumption of garden cress greatly helps to improve and boost libido.

12. Gastrointestinal Treatment

Garden cress can be used as a laxative and purgative for patients suffering from constipation. Garden cress seeds can be blended and mixed with honey, which is used for treating diarrhoea and dysentery. Garden cress can be blended and infused with hot water, which is used for treating colic especially in children.

13. Anti-carcinogenic

Garden cress seeds have antioxidants that help to prevent free radicals from damaging the body cells. Due to this property, it can serve as a chemoprotective drugs for protecting the body from cancerous growths.

14. Nutritional Values of Garden Cress

Garden cress is an excellent source of folic acid, vitamins C, dietary fiber, iron, calcium, protein, vitamin A, folate and vitamin E. The seeds of garden cress are also highly nutritive and they contain ascorbic acid, tocopherol, folic acid, calcium, linoleic fatty acids, iron, beta-carotene and arachidic.

15. Memory Booster

Garden cress seeds contain arachidic fatty acid and linoleic acids thus can serve as a memory booster.

Side-effects of Garden Cress [22-31]

1. Diuretic Properties

Garden cress contains diuretic properties thus patients suffering from frequent passage of water and urine should be cautious when using this plant.

2. Abortifacient Properties

Garden cress is abortifacient in nature thus capable of inducing abortion in early pregnant women if taken in excess. Pregnant women should refrain from eating garden cress as it has the tendency to induce uterine contractions and abortion. Garden cress seeds can increase uterine contraction, thus certain people use it to induce labor in late stages of pregnancy.

3. Goitrogenic Properties

Garden cress contains goitrogens, which are substances that subdue the proper functioning of the thyroid gland through its interference with iodine absorption. If consumed in large quantities can cause the thyroid gland to enlarge, thereby causing goiter and hypothyroidism.

FACTS ON MEDICINAL VALUES: [32-39]

Lepidium sativum in general is Antiasthmatic in nature; therefore, it provides natural breathing during Asthma and cures it. It has the ability to improve the appetite in Anorexia patient. It effectively expels tapeworms from the body. It advantageously inhibits the oxidation. It provides relief from Hiccups. It protects the body from Skin diseases. It is Stimulant in nature which increases the stamina. It also stimulates the body and brain functions. Thus, it is used to treat Brain Disorders. The seeds are optimal to counter Gout. It treats Diarrhea. It has Analgesic properties which potentially relieves from pain. It mitigates cough. *Lepidium sativum* has Antibacterial attribute which protects the body from bacterial infection. The Antidiabetic attribute is essential to lower the blood sugar levels and to cure Diabetes. It heals the inflamed area of the body and inhibits the inflammation. Due to Antihypertensive property, it is prescribed to treat high blood pressure. It is widely used to cure the symptoms of Scurvy. It is considered as an effective remedy to cure Constipation. It has Diuretic action which flushes out the toxins from the body. It effectively purifies and removes the impurities from the blood. It avoids the risk of abdominal diseases. *Lepidium Sativum* removes bad breath of the mouth. The digestive effect of this herb in the body keeps Digestive Disorders at bay. It has the ability to increase the flow of urine and expelling the toxins, salt and water from the body. Thus, it hinders Urinary problems. The Emmenagogue attribute stimulates and normalizes the menstruation flow to prevent menstrual disorders. Often, it is food remedy to stop Heavy Menstrual bleeding. It boosts up the Immune System and protects the body from getting sick. It is Hepatoprotective in nature, which prevents Liver damage. It improves the liver function and avoids the risk of liver diseases. It relieves from the inflammation of the joints and treats Arthritis. It is potent to reduce the weight and provides relief from Obesity. The Galactagogue effect of this herb within the body promotes the milk flow after pregnancy. Thus, it prevents from the experience of breast milk insufficiency. The seeds are effective in fixing the fractures and repairing the bones. The herb also has an Ophthalmic attribute. This makes it a good cure for curing eye diseases. It easily reduces Blemishes of the skin. It completely removes and reduces dandruff. The leaves of *Lepidium sativum* work as an Antidote against snake bite.

SUMMARY AND CONCLUSION:

Lepidium sativum Linn. belongs to family Cruciferae (cabbage family) and is commonly known as "Common cress," "Garden cress," or "Halim." The plant is called "Hab el Rashaad" or "Thufa" in Saudi Arabia and is a popular herbal plant grown in many

regions of Saudi Arabia, such as Hijaz, AL-Qaseem, and the Eastern Province. In Europe and America, the leaves are used in salad. In various countries of Africa, *Lepidium sativum* seeds are thought to be an effective medicinal remedy to cure respiratory disorders, like bronchitis and asthma. The plant is cultivated as culinary vegetable all over Asia. In South Asia, it is used in traditional medicine to treat asthma, bronchitis, and cough and is considered useful as abortifacient, antibacterial, aphrodisiac, diuretic, expectorant, gastrointestinal stimulant, gastroprotective, laxative, and stomachic. The plant is known to contain imidazole, lepidine, semilepidinoside A and B, β -carotenes, ascorbic acid, linoleic acid, oleic acid, palmitic acid, stearic acid, sinapic acid and sinapin. *Lepidium sativum* is reported to exhibit antihypertensive, diuretic, anti-inflammatory, analgesic, anticoagulant, antirheumatic, hypoglycemic, laxative, prokinetic, antidiarrheal, and antispasmodic properties. It has been shown to possess antiasthmatic and bronchodilatory potential in preliminary studies, but there is no report available in the literature on the pharmacological basis for its medicinal use. Traditional sources of medicinal plants can be extended for future investigation into the field of pharmacology, phytochemistry, ethnobotany and other biological actions for drug discovery.

REFERENCES:

1. Al-Jenoobi F. I., Al-Thukair A. A., Alam M. A., Abbas F. A., Al-Mohizea A. M., Alkharfy K. M. and Saleh A. Al-Suwayeh (2014), Effect of Garden Cress Seeds Powder and Its Alcoholic Extract on the Metabolic Activity of CYP2D6 and CYP3A4, Evidence-Based Complementary and Alternative Medicine.
2. Bedassa T., Andargie M. and Eshete M., Genetic divergence analysis of garden cress (*Lepidium sativum* L.) International Journal of Biodiversity and Conservation, 2013; 5(11): 770-771.
3. Datta P. K., Diwakar B. K., Viswanatha S., Murthy K. N. and Naidu K. A, Safety evaluation studies on Garden cress (*Lepidium sativum* L.) seeds in Wistar rats, International Journal of Applied Research in Natural Products, 2011; 4(1).
4. Diwakar B. T., Dutta P. K., Lokesh B. R., and Naidu K. A, Bio-availability and metabolism of n-3 fatty acids rich garden cress (*Lepidium sativum*) seed oil in albino rats. Prostaglandins Leukot. Essent. Fatty Acids, 2008; 78(2): 123-125.
5. Eddouks M., Maghrani M, Effect of *Lepidium sativum* L. on renal glucose reabsorption and urinary TGF-beta 1 levels in diabetic rats, 2008; 22(1): 1-3.
6. Ketchen EE, Porter WE, Bolton NE. The biological effects of magnetic fields on man. Am Ind Hyg Assoc J. 1978; 39: 1
7. Cook SD, Barrack RL, Santman M, Patron LP, Salkeld SL, Whitecloud TS. The Otto Aufranc Award. Strut allograft healing to the femur with recombinant human

- osteogenic protein-1. Clin Orthop Relat Res. 2000;381:47–57.
8. Ripamonti U. Bone induction by recombinant human osteogenic protein-1 (hOP-1, BMP-7) in the primate *Papio ursinus* with expression of mRNA of gene products of the TGF-beta superfamily. J Cell Mol Med. 2005;9:911–928.
9. Han ZB, Chen LP, Yang XZ. Experimental study of fracture healing promotion with mechanical vibration in rabbits [in Chinese] Chung Hua Wai Ko Tsa Chih. 1994;32:215–216.
10. Diebert MC, McLeod BR, Smith SD, Liboff AR. Ion resonance electromagnetic field stimulation of fracture healing in rabbits with a fibular osteotomy. J Orthop Res. 1994;12:878–885.
11. Bruce GK, Howlett CR, Huckstep RL. Effect of a static magnetic field on fracture healing in a rabbit radius preliminary result. Clin Orthop Related Res. 1987;222:300–305.
12. Ageel AM, Tariq M, Mossa JS, Al-Yahya MA, Al-Said MS. Plants Used in Saudi Folk Medicine. Riyadh, Saudi Arabia: KACST, King Saud University Press; 1987. 245–415.
13. Qudamah A. Dictionary of Food and Treatment by Plants. Beirut: Dar Alnafaes; 1995. pp. 241–244.
14. Czimmer G, Szabo LG. Therapeutical effect and production of garden cress (*Lepidium Sativum* L) Gyogyszerezset. 1988;32:79–81.
15. Ahsan SK, Tariq M, Ageel M, Al-Yahya MA, Shah AH. Studies on some herbal drugs used in fracture healing. Int J Crude Drug Res. 1989;27:235–239.
16. Ricciardi L, Perissinotto A, Dabala M. Mechanical monitoring of fracture healing using ultrasound imaging. Clin Orthop. 1993; 293:71–76.
17. Cunningham JL, Kenwright J, Kershaw CJ. Biomechanical measurement of fracture healing. J Med Eng Technol. 1990;14:92–101.
18. Muir P, Markel MD, Bogdanske JJ, Johnson KA. Dual energy X-ray absorptiometry and force-plate analysis of gait in dogs with healed femora after leg lengthening plate fixation. Vet Surg. 1995;24:15–24.
19. Hulth A. Current concepts of fracture healing. Clin Orthop Related Res. 1989;249:265–284.
20. Pennig D. The biology of bones and of bone fracture healing. Unfallchirurg. 1990;93:488–491.
21. Kolodziejcki J, Mruk-Luczkiwicz A, Mionskowski H. Physicochemical investigations on the oil from seeds of genus *Lepidium* L. Cruciferae. Diss Pharm Pharmacol. 1969;21:235–239.
22. Burghardt H, Brunner H, Oelmuller R, Lottspeich F, Oster U, Rudiger W. Natural inhibitors of germination and growth, VII synthesis of Ribulosebiphosphate carboxylase in darkness and its inhibition by Coumarin. Z Naturforsch [C] 1994;49:321–326.
23. Koropp K, Volkmann D. Monoclonal antibody CRA against a fraction of action from Cress roots recognized its antigen in different plant species. Eur J Cell Biol. 1994;64:153–162.
24. Iori R, Rollin P, Streicher H, Thiem J, Palmieri S. The myrosinase-glucosinolate interaction mechanism studied using some synthetic competitive inhibitors. FEBS Lett. 1996;385:87–90.
25. Giussani A, Heinrichs U, Roth P, Werner E, Schramel P, Wendler I. Biokinetic studies in humans with stable isotopes as tracers. Part 1: a methodology for incorporation of trace metals into vegetables. Isotopes Environ Health Stud. 1998;34:291–296.
26. Patel MM, Chauhan GM, Patel LD. Mucilages of *Lepidium Sativum*, *Linn* (Asario) and *Ocimum Canum* Sims (Bavchi) as emulgents. Indian J Hosp Pharm. 1987;24:200–202.
27. Wendt L, Meler J. Rheological study of pharmaceutical emulsions containing mucilage from the seeds of garden Cress instead of gum arabic. Farm Pol (Farmacja-Polska) 1988;44:87–91.
28. Pollak D, Floman Y, Simkin A, Avinezer A, Freund HR. The effect of protein malnutrition and nutritional support on the mechanical properties of fracture healing in the injured rat. J Parenter Enteral Nutr. 1986;10:564–567.
29. Delgado Martinez AD, Martinez ME, Carrascal MT, Rodriguez Avial M, Munuera L. Effect of 25-OH vitamin D on fracture healing in elderly rats. J Orthop Res. 1998;16:650–653.
30. Lindgren JU, DeLuca HF, Mazess RB. Effects of 1, 25 (OH) 2D3 on bone tissue in the rabbit: studies on fracture healing, disuse osteoporosis and prednisolone osteoporosis. Calcif Tissue Int. 1984;36:591–595.
31. The Plant List: A Working List of All Plant Species, retrieved 8 May 2016
32. Cassidy, Frederic Gomes and Hall, Joan Houston. Dictionary of American regional English, Harvard University Press, 2002. Page 97. ISBN 0-674-00884-7, ISBN 978-0-674-00884-7
33. Staub, Jack E, Buchert, Ellen. 75 Exceptional Herbs for Your Garden Published by Gibbs Smith, 2008. ISBN 1-4236-0251-X, 9781423602514
34. Vegetables of Canada. Published by NRC Research Press. ISBN 0-660-19503-8, ISBN 978-0-660-19503-2
35. Boswell, John T. and Sowerby, James. English Botany: Or, Coloured Figures of British Plants. Robert Hardwicke, 1863. Page 215.
36. Vegetables of Canada. NRC Research Press. ISBN 0-660-19503-8, ISBN 978-0-660-19503-2
37. Hirsch, David P.. The Moosewood Restaurant kitchen garden: creative gardening for the adventurous cook. Ten Speed Press, 2005. ISBN 1-58008-666-7, ISBN 978-1-58008-666-0
38. http://www.organicindia.com/PR_OH_chandrashoor.php
39. The Wealth of Indian Raw Materials,. New Delhi: Publication and information Directorate. 1979. pp. CSIR Vol 9, Page 71–72.