

## A Brief Note on *Lepidium sativum* L.: A Review

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**Abstract:** A review of *Lepidium sativum* was conducted with the objective of briefing generation information about the plant. Hence, the origin, distribution, botany and genetic diversity are noted based on available beneficial literature. Besides, the economic parts, cultivation practices, productivity and benefits of the plant are also broadly discussed in this paper. Based on the works of literature, we understood that *Lepidium sativum* is a historical plant with good background and that can contribute a lot in the future in the areas of traditional and modern medicines for the growing world population. It was reported that *Lepidium sativum* is also used as a dietary supplement nutritional and it is a plant whose leaves can be harvested and used within a month, seeds can be collected and obtained within 90 days after sowing and essential oil used for various purposes. The presence of genetic variability in *Lepidium sativum* is also considered an opportunity.

**Key words:** Fetto or Garden Cress • Medicinal Value • Nutritive Value

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### INTRODUCTION

*Lepidium sativum* is one of the forgotten and underutilized medicinal and nutritionally important plants in many parts of the world. However, the plant is versatile and used for various purposes globally. Global population grows together with the increase in food and medicine need of the growing population formed special agricultural practices attention towards crops of short growing period and also valuing traditional medicinal practices. *Lepidium sativum* is believed to be a short growing crop with food and medicinal values. It has nutritional importance and antimicrobial activities. But, it is hard to get information on production, productivity and improvement efforts with respect to the plant. Therefore, the concern of this review paper is to collect summaries and provide relevant information about the *Lepidium sativum* for producers, consumers, researchers and students.

**Origin and Distribution of *Lepidium Sativum*:** *Lepidium sativum* is annual medicinal plant from the brassicaceae family [1]. It is known by various names like common cress (English) and Fetto (Amharic). *Lepidium sativum* is believed to be originated from the highland regions of

Ethiopia and Eritrea [2, 3] and then, distributed to various parts of the world. However, others reported that it was originated from southwest Asia and then spread to Western Europe [4]. Currently, *Lepidium sativum* (Garden cress or Fetto) is commonly known in different parts of the world for its medicinal uses and food substances [5, 6].

**Botanical Descriptions of *Lepidium Sativum*:** *Lepidium sativum* (Garden cress or Fetto) is a fast-growing erect, branched, edible herb that broadly related to mustard [7]. The presence of both diploid forms ( $2n = 2x = 16$ ) and tetraploid forms ( $2n = 4x = 32$ ) in Garden cress or Fetto was written by Bhat *et al.* [3] cited [8]. It is annual herbaceous plant that grows up to 60cm height and possesses little white flowers in long racemes [6, 9]. The pods of *L. sativum* are obovate, rotundate, elliptic, irregular at apex emarginated and winged [10]. Its leaves are long at the bottom of the stem and small green feather-like leaves arranged on the opposite side of its stalk at the top. They could differ a bit in shape but not in taste. They are irregularly pinnate, alternate, up to 12cm X 9cm with a petiole up to 4 cm long. Leaflets are opposite, in outline ovate or ovate-lanceolate, glabrous (hairless, smooth), 1.5-8.0 to 1.5-3.0 cm or larger and thin [4].

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The flowers are bisexual, regular, 4-merous, pedicel 1.5–4.5 mm long, ascending; sepals are ovate, 1–2 mm long; petals are spatulate with the short claw, up to 3 mm long, white or pale pink; anthers are usually purplish. The fruits are globule, 1.2 cm across and purple-black with hard ribbed endocarp. Seeds are small in size, oval-shaped, pointed and triangular at one end, smooth, about 2-3 mm long, 1-1.5 mm wide, reddish-brown, have peppery, pungent taste [9]. And seedling with epigeal germination; cotyledons 3-foliolate, leaflets spatulate, lateral ones smaller than central one [4, 6].

**Genetic Diversity of *Lepidium Sativum*:** Genetic diversity is the basis for the survival of plants in nature and for crop improvement [7]. Diversity in plant genetic resources provides the opportunity for plant breeders to develop new and improved cultivars with desirable characteristics, which include both farmer-preferred traits (high yield potential, large seed, etc.) and breeder-preferred traits (pest and disease resistance and photosensitive) [11]. Different methods, like morphological and molecular, are applied to detect diversity studies. The genus *Lepidium* is made up of about 150 species and the species *L. sativum* (Garden cress or Fetto) has been divided into three botanical varieties as *Vulgare*, *Crispum* and *Latifolium* based on the morphology of the leaf, stem and root. In their study, Bedassa *et al.* [12] classified 49 Ethiopian accessions into seven distinct groups, mainly based upon morphologic traits. Such a similar classification is simple, reliable and aids to evaluate not only the patterns of genetic variation but also the paths of developing target traits such as yield. Said and Kassahun [13] reported the presence of higher genetic diversity of *Lepidium sativum* in Ethiopia. The obtained information can be useful to identify groups of accessions that have desirable traits for different targets including crossing, planning germplasm collecting efforts, establishing core collections, revealing the structure of variation and studying some aspects of crop evolution.

**Economic Yield of *Lepidium Sativum*:** The economic yields of the *Lepidium sativum* (Garden cress or Fetto) plant vary among geographical, cultural and spiritual variations. The seeds, leaves, essential oil and roots of the plant are the important yields that the plant can contribute to the world. In Ethiopia seed is the economic yield which is similar with that of India where the plant cultivated mainly for its seeds [3].

**Cultivation and Productivity of *Lepidium Sativum*:** *Lepidium sativum* (Garden cress or Fetto) can grow in any

type of climate and soil condition and with less agricultural inputs [7]. It can tolerate slight acidity. Its easy cultivation and tolerance to different environmental conditions gave it the ability to spread all around the world [4]. Garden cress or Fetto land-races have been grown in teff field in Ethiopia and need no special treatments that relate to disease, insects and water like that of other Cruciferae plants. *Lepidium sativum* (Garden cress or Fetto) is an easily grown plant with few requirements. It can be cultivated for seeds and edible leaves and the cultivation practices vary depending on the objective of the cultivation. For seed yield, the plant stays a long time in the field that can extend up to 90 days from sowing and needs different field management practices [8]. For instance, a spacing of 15cm between rows and 10cm between plants was reported for edible leaves production [14]. The seed sprouts four or six days after sowing depending on the season and the leaves are ready for consumption after two or three weeks. Besides, Bhat *et al.* [3] reported maximum seed yield per hectare (1.85 t) using a spacing of 30 cm x 10 cm. In Ethiopia, it is not commonly cultivated using separate farm plots rather planted along the Teff field and backyard as a border crop. It is planted for its seeds used for medicine for humans and animals and the productivity is not well-known hitherto in the country.

**Potential Benefits of *Lepidium Sativum*:** Garden cress or Fetto is an ancient herb that has been distributed and widely consumed among different continents in various aspects.

**Health Benefits of *Lepidium sativum*:** The seeds have been considered a very useful medicinal plant and used as a medicine in the Ayurvedic System of Medicine since the Vedic era [15]. The seeds of the plant are rubefacient, galactagogue, emmenagogue, laxative, tonic, aphrodisiac and diuretic [16]. They are used in poultices for hurts and sprains [17, 18]. Garden cress or Fetto seed is reported to exhibit anti-rheumatic [19] and bronchodilatory potential [20]. The paste of the garden cress of Fetto seeds is applied in rheumatic joints to relieve the pain and swelling. It is also useful in hiccup, dysentery, diarrhea and skin disease caused by impurities of blood [21, 22]. According to Toxicology studies of Garden cress (*Lepidium sativum*) seeds revealed that it can be considered non-toxic and safe. Seeds show many medicinal properties such as antidiabetic, hypocholesterolemic, antihypertensive, antidiarrheal, antispasmodic [2], anti-inflammatory, antipyretic and analgesic activities [23].

It also has hepatoprotective [24], fracture healing, diuretic, nephrocurative, nephroprotective [24], galactagogue and used in breast cancer [25]. Ethanol extracts of Garden cress or Fetto seeds were effective in treating inflammatory bowel disease. Salih and Kadhim [26] reported the possibility of using *Lepidium sativum* extracts for making chewing gum against oral pathogens. Besides, good antibacterial effects of *Lepidium sativum* ethanol and aqueous extracts against some gram-positive and gram-negative bacteria were reported [27]. Besufekad *et al.* [28] also reported the antibacterial effects of *Lepidium sativum* ethanol extracts against pathogenic bacteria. The effectiveness of the methanolic extracts of *Lepidium sativum* seeds against animal trypanosomiasis which is a catastrophic parasitic protozoan disease determined. In addition, the traditional trends of using *Lepidium sativum* for fracture healing in Ethiopia were scientifically proved by using the methanolic and aqueous extract of *Lepidium sativum* seeds on the fracture healing property [29, 30]. Traditional sweets for lactating mothers are prepared from the Garden cress or Fetto seeds [31]. The plant is one of the best medicinal plants recognized in African countries. The root is used in secondary syphilis and tenesmus [7].

**Nutritional Benefits of *Lepidium sativum*:** Agarwal and Sharma [32] reported that garden cress seeds were good sources of macro (protein and fat) as well as micro (iron, calcium and phosphorous) nutrients. The leaves of garden cress plant are consumed raw in salads, also cooked with vegetable curries and used as garnish. Garden cress or Fetto seeds are high with macro and micronutrients. The seeds are high in calories (454 kcal) having 25 gram protein, 24 gram fat, 3 gram dietary fibre and 33gram of carbohydrates per 100gram and also has significant amount of minerals viz., 377 mg of calcium, 430 mg magnesium and 723 mg of phosphorous and sufficient amount of vitamins, mainly niacin (14.3 mg), riboflavin (0.61 mg) and thiamine (0.59 mg) and per 100g seeds [33, 34]. Garden cress or Fetto (*Lepidium sativum*) seeds are rich source of proteins, dietary fiber, minerals and essential amino acids and in iron content. Iron rich supplements are suitable for improving iron status in body. It contains phenolic compounds which might be responsible for its strong antioxidant capacity. It is the highest iron containing plant source ever known, about 100 mg/100g of iron is present in garden cress seeds having a better bioavailability [35]. The plant is used as fodder for horses and camels [21]. It is supplemented in the diet of lactating women to increase the milk secretion

during post natal period [36, 37]. *Lepidium sativum* seeds used for several food formulations and health drink preparations [38].

According to Shawle *et al.* [39], Garden cress or Fetto can be included as feed additive at a level of 0.75 % in the total ration for better and positive results on biological performance and health status of broilers. Many authors also reported the importance of dietary supplement of *Lepidium sativum* and its effect in reducing cholesterol level in advance. Sat *et al.* [40] confirmed that Garden cress or Fetto is potential source for alternative dietary supplements of minerals and natural phenolic antioxidants as it has a high P, K, Ca, Mg and Na content.

## CONCLUSION

Garden cress or Fetto is a versatile annual medicinal plant that has high potential in treating various health-related problems. It will use beneficial for both traditional practitioners and modern pharmaceutical industries. In a world where the populations, as well as new and emerging diseases are, being increased likes COVID-19, Garden cress or Fetto can be an excellent source of medicine. The plant products also have nutritional benefits as they constitute important minerals and vitamins. However, for sustainable use of the plant good conservation, variety improvement and research-extension linkage strategies should be set and practiced intensely.

## REFERENCES

1. Zhan, L.J., E. Fontane, G. Tibaldi and S. Nicola, 2009. Qualitative and physiological response of minimally processed garden cress (*Lepidium sativum* L.) to harvest handling and storage conditions. J. Food Agric. Environ., 7: 43-50.
2. Juma, A.B.H., 2007. The effects of *Lepidium sativum* seeds on fracture-induced healing in rabbits. Medscape General Medicine, 9(2): 23.
3. Bhat G.N., A.B. Mastiholi, K.N. Kattimani, E. Rajashekhar, G. Prabhling and D.L. Rudresh, 2020. Effect of spacing and biofertilizers on growth and yield of garden cress (*Lepidium sativum* L.). International Journal of Chemical Studies, 8(1): 2191-2193.
4. Falana, H., W. Nofal and H. Nakhleh, 2014. A review article *Lepidium sativum* (Garden cress). Pharm-D Program, College of Nursing, Pharmacy and Health Professions, Birzeit University, pp: 1-8.

5. Jain, T. and K. Grover, 2016. Effect of processing on nutrients and fatty acid composition of garden cress (*Lepidium sativum*) seeds. Food Chemistry, 213: 806-812.
6. Baregama, C. and A. Goyal, 2019. Phytoconstituents, pharmacological activity and medicinal use of *Lepidium sativum* linn: a review. Asian Journal of Pharmaceutical and Clinical Research, pp: 45-50.
7. Kumar, S., A. Goyal, Sheorayan, S. Kajla, O. Yadav and M. Mangal, 2012. Assessment of genetic diversity in *Lepidium sativum* using RAPD and ISSR markers. Ann. Biol., 28: 93-97.
8. Anonymous, 1972. The Wealth of Ind. Raw Materials, Publication and information Directorate, Council of Scientific Information and Research, New Delhi, pp: 71-72.
9. Vaishnavi, Gupta, R. and P. Choudhary, 2020. Botanical description of garden cress (*Lepidium sativum* L.) plant and physical characteristics of its seeds. Journal of Pharmacognosy and Phytochemistry, 9(5): 2424-2428.
10. Kaur, A., R. Kumar, S. Rani and A. Grewal, 2015. Genetic diversity analyses of *Lepidium sativum* (Chandrasur) using inter simple sequence repeat (ISSR) markers. Journal of Forestry Research, 26(1): 107-114.
11. Bhandari, H.R., A.N. Bhanu, K. Srivastava, M.N. Singh and H.A. Shreya, 2017. Assessment of genetic diversity in crop plants-an overview. Adv. Plants Agric. Res., 7(3): 00255.
12. Bedassa, T., M. Andargie and M. Eshete, 2013. Genetic variability and association among yield, yield-related traits and oil content in Ethiopian garden cress (*Lepidium sativum* L.) genotypes. Journal of Plant Breeding and Crop Science, 7(5): 141-149.
13. Said, M. and T. Kassahun, 2015. Molecular genetic diversity study of *Lepidium sativum* population from Ethiopia as revealed by inter simple sequence repeat (ISSR) markers. African Journal of Biotechnology, 14(17): 1461-1467.
14. Rangari, V., 2002. Pharmacognosy and Phytochemistry, Carrier Publication.
15. Sharma, A., 2020. A Comprehensive Review on Pharmacological Properties of Garden cress (*Lepidium sativum*) Seeds. Current Research in Pharmaceutical Sciences, 10(2): 13-18.
16. Raval, N.D. and T.N. Pandya, 2009. Clinical trial of *Lepidium sativum* Linn (Chandrashura) in the management of Sandhivata (osteoarthritis). AYU (An international quarterly journal of research in Ayurveda), 30(2): 153.
17. Kirtikar, K.R. and B.D. Basu, 1933. Indian Medicinal Plants, 173-175, Vol I, M/S Bishensingh Mahendra Palsingh., Dehradun.
18. Nadkarni, A.K., 1954. Indian Materia Medica. Bombay: Popular Prakashan Pvt. Ltd, pp: 736-737.
19. Ahsan, S.K., M. Tariq, M. Ageel, M.A. Alyahya and A.H. Shah, 1989. Studies on some herbal drugs used in fracture healing. International Journal of Crude Drug Research, 27(4): 235-239.
20. Mali, R.G., S.G. Mahajan and A.A. Mehta, 2008. Studies on bronchodilatory effect of *Lepidium sativum* against allergen induced bronchospasm in guinea pigs. Pharmacognosy Magazine, 4(15): 189-192.
21. Gupta, P.C., D. Pant, P. Joshi and D.R. Lohar, 2010. Evaluation of antibacterial activity of *Lepidium sativum* L. seeds against food borne pathogens. Int. J. Chem. Anal. Sci., 1: 74-75.
22. Rahimi, R., M.R. Shams-Ardekani and M. Abdollahi, 2010. A review of the efficacy of traditional Iranian medicine for inflammatory bowel disease. World Journal of Gastroenterology: WJG, 16(36): 4504.
23. Adam, S.E.I., 1999. Effects of various levels of dietary *Lepidium sativum* L. seeds in rats. The American Journal of Chinese Medicine, 27(03n04): 397-405.
24. Doke, S. and M. Guha, 2014. Garden cress (*Lepidium sativum* L.) seed an important medicinal source: A. Journal of Natural Products of Plant Resources, 4: 69-80.
25. Yadav, Y.C., D.N. Srivastav, A.K. Seth, V.D. Gupta, K.S. Yadav and S. Kumar, 2009. Nephroprotective and curative activity of *Lepidium sativum* L. seeds in albino rats using cisplatin induced nephrotoxicity. Pharmacologyonline, 3: 640-646.
26. Salih, N.M. and R.J. Kadhim, 2019. Manufacturing of Medicate Chewing Gum against Oral Pathogens by the Extract of Seeds of *Lepidium sativum* L. Advances in Environmental Biology, 13(5): 1-6.
27. Akrayi, H.F. and J.D. Tawfeeq, 2012. Antibacterial activity of *Lepidium sativum* and *Allium porrum* extracts and juices against some gram positive and gram negative bacteria. Medical Journal of Islamic World Academy of Sciences, 20(1): 10-16.

28. Besufekad, Y., S. Beri, T. Adugnaw and K. Beyene, 2018. Antibacterial activity of Ethiopian *Lepidium sativum* L. against pathogenic bacteria. *Journal of Medicinal Plants Research*, 12(6): 64-68.
29. Atasan, S.K., 1989. Studies on some herbal drugs used in fracture healing. *Int. J. Crude Drug Res.*, 27: 235-239.
30. Lii, V.D., I. Kumar, K. Palandurkar, R. Giri and K. Giri, 2020. *Lepidium sativum*: Bone healer in traditional medicine, an experimental validation study in rats. *Journal of Family Medicine and Primary Care*, 9(2): 812.
31. Abuelgasim, A.I., H.S. Nuha and A.H. Mohammed, 2008. Hepatoprotective effect of *Lepidium sativum* against carbon tetrachloride induced damage in rats. *Research Journal of Animal & Veterinary Sciences*, 3: 20-23.
32. Agarwal, N. and S. Sharma, 2013. Garden cress (*Lepidium sativum* L.) - a non conventional traditional plant item for food product. *Abu-Rumman, A.M.*, 2018. Gas Chromatography-Mass Spectrometry (GC-MS) Analysis of Extracted Oil from Whole Garden Cress (Rashaad) Seeds, 7(4): 1-8.
33. Gopalan, C., B.V.R. Sastri, S.C. Balasubramanian, B.S.N. Rao, Y.G. Deosthale and K.C. Pant, 2010. Nutritive value of Indian foods. National Institute of Nutrition Hyderabad, India. Indian Council of Medical Research (ICMR), Hyderabad.
34. Chaudhary, P. and R. Gupta, 2017. Nutritional evaluation of garden cress seeds (*Lepidium sativum*). *International Journal of Food and Nutritional Science*, 6: 35-40.
35. Chand, Y., D.N. Srivastav, A.K. Seth, S. Vipin, R. Balaraman and K.G. Tejas, 2010. *In vivo* antioxidant potential of *Lepidium sativum* L. seeds in albino rats using cisplatin induced nephrotoxicity. *International Journal of Phytomedicine*, 2: 292-298.
36. Sahsrabudde, M.B. and N.N. De, 1943. *Current Science*, 12: 23-24.
37. Shail, Manjari, D., K. Neeraj and L.N. Gupta, 2016. Nutritional importance of *Lepidium sativum* L. (Garden cress/ Chandrashoor): A Review. *Int. J. Pharmacy and Analytical Research*, 5(1): 152-160.
38. Singh, C.S. and V.K. Paswan, 2017. The potential of garden cress (*Lepidium sativum* L.) seeds for development of functional foods. *Advances in Seed Biology*.
39. Shawle, K., M. Urge and G. Animut, 2016. Effect of different levels of *Lepidium sativum* L. on growth performance, carcass characteristics, hematology and serum biochemical parameters of broilers. *Springer Plus*, 5: 1441.
40. Sat, I.G., E. Yildirim, M. Turan and M. Demirbas, 2013. Antioxidant and Nutritional Characteristics of Garden Cress (*Lepidium sativum*). *Acta Sci. Pol., Hortorum Cultus*, 12(4): 173-179.