

Garden Cress Seeds: Tiny But Mighty Nutrition Bombs

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ABSTRACT

Lepidium sativum, commonly known as garden cress, is a fast-growing herb from the cruciferous family with a rich history of traditional medicinal uses. This comprehensive review explores the various properties and applications of *Lepidium sativum* in the realms of traditional and folk medicine, with a focus on its potential pharmacological effects. The plant is utilized in daily diets, Ayurvedic medicine, and Unani systems for its diverse range of health benefits.

The article highlights the plant's traditional uses in treating ailments such as asthma, bronchitis, and rheumatism, as well as its role in promoting mental clarity and intellect. It further delves into its Ayurvedic properties, emphasizing its taste (Katu, Tikta), qualities (Raghu, Ruksha, Tikсна), potency (Usna), and therapeutic actions.

The pharmacological activities of *Lepidium sativum* are examined in detail, including its anti-diabetic effects, anti-inflammatory, antipyretic, analgesic, coagulant properties, and diuretic effects. Notably, the review explores the potential anti-cancer properties of *Lepidium sativum*, emphasizing its role in apoptosis induction and the presence of organosulfur compounds.

Furthermore, the article discusses the nutrient-rich oil derived from *Lepidium sativum* seeds, known for its ideal fatty acid composition. It explores recent studies demonstrating the preventive effectiveness of this oil, which is rich in alpha-linolenic acid and possesses a balanced ratio of omega-3 (n-3) and omega-6 (n-6) fatty acids.

In conclusion, this review provides a comprehensive overview of the multifaceted medicinal and pharmacological properties of *Lepidium sativum*, shedding light on its potential as a natural remedy for various health conditions. It underscores the need for further research to unlock the full therapeutic potential of this versatile herb.

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INTRODUCTION

Lepidium sativum is a fast-growing herb commonly referred to as garden cress from the cruciferous family. In some regions, garden cress is known as pepperweed, mustard cress, "garden pepper cress," "pepper grass," or "poor man's pepper." Garden watercress is genetically related to watercress and mustard watercress and has the same peppery, spicy taste and aroma. [1, 2].



Fig 1: garden cress seeds.



Fig 2: garden cress plant

The parts used for medicinal purposes are leaves, flowers, seeds, and oil [3 6] Different part of *L. Sativum* is also used to treat throat diseases, asthma, headaches, uterine tumors, nasal polyps, breast cancer [3] and healing bone fractures [7]. This plant has been shown to have antipyretic, analgesic, anticoagulant [3], antihypertensive [8], diuretic [9], and antiasthmatic [10] effects. In animal studies, *L. sativum* oil was found to reduce lymphocyte proliferation and the production of inflammatory mediators by peritoneal macrophages [11]. Another study found Nonconventional treatments are attractive due to their claim to counteract the problems of conventional treatments, such as high cost and serious side effects Many natural dietary agents, including vegetables, fruits, herbs, and spices have been used in traditional medicines, as non-conventional treatments, for thousands of years, but without sufficient scientific proofs. If effective, natural agents might lead to the development of natural and novel drugs with low or no side effects Numerous epidemiological, biological and clinical studie (American Cancer Society, 2010; Amin and Mousa, 2007; Anand et al., 2008; Berquin et al., 2008; Campbell et al., 2007; Cao et al., 2010; Conforti et al., 2008, 2009). Many dietary agents, such as curcumin (in turmeric) and epigallocatechin gallate (in green tea), have been shown (Berquin et al., 2008; Czene et al., 2002) to cause induction of apoptosis and cell cycle arrest in many types of cancer cells without affecting normal cells. Cruciferae or Brassicaceae vegetables, such as garden cress (*Lepidium sativum*, [*L. sativum*]), and their active ingredients have 0pbeen found to stimulate apoptosis in cancer cells (Das et al., 2000; Divisi et al., 2006; Diwakara et al., 2008), thereby killing cancer cells

specifically without harming normal healthy cells. The chemopreventive and anti-cancer effects of Cruciferous Vegetables have also been attributed to the presence of high Levels of organosulfur compounds (Diwakara et al., 2008; Johansson et al., 2003; Jourdan et al., 2007; Kaefer and Milner, 2008; Karazhiyan et al., 2009), which have been shown To exert diverse biological effects, including induction of carcinogen detoxification, inhibition of tumor cell proliferation, Free radical scavenging, induction of cell cycle arrest, and Induction of apoptosis The oil of the *L. sativum* seeds are rich in alpha-linolenic acid and contain an ideal ratio of x-3 (n-3) and x-6 (n-6) fatty acids. Kassie et al., 2002; Kassie et al., 1999. Recent studies (Kassie et al., 2002; Kassie et al., 2003; Khan et al., 2008; Matthaus and Angelini, 2005; Mc Gee et al., 2002) have demonstrated preventive effectiveness. I did. The effects of polyunsaturated, 2010). feeding Wistar rats a diet containing *L. sativum* oil for 60 days increased tocopherol levels and antioxidant enzyme activities [12].

Traditional uses Daily use:

The vegetable leaves of the garden cress are eaten raw in salads, cooked in vegetable curry and used as a side dish. When storing raw harvested watercress, care must be taken to prevent signs of stickiness, pungency or discoloration. Leaves should be left on the stem until needed for use.. [13] Ayurveda has a history of about 5000 years in India and consists of a comprehensive herbal medicine system that is currently very popular in India. It is estimated that 80% of the total Indian population uses folk medicine to treat common diseases.[16] India is a developing country with majority of population living in rural areas with basic amenities and poor healthcare facilities. The place of medicinal plants in preventing common diseases is further examined under the five core principles of the Primary Health Care (PHC) approach. [17] *Lepidium sativum*, commonly known as garden cress, is an edible herb growing to a height of 50 cm. It is well-known to mankind by several different names as Halim, Holan, Chandrasura, etc., and grows well in all types of soil and climate.[18] The plant has its origin in Egypt and South West Asia, but is now cultivated throughout the world for its seeds. It is widely used as an analgesic, anti-spasmodic, anti-diarrhoeal, galactagogue, hepatoprotective, [19] antioxidant, anti-inflammatory [20] diuretic, etc.



Fig 3: Laddu of Halim seeds



Fig 4: khir of Halim seeds

Folk medicine:

This plant is used in Indian folk medicine by tribal and rural populations to treat various ailments. The natives of Sikkim and West Bengal use this plant to treat asthma, bronchitis, dysentery, pain, pneumonia and abdominal pain [22] In the Purulia region of West Bengal, the leaves of the plant are used as an edible vegetable[21].

Unani:

The Unani system of medicine states that the seeds and leaves of *L. sativum* have diuretic, laxative and aphrodisiac properties and are recommended for inflammation, chest pain, bronchitis, rheumatism and

muscle pain. It is reported to improve mental abilities and clarify intellect (Kirtikar and Basu, 1933).

Ayurveda:

The Unani system of medicine states that the seeds and leaves of *L. sativum* have diuretic, laxative and aphrodisiac properties and are recommended for inflammation, chest pain, bronchitis, rheumatism and muscle pain. It is reported to improve mental abilities and clarify intellect (Kirtikar and Basu, 1933).

Properties and Ayurvedic Medicinal uses [2].

Rasa: Katu, Tikta

Guna: Raghu, Ruksa, Tiksna

Virya: Usna

Vipaka: Katu

Karma: Balapustivivardhana,

Vataslesmahrt

Origin:

Synonyms

Hindi - Halim, Aselio

English - Cress, Watercress

Assami – Halim-shak

Urdu – Halim

Bangali - Halim-shak

French - Cressan alenois, Passerage cutivee

Gujarat – Asaliya

Italian - Agretto, cressione

Kannada- Allibija, Kurthika

Oriya - Hidamba saga

Punjabi – Halon, Teza

k Bangali - Halim-shak

Russian - Kress-Salat

Sanskrit- chandrika, Raktabija

Spanish - Lepido, Mastuerzo

German - Gartenkresse

Marathi – Aliv

Tamil - Ativerai

Telugu - Adiyalu, Addi

The plant is primarily native to the Mediterranean region, but is widely cultivated throughout India and is now most commonly found in western India. In India, it is mainly cultivated in Utter Pradesh, Maharashtra, Gujarat, Madhya Pradesh and Rajasthan [14].

To the best of our knowledge, there are no reviews on the anti-inflammatory, antioxidant and immunomodulatory effects of *L. sativum*. The novelty of this review is that it examines the anti-inflammatory, antioxidant and immunomodulatory effects of *L. sativum* and its components in in vitro and in vivo laboratory models. However, exact origin of it is still not clear but it might be originated from the North-East Africa, most importantly from, Ethiopia, Ethiopia ,Egypt, South-West Asia. Due to

availability of a wide range of dominant *Lepidium sativum*. into the, Vavilov (1926), Ethiopia regions took it to Ethiopia that is its main centre of origin. Contains edible seeds oil having incites, appetite stimulant and anti-scorbutic medicinal properties, *Lepidium sativum* have high medicinal values such as this plant has several medical implications as a human skin disorder, livestock drench for stomach-disorders, sunburn, amoebic infection thus applied on skin as insect-repellant. Additionally, it is also utilized by the soldiers for the warmth feeling at night and for cramps in stomach [15]

Common species of *Lepidium*

1. *Lepidium draba*

It is found as a cultural weed in Punjab. It is found in Persia, Mesopotamia, the Caucasus, Europe and the Mediterranean region. The plant is said to have anti-malarial properties and will cause bleeding if consumed raw. The seeds are used as a remedy for flatulence, if seven or eight seeds are taken at a time. In Waziristan it is used as a tonic and stomach tonic and in Europe also as an antimalarial. The fruit has a horizontally elongated tip. All values without wings[10]



Fig 5: *Lepidium draba*

2. *Lepidium crassifolium*:

It is found in Balochistan and the eastern region, spreading throughout Europe. The seeds are prescribed internally for the treatment of rheumatism

and dropsy. The plant is used as a medicine to treat rheumatism. The fruit shell is elliptical, ovoid, with a point, except for winged values, and the leaves are fleshy.



Fig 6: *Lepidium crassifolium*

3. *Lepidium latifallum*:

It is found in Kashmir. It is distributed in Europe and North and West Asia. The plant has antiseptic and anti-infective effects. It is used in skin diseases. The fruit shell is elliptical, egg-shaped, the entire head, leaves and roots are wingless and fleshy.





Fig 7: Lepidium latifallum

4. Lepidium Ruderale:

It is found in Kashmir at altitudes ranging from 7,000 to 3,000 feet. It extends through the eastern regions to Europe. This also happens in Australia. The plant is used in impetigo.



Fig 8: Lepidium Ruderale

5. Lepidium perfoliatum:

It is found in Balochistan and Afghanistan, from where, through the eastern region, it extends to southern Europe. In Europe, this herb is often considered a useful antimalarial medicine [11,12.]



Fig 9: Lepidium perfoliatum:

Pharmacological activity of Lepidium sativum:

Anti-diabetic effect of Lepidium sativum:

Aqueous extract of watercress has been demonstrated to have hypoglycemic effects independent of insulin secretion. Oral administration (15-20 seeds per day) significantly reduced blood glucose levels during chronic and acute treatment without affecting insulin

secretion. Supplementation with legume extract has been shown to significantly reduce glucose, creatinine, and alkaline phosphatase levels. My elevated cholesterol levels have almost returned to normal. Additionally, malondialdehyde levels were significantly reduced compared to diabetic controls.

Anti-inflammatory, Anti-pyretic, Analgesic and Coagulant effect of *Lepidium sativum*:

Ethanol extract of *Lepidium sativum* seeds has been studied for its anti-inflammatory, antipyretic, analgesic and coagulant activities. Additionally, the toxicity test results showed that no side effects or side effects occurred when the extract was administered orally at a single dose of 0.5 to 3 g/kg.

Mouse mortality; In contrast, animals treated with ethanol extract (100 mg/kg) in drinking water for 3 months showed no signs of toxicity except for a statistically non-significantly higher mortality rate. These

Results show that *Lepidium sativum* seeds have significant anti-inflammatory, antipyretic, analgesic and coagulant activities [24].

diuretic effect of *lepidium sativum*:

Aqueous and methanolic extracts of *L. sativum* showed a dose-dependent increase in urinary excretion. The maximum increase in urinary excretion was observed at a dose of 100 mg/kg compared to the aqueous extract.

The methanol extract (100 mg/kg) increased the urine output of the group by 41.05%, compared to 49.89%.

Specific conductivity, a measure of the ionic content of urine, increased dose-dependently in all cases.

Extract treatment group. Therefore, the diuretic effect of both extracts is manifested by an increase in both water excretion and excretion.

Sodium and potassium[25]

Effect of *lepidium sativum* on cancer,

Nonconventional treatments are attractive due to their claim to counteract the problems of conventional treatments, such as high cost and serious side effects. Many natural dietary agents, including vegetables, fruits, herbs, and spices have been used in traditional medicines, as non-conventional treatments, for thousands of years, but without sufficient scientific proofs. If effective, natural agents might lead to the development of natural and novel drugs with low or no side effects. Numerous epidemiological, biological and clinical studies (American Cancer Society, 2010; Amin and Mousa, 2007; Anand et al., 2008; Berquin et al., 2008; Campbell et al., 2007; Cao et al., 2010; Conforti et al., 2008, 2009). Many dietary agents,

such as curcumin (in turmeric) and epigallocatechin gallate (in green tea), have been shown (Berquin et al., 2008; Czene et al., 2002) to cause induction of apoptosis and cell cycle arrest in many types of cancer cells without affecting normal cells. Cruciferae or Brassicaceae vegetables, such as garden cress (*Lepidium sativum*, [*L. sativum*]), and their active ingredients have been found to stimulate apoptosis in cancer cells (Das et al., 2000; Divisi et al., 2006; Diwakara et al., 2008), thereby killing cancer cells specifically without harming normal healthy cells. The chemopreventive and anti-cancer effects of Cruciferous Vegetables have also been attributed to the presence of high levels of organosulfur compounds (Diwakara et al., 2008; Johansson et al., 2003; Jourdan et al., 2007; Kaefer and Milner, 2008; Karazhiyan et al., 2009), which have been shown to exert diverse biological effects, including induction of carcinogen detoxification, inhibition of tumor cell proliferation, free radical scavenging, induction of cell cycle arrest, and induction of apoptosis. The oil of the *L. sativum* seeds are rich in alpha-linolenic acid and contain an ideal ratio of ω -3 (n-3) and ω -6 (n-6) fatty acids. Kassie et al., 2002; Kassie et al., 1999. Recent studies (Kassie et al., 2002; Kassie et al., 2003; Khan et al., 2008; Matthaus and Angelini, 2005; Mc Gee et al., 2002) have demonstrated preventive effectiveness. I did. The effects of polyunsaturated, 2010).

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