International Journal of Science and Research Methodology (IJSRM)
Volume 28, Issue 4, April 2025 ijsrm.humanjournals.com ISSN: 2454-2008

Therapeutic Potentials of Jirjeer Seeds (*Eruca sativa Linn*) in Skin Disorders: A Review

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Received: 2025-4-01 Revised: 2025-4-10 Accepted: 2025-4-19

ABSTRACT

Jirjeer (*Eruca sativa*) is a well-known Unani drug used since centuries in a number of pathological conditions including skin diseases. Its therapeutic uses have been described in classical Unani literature. Jirjeer is a widely used medicinal plant. Eruca sativa is an annual leafy oilseed plant growing up to 80 cm tall. It has three types: one with rough leaves, stems, and white seeds; another, called "*Tarah Tezak Shahi*" in Persian, with larger leaves, red flowers, and reddish seeds; and a third with smaller leaves and seeds, considered the finest. The plant's stem leaves are smaller with a pungent taste, while its bisexual white flowers with purple veins are large but few (2-3 cm). Its cylindrical fruit has a 3-4 mm flattened beak, and its pale brown to olive green seeds (1.5-2 mm) are arranged in 2-3 rows. It is cultivated in Mediterranean region coast, also grow in Middle-East, South Asia, North Africa, Iran, Pakistan and India. In India it is cultivated in Haryana, Punjab, Uttar Pradesh, Madhya Pradesh and Delhi. The results of various scientific studies showed that Jirjeer possesses anti-oxidant, anti-fungal, anti-inflammatory, anti-hypertensive, hepatoprotective, and other properties. Compounds like *Namak-e-shaikh-ur-raees, Laboob-e-sagheer* are prepared using Jirjeer. Keeping in view the high medicinal importance of the drug in Unani medicine, the present review provides available information on traditional uses and pharmacological properties of Unani drug Jirjeer.

Keywords: Unani medicine, Jirjeer, Tukhme Tarah Tezak, Erucic acid, Skin diseases

INTRODUCTION

Medicinal plants have been used worldwide for therapeutic purposes to treat various diseases, making them one of the oldest and safest methods for managing health conditions. Additionally, they play a crucial role in the production of herbal medicines, which are generally considered safer than modern allopathic treatments. With only a limited number of species having been extensively studied for their medicinal properties, mechanisms of action, safety, and toxicity, many researchers are now focusing on exploring the potential of these plants. Among the many promising medicinal plants, *Eruca Sativa* (Family Brassicaceae) stands out as a versatile herb. Numerous studies have highlighted its extensive pharmacological potential, making it an increasingly valuable plant in medicine.

Jirjeer is an annual herb cultivated as a field crop, for the oil expressed from the seed.[1] It is commonly known as rocket plant, and is a member of mustard (Brassicaceae) family.[1-3] It is about 1-1.5 feet long and is widely grown all over the world. It is traditionally used for various therapeutic purposes. Eruca sativa is a member of Mustard family, originated in Mediterranean region coast, also grow in Middle-East, South Asia, North Africa, Iran, Pakistan and India.[4] In India it is cultivated in Haryana, Punjab, Uttar Pradesh, Madhya Pradesh and Delhi.[1,5,7] For medicinal purpose, the plant should be gathered when in flowering, and for eating before flowering.[5]

The airy tender fresh parts of plant were used in salad, also as spice, and as a medicinal remedy for various diseases. Seeds are rich in oil (Taramira oil), which are used for cooking in the place of mustard oil for better taste. It contains Erucic acid as a major component. Conventionally, the plant consumed as tonic, rubefacient, astringent, digestive, laxative, emollient, stimulant, stomachic, scurvy, aphrodisiac and diuretic.[3-4]

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Volume 28, Issue 4, April 2025 ijsrm.humanjournals.com ISSN: 2454-2008

Taxonomical classification of *Eruca sativa* [3,6]

Kingdom	Plantae
Subkingdom	Tracheobionta
Subdivision	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Rosidae
Order	Brassilcales
Family	Brassicaceae
Genus	Eruca
Species	Eruca sativa

VERNACULAR:[1,4-5,7-9]

Botanical name	Eruca sativa Mill
English	Rocket
Arabic	Jirjeer
Urdu	Taaramiraa
Ayurvedic	Tuvari, Tuvarikaa, Shveta-sursaa, Bhutaghna, Daradharsha, Siddaartha
Unani	Jirjeer, Taramiraa
French	Roquette
Sanskrit	Bhutagna, Siddartha
Bengal	Shwetsursha
North-western	Duan, Tara, lalu, sahwan, Taramira
Punjabi	Assu, Tara, Jumba, Usan
Persian	Tarah Tezak
Sindhi	Aharyu
Hindi	Taramira
Spanish	Oruga, Roqueta

Also known as “cultivated” rocket, “annual” rocket, “true” rocket, arugula, roquette, “white pepper”, or taramira

Fig No. 01: Jirjeer Plant[10]

Fig No. 02: Jirjeer Seeds[10]

MORPHOLOGY

Macroscopic features:

Eruca sativa is an annual herbaceous leafy oilseed plant, rising up to 80cm height.[3] There are three types of garden arugula. The first type is like radish with stems, and its leaves are rough. Its seeds are white. The second type doesn't have stems, and its leaves are larger with red flowers. Its seeds are reddish and long, and its flavour is milder. This type is known as "*Tarah Tezak Shahi*" in Persian. The third type has smaller leaves and seeds compared to garden arugula and is often referred to as the best quality and finest arugula. This type is considered the most superior among them.[2,8]

Leaves found along the stem are smaller and have pungent or spicy flavour. Flowers are bisexual, white in colour with purple veins, large in size, less in number, 2-3cm in diameter. Fruits are cylindrical in shape with flattened beak 3-4mm long. Seeds are ovoid or spherical extended from 1.5-2mm, pale brown to olive green shade, and set in 2-3 rows on either side.[3]

Microscopic features:

Transverse section of seed shows outer seed coat consisting of single layer of thin walled cuticularized epidermis filled with mucilage, followed by a single layer of thin-walled hypodermal cells, palisade-like cells consisting of single layer of thick-walled elongated cells filled with reddish brown contents. Inner seed coat consisting of single layer of less thickened cells with cell contents. Cotyledons, large consisting of oval to polygonal moderately thick-walled parenchyma cells filled with aleurone grains and oil. Powdered seeds show the presence of lignified cells, calcium oxalate crystals and starch grains.[11]

UNANI DESCRIPTION

Hasase mustamila **(Parts used):** Seeds, leaves and oil[7-8]

Mizaj **(Temperament):**

Harr Yabis[7]

2^0 *Harr* 2^0 *Yabis* [8,12-13]

3^0 *Harr* 3^0 *Yabis* [9]

Af'aal **(Therapeutic actions):**[4,8-9,13-14]

Jaali (Detergent), *Mufatteh-e-sudad* (Deobstruent), *Musakkin-i-Alam* (Analgesic), *Muhammir* (Rubefacient), *Mulattif* (Demulcent), *Hazim* (Digestive), *Muqqawwi-e-bah* (Aphrodisiac), *Muwallid-e-mani* (Spermatogenic), *Daf-e-sumoom* (Antidote for poision), *Kasir-e-riyah* (Carminative), *Muddir-i-bowl* (Diuretic), *Mudirr-e-hayd* (Emmenogogue), *Mulaiyyan* (laxative), *Muzliq-e-mani* (Lubricant), *Muddir-e-shir* (Galactogogue) and *Mufattit-i-hasah* (Lithotriptic).

Istemalat **(Uses):**[2,8-9,12-13,15]

Kharish (Itching), *Bahaq aswad* (Pityriasis nigra), *Kalaf* (Melasma), *Basur labniya* (Acne vulgaris), *Bars* (Vitiligo), *Namash wa Barash* (Naevus/ Freckles), *Mohsin-e-laun* (Improve fairness), *Imbat-e-sha'ar / Moalid-e-sha'ar* (Hair re-growth), *Taqshur-e-azfar* (Nail fissure), *Suda-e tihal wa jigar* (Liver and spleen obstruction), *Daf-e-sumoom* (Antidote for mongoose), *Muharrik-e-bah* (Increase sexual power), *Usr-ul-baul* (Dysuria), *Zahir* (Dysentery), *Ehtebas-e-tams* (Amenorrhea), *Hasat-e-kulya* (Kidney stone), *Mussamin-e-badan* (Increase musculature).

Nafa-e-Khas: **(Main Function):** *Muqawwi-e-bah* (Aphrodisiac)[9,13]

Muzir **(Adverse effect):**

Dard-e-sar (Headache)[12,14,16], *Zouf-e- basar* (Decrease eye-sight),[12-14] for Hot temperament,[9] *Josh-e-khoon*.[13-14]

***Musleh* (Corrective):**

Khurfa, Kasni,[12-13] *Kahu, Kasni, Khurfa* (for hot temperament),[8,14,16] Fresh milk (*Josh-e-khoon*),[13-14] *Badam* (Decrease eye-sight), *Isapghol* (Headache).[14]

***Badal* (Substitute):**

Husn-e-yusuf burnt[9], *Tukhm-e-gajar,*[13-14,16] *Todri,*[12-14,16] *Tukhm-e-gandna*,[16] *Tukhm-e-pyaaz*,[13-14] *Tukhm-e-haloon*,[14] *Habul rashad.*[8]

***Miqdaar* khurak (Dosage):** 1-2gms[7],1-3gms[9]

***Murakkabat* (Compound formulations):** *Namak-e-shaikh-ur-raees, Laboob-e-sagheer*[9,15]

Biochemical Constituents:

It contains Erucic acid (major content), oleic acid, linoleic acid, saturated fatty acids (myristic acid, palmitic acid, stearic acid, linoleic acid, linolenic acid, erucic acid, and oleic acid) and volatile oil (myristicin, terpineol, apiole, cis-verbenol, and β-phellandrene). Seeds having active constituents such as cardiac glycosides, flavonoids, polyphenols, glucosinolate, glucoerucin, vitamin C, saponins and tannins and carotenoids. It is a rich source of minerals and electrolytes in leaves are phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sodium (Na), iron (Fe), copper (Cu), manganese (Mn), and zinc (Z).[3,17]

Reported Pharmacological activities:

1. Antioxidant effect:

E. sativa flower extract is a potent antioxidant, with phenolic concentrations in the leaves being six times higher than in the stems of rocket. The seed extract also contains substantial levels of phenolics, which are recognized as natural antioxidants due to their free radical scavenging or quenching abilities.[3]

2. Antibacterial effect:

E. sativa seed extract has a potent antimicrobial activity, considering it as a promising antibacterial agent against resistant gram-negative (G-ve) and gram-positive (G+ve) bacteria, which confirm its use as a remedy in traditional medicine for the management of urinary, skin infections, fever, and diarrhoea. The bioactive compounds, erucic acid, and isothiocyanates are responsible for antibacterial effect.[18]

3. Antifungal effect:

Rocket leaf oil, extracted by steam distillation has significant antifungal effect. Powdered seeds of E. sativa demonstrate antifungal effect. Crude aqueous seeds exhibited strong powerful antifungal effect against the fungus Spadicoides stoveri and Paecilomyces variotii while insignificant inhibition against other fungal strains.[19]

4. Anti-inflammatory and Antiedema effect:

Rocket seeds are used traditionally for the management of rheumatoid arthritis. The anti-inflammatory effect of the seeds is possibly mediated by flavonoids such as quercetin and isorhamnetin, as well as by 4-methylthiobutyl isothiocyanate, the main isothiocyanate found in seeds. 4-methylthiobutyl isothiocyanate inhibits the expression of pro-inflammatory genes, tumour necrosis factor-alpha, and some other interleukins (ILs).[20]

5. Effect on fertility:

Rocket was recognized as a powerful aphrodisiac remedy. Ethanolic extract of E. sativa was reported to have an androgenic action or induce testicular steroids production which stimulates the preputial gland, as well it enhances spermatogenesis in the male mice testis.[4]

6. Hepatoprotective effect:

E. sativa leaves and seeds notably restore non-protein sulfhydryl levels in liver tissue, aiding liver and immune function. The potential hepatoprotective effect of ethanolic rocket extract may be linked to the inhibition of the cytochrome P450 oxygenase enzyme system, along with glucoerucin, the primary glucosinolate in rocket, which exhibits both direct and indirect antioxidant effects, as well as the ability to decompose hydroperoxides and H2O2.[4]

7. Hyperlipidaemic effect:

E. sativa leaf extract possesses anti-hyperlipidaemic and anti-hypercholesterolemic effects. E. sativa leaves contain vitamin C, which promotes plasma cholesterol conversion into bile acid, as a result subsequent decrease in serum cholesterol levels, additionally the capacity of the vitamin C to prevent the oxidation of high-density lipoprotein.[3]

8. Antihypertensive effect:

Rocket extract also directly affects vascular smooth muscle in rats. Crude extract and, especially, ethyl acetate fraction are loaded with flavonoids and phenols. Erucin (also major component of rocket) is produced from sulforaphane metabolism. Sulforaphane is known with potential hypotensive effect, so the antihypertensive effect is possibly due to quercetin, erucin, and other rocket constituents.[21]

9. Antidiabetic effect:

Rocket seeds and leaves ameliorate hyperglycaemia and produce antidiabetic effect. E. sativa seed oil has powerful antihyperglycemic and antihyperlipidemic actions in streptozotocin (STZ)-induced diabetic rats. High glucose concentration yields reactive oxygen species (ROS) due to autoxidation, metabolism of glucose, and the development of advanced glycosylation end products.[22]

CONCLUSION

The seeds of Jirjeer have been used since times unknown to treat wide range of diseases. Jirjeer seeds can be used in many skin problems. It has been subjected to phytochemical, experimental and clinical investigations and studies have established its anti-oxidant, anti-bacterial, anti-fungal, anti-inflammatory and anti-edema effect. Many scientific studies have proved the claims of traditional medicine. However, further detailed clinical researches have to be conducted to explore the full therapeutic potentials of this drug in order to establish it as a standard drug.

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How to cite this article:
Ayesha Tabasum et al. Ijsrm.Human, 2025; Vol. 28 (4): 17-22

Conflict of Interest Statement: All authors have nothing else to disclose.