



Garden rue: A path for protective health and its production potential

Shanigala Raviteja^{1*}, V. P. Singh¹, Subhrajyoti Mohanty² and Arvind³

¹Department of Plantation, Spices, Medicinal and Aromatic Crops, College of Horticulture Bagalkot, University of Horticultural Sciences Bagalkot-587104, Karnataka, India

²Department of Floriculture and Landscaping Architecture College of Horticulture Bagalkot, University of Horticultural Sciences Bagalkot-587104, Karnataka, India

³Department of Fruit Science College of Horticulture Bagalkot, University of Horticultural Sciences Bagalkot-587104, Karnataka, India

*E-mail ID: ravitejashanigala1@gmail.com

Abstract

Garden rue (*Ruta graveolens* L.) is an important medicinal and aromatic plant valued for its diverse therapeutic properties and wide range of bioactive compounds. The plant contains flavonoids, alkaloids, coumarins, terpenoids, essential oils and furoquinolines along with rutin and quercetin being the major active constituents responsible for many of its pharmacological effects. Traditionally, it has been used for the treatment of inflammatory disorders, rheumatism, skin diseases, ulcers, arthritis, venom poisoning and various other ailments. Rue also possesses antispasmodic, anti-inflammatory, antihistaminic, insect-repellent and potential anticancer properties. The article highlights the production technology of garden rue, including suitable soil and climate, propagation methods, nursery management, transplanting, irrigation, nutrient management, plant protection and harvesting practices. Under proper crop management, a dry herbage yield of 2.5 - 3.0 t ha⁻¹ can be obtained. Although the plant has significant medicinal value, excessive consumption or improper use may cause toxic effects. Therefore, garden rue has considerable potential as a high-value medicinal crop.

Keywords: Garden, flavonoids, alkaloids, coumarins, terpenoids, therapeutic

Received: 01 July 2026
Revised: 03 July 2026
Accepted: 04 July 2026
Published online: 07 July 2026

Article ID: SR01132

Citation: Raviteja, S., Singh, V. P., Mohanty, S., & Arvind. (2026). Garden rue: A path for protective health and its production potential. *Scientia Review*, 2(7), 3-6

Introduction

Garden rue is a miraculous medicinal plant locally recognized as 'Rue,' 'Sitab' or 'Saddab' is being used to cure many diseases. In the period of Roman, *R. graveolens* L. appeared for the first time in Western Europe. It is found in Middle-East India and China, and probably seen in Iran, Central, South, and North America. In the Indian Peninsula, it is cultivated in gardens and fields for ornamental purpose. It is located at various countries like Peru, Brazil, Italy, Ethiopia, etc. *R. graveolens* L. is mentioned in red data book of Bulgaria as an endangered plant. Biologically active compounds in *R. graveolens* L. are steroids, flavonoids, essential oil, alkaloids, furoquinolines, glycosides, coumarins and acidone are found in the various plant parts. Secondary metabolites are abundantly present in all portions of the plant. *R. graveolens* L. is also mentioned as a 'cardiac plant' due to the presence of a high range of therapeutic effects. Rutin and quercetin are active flavonoid compounds of Rue. The volatile oil of plant

contains a high level of alcohol, diphenolic acids and ketones.

The *R. graveolens* extracts have been used as an antidote for toxins such as snake and scorpion venoms (Sallal and Alkofahi, 1996). From ancient year's, *R. graveolens* has been used as a folklore medicine for treatment of various diseases such as eye problems, rheumatism, dermatitis, pain and many inflammatory diseases (Ratheesh and Helen, 2007). It acts as an emenagogue through the effect of rutin and stimulates the uterine basal fiber. It was not recommended for use by pregnant or lactating women because in high concentrations it can provoke hyperemia in the uterus and high mobility (oxytocic action) which may cause abortion. Rutin helps increase visual sharpness and benefits other visual problems, and it was used against edema, thrombo - genesis, inflammation, spasms, and hypertension (Miguel, 2003).

The essential oil extracted from *R. graveolens* is having properties like spasmolytic, anti -

inflammatory and antihistaminic and is a vermifuge (Said *et al.*, 1990). The essential oil extracted from *R. graveolens* is also has a depressing effect on the central nervous system. At high concentrations it works as a narcotic poison, provoking violent intestinal inflammation, tongue and larynx tumefaction, excitement, vertigo, mental confusion, trembling, nephritis with uterine swelling and abortion, liver damage, followed by fatigue, intestine damage and eventually death (Miguel, 2003).

Biology of plant

The *R. graveolens* L. is an evergreen, hardy, shrub, going around one-meter-tall, greyish in colour and having keen and unpleasant odour in leaves and remified stem. Leaves of the plant are small, oblong, deeply divided, pinnate and glandular dotted. Flowers are yellow, small (13 mm) and present in clusters and blossoms in the summer and spring. Flowers have four petals and the central flower has a total of five petals. The fruit is small, round and 4-5 lobulated.



Fig. 1. *Ruta graveolens* (Rue) seeds



Fig. 2. *R. graveolens* growing plant



Fig. 3. Garden rue at flower initiation stage

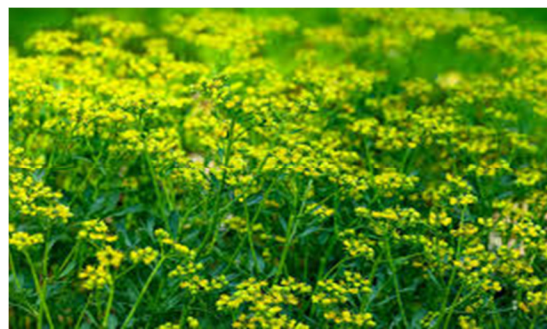


Fig. 4. Field view of Garden rue crop

Rue is a scented, perennial and glabrous herb or a sub-shrub having slender, glabrous, pale, smooth, glaucous green stem, that is grown up to one-meter height. Leaves of the plant in appearance is alternate, glaucous, gland-dotted, compound 2-3 pinnate with oblong or linear-oval leaflets. Inflorescence of the *R. graveolens* L. have tetramerous flowers and terminal ones are pentamerous. Petals of the plant are distinctly widely spreading, a greenish yellow colour, banded on top and wide connected to the narrow claw situated below. Margins are wavy or often toothed. *R. graveolens* L. have hard, dry, roundish, 4-5 blunted lobed to top, fruits (Kannan & Babu, 2012).

Chemical composition

The phytochemical compounds present in *R. graveolens* are acridone alkaloids, coumarins, volatile substances, terpenoids, flavonoids and furoquinolines (kuzovkina *et al.*, 2004). Hashemi *et al.*, 2011 proven the existence of saponin, tannins and glycosides in Rue. Rutin and quercetin are the main active flavonoids of *R. graveolens*. Rutin was first isolated from the leaves of rue (Pathak *et al.*, 2003). A high content of aliphatic acids, alcohols and ketons were found in *R. graveolens* volatile oil (Ivanova *et al.*, 2004). 2-undecanone (33.9%), 2-Heptanol acetate (17.5%), 1-dodecanol (11.0%), geyrene (10.4%), 2-nonanone (8.8%), 2-Decanone (1.9%), Geijerene (1.6%), transpiperitenone oxide (1.4%), cis-piperitenone oxide (1.2%), 2-methyl-undecanal (1.1%), 2-dodecanone (1.1%), 2-nonanol (1.1%), elemol (1.1%) are the main active compounds of the essential oil of the flowering aerial parts of the plant (Soleimani *et al.*, 2009).

Therapeutic uses

Inflammatory disorders, eczema, ulcers, arthritis, fibromyalgia, antidotes for venoms, insect repellent, and as an abortifacient are just a few of the reported medicinal uses for it. In addition, the plant has long been used to season a variety of foods, including soup, cheese, butter, coffee, and tea, as well as to make emmenagogues and antispasmodics in the form of rue oil and infusions. Rue has also been

demonstrated to increase the sensitivity of cancer cells to death while having no effect on normal cells by inducing the removal of an amide group from the antiapoptotic protein Bcl-xL in human brain cancer cells but not in healthy B and T lymphocytes.

Side effects

Rue is an active irritant whether applied externally or taken internally, sometimes it produces painful vomiting, always great prostration, and confusion of mind, cloudy vision, feebleness and slowness of pulse, coldness of extremities and twitching of the limbs (Dymock, 1972).

Production technology of garden rue

Soil & climate

Grows well in sandy-loamy soil with medium fertility. Soils with well decomposed FYM is found best for germination and better survival of seedlings & productivity. It requires 6.0 to 8.0 pH. Mild and tropical climates are better suitable for rue. It can easily tolerate hot and dry conditions and prefers open spaces under bright sunlight. Optimum temperature required is 15-28 C and relative humidity is 60-75%.

Propagation

Generally propagated by seeds and cuttings. Commercial propagation is through seeds and seeds are viable for 2-3 years. Required seed rate per hectare is 250-300grams.

Nursery management

Raised bed of 1m width and convenient length is followed. Nursery bed can be raised up to 10-15cm height. Bold and healthy seeds can be sown at a depth of 1.5-2.0 cm and covered with fine soil. Provide irrigation with the help of rose can for a few days of post sowing and where in germination takes place around 20-30 days after sowing.

Transplanting

Seedlings of 20-25 cm height is preferred. The age of seedlings should be 50-55 days. The spacing followed between row to row is 40cm and plant to plant spacing is 40cm.

Irrigation management

In lighter soils, more frequent irrigation is required than that in heavy soils. Weekly or fortnightly irrigation is followed once the plant gets established. Field should be free from weeds and manual hand weeding is followed.

Nutritional management

About 10 tonnes per hectare FYM is recommended along with NPK - 150:50:50 Kg per hectare. The 50% of N and full dose of P and K are applied as basal dose before planting,

another 50% of N is top dressed 45 days after transplanting.

Plant protection management

A.Major Pests	Symptoms	Management
Citrus butter fly(<i>Papilio demoleus</i>)	Defoliation of plant Skeletal appearance of leaves and stunted growth of plants	<ul style="list-style-type: none"> Spraying of pongamia oil or neem oil 2% Spray with Methyl parathion @ 1ml/L & Monocrotophos @ 2ml/L
Aphid (<i>Myzus persicae</i>)	Curling, twisting and yellowing of leaves.	<ul style="list-style-type: none"> Spraying of neem oil 2%. Spray with Permethrin or Malathion @ 1ml/L
B. Major Diseases	Symptoms	Management
Root rot (<i>Pythium</i> and <i>Phytophthora sp.</i>)	water-soaked lesion at the base of the stem and at severe cases it leads to death of the plant	<ul style="list-style-type: none"> Remove affected plants and their roots. Only use fresh and sterilized soil mix Avoid over watering to plants and make sure that soil is well drained prior to planting Drenching Dithane M-45 (0.2%)

Harvesting and yield

Garden rue is harvested at full blooming stage around five to six months after planting. The harvested plants should be dried in shade and stored at moisture free conditions. At this stage it contains maximum percentage of active ingredients like Essential oil, Rutin, Coumarin. The average yield of 2.5-3.0 tons per hectare of dry herbage can be obtained with good management practices.

Conclusion

R. graveolens is a potential medicinal crop and now a days the demand for this crop is increasing day by day due to presence of its phytotherapeutic and pharmacological properties. The essential oil extracted from *R. graveolens* is also has a depressing effect on the central nervous system. At high concentrations it works as a narcotic poison, provoking violent intestinal inflammation, tongue and larynx tumefaction, excitement, vertigo, mental confusion, trembling, nephritis with uterine swelling and abortion, liver damage, followed by fatigue, intestine damage and eventually death. So it is important to use in appropriate concentrations.

Reference

Dymock, W. (1972). Pharmacographia Indica: a history of the principal drugs of vegetable origin. In *Pharmacographia indica: a history of the principal drugs of vegetable origin* (pp. 546-p).
Ivanova, A., Kostova, I., Navas, H. R., & Villegas, J.

- (2004). Volatile components of some Rutaceae species. *Zeitschrift für Naturforschung C*, 59(3-4), 169-173.
- Kannan, R., & Babu, U. V. (2012). Identity and pharmacognosy of *Ruta graveolens* Linn. *Ancient Science of Life*, 32(1), 16-19.
- Kuzovkina, I., Al'terman, I., & Schneider, B. (2004). Specific accumulation and revised structures of acridone alkaloid glucosides in the tips of transformed roots of *Ruta graveolens*. *Phytochemistry*, 65(8), 1095-1100.
- Said, M. S., Tariq, M., YAHYA, M., Rafatullah, S., Ginnawi, O. T., & Ageel, A. M. (1990). Studies on «*Ruta Chalepensis*», an Ancient Medicinal Herb Still used in Traditional Medicine. *Journal of ethnopharmacology*, 28(3), 305-312.
- Miguel, E. S. (2003). Rue (*Ruta L.*, Rutaceae) in traditional Spain: frequency and distribution of its medicinal and symbolic applications. *Economic botany*, 57(2), 231-244.
- Pathak, S., Multani, A. S., Banerji, P., & Banerji, P. (2003). *Ruta 6* selectively induces cell death in brain cancer cells but proliferation in normal peripheral blood lymphocytes: A novel treatment for human brain cancer. *International journal of oncology*, 23(4), 975-982.
- Ratheesh, M., & Helen, A. (2007). Anti-inflammatory activity of *Ruta graveolens* Linn on carrageenan induced paw edema in wistar male rats. *African journal of Biotechnology*, 6(10).
- Sallal, A. K. J., & Alkofahi, A. (1996). Inhibition of the haemolytic activities of snake and scorpion venoms in vitro with plant extracts. *Biomedical Letters (United Kingdom)*, 53(212).
- Soleimani, M., Azar, P. A., Saber-Tehrani, M., & Rustaiyan, A. (2009). Volatile composition of *Ruta graveolens* L. of North of Iran. *World Applied Sciences Journal*, 7(1), 124-126.