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RESEARCH ARTICLE

UNVEILING THE SECRETS OF RUE (A MINI-REVIEW)

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ABSTRACT

Ruta graveolens is an herb, which has more medicinal qualities. Ruta came from the Greek word (hrute). This plant is more aromatic and comes under the Rutaceae family. Different varieties of essential oils are extracted from Rue. This plant is also used in the Unani system of medicine. *Ruta graveolens* has some disadvantages like abortifacient, acro-narcotic poison, an aphrodisiac activity and a few more. Many research works have been done using *Ruta graveolens*. Insecticide and pesticide properties are also present in *Ruta graveolens*. Shoots and leaves of *Ruta graveolens* are used more in medicine.

INTRODUCTION

Ruta graveolens is commonly known as Rue. This plant is found in the Balkans Peninsula. It has more medicinal qualities. It was widely used and slowly decreased due to its bitter taste. This plant can tolerate both dry and hot climatic conditions. This plant has leaves throughout the year, a so-called as an evergreen herb (<https://www.planetaryurveda.com/common-rue-ruta-graveolens/>). *Ruta graveolens* is one of the important families of Rutaceae. This plant is considered an aromatic plant. *Ruta graveolens* is a "Herb of grace" and it is commonly known as Rue. This plant mainly grows in Jordan and the Mediterranean region. Germination of seeds is very low in *Ruta graveolens* (Zakaria, 2015). In India, *Ruta graveolens* is commonly called Sudab or Sadab (Shabir Ahmad Anonymous 2004; Kirtikar, 2003; Bently, 2004). The native of *Ruta graveolens* in Europe (Salim Khan, Khanda Jabeen Mirza and Malik Zainul Abdin, 2011). Common Rue consists of chemical constituents, alkaloid extracts like acridone, and quinoline, which has spasmolytic action (<https://www.planetaryurveda.com/common-rue-ruta-graveolens/>). *Ruta graveolens* has antioxidant activity, anti-inflammatory activity, anti-inflammatory, and antioxidant activity, and cytotoxic activity on the human cancer cell, anti-tumour activity, anti-arrhythmic activity, and anti-oxidative activity, anti-microbial and cytotoxic activities, anti-androgenic activity, anti-conceptive and anti-fertility activity.

Ruta graveolens naturally occurs in South Europe and North Africa, it grows normally on waste stony ground (Zakaria, 2015).

TAXONOMY (<https://www.planetaryurveda.com/common-rue-ruta-graveolens/>):

Kingdom	:Plantae
Division	:Angiosperms
Class	:Eudicots
Order	:Sapindales
Family	:Rutaceae
Genus	: <i>Ruta</i>
Species	: <i>R. graveolens</i>

VERNACULAR NAMES (Shabir Ahmad Parray, 2012; Baitar, 1991; Hakeem, 2002):

Ruta graveolens has different names in different languages.

Hindi	:Sanool, Saatri
Urdu	:Sudab
Arabic	:Sudab, Suzab
Persian	:Satap
Greek	:Fejan, Safayan
Sanskrit	:Sadapan
English	:Rue, Garden Rue, Herb of grace

USES OF THE FAMILY RUTACEAE: Rutaceae family is famous all over the world because it includes citrus fruits like oranges, lemons, and grapes in this family (Shabir Ahmad Parrray, 2012). A decoction made from the aerial parts of *Ruta chalepensis* is used for treating rheumatic and mental disorders and is also used as an analgesic and antipyretic (Mansour, 1990). The leaves of *Ruta montana* are infused with vinegar and given to children to treat convulsions and nervous disorders (Ayda, 2017). *Ruta graveolens* has been approved by the Food and Drug Administration for use as a flavouring agent (Preethi, Girija Kuttan, 2006)



Figure 1. *Ruta graveolens*

MORPHOLOGY: The Rutaceae family is used worldwide in traditional medicine. The plant is about one meter high (approximately), aromatic with an unpleasant odour and also an ornamental evergreen shrub. *Ruta graveolens* (Figure 1) leaves are small, oblong, pinnate, deeply divided and glandular dotted. The small yellow flowers are arranged in cluster form in the branched stem. All flowers in this plant have 4 petals, whereas the flower in the centre has 5 petals in a particular season such as spring and summer. The fruits of *Ruta graveolens* are round, small, 4 or 5-lobed, and greyish brown. The fruits taste strongly bitter. 120 compounds are present in the roots and aerial parts of the plant. *Ruta graveolens* is used in clinical conditions from ancient periods (Salim Khan, 2011). The height of the plant is about 2 to 2½ feet. Its seeds are ovoid, flattish in front, rounded on the back, angular, rough, and Testa blackish, the embryo is curved from base to apex and it is surrounded by fleshly endosperm (Shabir Ahmad Parrray, 2015; Nadkarni, 2005; Kirtikar, 2023). *Ruta graveolens* is also used in the Unani system of medicine in India. This is also called Garden Rue (Afaq Ahmad Malik, 2013). The seeds will get ripen from August to October. The shrub can grow well in soil conditions such as well-drained soil and nutritionally poor soil. The plants grow without shade or in half shade (<https://www.planetaryurveda.com/common-rue-ruta-graveolens>).

MEDICINAL PROPERTIES: *Ruta graveolens* has medicinal properties like an anthelmintic, antiepileptic, antispasmodic, rubefacient, antidote, haemostatic, antidiarrheal, ophthalmic, stomachic and anti-inflammatory.

This plant has antifungal properties, so we can treat fungal infections such as athlete's foot and dermatitis. When it is taken in large doses it is toxic, in severe cases, it is used directly. This plant can relieve Itching in the skin. This particular herb will eliminate free radicals in the skin which cause skin's premature ageing. It is also used as facial steams in spas. The extracts can also be used as an insecticide where lice in the hair can be reduced. Rue's oil can be used for treating damaged hair, so it makes hair healthy and shiny. This herb can be used for the treatment of epilepsy and hysteria because of its sedative and antiepileptic properties. This plant has neurotoxins, so it helps in relaxing and desensitizing nerves. *Ruta graveolens* has insecticide and pesticide properties, so it is used as a fumigant, vaporizer or insect stick. *Ruta graveolens* is used to treat bacterial infections such as colon, intestine and urinary tract infections. By using this plant *Salmonella* can be treated. This herb can also be used to treat menstrual cramps, muscle pain and anxiety. Arthritis pain and inflammation can also be treated. Muscle and joint pains can also be reduced. It is used as a first aid remedy in the homoeopathic system. It is also used in the treatment of tendons, periosteum, cartilage, sprain and strains. When it is used for a long time, it can treat ganglion.

Persons having kidney or liver problems should not use this plant. This plant also has abortifacient action, so it is avoided for pregnant women (<https://www.planetaryurveda.com/common-rue-ruta-graveolens>). *Ruta graveolens* is used as traditional medicine against stimulants, emmenagogues, diuretics and resolvent (Shabir Ahmad Parrray, 2012). *Ruta graveolens* is used as a remedy for aching pain and eye-induced headache. This plant is also used to treat stiff neck, gastric disorders, dizziness, and headache. *Ruta graveolens* is replaced by *Euphorbia dracunculoides* where which are sold in local markets (Salim Khan, 2011). This plant is used to treat gastrointestinal disorders, eye problems, leukoderma and ulcers. Jordan people use *Ruta graveolens* as an aphrodisiac, fertility-promoting, antispasmodic, diuretic, sedative and analgesic agent and also used for antirheumatic effect. Invitro culture of *Ruta graveolens* of clonal propagation increases the rate of this species (Zakaria, 2015). Using this plant drug with honey treats paralysis, tremors, joint pain and nervous disorders (Sina, 1998; Sina, 2007). Colitis, flatulent colitis and flatulence can be relieved by the decoction of Sudab (Attar, 2020). It is also useful for chest pain which is caused due to pneumonia and pleurisy because it is an analgesic. The paste of *Ruta graveolens* leaf is applied on the abdomen, so it is effective in dropsy. Infantile paralysis can also be treated by the infusion of the shrubs leaf. It is used as a nasal drop. Disorders like urinary bladder and kidney can be treated by this drug, so that the functions of these organs may regulate. As per Jalinoos (Galen), epilepsy can be treated perfectly by using this plant sudab, and it is also used as an antidote for different poisons (Baitar 1999; Attar, 2020). Sudab leaves also increase our eyesight, and they can be taken with or without salt. The leaves of this plant are used for extra vaginal application, where the leaves are used as a suppository. Amenorrhea can be treated by giving syrup orally. It also helps in the removal of the foetus and placenta. The extract of sudab and the extract of fennel and honey can be taken orally, so the eyesight is strengthened. The seeds of this drug are powdered, and that may lead to abortifacient. *Ruta graveolens* encourages menstruation, where the muscles of the uterus will stimulate and will upgrade the menstrual flow (Shair, 2012). This plant is more conscious of the initiation of abortion.

As per Ayurveda *Ruta graveolens* is laxative, bitter and hot in its action. It is also used to treat gleet and urinary discharges. In the Unani system, they use leaves (barge-sudab), seeds (tukhmesudab), and oil (roghane-sudab) (Afaq Ahmad Malik, 2013).

PHYTOCHEMICAL ANALYSIS: Analysis of the essential oil of *Ruta graveolens* is done by GC/MS. 82% of essential oil was found in *Ruta graveolens*. Compounds identified in oil are undecanone (30.73%), 2- nonanone (18.06), 2-nonyl acetate (11.03%), Psoralen (1.28%), bergaptene or xanthotoxin (7.24%) (Karim, 1989). The essential oil from the aerial parts of *Ruta graveolens* is done by hydrodistillation, where the yield is about 0.74% on a dry weight basis (Vincenzo, 2002). This plant plays a variety of roles because *Ruta graveolens* has a different chemical composition (Shabir, 2012). The extracts of *Ruta graveolens* are treated with methanol, petroleum ether, ethyl acetate and water-methanol and it has antimicrobial and cytotoxic activities (Ivanovaa, 2005). *Ruta graveolens* extract was found cytotoxic for DLA (Dalton's Lymphoma Ascites), EAC (Ehrlich Ascites Carcinoma) and L929 cells in the culture (IC100=16mg/ml). It may also have more lifespan of tumour-carrying animals (Preethi, 2006). Essential oil is isolated from aerial parts. The plant should full bloom and then it should be harvested in the second growing season. The plant consists of some active principles like glycosides, alkaloids, furocoumarins, an essential oil with methyl ketones and other compounds (Afaq Ahmad Malik, 2013). Common Rue consists of chemical constituents an alkaloid extract like acridone and quinoline, where it has spasmolytic action (<https://www.planetayurveda.com/common-rue-ruta-graveolens/>).

RECENT RESEARCH IN RUTA GRAVEOLENS: The essential oil of *Ruta graveolens* is being used as an insecticide, but this has high biodegradability and rapid volatilization. Hence this essential oil is not persistent. To overcome this disadvantage, this essential oil is absorbed into mineral matrices. Hence it slows down rapid volatilization (Perera, 2002). A compound isolated from *Ruta graveolens* has promoted transcription of microtia-related transcription and also enhanced melanin production, hence it is used in the treatment of vitiligo (Pazilaiti Ainiwaer, 2002). *Ruta graveolens* is used for the treatment of psoriasis (Agnieszka Szewczyk, 2002). The extract of *Ruta graveolens* is used as an anti-fouling agent. Thermogravimetric analysis showed that the use of this extract on silicon matrix increases its thermal stability (Ariane V. Zmozinski, 2021).

DISADVANTAGES: The usage of Rue is harmful to pregnant women. This plant has anaphrodisiac and abortifacient activity, so it is not given to pregnant women (Shabir Ahmad Parray, 2012; Nadkarni, 2005; Kirtikar, 2003). It also causes inflammation of the uterus and also leads to uterine haemorrhage. This *Ruta graveolens* also has antispasmodic properties (Shabir, 2012). *Ruta graveolens* is an acro-narcotic poison. When the Rue is unpleasant and used in more amounts it causes redness, swelling and vesication. It also gives some side effects like the confusion of mind, cloudy vision, painful vomiting and slowness of pulse. It may also cause an allergic reaction and lead to photodermatitis (Shabir Ahmad Parray, 2012; Anonymous, 2004; Evans, 2002).

CONCLUSION

The whole plant of *Ruta graveolens* has medicinal benefits. *Ruta graveolens* can treat gastrointestinal disorders, stiff next, menstrual problems, arthritis, ulcers, eye problems, nervous disorders and many other diseases. This plant is used worldwide, but there are a few disadvantages to this plant. This

plant should not be used by pregnant women. Many compounds have been extracted from *Ruta graveolens* for different studies.

CONFLICT OF INTEREST: The authors have no conflict of interest.

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