

## Medicinal properties of *Ruta Graveolens* L. A plenteous life saver

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### Abstract

*Ruta graveolens* commonly known as Rue, belongs to the family Rutaceae, native to the Mediterranean region and richly present all over the world. In India, it is used in Ayurveda Homeopathy and Unani medical system and also widely used in countries like China, Brazil, Ethiopia, North, Central, South America in the time immemorial, it is used as a traditional medicine. *Ruta graveolens* shows various therapeutic values and is useful in healing visual problem, skin problem, reproductive problem, Rheumatism, Dermatitis, pain, cold etc. It also has many peculiarities like anticancer, antitumor, antidiabetic, anti-inflammatory, cytotoxic, due to the presence of many phytochemicals such as flavonoids phenols, tannis, alkaloids, and furocoumarines etc. *Ruta graveolens*, is also used in commercial aspects as well as for ritual purposes.

**Keywords:** Therapeutic value, anti-inflammatory, cytotoxic, phytochemical, rheumatism anti-inflammatory

### Introduction

With global importance, plants are local heritage as well. Medicinal plants are present at a wide range in the world from the time immemorial. Plant extracts are being used as a source of remedy for various diseases. Primary Health Care is based on medicines obtained through plants spread over in the three quarters of the world. (Bahu BS. 2012) due to easy availability, maximum therapeutic values and minimum side effects.

*Ruta graveolens* is perennial sub shrub which belongs to the family rutaceae and order sapindales that contains about 160 genera and about 1600 species (Jinous asgarpanah 2012) [22] Since ancient times, Rue is one of the key plant of the European pharmacopoeia. It is native to Mediterranean Balkan peninsula and is also known in different countries of North, Central, and South America, China, India, middle East and South Africa (Miguel 2003) [31]

*Ruta graveolens* is perennial, evergreen, sub shrubs, whose stem is green, ramified, a meter tall, woody from the base, and herbaceous from the tip. Its leaves are green, dissected, grey in colour with sharp unpleasant odour. The leaves are also small in shape, deeply divided, oblong and pinnate. Its flowers are small, present in cluster with yellow colour, having four petals but five in centre flower which blossom during spring and summer. (Dr J. Pronczuk 1989) [13] It is taken from the Greek word reuo with its genus name Ruta, the meaning of Reuo is "into set free" that indicates herb's utility in the treatment of diseases (Duke 2002) [14]. *Ruta* is a widely utilised and a well-known plant with ornamental, aromatic, culinary and medicinal properties (D.H. Tejavathi et. al. 2010) [44] *Ruta graveolens* are used in both traditional as well as modern medicinal system due to the presence of various phytochemical, alkaloids, flavonoids, phenol, and glycoside diterpenes triterpenes (Narayanappa M. et al. 2015) [37] volatile oil, sterols, coumarins, triterpenes (Chen Huang et. al. 2001) [12], furoquinolines, volatile substances and terpenoids (Kuzovkina et al. 2004) [25].

### Common and synonyms name of the plant

Table 1

Sitab or sudab	India
Ruda	latin-America, Spain
Arruda	Spain
Erruda	Spain
Arroda	Spain
Rue	USA, UK
Herb of grace	USA, UK
Country man's treacle	USA, UK
Herbygrass	USA, UK
Rue officinale	Fr.
Rue fetide	Fr.
Herbe de grace	Fr.
Sodaab	Iran

### Material and Methodology

The present study provides a collection of information about the medicinal properties and other uses of *Ruta graveolens* L. The literatures were collected from review of various research papers, information was searched using various electronic catalogue that is Google Scholar science, sciencedirect and PubMed etc.

### Medicinal Properties

*Ruta graveolens* is rich in Phtyochemical, flavonoids are responsible for cytotoxic activity, (Travato et al. 1996), rue shows to portent anti-HIV agent (Bissacia et al. 1993) and is also used for curing neural disorder, like multiple sclerosis (Koppennofer 1995). All parts of the *Ruta* are carminative, emmenagogue, expectorant, haemostatic, aborifacient, antispasmodic, anthelmintic, rubefacient, and ophthalmic (Guarrea 1999 and Ivanova et al. 2005). Decoction of *Ruta graveolens*, have been used for flatulence, enema relives, colitis and flatulent colitis (Baiteer I. et al. 1999), Alkaloid of *Ruta graveolens* has been successfully used in the treatment

of glaucoma and atropine poisoning (Toma 2000)<sup>[45]</sup> Use of *Ruta graveolens* against intracranial cysticercosis is reported (Benerji and Benerji 2001). The flavonoids, presents in rue are also responsible for activity of antibacterial. (Akzoreky *et al.* 2003)

In some Latin American countries, such as Uruguay and Mexico, traditional healers, have been using the herb for gastrointestinal disorder, abortion and cardiovascular system (C. Ciganda, *et al.* 2003)<sup>[11]</sup> in has been, brought to knowledge that *Ruta*, which is homeothically potentiated completely destroys the brain cancer cells (Pathak *et al.* 2003)<sup>[39]</sup> and *Ruta graveolens* is also considered to be ant androgenic (Khouri *et al.* 2005)<sup>[26]</sup>

According to (A. Lvanova *et al.* 2005), different extracts of *Ruta graveolens*, that are methanol, petroleum ether, Ethyl acetate and water have been found to possess cytotoxic and antimicrobial activities. Xanthotoxin, Burgaptin, Isopimpinellin Furocoumarin, are used in the treatment of skin diseases, examples psoriasis, mycosis, Fungoids or in pigmentation disorder example vitilago (Ekierts *et al.* 2005) *Ruta graveolens* have been found to possess antitumor activity, *Ruta graveolens* is found significant, in increasing lifespan of A cites DLA and EAC in animals, who are bearing tumour. (K.C. Preeti *et al.* 2006), antirheumatic, tranquilizing and memory enhancing effects of *Ruta graveolens* are reported in British and Denmark's traditional methods. (A. Adsersen *et al.* 2006)<sup>[2]</sup>.

African traditional healers are using dry leaves of *Ruta graveolens* for diabetes, headache, urinary ailments disorders, and cardiovascular system (T S Thring *et al.* 2006)<sup>[46]</sup>. According to (Raheesh and Helen 2007)<sup>[42]</sup>, *R. graveolens* can be used as a folklore medicine, for many diseases such as eye infections, rheumatism, dermatitis, pain, and many inflammatory diseases. Extract of *Ruta graveolens* with methanol, petroleum ether ethyl Acetate and water methanol extract have been found to cause antimicrobial activity and cytotoxic activity. *Ruta* in combination with Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> has been found to be factored in treatment of brain cancer, particularly glioma. Leaf extracts of *Ruta graveolens* have free radical scavenging activity that can be profitable for action against liver damage and also shows significant antidiabetic and antioxidant activity. (Pinky Pandey *et al.* 2011)<sup>[40]</sup>

Alkoloids found in the phytochemical analysis of herb, can act as a antimicrobial compound (Mathews P. Raj 2013)<sup>[34]</sup> Many volatile compounds, and oil present in *Ruta graveolens* (Masho. *et al.* 2015)<sup>[35]</sup>, volatile oil from herb is showing phototoxic, anthelmintic and bacteriostatistical activity (Petit-Paly *et al.* 1988)<sup>[38]</sup>. Approximately 2% rutin present in *Ruta graveolens*, as a main flavonoid (Ahmed *et al.* 2010)<sup>[32]</sup> and rutin can exhibit, many activities like antitumor, antibacterial, anti-inflammatory, antimutagenic, anti-diarrheal, myocardial protecting vasodilator, immunomodulator, and hepato protective activity (Janbaz *et al.* 2002)<sup>[21]</sup>

This plant has been suggested for herbal treatment of Insomnia, abdominal cramps, renal trouble, headache and nervousness (J Fatima Benazir 2011)<sup>[23]</sup>. *Ruta* used as a medicine in traditional system, for the diseases like hysteria, gastrointestinal disorder and menstrual problem, juice of fresh leaves are used to cure toothache and earache (Giresha *et al.* 2015)<sup>[18]</sup> psoralens and methyl-nonyl ketones are the active contents of clinical importance and therefore they are responsible for hepato toxicity, photosensitization and

affects the uterus respectively (Ajit kengar *et al.* 2015)<sup>[3]</sup>. In homeopathy, for the treatment of muscular strength, injuries, eyestrain, joints, Arthritis, toothache, rheumatism, back pain and headache, *Ruta graveolens* are abundantly used. (Narayanappa M. *et al.* 2016)<sup>[37]</sup>. For skin diseases, headache, stomach and indigestion for children, leaves and aerial parts of *Ruta graveolens* are being used (Kathirvel Poonkhodi *et al.* 2017) Also, in the extracts of leaves and stem, anti-diarrheal activities were found (Pikee Pandey *et al.* 2012)<sup>[41]</sup>

### Economic, Ritual and other uses

To control, powdery of tobacco, efficiency of *Ruta* extract, sodium bicarbonate and fungicides activity had been done on tobacco leaves. Ninety present diseases were controlled. By efficiency of hydrolic extracts of leaves of *Ruta graveolens*, which showed biological activity on conidia of *E. Orontii*. In repeated application rue extract was very effective in controlling powdery mildew (Lahoz E. *et al.* 2001)<sup>[30]</sup>.

*Ruta graveolens* is rich in methyl-nonyl-ketone, so it is used as a scent for perfumes and soaps, while methyl-nonyl-Ketone used in the preparation of methyl-nonyl acetaldehyde is extensively used in the synthetic perfumes (anonymous 2003)<sup>[5]</sup>

In South America, *Ruta graveolens* is cultivated as an ornamental and medicinal plant as well as charm against Evil. (Mohammed Faizal *et al.* 2005).

It is used as a food stuff in salad, sandwiches, fish, egg dishes, pickles and condiments (N. Ahmad *et al.* 2010)

*Ruta graveolens* has a strong smell due to which people plant this herb around their houses to ensure safety from the snakes. (Mathews P. Raj *et al.* 2013)<sup>[34]</sup>

In the European Union, Rue herb is used as flavouring agent in certain food products, like backed goods, frozen dairy products, soft candy or non-alcoholic beverage. The United States food and drug administration, gave safe status to *Ruta graveolens* to be added in human food as flavouring agent (Dragana R. *et al.* 2014)<sup>[15]</sup>

The paste of the roots can be used in curing snake bites (Manali at all 2017)

In East Asia since many years *Ruta graveolens* are being used as a part of diet and perform dual work as medicine and food. (Yang *et al.* 2006)<sup>[47]</sup>

Stem of *Ruta graveolens* is kept under the pillow or in pockets for protection against witches and people is say about *Ruta* as; “La ruta fa vehir la vista acuta” (Lara Lucchetti lara *et al.* 2019)<sup>[29]</sup> Many spas use it for hair treatment for healthy and shiny hairs (Gayatri 2019)<sup>[17]</sup>

Rue grows in the garden as ornamental plant and used in nosebags. To avoid cats, because cat don't like, smell of rue. A branch of Rue is using in catholic church to sprinkle holy water on its followers, this period is known as “herb of grace” (*Ruta graveolens*: Wikipedia).

### Conclusions

Since time centuries-old, people have tried to discover medicines to relieve pain and treat ailments. In every age, from the birth of civilization up to this present era of modern technologies, the therapeutic possessions of *Ruta graveolens* is acknowledge and noted, for various diseases. *Ruta graveolens* had lots of medicinal properties, and is being used in different countries for the treatment of various diseases and for also various uses. This ia a very beautiful

plant with fine aroma, and this is not superlative to say that Ruta is a life saver plant

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