Preliminary Phytochemical And Biochemical Analysis of Ruta Graveolens, Linn .; (Family- Rutaceae)

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Abstract- *Medicinal plants are a source of great economic value in the Indian subcontinent. Nature has bestowed on us a very rich botanical wealth and large number of diverse types of plant grows in different parts of the country. India is rich in two levels of biodiversity, namely species diversity and habitat diversity. In India, thousands of species are known to have medicinal value and the use of different parts of several medicinal plants to cure specific aliments has been in vogue since ancient times. Plants synthesis hundreds of chemical compounds for functions including defence against insects, fungi, diseases and herbivorous mammals. Numerous phytochemical with potential or established biological activity have been identified. The present study of phytochemical and biochemical analysis of leaf extract of Ruta graveolens in ethanol extract revealed the presence of carbohydrates, proteins, glycosides, flavonoids, alkaloids and saponins , amino acids ,tannins, steroids and terpenoids. In methanol and ethyl acetate extracts revealed the presence of carbohydrates, protein, amino acids, steroids, glycosides, flavonoids, alkaloids, terpenoids. The plant leaf was evaluated for the nutritional analysis showed that carbohydrates 18 mg/g, protein 0.88 mg/g, starch 16.2 mg/g. results shows that carbohydrate is the more amount than protein and starch.*

Keywords- Phytochemical, Biochemical, Ruta graveolens

I. INTRODUCTION

Medicinal plants are a source of great economic value in the Indian subcontinent. Medicinal plants are rich source of novel drugs that forms the ingredients in traditional systems of medicine, modern medicines, nutraceutical, food supplements, folk medicines, pharmaceutical intermediates, bioactive principles and lead compounds in synthetic drugs (Ncube, 2008). Herbal medicines are the oldest remedies known to mankind. From the time immemorial man is trying to control diseases through various ways and different medicinal plants have been contributed a lot in this regard from time to time. Plant derived medicines have been part of traditional health care in most of the world for thousands of years. Plants are the most important source for all kind of food and medicine. They are valuable source of natural active constituents that are used to maintain human health and also used for the treatment of many human diseases. They are good source of economically important compounds, vitamins, and minerals which have anti-oxidant, anti-tumour, anti mutagenic and diuretic activities.

II. MATERIALS AND METHODS

Study Area (Plate 1 & 2)

The Nilgiri District is in the southern Indian state of Tamil Nadu. Nilgiri is the name given to a range of mountains spread across the borders among the states of Tamil Nadu, Karnataka and Kerala. The Nilgiri Hills are part of a larger mountain chain known as the Western Ghats. The plant species *Ruta graveolens* is an evergreen shrub. The fresh plants were collected from Nilgiri district of Tamil Nadu.

Plate -1 Location map

Plate -2 Study area

Systematic position

Kingdom : Plantae
Division : Magnoliophyta
Class : Magnoliopsida
Order : Sapindales
Family : Rutaceae
Genus : *Ruta*
Species : ***R. Graveolens*, Linn.*;***

Plate -3 Habit of *Ruta graveolens*

Ruta graveolens, L.; commonly known as rue is an herbaceous perennial, originally native to the Mediterranean region. It is now cultivated in many parts of the world. *Ruta graveolens* is a small evergreen sub-shrub or semi woody perennial, up to 0.6 to 0.9 m tall and almost as wide. The Leaves are alternate , small, oblong , deeply divided , with a characteristic greyish colour. Flowers are small, arranged in paniculate clusters. Flowers on the rue bloom they are generally yellow or a greenish/yellow. The stems become woody near the base, but remain herbaceous nearer the tips. Fruits are dry, hard rounded, 4 or 5 lobed at the top, greyish-brown and rough.

Collection of the sample

For the present study plant sample is selected at Nilgiris to find out the phytochemical, and biochemical of the *Ruta graveolens* leaf extract were analysed. The entire plants were cleaned to remove adhering dust and then dried under shade. The dried plant sample powdered with the help of pulveriser. The powdered sample was stored used for further studies.

Powdered sample

Dried sample

Preparation of plant extract

15g the plant powder was subjected to 100ml of ethanol, methanol, and ethyl acetate was extracted separately using shaker system for 48 hours and this was used for further analysis.

I. Preliminary phytochemical analysis

The phytochemical screening of ethanol extract of analysed by standard methods and shown various phytochemical constituents such as carbohydrates, proteins, amino acids, starch, steroids, glycosides, flavonoids, alkaloids, tannins, saponins and terpenoids.

Biochemical analysis

The biochemical analysis of Carbohydrate and Starch were analysed by Anthrone method (Hedge, J.E. and Hofreiter, B.T 1962). Protein estimation were analyzed by Lowry's method (Lowry, *et al*., 1951).

III. RESULTS AND DISCUSSION

The present study of phytochemical analysis of ethanol extracts of *Ruta graveolens* revealed the presence of

carbohydrates, proteins, glycosides, flavonoids, alkaloids, saponins, amino acids, tannins, steroids and terpenoids are absent in ethanol extract of *Ruta* graveolens. In methanol extracts revealed the presence of carbohydrates, proteins, amino acid, steroids, glycosides, flavonoids, alkaloids and terpenoids. Saponins and tannins were absent. In ethyl acetate revealed the presence of revealed the presence of carbohydrates, proteins, amino acids, steroids, glycosides, flavonoids, alkaloids, terpenoids. Saponins and tannins are absent.

Table -1Qualitative analysis of phytochemical present in the ethanol extract of *Ruta graveolens*

S.No	Types of compounds	Ethanol extract
1	Carbohydrates	++
2	Proteins	+
3	Amino acids	–
4	Steroids	–
5	Glycosides	++
6	Flavonoids	++
7	Alkaloids	++
8	Tannins	–
9	Saponins	++
10	Terpenoids	–

(++ indicates strongly present, + indicates moderately present, and – indicates absent)

Table-2 Qualitative analysis of phytochemical present in the methanol extract of *Ruta graveolens*

S.No	Types of compounds	Methanol extract
1	Carbohydrates	++
2	Proteins	++
3	Amino acids	+
4	Steroids	+
5	Glycosides	+
6	Flavonoids	+
7	Alkaloids	+
8	Tannins	–
9	Saponins	–
10	Terpenoids	+

(++ indicates strongly present, + indicates moderately present, and – indicates absent)

Table-3 Qualitative analysis of phytochemical present in the ethyl acetate extract of *Ruta graveolens* leaf

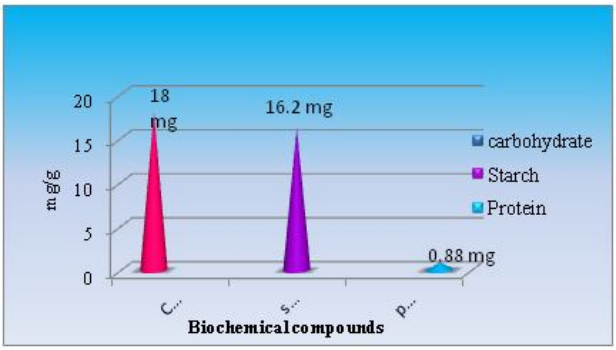
S.No	Types of compounds	Ethyl acetate extract
1	Carbohydrates	++
2	Proteins	++
3	Amino acids	+
4	Steroids	++
5	Glycosides	+
6	Flavonoids	++
7	Alkaloids	++
8	Tannins	–
9	Saponins	–
10	Terpenoids	++

(++ indicates strongly present,+ indicates moderately present, and – indicates absent)

Table -4 Carbohydrate starch and protein content present in the leaf of Ruta graveolens

Sample	Carbohydrate content in mg/gm	Starch content in mg/gm	Protein content in mg/gm
Leaf powder	18 mg	16.2 mg	0.88 mg

Chart: Carbohydrates, starch and protein content present in the leaf extract of *Ruta graveolens*



REFERENCES

[1] Ajit. A , Kengar and Govind.T , Paratkar (2015). Evaluation of essential oil of fresh and dry leaves of *Ruta graveolens* L, *International Journal of current research in biosciences and plantbiology*, vol- 2(9), Pp-33-37, ISSN-2349-8080.

[2] Abyshev (1992). The aerial parts of flowering plants of *Ruta graveolens*, Vol- 2(6) , Pp-1-62.

[3] Hedge J.E and Hofreiter B.T. Carbohydrate chemistry,17 (Eds.whistler R.L and Be Miller J.N, Academic press, New York.

[4] Jinous Asgarpanah, Roghaieh Khoshkam (2012). photochemistry and pharmacological properties of *Ruta*

graveolens L. *Journal of Medicinal Plants Research*, vol-6(23), Pp-3942-3949, ISSN- 1996-0875.

[5] Migual (2003). Phytochemistry and pharmacological properties of *Ruta graveolens* L.; *Journal of medicinal plant research,* Vol- 6(23).

[6] Nazish sakoos ,Mir ,Amin ,Alim (2009). Preliminary phytochemical analysis of *Ruta graveolens*, *Journal of Medicinal plant,* Vol- 3(2), Pp- 41-44.

[7] Ncube NS, Afolayan Ajand Okoh A (2008). Assessment techniques of antimicrobial properties of natural compounds of plant origin current methods and future trends, *African Journal of biotechnology*, Vol- 7(12), Pp-1797-1806.

[8] Pinkee pandey,Archana Mehta,Subhadip Hajra (2016). Evalution of the immunomodulatory activity of the Alcoholic extracts of *Ruta graveolens* leaves, *Journal of pharmacy and pharmaceutical sciences,*Vol- 8, Pp- 333-335, ISSN- 0975-1491.

[9] Rajeshwari sivaraj, Balakrishnan, Thenmozhi and Venckatesh (2010).Preliminary phytochmical analysis of *Ruta graveolens, International journal of pharmaceutical sciences and Research,* Vol-2,Pp -132-136, ISSN-0975-8232.

[10] Tekilt gebregiorgis amabye and tanveer mahamadali shalkh (2015). Phytochemical Screening and Evalution of Antibacterial Activity of *Ruta graveolens*, *Journal of Natural Products Chemistry and Rresearch*, Vol- 3, Pp-2-4,ISSN- 2329-6836.