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Research Article

**PHYTOCHEMICAL EVOLUTION AND ANTIMICROBIAL
ACTIVITY OF CURED METHANOL ROOT POWDER
EXTRACT *RHODOMYRTUS TOMENTOSA*****P. V. Sivakumar, K. Palanisamy and M. Lenin**PG & Research. Dept. of Botany Arignar Anna Government Arts College, Namakkal-2
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Received: 30 December 2016 **Accepted:** 19 February 2017 **Published:** 28 February 2017**Abstract:**

Rhodomyrtus tomentosa has been employed in traditional Thai medicine to treat colic diarrhea, dysentery, abscesses, blood sugar levels, haemorrhage and gynecopathy. The plant *Rhodomyrtus tomentosa* is native to Southern and Southeastern Asia. The present study was carried out to evaluate the phytochemicals present in the root powder and also to study antimicrobial activity same crude extract. The phytochemical study showed the presence of many phytochemical compounds like Alkaloids, Flavonoids, Steroids, Terpenoids, Phenols, Anthocyanin, polar, dipolar and non polar solvent using root powder. Highest flavonoid content was observed in the methanolic extracts. And also study was carried which is given highest antimicrobial activity controlled was observed in the Kirby-Bauer disk-diffusion method.

Keywords: Phytochemical, Polar, Dipolar, Antimicrobial, Medicine.

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INTRODUCTION:

In recent years, nearly 80% of the world's population relies on traditional medicines for primary health care, and most of these traditional medicines involve the utilization of plant extracts. As a result of the unmatched availability of chemical diversity, standardized plant extracts and pure compounds isolated from the extracts offer a broad opportunity for the identification of new drugs[1]. The discoveries reported in the study highlight the potential of *R.tomentosa* as a new source of health-promoting compounds such as dietary fibers, essential fatty acids, and phenolic compounds. A total of 19 phenolic compounds were tentatively characterized, including stilbenes and ellagitannins as major components, followed by anthocyanins, flavonols, and gallic acid. Piceatannol, a promising health-promoting stilbene component[2]. Flavonoids are a large group of plant polyphenol secondary metabolites that were widely found in the leaves, seeds, bark, and flowers of plants. Depending on their structural characteristics, flavonoids are divided into six classes, including flavanones, flavones, flavonols, isoflavonoids, anthocyanins and flavans [3]. Plant extracts contain different bioactive compounds that play a key role in treating illnesses. Bioactive compounds in plants are described as secondary plant metabolites that elicit pharmacological or toxicological effects in humans and animals[4]. Herbal medicines have less adverse effects as compared with modern medicines. The delivery of plant/herbal therapeutic molecules as drugs is problematic due to poor solubility, poor permeability, low bioavailability, instability in biological milieu and extensive first pass metabolism[5].

Recently, the ethanol extract of *R. tomentosa* leaves and rhodomyrone, its principle compound, have been demonstrated to have excellent antibacterial activity against Gram-positive bacteria [5]. However, little information is available in the literature concerning the chemical constituents and pharmacological activity of *R. tomentosa*. This review article explores the ethnopharmacological and pharmacological activities and phytochemicals, which provide evidence of a potent drug with potential application in treating a variety of illnesses. The edible berries of *R. tomentosa* are of dark violet color, bell shape and have been historically used as a folk medicine to treat diarrhea, dysentery and traumatic hemorrhage[6]. Ethnomedicinal activities of this plant may be due to its antioxidant property. Phytochemicals are responsible for medicinal activity of plants and they have protected human from various diseases [7]. Phytochemicals are basically divided into two

groups i.e., primary and secondary metabolites [8]. Phytochemicals are defined as bioactive non-nutrient plant compounds found in fruits that have been attributed to reduce the risk of major chronic diseases [9]. The major constituents of phytochemical consist of carbohydrates, aminoacids, proteins and chlorophylls, while, secondary metabolites consist of alkaloids, saponins, steroids, flavonoids, tannins, etc. [8]. Therefore, the aims of this study are to investigate the chemical constituents from root of *R.tomentosa* and to evaluate the antibacterial activity of the crude extracts and the isolated compounds via assay-guided isolation.

MATERIALS AND METHODS:**Collection and Preparation of *R. tomentosa* extract**

Fresh leaves of *R. tomentosa* were collected from Paranipettai, Annamalai University, Tamilnadu, India. Methanolic extract of *R. tomentosa* root was obtained according to the method of Limsuwan and Voravuthikunchai [10]. Briefly, the leaves were washed with running tap water and dried in an oven at 45C for 5 days at room temperature for 7 days with occasional shaking. The ethanolic extract was filtered through Whatman no. 1 filter paper and evaporated until completely dried. A stock solution was prepared by dissolving 100mg of the crude extract in 1 ml of DMSO.

Preliminary Phytochemical Analysis

The root powder was dissolved in various solvents and the preliminary phytochemical tests were carried out using Harborne [11].

Test for Alkaloids

To 1ml of the extract, 2ml of Mayer's reagent was added. Appearance of dull white precipitate indicated the presence of alkaloids[11].

Test for Flavonoids

To 1ml of extract, 1ml of neutral ferric chloride was added. The formation of brown colour confirmed the presence of flavonoids.

Test for Steroids

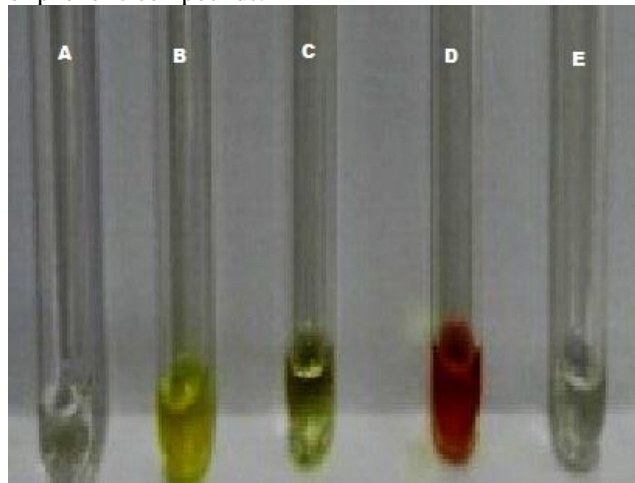
The extracts were dissolved in 2ml of chloroform to which 10 drops of acetic acid and five drops of concentrated sulphuric acid were added and mixed. The change of red colour through blue to green indicated the presence of steroids[11].

Test for Terpenoids

Five ml of each extract was mixed in 2ml of chloroform and concentrated sulphuric acid (3ml) was carefully added to form a layer. A reddish brown precipitate of the interface indicated the presence of terpenoids[11].

Test for Phenols

To 1ml of extract, lead acetate solution was added and the precipitate formation indicated the presence of phenolic compounds.

**Test for Anthocyanin**

A small amount of extract was treated with 2ml of NaOH and observed for the formation of blue green colour

Microorganisms used

The bacteria used are Gram-positive bacteria (*Staphylococcus aureus*) and Gram-negative bacteria (*P. aeruginosa*) which were obtained from Environmental Microbiology Laboratory, Thanjavur, with each concentration of culture test was 106 cfu/ml which has been likened to the turbidity standard solution.

Agar well diffusion method

Antibacterial activity was tested by the agar well diffusion method. Muller Hinton Agar was

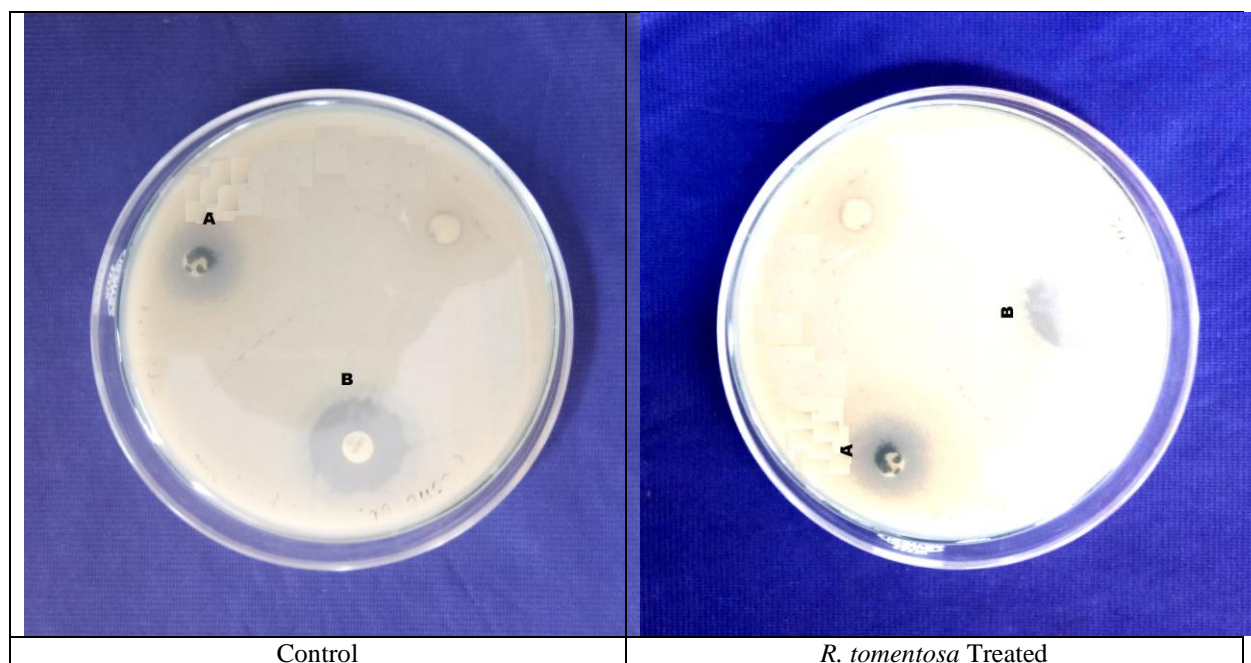
prepared and autoclaved for 15–20 minutes and poured in Petri plates and then cooled. The different concentrations (200, 400, and 600 mg/ml) of extract and fractions were used for this study. The Petri plates were kept for 3–4 h at low temperature and incubated at 36–37°C for 24 h. Antibacterial activity was recorded by measurement of the zone of inhibition around each disc in the plate using zone reader. Dimethyl sulfoxide was used as negative control, and standard antibiotic Kalmicetine (chloramphenicol) was used as positive control. Each assay was used triplicate for determination of antibacterial test [12].

RESULTS:

In the present study was carried *R. tomentosa* plant root dry and collected power after power preparation preliminary evaluation done by polar and non-polar solvent in this view of warm method solvent was prepared at suitable levels. The phytochemical compounds Alkaloids, Flavonoids, Steroids, Terpenoids, Phenols, Anthocyanin present in root extract (Figure1). The phytochemical screening root extract showed methanol, ethanol and Hexene extract the table values indicated ++ strongly present and also + is represented average level present in respective solvents. Compare to other solvents like ethanol and hexane low level of phenol and flavonoid phyto compound present in low levels, likewise methanol solvent highest-level phenol and flavonoid present in the root powder extract. The Terpenoids and Steroids low level present in the ethanol and hexane directly high level was observed methanol root extract (Table 1).

Table1. Phytochemical screening results of root extract

Analysis name	Methanol	Ethanol	Hexene
Alkaloids	++	++	-
Flavonoids	++	++	-
Steroids	+	+	+
Terpenoids	++	+	-
Phenols	++	++	-
Anthocyanin	+	+	-



The bacteria used are Gram-positive bacteria (*Staphylococcus aureus*) and Gram-negative bacteria (*P. aeruginosa*) treated laboratory condition it gives some circle controlled by other. When the increase concentration it creates normal zone *Staphylococcus aureus* and *P. aeruginosa* induces *R. tomentosa* plant extract give a positive control and reduces pathogens growth. Gram positive and Gram-negative bacteria two-way process moderate plant extract concentration when we increase at a time pathogen level was reduce it measures zone of inhibition levels. Thus, our study was confirmed to reduce both bacteria like gram positive and gram negative.

DISCUSSION:

Our study focused was phytochemical evolution and antimicrobial activity of cured methanol root powder extract *Rhodomyrtus tomentosa*. Previous studies have shown that the chemical constituents isolated from plants have been used for the prevention and treatment of cancer, heart disease, diabetes mellitus, and higher blood pressure[13]. Indonesia is one country that many use as traditional medicinal plants. Lately usage is increasing in line with the advancement of knowledge about the properties of grown-plant[14]. Plants that have potential as a drug is haramonting. But the plant has not been widely used by the community. The accumulation of inflammatory cells in the alveolar wall causes thickening of the alveolar wall structure. The occurrence of damage in the T1 group is higher than T2 due the outside variables that cannot be controlled, such as the psychological condition of mice by the surrounding environment, such as the environment that is too noisy, giving repeated treatments, and fighting between mice. Damage is also evident in alveoli epithelial cells because of the relationship between alveoli and blood capillaries during gas exchange the relationship of the alveolar is not tight and the shape of the lumen is irregular. The phytochemical constituents play a significant role in the identification of crude drugs and also to evaluate drugs derived from the plant sources [15]. The

phytochemical screening of leaf of *Phyllanthus amarus* revealed the presence of flavonoids, tannins, alkaloids, terpenoids, saponins and cardiac glycosides [16].

Compared with another berries, the presence of quercetin in *R. tomentosa* berries was in agreement with [17] who reported the ubiquity of quercetin in 25 edible berries. Besides being prevalent in berries, quercetin was detected in 41 of 62 tropical edible plants ranging from 14.5 to 1497.5 mg/kg dry weight in tropic plants grown in Malaysia [18]. The existence of quercetin, myricetin, and kaempferol in a single variety of berries, however, was not reported in any of the 25 berries from Finland [18]. According to [6], the anti-ulcerogenic activity of an aqueous alcoholic (70%) extract of *R. tomentosa* was investigated using acetic-acid-induced chronic ulcer model in rats. The anti-bacterial activity the increase in the levels of superoxide dismutase and catalase, and the decrease in lipid peroxidation. It was suggested that the presence of triterpenoids, flavonoids, and phenolic compounds is probably related to the potent anti-bacterial activity.

CONCLUSION:

In present study conclude that the Phytochemical evolution and antimicrobial activity of cured methanol root powder extract *Rhodomyrtus*

tomentosa. The *R. tomentosa* has many different bio active compositions such as Alkaloids, Flavonoids, Steroids, Terpenoids, Phenols, Anthocyanin. Moreover, *R. tomentosa* is a promising source of biologically active metabolites including phenolic and terpenoid compounds. Notably, various health beneficial effects of *R. tomentosa* including antioxidant, antibacterial, anti-inflammatory, and anticancer activities have been revealed by in vitro and in vivo experimental models. Thus, it is believed that *R. tomentosa* can be applied as a functional food for prevention and/or treatment of chronic diseases. However, further studies regarding the discovery of novel compounds and biological activities of *R. tomentosa* and the development of new health benefit products are necessary in the future.

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