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ANTIMICROBIAL ACTIVITIES OF *PSIDIUM GUAJAVA* L LEAF EXTRACT

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ABSTRACT

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Psidium guajava is an important food crop and medicinal plant in tropical and subtropical countries.. The extracts and metabolites of this plant, particularly those from leaves are useful pharmacological activities. Many pharmacological studies have demonstrated the ability of this plant to exhibit antioxidant, antimicrobial activities. It has suggested that the extract from *Psidium guajava* leaves possesses antidiabetic effect especially in type 2. The anti-microbial test results showed that the leaf extraction had potential anti-microbial activity against Gram positive and Gram negative bacterial strains.

INTRODUCTION

Medicinal plants are of great importance to the health of individual and communities. The medicinal value of these plants lies in some chemical active substances that produce a definite physiological action on human body. The most important of these chemically active constituents of plants are alkaloids, tannin, flavonoid and phenolic compounds. Many of these indigenous medicinal plants are also used for medicinal purposes (1,2).

The leaves and bark of *Psidium guajava* tree have a long history of medicinal uses that are still employed today. In folk medicines, extracts of roots, bark, and leaves are used to treat gastroenteritis, vomiting, diarrhea, dysentery, wounds, ulcers, toothache, coughs, sore throat, inflamed gums and a number of other conditions (3).

Psidium guajava (Guava) is a small tropical tree that grows up to 35 feet tall; it is widely grown for its fruit in tropics. It is a member of the Myrtaceae family, with about 133 genera and more than 3,800 species. The leaves are when crushed, evergreen, opposite, short petiole, oval or oblong, elliptic, sometime irregular. The fruits are sweet musky odor when ripe, may be round, ovoid or pear shaped, and the skin is light yellow and thin. Next to skin is a layer of granular flesh, white yellowish, light or dark pink or near red juicy, acid, sub acid or sweet and flavorful. (4, 5, 6). Guava contain the phytochemicals including polysaccharides, vitamins, essential oils minerals, enzymes, proteins (7), sesquiterpenoid alcohols and triterpenoid acids, alkaloids, glycosides, steroids, flavanoids, tannins, saponins (8). *Psidium guajava* or guava is very rich in antioxidants and vitamins and also high in lutein, zeaxanthine and lycopene (9).

Guavas are rich in dietary fiber, vitamins A and C, folic acid, and the dietary minerals, potassium, copper and manganese. Having a generally broad, low-calorie profile of essential nutrients and a single common guava fruit contains about four times the amount of vitamin C as an orange. It often included among super fruits, being rich in dietary fiber, vitamins A and C, folic acid, and the dietary minerals, potassium, copper and manganese. The fruit contains about four times the amount of vitamin C as an orange (10).

MATERIALS AND METHODS

Plant Material

The leaves of *Psidium guajava* were collected from Tiruchirappalli region, the month of December 2011. Three kilo gram of *Psidium guajava* leaves were properly shade dried, powdered and extracted serially in soxhlet extractor with, ethanol and water. The organism

includes both pathogenic and non pathogenic such as *Escherichia coli* *Staphylococcus aureus* and *Bacillus cereus*.

Preparation of extract for anti bacterial activity

In vitro anti-bacterial activity of extract was performed by direct plate method. From the nutrient broth 50 µl of each test organisms were transferred into different Nutrient agar (Hi Media, India) was used as the bacteriological medium 20 ml. and the organism was spread throughout the medium by sterile L rod. After spread a plate and in different concentrations of leaf extracts of 50 µl , 100 µl , and 200 µl was introduced into each plate. Control plates were also maintained. All tubes were incubated at 37°C for 24hrs. The lowest concentration that did not permit any visible growth when compared with the control was considered as the minimum inhibitory concentration. The contents of all tubes that showed no visible growth were cultured on nutrient agar, incubated at 37°C for 24hrs. The minimum bactericidal concentration was considered as the lowest concentration that could not produce a single bacterial colony.

RESULTS AND DISCUSSION

Various concentration of *Psidium guajava* inhibited the growth of the entire test organism used namely *Escherichia coli* *Staphylococcus aureus* and *Bacillus cereus*. The highest growth inhibitory activity was achieved with the extract volume of 200 µl of the extract. The zone inhibition ranged from 15 to 25 mm. the highest zone inhibition occurred in growth of *Escherichia coli* and *Staphylococcus aureus*. Anti-microbial activity showed that, the inhibition zones were found increased considerably when the concentration rate increased. Therefore it can be said that quantity of the leaf extract was important for inhibition effect (11).

CONCLUSION

Psidium guajava L. is much of the traditional uses have been validated by scientific research. A number of chemicals isolated from plants like quercetin, guaijaverin, flavonoids and galactose-specific lecithins have shown promising activity in many human trials. The plant has been extensively studied in terms of pharmacological activity of its major components, and the results indicate potent antimicrobial activities. In recent years, emphasis of research has been on utilizing traditional medicines that have a long and proven history of treating various ailments. Quite a significant amount of work has been done on the pharmacological and biological activity and possible application of chemical compounds from whole part of the plant.

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