

**A WAR AGAINST DISEASE - ANTIMICROBIAL ACTIVITY OF EVER GREEN  
MEDICINAL PLANT – ANNONAMURICATA (GRAVIOLA)****\*Suganya M.<sup>1</sup>, Megala M.<sup>2</sup> and Rubalakshmi G.<sup>3</sup>**<sup>1</sup>Assistant Professor, Department of Biochemistry, Vivekanandha College of Arts & Science for Women, Thiruchengode, Namakkal District, Tamil Nadu, India.<sup>2</sup>Department of Biochemistry, Vivekanandha College of Arts & Science for Women, Thiruchengode, Namakkal District, Tamil Nadu, India.<sup>3</sup>GRD BIO CLINICAL Research, Rasipuram - 637408, Namakkal District, Tamil Nadu, India.**\*Corresponding Author: Suganya M.**

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**ABSTRACT**

Medicinal plants used as natural medicines. Herbs have been utilized to treat acute and chronic disorders for thousands of years. Plant have been the source of medicines in pharmacopoeia. One such plant is *Annonamuricata* (*Graviola*), is an indigenous medicinal plant belonging to the family Annonaceae. There is no systematic work that has been undertaken on this plant. The objective of the present study is the antimicrobial and antithrombotic activities of plant graviola. The hydroalcoholic extract of graviola showed better inhibition towards gram negative, gram positive bacteria with the maximum effect shown by the fruit extract. The findings of present study suggests that hydroalcoholic extract possessed most antimicrobial activity. The hydroalcoholic extract can be used as an effective and antimicrobial agent to combat various ailments caused by the free radicals and bacterial species.

**KEYWORDS:****INTRODUCTION**

India is the largest producer of medicinal plants and is rightly called the "*Botanical Garden of the World*". Medicinal plants are nature's priceless gift to human. The development in the field of modern medicine temporarily subdued the traditional herbal medicine. But it has now staged a comeback and a "herbal renaissance" is blooming across the world.<sup>[2]</sup> According to world health organization (WHO) greater than 80% of the total world's population depends on the traditional medicines in order to satisfy their primary health care needs.<sup>[3]</sup> It also suggested in improving the technologies for cultivation of medicinal plants which have the capacity of exerting a physiologic action on the human body were the primary features.

Numerous studies have shown that aromatic and medicinal plants are sources of diverse nutrient and non-nutrient molecules, many of which display antimicrobial properties which can protect the human body against both cellular oxidation reactions and pathogens. Thus it is important to characterize different types of medicinal plants for their antioxidant and antimicrobial potential.<sup>[4,5]</sup> Aromatic and medicinal plants are known to produce certain bioactive molecules which react with other organisms in the environment, inhibiting bacterial or fungal growth (antimicrobial activity). The substances that can inhibit pathogens and have little toxicity to host

cells are considered candidates for developing new antimicrobial drugs.<sup>[6]</sup> All over the world the herbal medicine acts as the representative of the most important fields of traditional medicine.

*Annona muricata* otherwise known as sour soup, evergreen tree and guanabana. *Annona Muricata* is a small, upright ever green tree growing 5 to 6 meters in height with large dark green and glossy leaves. This fruit is have been used to help relive various disease.<sup>[1]</sup> *Annona Muricata* fruit is also preventing infection by inhibiting the growth of virus, bacteria and parasites. *Annona Muricata* tree are used in natural medicine in the tropics. As the fruit of this plant is highly nutritious this paves the ways to work in future on its potential to serve as an edible vaccine.<sup>[2]</sup>

**MATERIALS AND METHODS****PLANT COLLECTION AND IDENTIFICATION**

*Annona muricata* used in the study was identified in the botanical survey of VICAS botany department, the reference material has been kept under reference VICAS/SC/05/15-16. Fresh whole fruit was collected randomly from the region of in around Kolli Hills, Tamilnadu. Fresh fruit was air dried and then homogenized to fine powder and stored in air tight bottle.

**PREPARATION OF PLANT EXTRACTS****MATERIALS****PLANT PARTS**

- ❖ Fruit

**METHOD**

The shade dried coarsely powdered fruit of *Annona muricata* (50g) was extracted with 500 ml of 80% aqueous ethanol by maceration at room temperature for 72 hours. After extraction, the extract was filtered, concentrated to dryness in rotavapour under reduced pressure and controlled temperature (40-50°C). Dark yellowish brown color residue was then stored in desiccators. The extractive value of hydro alcoholic extract of *Annona muricata* was found. The extracts were stored in airtight bottles for further use.

**ANTIMICROBIAL ASSAY**

The media and the test bacterial cultures were poured into dishes (Muller -Hinton agar media). The test strain (0.2ml) was inoculum size (108 cells/ml) when the temperature reached 40-42°C. Care was taken to ensure proper homogenization. The fruit extract were tested for antimicrobial activity in the agar well diffusion assay (Perez et al., 1990) against *Bacillus subtilis*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsilla pneumonia*, *Enterococcus faecalis*, *Micrococcus luteus*, *Staphylococcus aureus*, *Streptococcus Durans*, *Shigella flexnari*, *Vibrio parahaemolyticus*, *Candida Albicans* and *Aspergillus Niger*.

**AGAR WELL DIFFUSION METHOD**

The antimicrobial activity was tested against Hydro alcoholic fruit of *Annona muricata*. The inoculation of microorganism was prepared from bacterial culture (Parihar and Bohar, 2006). About 15-20 ml of Muller - Hinton agar medium was poured in the sterilized petridish and allowed for solidification. One drop of bacterial strains was spread over the medium by a rod. Wells of 6mm in diameter and about 2cm apart punctured in the culture medium using sterile corkborers. The solution of all the extracts of leaves (10mg/ml) was prepared in sterile distilled water. 100 ml of the extracts were transferred in to holes using sterile Pasteur pipettes. Plates were incubated in air at 37°C for 24 hours. Antimicrobial activities were evaluated by measuring inhibition zone diameters.

**RESULT****ANTI MICROBIAL ACTIVITY**

Table 2 shows the antimicrobial activity of extract hydro alcoholic of fruit of *Annona muricata*. The largest zone of inhibition was exhibited by the hydro alcoholic extract *Bacillus subtilis*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsilla pneumonia*, *Enterococcus faecalis*, *Micrococcus luteus*, *Staphylococcus aureus*, *Streptococcus Durans*, *Shigella flexnari*, *Vibrio parahaemolyticus*, *Candida Albicans* and *Aspergillus Niger* of when compared to other extracts.

**Table-2 ANTIMICROBIAL ACTIVITY OF HYDROALCOHOLIC EXTRACT OF FRUIT OF ANNONA MURICATA GRAM POSITIVE BACTERIA**

S. No	Microorganisms	Streptomycin	Zone of inhibition (mm) Different Concentration			
			Hydroalcoholic extract of AM(25µg)	Hydroalcoholic extract of AM(50µg)	Hydroalcoholic extract of AM(75µg)	Hydroalcoholic extract of AM(100µg)
1	<i>Bacillus subtilis</i>	29	09	11	17	19
2	<i>Enterococcus faecalis</i>	27	10	12	13	16
3	<i>Micrococcus luteus</i>	24	11	12	14	15
4	<i>Staphylococcus aureus</i>	26	08	12	16	19
5	<i>Streptococcus durans</i>	25	07	10	11	14

**GRAM NEGATIVE BACTERIA**

S. No	Microorganisms	Chloramphenicol	Zone of inhibition (mm) Different Concentration			
			Hydroalcoholic extract of AM(25µg)	Hydroalcoholic extract of AM(50µg)	Hydroalcoholic extract of AM (75µg)	Hydroalcoholic extract of AM(100µg)
1.	<i>Shigella flexnari</i>	25	10	11	13	14
2.	<i>Klebsilla pneumonia</i>	26	11	12	15	18
3.	<i>Pseudomonas aeruginosa</i>	24	09	10	12	15
4.	<i>E.coli</i>	30	08	11	14	17
5.	<i>Vibrio parahaemolyticus</i>	24	10	10	13	15

**ANTIFUNGAL ACTIVITY**

S. No	Microorganisms	Penicillin	Zone of inhibition (mm) Different Concentration			
			Hydroalcoholic extract of AM(25µg)	Hydroalcoholic extract of AM(50µg)	Hydroalcoholic extract of AM(75µg)	Hydroalcoholic extract of AM(100µg)
1.	<i>Candida albicans</i>	28	10	11	13	15
2.	<i>Aspergillusnigar</i>	25	08	10	14	16

**DISCUSSION**

The antimicrobial activities of the plant extracted in different solvents varied greatly because there are many factors that influence the active principle present in the plant. Here the polarity of the extracting solvents was different and it greatly influenced the antimicrobial properly. Different plants have been used as sources of inspiration in the development of novel drugs.<sup>[7]</sup> Many plant species have been evaluated for their antimicrobial activity in the past 20 years. In the *invitro* antimicrobial activity of hydro alcoholic extract of fruit of *Annona muricata*. Many plant species have been evaluated for their antimicrobial activity in the past 20 years. In antimicrobial activities of the various hydro alcoholic extract of many factors of influence of the plant. Different plants have been used to the inspirations in the development of novel drugs. Antimicrobial effect of hydro alcoholic extract of fruit of *Annona muricata* against gram positive bacteria and gram negative bacteria suggest that they possess the remarkable therapeutic action of gastrointestinal and skin disease.

**CONCLUSION**

The hydroalcoholic extract of fruit of *Annona muricata* tested for antimicrobial activity, hydroalcoholic extract was found to possess strong antimicrobial activity against the tested pathogens. The findings of the present investigation suggest that the fruit extract possess compounds with antimicrobial activity and could serve as useful sources for new antimicrobial agents.

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