Antifungal activity of ethanol extract of Psidium Guajava (Myrtaceac) leaves

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Abstract

The ethanol extract of leaves of psidium Guajava on Aspergillus Flavus and Fusarium Oxysporum was investigated invitro in Lab. A.Flavus and F.Oxysporum were collected by lab stock for the purpose of the study. The plant psidium guajava extract was constituted into five different concentrations (2%,4%,8%,12% and 20%). A potato dextrose Agar (PDA) was prepared according to my specifications for the growth of test organisms. In sterilized petri dishes containing a mixture of potato dextrose agar media and ethanol extracts the organisms were inoculated. The growth of the organisms reduced it is shown by the result. I know about the gowth inhibition of F.Oxysporum was higher compared to that of A.Flavus.

Keywords: Aspergillus Flavus, Ethanol Extract, Fusarium Oxysporum, Leaves, Psidium Guajava and PDA

Introduction

This is a common tropical plant name Guava, *Psidium guajava* (Linn.), which is a member of *Myrtaceae* family. It is used as food but also as medicinal purpose, and the various parts of this plant have a number of medicinal properties like it has antimicrobial activity,antifungal activity and anticancer property. The advantage is that plantation of guava is relatively easy to cultivate in a variety of soils and adapts to different climatic conditions; the guava fruits are born fairly in a short period. Guava trees are found throughout India and they are planted in the states Andhra Pradesh, Assam, Bihar, Maharashtra, Uttar Pradesh, and West Bengal and this states are cultivate this plant. The guava extract is used in multiple medicinal properties such as use for the treatment of communicable diseases and non-communicable diseases.

We know the microorganisms harm our life physically. $5x10^3$ microbial cells estimated exist on earth. New human infections is increasing day after day and the harmful microbes also strong day after day due to increase in number of cancer patients and many microorganisms have developed resistance to conventional antifungal and antibiotics, hence the need for a good plant based on an alternative form of antifungal and antibiotic drug to minimize the growth of those microbes. The purpose of my research to investigate the anti-fungal efficacy of the leaf extract of *Psidium Guajava* by determining the efficacy of the leaf extract on *A. flavus and F. oxysporum.*

Materials and Methods

Sample collection: *Psidium Guajava* plant was used for the study of antifungal activity. The collected samples were packed in neat and clean sterilized polythene bag and brought in Lab. The

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sample then transferred to the Lab for the study.

The plant material Preparation:

The samples first washed with distill water and air dried under room temperature of 37±3^{0}C, so as the phytochemical constituents in it to preserve. By using mortar and pestle the dried material was crushed and then sieved obtained fine powder. 50gm of powder weighed using weighing balance. After in a neat and clean conical flask the powder was transferred.

Extraction of Plant:

First ethanol was taken 500ml after added in the conical flask containing 50gm of the powdered material; the sample was cupped with aluminum foil, stirred and kept for 3days. By using muslin cloth it will be filtered. By the stainless plate the filtrate obtained was collected and evaporated to dryness by using hot plate set at 40^{0}C. When the resultant extract was scraped of it will be kept in a clean foil paper and labelled.

Culture Media Preparation:

The nutrient media potato dextrose agar to be used. It was taken then prepared to the my instruction. In 1000ml distilled water 39gm of potato dextrose agar was dissolved. For inhibit the growth of bacteria 1gm of Kanamycin was added. Then heated the mixture to be sure of complete dissolution. After it was autoclaved at 121^0**C** for 17minutes it will be allowed to cool at room temperature.

Plant extract preparation:

By using syringed 5ml of distilled water measured and poured into test tubes and then to cover the test tubes cotton wool was used. After then it autoclaved for 17minutes at 121^{0}C.0.01gm,0.04gm,0.08gm,0.12gm and 0.20gm of the extract were then measured separately and added to the test tubes to each and mixed thoroughly to obtain mixtures. The constitute mictures the concentration of the extract as 2%, 4%, 8%, 12% and 20% for antifungal activity.

Test organisms

For stuck in the laboratory the test organisms were collected. The test organisms were A.Flavus and F.Oxysporum.

Antifungal Assay

The incorporated method agar was used for the antifungal effect to determine of the plant extract. For prepare PDA media of 20ml was dissolved into Petri dishes and 2%, 4%, 8%, 12% and 20% of the varying plant extract concentrations separately added to PDA medium in triplicates in the Petri dishes and allowed to solidify at room temperature (37± 3^{0}C). A.Flavus and F.Oxysporum obtained from the stuck culture of laboratory were separately triplicates in inoculated into each PDA extract medium. The plant extract without PDA medium was used as control and the test organisms were triplicates in into it. For 1week these were kept in the incubation room and for growth observed daily.

Measurement of growth (diameter)

Along two directions the colony diameter taken on two perpendicular lines drawn on the reverse side of the plates. For in terms of percentage inhibition the effectiveness of the extract was recorded.

$$\%\, Mycellial\ inhibition = \frac{MG\ (control) - MG\ (treatment)}{MG\ (control)}\ x\ 100$$

where MG is Mycellial growth

Results

I know about the ethanol extract of the antifungal assay of Psidium Guajava on A.Flavus and F.Oxysporum indicated that the inhibition on the growth of those test organisms by the plant extract

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shown in Table 1. The highest zone of inhibition was 30.51 ± 3.20^{a} at 20% concentration of the plant extract agonist A.Flavus and 26.93 ± 7.47^{b} was recorded for F.Oxysporum. I know there was no significant difference at $p<0.05$ on the growth inhibition of test organisms at the concentrations of plant extract are 4%,8%,12% and after observed the inhibiting affect for both organism at 2% concentrations. Values are mean + standard error of 3replication means in a column with significantly different ($P<0.05$) of different superscript.

Table 1: Study about Psidium Guajava leaves of ethanol extract on antifungal activity.

Concentration (%)	Zone of Growth inhibition (%)	
	A.flavus	***F.oysporum***
2	18.41 ± 2.91^{d}	6.67 ± 0.88^{d}
4	21.00 ± 3.04^{c}	13.33 ± 0.88^{c}
8	25.20 ± 1.03^{bc}	14.90 ± 2.01^{bc}
12	26.93 ± 7.47^{b}	18.24 ± 1.58^{b}
20	30.51 ± 3.20^{a}	26.24 ± 0.55^{a}
Control	0	0

Values are mean ± standard error of 3 replication means in a column with significantly different ($P< 0.05$) of different superscript.

Discussion

In lab the research work observed from result indicated that ethanollic leaf extract of psidium Guajava has the efficacy of antifungal activity on A.Flavus and F.Oxysporum as growth of the organisms on the plant extract were inhibited at different concentrations.

CONCLUSION

The revealed study describes that ethanol leaves extract of Psidium Guajava has antifungal properties as growth of test organisms was inhibited. Rather than F.Oxysporum I found A.Flavus is more sensitive to the plant extract as I know if concentration higher of the extract, there is more inhibitory effect on the organisms.

RECOMMENDATION

In this research the plant is a good source for production of drugs with a broad spectrum activity. My result of study suggests that ethanol extract process a compound with antifungal properties which is used as antifungal agent in novel drugs for the treatment of different fungal disease.

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