International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: 6.614
Available Online at www.journalijcar.org
Volume 9; Issue 05(A); May 2020; Page No.22025-22027
DOI: http://dx.doi.org/10.24327/ijcar.2020.22027.4339

Research Article

A COMPARATIVE AND CORRELATION ANALYSIS OF FIVE DIFFERENT SOLVENT EXTRACTS OF *Anacardium occidentale L* WITH FIVE DIFFERENT BACTERIA

Ajay P Dev[1]*, Anoop M[1]and Shilpa Venkatesh[2]

[1*]Dept of Biotechnology and Research, K.V.M College of Science & Technology, Cherthala 688527
[2]S.D.V Colleges of Arts and Applied Science, Alappuzha, Kerala-688003

A R T I C L E I N F O

Article History:
Received 13th February, 2020
Received in revised form 11th March, 2020
Accepted 8th April, 2020
Published online 28th May, 2020

Key words:

Anacardium occidentale L , Antibacteria, Solven extracts, Correlation.

A B S T R A C T

Different solvent extracts (ethanol, acetone, chloroform, hexane and aqueous) of leaves of *Anacardium occidentale L* were used for phytochemical evaluation and analysis of antibacterial activity. Phytochemical analysis of the extracts of *Anacardium occidentale* leaves revealed the presence of alkaloids, flavonoids, tannins, glycosides and phenols as secondary metabolites. The antibacterial activity was tested upon *Escherichia coli, Pseudomonas sp., Klebsiella pneumonia, Mycobacterium smeg, and Vibrio cholerae.* All the extracts exhibited antibacterial activity, where the ethanol extract presented greater zone of inhibition of 10mm against *Pseudomonas* and acetone extracts recorded zones of inhibition of 10mm against *Escherichia coli* and *Vibrio cholerae*. The inhibition diameter were compared against zone of inhibition formulated by Gentamycin, Erythromycin, Ampicillin and Amoxicillin against the respective bacteria. The ethanolic extracts presented greater correlation with various antibiotic controls used against the bacteria and has showed maximum zones of inhibition to various bacteria selected in the present work.

INTRODUCTION

The Ayurvedic system of medicine has been established in India since a number of decades, and it still remains the foundation of the traditional system of Indian medicine. With an increasing commercialization of herbal products, there was a need for the scientific community to introduce a quality control system for plant based medicines. Infectious diseases caused by pathogens such as bacteria, fungi and viruses are major challenges to public health, in that microbial activity promotes morbidity and mortality of the human host. *Staphylococcus aureus* is the causative organism of skin infections, pneumonia, food poisoning and toxic shock syndrome. *Escherichia coli* are of several types and harbored in the digestive tracts of human and animals. Although most *E. coli* are harmless microbes, some can cause hemorrhage, urinary tract infections and anemia. *Anacardium occidentale L.* (Family Anacardiaceae), is a multipurpose tree of the tropics which attains a height of about 10-15m. They grow on relatively dry soil in nature but in cultivation grow well in the tropical rain forest. The cashew tree produces many products and resources.The present study is, therefore, designed to study the phytochemical constituents, antibacterial, and antifungal properties and inhibitory activities of *Anacadium occidentale* leave extracts against some clinically important microorganisms

Corresponding author:* **Ajay P Dev
Dept of Biotechnology and Research, K.V.M College of Science & Technology, Cherthala 688527

METHEDOLOGY

Collection and Preparation of leaf samples

The leaves were washed several times with water; shade dried and then pulverized to coarse powdered in an electric grinder. The powder was stored in air tight bottles.

Preparation of the extract

The 30g shade dried powder of *Anacardium occidentale* (leaf) were subjected to cold extraction using each of the 250ml solvents (hexane, chloroform, acetone, ethanol and water) in the increasing order of polarity.

Phytochemical analysis was performed as per standard Protocol .(Abulude ***et al*** ,2009)

Antibacterial Activity

The bacterial strains were collected from culture collection centers of PMC ,Alapppuzha ,Kerala and were sub cultured and stored .The bacteria were inoculated in nutrient broth and incubator at 37°C in incubator. 24 hours old cultures were used for further studies.

Statistical Studies

The correlation of diameter of zone of inhibition between various solvent extracts to various positive controls was studied using Microsoft Excel 2007.

RESULT AND DISCUSSIONS

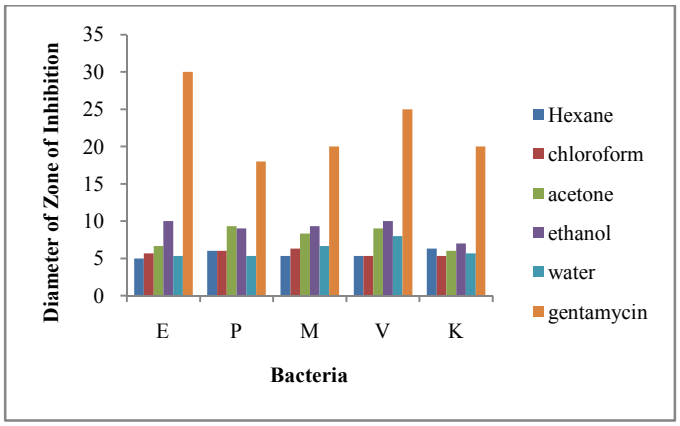

Fig 1 comparative analysis of antibacterial activity of different solvent extracts of *Anacardium occidentale L* with Gentamycin

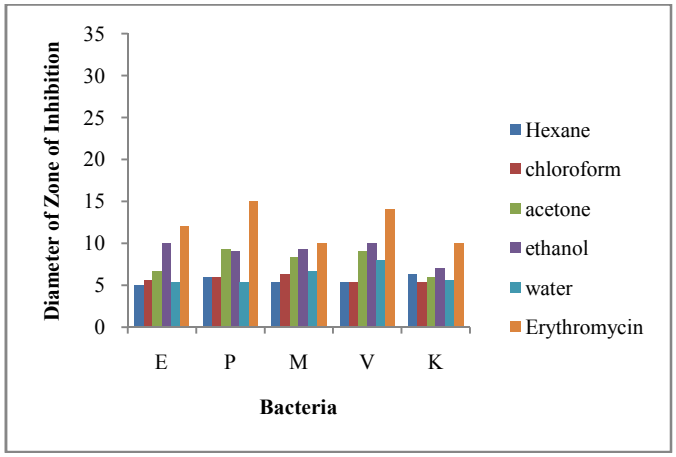

Fig 2 comparitive analysis of antibacterial activity of different solvent extracts of *Anacardium occidentale L* with Erythromycin

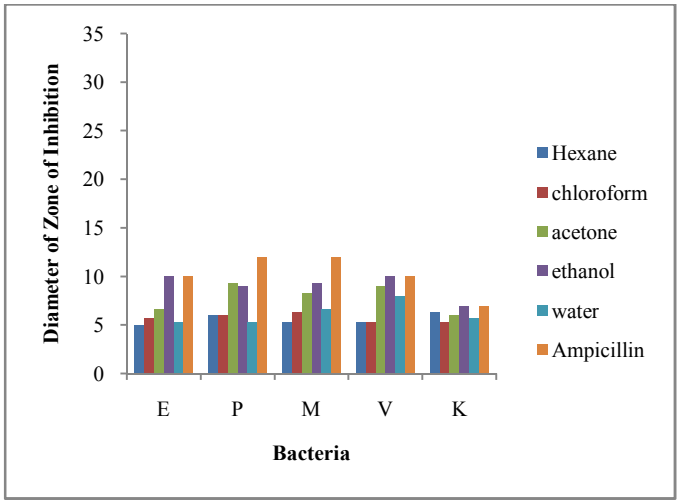

Fig 3 comparitive analysis of antibacterial activity of different solvent extracts of *Anacardium occidentale L* with Ampicillin

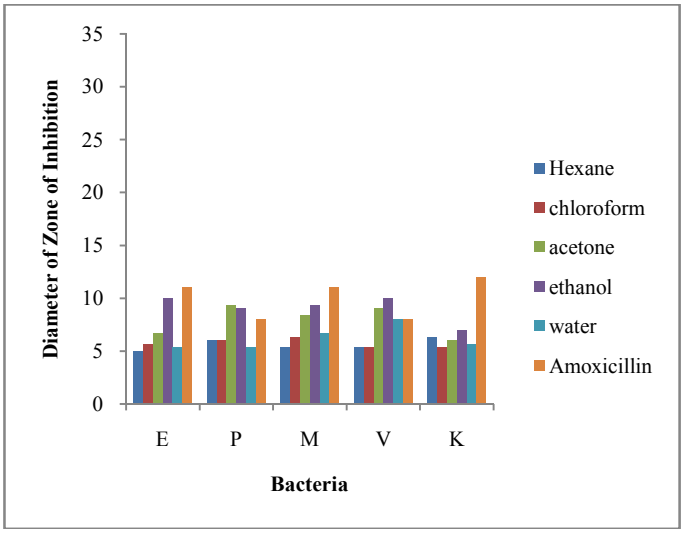

Fig 4 comparitive analysis of antibacterial activity of different solvent extracts of *Anacardium occidentale L* with Amoxicillin

After 24 hours of incubation, zones of inhibition were observed in the incubated plates. Zone of inhibition was found to be highest in Ethanol and Acetone solvent of leaf extracts of *Anacardium occidentale.* Among them Ethanol leaf extract showed the maximum zone of inhibition.

Statistical Analysis

Table 1 Correlation of 5 different solvent extracts of *Anacardium occidentale L* with Standard Controls

	Gentamycin	erythromycin	Ampicilin	Amoxiciliin
Hexane	-0.767	-0.039	-0.415	0.0671
Chloroform	-0.3814	-0.0982	**0.82**	-0.003
Acetone	-0.3219	**0.7058**	**0.787**	-0.8812
Ethanol	**0.587**	**0.468**	**0.652**	-0.5058
Water	0.0935	0.1103	0.08555	-0.39049

A strong positive correlation was shown by chloroform extract of the plant sample which was presented to be 0.82.The acetone extract presented 0.70 with erythromycin and 0.787 with Ampicillin.The ethanolic extract showed more positive correlations with three antibiotic controls used .A value of 0.468 with erythromycin 0.652 with Ampicillin and 0.587 with Gentamycin.(Table 1).

CONCLUSION

The phytochemical screening of *Anacardium occidentale* in hexane, chloroform, ethanol, acetone, and aqueous leaf extracts indicated the presence of carbohydrate, alkaloids, alkaloids, cardiac glucoside, coumarin glycoside, saponins, flavonoids, phytosterols, fats, oils , phenol , tannins and terpenoids. In aqueous extract some of the phytochemicals showed their absence.Antibacterial activity of hexane , chloroform , ethanol , acetone , and aqueous leaf extracts of *Anacardium occidentale* against *E.coli , K. pneumonia , Pseudomonas sp , Vibrio cholera* and M. *smeg* showed characteristic zones. Ethanol and acetone extracts of *Anacardium occidentale* showed the highest zone of inhibition and has shown consistant correlation with three positive controls used (Table 1) and proved to be the best candidate in the phytochemical extraction of the plant compounds for effective antibacterial activity.

References

1. Abulude, F.O., Ogunkoya, M.O. and Adebote, V.T.,2009. Phytochemical and Antibacterial investigations of crude extracts of leaves and stem barks of *Anacardium occidentale*. *Continental Journal of Biological Sciences*, 2: 1216.
2. Doss, A.V. and Thangavel, P.K., 2011. Antioxidant and antimicrobial activity using different extracts of *Anacardium occidentale* L. *International Journal of Applied Biology and Pharmaceutical Technology*. 2:436–443.
3. El-Mahmood, A. M., Doughari, J. H. and Kiman, H. S.,2010.In vitro antimicrobial activity of crude leaf and stem bark extracts of Gmelinaarborea against some pathogenic species of Enterobacteriaceae. African *Journal of Pharmacy and Pharmacology* 4(6):355-361.
4. El-Mahmood, A. M., Doughari, J. H. and Kiman, H. S., 2010.In vitro antimicrobial activity of crude leaf and stem bark extracts of Gmelinaarborea against some pathogenic species of Enterobacteriaceae. African Journal of Pharmacy and Pharmacology 4(6):355-361.
5. Goncalves, G.M.A. and Gobbo, J.,2012. Antimicrobial Effect of *Anacardium occidentale* Extract and Cosmetic Formulation Development. Brazilian Archives of Biology and Technology, 55, 843-850.
6. Goncalves, G.M.A. and Gobbo, J.,2012. Antimicrobial Effect of *Anacardium occidentale* Extract and Cosmetic Formulation Development. Brazilian Archives of Biology and Technology, 55, 843-850.
7. Kannan, V.R., Sumathi, C.S., Balasubramanian, V. and Ramesh, N.,2009. Elementary Chemical Profiling and Antifungal Properties of Cashew (*Anacardium occidentale* L.) Nuts. Bot Research Resources, 2, 253-257.

How to cite this article:

Ajay P Dev, Anoop M and Shilpa Venkatesh (2020) 'A Comparative and Correlation Analysis of Five Different Solvent Extracts of Anacardium Occidentale l with Five Different Bacteria ', *International Journal of Current Advanced Research,* 09(05), pp. 22025-22027. DOI: http://dx.doi.org/10.24327/ijcar.2020.22027.4339

****