



To study the Antibacterial Properties of *Murraya Koenigii* on *Staphylococcus Aureus* (MTCC-3160)

Somya Sharma and Jagriti sharma

Department of Biotechnology
Raja Balwant Singh College Khandari, Agra

ABSTRACT :

Curry leaves (*Murraya Koenigii*) are a popular leaf-spice used in very small quantities for their distinct aroma due to the presence of volatile oil and their ability to improve digestion. These leaves are widely used in Asian cuisines for flavoring foods. The leaves have a slightly pungent, bitter and feebly acidic taste, and they retain their flavor and other qualities even after drying. The leaves of *Murraya Koenigii* contain proteins, carbohydrate, fiber, minerals, carotene, nicotinic acid, Vitamin C, Vitamin A, calcium and oxalic acid. It also contains crystalline glycosides, carbazole alkaloids, koenigin, girinimbin, iso-mahanimbin, koenine, koenidine and koenimbine. Triterpenoid alkaloids cyclomahanimbine, tetrahydromahanimbine are also present in the leaves. Murrayastine, murrayaline, pyrayafolinecarbazole alkaloids That proves the antibacterial properties of curry leaves these phytochemicals prevent bacterial growth to study the antibacterial properties we used kirby bauer disc diffusion method after preparing the extract of curry leaves with the help of soxhlet

The nutrient broth of the test organism *Staphylococcus Aureus* MTCC-3160 were spread over the solidified MHA media containing petri plates. The sterile Whitman's paper discs were left in serial dilution with different concentration of ethanol and aqueous extract. The antibiotic gentamicin was used for the positive control and the disc which was dipped in distilled water was used as negative control. The disc already prepared in different extracts were positioned on petri plates containing MHA media. The plates were kept for incubation. The formation of zones around the discs proved the antibacterial and antimicrobial effect of curry leaves.

KEYWORDS :

Ethanol leaf extracts, *Murraya Koenigii*, *Staphylococcus Aureus*, Zone of inhibition.

INTRODUCTION :

Plant's extract have been widely used to treat bacterial diseases. Curry leaves belongs to the family Rutaceae consisting 150 genera it is considered one of the important ingredients in South Asia particularly India, Sri Lanka and Bangladesh the antibacterial property of curry leaves is due to the nutritional composition of it such

as pinene, sabinene, caryophyllene, cardinol and cardinane the bioactive phytochemicals like alkaloids essential oils Phenolics, minerals and proteins shows the zone formation due to the inhibition of growth of bacteria. In this review Ethanol extracts of *Murraya Koenigii* against mycobacterium such as *Staphylococcus Aureus* A common component of the body's micro bacterium it is a gram positive spherically shaped bacterium that belongs to the bacillota. S. Aureus is susceptible to the antibacterial properties of curry leaves the plant extracts ethanol and acetone demonstrated a notable effect against these bacterium strains.

MATERIALS AND METHODOLOGY

Laminar air flow, Dry heat oven, Autoclave, Soxhlet, Weighing Balance

EQUIPMENT USED

Petri dish, Conical flask, Measuring cylinder, Motar Pestle

CHEMICALS

Mueller Hinton agar (MHA), Discs, Ethanol

Test organism - *Staphylococcus Aureus* MTCC -3160 is a member of the Bacillota family . It is a spherically shaped gram positive bacterium.

LEAF EXTRACT PREPARATION

The leaves of *Murraya koenigii* were collected from Raja Balwant Singh College, khandari (Agra) after collecting . The leaves were washed using lukewarm water . Then they were kept in the shade to dry them the next day by using Pastor and Mortar they were crushed until they turned into powdered form . The crushed powder was measured by weighing balance (18 gm) later on to prepare the extract by using soxhlet A thimble was prepared by using filter paper then the thimble was kept inside the main chamber of soxhlet extractor for about 2 days after the completion of 18 cycles by using two different solvent (Aqueous and Ethanol) at 100 degree Celsius and 80 degree Celsius when the siphon tube of extractor became colourless then the extract is prepared.

PREPARATION OF MUELLER HINTON AGAR

Weighing the MHA on the weighing balance. Suspend 7 gm in 250 ml of distilled water, bring to the boiler to dissolve the medium completely and then Autoclaved it at 15 lb pressure, 121 degree celcius for about 15 min and cool it down. Pour the media on the petri plates uniformly then wait until it gets solidified.

ANTIBACTERIAL ACTIVITY OF *Murraya Koenigii*

The antibacterial property was measured by using the kirby diffusion method the nutrient broth culture of staphylococcus Aureus MTCC -3160 by using cotton swab was suspended on MHA media containing petri plates and after 15 minutes till then we prepared serial dilutions of the Curry leaves extract of the concentration 1, 1/10, 1/100.

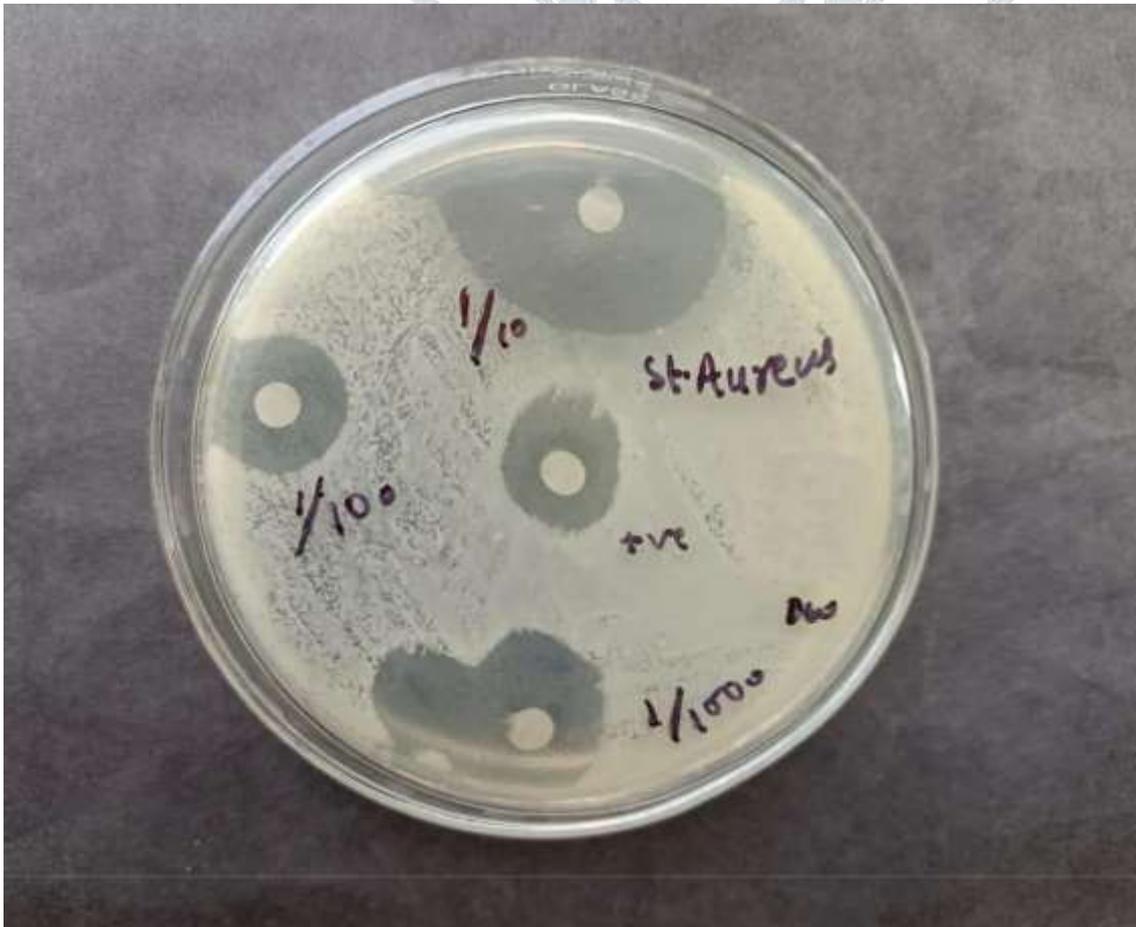
We took 1 ml Curry leaves extract and then dissolved in 9 ml distilled water, and further on.

We took the disc of diameter 5 mm allowed to dip these in various serial dilutions for same 15 min.

RESULTS AND OBSERVATIONS



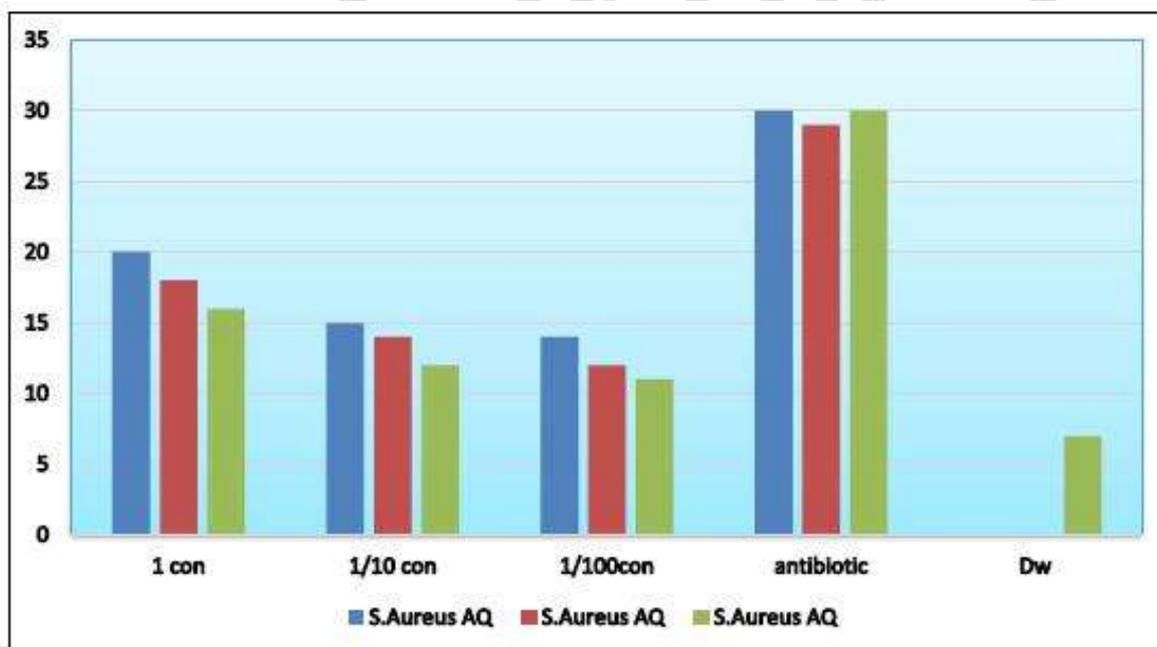
The two extracts ethanol and aqueous of *Murraya Koeiginii* shows the inhibition on *staphylococcus Aureus*



In the present study, the evaluation of antibacterial activity of and polar (distilled water, ethanol) extracts of the leaves of *Murraya Koenigii*. Against gram-positive bacteria were studied using agar well diffusion method. The data pertaining to the antimicrobial potential extract of the leaves of *Murraya Koenigii*.

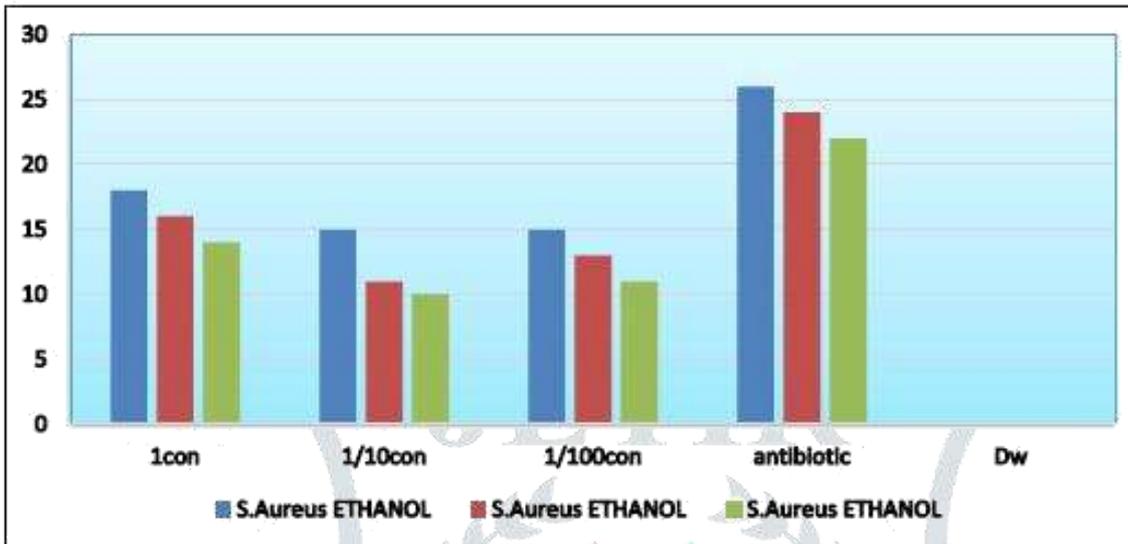
The results revealed variability in the inhibitory concentration of each extracts against a panel of pathogenic bacteria.

organism	solvent	1 con	1/10 con	1/100con	antibiotic	Dw
S.Aureus	AQ	20	15	14	30	0
S.Aureus	AQ	18	14	12	29	0
S.Aureus	AQ	16	12	11	30	7



ETHANOL OF *Murraya Koenigii*

organism	solvent	1con	1/10con	1/100con	antibiotic	Dw
S.Aureus	ETHANOL	18	15	15	26	0
S.Aureus	ETHANOL	16	11	13	24	0
S.Aureus	ETHANOL	14	10	11	22	0



THE CALCULATION OF STANDARD DEVIATION OF THE GROUPED DATA OF DIFFERENT CONCENTRATION OF 2 DIFFERENT TYPES OF SOLVENT USED FOR ZONE INHIBITION TO MEASURE THE ANTIBACTERIAL PROPERTIES OF CURRY LEAVES AGAINST S.AUREUS (AQUEOUS AND ETHANOL EXTRACTS BY DISC DIFFUSION METHOD)

AQ	AQ	AQ
1/10CON	1/100CON	1
15	14	20
14	12	18
12	11	16
AVERAGE - 13.66667	AVERAGE - 12.33333	AVERAGE - 13
SD=1.265	SD=1.2489	SD=1.631

ORGANISM USED S. Aureus

ETHANOL	ETHANOL	ETHANOL
1/10CON	1/100CON	1CON
15	15	18
11	13	16
10	11	14
AVERAGE - 12	AVERAGE - 13	AVERAGE - 16
SD=2.17	SD=2.049	SD=2.308

CONCLUSION

Murraya koenigii (Curry leaves) extracts have demonstrated antibacterial effects particularly on Staphylococcus, as compared to antibiotics such as Gentamicin in our study. The ethanol and aqueous extracts of curry leaves were found to be effective against tested bacterial strains except *M. Koenigii* has the bioactive potential and it may be the best natural alternative to antibiotic therapy for tested microbes. Therefore, curry leaves could be effectively used as a natural remedy in everyday meal, for the prevention of bacterial infections. Indeed this phenomenal plant may serve as a useful resource in the food industry and clinical medicine. This research could be further extended to test the bioactive properties of curry leaves for therapeutic use.

REFERENCES

1. **Anita Joshi, Varsha Dattatraya Shahane, Varsha Gore, and Renu Bharadwaj (2009).** Hindustan Antibiotics Bulletin; **47-48(1-4): 7-12.**
2. **Bhandari PR.** Curry leaf (*Murraya koenigii*) or Cure leaf: Review of its curative properties. J. Med. Nutr. Nutraceut, **2012; 1: 92-97.**
3. **Collee J.G., Miles R.S., Watt B.** Tests for identification of bacteria. In: Collee J.G., Fraser A.G., Marmion B.P., Simmons A. (editors): Mackie and McCartney Practical Medical Microbiology, 14th edition. Churchill Livingstone, New York, **1996; 131-49.**
4. **Das BN and Biswas BK.(2012)** Antibacterial and cytotoxic activities of the leaf extract of *Murraya Koenigii*. Int. J. Life Sc. Bt& Pharm. Res.; **1(3): 59-63.**
5. **Disegha GC, and Onuegbu Izionworu V.(2014),** Antifungal Activities of Curry Leaf (*Murraya Koengii*) Extract on Some Selected Fungi. Chemistry and Materials Research,; **6(11): 2224-3224**