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Study of Antibacterial and Antioxidant activity of *Arisaema tortuosum* Schott

R.P.Patil, L.H.Kamble* and V.C.Patil**

Dept of Botany, Deogiri College, Aurangabad.

*School of Life Sciences, SRTMU, Nanded.

** Dept of Botany, Dayanand College, Latur.

Email: lhkamble@gmail.com

ABSTRACT

In this study, tuber extracts of *Arisaema tortuosum* were investigated for in-vitro antibacterial and antioxidant activity. The antibacterial properties were tested against five human pathogens such as *Klebsiella pneumonae, Staphylococcus aureus, Escherichia coli, Proteus vulgaris, Pseudomonas aeriginosa* using two solvents viz methanol and acetone by well diffusion method. The maximum antibacterial activity was observed in methanolic extract against all tested pathogenic strains. The antioxidant potential of *Arisaema tortuosum* was determined by using three methods viz DPPH, HRSA and FRAP assay. The results obtained from these three methods revealed % free radical scavenging activity in methanolic extract. In FRAP, methanolic extract shown higher antioxidant power than that of acetone extract. The standard antioxidant BHA at the same concentration exhibited a good deal of free radical scavenging percentage.

INTRODUCTION

The *Araceae* is largely tropical monocot family, comprising of 105 genera & 3000 species in he world.The genus *Arisaema* consists of 200-300 species. The centre for *Arisaema* growth Western Ghats, Yunnan, Himalaya.*Arisaema* has asthetic, antihepatotoxic, anticancerous, antimicrobial, anti-insect & antioxidant properties. Lectin of *A. tortuosum* shows anticancer activity against human cancer cell lines.

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EXPERIMENTAL

i. Collection of Plant Material: The plant species selected were symptomless and apparently healthy individual plants were randomly chosen from their respective sites. The samples were collected in sterilized polythene bags.

ii.Antibacterial activity: The extract of Leaves of their antibacterial activity against pathogenic and non-pathogenic bacteria using agar well diffusion method.

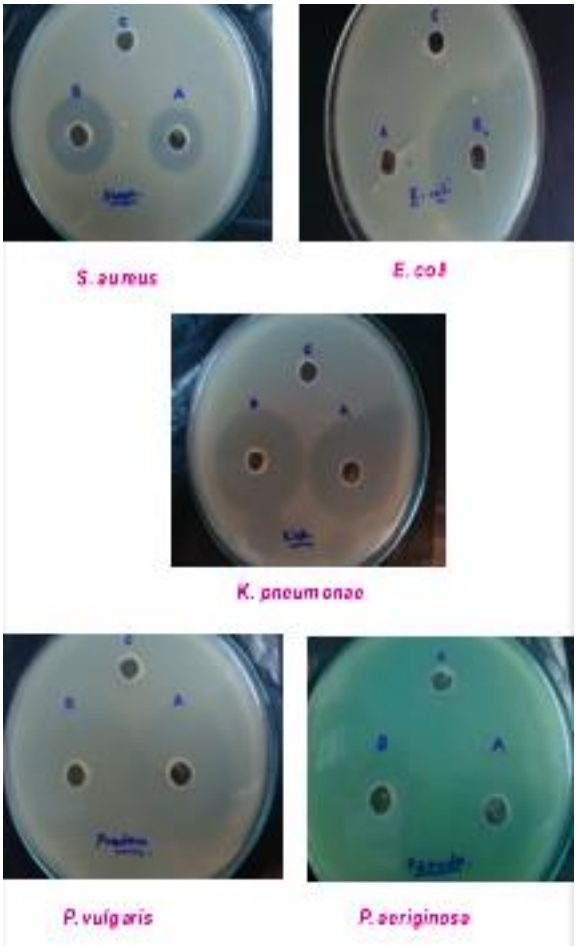
iii. Determination of Minimum Inhibitory Concentration: The MIC was calculated using standard method, and recorded values were estimated.

iv. Determination of free radical scavenging activity by **a)** Ferric reducing antioxidant potential **b)** DPPH assayand**c)** Hydroxyl radical scavenging activity was perfomed.

RESULT AND DISCUSSION

1. Antibacterial activity: Antibacterial activity was tested against*Klebsiella pneumoniae, Staphylococcus aureus, Proteus vulgaris, Pseudomonas aeriginosa* and *Escherechia coli*

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Tuber extracts of *Arisaema tortuosum* were investigated for in-vitro antibacterial and antioxidant activity. The antibacterial properties were tested against five human pathogens such as *Klebsiella pneumonae, Staphylococcus aureus, Escherichia coli, Proteus vulgaris, Pseudomonas aeriginosa* using two solvents viz methanol and acetone by well diffusion method. The maximum antibacterial activity was observed in methanolic extract against all tested pathogenic strains showing zone of inhibition 34mm, 22mm, 40mm, 34mm, 20mm *for Klebsiella pneumonae, Staphylococcus aureus, Proteus vulgaris, Escherichia coli, Pseudomonas aeriginosa* respectively while acetone extract exhibited the antibacterial activity against two studied pathogens showing zone of inhibition 20mm, 40mm for *Proteus vulgaris, Pseudomonas aeriginosa* respectively.The minimum inhibitory concentration (MIC) of methanolic extract ranged from 59µg to 127µg. The antioxidant potential of *Arisaema tortuosum* was determined by using three methods viz DPPH, HRSA and FRAP assay. The results obtained from these three methods revealed % free radical scavenging activity in methanolic extract were 31.5% (10/ml), 48.57% (50/ml),

57.40% (100/ml) whereas in acetone extract 10.22%(10/ml), 14.77% (50/ml), 20.88% (100/ml) for DPPH. In HRSA, 15.06% (10/ml), 50% (50/ml), 57.53% (100/ml) for methanolic extract while for acetone extract it was 1.08% (10/ml), 9.14% (50/ml) and 19.36% (100/ml). In FRAP, methanolic extract shown higher antioxidant power than that of acetone extract. The standard antioxidant BHA at the same concentration exhibited 17.04%, 73.29%, 91.19% free radical scavenging percentage.

Table 1: In vitro Antibacterial activity of *A. tortuosum*

Species	**Methanol extract**	**Acetone extract**	**MIC# µg/ml**
Klebsiella pneumoniae	34±3	ND	72±1
Staphylococcus aureus	22±2	ND	76±2
Proteus vulgaris	40±1	20	127±1
Pseudomonas aeriginosa	34±3	44	54±1
Escherechia coli	20±2	ND	62±2

MIC# values *are mean ±S.E.M. of three parallel measurements*

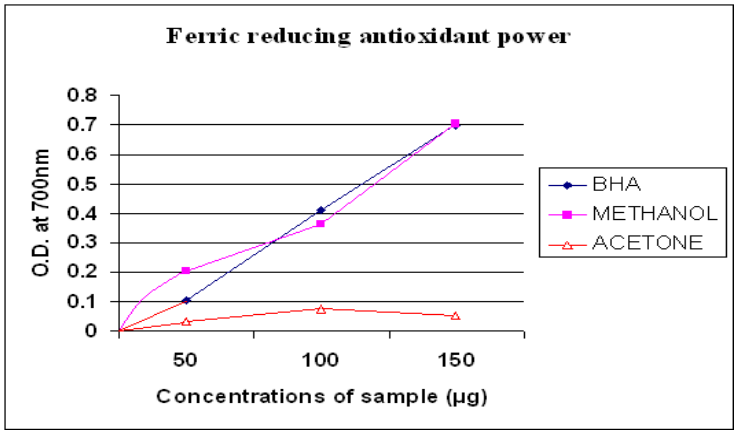
Table 2.Antioxidant activity

Conc. Of sample (µg/ml)	Methanolic extract	Acetone extract	Aqueus extract	BHA (standard)
10	31.50±2	10.22±2	3.51±2	17.04±2
50	48.57±2	14.77±2	5.27±2	73.29±2
100	57.40±2	20.882±	6.152±2	91.19±2

Table 3.Hydroxyl radical scavenging activity

Conc of sample (µg/ml)	Methanolic extract	Acetone extract	Aqueous e±xtract
10	15.06±2	1.08±2	3.0±2
50	50.0±2	9.14±2	5.3±2
100	57.53±2	19.36±2	6.7±2

Table 4. Ferric reducing antioxidant power:



Conclusion: The results of the present study indicate that the tubers of the *Arisaema tortuosum* can be explored for the development of novel antimicrobial and antioxidant agents. Ultimately supplementing a balanced diet with *A. tortuosum* provide health promoting effects.

References

- **Masih Usha, Shrimali Ragini, and Naqvi S. M. A** Antibacterial Activity of Acetone and Ethanol Extracts of Cinnamon (*Cinnamomumzeylanicum*) and Ajowan (*Trachyspermumammi*) on four Food Spoilage Bacteria *International Research Journal of Biological Sciences* **(2012)**Vol. 1(4), 7.
- **SonikaKapoor** In vitroAntimicrobial and Antioxidant Potential of Aqueous Extract of Common Medicinal Plants Indian journal of applied research **(2014)** Vol 4,10-11.

- **Yadav M.,Chatterji S., Sharad Kumar Gupta, And Geeta Watal (2014)** Preliminary Phytochemical Screening Of Medicinal Plants Used In Tradition Medicines. vol. I, No. V, 49-54.
- **Dwivedi S. N., Mishra R. P. and Sangeeta Alava** Phytochemistry, Pharmacological studies and Traditional benefits of Trachyspermumammi (Linn.) sprague. *International journal of pharmacy & life sciences***(2012)**Vol. 3, 1705-1709.
- **Savita Aggarwal and Sanjay Goyal** In vitro antimicrobial studies of *Trychyspermum ammi; International Journal of Pharma and Bio Sciences* **(2012)** 3(4): (P) 64 – 68.
- **Savithramma N., M. Linga Rao and D. Suhrulata**Screening of Medicinal Plants for Secondary Metabolites. Middle-East journal of scientific research **(2011)**8(3)579-584.