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Screening Of Phyto-Chemical and Antibacterial Activity of *Cayratia Trifolia* (L.) Domin

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Abstract
The screening and study of selected Indian medicinal plant *Cayratiatrifolia* (L.) Domin., were selected for phytochemical screening and antibacterial studies. The solvents used for the extraction of plant tubers were ethanol, benzene, chloroform, acetone, petroleum ether and distilled water. The in vitro antibacterial activity was performed by agar well diffusion method. The most susceptible Gram-Postive and Gram-negative bacteria were tested. The extracts of *Cayratiatrifolia* (L.) Domin. inhibited the growth of the bacterial strains investigated. The most active extracts were compared with the *Yeast candida, Aspergillus niger, Staphylococcus aureus, Escherichia coli, Salmonella typhi, Bacillus subtilis, Pseudomonas fluorescence, Klebsiellapneumoniae*and *Streptococuspyogenes*. The results obtained in the present study suggest that preliminary phytochemical analysis detected the presence of Alkaloids, Flavonoids, Terpenoids, Steroids, Cumarins, Carbohydrates and Tanins. The *Cayratiatrifolia* (L.) Domin. could be used in treating diseases caused by the test organisms.
Keywords: Medicinal plants, Phytochemicals, Antibacterial activity,*Cayratiatrifolia*(L.) Domin., and Pathogens.

INTRODUCTION

Medicinal plants represent a rich source of antimicrobial agents. Plants are used medicinally in different countries and are a source of many potent and powerful drugs. In developing countries, low income people such as farmers, people of small isolate villages and native communities use folk medicine for the treatment of common infectious diseases. These plants are ingested as decoctions, teas or juice preparations[1]. Medicinal plants are moving from fringe to main stream use with a greater number of people seeking remedies and health approach[2]. It is no wonder that the world's one-fourth population i.e. 1.42 billion people, are dependent on traditional medicines for the treatment of various ailments[3].

Preliminary studies on phytochemicals and antimicrobial activity of solventExtracts of Eichhorniacrassipes(Mart.)Solms.They had study the fresh plant contain alkaloids, flavonoids, phenols, sterols, terpenoids,anthoquinones and protein[4]. Preliminary phytochemical screening of different solvent extracts of stem Bark and roots of *Dennetiatripetala*G. Baker[5]. Preliminary phytochemical and Fourier Transform Infrared Spectral analysis and Antimicrobial Studies of solvents extracts of *Urgineaindica*(Roxb.) Kunth (Liliaceae) and *CycleapeltataArn.* ex Wight (Menispermaceae), results were clearly revealed that the plant contained different bioactive compounds such as of Alkaloids, Anthoquinones, Coumarins, Steriods and Flavonoids compounds were rich in the extracts of *Urgineaindica*(Liliaceae) and *Cycleapeltata*(Menispermaceae) are connected with defense mechanism against many microorganisms[6].Antibacterial, antifungal and insecticidal activities of the bark of millettiaovalifolia.The ethyl acetate fraction of the extracts of stem bark of Millettiaovalifolia was evaluated for their antibacterial, antifungal and insecticidal activities[7].The leaves of *Milletiaauriculata*have antimicrobial activity against some gram-positive and gram-negative bacteria such as *B.substilis, E. coli, S. typhi, S.aureus*[8].

The most essential of these bioactive constituents of plants are alkaloids, tannins, flavonoids and phenolic compounds. Many of the indigenous medicinal plants are used as spices and food.[9]Traditionally herbal extracts were known to be effective against microorganisms as a result; plants form the basis of modern medicine. Plants produce phytochemicals to protect themselves; but recent studies indicate that many phytochemicals can also protect humans against infectious diseases[10-13]

MATERIALS AND METHODS

Plant collection

The following medicinal plants were selected and collected for the study from the local area of Uttamsagar forest of Betul district. The *Cayratiatrifolia*(L.) Domin.was collected from

follow land in and arroundUttamsagrforest brought into the laboratory for further processes. The collected samples were carefully stored in sterile polythene bags and used for the further study.

Sterilization of Plant Materials

The disease free roots and tubers were selected for this investigation. About 2gm dried roots and tubers were taken. Then, surface sterilized with 0.1% mercuric chloride and alcohol from few seconds. Again the materials were washed thoroughly with distilled water.

Preparation of Plant Extracts

The organic solvent extract was prepared by adding 5 gm powder of ethno veterinary medicinal plants in 250 ml of organic solvent(Absolute Alcohol, Acetone, Petrolium Ether, Benzene, chloroform and Distil Water) for 6 hrs. by Soxlhet method and filtrate was evaporated in controlled conditions of temperature of active constituents of preparations. Dried extracts were stored in labelled sterile wide mouthed screw capped bottle at 40c and used for further study.

Preliminary Phytochemical screening

Phytochemical screening were performed to assess the qualitative chemical composition of different crude extracts using commonly employed precipitation and coloration reactions,the methods of Harbone[14], Trease and Evans[16]were used to identify the major secondary metabolites like Alkaloids, Flavonoids, Saponins, Carbohydrate, Protein, Phenols, Steroids, Tannins, Glycosides, Terpenoids, Phlobatannins, Coumarins, Emodins, Anthoquinones, Anthocyanins, Leucoanthocyanins in the extracts.

Antimicrobial screening

All solvent extracts were screened *in vitro* growh inhibitory activity against different microbes *E. coli,Pseudomonas fluroscene ,Salmonellatyphi Bacillus subtilis ,Klebsiellapneumoniae ,Staphylococcus aureus ,Streptococus*Yeast candida ,*Aspergillus niger.* using disc-diffusion method. The bacteria rejuvenated in Nutrient broth (Hi-media – laboratories, Mumbai, India) at 37^0c for 18 hrs. and then stored at 40^0c on Nutrient agar subcultures were prepared from the stock for bioassay.

RESULT AND DISCUSSION

Table 1:-Preliminary Phytochemical screening of various extracts of *Cayratia trifolia*(L.) Domin**.**

Plant parts	**Test / Reagents Used**	**Ethanol extract E**	**Benzene extract B**	**Chloroform Extract C**	**Acetone extract A**	**Petroleum Ether P**	**Distil Water extract W**
Tuber	Alkaloids (Hager's Test)	+	-	-	+	-	-
	Glycosides (Libermann's Test)	+	+	+	+	+	+
	Phenols	_	_	_	_	_	_
	Saponins (Foam Test)	–	–	–	–	–	–
	Tannis (Braymer's Test)	–	–	–	–	–	–
	Flavonoids	+	_	_	+	_	_
	Terpenoids	+	-	_	+	_	_
	Steroids (Salkowski Test)	+	+	+	+	+	+
	Phobatannins (Precipitate Test)	_	_	_	_	_	_
	Coumarins	+	-	-	+	_	_
	Proteins (Xanthoproteic Test)	+	+	+	+	+	+
	Emodins	_	_	_	_	_	_
	Carbohydrates (Molisch Test)	+	–	–	+	+	–

Present -- **+ve** Absent -- **-ve**

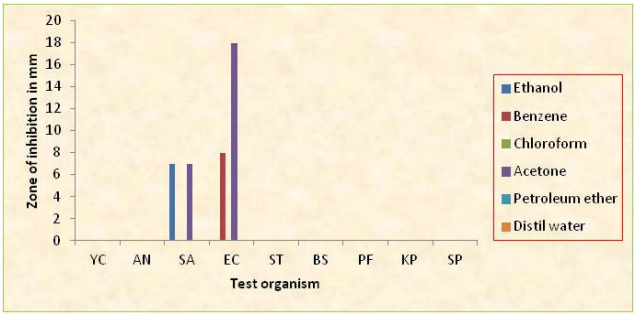
Table2 : Antimicrobial activity of tuber extracts of *Cayratiatrifolia* by Disc Diffusion Method (Zone of Inhibition in mm at 100 µg/disc)

S.No	Microorganism	Ethanol	Benzene	Chloroform	Acetone	Petroleum ether	Distil water
1	**YC**	0	0	0	0	0	0
2	**AN**	0	0	0	0	0	0
3	**SA**	7	0	0	7	0	0
4	**EC**	0	8	0	18	0	0
5	**ST**	0	0	0	0	0	0
6	**BS**	0	0	0	0	0	0
7	**PF**	0	0	0	0	0	0
8	**KP**	0	0	0	0	0	0
9	**SP**	0	0	0	0	0	0

*Data represented in mean of three replicates.

YC = *Yeast candida,* **AN** = *Aspergillus niger,* **SA** = *Staphylococcus aureus,*
EC = *Escherichia coli,* **ST** = *Salmonella typhi,* **BS** = *Bacillus subtilis,*
PF = *Pseudomonas fluorescence,* **KP** = *Klebsiellapneumoniae,*
SP = *Streptococuspyogenes*

Figure 1 : Analysis of antimicrobial sensitivity of tuber extract of *Cayratiatrifolia*



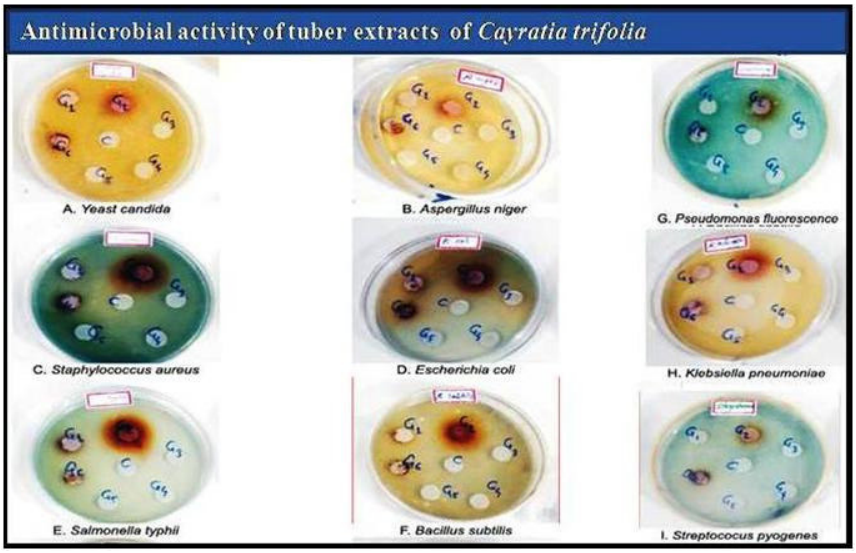


Figure 2 : Antimicrobial activity of tuber extracts of ***Cayratiatrifolia*** by Disc Diffusion Method.

Phytochemical screening:-

From the above table no. 1 it is clear that,

Alkaloids

It was found that concentration of alkaloids have been extracted in Ethanol and Acetone extract. This is evident from the positive test with Hager's reagent. Benzene, Chloroform, Petroleum ether and Distil water extracts have shown negative test for alkaloid.

Glycosides

All extracts have shown positive test for Glycosides with Libermann's reagent.

Phenols

All extracts have shown negetive test for Phenols.

Saponins

All extracts have shown negetive test for Saponin.

Tannins

All extracts have shown negetive test for tannins with Braymer's reagent.

Flavonoids

It was found that concentration of flavonoids have been extracted in Ethanol and Acetone extract. This is evident from the positive test. Benzene, Chloroform , Petroleum ether and Distil water have shown negetive test for flavonoids.

Terpenoids

It was found that concentration of terpenoids have been extracted in Ethanol and Acetone. This is evident from the positive test. Benzene, Chloroform , Petroleum ether and Distil water have shown negetive test for terpenoids.

Steroids

All extracts have shown positive test for Steroids with Salkowski reagent.

Phlobatannins

All extracts have shown negetive test for Phlobatannins.

Coumarins

It was found that concentration of Coumarins have been extracted in Ethanol and Acetone extract. This is evident from the positive test. Benzene, Chloroform, Petroleum ether and Distil water have shown negetive test for Coumarins.

Proteins

All extracts have shown positive test for Proteins with Xanthoproteic reagent.

Emodins

All extracts have shown negetive test for Emodins.

Carbohydrates

It is found that concentration of Carbohydrate have been extracted in Ethanol, Acetone and Petroleum ether extract. This is evident from the positive test with Molisch reagent. Benzene, Chloroform and Distil water have shown negetive test for Carbohydrates.

Antimicrobial activity:-

The ethanol extracts was inhibitory against *Staphylococcus aureus*. The maximum zone of inhibition of 7 mm was observed in ethanol extracts against pathogen *Staphylococcus aureus*. Ethanol extracts was found non reactive to other test organisms. The benzene extracts showed positive results against *Escherichia coli*. The maximum zone of inhibition of 8 mm was observed in benzene extracts against pathogen *Escherichia coli*. The benzene extracts was found non reactive to other test organisms. The acetone extracts also showed positive results against *Staphylococcus aureus* and *Escherichia coli*. The maximum zone of inhibition of 18 mm was observed in acetone extracts against *Escherichia coli*. The acetone extract was more effective with broad spectrum of antibiosis against *Escherichia coli*. The acetone extracts was found non reactive to other test organisms excepts *Staphylococcus aureus* and *Escherichia coli*. Chloroform, Petroleum ether and aqueous extracts showed no any response to the all test organisms and reactions were nullified.

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REFERNCES

Gonzalez J, J.(1980),*Ethnopharmacol.,* 2: 43-47.

Saha D, Pahari SK, Maity T, Sur D. (2010), International Journal of Pharma Sciences and Research, 1(11), 473- 475.

Jena A, Saha D, Biswal B, Jana S B, Koley A, Sur D, (2011), A Battacharya. InternationalJournal of Research in Pharmaceutical and Biomedical Science, 2(1), 2229-3701.

Thamaraiselvi, Lalitha P and JayanthiP.,(2012), Asian Journal of Plant Science and Research,2 (2) , 115-122.

Solomon C.U, ArukweUche I. and Onuoha I, (2013), Asian Journal of Plant Science and Research,3(3), 10-13.

Patil U. S., Deshmukh O.S. and Ganorkar R.P. ,(2015); European Journal Of Pharmaceutical and Medical Research,2(6), 171-176.

Rahman Taj Ur, UddinGhias, LiaqatWajiha, Zaman Khair, Mohammad Ghulam, and Choudhary Muhammad Iqbal, (2013), International Journal of Scientific Research and Essays,1(1) 4-9.

Ganorkar R. P., SatputeS.V,.Deshmukh R.S,International Journal of Pharmacy and Pharmaceutical Research. Human, 2016; 6 (1): 195-200.

Amin Mir M. Sawhney SS, Jassal MMS. Wud pecker Journal of Pharmacy and Pharmocology., 2013; 2: 1-5.

Jeeva S; Kiruba S; Mishra B P; VenugopalN ; Das SSM ; Sukumaran S. , (2006)*Indian Journal of Traditional Knowledge*; 5: 501-509.

Domettila C; Joselin J; JeevaS. , (2013); *Journal of Chemical and Pharmaceutical Research*,5(4): 275-278.

Balakumar S; Rajan S; Thirunalasundari T; JeevaS. , (2011)*Asian Pacific Journal of Tropical Biomedicine*; 1: 309-312.

Rajan S; Thirunalasundari T; JeevaS. , (2011)*Asian Pacific Journal of Tropical Medicine*; 4: 294-300.

HarborneI. B.,(1973), Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis, Chapman and Hall, New York,NY, USA, 2nd edition.

TreaseG. E. and EvansW. C.,(1983), Textbook of Pharmacognosy,Tindall, London, UK, 12th edition.

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