

Acta Biomedica Scientia

e - ISSN - 2348 - 2168 Print ISSN - 2348 - 215X

www.mcmed.us/journal/abs

Research Article

PHYTOCHEMICAL SCREENING AND *IN VITRO* ANTIMICROBIAL ACTIVITY OF VARIOUS EXTRACTS OF *GOMPHRENA SERRATA*

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ABSTRACT

The traditional medicine refers to a board range of ancient, natural Health care practices including folk/tribal practices as well as Ayurveda, Siddha and Unani. Herbs, which have always been the principle of medicine in developing countries, as the people strive to stay healthy in the phase of chronic stress and pollution. The aim of the present investigation was to evaluate the preliminary phytochemical screening and antimicrobial activities of various extracts of *Gomphrena serrata* with the help of In vitro antimicrobial models. Evaluation of antimicrobial activity of *Gomphrena serrata* against microorganisms causing skin infections intestinal and urinary tract infections was done *Gomphrena serrata* could effectively fight against microorganisms causing Skin infections, Intestinal and Urinary tract infections.

Keywords :-Atharvaveda, Traditional medicine, Intestinal, Urinary tract infections.



INTRODUCTION

The medicinal practices originated from time immemorial and developed gradually, to a large extent, by relying or based on practical experiences without significant references to Modern scientific principles [1]. Although herbal medicines are effective in the treatment of various ailments very often these drugs are unscientifically exploited and/or improperly used. Therefore, these plants drugs deserve detailed studies in the light of modern science. It is estimated that about 7,500 plants are used in local health traditions mostly in, rural and tribal villages of India [2].

In India the use of medicinal herbs is as old as 1500 BC. Underlying the medical culture of India both folk traditions as well as codified knowledge systems is a deep understanding of the medicinal value of the plants starting with the references in the atharvaveda, we have textural evidence of tradition of use of medicinal plants that is more than three thousand years old. The world

health organization launched its first ever comprehensive traditional medicine strategy in 2002. The strategy is designed to assist countries to:

1. Develop national policies on the evaluation and regulation of TM/CAM PRACTICES

2. Create a stronger evidence base on the safety, efficacy and quality of the TM/CAM Products and practices [3]

3. Ensure availability and affordability of TM/CAM including essential herbal medicines,

4. Promote therapeutically sound use of TM/CAM by providers and consumers

Antimicrobial medicines can be grouped according to the microorganisms they act primarily example, antibiotics against. For are used against bacteria and antifungal are used against fungi. main antimicrobial The classes of agents are disinfectants (nonselective antimicrobials such

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as bleach), which kill a wide range of microbes on nonliving surfaces to prevent the spread of illness, antiseptics (which are applied to living tissue and help reduce infection during surgery), and antibiotics (which destroy microorganisms within the body) [4].

MATERIALS AND METHODS Plant Profiles

Plant : Gomphrena serrataCommon name : Tellabendumali (Telugu),G.decumbensjacq.(English)Family : Amaranthaceae.

Collection and Identification of Palnt Materials

The plant material *Gomphrena serrata* was collected from Tirumala hills, Chittoor district. The leaves were identified, confirmed and authenticated by comparing with an authentic specimen by a Botanist Madhav Chetty. The plant material were dried under shade, segregated, pulverised by a mechanical grinder and passed through a 40 mesh sieve.

Extraction of the Plant Material

Twenty grams (20g) of the pulverized leaves of each plant wasdecocted with 100ml of cold water left overnight, hot water (100°C) for 5 minutes), and ethanol .Prior to decoction, the leaves were soaked in the extracting solvent for 3 days. The mixture was then filtered and the filtrate evaporated to semi solid mass using a rotary evaporator (Brichi, Germany) and subsequently drying in a beaker on water bath to give a dark resinous mass. The plant extracts from the various solvents were reconstituted using 10%V/V ethanol as solubilising agent at concentration of (10 and 100)mg/ml for antimicrobial activity evaluation [5].

Phytochemical Analysis of Aqueous Extract of Gomphrena serrata Test for Alkaloids

Dragondroff's test

To 1 ml of the extract, 1 ml of Dragondroff's reagent was added; formation of orange red precipitate indicated the presence of alkaloids.

Hager's test

To 1ml of the extract, 3ml of Hager's reagent was added; the formation of yellow precipitate confirmed the presence of alkaloids [6].

Test for Flavonoids: Shinoda test

To 1ml of the extract, magnesium turnings were added fallowed by 1-2 drops of concentrated hydrochloric acid .Formation of red colour showed the presence of flavonoids.

Test for phlobatannins

3ml of aqueous extract was added to 2ml of 1%Hcl and the extract was boiled. Deposition of red precipitate was taken as an evidence for the presence of phlobatannins.

Test for Steroids

Salkowski Tests

Chloroform solution of the extract when shaken with concentrated sulphuric acid and on standing yields red colour.

Test for Terpenoids

3ml of organic extract was dissolved in 2ml of chloroform and evaporated to dryness.2ml of concentrated sulphuric acid was then added and heated for about 2min. Development of greyish colour indicates the presence of Terpenoids.

Test for Cardiac Glycosides Legal test

The extract was dissolved in pyridine and Sodium nitroprusside solution was added to make it alkaline. The formation of pink red to red colour showed the presence of glycosides.

Test for Saponins

About 1 ml of extract was diluted separately with distilled water to 20 ml, and shaken in a graduated cylinder for 15 minutes. A1% 1cm layer of foam indicated the presence of Saponins [7-10].

IN-VITRO ANTI MICROBIAL ACTIVITY Microbial strains tested

In this study, Micro organisms were selected to cover Gram-positive bacteria and Gram-negative bacteria namely, *Escherichia coli, Bacillus subtilis, Proteus mirabilis, Pseudomonas aureginosa, Malassezia furfur.* The tested strains were obtained from Microbiology Laboratory, SVCP, A. Rangampet, Tirupati. The Microorganisms were allowed to grown over night at 37^o C in 2% nutrient agar at pH 7. The sensitivity of Microorganisms to the reference antibiotic was checked. For this purpose Ciprofloxacin was used as reference antibiotic [11].

Preparation of inocula

The inocula were prepared by inoculating a loop of each bacterial strain from 24 hours of old culture into a sterile nutrient broth aseptically in the laminar air flow unit. The culture growth was allowed for 24 hours in incubator at 37° C [12].

Determination of antimicrobial activity

The screening of Anti-microbial efficacy of the various extract of *Gomphrena serrata* as performed on

various microorganisms by using agar well diffusion method. The agar plates were prepared by pouring 20 ml of sterile molten Mueller-Hinton (MH) agar (Himedia Lab Pvt. Ltd, Mumbai, India). The bacterial cultures were prepared by adding the seed culture in the autoclaved agar medium followed by pouring into Petri plates. The solid agar medium was gently punctured with the aid of 8mm sterile cork borer to make a proper well. 50ul of Gomphrena serrata extract (50mg/ml) was added in the pre labelled wells together with reference antibiotic i.e. Ciprofloxacin. Here various extract of Gomphrena serrata served as test and Ciprofloxacin served as standard. The reference Antibiotic was used in the concentration range of 100µg/ml. It was taken care that the sample should be placed at the level of cavity. The diffusion of extract was allowed for 1hr at room temperature on a sterile bench. Then the Petri plates were incubated for 48 hrs at 37° C. After 48 hrs the plates were observed for the presence of inhibition of bacterial growth and that was indicated by clear zone of inhibition of bacterial growth around the wells. The size of Inhibitory zone was measured in mille meters (mm). Minimum Inhibitory Concentration (MIC) was determined [13].

RESULTS AND DISCUSSION

The results of modified agar well diffusion method (Table 1) showed that prepared CWEGS, HWEGS, EEGS, having Inhibitory effect on the microorganisms which are responsible for the intestinal infections, skin infections and urinary tract infection. The Anti-microbial activity of the herbal extract has been comparable to that of market antibiotic (Ciprofloxacin). The diameter of Zones of inhibitions was also given in the table 1.

Table 1. Phytochemical analysis of various extracts of Gomphrena serrata

S.NO	TEST	CWEGS	HWEGS	EEGS
1.	Alkaloids	+	+	+
2.	Flavonoids	+	-	+
3.	Phlobatannins	+	-	-
4.	Steroids	+	-	-
5.	Terpenoids	+	+	+
6.	Cardiac glycosides	+	-	-
7.	Saponins	+	-	+

Table 2. Antimicrobial activity of Cold water extract of Gomphrena serrata

Microorganisms	Zone of inhibition
	CWEGS
Escherichia coli	29±1.0
Bacillus subtilis	31±1.0
Proteus mirabilis	27±2.0
Pseudomonas aureginosa	30±1.0
Malassezia furfur	30±2.0

Table3. Antimicrobial activity of Hot water extract of Gomphrena serrata

Microorganisms	Zone of inhibition(mm)	
	HWEGS	
Escherichia coli	26±1.0	
Bacillus subtilis	24±1.0	
Proteus mirabilis	25±2.0	
Pseudomonas aureginosa	25±1.0	
Malassezia furfur	22±2.0	

Table 4. Anti microbial activity of Ethanolic extract of Gomphrena serrata

Microorganisms	Zone of inhibition(mm)
	EEGS
Escherichia coli	23±2.0
Bacillus subtilis	23±1.0
Proteus mirabilis	23±1.0
Pseudomonas aureginosa	25±2.0
Malassezia furfur	25±1.0

Microorganisms	Zone of inhibition	
	Standard (Ciprofloxacin)	
Escherichia coli	27±1.0	
Bacillus subtilis	25±1.0	
Proteus mirabilis	28±2.0	
Pseudomonas aureginosa	22±2.0	
Malassezia furfur	23±1.0	









SUMMARY AND CONCLUSION

In the present study an attempt has been made to explore pharmacognostical and phytochemical parameters besides evaluating antimicrobial activity against microorganisms causing skin infection, intestinal infections and urinary tract infection. The identification of plant material taxonomically and pharmacognostically is important to provide standards and avoid adulteration of drugs. Table 1 shows the Preliminary phytochemical analysis of the extract showed the presence of Alkaloids, Flavonoids, Phlobatannins, Steroids, Terpenoids, Cardiac Glycosides, Anthraquinones and Saponins constituents may be responsible for the healing potential of Skin infections, Intestinal and Urinary tract infections [14-18].

Evaluation of antimicrobial activity of *Gomphrena serrata* against microorganisms causing skin infections intestinal and urinary tract infections was done by using agar well diffusion method from table 2 to table 5. After 24 hrs we measured the zone of inhibition to confirm the antimicrobial activity of the prepared *Gomphrena serrata* [19-21].From the above results it can be concluded that the *Gomphrena serrata* could effectively fight against microorganisms causing Skin infections, Intestinal and Urinary tract infections

ACKNOWLEDGEMENT

CONFLICT OF INTEREST No interest

Nil

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Cite this article:

Thamizhvanan K, Prathap M, Usha Kiran Reddy T, Teja PT, Sushmitha B. Phytochemical Screening And *In Vitro* Antimicrobial Activity of Various Extracts Of *Gomphrena serrata*. *Acta Biomedica Scientia*. 2019;6(2):40-46. DOI: <u>http://dx.doi.org/10.21276/abs.2019.6.2.1</u>



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