



Short Communication

STUDY OF ANTIBACTERIAL ACTIVITY OF *CHLORIS BARBATA* (SW) LEAVES

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ABSTRACT

Our present study is aimed to detect the medicinal uses of the plant *Chloris barbata* (SW) belonging to the family Poaceae. The in vitro screening of antimicrobial properties of *Chloris barbata* was evaluated by the agar well diffusion method. The extracts were prepared by continuous hot percolation method with chloroform and methanol. Aqueous extract was prepared by maceration. The presence of phytosterols, flavonoids, tannins, phenols, carbohydrates, proteins and amino acids were detected in the preliminary phytochemical tests. Moderate antibacterial activity was observed in the extracts (250µg/ml) against some pathogenic microorganisms when compared with the standard Ciprofloxacin.

KEY WORDS: *Chloris barbata*, antibacterial; Ciprofloxacin.

INTRODUCTION

Medicinal plants are a group comprise approximately 8000 species and account for about 50% of all the higher flowering plant species in India. The World Health Organization (WHO) estimated that 80% of the populations of developing countries rely on traditional medicines, mostly plant drugs, for their primary health care needs. Also, modern pharmacopoeia still contains at least 25% drugs derived from plants and many others which are synthetic analogues

built on prototype compounds isolated from plants. Demand for medicinal plants are increasing in both developing and developed countries due to growing recognition of natural products, being non-narcotic, having no side-effects and easily available at affordable prices. Plants have provided Western medicine with an abundance of drugs and treatments for a variety of health problems¹. The increasing interest on traditional ethno medicine may lead to discovery of novel therapeutic

agents. Antimicrobial drug resistance is also of economic concern with impact on medical practitioners, patients, health care administrators, pharmaceutical companies and the public². The development of new antimicrobial drugs has been used to overcome resistance. However, plant-derived medicines have been part of traditional health care in most part of the world and the antimicrobial properties of plant derived compounds are well documented and there is increasing interest in plants as sources of antimicrobial agents³.

Chloris barbata (SW) commonly called as swollen finger grass (Family: Poaceae) is a tufted annual grass about 70cm high, internodes are longer at the top and shorter at base; leaves lanceolate, narrowly linear, acuminate; spikes 6cm long, floral glumes densely hair, awned, grains oblong. Frequently found along cultivated fields and in forest hilly areas⁴. The whole plant is used in treating Rheumatism⁵. The juice from the plant is used in treating various skin disorders and possesses anti-diabetic, anti bacterial and antimicrobial properties⁶. The present study has been carried out to investigate the antimicrobial activity against nine different bacterial strains.

MATERIALS AND METHODS

Plant material collection

The plant was collected from Kurnool district of Andhra Pradesh in the month of

October 2011 and was authenticated by Dr. P. Jayaraman, (PARC) Tambaram, Chennai. The aerial part was air dried to a constant weight and made into coarse powder.

Preparation of the extracts

About 450 g of the coarse powder was extracted with ethanol followed by chloroform by continuous hot percolation method (Soxhlet apparatus). The marc was then macerated with water to get aqueous extract. All the extracts were then evaporated under reduced pressure and they were stored in refrigerator till use.

Phytochemical studies

All the extracts were subjected to preliminary phytochemical screening to identify the constituents present in them^{7,8}.

Microorganisms

A total of eight bacterial and two fungal species were used in this study. Microorganisms were procured from Microbial type culture collection (MTCC), Chandigarh, National collection of industrial microorganism (NCIM), Pune and American type culture collection (ATCC). The list of microorganisms used in this study is included in the Table 1.

Antimicrobial activity

Agar well diffusion assay

All the extracts were dissolved in DMSO (1%) to get a concentration of 250µg/ml. Agar plates were used for the study using cup plate method. The microorganisms

were inoculated on the agar medium by spread plate technique. Four wells were bored in each plate and 10 μ l of the extract samples were added in the well plate. The inoculated plates were incubated at 37°C for 24 h. Antimicrobial activity was evaluated by measuring the zone of inhibition against the test organisms. All the assays were carried out in triplicate and the results recorded as mean \pm SEM of the three experiments. Ciprofloxacin at the concentration of 1 mg/ml (10 μ l/well) was used as standard.

RESULTS AND DISCUSSION

The current study was initiated because of the increasing resistance to antibiotics of

many skin pathogens including bacteria and fungi. Plant extracts and compounds are of new interest as antiseptics and antimicrobial agents in dermatology⁹. The methanolic and aqueous extracts of *Chloris barbata* exhibited moderate antibacterial activity with all the tested strains of microorganisms at 250 μ g/ml concentration on comparison with the standard ciprofloxacin. The obtained activity may be due to the presence of flavonoids and tannins. Further studies are under progress to characterize the active principles.

Table 1: Antimicrobial activity of the extracts of *Chloris barbata*

Sl.no	Micro organisms	Conc. of extract (mg/ml)	Zone of inhibition			Standard Ciprofloxacin 100 mg/ml
			Chloroform extract (mm)	Aqueous extract (mm)	Methanolic extract (mm)	
1.	<i>S. typhi</i> (ATCC 12176)	250	10	14	10	33
2.	<i>B. Lintus</i> (NCIM 2018)	250	7	15	12	30
3.	<i>K. pneumonia</i> (NCIM 2707)	250	7	15	12	30
4.	<i>S. griseus</i> (NCIM 2623)	250	7	13	14	31
5.	<i>B. subtilis</i> (NCIM 2063)	250	8	13	14	34
6.	<i>S. aureus</i> (ATCC 29737)	250	11	12	13	34
7.	<i>S. albus</i> (NCIM 2178)	250	10	15	10	37
8.	<i>E. coli</i> (ATCC 10536)	250	12	15	10	37
9.	<i>P. aeruginosa</i> (NCIM 2206)	250	7	15	17	39

CONCLUSION

The results from this investigation indicates that the medicinal plant extracts offer significant potential for the development of novel antimicrobial therapies and treatments of several diseases caused by microorganisms. The results of this study give some scientific credence to the indigenous uses of the Indian medicinal plants evaluated for the treatment of fever. This study supports further research will be needed for identification of the bioactive compounds of the plant which are responsible for the pharmacological action against the disease causing human pathogens.

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