SHORT COMMUNICATION Open Access

ISSN 2278-1404

International Journal of Fundamental & Applied Sciences

Psoralea Corylifolia L. A Potent Medicinal Plant with Broad Spectrum of Medicinal Properties

B Kiran*, V Lalitha, KA Raveesha

PG Department of Biosciences, CMR Institute of Management Studies (Autonomous), HRBR layout, Kalyana Nagar, Bangalore - 560043, Karnataka State, India, Department of Studies in Botany and Microbiology, Maharanis Science College for Women, Palace Road Bangalore-560001, Karnataka State,India, Department of Studies in Botany, Manasagangotri, University of Mysore, Mysore-570 006, Karnataka State, India

Abstract : ***Kindly rewrite Title & Abstract in IJFAS Format***

Background & Objective:

Material & Methods

Antifungal activity of the bioactive compound 2H-Furo[2,3-H]-1-benzopyran-2-one isolated from seeds of *Psoralea corylifolia* L. recorded complete inhibition of *Drechslera halodes* and *Trichoderma viride* at 800ppm concentration. **Results:** *Cladosporium cladosporoides* recorded 98.0% inhibition at 1000ppm , *Curvularia lunata* recorded 71.0% inhibition at 800ppm and *Alternaria alternata* recorded 90.0% inhibition at 900ppm concentration respectively. The Minimum Inhibitory Concentration (MIC) of all the test fungi was identified and all the results obtained were compared to synthetic fungicide Dithane M45 and Bavistin. **Conclusion: Needed**

Key words: *Psoralea corylifolia, Bioactive compound, Antifungal, Bavistin, Dithane M45*

1. Introduction

According to the World Health Organization (WHO), more than 80% of the world's population relies on traditional medicine for their primary healthcare needs[1]. The use of herbal medicines in Asia represents a long history of human interactions with the environment. Plants used for traditional medicine contain a wide range of substances that can be used to treat chronic as well as infectious diseases[2]. Plants have been a source of herbal remedies throughout the history of mankind. Various medicinal plants have been used for years in daily life to treat diseases all over the world[3,4,5]. Over 20,000 plants have medicinal values and many plants are yet to be explored for their potentials. In addition, many of the existing synthetic drugs cause various side effects. Hence, drug development from plant based compounds could be useful in meeting this demand for newer drugs with minimal side effects [6,5]. Antimicrobial compounds are a group of chemical compounds which are biosynthetically or synthetically produced which either destroy or usefully suppress the growth and metabolism of variety of microorganisms. These compounds have various functional groups to be active. Some antimicrobial agents are effective in controlling infectious diseases in plants, animals and humans [7]. Increasing reliance on the use of medicinal plants in the industrialized societies has been traced to the extraction and development of several drugs and chemotherapeutics from these plants as well as from traditionally used rural herbal remedies [8]. In the present study, antifungal activity of bioactive compound 2H-Furo[2,3-H]-1-benzopyran-2-one isolated from seeds of *Psoralea corylifolia* L belongs to family Fabaceae were investigated in *invitro* condition compared with synthetic fungicide.

**Corresponding author*

Full Address :

PG Department of Biosciences

CMR Institute of Management Studies (Autonomous)

C.A. #2, 3rd 'C' Cross, 6th 'A' Main, HRBR layout, 2nd Block Kalyana Nagar, Bangalore -560043,Karnataka, India

Ph.No: 09379267558

E.mail: bkiran2702@gmail.com

2. Material and Methods

2.1 Plant material

Fresh and healthy seeds of *P.corylifolia* L., were washed with tap water thrice and two to three times with distilled water .The seeds were air dried at room temperature. Completely air dried seeds were powered.

2.2 Isolation of the Bioactive compound

Bioactive compound was isolated from seeds of *P. corylifolia* following the procedure of Harborne [9].

2.3 Antifungal activity assay of the bioactive compound

2.3.1 Test Fungi

Six fungal species viz., *Cladosporium cladosporoides, Curvularia lunata, Drechslera halodes, Alternaria alternata* and *Trichoderma viride* isolated from soil sample served as test fungi.

2.3.2 Poisoned food technique

CDA medium with different concentrations of the bioactive compound viz., 100, 200, 300, 400, 500, 600, 700, 800, 900 and 1000ppm were prepared and poured into sterile petriplates allowed to cool and solidify. Five mm mycelium disc of seven day old cultures of *C.cladosporoides, C. lunata, D. halodes, A. alternata* and *T. viride* were placed at the center of the petriplates and incubated at 25 ±1° C. The CDA medium without bioactive compound but with the same concentration of sterile distilled water served as control. The colony diameter

was measured in mm. Similarly synthetic fungicides viz., Dithane M45 and Bavistin were also tested against all the test fungi at the recommended dose of 2000ppm concentration. For each treatment three replicates were maintained. The percent inhibition of mycelial growth if any was determined by the formula PI = (C-T/C)X100 Where C= Diameter of control colony, T=Diameter of treated colony. Minimal inhibitory concentration (MIC) for each of the test fungi was also determined [10,11]. The data were subjected to statistical analysis by ANOVA and Tukey's HSD.

3. Result

3.1 Isolation of the Bioactive compound

The bioactive compound 2H-Furo[2,3-H]-1-benzopyran-2-one was isolated. From the observation it was recorded 0.47 Rf value and 138^0 C melting point.

C. lunata recorded 98.0% ,*D.halodes,* recorded 95.0%, *A. alternata* and *T.viride* recorded 100% inhibition (Table I).

4. Discussion

Plants have supplied over 25% of prescription drugs used in human medicine and such pharmacologically active plants have also provided leads to natural pesticides[12]. Many of the plant materials used in traditional medicine are readily available in rural areas at relatively cheaper than modern medicine[13]. Plants generally produce many secondary metabolites which constitute an important source of microbicides, pesticides and many pharmaceutical drugs. Plant products still remain the principal source of pharmaceutical agents used in traditional medicine [14,15]. It is estimated that approximately fifty six percent of lower income world population use herbal medicine and

Table I: Effect of bioactive compound 2H-Furo[2,3-H]-1-benzopyran-2-one isolated from the seeds of *P. corylifolia* L. on mycelial growth of different species of soil borne fungi

Microorganisms	Inhibition (%) Concentration of the Bioactive Compound (ppm)												
	100	200	300	400	500	600	700	800	900	1000	Dithane M45 2000 ppm	Bavistin 2000 ppm	MIC (ppm)
Cladosporium cladosporoides	10.5^{a} ±0.0	17.3^{b} ±0.0	29.0^{c} ±0.2	43.2^{d} ±0.0.	56.8^{e} ±0.0	69.0^{f} ±0.0	80.0^{g} ±0.0	88.3^{h} ±0.0	95.2^{i} ±01	98.0^{j} ±0.0	95.0^{a} ±0.0	100.0^{b} ±0.0	-
Curvularia luna-ta	7.5^{a} ±0.1	14.9^{b} ±0.0	21.4^{c} ±0.0	34.2^{d} ±0.0	43.9^{e} ±0.0	56.7^{f} ±0.1	68.1^{g} ±0.1	71.0^{h} ±0.1	71.0^{h} ±0.2	71.0^{h} ±0.1	98.0^{a} ±0.1	100.0^{b} ±0.1	800
Drechslera halodes	11.2^{a} ±0.0	23.5^{b} ±0.1	35.0^{c} ±0.0	49.0^{d} ±0.1	60.0^{e} ±0.1	78.0^{f} ±0.0	91.0^{g} ±0.0	100^{h} ±0.0	100^{h} ±0.0	100^{h} ±0.0	95.0^{a} ±0.0	100.0^{b} ±0.0	800
Alternaria alternata	10.0^{a} ±0.0	17.5^{b} ±0.2	27.3^{c} ±0.1	39.0^{d} ±0.2	46.0^{e} ±0.1	57.0^{f} ±0.2	71.0^{g} ±0.2	83.2^{h} ±0.1	90.0^{i} ±0.0	90.0^{i} ±0.2	100.0^{a} ±0.0	100.0^{b} ±0.0	900
Trichoderma viride	15.0^{a} ±0.1	28.4^{b} ±0.0	39.0^{c} ±0.1	56.2^{d} ±0.0	70.0^{e} ±0.0	88.0^{f} ±0.0	97.3^{g} ±0.0	100^{h} ±0.0	100.0^{h} ±0.1	100.0^{h} ±0.0	100.0^{a} ±0.1	100.0^{b} ±0.0	800

*Values are the mean of three replicates, ± standard error. The means followed by the same letter (S) are not significantly different at P<0.05 when subjected to Tukey's HSD. Pattern of percent Inhibition increase is not uniform for all the microorganisms.

3.2 Antifungal activity assay of the bioactive compound

3.2.1 Poisoned food technique

Among the five fungi tested, complete inhibition was observed in *D. halodes* and *T. viride*. In *D. halodes* complete inhibition was observed in 800ppm concentration and at 700ppm concentration the inhibition percentage was 91.0%, 78.0% at 600ppm , 60.0% in 500ppm and at 100ppm concentration, the percentage inhibition was 11.2. *T. viride* recorded 15.0% in 100ppm, 28.4% in 200ppm , 88.0% in 600ppm and 97.3% in 700ppm concentration. Complete inhibition was observed in 800ppm concentration of the bioactive compound. In *A. alternate,* maximum inhibition was observed at 900ppm and recorded 90.0% inhibition. At 800ppm concentration, it was recorded 83.2% inhibition and at 100ppm concentration it was recorded 10.0% inhibition. *C. cladosporoides* recorded maximum inhibition of 98.0% in 1000ppm concentration, 95.2% in 900ppm and 88.3% inhibition in 800ppm concentration. In *C. lunata* at 800, 900 and 1000ppm concentration, it was recorded 71.0% inhibition and at 100ppm, it was recorded 10.5% inhibition. The minimum inhibitory concentration (MIC) of four fungi was identified and recorded 800ppm in *C. lunata* , *D.halodes,* and *T.viride.* *A. alternata* recorded 900ppm as a MIC. Compared to synthetic fungicides Dithane M 45 and Bavistin, 100% inhibition was observed in all the test fungi at a recommended dosage of 2000ppm in Bavistin. In Dithane M 45, *C.cladosporoides* recorded 95.0%,

supplementation for their primary health care[16]. In the recent years, research on medicinal plants has attracted a lot of attentions globally. Large body of evidence has accumulated to demonstrate the promising potential of Medicinal Plants used in various traditional, complementary and alternate systems of treatment of human diseases. Plants are rich in a wide variety of secondary metabolites such as tannins terpenoids, alkaloids, flavonoids, etc, which have been found in vitro to have antimicrobial properties [17,18,19].

5. Conclusion

From the above observation it can be concluded that the bioactive compound 2H-Furo[2,3-H]-1-benzopyran-2-one isolated from the seeds of *P. corylifolia* showed a promising result in controlling the soil borne fungi and compared to synthetic fungicides, bioactive compound recorded a better result in inhibiting the fungi at lower concentration. Hence the bioactive compound 2H-Furo[2,3-H]-1-benzopyran-2-one can be exploited for different types of biological assay which is ecologically safe.

Acknowledgement

The authors are thankful to the CMR Institute of Management Studies (Autonomous), Maharanis Science college for women, Bangalore and Herbal Drug Technology laboratory, University of Mysore, Mysore for providing facilities.

Reference

1. Duraipandiyan V, Ayyanar M & Ignacimuthu S, Antimicrobial activity of some ethnomedicinal plants used by Paliyar tribe from Tamil Nadu, India. *BMC Complementary Altern Med*, **6** (2006) 35.
2. Goyal AK, Middha SK, & Sen A. Evaluation of the DPPH radical scavenging activity, total phenols and antioxidant activities in Indian wild *Bambusa vulgaris* "Vittata" methanolic leaf extract, *J Nat Pharm*, **1** (2010) 40-45.
3. Middha SK, Usha T, Goyal AK, & Pande V, An invitro new vista to identify hypoglycemic activity. *Int J Fundam Appl Sci*, **1** (2012) 27–29.
4. Prashanthi P, Anitha S, & Shashidhara S, Studies on the antibacterial activity of the aqueous extract of the roots of *Rotula aquatica* Lour. *Int J Fundam Appl Sci*, **1** (2012) 88–91.
5. The Wealth of India, Raw materials, Council of Scientific and Industrial Research. New Delhi: **9** (1972) 80.
6. Srivastava A & Shukla KYN, Recent development in plant derived antimicrobial constituents- a Review. *J Med Arom Plant Sci,* **20** (2000)17.
7. Lavanya G & Brahmaprakash GP, Phytochemical Screening And Antimicrobial Activity Of Compounds From Selected Medicinal And Aromatic Plants, *Int j sci nat,* **2** (2011) 287.
8. Rajendra G & Kyong SK, Bioactive Volatile Compounds Of Three Medicinal Plants From Nepal. *Kathmandu Uni J Sci Eng Tech*, **8** (2012) 51.
9. Harborne JB, Phytochemical methods: A guide to modern techniques of plant analysis.3rd ed. Chapman and Hall publishers, New York (1998) 7-14.
10. Pinto CMF, Maffia LA, Casali VWD & Cardoso AA, *In vitro* effect of plant leaf extracts on mycelial growth and sclerotial germination of *Sclerotium cepivorum. J phytopathol,* **146** (1998) 421.
11. Bansal RR & Guptha RK, Evaluation of plants extracts against *Fusarium oxysporum*, wilt pathogen of fenugreek. *Ind Phytopathol*, **53** (2000) 107.
12. Sener B, Bingol F, Erdogan I, Bowers WS, & Evans PH, Biological activity of some Turkish medicinal plants. *Pure Appl Chem*, **70** (1998) 403.
13. Mann A, Banso A & Clifford LC , An antifungal property of crude plant extracts from *Anogeissus leiocarpus* and *Terminalia avicennioides. Tanzania J Health Res*, **10** (2008) 34.
14. Ibrahim MB, Anti-microbial effects of extract leaf, stem and root bark of Anogeissus leiocarpus on *Staphylococcus aureaus, Streptococcus pyogenes, Escherichia coli* and *Proteus vulgaris*. *J Pharma Devpt,* **2** (1997) 20.
15. Ogundipe O, Akinbiyi O & Moody JO, Antibacterial activities of essential ornamental plants, *Nigeria J Nat Prod & Med,* **2**(1998) 46.
16. Planta M & Gundersen B, Prevalence of the use of herbal products in a low income population. *Family Med ,* 32 (2000) 252.
17. Dahanukar SA, Kulkarni RA, & Rege NN, Pharmacology of Medicinal Plants and Natural Products, *Ind J Pharmacol*, **32** (2000)81.
18. Cowan MM, Plant products as anti-microbial agents. *Clin microbiol reviews*, **12** (1999) 564.
19. Alam S, Antimicrobial Activity of Natural Products From Medicinal Plants, *Gomal J Med Sci*, **7** (2009)72.